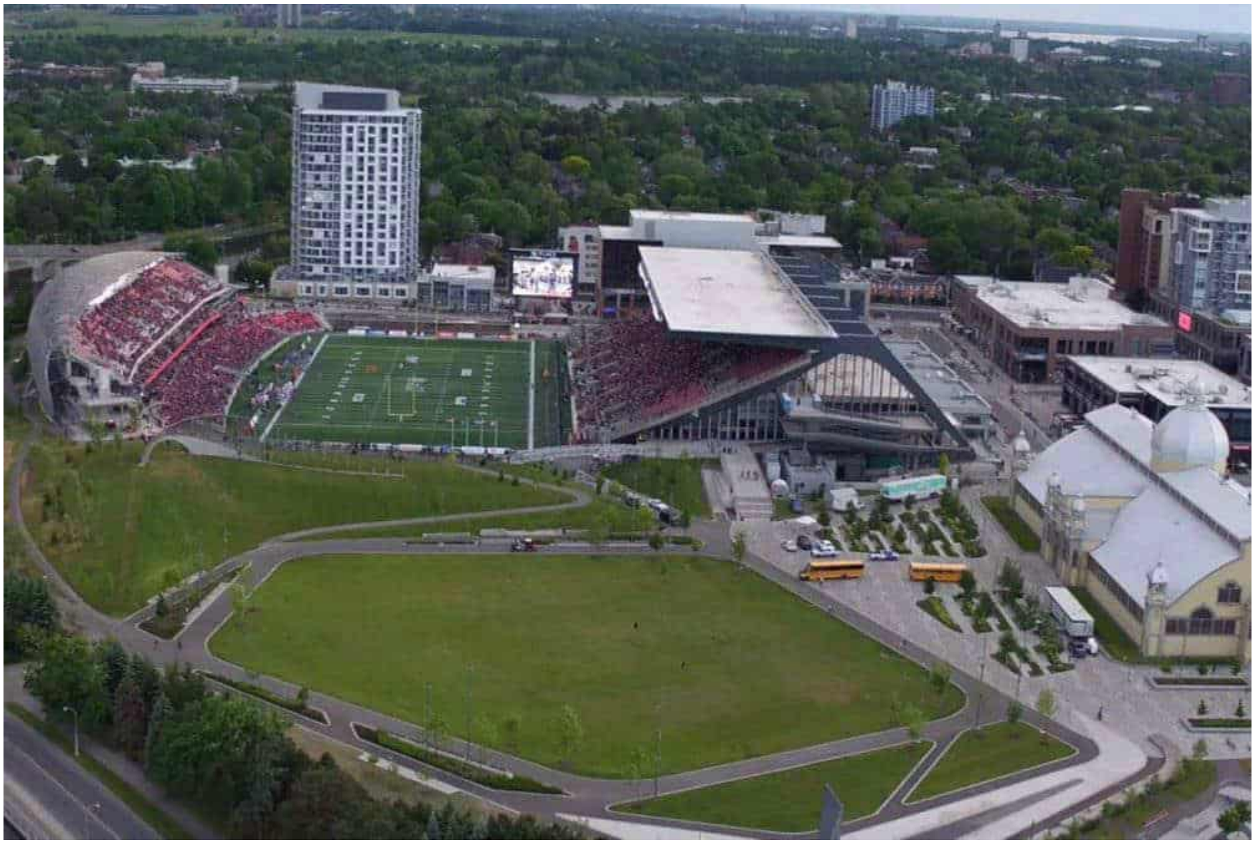
CITY OF OTTAWA

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

LANSDOWNE PARK - NORTH SIDE STANDS

JANUARY 17, 2025



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CITY OF OTTAWA

PROJECT NO.: CA0045396.3464
January 17, 2025

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January 17, 2025

City of Ottawa
Corporate Real Estate Office
110 Laurier Avenue West
Ottawa, Ontario
K1P 1J1

Attention: **Richard Barker**
Advisor, Environmental Remediation Unit

Dear Mr. Barker:

Subject: **Phase Two Environmental Site Assessment**
Lansdowne Park - North Side Stands

Please find enclosed one (1) electronic copy, in PDF format, of our Final report entitled *Phase Two Environmental Site Assessment*, Lansdowne Park - North Side Stands.

We thank you for entrusting us with this assignment and look forward to future opportunities with the City. In the meantime, should you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Yours sincerely,

WSP Canada Inc.

Jason F. Taylor, H.B.Sc.
Senior Environmental Scientist

Encl. (1)
WSP ref.: CA0045396.3464

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EXECUTIVE SUMMARY

WSP Canada Inc. (“WSP”) was retained by City of Ottawa (the “City“) to conduct a Phase Two Environmental Site Assessment (ESA) of a 0.8527 hectare portion of the larger Lansdowne Park property located at 945 Bank Street currently occupied by the TD Place Stadium North Side Stands and part of the TD Place Area (hereinafter referred to as the “Phase One Property” or “Site”). The Phase Two Property is identified in Ontario Land Titles (LT) as part of Property Identification Numbers (PIN) 04139-0263 to 04139-0269 and is legally described as Part of Lot 23 (Block 5), Part of Lots 19, 20, 21 & 22 (Block 6), & Part of O’Connor Street (Closed by Judge’s Order Instrument No LT1245216) Registered Plan No. 26085, Lots 17 to 23, 61 & 62, and Part of Lots 16, 24 and 46 to 60, Part of Lansdowne Avenue (Closed by Judge’s Order Instrument No LT1245216) Registered Plan No. 35722, Part of Lots 46, 47, 48, 49 & 50 Registered Plan No. 30307 and Part of Lot “I” Concession “C” (Rideau Front). The Phase Two Property is currently owned by the City and was occupied by the Ottawa Sports and Entertainment Group (OSEG) for use as the TD Place Stadium North Side Stands as well as the TD Place Arena and office spaces.

The Phase Two ESA was undertaken to 1) further assess Areas of Potential Environmental Concern (APEC) identified in a Phase One ESA previously carried out at the Phase Two Property by WSP, as documented in the report entitled “Phase One Environmental Site Assessment, Lansdowne Park – North Side Stands, Ottawa, Ontario,” dated December 19, 2024, (WSP, 2024); 2) determine the location and concentration of contaminants in the land or water on, in or under the Phase Two Property; 3) obtain information about environmental conditions in the land or water on, in or under the Phase Two Property necessary to undertake a risk assessment, in accordance with *Ontario Regulation 153/04 – Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA Part XV.1 of the Environmental Protection Act (EPA)*, as amended (“O.Reg. 153/04”) with respect to one or more contaminants of concern; and 4) determine if applicable Site Condition Standards and standards specified in a risk assessment for contaminants on, in or under the Phase Two Property were met as of the certification date.

While this Phase Two ESA was conducted in accordance with the requirements of Schedule E of O.Reg. 153/04, WSP understands that the Phase Two ESA is required for due diligence purposes to support the Site Plan Application for the redevelopment of the North Side Stands only and the filing of a Record of Site Condition (RSC) is not required at this time. The Phase Two ESA was conducted in accordance with the proposed scope of work and Terms of Reference provided in WSP’s proposal / work agreement 2024CA326951 dated October 24, 2024 and subsequent amendments.

The Phase One ESA (WSP, 2024) identified a number of Potentially Contaminating Activities (PCA) and/or current/historic uses or activities, both on and off the Phase Two Property and within the Phase One Study Area (see Figure 4B), that have resulted in the identification of eight (8) Areas of Potential Environmental Concern (APEC) at the Phase Two Property. The Phase Two ESA was undertaken in October through December 2024, to quantitatively assess the APECs identified in the WSP’s Phase One ESA (See Figure 5).

The Phase Two ESA consisted in the drilling and sampling of six (6) boreholes (BH3-24 to BH8-24) advanced to depth ranging up to 8.2 m below ground surface (mbgs). Borehole locations were selected based on site accessibility and access limitations imposed by the existing building and structures. Five (5) of the boreholes (BH3-24, BH5-25, BH6-24, BH7-24 and BH8-24) were instrumented as groundwater monitoring wells.

Overburden beneath the Phase Two Property is generalized as consisting of near-surface fill consisting of silty and gravelly sand with some instances of trace construction debris including pieces of asphalt to depths ranging from 0.06 to 3.05 mbgs, underlain by native deposits of sand with instances of trace to some silt and instances of trace to some gravel or pieces of rock, that extend beyond the maximum depth of investigation (8.2 mbgs). Bedrock was encountered at depths ranging between 16.23 mbgs 22.15 mbgs during a geotechnical investigation conducted by Paterson Group concurrently with the Phase Two ESA (Paterson, 2024).

The existing and planned future use of the Phase Two Property is community. In accordance with requirements of O.Reg.153/04, the Phase Two Property was evaluated with respect to the MECP Table 3 SCS for industrial/commercial/community property uses in non-potable water conditions.

The ground water table was encountered beneath the Phase Two Property at depths between 2.27 and 6.23 mbgs (approximate elevation 59.99 – 60.27 metres above sea level (masl) residing within the native sandy deposits. Based on the groundwater elevation measured on November 8, 2024, shallow ground water flow reflects topography with flow directed to southeast across the Phase Two Property towards the Rideau Canal.

The maximum horizontal hydraulic gradient in the shallow water table (0.005) exists near the southeast corner of the Site while the minimum horizontal hydraulic gradient (0.002) was observed in the northern portion of the Phase Two Property during the November 2024 monitoring event. The average horizontal gradient across the Site in November 2024 was approximately 0.004.

Combustible organic vapour (COV) and total organic vapour (TOV) concentrations measured in soil samples collected during the drilling program ranged from non-detect to 95 parts per million (ppm) (hexane equivalent) and 100 ppm (isobutylene equivalent), respectively.

Grain size analyses of native soils indicate that the soils at the Phase Two Property would be comprised of less than 50% soil particles passing the 75 micrometre (µm) size sieve on more than 30% of the volume of soil investigated and are thus classified as coarse textured in accordance with O.Reg.153/04.

Selected soil samples chosen based on field screening were submitted for analysis of contaminants of potential concern (COPC) including petroleum hydrocarbon fractions F1-F4 (PHCs); polycyclic aromatic hydrocarbons (PAHs); metals (barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, molybdenum, nickel, silver, thallium, uranium, vanadium, zinc); hydride forming metals including arsenic (As), antimony (Sb), selenium (Se); and other regulated parameters including hexavalent chromium (Cr[VI]), hot water-soluble boron (B-HWS), mercury (Hg), electrical conductivity (EC), sodium adsorption ratio (SAR), cyanide and pH. All soil samples reported concentrations below the applicable Table 3 SCS with the following exceptions:

- Benzo(a)pyrene in soil samples collected from boreholes BH6-24 and BH8-24. The benzo(a)pyrene impacted soil is inferred to be associated with poor quality fill material placed during previous construction activities at the Phase Two Property. The inferred area of soil impacted by benzo(a)pyrene is estimated at 3,300 m^2; and,
- EC in soil a sample in borehole BH8-24 on the eastern portion of the Phase Two Property near the TD Place Arena entrance, is likely associated with road salting activities on the Phase Two Property. The inferred area of soil impacted by EC is estimated at 1,400 m^2.

Selected groundwater samples were submitted for chemical analyses of the COPCs including BTEX, PHCs, PAHs, polychlorinated biphenyls (PCBs) and ammonia. All ground water samples reported concentrations below the applicable Table 3 SCS.

In summary, the Phase Two ESA soil and groundwater analytical data confirmed that the Phase Two Property has been impacted, likely through the placement of poor quality fill or the presence of construction debris within reworked native material. Soil impacts by one of more of the COPC were identified at two (2) of the six (6) boreholes (BH6-24 and BH8-24) advanced at the Phase Two Property. These include beneath the North Side Stands (BH6-24) and immediately adjacent to the TD Place arena structure (BH8-24) (see figures 11A and 14A). No groundwater impacts were identified exceeding the applicable SCS beneath the Phase Two Property.

The use of de-icing salts on adjacent roadways, pathways, steps and entryways has likely contributed to the elevated EC reported in the shallow soil sample collected from BH8-24 near the entry way to the TD Place Arena. As per Section 49.1 of O.Reg. 153/04, the applicable SCS is deemed not to be exceeded if the Qualified Person has determined that the exceedance has been caused by a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both

Based on the conclusions of this report, an RSC cannot be filed unless the impacts are delineated, remediated and/or addressed through a Risk Assessment carried out in accordance with O.Reg.153/04. Furthermore, it should be noted that any excess soil generate as a result of remediation or redevelopment activities exceeding the MECP Table 3 SCS for industrial/commercial/community property uses will likely require disposal at a facility licensed to accept such soil. Additionally, further investigation could be carried out and potentially reduce the estimate areas of impacted soil.

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LIST OF ACRONYMS

APEC	Area of Potential Environmental Concern
AST	Aboveground Storage Tank
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CALA	Canadian Association for Laboratory Accreditation
C of A	Certificate of Approval
CN	Cyanide
COPC	Contaminant of Potential Concern
COV	Combustible Organic Vapour
CSM	Conceptual Site Model
DO	Dissolved Oxygen
EC	Electrical Conductivity
EPA	Environmental Protection Act
ESA	Environmental Site Assessment
LDPE	Low-Density Polyethylene
masl	Metres Above Sea Level
mbgs	Metres Below Ground Surface
MDL	Method Detection Limit
MECP	Ministry of the Environment, Conservation and Parks
MTM	Modified Transverse Mercator
MW	Monitoring Well
PCA	Potentially Contaminating Activity
ORP	Oxidation Reduction Potential
PCBs	Polychlorinated Biphenyls
PHCs	Petroleum Hydrocarbons
PAHs	Polycyclic Aromatic Hydrocarbon
QA/QC	Quality Assurance/Quality Control
RDL	Reporting Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
RSC	Record of Site Condition
SAP	Sampling and Analyses Plan
SAR	Sodium Adsorption Ratio
SCS	Site Condition Standard
TCLP	Toxicity Characteristic Leaching Procedure
µg/g	Micrograms per Gram
µg/L	Micrograms per Litre
TOV	Total Organic Vapour
UST	Underground Storage Tank

VOCs	Volatile Organic Compound

1 INTRODUCTION

WSP Canada Inc. ("WSP") was retained by the City of Ottawa (the "City") to conduct a Phase Two Environmental Site Assessment (ESA) of a portion of the property located at 945 Bank Street in the City of Ottawa, commonly known as Lansdowne Park. The subject parcel, hereinafter referenced as the "Phase One Property" or "Site", comprises an area of 0.8527 hectares currently occupied by TD Place Stadium North Side Stands and part of TD Place Area. A key plan showing the location of the Phase Two Property is provided on Figure 1. The Phase One Property is currently owned by the City and is operated by Lansdowne Stadium Limited Partnership, a limited partnership between the City of Ottawa and the Ottawa Sports and Entertainment Group ("OSEG").

The Phase Two ESA was undertaken to: 1) further assess Areas of Potential Environmental Concern (APEC) identified in a Phase One ESA previously carried out at the Phase Two Property by WSP, as documented in "Phase One Environmental Site Assessment, Lansdowne Park – North Side Stands, Ottawa, Ontario," dated December 19, 2024, (WSP, 2024); 2) determine the location and concentration of contaminants in the land or water on, in or under the Phase Two Property; 3) obtain information about environmental conditions in the land or water on, in or under the Phase Two Property necessary to undertake a risk assessment, in accordance with *Ontario Regulation 153/04 – Records of Site Condition, Part XV.1 of the Environmental Protection Act (EPA Part XV.1 of the Environmental Protection Act (EPA)*, as amended ("O.Reg. 153/04") with respect to one or more contaminants of concern; and 4) determine if applicable Site Condition Standards and standards specified in a risk assessment for contaminants on, in or under the Phase Two Property were met as of the certification date.

This Phase Two ESA was conducted in accordance with the requirements of Schedule E of O.Reg. 153/04 and in accordance with the proposed scope of work and Terms of Reference provided in WSP's proposal 2024CA326951 dated October 24, 2024, and subsequent amendments.

1.1 PHASE TWO PROPERTY DESCRIPTION

Figure 2 provides a layout of Lansdowne Park and the location of the Phase One Property therein. The Phase One Property is irregular in shape with a frontage of approximately 171 metes facing Exhibition Way and a lot depth of approximately 51 metres. A generalized site plan depicting the layout of the Phase One Property is provided on Figure 3.

The Phase Two Property is identified in Ontario Land Titles (LT) as part of Property Identification Numbers (PIN) 04139-0263 to 04139-0269 and is legally described as Part of Lot 23 (Block 5), Part of Lots 19, 20, 21 & 22 (Block 6), & Part of O'Connor Street (Closed by Judge's Order Instrument No LT1245216) Registered Plan No. 26085, Lots 17 to 23, 61 & 62, and Part of Lots 16, 24 and 46 to 60, Part of Lansdowne Avenue (Closed by Judge's Order Instrument No LT1245216) Registered Plan No. 35722, Part of Lots 46, 47, 48, 49 & 50 Registered Plan No. 30307 and Part of Lot "I" Concession "C" (Rideau Front).

The Phase Two Property is located on the south side of Exhibition Way, approximately 45 metres east of Bank Street (Figure 1). The Phase Two Property lies in a municipal urban setting in an area of mixed residential and commercial land uses. The Lansdowne Park property is mixed-use property including commercial retail and office and residential property uses (Zone A), mixed commercial and community uses including TD Place, the Aberdeen Pavilion and Horticulture Building (Zone B), and an Urban Park (Zone C). The Phase One Property lies within Zone B of Lansdowne Park.

The Phase Two Property is currently developed with the North Side Stands and arena venue of TD Place, a multi-venue sports and entertainment facility including an indoor arena (home of the Ottawa 67's and Ottawa Charge hockey clubs and the Ottawa BlackJacks basketball club) and outdoor stadium (home of the Ottawa Redblacks football club and Ottawa Atletico soccer club).

The Phase Two Property is currently operated by Lansdowne Stadium Limited Partnership, a limited partnership between the City of Ottawa and the Ottawa Sports and Entertainment Group ("OSEG"), the latter of which manages the sports teams and is responsible for the operation and programing of the stadium and indoor arena.

A plan of survey of the Phase Two Property is provided in Appendix A.

1.2 PROPERTY OWNERSHIP

Contact information for the Phase Two Property Owner is as follows:

Table 1.1 Phase Two Property Owner and Contact Information

Organization:	City of Ottawa
Contact:	Richard Barker Specialist, Environmental Remediation Environmental Remediation Unit
Address:	Housing Solutions and Investment Services Strategic Initiatives Department 110 Laurier Avenue West, Ottawa ON K1P 1J1
Telephone:	613-580-2400 x12567
Email:	richard.barker@ottawa.ca

1.3 CURRENT AND PROPOSED FUTURE USES

The Phase Two Property is currently used for commercial/community purpose as defined under O.Reg. 153/04. Based on discussions with the City the future use of the Phase Two Property will be consistent with commercial/community property use as defined under O.Reg. 153/04. There is no proposed change in property use, and as such, a Record of Site Condition (RSC) is not required to be filed under O.Reg.153/04 in support of the planned redevelopment.

1.4 APPLICABLE SITE CONDITION STANDARDS

The legislative and regulatory requirements for contaminated sites in Ontario are established by O.Reg.153/04. O.Reg.153/04 provides two (2) approaches for cleaning up contaminated sites including: 1) restoration to generic Site Condition Standards (SCS) comprised of background standards and effects-based standards; and 2) preparation of a risk assessment. The generic and background SCS are set out in the document entitled "*Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act"* dated 15 April 2011 (MECP, 2011a). The generic effects-based SCS have been developed using a risk-based approach and are provided in Tables 2 through 9. The application of the appropriate generic effects-based SCS is dependent upon several site-specific conditions including:

1) the existing/proposed property use; 2) the existing/potential ground water use; 3) depth of clean-up;
4) soil texture; 5) depth to bedrock; 6) proximity to a water body; and 7) soil pH.

The SCS applicable to the Phase Two Property have been evaluated based on the following rationale:

- There are no known areas of natural significance or conditions in the vicinity of the Phase Two Property, which would cause the Phase Two Property to be classified as potentially sensitive according to the Ministry of Natural Resources' Natural Heritage Information Centre web site;
- Based on the results of the borehole drilling, the depth of the soil on the Phase Two Property is greater than 2.0 metres below ground surface (mbgs). Final grades following redevelopment of the Phase Two Property will be similar to the current grades and thus will not affect the soil depth characteristics such that the Phase Two Property would ever be classified as a shallow soil property;
- Ground water is not used as a source of potable water within 250 metres of the Phase Two Property and municipal services are in place;
- Discrete or average (from within a 2 m radius) soil pH values measured across the Phase Two Property ranged reported within the range of 7 – 9;
- No permanent water bodies are located on or within 30 metres of the Phase Two Property. The Rideau Canal lies 175 metres southeast of the Phase Two Property at is closest approach to the Phase Two Property; and,
- Based on the grain size distribution curves completed as part of previous assessments at Lansdowne Park (Appendix D), the predominant subsurface soil conditions across the Phase Two Property are considered coarse textured for the purposes of assessment.

Based on the Phase Two Property characteristics and the proposed commercial/community property use, the Table 3 SCS for Industrial/Commercial/Community property use and coarse textured soils in a non-potable ground water condition as provided in *Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act* (MECP, April 15, 2011) have been applied in assessing the soil and ground water quality at the Phase Two Property.

2 BACKGROUND INFORMATION

2.1 PHYSICAL SETTING

The Phase Two Property lies in a typical municipal urban setting in an area of mixed residential and commercial land uses. The Phase One Property lies within Lansdowne Park, a mixed-use property including retail, office and residential property uses (Zone A) as well as TD Place, the Aberdeen Pavilion and Horticulture Building (Zone B) and an Urban Park (Zone C). The general physical setting of the Phase Two Property and surrounding properties within the Phase Two Study Area are shown on Figures 2 and 3, respectively.

The topography across the Phase Two Property is relatively flat with an elevation of approximately 66.0 metres above sea level (masl). The Modified Transverse Mercator (MTM) grid reference coordinates of the centre of the Phase Two Property are Easting 368692.79 and Northing 5029067.41 (MTM Zone 9, 1983 North American Datum (NAD83), Canadia Spatial Reference System (CSRS)2010).

The Phase Two Property is currently developed with one building including a portion of TD Place Arena and the Stadium North Side Stands.

There are no Areas of Natural Significance located within 250 metres of the boundaries of the Phase Two Property. The Rideau Canal, a UNESCO World Heritage Site, lies south and east of the Phase Two Property, lying 31.6 metres south of the Phase Two Property at is closest point. There are no drinking water wells on the Phase Two Property.

2.2 PAST INVESTIGATIONS

2.2.1 PHASE ONE ESA (2012, UPDATED 2014)

AMEC (now WSP) completed a Phase One ESA of the Lansdowne Park property of which the Phase Two Property is part of in April 2014. The findings of the investigation are presented in the report titled *“Phase One Environmental Site Assessment, Lansdowne Park & Sylvia Holden Commemorative Park – 945 Bank Street, Ottawa, Ontario”*, dated 09 April, 2014 (AMEC, 2014).

Several of the PCAs identified at the Lansdowne Park property and/or within the Lansdowne Park property Phase One Study Area were considered to result in APECs at the Lansdowne Park property. In addition to the on-site and off-site PCAs, a number of historical activities other than those identified as PCAs in O.Reg. 153/04, as amended, were identified at the Lansdowne Park property that were considered to pose APECs at the Lansdowne Park property. These included: 1) the storage and handling of coal as a historic heating fuel; 2) the management of coal residues and wastes; and 3) historic ice making at the Horticultural Building, McElroy Building, Curl-o-Drome. Ice making activities at the Civic Centre are also considered to be an APEC. Several of the APECs were identified during previous investigations and were either not assessed during those investigations, or were, in AMEC’s opinion, not subject to a sufficient level of investigation to qualitatively and quantitatively dismiss them as an APEC and were thus carried forward.

AMEC's findings regarding APECs as a result of the records review, interviews and the site reconnaissance are summarized in the table below.

- APEC-1: Potential soil and/or ground water impact from remnant subsurface heating oil impact in the vicinity of the former Coliseum Annex boiler rooms;
- APEC-2: Potential soil and/or ground water impact from remnant subsurface heating oil impact in the vicinity of the East Lavatory (Horticultural Building) boiler room;
- APEC-3: The eastern landfill (Ur-27) beneath the eastern portion of the Lansdowne Park property;
- APEC-4: The suspected southern landfill in the vicinity of the south side Stands; and,
- APEC-5: Potential soil and/or ground water impact by ammonia in the vicinity of the Horticultural Building associated with former indoor ice making activities.
- APEC-6: Potential soil and/or ground water impact from a historic gasoline service station and historic dry-cleaning facility formerly located at 1014/1016 Bank Street, approximately 23 metres west of the Lansdowne Park property at the northeast corner of the intersection of Bank Street and Wilton Avenue;
- • APEC-7: Potential soil and/or ground water impact from historic gasoline service stations, automotive repair shops and dry cleaners formerly located along Bank Street, including a historic gasoline service station located approximately 25 metres northwest of the Phase One Property at 912 Bank Street;
- • APEC-8: Potential soil and/or ground water impact from a historic transformer, potentially containing oil with polychlorinated biphenyls (PCB) additives, located north of the former Coliseum Building near the west end of the former Coliseum Annex;
- • APEC-9: Potential soil and/or ground water impact from the transformer vault and boiler room and potential unknown fuel sources at the southeast corner of the former McElroy Building;
- • APEC-10: Potential soil and/or ground water impact associated with historic fuel sources and storage methods for the Horticultural Building heating equipment;
- • APEC-11: Potential soil and/or ground water impact associated with a former gasoline and oil storage area located near the former General Purpose Building during occupation by the Military from 1941 through to 1946;
- • APEC-12: Potential soil and/or ground water impact from a free standing boiler house and the boiler house for the former Agricultural Implement Building/Machinery Hall Building located just east of the on NCC Lands;
- APEC-13: Potential soil and/or ground water impact by ammonia in the vicinity of the Civic Centre ice making equipment;
- APEC-14: Potential soil and/or ground water impact by ammonia in the vicinity of the former McElroy Building and former Curl-o-Drome (a.k.a. General Purpose Building) ice making equipment; and,
- APEC-15: Unknown material types and quality associated with fill that has been placed across the Lansdowne Park property.

The 2014 Phase One ESA (AMEC, 2014) was prepared by AMEC (now WSP) under the supervision of Kevin Hicks, M.Sc., P.Geo., QP_{ESA} who supervised the undertaking of this Phase Two ESA. The Phase One ESA was carried out in accordance with and met the reporting requirements of O.Reg. 153/04, as amended and was ultimately used to support the filing of RSC for Zone A and Zone C of Lansdowne Park. The information or data which was used from the Phase I ESA (AMEC, 2014) is thus confirmed to be of adequate quality such that it can be relied upon.

2.2.2 PHASE TWO ESA (2012, UPDATED 2013)

AMEC (now WSP) completed a Phase Two ESA at the Lansdowne Park property, of which the Phase Two Property is a part of, in October 2013. The findings of the investigation are documented in the report titled "Supplemental Phase Two Environmental Site Assessment, Lansdowne Park and Sylvia Holden Commemorative Park, 945 Bank Street, Ottawa, Ontario", dated 30 October 2013 (AMEC, 2013).

The Supplemental Phase Two ESA was undertaken to: (i) further assess APECs identified in a Phase One ESA dated March 7, 2012 (AMEC, 2012a); (ii) to address comments made by the Ministry of the Environment (MOE) on the work undertaken previously and further work as recommended by XCG Environmental Engineers & Scientists ("XCG"), a consultant working on behalf of a local public interest group (MOE, 2011b and MOE, 2011c). The Supplemental Phase Two ESA was used to support the filing of Records of Site Condition (RSCs) for Zone A (redeveloped to mixed commercial and residential property uses) and Zone C (redeveloped parkland property use).

The primary findings of the intrusive investigations carried out at the Lansdowne Park property as part of the Phase Two ESA were as follows.

In general, the subsurface conditions at the Lansdowne Park property consisted of 0.5 to 6.1 metres (BH11-6) of surficial fill consisting of various geologic materials (apparently local soil), waste (e.g., ashes, cinders, coal, putrescible organic matter) and construction/demolition debris (e.g., brick, glass, metal, wood) overlying native loamy sand, underlain by gravelly loamy sand. Waste and construction/demolition fill occur locally across the Lansdowne Park property, notably in vicinities of former buildings that previously existed at the Lansdowne Park property, whereas fill consisting of re-worked soil is more ubiquitous across the Lansdowne Park property. The thickest fill placements were encountered within the former Eastern Landfill (Ur-27). The footprint of the Eastern Landfill (Ur-27) is roughly coincident with a portion of the former shoreline of the inlet from the Rideau Canal.

Although widespread, the loamy sand unit was not continuous across the Lansdowne Park property. It is absent in the general vicinity of the Civic Centre Arena, in the southwest corner of the Lansdowne Park property and at several locations in the east-central portion of the Lansdowne Park property located within or near the inferred footprint of the former inlet of the Rideau Canal. The gravelly loamy sand beneath the loamy sand was found to be essentially continuous across the Lansdowne Park property and extended to the maximum depth of investigation (21.95 mbgs) as determined in a geotechnical investigation of the Lansdowne Park property (Paterson, 2010a).

With the exception of the northeastern portion of the Lansdowne Park property, shallow ground water flow reflects topography with flow directed west to east (low water table condition) or west-southwest to east-northeast (high water table condition) across the Lansdowne Park property. Mounding in the northern corner of the Lansdowne Park property was evident in all monitoring events, resulting in localized outward radial flow to the west, south and east. The mounding was attributed to water originating from the portion of the Rideau Canal located north of the Lansdowne Park property and migrating within the fill materials placed within the former inlet of the Rideau Canal. The combination of these two effects results in shallow ground water flowing off-site across the eastern Lansdowne Park property boundary. A localized, modest depression in the water table exists in the northern portion of the Lansdowne Park property at MW10-19. Its existence is attributed to locally enhanced vertical migration due to the presence of more permeable soil in this area (the gravelly loamy sand unit is replaced with gravelly sand to the south at BH11-11 and by sand at BH11-12 and BH-30 to the east).

Horizontal ground water flow at the Lansdowne Park property was estimated to range from 0.6 m/yr east-northeast to 109 m/yr east with the highest velocities present near the eastern Lansdowne Park property boundary in the vicinity MW10-16 and the lowest velocities present in the vicinity of the Horticultural Building.

There were no known utilities on-site or near the Lansdowne Park property that were deep enough to intersect the shallow water table with the exception of the northeast portion of the Lansdowne Park property where shallower water table elevations occur in the vicinity of the former inlet of the Rideau Canal. The portion of the Rideau Canal located north of the Lansdowne Park property appeared to be influencing the shallow ground water regime due to induced ground water flow along the route of the former inlet of the Rideau Canal that enters the Lansdowne Park property near its northern corner.

Widespread impacts with PAH and heavy metals (and a single instance of an elevated concentration of petroleum hydrocarbons Fraction F3 [PHC F3] in landfill waste) were identified throughout much of Zone A (Generic RSC Property) and Zone C (RA RSC Property) as well as within adjacent areas within Zone B. The impacts were attributed to the past use of coal for heating purposes and the disposal or re-use of spent residues as fill material on-site and the deposition of waste in the former Eastern Landfill (Ur-27).

Elevated PHC F3 in native soil was identified at one location beneath the former Coliseum Annex Boiler Room. This impact was attributed to the past storage and use of heating oil at this location. Heating oil was historically stored in an underground storage tank (UST) that was removed some time prior to May 1993 when a remedial excavation was undertaken to address petroleum impacted soil associated with the former UST.

No other issues (e.g., elevated concentrations of VOC, PCB, dioxins and furans), were identified in any other tested soil/fill samples.

There were no ground water impacts identified beneath the Lansdowne Park property. The samples collected from each monitoring well met the 2011 Table 3 SCS for all tested parameters including VOC, PAH, metals, PHC and landfill leachate indicator parameters. Several samples exhibited exceedances of the 2011 Table 3 SCS for one of more PHC fractions on initial sampling; however, all such locations reported non-detect PHC concentrations upon re-sampling using conventional inertial lift sampling methods and/or re-sampling using low flow sampling techniques.

Several landfill leachate indicator parameters for which no Table 3 SCS exist including ammonia, iron, chemical oxygen demand (COD) and dissolved organic carbon (DOC) exhibited elevated concentrations in groundwater within the footprint of the Eastern Landfill (Ur-27) relative to the surrounding areas.

Low to slightly elevated levels of methane measured in the subsurface within the limit of the former inlet from the Rideau Canal within the footprint limit of Eastern Landfill (Ur-27) and extending to the south. Methane levels in the Eastern Landfill (Ur-27) ranged from 0.8% vol. to 7.3% vol. with up to three locations reporting concentrations excess of the 20% LEL warning threshold. While anaerobic conditions consistent with potential methane generation were noted to exist within the limit of the Eastern Landfill (Ur-27), no measurable subsurface gas pressures were observed at any of the gas probe locations thus implying low gas generation rates. Methane levels measured within the former inlet south of the Eastern Landfill (Ur-27) were less than instrument detection limits (BH12-1) or were well below the 20% LEL threshold limit reporting at 5% LEL (BH12-2).

Approximately 36,015 m^3 (roughly 68,425 tonnes) impacted soil covering an area of approximately 28,770 m^2 were excavated at the Lansdowne Park property between June 26, 2012 and September 6, 2012 and transported to Zone C where the impacted soil was used to construct the East Berm, a large earthen berm to be located east of the existing Frank Clair Stadium. Approximately 210 m^3 (399.51 tonnes) of soil exhibiting elevated levels of pH was excavated from Zone A on July 20, 2012 and transported to the BFI Canada Ottawa Landfill located at 3354 Navan Road, Ottawa, Ontario for final disposal. In some instances the excavation was terminated at the limits of Zone B (Generic RSC Property). In these areas the toe of the excavation was excavated just beyond the Zone A property limit to ensure that no contaminated soil remained at the Generic RSC Property (Zone A).

Approximately 11,640 m^3 (roughly 22,115 tonnes) of clean soil segregated during the remedial excavation was placed into three stockpiles containing approximately 5,840 m^3, 2,900 m^3 and 2,900 m^3 located at the western portion of the Lansdowne Park property (Zone C) for potential as backfill at the Lansdowne Park property or removal from Lansdowne Park property re-use at another location as excess material.

With the exception of several small areas, the remedial excavation was not backfilled due to the impending redevelopment of the Lansdowne Park property which included the excavation of a large underground parking structure, the footprint of which was roughly coincident with the Generic RSC Property (Zone A). Approximately 2,450 m^3 of the 11,640 m^3 of clean stockpiled soil excavated at the Lansdowne Park property meeting 2011 Table 3 SCS was placed at the Generic RSC Property (Zone A) as backfill material immediately around and east of the Horticultural building to accommodate a work area for the Horticultural Building relocations, along Holmwood Avenue as shoring where the excavation reached the property limit, and as excavation ramp construction material and shoring west of the Aberdeen Pavilion. The remainder of the clean stockpiled soil was left on the western portion of the Lansdowne Park property (Zone C) for future re-use on portions of the Lansdowne Park property other than the RSC Property and/or removal from the Lansdowne Park property as excess material.

Results of the Lansdowne Park property and remediation confirmatory soil sampling programs indicated that soil within Zone A met the 2011 Table 3 SCS, the remedial works were successful in removing all contaminated soils from Zone A, and that no further remedial action was required on this portion of the Lansdowne Park property. RSC No. 205852 for Zone A was filed in the Environmental Site Registry on November 21, 2011. RSC No. 213166 for Zone C was filed in the Environmental Site Registry on May 12, 2014.

2.2.3 PHASE ONE ESA (2024)

WSP completed a Phase One ESA of the Phase Two Property in December 2024, the findings of which are presented in the report titled *"Phase One Environmental Site Assessment, Lansdowne Park – North Side Stands, Ottawa, Ontario"*, dated 19 December, 2024 (WSP, 2024). The findings of the Phase One ESA identified several past or present uses and/or PCAs on, in or under the Phase One Property or within the Phase One Study Area that contribute to APECs on the Phase One Property where one or more contaminants may be present. Five (5) on-site PCAs (30A, 55A, QP1A, QP2A, QP3A) at the Phase One Property and eight (8) off-site PCA within the Phase One Study Area (28A, 28B, 28C, QP1B, QP2B, QP3B, QP4A, QP4B) were identified that contribute to eight (8) APECs that include the following:

Table 2.1 Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of APEC on Phase One Property	Potentially Contaminating Activity*	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
APEC-1: Unknown fill quality. Historic infilling and grading of the Phase One Property with fill of unknown quality prior to or during construction of the North Side Stands and TD Place Arena and Salons	Entire Phase One Property	PCA 30A: Importation of Fill Material of Unknown	On-site	PAHs, Metals, As, Sb, Se, B-HWS, Cr(VI), Hg, BTEX, PHCs, CN, EC, SAR	Soil
APEC-2: Oil filled transformer in electrical room.	Located centrally on the east portion of the service (lower) level of TD Place	PCA 55A: Transformer Manufacturing, Processing and Use	On-site	PHCs, PAHs, PCBs	Soil and Groundwater
APEC-3: Arena ice making plant. Located on the service (lower) level of TD Place and associated chiller pipelines beneath the arena surface	Located centrally on the east portion of the service (lower) level of TD Place	PCA QP1A: Arena Ice Making Plant (QP defined PCA)	On-site**	Ammonia, glycol (propylene and ethylene)	Groundwater
APEC 4: Brine distribution and chiller lines beneath ice rink	Located centrally on the north portion of the Site beneath the ice rink and extending to the ice making plant)	PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant (QP defined PCA)	On-site***	EC, SAR Na, Cl	Soil Groundwater
APEC-5A: Existing and former tanks including one 2,273 L gasoline AST and one 2,273 L diesel AST; one diesel back-up generator equipped with internal 5,791 L diesel AST; one former AST Located beneath the stadium ramp on the east side of TD Place APEC 5B: Arena ice making plant** Apec 5C: Glycol based snow and ice melting system for the Loading Ramp down to the service (lower) level of TD Place	Located near the northeast corner of the Phase One Property on the loading dock ramp.	PCA 28A, 28B, 28C: Gasoline and Associated Products Storage in Fixed Tanks and PCA QP1B: Arena Ice Making Plant (QP defined PCA) PCAs QP4A and QP4B: Glycol Snow and Ice Melting System (QP defined PCA)	Off-site	BTEX, PHCs, PAHs, Ammonia, glycol (propylene and ethylene) Glycol (propylene and ethylene)	Soil and Groundwater Groundwater Groundwater
APEC 6: Brine distribution and chiller lines beneath ice rink	Located centrally on the north portion of the Site beneath the ice rink and extending to the ice making plant)	PCA QP2B: Brine Distribution and Chiller Lines for Ice Making Plant (QP defined PCA)	off-site***	EC, SAR Na, Cl	Soil Groundwater

<table>
<tr><td>APEC 7: Application of winter de-icing agents. On sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety</td><td>Pedestrian walkways north of Building J, stairs at northeast and northwest entrances to TD Area.</td><td>PCA QP3A: Application of Winter de-icing Agents (QP defined PCA)</td><td>On-site</td><td>EC, CN, SAR
Na, Cl</td><td>Soil
Groundwater</td></tr>
<tr><td>APEC 8: Application of winter de-icing agents. On roads, sidewalks, pathways and laneways for pedestrian and vehicle safety</td><td>Roadways, laneways and pathways immediately north, east and west of Phase One Property</td><td>PCA QP3B: Application of Winter de-icing Agents (QP defined PCA)</td><td>Off-site,</td><td>EC, CN, SAR
Na, Cl</td><td>Soil
Groundwater</td></tr>
<tr><td colspan="6">PCA - *Potentially Contaminating Activity as provided in Schedule D of O.Reg. 153/04 as amended, where applicable, or as determined by the Qualified Person (QP).</td></tr>
<tr><td colspan="6">** This PCA occurs both on-site (PCA QP1A) and off-site (PCA QP1B) as a continuous entity being represented the ice making plant within TD Place (PCA QP1A), the chiller unit on the building exterior (PCA QP1B) and ammonia and glycol supply and return lines running between the two (PCAs QP1A and QP1B).
*** This PCA occurs both on-site (PCA QP1A) and off-site (PCA QP1B) as a continuous entity being represented by the footprint of the arena ice surface and lines leading to it from the arena ice plant.</td></tr>
<tr><td colspan="3">BTEX –Benzene, Toluene, Ethylbenzene and Xylenes
PAHs - Polycyclic Aromatic Hydrocarbons
PCBs – Polychlorinated Biphenyls
PHCs – Petroleum Hydrocarbons
Metals – Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Ag, Tl, U, V, Zn
As, Sb, Se – Arsenic, Antimony and Selenium (hydride metals)
B – HWS – Boron, Hot Water Soluble</td><td colspan="3">Cr (VI) –Hexavalent Chromium
Hg – Mercury
Na – Sodium
Cl^- - Chloride
CN - Cyanide
EC – Electrical conductivity
SAR – Sodium adsorption Ratio</td></tr>
</table>

As per Section 49.1 (1) of O.Reg. 153/04, although APECs 7 and 8 may result in exceedances of the applicable Site Conditions Standards (SCS) for one or more of electrical conductivity (EC), sodium adsorption ratio (SAR) and cyanide (CN) in soil and/or sodium (Na) and chloride (Cl^-) in groundwater, the applicable SCS is deemed not to be exceeded given that a substance has been applied to surfaces for the safety of vehicular and/or pedestrian traffic under conditions of snow or ice or both. These APECs need not be investigated as part of a Phase Two ESA but may need to be considered under *Ontario Regulation 409/19 – On-site and Excess Soil Management*, as amended (“O.Reg.406/19”) with respect to any excess soil that may be generated during redevelopment.

Several other PCAs (PCA 27, 28, 30, 37, 55, 58 and QP2) were also identified on surrounding properties within the Phase One Study Area, none of which are interpreted to result in an APEC on the Phase One Property either due to their downgradient location relative to the Phase One Property, distance from the Phase One Property, or previous investigations at the locations of the off-site PCAs or otherwise which determined them to be of no potential concern.

The 2024 Phase One ESA (WSP, 2024) was prepared by WSP Canada Inc., under the supervision of Kevin Hicks, P.Geo., the QP_{ESA}, who supervised the undertaking of this Phase Two ESA. The Phase One ESA was completed in accordance with the requirements of Schedule D of O.Reg. 153/04.

3 SCOPE OF THE INVESTIGATION

3.1 OVERVIEW OF SITE INVESTIGATION

The investigations documented in this report were carried out to characterize the subsurface soil and ground water conditions at the Phase Two Property with respect to the previously noted APECs and to provide a Phase Two ESA report compliant with the requirements of O.Reg. 153/04. It is understood that a Record of Site Condition (RSC) filing is not required for the Phase Two Property at this time.

The Phase Two ESA was conducted from October to December 2024 and involved the advancement of six (6) boreholes at the Phase Two Property, identified as BH3-24, BH4-24, BH5-24, BH6-24, BH7-24 and BH8-24, five (5) of which completed as ground water monitoring wells (BH3-24/MW24-1, BH5-24/MW24-4, BH6-24/MW24-3, BH7-24/MW24-5 and BH8-24/MW24-2) to facilitate the collection of representative soil and groundwater samples for laboratory analyses.

Specific details regarding the rationale for the locations of boreholes and monitoring wells and the selection of analytical parameters are provided in the Sampling and Analysis Plan provided in Appendix B. The Sampling and Analysis Plan was prepared by Kevin Hicks, P.Geo., QP_{ESA}.

This Phase Two ESA was conducted in accordance with the requirements set forth under O. Reg. 153/04 and related supporting documents established there under. The sampling methods employed in carrying out the investigations complied with the requirements established by the MECP in the document entitled *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario* (MOEE, 1996). The scope of work for the Phase Two ESA included of the following tasks:

- Developing a site-specific Health & Safety Plan (HASP) for the intrusive work at the Phase Two Property;
- Completing a review of all applicable existing environmental reports prepared in reference to the Phase Two Property;
- Conducting a Site visit to evaluate access, borehole and monitoring well locations with the owner/tenants and contractors, and marking the location of all intrusive sampling locations for utility locating purposes;
- Reviewing private and public utility locates completed for the Phase Two Property and provided by Paterson Group (”Paterson”);
- Advancing six (6) boreholes to depths ranging from 4.42 – 7.77 metres below ground surface (mbgs);
- Installing groundwater monitoring wells in five (5) of the boreholes;
- Field screening all soil samples collected during borehole drilling using visual/olfactory methods and measuring both total organic vapour (TOV) and combustible organic vapour (COV) concentrations using an RKI Eagle 2 or equivalent;
- Surveying the sampling locations relative to the Modified Transverse Mercator (MTM) reference grid (Easting and Northings) and ground surface and top of well casing elevation relative to geodetic elevations;

- Developing the newly installed monitoring wells by removing at least three (3) well volumes or until the well is dry and allowed to recover;
- Conducting one (1) groundwater monitoring event at the newly installed monitoring wells. Monitoring included measuring groundwater levels, depth to bottom and checking for free-phase hydrocarbons/sheens;
- Purging the newly installed monitoring wells until stabilization of indicator parameters was achieved or until up to three (3) well water volumes of water were removed, whichever came first. Purging was carried out using a peristaltic pump. Field parameters including temperature, potential hydrogen (pH), conductivity, dissolved oxygen (DO) and oxidation reduction potential (ORP) were measured throughout the purging and sampling process with samples being collected upon stabilization of the field parameters. Groundwater samples for metals analyses were field filtered using Waterra™ disposable field filters;
- Submitting selected soil and groundwater samples for laboratory analysis of potential contaminants of concern (COPC) including benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbon fraction F1 – F4 (PHCs), metals, hydride forming metals, polycyclic aromatic hydrocarbons (PAHs), electrical conductivity (EC), sodium adsorption ratio (SAR), cyanide (CN), pH and ammonia;
- Evaluating the results of the chemical analyses with the applicable property use criteria outlined in the “Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act”, as amended; and,
- Preparing a report documenting the findings of the Phase Two ESA.

3.2 MEDIA INVESTIGATED

Soil and groundwater within the APECs identified in the Phase One ESA (WSP, 2024) were investigated during the completion of this Phase Two ESA. The investigation of sediment and surface water was not applicable as no surface water bodies are present at or within 30 m of the Phase Two Property.

A Sampling and Analysis Plan (SAP) was developed prior to the field sampling events which outlined the proposed sampling locations, contaminants of potential concern, and the rationale for sampling and analysis at each location. The APECs and sample locations are shown on Figures 5 and 6, respectively. A copy of the SAP is provided in Appendix B.

3.3 PHASE ONE CONCEPTUAL SITE MODEL

The Phase One Conceptual Site Model was presented in WSP, 2024 and is as follows:

3.3.1 PROPERTY LOCATION AND DESCRIPTION

The Phase One Property comprises a 0.8527 hectare parcel located within Zone B of Lansdowne Park. A key plan showing the location of the Phase One Property is provided on Figure 1. The Phase One Property is located on the south side of Exhibition Way, approximately 45 metres east of Bank Street. The Phase One Property lies in a municipal urban setting in an area of mixed residential and commercial land uses. The Phase One Property lies within Lansdowne Park, a mixed-use property including retail, office and residential property uses (Zone A) as well as TD Place, the Aberdeen Pavilion and Horticulture Building (Zone B) and an Urban Park (Zone C) (Figure 2).

The Phase One Property is near rectangular in shape with a frontage of approximately 171 metes along Exhibition Way and a lot depth of approximately 51 metres. The Phase One Property is currently developed with one (1) building including a portion of TD Place Arena and the Stadium North Side Stands. The Phase One Property is currently occupied by Lansdowne Stadium Limited Partnership, a limited partnership between the City of Ottawa and the Ottawa Sports and Entertainment Group ("OSEG"), the latter which manages the sports teams and is responsible for the operation and programing of the stadium and arena. A generalized site plan depicting the layout of the Phase One Property is provided on Figure 3.

3.3.2 DEVELOPMENT AND USE

According to historical records obtained by WSP, including street directories, fire insurance plans, aerial photography, previous reports, and discussions from the Phase One Property representative, the Phase One Property was part of a larger property first developed in the mid-1800s for use as a park and agricultural exhibition grounds. The earliest record is a reference in previous Phase One ESA conducted for the Lansdowne Park property in 2014 (AMEC, 2014) indicating the Ottawa Agricultural Society acquired a portion of the Phase One Property in 1868. A historical plan of the Glebe dated 1870 identifies the Lansdowne Property including the Phase One Property as "Fairground". At that time the Phase One Property was located on the outskirts of Ottawa and it is inferred that it consisted of agricultural land. The development of properties surrounding the Phase One Property began prior to the early 1900s. Prior to development, surrounding properties are inferred to have been used primarily for agricultural purposes.

As early as 1910 the Phase One Property appeared to be occupied by the former Grand Stand and Fire Hall No 10. In 1966/1967, the Grand Stand was rebuilt as the North Side Stands with the Civic Centre (Now TD Place) constructed beneath them covering a majority of the Phase One Property.

Through well over 100 years of continuous use the Phase One Property and the greater Lansdowne Park property has undergone numerous changes including both infrastructure and physiography. Lansdowne Park is currently home to the Ottawa 67's and Ottawa Charge hockey clubs, the Ottawa Redblacks football club, the Ottawa BlackJacks basketball club and the Atletico Ottawa soccer club. More notably, Lansdowne Park was the home of the Central Canada Exhibition (CCE) from its inception in 1888 up until 2009. From 1941 through to 1946, Lansdowne Park was occupied by the Canadian Military (for training purposes) during World War II.

In June 2010, Ottawa City Council approved the Lansdowne Partnership Plan, an innovative and dynamic solution to redevelop Lansdowne Park through a public-private partnership with Ottawa Sports and Entertainment Group (OSEG). The plan involved three major components of redevelopment including:

- Refurbishing Frank Clair Stadium (sports stadium) and Civic Centre (arena complex);
- Constructing a mixed-use area that includes retail, office, and residential uses; and,
- Creating of a large urban park.

The Lansdowne Park property comprises an area of 15.64 hectares located on the east side of Bank Street and south of Holmwood Avenue in the Glebe neighbourhood of the City of Ottawa, Ontario. The property is bordered to the east and south by Queen Elizabeth Driveway and the Rideau Canal.

Lansdowne Park presently includes a variety of property uses including residential, commercial, community and parkland. These property use areas comprise three discreet zones including:

- Zone A – mixed residential/commercial property use, including the northwestern and north central portions of Lansdowne Park and the western frontage along Bank Street;
- Zone B – mixed commercial/community property use, including the Aberdeen Pavilion, TD Place and relocated Horticultural Building; and,
- Zone C – Urban Park, including the eastern and southern portions of Lansdowne Park.

The Phase One Property lies in a municipal urban setting in an area of mixed residential and commercial land uses. The Lansdowne Park property is mixed-use property including retail, office and residential property uses (Zone A) as well as TD Place, the Aberdeen Pavilion and Horticulture Building (Zone B) and an Urban Park (Zone C). The Phase One Property lies within Zone B of Lansdowne Park.

Roadways and property uses within the Lansdowne Park property are shown on Figure 2. A plan depicting the general layout of the Phase One Property is provided on Figure 3. The Phase One Study Area is depicted on Figure 4.

3.3.3 DRINKING WATER WELLS

The Phase One Study area is supplied by a municipal drinking water system as defined in the Safe Drinking Water Act. No water wells were observed at the Phase One Property by WSP during the Phase One Property reconnaissance. WSP was informed by the Phase One Property representative that no water wells are currently present at the Phase One Property.

3.3.4 TOPOGRAPHY AND DRAINAGE

The Phase One Property lies at an approximate elevation of 66 masl. The topography across the Phase One Property is relatively flat. Surface runoff is directed by grading and curbs to stormwater catch basins located about the Phase One Property or on the adjacent parcels. Rooftop drainage is directed to the stormwater management system.

3.3.5 GEOLOGY & HYDROGEOLOGY

Surficial materials in the vicinity of the Phase One Property are noted to be comprised of fill materials extending to depths ranging from 3.81 to 5.18 metres below ground surface (mbgs) underlain by native deposits consisting of combinations of loamy sand and sand and gravel to the termination depths of the boreholes (not on inferred bedrock) ranging from 4.57 to 8.23 mbgs. The above description was extrapolated from three (3) boreholes (BH11-19, BH11-20 and MW10-2) located at or near the northeast corner of the Phase One Property (AMEC, 2013).

The Phase One Property is underlain by bedrock of both the Billings and Lindsay Formations which are Ordovician in age and are composed of dark brown to black shale with laminations of calcareous siltstone; and sublithographic to fine crystalline limestone, nodular in part, with interbeds of calcarenite and shale, respectively (OGS, 1984).

The depth to bedrock beneath the Phase One Property varies between 16.23 and 22.15 metres (Paterson, 2024).

Groundwater levels were encountered between 5.0 – 6.3 mbgs at monitoring well MW10-2 located near the northeast corner of the Phase One Property in 2010/2011 and groundwater flow across the Phase One Property was generally to the east-southeast during this period (AMEC, 2013). The regional groundwater flow direction, based on topographic features and knowledge gained from other sites in the area, is expected to be to the northeast.

3.3.6 WATER BODIES AND AREAS OF NATURAL SIGNIFICANCE

The Rideau Canal is located approximately 200 metres east and south of the Phase One Property and flows north to the Ottawa River, which is located approximately 3 kilometres north of the Phase One Property. It is inferred that the Phase One Property does not include land that contains or is within 30 metres of a "water body" which classifies/would have classified it as a sensitive site under O.Reg. 153/04.

Based on a review of available information sources concerning the Phase One Property is not within 30 metres of an "Area of Natural Significance" and therefore would not be considered a sensitive site under O.Reg. 153/04.

3.3.7 POTENTIALLY CONTAMINATING ACTIVITIES

Several PCAs were identified at the Phase One Property and within the Phase One Study Area. Five (5) PCAs identified on the Phase One Property including the following types:

- PCA 30A - Importation of Fill Material of Unknown Quality;
- PCA 55A - Transformer manufacturing, processing and use;
- Other PCA QP1A - Ice Making Plant Using Ammonia (QP defined PCA);
- Other PCA QP2A- Brine distribution and chiller lines for ice making plant (QP defined PCA); and,
- Other PCA QP3A Application of Winer De-icing Agents (QP defined PCA).

The locations of the on-site PCAs are shown on Figure 4A. Each of these PCAs results in an APEC at the Phase One Property.

Thirty-one (31) PCAs within the Phase One Study area including the following types:

- 27 - Garages and maintenance and repair of railcars, marine vehicles and aviation vehicles;
- 28 – Gasoline and Associated Products Storage in Fixed Tanks;
- 30 - Importation of Fill Material of Unknown Quality;
- 37 – Operation of Dry Cleaning Equipment;
- 55 -Transformer Manufacturing, Processing and Use;
- 58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners;
- Other PCA QP1 - Ice Making Plant Using Ammonia (QP defined PCA);
- Other PCA QP2- Brine distribution and chiller lines for ice making plant (QP defined PCA);
- Other PCA QP3– Application of Winter De-Icing Agents (QP defined PCA); and,
- Other PCA QP4 – Glycol Snow and Ice Melting Systems.

The location of each off-site PCA within the Phase One Study Area is shown on Figure 4B. PCAs to the west of and/or immediately adjacent to the Phase One Property are considered to represent a potential concern as they are inferred to be transgradient and proximal to the Phase One Property or hydraulically up-gradient of the Phase One Property and therefore have the potential to be impacted by contamination migrating in groundwater. These PCAs were previously investigated during a previous Phase Two ESA of the Lansdowne Park Property, the findings of which indicated none of the PCA to the north of the Phase One Property result in an APEC (AMEC, 2013). PCAs located to the north, south and east of the Phase One Property are inferred to be downgradient or transgradient and thus represent less of a concern; however, properties which are adjacent to the Phase One Property are still considered to represent potential concerns due to their proximity. Off-site PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks and PCAs QP3A and QP3B: Glycol Snow and Ice Melting Systems are considered to result in an APEC at the Phase One Property (APEC 4).

3.3.8 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Based on the findings of this Phase One ESA, three (3) on-site PCAs and five (5) of-Site PCAs were identified at the Phase One Property that result in APECs at the Phase One Property where one or more Contaminants of Potential Concern may be present. The APECs associated with on-site PCAs include:

- APEC 1: Infilling of the Phase One Property – PCA 30A: Importation of Fill of Unknown Quality;
- APEC 2: Electrical transformer in electrical room – PCA 55A: Transformer Manufacturing, Processing and Use; and,
- APEC 3: Arena Ice Making Plant and Piping Beneath the Ice Surface – PCA QP1A: Ice Making Plant
- APEC 4: Brine distribution and cooling lines located beneath the arena surface south of the Phase One Property– PCA QP2B (QP defined PCA);
- APEC 5A: Gasoline and Diesel Above Ground Storage Tanks – PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks and B) Arena ice making plant – PCA QP1B; C) Loading Ramp Glycol Snow and Ice Melting System – PCAs QP4A and QP4B: Glycol Snow and Ice Melting System;
- APEC 7: Application of winter de-icing agents on sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety – PCA QP3A (QP defined PCA); and,
- APEC 8: Application of winter de-icing agents on sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety – PCA QP3B (QP defined PCA).

The APEC locations are shown on Figure 5.

3.3.9 CONTAMINANTS OF POTENTIAL CONCERN

COPCs associated with the APECs include PHCs, PAHs, BTEX, PCBs, metals, As, Sb, Se, B-HWS, Cr(VI), Hg, CN, and glycol in soil and groundwater; EC and SAR in soil, and Na, Cl and ammonia in groundwater.

3.3.10 PREFERENTIAL PATHWAYS

Groundwater in the vicinity of the Phase One Property resides at approximately 5 m below ground surface (AMEC, 2013). There are no known utilities on-site or near the Phase One Property that are deep enough to intersect the shallow water table. A large single level underground garage is located immediately adjacent the north side of Building J and extends over a large portion of Zone A of Lansdown Park; however, its depth may not be sufficient to have a significant affect to groundwater flow and its transport of contaminants in the area.

The native soils beneath the Phase One Property and within the greater Lansdowne Park consist of sand and loamy sands. These soils are wells drained with hydraulic conductivity values in the order of 10^{-5} m/sec and are thus unlikely to result in channelized flow in any utility trenches founded above the seasonal water table.

3.3.11 UNCERTAINTY

A data gap was identified in that the Phase One Property representatives had little knowledge of the history of the property prior to their service years at the property (approximately 9 years). In, addition, fill quality at the Phase One Property is based on a limited number of boreholes and monitoring wells advanced in proximity to the Phase One Property as well the likely shallow fill removal and placement during the Lansdowne Park redevelopment in 2013/2014.

3.4 DEVIATIONS FROM SAMPLING AND ANALYSIS PLANS

The Phase Two ESA sampling and analysis plan (SAP) is presented in Appendix B. Field work was completed as per the SAP and no deviations were made.

3.5 IMPEDIMENTS

No impediments were encountered during completion of the Phase Two ESA. Adjustments made to the borehole/monitoring well locations were due to the presence of utilities, construction activities and/or traffic safety issues, however the location adjustments did not impact the overall investigation objectives.

4 INVESTIGATION METHODS

4.1 GENERAL

The Phase Two ESA was carried out in accordance with the Sampling and Analysis Plan presented in Appendix B and WSP's Standard Operating Procedures (SOP) cited therein. The subsurface conditions and representative samples of soil and groundwater media were obtained through the completion of a multi-faceted investigation and sampling program that included drilling of boreholes and the installation of groundwater monitoring wells.

Geological and hydrogeological conditions were established from visual observations and soil samples collected during the borehole drilling program and monitoring wells installed at the Phase Two Property. Soil and groundwater quality data was obtained from visual and olfactory observations, field screening methods and laboratory analysis performed on samples deemed to be representative of worse case conditions to provide quantitative assessment of the APECs with respect to the applicable SCS.

Table 1 provides a summary of the APEC dispositions in terms of sample type and location, media sampled and COPC analyzed. Sampling locations are shown on Figure 6 together with the APECs.

4.2 DRILLING AND EXCAVATING

The locations of all buried and overhead services were obtained prior to Initiating any of the subsurface investigations. WSP reviewed the public and private locates provided by Paterson which were completed as part of their concurrent geotechnical investigation.

4.2.1 BOREHOLE DRILLING

A borehole drilling and soil sampling program was performed at the Site between October 9 and November 1, 2024, to assess the surface and subsurface soil conditions beneath the Phase Two Property. A total of six (6) boreholes (BH3-24, BH4-24, BH5-24, BH6-24, BH7-24 and BH8-24) were advanced at the Site. Five (5) of the boreholes were instrumented as groundwater monitoring wells (BH3-24/MW24-1, BH5-24/MW24-4, BH6-24/MW24-3, BH7-24/MW24-5 and BH8-24/MW24-2). The borehole locations are shown on Figure 6. The rationale for the selection of these locations is provided in Table 1.

The borehole investigations were completed by George Downing Estate Drilling Ltd. ("Downing") of Hawkesbury, Ontario. The boreholes were advanced to depths ranging from approximately 4.5 – 8.0 mbgs using a rubber track-mounted CME LC 22 drilling rig. All boreholes were advanced using standard 200 mm diameter hollow stem augers. Sixty cm soil samples were collected using standard split spoon sampling techniques at regular intervals throughout borehole advancement within the overburden.

Hollow stem augers employed for soil sampling and monitoring wells installations arrived at the site in a pre-cleaned condition. Auger flights were cleaned by brushing between individual borehole locations to remove any adhered soil and/or debris. The lead auger was also washed in Alconox solution between borehole locations. Split spoons and casing rods were also cleaned between borehole locations. These decontamination procedures are considered to be adequate given the non-cohesive nature of the soils present beneath the Phase Two Property.

Boreholes not instrumented with groundwater monitoring wells were backfilled with 10 mm bentonite chips (Holeplug™) in accordance with Ontario Regulation 903. Details of the borehole drilling and soil sampling are provided in the stratigraphic and instrumentation logs in Appendix C. All drilling activities were completed under the supervision of WSP field staff.

4.3 SOIL SAMPLING

Soil samples retrieved during the borehole sampling programs were examined, classified, and logged according to soil type, moisture content, colour, consistency, and presence of visual and/or olfactory indicators of negative impact. The soil samples recovered at the Site were subsampled based on visual observations including fill/soil type and visual/olfactory evidence of suspected impact.

Soil samples were split into duplicate fractions upon recovery at the surface. The primary sample fractions were placed in laboratory supplied glass sample jars and stored in coolers with ice for potential laboratory analysis. Samples selected for analysis of volatile parameters including VOC (including BTEX) and PHC F1 were micro-cored and field preserved using methanol charged vials supplied by the analytical laboratory to minimize potential losses due to volatilization. The duplicate sample fractions were placed in “Ziploc” sample bags and stored at ambient temperature for subsequent field vapour screening purposes.

All soil samples were collected in accordance with strict environmental sampling protocols to minimize loss of volatile organics and to ensure reliable and representative results. Disposable nitrile gloves were used and replaced between the handling of successive samples. All soil sampling equipment (stainless steel trowels, spatulas, etc.) was thoroughly decontaminated between soil sample locations to prevent potential cross-contamination. Decontamination activities included:

- Physical removal of any adhered debris;
- Wash/scrub in “Alconox” soap solution;
- Distilled water rinse;
- Methanol rinse; and
- Air dry.

Soil samples considered to be representative of “worst-case” environmental conditions were selected for chemical analysis based on visual and olfactory observations made in the field and on field screening results. A soil sample summary is provided in Table 3.

4.4 FIELD SCREENING METHODS

All soil samples were screened in the field for gross evidence of negative environmental impact including visual (staining, presence of deleterious or foreign materials) and odours. Soil sample headspace screening was also performed to facilitate sample selections for laboratory analysis and to provide a semi-quantitative assessment of the vertical contaminant distributions at each borehole location. The duplicate soil sample fractions were screened for combustible organic vapour (COV) and total organic vapour (TOV) concentrations using the sample headspace method. COV and TOV concentrations were measured using an RKI Eagle 2 combined combustible gas analyzer (CGA) and photoionization detector (PID) fitted with a 10.2 eV lamp and calibrated to known hexane and isobutylene standards and operated in methane elimination mode.

Table 4.1 Field Screening Instrument Information

Instrument Make and Model Number	RKI Eagle 2
Chemicals the Equipment Can Detect and Associated Detection Limits	The PID detects VOCs that excite below an ionization potential of 10.6 eV, which includes a wide range of chemicals such as solvents and fuels. The PID provides an indication of organic contamination in soil but does not measure concentrations of individual contaminants. The CGA detects combustible vapours such as those associated with fuels. The CGA was operated in the methane elimination mode. Both the PID and CGA provide an indication of contamination but not specific chemical concentrations.
Precision of the Measurements	Detection ranges for the PID are from 0 to 50 ppm and from 0 – 2,000 ppm. The resolution of this instrument is 0.02 ppm for readings in the range of 0 and 50 ppm and 1 ppm for readings in the range of 0 – 2,000 ppm. The detection limit of the CGA ranges from 0 to 11,000 ppm (i.e., 100 % LEL of hexane).
Accuracy of the Measurements	The accuracy of the PID is +/- 10% for VOCs in the range of 0 and 2,000 ppm and +/- 20% of the reading above 2,000 ppm. The CGA has an accuracy of ± 5% of reading or ± 2% LEL, whichever is greater, in LEL mode and ± 50 ppm or ± 5% of reading, whichever is greater, in ppm mode.
Calibration Reference Standards Such as Span Gas	The PID was equipped with a 10.6 electron-volt (eV) lamp, which was calibrated with a known concentration of isobutylene (100 ppm). The CGA measures total combustible gases, calibrated to a known concentration of hexane (16%LEL).
Procedures for Checking Calibration of the Equipment	The instrument was rented Maxim Environmental. Maxim calibrates its instruments on a regular basis, including prior to the use on this project, to ensure consistent results. Verification of instrument calibration was performed on each day the instrument was in use, including measurements at the beginning and end of each day to assess any daily instrument drift. When necessary, the instrument was calibrated in accordance with the manufacturer's instructions.

4.5 GROUND WATER: MONITORING WELL INSTALLATION

The monitoring wells were constructed by Downing under WSP supervision using 32-millimetre or 52-millimetre diameter, Schedule 40, flush-joint threaded PVC monitoring well supplies. The monitoring wells were completed with 1.5 or3.0 metre length of #10 mil slotted intake screen. The tops of the intake screens were then extended to the ground surface using solid riser pipe. A silica sand filter pack was placed between the intake screen and the wall of the borehole. The filter pack was extended approximately 0.3 metres above the top of the well screen to allow for settlement of the sand packs and to accommodate expansion of the overlying well seals. A bentonite seal of a minimum thickness of 30 cm was placed above the sand pack. The annular space was then filled and extended to approximately 0.3 mbgs with drill cuttings, silica sand or bentonite pellets. The monitoring wells were finished at the surface with flush mount steel casing set in a concrete surface seal.

The locations of the monitoring wells are shown on Figure 6. Details of the monitoring well constructions are included in the stratigraphic and instrumentation logs in Appendix C and are summarized in Table 2.

All ground water monitoring wells installed at the Phase Two Property were instrumented with dedicated Waterra inertial lift pumps and sufficient lengths of polyethylene tubing to facilitate well development, purging, and sampling requirements. Approximately four days following installation, each monitoring well was developed by extracting approximately five to ten well volumes to remove any residual sediment and/or drill cuttings introduced during the borehole drilling and well installation process, stabilize and grade the filter pack, retrieve lost drilling fluids, improve connectivity between the well and the formation, and restore ground water that may have been disturbed or altered during the drilling process. Details of the well development activities are summarized in Table 4.

4.6 GROUND WATER: FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

Groundwater monitoring, including measuring the depth to the static water level and assessing the presence/absence of measurable accumulations of non-aqueous phase liquid (NAPL), was conducted on November 8, 2024 and included all monitoring wells installed as part of the investigation. Measurements of depth to ground water were taken using a Heron Instruments electronic interface probe and reduced to static elevations based on the monitoring well survey data (Table 2). Free phase NAPL layering was not detected in any of the monitoring wells installed at the Phase Two Property. The interface probe was cleaned in Alconox solution between monitoring wells to prevent cross-contamination.

Field parameters including temperature, dissolved oxygen (DO), pH, oxidation reduction potential (ORP), conductivity and Total Dissolved Solids (TDS) were measured during purging prior to sampling of the wells on November 8, 2024. Field parameters were measured using a YSI 556 Water Quality Monitoring System. The field measurements were taken using a flow through cell connected directly to the dedicated Waterra tubing instrumented at each monitor location.

4.7 GROUND WATER: SAMPLING

Groundwater sampling was conducted on November 8, 2024 and December 4, 2024. The monitoring wells were purged until field parameter measurements using a YSI 556 Water Quality Monitoring System reached stabilization. Purging and sampling was conducted at a flow rate of 100 ml/min.

Groundwater samples were collected directly into laboratory supplied sample containers pre-inoculated with any necessary preservatives. Dedicated (one pair per sample), disposable nitrile gloves were used throughout the proceedings. Vials that contained samples to be analyzed for volatile compounds were inverted after filling and inspected to ensure that no head space was present in any vial. Samples were placed in a cooler and stored on ice until delivered to the analytical laboratory. Blind field duplicate samples (one duplicate for every 10 samples) were collected for analysis in accordance with the Analytical Protocol. The ground water samples were analyzed for the selected parameters as outlined in Table 5. A summary of the ground water sampling field activities, field parameter measurements, and observations is provided in Table 6.

4.8 ANALYTICAL TESTING

Representative soil and groundwater samples collected during the investigation were submitted for laboratory analysis of suspect parameters of concern. All laboratory chemical analyses were conducted by ALS Global Environmental ("ALS") of Ottawa, Ontario. ALS is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) Standards Council of Canada (SCC) in accordance with ISO/IEC 17025:2017 – General Requirements for the Competence of Testing and Calibration Laboratories for the tested parameters set out in the Soil, Ground Water and Sediment Standards.

4.9 RESIDUE MANAGEMENT PROCEDURES

Investigation-derived wastes (auger cuttings, decontamination fluids, well development and purge water) were placed in 205-L steel drums and stored on-site pending the results of soil waste classification testing and were transported off-site for end disposal or treatment by a licensed waste management contractor.

4.10 ELEVATION SURVEYING

Paterson provided survey data for each of the borehole/monitoring well locations which it collected as part of the concurrent geotechnical investigation. Surface elevations for each borehole location and top of well casing elevations were referenced to geodetic. The locations of all sampling locations were referenced to the Modified Transverse Mercator (MTM) reference grid, Zone 9, 1983 North American Datum (NAD83), Canadia Spatial Reference System (CSRS)2010.

4.11 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

A strict Quality Assurance/Quality Control (QA/QC) program was implemented and maintained throughout the project to ensure the Site data to be representative of the actual Site conditions. The QA/QC program provides a method of documented checks to assess the precision and accuracy of collected data. The QA/QC program includes a set of standard procedures or protocols to be followed throughout the investigations. To this end, WSP field and QA/QC protocols have been developed in recognition of recognized scientific and engineering practices to meet or exceed those defined in the MECP documents entitled Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04 (June 2011) and Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario (1996) and Canadian Council of Ministers of the Environment (CCME) Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites (1993) and Guidance Manual For Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment -– Volume 1 through 3 (2016). The field QA/QC program included the following components:

- The use of personal protective equipment (PPE) including hard hats, safety glasses, safety work boots and high visibility vests;
- The use of standard operating procedures (SOP) developed to meet or exceed industry standard practices;

- Thorough documentation of all field activities and sample handling practices including field notes, chain of custody forms, memos to file, etc.;
- Daily inspection and calibration of all field instruments prior to use;
- Use of new disposable latex or nitrile gloves worn when handling samples of environmental media and/or monitoring or measuring equipment;
- The use of dedicated or disposable sampling equipment where practical or the implementation of thorough equipment decontamination procedures to prevent cross contamination between sample locations;
- Use of pre-cleaned, pre-labelled sample containers supplied by the analytical laboratory which performed the samples analyses;
- Storage and transportation of all samples collected in the field in clean coolers on ice until delivered to the laboratory;
- Samples were delivered to the laboratory by WSP staff and submitted under chain of custody protocol;
- The incorporation of blind duplicate samples, travel blanks, equipment blanks and field blanks into the sampling and analytical programs to assess the validity of the data received from the analytical laboratory; and,
- The use of laboratory analytical protocols and method detection limits that have been established in accordance with regulatory requirements for the province of Ontario.

All sample containers and preservatives, where applicable, were supplied by the subcontract laboratory and were consistent with the specifications provided in Tables A (soil) and B (ground water) of the Analytical Protocol (MOE, 2011e). Soil samples that were submitted for analysis for BTEX and PHC F1 were cored and methanol preserved in accordance with the requirements of the Analytical Protocol (MOE, 2011e). Similarly, all samples were placed on ice in coolers after collection to meet the storage requirements of the Analytical Protocol (MOE, 2011e). All samples were labelled with unique identifiers indicating the borehole/monitoring well of origin and depth interval (soil samples), with the exception of field duplicate samples that were labelled with aliases to prevent identification by the laboratory. All samples were transported by WSP staff directly to the laboratory under continuous Chain of Custody documentation. Each Chain of Custody form had a unique serial number.

5 REVIEW AND EVALUATION

5.1 GEOLOGY

The subsurface conditions encountered at the Phase Two Property are described in the stratigraphic and instrumentation logs provided in Appendix C. In general, the subsurface conditions at the Phase Two Property consisted of surficial fill comprised of various geologic materials including silty and gravelly sand with some instances of trace construction debris including pieces of asphalt overlying native sand with instances of trace to some silt and instances of trace to some gravel or pieces of rock. Construction fills occur locally across the Phase Two Property whereas fill consisting of geologic materials are more ubiquitous across the Phase Two Property. Cross sections providing a general depiction of the subsurface stratigraphy based on the boreholes completed by WSP and by Paterson are presented on Figures 7B and 7C. The locations of the cross sections are indicated on Figure 7A.

5.2 GROUND WATER: ELEVATIONS AND FLOW DIRECTION

The monitoring wells installed during this investigation consisted of water table wells installed to provide further assessment and/or delineate impacts identified during the initial investigation. Well construction details are summarized in Table 2.

No free phase NAPL, including hydrocarbon film or sheen, was observed or measured with an interface probe during this investigation. Measurements of depth to ground water were taken using a Heron Instruments electronic interface probe with the measurement taken at the highest point on the rim of the well casing. The measurements were reduced to static elevations based on the monitoring well survey data.

All ground water measurements/elevation data obtained during the investigations are summarized in Table 5. Figure 8 presents the interpreted configuration of the shallow water table on November 8, 2024.

During the November water level monitoring event, the depth to the water table ranged from 2.27 to 6.23 mbgs, corresponding to a water table elevation ranging from 59.99 to 60.27 masl. Shallow ground water flow reflects topography with flow directed southeast across the Phase Two Property.

Utilities beneath the Site are inferred to be too shallow to influence ground water flow beneath the Phase Two Property.

5.3 GROUND WATER: HYDRAULIC GRADIENTS

The maximum horizontal hydraulic gradient in the shallow water table (0.005) exists near the southeast corner of the Site while the minimum horizontal hydraulic gradient (0.002) was observed in the northern portion of the Phase Two Property during the November 2024 monitoring event. The average horizontal gradient across the Site in November 2024 was approximately 0.004.

5.4 FINE-MEDIUM SOIL TEXTURE

Based on the grain size analysis completed by Paterson during their concurrent geotechnical investigation the soil texture is considered to be coarse for the purposes of assessment. The results of the grain size analyses are provided in Appendix D.

5.5 SOIL: FIELD SCREENING

The results of the TOV/COV field screening measurements are included on the borehole logs in Appendix D. All measurements were low, generally reporting at <10 ppm isobutylene equivalent with the following exceptions:

- An elevated TOV measurement was reported in soil sample BH3-24-SS4 (100 ppm). The corresponding COV measurement was 1 ppm. No odour or staining was observed on the sample. Sample was submitted for analysis of BTEX, PHCs, PAHs, metals, hydride forming metals, B-HWS, Cr (VI), Hg, CN, EC, and SAR as well as pH determination;
- Slightly elevated COV measurements were reported in samples BH5-24-SS2 (95 ppm) and BH5-24-SS3B (55 ppm). The corresponding TOV measurements were reported at 1 ppm and 21 ppm, respectively. No odour or staining was observed on the samples. Both samples were submitted for analysis of BTEX, PHCs, PAHs, metals, hydride forming metals, B-HWS, Cr (VI), Hg, CN, EC, and SAR as well as pH determination; and,
- Slightly elevated COV measurement was reported in sample BH8-24-SS10 (25 ppm). The corresponding TOV measurement was 1 ppm. No odour or staining was observed on the sample. Sample was submitted for analysis of BTEX, PHCs, PAHs, metals, hydride forming metals, B-HWS, Cr (VI), Hg, CN, EC, and SAR as well as pH determination;

5.6 SOIL QUALITY

The analytical results for all soil/fill samples collected during the Phase Two ESA as well as MECP Table 3 SCS are presented in Table 7. Figures 9, 10, 11A, 12, 13 and 14A show the soil sample locations, sample depths and results of the soil samples analyses for BTEX, PHCs, PAHs, Metals and hydride forming metals, ORPs (including B-HWS, Cr(VI), Hg) and ORPs (includes CN, EC, SAR), respectively, in plan view. Parameters exceeding MECP Table 3 SCS are indicated by **red highlighting and bold font** whereas those meeting SCS are indicated by green highlighting. Figures 11B, 11C, 14B and 14C show exceedances for PAH and EC on cross section A-A' and B-B', as applicable. Where the number of samples submitted for a given analysis is stated in the text, the number does not include field duplicate samples.

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES

Fifteen (15) discrete samples were submitted for analysis of BTEX. BTEX compounds were not detected in any of the soil samples submitted for analysis. Based on the analytical reporting detection limits (RDL) reported by the laboratory, all samples were determined to be below the applicable MECP Table 3 SCS.

PETROLEUM HYDROCARBONS

Fifteen (15) discrete samples were submitted for analysis of PHCs. PHCs were not detected in the soil samples submitted for analysis, with the following exceptions:

- PHC F1 and F2 were reported in sample BH5-24-SA3B at 6.3 µg/g and 17 µg/g, respectively. Both concentrations are below their respective MECP Table 3 SCS (55 µg/g, 230 µg/g, respectively);
- PHC F3 was reported in sample BH7-24-SS1 at a concentration of 51 µg/g, which is below the applicable MECP Table 3 SCS (1,700 µg/g); and,
- PHC F3 and F4 were reported in sample BH8-24-SS3 at 81 µg/g and 442 µg/g, respectively. Both concentrations are below their respective MECP Table 3 SCS (1,700 µg/g, 3,300 µg/g, respectively);;

Based on the analytical reporting detection limits (RDL) reported by the laboratory, all samples were determined to be below MECP Table 3 SCS.

POLYNUCLEAR AROMATIC HYDROCARBONS

Fifteen (15) discrete samples were submitted for analysis of PAHs. Several PAH compounds were detected in one or more of the soil samples submitted as part of the surface soil sampling program. Exceedances of the MECP Table 3 SCS by benzo[a]pyrene were reported in three (3) samples collected at two (2) locations (BH6-24-SA2B-3, BH8-24-SS3, and BH8-24-SS4), as identified by bold text and yellow highlighting in Table 7.

The locations of the soil samples exceedances are shown in plan view on Figure 11A and on cross sections A-A’ and B-B’ on Figures 11B and 11C, respectively.

METALS

Fifteen (15) discrete samples were submitted for analysis of metals (barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, silver, thallium, uranium, vanadium and zinc) and hydride forming metals (antimony, arsenic, selenium). One or more metals or hydride forming metals were detected in each of the soil samples; however, all concentrations were below applicable MECP Table 3 SCS.

It is noted that all soils naturally contain trace levels of metals. The presence of metals in soils is, therefore, not necessarily indicative of contamination. The concentration of metals in uncontaminated soil is primarily related to the geology of the parent material from which the soil was formed. However, elevated concentrations of specific metals may accumulate in soil and fill materials due to anthropogenic activities and or as a result of the nature and origin of fill materials.

POLYCHLORINATED BIPHENYLS

Four (4) discrete soil samples were submitted for analysis of polychlorinated biphenyls (PCBs). PCBs were not detected in the soil samples submitted for analysis. Based on the analytical RDLs reported by the laboratory, all submitted samples are deemed to be below the applicable MECP Table 3 SCS.

OTHER REGULATED PARAMETERS

Fifteen (15) discrete samples were submitted for analysis of other regulated parameters (ORPs) including hot water soluble boron (B-HWS), hexavalent chromium (Cr (VI), mercury (Hg), cyanide (CN), electrical conductivity (EC) and sodium adsorption ratio (SAR)

No ORPs exceeded their respective MECP Table 3 SCS n any of the samples with the exception of EC:

- EC measured for sample BH8-24-SS3 was 3.21 mS/cm which exceeds the MECP Table 3 SCS value of 1.4 mS/cm.

The location of the EC exceedance are shown in plan view on Figure 14A and on cross sections A-A’ and B-B’ on Figures 14B and 14C, respectively.

5.7 GROUND WATER QUALITY

The analytical results for all ground water samples collected during this Phase Two ESA as well as MECP Table 3 SCS are presented in Table 9. Figures 15 through Figure 19 show the groundwater sample locations, sample depths and results of the groundwater samples analyses for BTEX, PHCs, PAHs, PCBs and ammonia, respectively, in plan view. Table 2 lists the screened intervals for the monitoring wells. All of the wells are water table wells.

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES

One groundwater sample from each of the five groundwater monitoring wells installed as part of this investigation were analysed for BTEX. BTEX compounds were not detected in any of the groundwater samples submitted for analysis. Based on the analytical RDLs reported by the laboratory, all samples were determined to be below the applicable MECP Table 3 SCS.

PETROLEUM HYDROCARBONS

One groundwater sample from each of the five groundwater monitoring wells installed as part of this investigation were analysed for PHCs. PHCs were not detected in any of the groundwater samples submitted for analysis. Based on the analytical RDLs reported by the laboratory, all samples were determined to be below the applicable MECP Table 3 SCS.

POLYNUCLEAR AROMATIC HYDROCARBONS

Groundwater samples collected from MW24-1, MW24-2 and MW24-3 were analysed for PAHs. PAHs were only reported slightly above detection limits in the samples collected from MW24-2 but were well below their respective MECP Table 3 SCS. All PAHs were below analytical RDLs reported by the laboratory in samples collected from MW24-1 and MW24-3 and are deemed to be below the applicable MECP Table 3 SCS.

POLYCHLORINATED BIPHENYLS

One groundwater sample from MW24-1 and MW24-2 were analysed for PCB. PCB was not detected in either of the samples. Based on the analytical RDLs reported by the laboratory, both samples are deemed to be below the applicable MECP Table 3 SCS.

AMMONIA

One groundwater sample from each of the five groundwater monitoring wells installed as part of this investigation were analysed for ammonia. Ammonia was detected in groundwater sample MW24-4 at a concentration of 0.0069 mg/L. There in no MECP Table 3 SCS for ammonia. A Property Specific Standard (PSS) of 4.524 mg/L was developed for Zone C (as per Certificate of Property Use 0371-8TYQMY).

5.8 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

5.8.1 FIELD QUALITY ASSURANCE PROGRAM

The field QA/QC program was implemented to minimize and quantify sample biasing introduced during sample collection, handling, shipping and analysis and ensure the integrity of the groundwater, soil and soil vapour sampling and analytical testing results. Sampling protocols included use of standardized field procedures (e.g., minimizing sample handling, use of field QA/QC samples, using dedicated non-contaminating sampling equipment, using unique sample-specific identification procedures, using chain-of-custody records) and recognized laboratory analytical methods and procedures.

In addition to the protocols and measures cited above, the field quality assurance program included the use of field duplicates. Blind duplicate samples were collected at the rate of one (1) duplicate samples for every ten (10) samples (i.e., 10%).

5.8.1.1 FIELD DUPLICATES

Field duplicates consist of samples collected at the same time and location placed into separate containers and are submitted for laboratory analysis to evaluate laboratory precision and field sampling and handling procedures, as well as to assess potential sample heterogeneity. As such, the field duplicates are typically collected “blindly” so that they cannot be cross-reference to the parent or primary sample by the analytical laboratory. For water samples, duplicates are prepared by alternately filling the sample bottles. The relative percent difference (RPD) is defined as the absolute value of the variation between a sample and its duplicate, when compared to the average concentration of the original and the duplicate. It is used to assess the validity of the field and laboratory analytical procedures. Meaningful RPDs can only be calculated if concentrations of a parameter are greater than the analytical reporting detection limits (RDL) in both the primary and duplicate samples. Lower precision in the RPD calculation is expected when concentrations are less than five (5) times the RDL.

The results of the groundwater field duplicate sample analyses indicate that the sampling results are generally reproducible. In most cases RPDs for the primary and duplicate samples could not be calculated as results were either below RDL or were less than five times the reported RDL and thus not considered statistically significant. Where RPDs were calculable values were within the acceptable limits.

5.8.1.2 TRIP BLANKS

Trip blanks, also known as travel blanks, are employed to assess potential cross contamination of volatile organic compounds from other samples, ambient conditions, or other sources during sample storage and shipment prior to receipt at the laboratory. Trip blanks consist of analyte free media (soil or water) prepared and placed in the sample storage and shipping cooler by the laboratory, taken to the site, and returned unopened to the laboratory with the sample submission.

Trip blanks were not employed during the sampling programs; however, no volatile analytes were detected in any of the groundwater samples, thus negating the potential for sample cross contamination and the need for trip blanks.

5.8.2 LABORATORY QUALITY ASSURANCE PROGRAM

ALS has an extensive QA/QC program in place to ensure that reliable results are consistently obtained. The laboratory QA/QC program included adherence to recognized or proven laboratory sampling and analysis protocols (e.g., sample hold times, sample containers, sample preservatives, detection limits and approved methodology) and the analysis of laboratory QC samples (e.g., method blanks, laboratory sample duplicates, surrogate recovery and chemical spikes). Specific laboratory QA/QC measures include:

- Chain of Custody and sample integrity inspection.
- Strict documentation control and files.
- Trained personnel prepare and analyze samples according to Standard Operating Procedures (SOPs).
- All analytical methods are based on accepted (e.g. MOE, US EPA, ASTM) procedures and are fully validated prior to use.
- Precision is monitored by performing replicate analysis of samples within each batch.
- Accuracy is verified by analyzing spiked samples and reference materials within each batch.
- Instrument calibration integrity is ensured by analyzing calibration check standards within each run sequence.
- Matrix effects in organic analyses are assessed with surrogate fortification of each sample.
- Extensive use is made of reference material for routine procedure evaluation.
- Highest available purity analytical standards.
- Predefined analytical sequences ensure all results are traceable to calibration and QA/QC data.
- Hard copy or digital reports displaying all of the required data are generated for each instrument.
- Analytical results are determined only from instrument responses that fall within the calibration range.
- Acceptable QA/QC performance must be demonstrated prior to data authorization (data are subject to three levels of QC review: chemist, supervisor and manager).
- On-going method and instrument performance records are maintained for all analyses.
- Records containing all pertinent data are securely archived for five years.
- A full-time QA/QC Scientist evaluates the QA/QC program on an on-going basis.
- Laboratory blank, QC standards, and replicate samples were analyzed with the samples to assess the reliability of the analyses.

5.8.2.1 LABORATORY ACCREDITATION

The analytical laboratory employed to perform the laboratory analyses ALS is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with ISO/IEC 17025:2017 – *"General Requirements for the Competence of Testing and Calibration Laboratories"* for the tested parameters set out in the *"Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act" (MOE,* April 2011 and/or *"Guidance Manual For Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment -– Volume 4 Analytical Methods"* (CCME, 2016).

5.8.2.2 PERFORMANCE CRITERIA

The *"Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act"* ("MECP Analytical Protocol"; MECP, July 2011, amended as of July 1, 2011 and as of February 19, 2021) and/or *"Guidance Manual For Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment –– Volume 4 Analytical Methods"* ("CCME Analytical Methods"; CCME, 2016) establishes performance criteria for use when assessing the reliability of data reported by analytical laboratories. These include maximum hold times for the storage of samples/sample extracts between collection and analysis, specified/ approved analytical methods, required field and/or laboratory quality assurance samples such as blanks and field and laboratory duplicates, specified recovery ranges for spiked samples and surrogates (compounds added to samples in known concentrations for calibration purposes), Reporting Limits (RL) / Laboratory Reporting Limits (LRL) and specified precision required when analyzing laboratory duplicate and spike/controlled reference material samples.

5.8.2.3 LABORATORY DATA VALIDATION

<u>Sample Hold Times</u>

Sample analysis dates provided on the Reports of Analysis issued by ALS indicate that all sample analyses were performed within the required sample/extract hold times.

<u>Detection Limits</u>

The reported RDLs met the RLs established in the MECP Analytical Protocol.

<u>Laboratory Blank Samples</u>

Laboratory blank samples (also known as method blanks) consist of an uncontaminated media sample which is free of the target analytes or any other parameters that may interfere with the analysis and are subject to the entire analytical procedure including extraction, digestion, or any other preparation procedure. Method blanks are used to monitor laboratory background level of the target analytes and laboratory artefacts or anomalies. Methods blanks are also used to monitor cross contamination of carry-over between samples, notable when high concentrations of the target analytes are present.

Based on the laboratory Reports of Analysis, laboratory sample blank analyses met MECP requirements.

<u>Laboratory Control Samples</u>

Laboratory control samples (also known as blank spikes) consist of an uncontaminated media sample free of the target analytes or interferences which is fortified with a known concentration of target analytes. The blank spike is processed through the entire analytical method including any extraction, digestion or any other preparation procedure. Blank spikes are used to monitor analyte recovery and potential loss during the preparation procedures as well as to validate the calibration of the instrumentation or technique.

Based on the laboratory Reports of Analysis, recoveries reported for laboratory control samples were within acceptable limits.

Matrix Spike Samples

Matrix spike samples consist of an aliquot from a randomly chosen sample that is fortified with a known concentration of target analytes. Matrix spike samples are processed through the entire analytical method including any extraction, digestion or any other preparation procedure. The matrix spike sample is used to evaluate laboratory precision and to evaluate any “matrix effects” that may exist in a sample due to its composition that may affect the recovery of the target analytes. An example is the presence of peat in soils which tends to adsorb organic analytes resulting in a poor matrix spike recovery.

Based on the laboratory Reports of Analysis, recoveries reported for spiked samples/blanks were acceptable.

Laboratory Replicates

Laboratory replicates (or duplicates) consist of an aliquot from a randomly chosen sample within an analytical batch that is processed through the entire analytical method to evaluate analytical precision and sample homogeneity. The differences between the two sample results are expressed as RPDs.

Based on the laboratory Reports of Analysis, RPDs for laboratory replicate sample analyses met MECP requirements with the exception of benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene on Report of Analysis WT2432203 which exceeded the RPD limit of 50%. While the RPD was higher than normally accepted, it was accepted based on the results being less than 10 times the MDL.

Surrogate Recoveries

Surrogates are deuterated analogues or compounds not normally found in nature but behave chemically and physically similar to the target analytes in the analysis. Known surrogate concentrations are added to samples prior to analysis and recoveries calculated and expressed as a percentage. Surrogates are employed to monitor the efficiency of organic extractions, instrument performance and provide within run quality control. The results are reported as percentage recoveries based on the known concentrations added to the sample. If surrogate recoveries are above criteria, a high bias is assumed for that group of analytes; below criteria, a low bias is assumed. High bias would not be of concern for analytes that are under a regulatory limit. Low bias would be of concern for analytes that are under a regulatory limit depending on proximity to the limit. Extrapolation based on percent recovery would be advisable, however extremely low recoveries would affect data usability.

Laboratory surrogate recoveries reported as part of the laboratory Reports of Analysis were found to be within acceptable ranges.

5.8.3 QA/QC SUMMARY

In summary, the laboratory and field QA/QC data indicate that the soil and groundwater data have met the performance criteria of the MECP Analytical Protocol and have not been biased or compromised in any way. The analytical results are thus considered to be representative of the Site conditions and can be relied upon in the context of this report and its intended objectives.

5.9 PHASE TWO CONCEPTUAL SITE MODEL

The Phase Two Property comprises a 0.8527 hectare (ha) parcel located within Zone B of Lansdowne Park. A key plan showing the location of the Phase Two Property is provided on Figure 1. The Phase Two Property is located on the south side of Exhibition Way, approximately 45 m east of Bank Street. The Phase Two Property lies in a municipal urban setting in an area of mixed residential and commercial land uses. The Phase Two Property lies within Lansdowne Park, a mixed-use property including retail, office and residential property uses (Zone A) as well as TD Place, the Aberdeen Pavilion and Horticulture Building (Zone B) and an Urban Park (Zone C) (Figure 2).

5.9.1 SITE DESCRIPTION

The Phase Two Property is irregular in shape with a frontage of approximately 171 metes along Exhibition Way and a lot depth of approximately 51 metres. The Phase Two Property is currently developed with one (1) building including a portion of TD Place Arena and the Stadium North Side Stands. The Phase Two Property is currently occupied by Lansdowne Stadium Limited Partnership, a limited partnership between the City of Ottawa and the Ottawa Sports and Entertainment Group ("OSEG"), the latter which manages the sports teams and is responsible for the operation and programing of the stadium and arena. A generalized site plan depicting the layout of the Phase Two Property and the proposed development is provided on Figure 3.

5.9.1.1 POTENTIALLY CONTAMINATING ACTIVITIES

Based on the results of the Phase One ESA completed for the Phase Two Property (WSP, 2024), five (5) on-site PCAs were identified at the Phase Two Property while thirty-one (31) off-site PCAs were identified within the Phase One Study Area. On-site PCAs as shown on Figure 3 include the following:

- PCA 30A - Importation of Fill Material of Unknown Quality;
- PCA 55A - Transformer manufacturing, processing and use;
- Other PCA QP1A - Ice Making Plant Using Ammonia (QP defined PCA);
- Other PCA QP2A- Brine distribution and chiller lines for ice making plant (QP defined PCA); and,
- Other PCA QP3A Application of Winer De-icing Agents (QP defined PCA).

Off-site PCAs within the Phase One Study Area as shown on Figure 4 include the following:

- 27 - Garages and maintenance and repair of railcars, marine vehicles and aviation vehicles;
- 28 – Gasoline and Associated Products Storage in Fixed Tanks;
- 30 - Importation of Fill Material of Unknown Quality;
- 37 – Operation of Dry Cleaning Equipment;
- 55 -Transformer Manufacturing, Processing and Use;
- 58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners;
- Other PCA QP1 - Ice Making Plant Using Ammonia (QP defined PCA);
- Other PCA QP2- Brine distribution and chiller lines for ice making plant (QP defined PCA);

- Other PCA QP3– Application of Winter De-Icing Agents (QP defined PCA); and,
- Other PCA QP4 – Glycol Snow and Ice Melting Systems.

5.9.1.2 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

The Phase One ESA (WSP, 2024) identified several PCAs and/or past or present uses on, in or under the Phase Two Property or within the Phase One Study Area that are considered to represent APECs on the Phase Two Property where one (1) or more COPC may be present. A total of four (4) APECs were identified at the Phase Two Property as shown on Figure 5 and summarized as follows:

- APEC 1: Infilling of the Phase One Property – PCA 30A: Importation of Fill of Unknown Quality;
- APEC 2: Electrical transformer in electrical room – PCA 55A: Transformer Manufacturing, Processing and Use;
- APEC 3: Arena Ice Making Plant and Piping Beneath the Ice Surface – PCA QP1A: Ice Making Plant
- APEC 4A: Gasoline and Diesel Above Ground Storage Tanks – PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks;
- APEC 4B: Glycol snow and ice melting system beneath the loading dock ramp and glycol heating plant within the building – PCA QP3A and 3B: Glycol Snow and Ice Melting System (QP defined PCA);
- APEC 5: Application of winter de-icing agents on sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety – PCA QP2A: Application of winter de-icing agents to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow and/or ice (QP defined PCA);
- APEC 6: Application of winter de-icing agents on roads, sidewalks, pathways and laneways for pedestrian and vehicle safety – PCA QP2B: Application of winter de-icing agents to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow and/or ice (QP defined PCA);
- APEC 7: Application of winter de-icing agents on sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety – PCA QP3A: Application of Winer De-icing Agents (QP defined PCA); and,
- APEC 8: Application of winter de-icing agents on sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety – PCA QP3B: Application of Winer De-icing Agents (QP defined PCA).

As per Section 49.1 (1) of O.Reg. 153/04, although APECs 7 and 8 may result in exceedances of the applicable Site Conditions Standards (SCS) for one or more of electrical conductivity (EC), sodium adsorption ratio (SAR) and cyanide (CN) in soil and/or sodium (Na) and chloride (Cl^-) in groundwater, the applicable SCS is deemed not to be exceeded given that a substance has been applied to surfaces for the safety of vehicular and/or pedestrian traffic under conditions of snow or ice or both. These APECs need not be investigated as part of a Phase Two ESA but may need to be considered under *Ontario Regulation 409/19 – On-site and Excess Soil Management*, as amended ("O.Reg.406/19") with respect to any excess soil that may be generated during redevelopment.

The locations of the APECs are shown on Figure 5.

5.9.1.3 SUBSURFACE STRUCTURES AND UTILITIES

Underground utilities at the Phase Two property include natural gas, hydro, water, sanitary sewer, and telecommunication service to the on-site building, as well as storm sewers. Groundwater in the vicinity of the Phase Two Property resides at approximately 5 m below ground surface (AMEC, 2013). There are no known utilities on-site or near the Phase Two Property that are considered deep enough to intersect the shallow water table. A large single level underground garage is located north of the Phase Two Property and extends over a large portion of Zone A of Lansdown Park; however, its depth may not be sufficient to have a significant affect to groundwater flow and its transport of contaminants in the area.

5.9.2 PHYSICAL SETTING

The Phase Two Property is located in area of mixed residential and commercial land uses. The nearest water body to the Phase Two Property is the Rideau Canal, located approximately 200 m to the east of the Phase Two Property.

The elevation at the Phase Two Property is approximately 66.0 masl. The topography across the Phase Two Property is relatively flat.

5.9.2.1 STRATIGRAPHY

Surficial materials in the vicinity of the Phase Two Property are noted to be comprised of fill materials extending to depths ranging from 0.76 to 3.05 metres below ground surface (mbgs) underlain by native deposits consisting of combinations of sand with instances of trace to some silt and instances of trace to some gravel or pieces of rock to the termination depths of the boreholes (not on inferred bedrock) ranging from 4.42 to 8.23 mbgs.

An interpretation of the geologic stratigraphy at the Phase Two Property based on the Phase Two ESA is shown in the cross sections shown on Figures 7B and 7C. The locations of the cross sections are shown on Figure 7A.

5.9.2.2 HYDROGEOLOGICAL CHARACTERISTICS

Groundwater was encountered at depths between 2.27 – 2.34 mbgs beneath the service level of the North Side Stands and between 6.06 – 6.23 mbgs on the exterior of the structure. The regional groundwater flow direction, based on topographic features and knowledge gained from other sites in the area, is expected to be to the northeast. Locally, however, the shallow groundwater flow may be influenced by underground utility trenches, conduits, and structures, variations in soil type, and minor fluctuations in topography.

The groundwater elevations were measured on November 8, 2024. Based on the groundwater elevation measured on November 8th, the local groundwater flow under the Phase Two Property appears to be towards the southeast to the Rideau Canal. Groundwater elevations measured during groundwater monitoring events and groundwater flow patterns are shown on Figure 8.

The horizontal hydraulic gradient is estimated to range from 0.002 m/m (minimum) to 0.005 m/m (maximum) with an average of 0.0035 m/m.

Hydraulic conductivity testing was not completed at the Phase Two Property. The hydraulic conductivity that might be expected at the Phase Two Property, based on previously completed hydraulic conductivity tests at other monitoring wells located at Lansdowne Park ranges from $6x10^{-6}$ m/s to $1.3x10^{-5}$ m/s.

5.9.2.3 DEPTH TO BEDROCK

During the concurrent Paterson geotechnical investigation bedrock was encountered at depths ranging from 16.23 mbgs (BH5-24) to 22.15 mbgs (BH3-24) (Paterson, 2024). According to Paterson's geotechnical report bedrock consisted of excellent to good quality limestone of the Georgian Bay Formation.

5.9.2.4 DEPTH TO WATER TABLE

Based on the November 2024 groundwater monitoring event, the depth to groundwater in the shallow monitoring wells ranged from 2.269 mbgs beneath the north Side Stands structure to 6.227 mbgs at exterior locations.

Groundwater elevations measured during groundwater November monitoring event and groundwater flow patterns are shown on Figure 8.

5.9.2.5 SECTION 35, 41 OR 43.1 OF THE REGULATION

Section 35 of O.Reg. 153/04 is not applicable to the Phase Two Property, for the following reasons:

- The Phase Two Property, and all other properties located, in whole or in part, within 250 metres of the boundaries of the property, are supplied by a municipal drinking water system, as defined in the Safe Drinking Water Act, 2002;
- A Record of Site Condition would not specify agricultural or other use as the type of property use for which the Record of Site Condition would be filed;
- The Phase Two Property is not located in an area designated in the municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of groundwater;
- Neither the Phase Two Property or any the properties in the Phase One Study Area have a well used or intended for use as a source of water for human consumption or agriculture; and

Sections 41 and 43.1 of O.Reg. 153/04 are not applicable to the Phase Two Property, for the following reasons:

- The Phase Two Property is not in, adjacent to or within 30 m from an “area of natural significance” as defined by O.Reg. 153/04;
- The pH of the Phase Two Property soils measured during this Phase Two ESA are within the applicable range of 5 to 9 for surface soils and 5 to 11 for subsurface soils;
- The Phase Two Property is not considered a “shallow soil property” as defined by Ontario Regulation 153/04 (as amended) since bedrock occurs at depths greater than 2 m below grade across the entire site; and,
- The Phase Two Property does not include, is not adjacent to a water body, and does not include land that is within 30 m of a water body. The nearest water body to the Phase Two Property is the Rideau Canal, located approximately 175m southeast of the Phase Two Property.

The Qualified Person is of the opinion that, given the characteristics of the Phase Two Property and the certifications the Qualified Person would be required to make in filing a Record of Site Condition in relation to the Property, the MECP Table 3 SCS are applicable for use at the Phase Two Property.

5.9.2.6 SOIL PLACED ON, IN, OR UNDER THE PHASE TWO PROPERTY

Fill material was encountered beneath the Phase Two Property extending to depths ranging between 0.76 and 3.05 mbgs during this investigation. Trace quantities of construction debris as asphalt was present in some instances of the fill material. Based on the historical review fill may have been brought to the Site or is present as reworked native material placed or disturbed during the construction of the former Grand Stand structure previously located at the Phase Two Property or during the construction of the current North Side Stands and TD

Place Stadium. Fill may have been imported to the Phase Two Property prior to any development works for grade altering purposes.

5.9.2.7 PROPOSED BUILDINGS AND OTHER STRUCTURES

The Phase Two Property is part of the planned Lansdowne Park 2.0 redevelopment. The current North Side Stands and the TD Stadium beneath it will be demolished in preparation of the construction of new North Side Stands structure. The Phase Two Property will continue to be used as mixed community use.

5.9.3 CONTAMINATION PRESENT ON, IN OR UNDER THE PHASE TWO PROPERTY

Contaminants of concern in soil on the Phase Two Property exceeding Table 3 SCS have been confirmed through laboratory analysis to include benzo(a)pyrene and EC. COPC in ground water beneath the Phase Two Property do not exceed the MECP Table 3 SCS. Soil samples analyzed for COPC that exceeded the applicable MECP Table 3 SCS and the inferred extent of impacted soils at the Phase Two Property are shown in plan view on Figures 11A and 14A and in cross section views on Figures 11B, 11C, 14B and 14C.

Benzo(a)pyrene measured in soil samples collected at depths of 0.61 – 2.13 at borehole BH6-24 and 1.52-3.05 mbgs at borehole BH8-24, at the eastern portion of the Phase Two Property, reported concentrations of 0.39 µg/g to 0.46 µg/g, respectively, thereby exceeding the applicable MECP Table 3 SCS of 0.3 µg/g. The source of benzo(a)pyrene exceedances may be associated with the asphalt located in instances of fill at the Phase Two Property (APEC 1). The benzo(a)pyrene exceedance was delineated vertically by samples collected at greater depths and horizontally by samples collected at BH5-24 and BH3-24 where benzo(a)pyrene met the MECP Table 3 SCS and the boundary of the Phase Two Property. The area of soil impacted by Benzo(a)pyrene is estimated at 3,300 m^2 as shown on Figure 11A.

EC measured in soil sample SS3 from BH8-24 at a depth between 1.52 – 2.29 mbgs located on the eastern portion of the Phase Two Property exceeded the applicable MECP Table 3 SCS of 1.4mS/cm. The source of EC exceedances may be associated with the winter salting activities on the Phase Two Property as it is located near the main eastern entrance to the stadium. The EC exceedance was delineated vertically by samples collected at greater depths and horizontally by the boreholes BH3-24 and BH6-24 where EC met the MECP Table 3 SCS and the boundary of the Phase Two Property. The area of soil impacted by EC is estimated at 1,400 m^2 as shown on Figure 14A.

5.9.3.1 DISCHARGE OF CONTAMINANTS

The source of benzo(a)pyrene in soil at BH6-24 and BH8-24 cannot be identified with certainty but is inferred to be associated with the fill material placed at those locations. PAHs were noted as COPCs in fill material, and construction debris (i.e. asphalt) was noted in the fill material at BH8-24 but not at BH6-24 although trace amounts of construction debris may not have been readily apparent in soils from that location.

The exact source of the EC impacts in soil is unknown. EC soil impacts may be attributed to winter salting activities as the impacts were identified at a location near the main entrance to the stadium and at shallow depths consistent with a near surface origin.

5.9.3.2 MIGRATION OF CONTAMINANTS

Benzo(a)pyrene and EC were identified at concentrations exceeding MECP Table 3 SCS in subsurface soils above the water table. Benzo(a)pyrene is marginally soluble in water and thus would not be expected to be significantly influenced given the inferred age of these contaminants at the Phase Two Property. Elevated EC typical occurs as result of dissociable compounds that can readily dissolve in groundwater. As the EC impacts are located above the water table and beneath and asphalt surfaced area they are not expected to undergo significant migration.

Climatic and/or meteorological conditions are not expected to have a significant influence on the distribution and migration of contaminants in groundwater at the Phase Two Property.

5.9.3.3 VAPOUR INTRUSION

Based on the parameters identified at the Site exceeding the MECP Table 3 SCS (benzo(a)pyrene and EC), their reported concentrations, and their soil to indoor air (S-IA) component values, where established, there are no soil vapour intrusion concerns at the Phase Two Property.

5.9.4 CONTAMINANT EXPOSURE PATHWAYS AND RECEPTORS

Site plans and cross sections showing the lateral and vertical distributions of contaminants of concern at the Phase Two Property in soil are provided on Figures 11A to C and 14 A to C.

Benzo(a)pyrene measured in soil samples collected at depths of 0.61 – 2.13 at borehole BH6-24 and 1.52-3.05 mbgs at borehole BH8-24, at the eastern portion of the Phase Two Property, demonstrated values of 0.39 to 0.46, respectively, thereby exceeding the applicable MECP Table 3 SCS of 0.3. The benzo(a)pyrene exceedance was vertically delineated and limited horizontally as defined by BH5-24 and BH3-24 where benzo(a)pyrene met the MECP Table 3 SCS. The approximate areal extent of benzo(a)pyrene impacts are shown on Figure 11A while the approximate vertical extents are provided on Figures 11B and C.

EC measured in soil samples SS3 of BH8-24 at a depth between 1.52 – 2.29 mbgs located on the eastern portion of the Phase Two Property exceeding the applicable MECP Table 3 SCS of 1.4 mS/cm. The EC exceedances was vertically delineated and horizontally limited at the eastern portion of the Phase Two Property as defined by BH3-24 and BH6-24 where EC met the MECP Table 3 SCS. The approximate areal extent of EC impacts are shown on Figure 11A while the approximate vertical extents are provided on Figures 11B and C.

5.9.4.1 CONTAMINANT RELEASE MECHANISMS

The contaminants have been released into the natural environment through various mechanisms including either deliberate or accidental and inadvertent actions or a combination thereof. These mechanisms include:

- Benzo(a)pyrene soil impacts that are likely associated with construction debris (i.e. asphalt) within the fill material brought to or reworked at the Phase Two Property during construction activities at the Phase Two Property; and,
- EC soil impacts can likely be attributed to winter salting activities at and near the main eastern entrance to the Stadium.

5.9.4.2 CONTAMINANT TRANSPORT PATHWAY,

The Phase Two ESA identified COCs in soil, but not in groundwater. As such, pathways associated with COCs in groundwater (i.e., soil leaching to groundwater pathway, groundwater to surface water discharge volatilization from groundwater, uptake of groundwater COCs by plants and prey) are not of concern. As such, the key transport pathways of interest include:

- Volatilization to outdoor air, indoor air and trench air (from soil);
- Uptake of soil COCs by plants and prey; and,
- Movement of COCs through the food web (i.e., ingestion of plants and prey).

5.9.4.3 HUMAN AND ECOLOGICAL RECEPTORS LOCATED ON, IN OR UNDER THE PHASE TWO PROPERTY

Under a commercial or industrial land use, human health receptors on-Site may include long term indoor workers, long term outdoor workers and sub-surface workers.

In terms of ecological receptors, on-Site receptors include terrestrial birds and mammals, and plants and invertebrates.

5.9.4.4 RECEPTOR EXPOSURE POINTS

COCs can be contacted by human health and ecological receptors either directly in soil and indirectly in outdoor and indoor air. Potential exposure points relevant to human and ecological receptors include:

- Direct contact to soil – construction workers, landscape workers, residents, terrestrial plants, soil organism and birds and mammals;
- Inhalation of, or contact with vapour sourced from soil in outdoor air – construction workers, landscape workers, residents, terrestrial plants, soil organism and birds and mammals;
- Inhalation/ingestion of dust - construction workers, landscape workers, residents, terrestrial plants, soil organism and birds and mammals;
- Exposure to food and prey items following uptake of soil contaminants – terrestrial mammals and birds.

5.9.4.5 ROUTES OF EXPOSURE

COCs in soil can be contacted by human health and ecological receptors either directly (e.g., dermal contact, ingestion or inhalation of particulates) or indirectly (e.g., inhalation of vapours). Ecological receptors can also be exposed indirectly through the food chain.

In the absence of risk management measures (RMM), on-Site human health receptors may be exposed to COC in soil through:

- Direct contact (dermal contact, incidental soil ingestion, soil/dust inhalation); and,
- Inhalation of vapours in indoor, outdoor, and/or trench settings.

In the absence of RMMs, off-Site human health receptors may be exposed to COCs through vapour inhalation (indoor, outdoor, and trench settings) or migration of dust.

The key exposure pathways to the COC by on-Site terrestrial receptors include:

- Soil ingestion and direct contact by soil invertebrates;
- Root uptake and/or root contact with soil by terrestrial plants;
- Soil ingestion by mammals and birds; and,
- Ingestion of impacted food/prey by soil invertebrates, mammals and birds.

Additional exposure pathways, which result in minimal exposure, include the following:

- Inhalation of soil particulates by mammals and birds;
- Dermal contact by mammals and birds; and,
- Inhalation of outdoor air (sourced from soil) by soil invertebrates, mammals and birds and stem or foliar uptake by terrestrial plants.

The conceptual exposure model, which accounts for key exposure pathway incorporated by MECP in the development of the SCS, is provided on Figure 20.

5.9.5 NON-STANDARD DELINEATION

A standard delineation was conducted in accordance with section 7.1 of this Schedule as part of preparing the Phase Two Environmental Site Assessment report..

5.9.6 SECTION 49.1 OF THE REGULATION

As per Section 49.1 (1) of O.Reg. 153/04, although APECs 7 and 8 may result in exceedances of the applicable Site Conditions Standards (SCS) for one or more of electrical conductivity (EC), sodium adsorption ratio (SAR) and cyanide (CN) in soil and/or sodium (Na) and chloride (Cl-) in groundwater, the applicable SCS is deemed not to be exceeded given that a substance has been applied to surfaces for the safety of vehicular and/or pedestrian traffic under conditions of snow or ice or both. These APECs need not be investigated as part of a Phase Two ESA but may need to be considered under Ontario Regulation 409/19 – On-site and Excess Soil Management, as amended (“O.Reg.406/19”) with respect to any excess soil that may be generated during redevelopment.

6 CONCLUSIONS

The Phase One ESA (WSP, 2024) identified a number of Potentially Contaminating Activities (PCA) and/or current/historic uses or activities, both on and off the Phase Two Property and within the Phase One Study Area (see Figure 4B), that have resulted in the identification of eight (8) Areas of Potential Environmental Concern (APEC) at the Phase Two Property. The Phase Two ESA was undertaken in October through December 2024, to quantitatively assess the APECs identified in the WSP's Phase One ESA.

The Phase Two ESA consisted in the drilling and sampling of six (6) boreholes (BH3-24 to BH8-24) advanced to depth ranging up to 8.2 m below ground surface (mbgs). Borehole locations were selected based on site accessibility and access limitations imposed by the existing building and structures. Five (5) of the boreholes (BH3-24, BH5-25, BH6-24, BH7-24 and BH8-24) were instrumented as groundwater monitoring wells.

Overburden beneath the Phase Two Property is generalized as consisting of near-surface fill consisting of silty and gravelly sand with some instances of trace construction debris including pieces of asphalt to depths ranging from 0.06 to 3.05 mbgs, underlain by native deposits of sand with instances of trace to some silt and instances of trace to some gravel or pieces of rock, that extend beyond the maximum depth of investigation (8.2 mbgs). Bedrock was encountered was encountered at depths ranging between 16.23 mbgs 22.15 mbgs during a geotechnical investigation conducted by Paterson Group concurrently with the Phase Two ESA (Paterson, 2024).

The existing and planned future use of the Phase Two Property is community. In accordance with requirements of O.Reg.153/04, the Phase Two Property was evaluated with respect to the MECP Table 3 SCS for industrial/commercial/community property uses in non-potable groundwater conditions.

The ground water table was encountered beneath the Phase Two Property at depths between 2.27 and 6.23 mbgs (approximate elevation 59.99 – 60.27 masl residing within the native sandy deposits. Based on the groundwater elevation measured on November 8, 2024, shallow ground water flow reflects topography with flow directed to southeast across the Phase Two Property towards the Rideau Canal.

The maximum horizontal hydraulic gradient in the shallow water table (0.005) exists near the southeast corner of the Site while the minimum horizontal hydraulic gradient (0.002) was observed in the northern portion of the Phase Two Property during the November 2024 monitoring event. The average horizontal gradient across the Site in November 2024 was approximately 0.004.

Combustible organic vapour (COV) and total organic vapour (TOV) concentrations measured in soil samples collected during the drilling program ranged from non-detect to 95 parts per million (ppm) (hexane equivalent) and 100 ppm (isobutylene equivalent), respectively.

Grain size analyses of native soils indicate that the soils at the Phase Two Property would be comprised of less than 50% soil particles passing the 75 micrometre (µm) size sieve on more than 30% of the volume of soil investigated and are thus classified as coarse textured in accordance with O.Reg.153/04.

Selected soil samples chosen based on field screening were submitted for analysis of contaminants of potential concern (COPC) including petroleum hydrocarbon fractions F1-F4 (PHCs); polycyclic aromatic hydrocarbons (PAHs); metals (barium, beryllium, boron, cadmium, chromium (total), cobalt, copper, lead, molybdenum, nickel, silver, thallium, uranium, vanadium, zinc); hydride forming metals including arsenic (As), antimony (Sb), selenium (Se); and other regulated parameters including hexavalent chromium (Cr[VI]), hot water-soluble boron (B-HWS), mercury (Hg), electrical conductivity (EC), sodium adsorption ratio (SAR), cyanide and pH. All soil samples reported concentrations below the applicable Table 3 SCS with the following exceptions:

- Benzo(a)pyrene in soil samples collected from boreholes BH6-24 and BH8-24. The benzo(a)pyrene impacted soil is inferred to be associated with poor quality fill material placed during previous construction activities at the Phase Two Property. The inferred area of soil impacted by benzo(a)pyrene is estimated at 3,300 m^2; and,
- EC in soil a sample in borehole BH8-24 on the eastern portion of the Phase Two Property near the TD Place Arena entrance, is likely associated with road salting activities on the Phase Two Property. The inferred area of soil impacted by EC is estimated at 1,400 m^2.

Selected groundwater samples were submitted for chemical analyses of the COPCs including BTEX, PHCs, PAHs, polychlorinated biphenyls (PCBs) and ammonia. All ground water samples reported concentrations below the applicable Table 3 SCS.

In summary, the Phase Two ESA soil and groundwater analytical data confirmed that the Phase Two Property has been impacted, likely through the placement of poor quality fill or the presence of construction debris within reworked native material. Soil impacts by one of more of the COPC were identified at two (2) of the six (6) boreholes (BH6-24 and BH8-24) advanced at the Phase Two Property including beneath (BH6-24) and immediately adjacent to (BH8-24) the North Side Stand and TD Place arena structure, respectively. No groundwater impacts were identified exceeding the applicable SCS beneath the Phase Two Property.

The use of de-icing salts on adjacent roadways, pathways, steps and entryways has likely contributed to the elevated EC reported in the shallow soil sample collected from BH8-24 near the entry way to the TD Place Arena. As per Section 49.1 of O.Reg. 153/04, the applicable SCS is deemed not to be exceeded if the Qualified Person has determined that the exceedance has been caused by a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both

Based on the conclusions of this report, an RSC cannot be filed unless the impacts are delineated, remediated and/or addressed through a Risk Assessment carried out in accordance with O.Reg.153/04. Furthermore, it should be noted that any excess soil generate as a result of remediation or redevelopment activities exceeding the MECP Table 3 SCS for industrial/commercial/community property uses will likely require disposal at a facility licensed to accept such soil. Additionally, further investigation could be carried out and potentially reduce the estimate areas of impacted soil.

7 SIGNATURES

I, Kevin D. Hicks, M.Sc., P.Geo., QP$_{\text{ESA}}$,, by the signature provided below, certify that I conducted or supervised the carrying out of this Phase Two Environmental Site Assessment and the findings and conclusions of the report. I (name of reviewer and credentials), by the signature provided below, certify that I completed a technical review of this Phase Two Environmental Site Assessment and concur with the findings and conclusions of the report.

Respectfully Submitted,
WSP Canada Inc.

Prepared by:

Spencer Oklobdjiza, PMP, P.Geo. Environmental Scientist	Jason F. Taylor, B.Sc.H. Senior Environmental Scientist

Reviewed by:

Kevin D. Hicks, M.Sc., P.Geo., QP(ESA_
Senior Principal Hydrogeologist

Table 1.
Areas of Potential Environmental Concern Disposition Summary and Sampling Rationale

APEC Identifier	APEC Description	Location of APEC on Phase One Property	Potentially Contaminating Activity	Contaminants of Potential Concern (COPC)	Media Potentially Impacted	Sample Location ID	Sample Location Type	Sample Media	Sample ID	Sample Date	Sample Type	Sample Depth / Well Screen Interval (mbgs)	COPC Analyzed in Soil								COPC Analyzed in Groundwater						
													BTEX	Metals	PAHs	PHCs	PCBs	CN	EC	SAR	Ammonia	Na, Cl	Glycol	BTEX	PHCs	PAHs	PCBs
APEC 1	Historic infilling and grading of the Phase One Property with fill of unknown quality prior to or during construction of the North Side Stands and TD Place Arena and Salons	Entire Phase One Property	30. Importation of Fill Material of Unknown Quality	Metals, As, sb, Se, B-HWS, Cr(VI), Hg, BTEX, PHCs, PAHs, CN, EC, SAR	Soil	BH3-24	BHD	Soil	SA 4	10-Oct-24	BHD	2.29 - 2.90	●	●	●	●		●	●	●							
						BH3-24	BHD	Soil	SA 6	10-Oct-24	BHD	3.81 - 4.42	●	●	●	●		●	●	●							
						BH4-24	BHD	Soil	SA 2B	16-Oct-24	BHD	0.91 - 1.37	●	●	●	●		●	●	●							
						BH4-24	BHD	Soil	SA 5	16-Oct-24	BHD	3.05 - 3.66	●	●	●	●		●	●	●							
						BH5-24	BHD	Soil	SA 2	21-Oct-24	BHD	0.91 - 1.52	●	●	●	●		●	●	●							
						BH5-24	BHD	Soil	SA 3B	21-Oct-24	BHD	1.68 - 2.13	●	●	●	●		●	●	●							
						BH6-24	BHD	Soil	SA 2B-3	24-Oct-24	BHD	0.61 - 2.13	●	●	●	●		●	●	●							
						BH6-24	BHD	Soil	SA 4	24-Oct-24	BHD	2.29 - 2.90	●	●	●	●		●	●	●							
						BH7-24	BHD	Soil	SS1	29-Oct-24	BHD	0.25 - 0.76	●	●	●	●		●	●	●							
						BH7-24	BHD	Soil	SS2	29-Oct-24	BHD	0.76 - 1.37	●	●	●	●		●	●	●							
						BH7-24	BHD	Soil	SS3	29-Oct-24	BHD	1.37 - 2.13	●	●	●	●		●	●	●							
						BH8-24	BHD	Soil	SS3	01-Nov-24	BHD	1.52 - 2.29	●	●	●	●		●	●	●							
						BH8-24	BHD	Soil	SS4	01-Nov-24	BHD	2.29 - 3.05	●	●	●	●		●	●	●							
						BH8-24	BHD	Soil	SS5	01-Nov-24	BHD	3.05 - 3.81	●	●	●	●		●	●	●							
						BH8-24	BHD	Soil	SS10	01-Nov-24	BHD	6.86 - 7.62	●	●	●	●		●	●	●							
APEC 2	Oil filled electrical transformer located on the service (lower) level of TD Place	Located centrally on the east portion of the service (lower) level of TD Place	55. Transformer Manufacturing, Processing and Use	PHCs, PAH, PCBs	Soil Groundwater	BH3-24	BHD	Soil	SA 4	10-Oct-24	BHD	2.29 - 2.90			●	●											
						BH3-24	BHD	Soil	SA 6	10-Oct-24	BHD	3.81 - 4.42			●	●											
						MW24-1	MW	Groundwater	MW24-1	08-Nov-24	MW	4.8 - 7.8													●	●	●
						BH8-24	BHD	Soil	SS3	01-Nov-24	BHD	1.52 - 2.29			●	●											
						BH8-24	BHD	Soil	SS4	01-Nov-24	BHD	2.29 - 3.05			●	●											
						BH8-24	BHD	Soil	SS5	01-Nov-24	BHD	3.05 - 3.81			●	●											
						BH8-24	BHD	Soil	SS10	01-Nov-24	BHD	6.86 - 7.62			●	●											
						MW24-2	MW	Groundwater	MW24-2	08-Nov-24	MW	5.2 - 8.2													●	●	●
APEC 3	Arena ice making plant. Located on the service (lower) level of TD Place and associated chiller pipelines beneath the arena surface	Located centrally on the east portion of the service (lower) level of TD Place	QP-Defined PCA - Ice Making Plant Using Ammonia	Ammonia, glycol	Groundwater	BH3-24	BHD	Soil	SA 4	10-Oct-24	BHD	2.29 - 2.90															
						BH3-24	BHD	Soil	SA 6	10-Oct-24	BHD	3.81 - 4.42															
						MW24-1	MW	Groundwater	MW24-1	08-Nov-24	MW	4.8 - 7.8									●						
						BH8-24	BHD	Soil	SS3	01-Nov-24	BHD	1.52 - 2.29															
						BH8-24	BHD	Soil	SS4	01-Nov-24	BHD	2.29 - 3.05															
						BH8-24	BHD	Soil	SS5	01-Nov-24	BHD	3.05 - 3.81															
						BH8-24	BHD	Soil	SS10	01-Nov-24	BHD	6.86 - 7.62															
						MW24-2	MW	Groundwater	MW24-2	08-Nov-24	MW	5.2 - 8.2									●						
APEC 4	Brine distribution and chiller lines beneath ice rink	Located centrally on the north portion of the Site beneath the ice rink and extending to the ice making plant)	QP-Defined PCA - Brine Distribution and Chiller Lines for Ice Making Plant	EC, SAR Na, Cl	Soil Groundwater	BH5-24	BHD	Soil	SA 2	21-Oct-24	BHD	0.91 - 1.52							●	●							
						BH5-24	BHD	Soil	SA 3B	21-Oct-24	BHD	1.68 - 2.13							●	●							
						MW24-4	MW	Groundwater	MW24-4		MW	1.5 - 4.5															
						BH6-24	BHD	Soil	SA 2B-3	24-Oct-24	BHD	0.61 - 2.13							●	●							
						BH6-24	BHD	Soil	SA 4	24-Oct-24	BHD	2.29 - 2.90							●	●							
						MW24-3	MW	Groundwater	MW24-3	08-Nov-24	MW	1.5 - 4.5															

APEC 5	Existing and former tanks including one 2,273 L gasoline AST and one 2,273 L diesel AST; one diesel back-up generator equipped with internal 5,791 L diesel AST; one former AST Located beneath the stadium ramp on the east side of TD Place Arena ice making plant Glycol based snow and ice melting system for the Loading Ramp down to the service (lower) level of TD Place	Located near the northeast corner of the Phase One Property on the loading dock ramp	28. Gasoline and Associated Products Storage in Fixed Tanks	BTEX, PHCs, PAHs	Soil Groundwater	BH6-24	BHD	Soil	SA 2B-3	24-Oct-24	BHD	0.61 - 2.13	●		●	●											
						BH6-24	BHD	Soil	SA 4	24-Oct-24	BHD	2.29 - 2.90	●		●	●											
						MW24-3	MW	Groundwater	MW24-3	08-Nov-24	MW	1.5 - 4.5												●	●	●	
						BH8-24	BHD	Soil	SS3	01-Nov-24	BHD	1.52 - 2.29	●		●	●											
			QP-Defined PCA - Ice Making Plant Using Ammonia	Ammonia, glycol	Groundwater	BH8-24	BHD	Soil	SS4	01-Nov-24	BHD	2.29 - 3.05	●		●	●											
						BH8-24	BHD	Soil	SS5	01-Nov-24	BHD	3.05 - 3.81	●		●	●											
			QP-Defined PCA - Glycol Snow and Ice Melting System	Glycol	Groundwater	BH8-24	BHD	Soil	SS10	01-Nov-24	BHD	6.86 - 7.62	●		●	●											
						MW24-2	MW	Groundwater	MW24-2	08-Nov-24	MW	5.2 - 8.2												●	●	●	
APEC 6	Brine distribution and chiller lines beneath ice rink	Located centrally on the north portion of the Site beneath the ice rink and extending to the ice making plant)	QP-Defined PCA - Brine Distribution and Chiller Lines for Ice Making Plant	EC, SAR Na, Cl	Soil Groundwater	BH5-24	BHD	Soil	SA 2	21-Oct-24	BHD	0.91 - 1.52							●	●							
						BH5-24	BHD	Soil	SA 3B	21-Oct-24	BHD	1.68 - 2.13							●	●							
						MW24-4	MW	Groundwater	MW24-4		MW	1.5 - 4.5															
						BH6-24	BHD	Soil	SA 2B-3	24-Oct-24	BHD	0.61 - 2.13							●	●							
						BH6-24	BHD	Soil	SA 4	24-Oct-24	BHD	2.29 - 2.90							●	●							
						MW24-3	MW	Groundwater	MW24-3	08-Nov-24	MW	1.5 - 4.5															
APEC 7	Application of winter de-icing agents. On sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety	Pedestrian walkways north of Building J, stairs at northeast and northwest entrances to TD Area.	QP-Defined PCA - Application of Winter De-icing Agents	CN, EC, SAR Na, Cl	Soil Groundwater																						
APEC 8	Application of winter de-icing agents. On roads, sidewalks, pathways and laneways for pedestrian and vehicle safety	Roadways, laneways and pathways immediately north, east and west of Phase One Property	QP-Defined PCA - Application of Winter De-icing Agents	CN, EC, SAR Na, Cl	Soil Groundwater																						

Notes

BHD - Borehole discrete interval soil sample.

MW - Monitoring well groundwater sample.

🟩● Denotes all parameters in test group met applicable Site Conditions Standard.

🟧● Denotes one or more parameters in test group exceeded applicable Site Conditions Standard.

BTEX –Benzene, Toluene, Ethylbenzene and Xylenes

EC – Electrical conductivity

Metals – (Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Ag, Tl, U, V, Zn)

PAHs - Polycyclic Aromatic Hydrocarbons

PCB – Polychlorinated Biphenyls

PHCs – Petroleum Hydrocarbons

SAR – Sodium adsorption Ratio

Table 2. Borehole and Groundwater Monitoring Well Construction Details

Monitor Well ID	UTM Coordinates [1]		Date of Construction	Well Constructed By	Borehole and Groundwater Monitoring Interval Construction Data									
	Easting	Northing			Ground Surface Elevation (masl)	Top of Casing Elevation (masl)	Borehole Depth (mbgs)	Borehole Bottom Elevation (masl)	Casing Stick-up (m)	Depth to Bottom of Well Screen (mbgs)	Well Diameter (mm)	Well Screen Length (m)	Well Screen Interval (masl)	Geologic Media Intersected by Well Screen
BH3-24-A/MW24-1	368752.30	5029083.00	16-Oct-24	WSP	66.330	66.234	7.77	58.56	0.096	7.77	32	3.05	58.56 - 61.61	Silty sand and gravel
BH4-24	368655.15	5029026.59	16-Oct-24	WSP	66.180	-	4.42	61.76	-	-	-	-	- - -	-
BH5-24/MW24-4	368654.17	5029070.94	21-Oct-24	WSP	62.540	62.416	5.01	57.53	0.124	4.57	32	3.05	57.97 - 61.02	Gravelly silty sand to sandy silt
BH6-24/MW24-3	368726.10	5029111.91	24-Oct-24	WSP	62.490	62.395	4.57	57.92	0.095	4.57	32	3.05	57.92 - 60.97	Silty gravelly sand
BH7-24/MW24-5	368708.35	5029132.04	29-Oct-24	WSP	62.540	62.438	4.57	57.97	0.102	4.57	32	3.05	57.97 - 61.02	Medium sand
BH8-24/MW24-2	368758.14	5029099.16	1-Nov-24	WSP	66.050	65.990	8.22	57.83	0.060	8.22	51	5.18	57.83 - 63.01	Silty sand and gravel

Notes:

1 - Modified Transverse Mercator (MTM) Grid Reference, Zone 9, North American Datum (NAD) 1983, Canadian Spatial Reference System (CSRS) 2010.

masl = Metres Above Sea Level.

mrld = Metres Relative to Local Datum.

mbgs = Metres Below Ground Surface.

Elevations referenced to geodetic.

Table 3. Soil Sample Summary

Sample Location ID	Area of Potential Environmental Concern / Sampling Rationale	Sampling Date	Sample ID	Sample Type	Sample Depth (mbgs)	COV (ppm)	TOV (ppm)	Laboratory Sample ID	Laboratory Analyses											
									BTEX	PHCs F1 - F4	PAHs	Reg 153 Metals	As, Sb, Se	B-HWS	Cr(VI)	Hg	CN	EC	SAR	pH
BH3-24 / MW24-1	APECs 1, 2 and 3	10-Oct-24	SA4	SS	2.29 - 2.90	1	100	WT2430638-008	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH3-24 / MW24-1	APECs 1, 2 and 3	10-Oct-24	SA6	SS	3.81 - 4.42	0	1	WT2430638-009	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4-24	APEC 1	16-Oct-24	SA2B	SS	0.91 - 1.37	20	1	WT2431125-001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH4-24	APEC 1	16-Oct-24	SA5	SS	3.05 - 3.66	15	1	WT2431125-002	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH5-24 / MW24-4	APECs 1 and 3	21-Oct-24	SA2	SS	0.91 - 1.52	95	1	WT2431879-001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH5-24 / MW24-4	APECs 1 and 3	21-Oct-24	SA3B	SS	1.68 - 2.13	55	21	WT2431879-002	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH6-24 / MW24-3	APECs 1 and 3	24-Oct-24	SA2B-3	SS	0.61 - 2.13	15	1	WT2431879-004	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH6-24 / MW24-3	APECs 1 and 3	24-Oct-24	SA4	SS	2.29 - 2.90	20	1	WT2431879-005	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH7-24 / MW24-5	APECs 1 and 3	29-Oct-24	SS1	SS	0.25 - 0.76	0	0	WT2432203-001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH7-24 / MW24-5	APECs 1 and 3	29-Oct-24	SS2	SS	0.76 - 1.37	0	0	WT2432203-002	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH7-24 / MW24-5	APECs 1 and 3	29-Oct-24	SS3	SS	1.37 - 2.13	0	0	WT2432203-003	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8-24 / MW24-2	APECs 1, 3 and 4	1-Nov-24	SS3	SS	1.52 - 2.29	20	0	WT2432752-001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8-24 / MW24-2	APECs 1, 3 and 4	1-Nov-24	SS4	SS	2.29 - 3.05	10	0	WT2432752-002	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8-24 / MW24-2	APECs 1, 3 and 4	1-Nov-24	SS5	SS	3.05 - 3.81	0	0	WT2432752-003	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8-24 / MW24-2	QA/QC Blind Duplicate Sample	1-Nov-24	DUP-1	SS	3.05 - 3.81	0	0	WT2432752-005	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8-24 / MW24-2	APECs 1, 3 and 4	1-Nov-24	SS10	SS	6.86 - 7.62	25	1	WT2432752-004	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH8-24 / MW24-2	QA/QC Blind Duplicate Sample	1-Nov-24	DUP-2	SS	6.86 - 7.62	25	1	WT2432752-006	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes:

mbgs = Metres Below Ground Surface.

SS = Split Spoon Sample.

Reg 153 Metals includes Ag, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Th, U, V, Zn.

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes.

CN = Cyanide.

EC - Electrical Conductivity.

PHCs = Petroleum Hydrocarbons.

PAHs = Polynuclear Aromatic Hydrocarbons.

SAR = Sodium Adsorption Ratio.

Table 4. Monitoring Well Development Data

Monitor Well ID	UTM Coordinates [1]		Ground Surface Elevation (masl)	Top of Casing Elevation (masl)	Depth to Water (mbtoc)	Depth to Water (mbgs)	Depth to Bottom of Well Screen (mbgs)	Depth to Bottom of Bentonite Seal above Screen (mbgs)	Borehole Diameter (mm)	Well Diameter (mm)	Well Casing Volume (L)	Sand Pack Volume (L)	Desired Number of Volumes	Theoretical Well Development Volume (L)	Actual Well Development Volume (L)	General Observations
	Easting	Northing														
MW24-1	368752.30	5029083.00	66.330	66.234	6.080	6.18	7.77	4.41	200.0	32.0	1.3	17.0	5	91	40	Brown with heavy sediment - water is light brown with little sediment after purging. No sheen/odour.
MW24-2	368758.14	5029099.16	66.050	65.990	5.942	6.00	8.22	4.57	200.0	50.0	4.4	22.5	5	134	40	Brown with heavy sediment - water is light brown with little sediment after purging. No sheen/odour.
MW24-3	368726.10	5029111.91	62.490	62.395	2.198	2.29	4.57	1.21	200.0	32.0	1.8	24.2	5	130	40	Brown with heavy sediment - water is light brown with little sediment after purging. No sheen/odour.
MW24-4	368654.17	5029070.94	62.540	62.416	2.078	2.20	5.01	1.21	200.0	32.0	2.3	29.9	5	161	40	Brown with heavy sediment - water is light brown with little sediment after purging. No sheen/odour.
MW24-5	368708.35	5029132.04	62.540	62.438	2.147	2.25	4.57	1.21	200.0	32.0	5.1	26.2	5	157	40	Brown with heavy sediment - water is light brown with little sediment after purging. No sheen/odour.

Notes:
1 - Modified Transverse Mercator (MTM) Grid Reference, Zone 9, North American Datum (NAD) 1983, Canadian Spatial Reference System (CSRS) 2010.
mbgs = Metres Below Ground Surface.
masl = Metres Above Sea Level.
mrld = Metres Relative to Local Datum.
mbgs = Metres Below Ground Surface.
Elevations referenced to geodetic (GIVE NAME OF SURVEYOR AND BENCHMARK LOCATION / ID).
Elevations referenced to a temporary benchmark established on XXXXXX. The benchmark was assigned an arbitrary elevation of 100.000 metres.
Sand pack volume calculated based on borehole diameter, well casing outside diameter and height of water in well casing for unsubmerged well screens.
Sand pack volume calculated based on borehole diameter, well casing outside diameter and height of sand pack below bentonite seal for submerged well screens.
Sand pack porosity assumed to be 35%.
Theoretical development volume equals three time the summation of well casing volume and sand pack volume.

Table 5. Groundwater Monitoring Data

Monitoring Well ID	UTM Coordinates [1]		Ground Surface Elevation (masl)	Top of Casing Elevation (masl)	November 8, 2024				
	Easting	Northing			Depth to Water (mbtoc)	Depth to LNAPL (mbtoc)	Depth to Water (mbgs)	LNAPL Thickness (cm)	Static Elevation (masl)
MW24-1	368752.30	5029083.00	66.33	66.23	6.131	ND	6.227	ND	60.103
MW24-2	368758.14	5029099.16	66.05	65.99	5.998	ND	6.058	ND	59.992
MW24-3	368726.10	5029111.91	62.49	62.40	2.249	ND	2.344	ND	60.146
MW24-4	368654.17	5029070.94	62.54	62.42	2.145	ND	2.269	ND	60.271
MW24-5	368708.35	5029132.04	62.54	62.44	2.198	ND	2.300	ND	60.240

Notes:
1 - Modified Transverse Mercator (MTM) Grid Reference, Zone 9, North American Datum (NAD) 1983, Canadian Spatial Reference System (CSRS) 2010.
masl = Metres Above Sea Level.
mrld = Metres Relative to Local Datum.
mbtoc = Metres Below Top of Casing.
mbgs = Metres Below Ground Surface.
LNAPL = Light Non-Aqueous Phase Liquid.
ND - Not Detected.
Static Elevation Corrected for LPH Thickness, Where Present.
LNAPL Density = 0.85 g/ml (Measured / Assumed).
Elevations referenced to geodetic.

Table 6. Groundwater Sampling Data and Field Observations

Monitoring Well ID	Sample ID	Sampling Date	Water Level Data			Field Parameters					Laboratory Analyses					General Observations
			Initial Depth to Water (mbtoc)	Final Depth to Water (mbtoc)	Total Drawdown (m)	pH (pH units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Temperature (ºC)	Oxidation Reduction Potential (mV)	BTEX	PHCs F1 - F4	PAHs	PCBs	Ammonia	
MW24-1	MW24-1	8-Nov-24	6.131	6.131	0.00	7.45	0.68	0.71	16.1	235.6	✓	✓	✓	✓	✓	Clear, no sediment, no sheen/odour
MW24-2	MW24-2	8-Nov-24	5.998	5.998	0.00	7.59	0.81	1.81	16.1	246.1	✓	✓	✓	✓	✓	Clear, no sediment, no sheen/odour
MW24-3	MW24-3	8-Nov-24	2.249	2.259	0.01	7.75	0.83	0.57	14.5	198.2	✓	✓	✓		✓	Clear, no sediment, no sheen/odour
MW24-4	MW24-4	8-Nov-24	2.145	2.155	0.01	7.58	0.57	0.13	16.0	61.3	✓	✓	✓		✓	Cloudy, little sediment, no sheen/odour
MW24-4	DUP-1	8-Nov-24	-	-	-	-	-	-	-	-	✓	✓	✓		✓	QA/QC Blind Duplicate Sample
MW24-5	MW24-5	8-Nov-24	2.198	2.198	0.00	7.83	0.91	1.14	16.9	220.7	✓	✓	✓		✓	Clear, no sediment, no sheen/odour

Notes:
mbtoc = Metres Below Top of Casing.
Water Level Data as Recorded During Low-Flow Sampling.
Field Parameters Measured using a YSI 556 Multi-Parameter Water Quality Monitoring Instrument.
Groundwater Sampling Performed Using a Geotech Submersible Bladder Pump.
Groundwater Sampling Performed Using a Waterra Pegasus Alexis Peristaltic Pump.
mS/cm = MilliSiemens per Centimeter.
mV = Millivolts.
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes.
PHCs = Petroleum Hydrocarbons.
PAHs = Polynuclear Aromatic Hydrocarbons.
PCBs = Polychlorinated Biphenyls.

Notes on Soil Analytical Summary Tables

All Units in Micrograms per Gram (µg/g) Except Where Indicated Otherwise.

RDL = Laboratory Analytical Reporting Detection Limit.

RL = MECP 2021 Analytical Protocol Reporting Limit.

- = Not Analyzed or No Published Value.

DUP = Quality Assurance/Quality Control Duplicate Sample.

RPD = Relative Percent Difference (Between Primary and Duplicate Samples).

< = Less Than Laboratory Analytical Method Detection Limit or Reporting Detection Limit.

(a) F1 Fraction Does Not Include BTEX; However, the Proponent has the Choice as to Whether or not to Subtract BTEX from the Analytical Result.

(d) The Methylnaphthalene Standards are Applicable to Both 1-Methyl Naphthalene and 2-Methyl Naphthalene, with the Provision that if Both are Detected the Sum of the Two Must not Exceed the Standard.

(h) MECP Standard for Boron Based on Hot Water Extract.

(i) Analysis for Methyl Mercury is Required When the MECP Standard for Mercury (total) is Exceeded.

55	Parameter Concentration May Exceed Applicable Standard or Guideline Due to Elevated Reporting Detection Limit.
797	Parameter Concentration Exceeds MECP Table 3 Full Depth SCS for Industrial/Commercial/Community (I/C/C) Property Use, Coarse Textured Soil.

MECP Standards = Soil Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ministry of the Environment, Conservation and Parks, April 15, 2011.

Table 7. Summary of Soil Analyses

Sample Location				MECP Standards	BH3-24 / MW24-1	BH3-24 / MW24-1	BH4-24	BH4-24	BH5-24 / MW24-4	BH5-24 / MW24-4	BH6-24 / MW24-3	BH6-24 / MW24-3	BH7-24 / MW24-5	BH7-24 / MW24-5	BH7-24 / MW24-5	BH8-24 / MW24-2	BH8-24 / MW24-2	BH8-24 / MW24-2	BH8-24 / MW24-2
Sample No.				Full Depth	SA 4	SA 6	SA 2B	SA 5	SA 2	SA 3B	SA 2B-3	SA 4	SS1	SS2	SS3	SS3	SS4	SS5	SS10
Sample Depth (m)				Non-Potable	2.29 - 2.90	3.81 - 4.42	0.91 - 1.37	3.05 - 3.66	0.91 - 1.52	1.68 - 2.13	0.61 - 2.13	2.29 - 2.90	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Laboratory Name				Table 3	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS	ALS
Laboratory Work Order No.				I/C/C Use	WT2430638	WT2430638	WT2431125	WT2431125	WT2431879	WT2431879	WT2431879	WT2431879	WT2432203	WT2432203	WT2432203	WT2432752	WT2432752	WT2432752	WT2432752
Laboratory Sample ID				Coarse	WT2430638-008	WT2430638-009	WT2431125-001	WT2431125-002	WT2431879-001	WT2431879-002	WT2431879-004	WT2431879-005	WT2432203-001	WT2432203-002	WT2432203-003	WT2432752-001	WT2432752-002	WT2432752-003	WT2432752-004
Sample Date					10-Oct-2024	10-Oct-2024	16-Oct-2024	16-Oct-2024	21-Oct-2024	21-Oct-2024	24-Oct-2024	24-Oct-2024	29-Oct-2024	29-Oct-2024	29-Oct-2024	01-Nov-2024	01-Nov-2024	01-Nov-2024	01-Nov-2024
Analysis Date																			
Parameters	Units	RDL	RL																
Petroleum Hycrocarbons																			
Benzene	µg/g	0.005	0.02	0.32	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0138	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ethylbenzene	µg/g	0.015	0.05	9.5	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Toluene	µg/g	0.05	0.2	68	<0.050	<0.050	<0.050	<0.050	<0.050	0.083	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Xylenes, m,p-	µg/g	0.03	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	0.167	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene, o-	µg/g	0.03	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	0.032	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Total Xylenes	µg/g	0.05	0.05	26	<0.050	<0.050	<0.050	<0.050	<0.050	0.199	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PHC F1 (C6 - C10) [a]	µg/g	5	10	55	<5.0	<5.0	<5.0	<5.0	<5.0	6.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
PHC F2 (>C10 - C16)	µg/g	10	10	230	<10	<10	<10	<10	<10	17	<10	<10	<10	<10	<10	<10	<10	<10	<10
PHC F3 (>C16 - C34)	µg/g	50	50	1700	<50	<50	<50	<50	<50	<50	<50	<50	51	<50	<50	81	<50	<50	<50
PHC F4 (>C34)	µg/g	50	50	3300	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	442	<50	<50	<50
PHC F4 Gravimetric	µg/g	80	50	3300	-	-	-	-	-	-	-	-	-	-	-	2070	-	-	-
Polynuclear Aromatic Hydrocarbons																			
Acenaphthene	µg/g	0.05	0.05	96	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.096	<0.050	<0.050
Acenaphthylene	µg/g	0.05	0.05	0.15	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.142	<0.050	<0.050	<0.050	<0.050	0.052	<0.050	<0.050	<0.050
Anthracene	µg/g	0.05	0.05	0.67	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.132	<0.050	<0.050	<0.050	<0.050	0.078	0.195	<0.050	<0.050
Benzo[a]anthracene	µg/g	0.05	0.05	0.96	0.06	<0.050	<0.050	<0.050	<0.050	<0.050	0.475	<0.050	0.054	<0.050	<0.050	0.363	0.467	<0.050	<0.050
Benzo[a]pyrene	µg/g	0.05	0.05	0.3	0.069	<0.050	<0.050	<0.050	<0.050	<0.050	**0.418**	<0.050	0.076	<0.050	<0.050	**0.393**	**0.463**	<0.050	<0.050
Benzo[b]fluoranthene	µg/g	0.05	0.05	0.96	0.102	<0.050	<0.050	<0.050	<0.050	<0.050	0.595	<0.050	0.106	<0.050	<0.050	0.532	0.613	<0.050	<0.050
Benzo[g,h,i]perylene	µg/g	0.05	0.1	9.6	0.051	<0.050	<0.050	<0.050	<0.050	<0.050	0.216	<0.050	0.07	<0.050	<0.050	0.244	0.268	<0.050	<0.050
Benzo[k]fluoranthene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.249	<0.050	<0.050	<0.050	<0.050	0.204	0.234	<0.050	<0.050
Chrysene	µg/g	0.05	0.05	9.6	0.066	<0.050	<0.050	<0.050	<0.050	<0.050	0.447	<0.050	0.052	<0.050	<0.050	0.368	0.483	<0.050	<0.050
Dibenzo[a,h]anthracene	µg/g	0.05	0.1	0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.061	<0.050	<0.050	<0.050	<0.050	0.071	0.073	<0.050	<0.050
Fluoranthene	µg/g	0.05	0.05	9.6	0.132	<0.050	<0.050	<0.050	<0.050	<0.050	1.09	<0.050	0.097	<0.050	<0.050	0.721	1.19	<0.050	<0.050
Fluorene	µg/g	0.05	0.05	62	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.111	<0.050	<0.050
Indeno[1,2,3-cd]pyrene	µg/g	0.05	0.1	0.76	0.057	<0.050	<0.050	<0.050	<0.050	<0.050	0.266	<0.050	0.071	<0.050	<0.050	0.275	0.304	<0.050	<0.050
Methylnaphthalene, 1-, 2- d	µg/g	0.05	-	76	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Methylnaphthalene, 1- [d]	µg/g	0.03	0.05	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.03	<0.030	<0.030
Methylnaphthalene, 2- [d]	µg/g	0.03	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Naphthalene	µg/g	0.01	0.05	9.6	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	0.05	<0.010	<0.010
Phenanthrene	µg/g	0.05	0.05	12	0.071	<0.050	<0.050	<0.050	<0.050	<0.050	0.546	<0.050	<0.050	<0.050	<0.050	0.319	0.987	<0.050	<0.050
Pyrene	µg/g	0.05	0.05	96	0.112	<0.050	<0.050	<0.050	<0.050	<0.050	0.898	<0.050	0.086	<0.050	<0.050	0.614	0.958	<0.050	<0.050
Metals																			
Antimony	µg/g	0.1	1	40	0.48	<0.10	0.28	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.44	0.15	<0.10	<0.10
Arsenic	µg/g	0.1	1	18	2.41	1.32	1.36	0.49	0.87	1.84	1.05	1.52	1.23	0.65	1.18	1.58	0.92	0.86	1.66
Barium	µg/g	0.5	5	670	70.5	30.6	48.3	15.6	31.4	56.9	37.5	61.1	44.6	18	44.6	60.5	27.9	27.7	55.7
Beryllium	µg/g	0.1	2	8	0.34	0.28	0.31	<0.10	0.2	0.29	0.19	0.26	0.26	0.11	0.24	0.3	0.16	0.15	0.32
Boron (total)	µg/g	5	5	120	5.3	<5.0	<5.0	<5.0	<5.0	9.1	<5.0	8.6	5.8	<5.0	6.1	5.6	<5.0	<5.0	13.7
Boron (Available) [g]	µg/g	0.1	0.5	2	0.13	<0.10	0.13	<0.10	<0.10	0.11	0.15	0.17	0.91	<0.10	<0.10	0.19	<0.10	<0.10	0.11
Cadmium	µg/g	0.02	1	1.9	0.105	0.03	0.051	<0.020	0.021	0.024	0.039	0.028	0.073	<0.020	0.036	0.124	0.034	0.024	0.024
Chromium (Total)	µg/g	0.5	5	160	23.2	11.5	27	3.87	9.65	15.9	11.5	11.2	18.7	5.46	12.1	21.6	11.6	9.33	14.7
Chromium (vi)	µg/g	0.1	0.2	8	0.17	<0.10	0.18	<0.10	0.1	0.15	<0.10	0.16	0.14	<0.10	<0.10	0.23	<0.10	<0.10	0.11
Cobalt	µg/g	0.1	2	80	7.02	3.74	5.32	1.9	4.3	6.56	4.52	6.58	5.43	1.79	6.03	5.12	3.69	3.42	5.71
Copper	µg/g	0.5	5	230	13.4	9.88	10.6	5.91	11.8	15.3	11.1	12.5	12.2	6.66	20	11.3	8.39	9.01	14.6
Lead	µg/g	0.5	10	120	11.4	2.35	4.89	1	2.88	4.9	2.65	3.87	7.6	1.52	4.21	14.8	5.26	2.64	5.07
Mercury [h]	µg/g	0.005	0.1	3.9	0.0219	0.0064	0.0103	<0.0050	<0.0050	0.0079	<0.0050	0.0067	0.0158	<0.0050	<0.0050	0.0258	0.0099	0.006	0.0098
Molybdenum	µg/g	0.1	2	40	0.9	0.24	0.38	0.12	0.62	0.56	0.38	0.59	0.35	0.31	0.69	0.41	0.28	0.19	0.7
Nickel	µg/g	0.5	5	270	14.4	7.55	12.6	3.24	6.09	9.5	6.57	9.81	11.1	2.92	9.5	12.1	6.91	5.78	11.9
Selenium	µg/g	0.2	1	5.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Silver	µg/g	0.1	0.5	40	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	µg/g	0.05	1	3.3	0.136	<0.050	0.072	<0.050	0.067	0.138	0.06	0.133	0.082	<0.050	0.098	0.114	0.052	<0.050	0.16
Uranium	µg/g	0.05	1	33	0.679	0.669	0.572	0.248	0.442	0.46	0.478	0.432	0.432	0.379	0.6	0.468	0.381	0.404	0.458
Vanadium	µg/g	0.2	10	86	31	16.5	39.4	8.98	18.7	24.5	21.8	22.3	29.2	14.2	21.5	29.4	27.7	22.2	19
Zinc	µg/g	2	30	340	56.3	14.7	24.2	6.9	16.2	23.4	15.7	18.7	32.1	8.3	23.2	48.7	20.2	16	21.3
Inorganic Parameters																			
pH (range)	-	0.1	-	-	7.59	7.6	7.44	7.77	8.03	7.89	11.2	9.52	7.81	7.95	8.05	7.75	7.89	7.86	7.84
Cyanide (CN-)	µg/g	0.05	0.05	0.051	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Electrical Conductivity (EC)	mS/cm	0.005	0.005	1.4	0.256	0.272	0.405	0.167	0.138	0.138	0.202	0.159	0.694	0.13	0.0942	**3.21**	0.705	0.572	0.162
Sodium Adsorption Ration (SAR)	-	0.1	-	12	0.4	1.71	3.77	2.06	1.89	1.47	2.14	0.92	4.71	1.3	0.65	11.8	6.94	6.31	0.87
Polychlorinated Biphenyls																			
Polychlorinated Biphenyls	µg/g	0.03	0.3	1.1	-	-	-	-	-	-	-	-	-	-	-	<0.135	<0.030	<0.030	<0.030

Notes on Groundwater Analytical Summary Tables

All Units in Micrograms per Litre (µg/L) Except Where Indicated Otherwise.

RDL = Laboratory Analytical Reporting Detection Limit.

RL = MECP 2021 Analytical Protocol Reporting Limit.

- = Not Analyzed or No Published Value.

DUP = Quality Assurance/Quality Control Duplicate Sample.

RPD = Relative Percent Difference (Between Primary and Duplicate Samples).

* Denotes RPD Exceeds Recommended Alert Criterion Exceeded, However, Parameter Concentration Less than 5 Times Laboratory RDL.

< = Less Than Laboratory Analytical Method Detection Limit or Reporting Detection Limit.

55	Parameter Concentration May Exceed Applicable Standard or Guideline Due to Elevated Reporting Detection Limit.
797	Parameter Concentration Exceeds MECP Table 3 Full Depth Site Condition Standards for Non-Potable Ground Water Situation and Coarse Textured Soil

(a) F1 Fraction Does Not Include BTEX; However, the Proponent has the Choice as to Whether or not to Subtract BTEX from the Analytical Result.

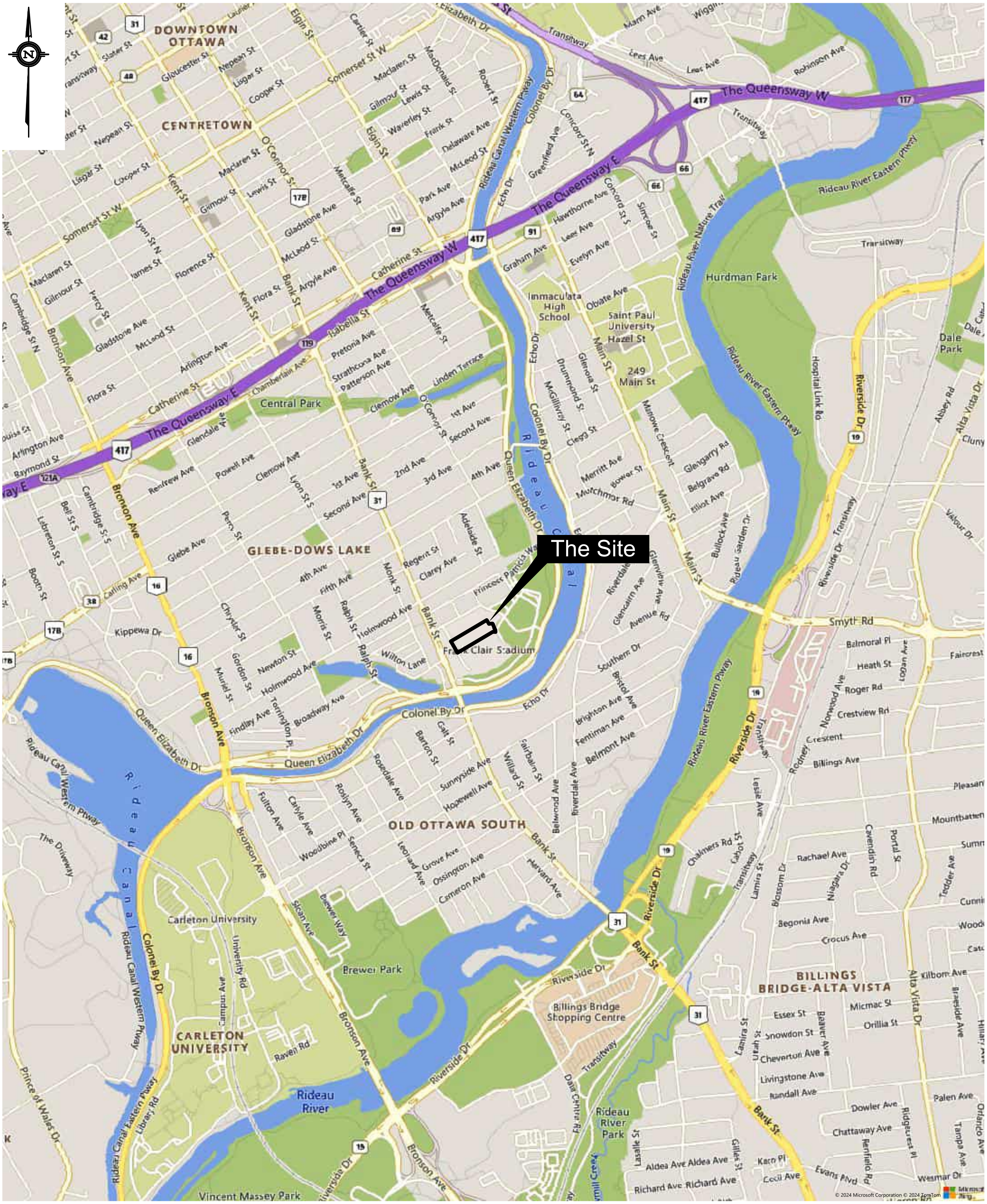
(c) For a Site to Meet the MECP Standard There Must be no Evidence of Free Product, Including but not Limited to, Visible Petroleum Hydrocarbon Film or Sheen Present on Groundwater, Surface Water or in any Groundwater or Surface Water Samples.

MECP Standards = Soil Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ministry of the Environment, Conservation and Parks, April 15, 2011.

Table 8 Summary of Groundwater Analyses

Sample Location				MECP Standards Full Depth Non-Potable Table 3 Coarse	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW24-1	MW24-2	MW24-3	MW24-4	MW24-5
Sample ID						MW24-1	MW24-2	MW24-3	MW24-4	MW24-5
Laboratory Name						ALS	ALS	ALS	ALS	ALS
Laboratory Work Order No.						WT2433595	WT2433595	WT2433595	WT2433595	WT2433595
Laboratory Sample ID						-001	-002	-003	-004	-005
Sample Date						8-Nov-24	8-Nov-24	8-Nov-24	8-Nov-24	8-Nov-24
Analysis Date						13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24	13-Nov-24
Parameters	**Units**	**RDL**	**RL**							
Petrolum Hydrocarbons										
Benzene	µg/L	0.5	0.5	44	-	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	µg/L	0.5	0.5	18000	-	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	µg/L	0.5	0.5	2300	-	<0.50	<0.50	<0.50	<0.50	<0.50
Xylenes, m,p-	µg/L	0.4	-	-	-	<0.40	<0.40	<0.40	<0.40	<0.40
Xylene, o-	µg/L	0.3	-	-	-	<0.30	<0.30	<0.30	<0.30	<0.30
Total Xylenes	µg/L	0.5	0.5	4200	-	<0.50	<0.50	<0.50	<0.50	<0.50
PHC F1 (C6-C10)[a]	µg/L	25	25	750[c]	-	<25	<25	<25	<25	<25
PHC F2 (>C10 - C16)	µg/L	100	100	150[c]	-	<100	<100	<100	<100	<100
PHC F3 (>C16 - C34)	µg/L	250	500	500[c]	-	<250	<250	<250	<250	<250
PHC F4 (>C34)	µg/L	250	500	500[c]	-	<250	<250	<250	<250	<250
General Inorganic Parameters										
Ammonia (as N, Total)	mg/L		-	-	4.524	<0.0050	<0.0050	<0.0050	0.0069	<0.0050
Polynuclear Aromatic Hydrocarbons										
Acenaphthene	µg/L	0.01	1	600	-	<0.010	<0.010	<0.010	-	-
Acenaphthylene	µg/L	0.01	1	1.8	-	<0.010	<0.010	<0.010	-	-
Anthracene	µg/L	0.01	0.1	2.4	-	<0.010	<0.010	<0.010	-	-
Benzo[a]anthracene	µg/L	0.01	0.2	4.7	-	<0.010	0.022	<0.010	-	-
Benzo[a]pyrene	µg/L	0.005	0.01	0.81	-	<0.0050	0.0252	<0.0050	-	-
Benzo[b+j]fluoranthene	µg/L	0.01	-	-	-	<0.010	0.027	<0.010	-	-
Benzo[g,h,i]perylene	µg/L	0.01	0.2	0.2	-	<0.010	0.018	<0.010	-	-
Benzo[k]fluoranthene	µg/L	0.01	0.1	0.4	-	<0.010	0.015	<0.010	-	-
Chrysene	µg/L	0.01	0.1	1	-	<0.010	0.027	<0.010	-	-
Dibenzo[a,h]anthracene	µg/L	0.005	0.2	0.52	-	<0.0050	<0.0050	<0.0050	-	-
Fluoranthene	µg/L	0.01	0.4	130	-	<0.010	0.048	<0.010	-	-
Fluorene	µg/L	0.01	0.5	400	-	<0.010	<0.010	<0.010	-	-
Indeno[1,2,3-cd]pyrene	µg/L	0.01	0.2	0.2	-	<0.010	0.017	<0.010	-	-
Methylnaphthalene, 1-[e]	µg/L	0.01	2	1800	-	<0.010	<0.010	<0.010	-	-
Methylnaphthalene, 2-[e]	µg/L	0.01	2	1800	-	<0.010	<0.010	<0.010	-	-
Methylnaphthalene, 1-,2-[e]	µg/L	0.015	2	1800	-	<0.015	<0.015	<0.015	-	-
Naphthalene	µg/L	0.05	2	1400	-	<0.050	<0.050	<0.050	-	-
Phenanthrene	µg/L	0.02	0.1	580	-	<0.020	0.023	<0.020	-	-
Pyrene	µg/L	0.01	0.2	68	-	<0.010	0.045	<0.010	-	-
Polychlorinated Biphenyls										
Polychlorinated Biphenyls	µg/L	0.06	0.2	7.8	-	<0.060	<0.060	-	-	-

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



LEGEND

200 0 200 400 600

METRES

TITLE:

SITE LOCATION PLAN

CLIENT:

Ottawa

wsp

DATE: DECEMBER 2024

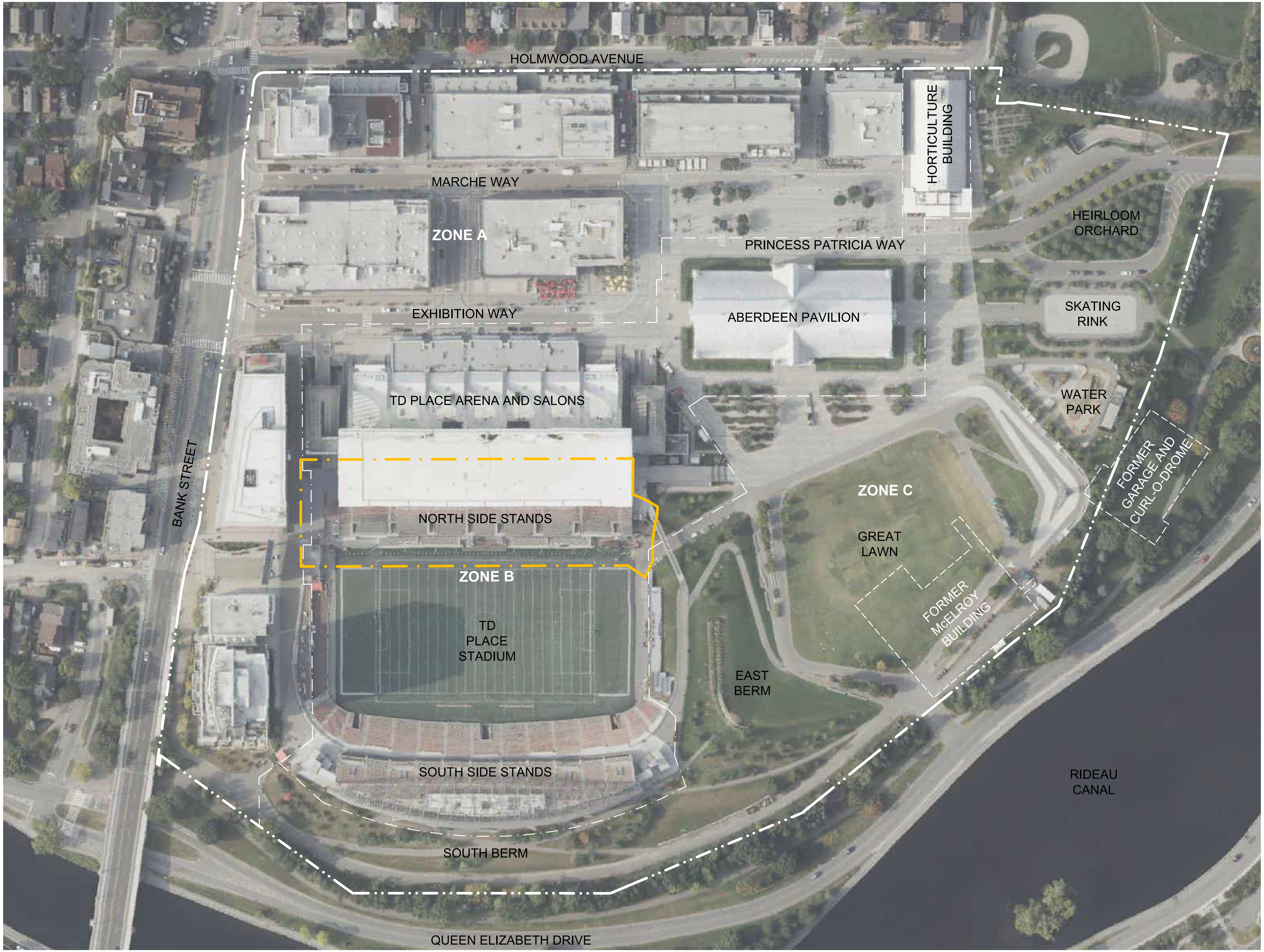
PROJECT NO: CA0045396.3464

FIGURE NO: 1

DRWN: JFT

CHK'D: KDH

SCALE: 1 : 20,000



LEGEND

- PHASE ONE PROPERTY BOUNDARY
- FORMER BUILDING (WHITE DASHED)

20 0 40 60 80

METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:

LANSDOWNE PARK GENERALIZED SITE PLAN

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 1,750

FIGURE NO: 2

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG

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LEGEND

- · -	PHASE ONE PROPERTY BOUNDARY
▬	ABOVEGROUND STORAGE TANK
▭	FORMER ABOVEGROUND STORAGE TANK

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

SITE PLAN SHOWING PROPOSED REDEVELOPMENT

PROJECT:

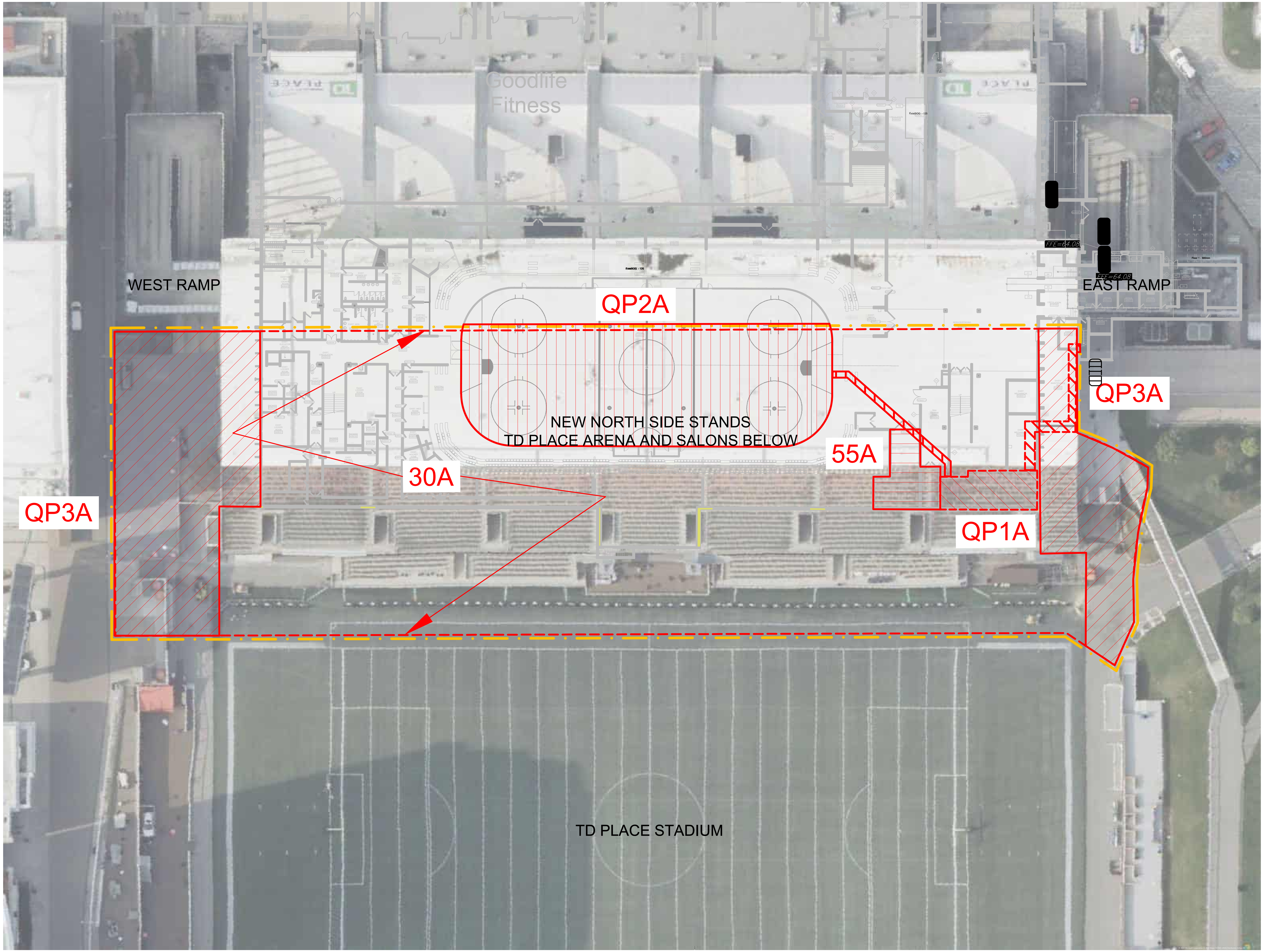
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 3	

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



LEGEND

▬ ▬	PHASE TWO PROPERTY BOUNDARY
▬	ABOVEGROUND STORAGE TANK
▭	FORMER ABOVEGROUND STORAGE TANK
4A	POTENTIALLY CONTAMINATING ACTIVITY

POTENTIALLY CONTAMINATING ACTIVITIES (See Table 6.2 in report for specific details):

PCA 30A: Importation of Fill Material of Unknown Quality

PCA 55A: Transformer Manufacturing, Processing and Use

PCA QP1: Arena Ice Making Plant (QP defined PCA)

PCA QP2: Brine Distribution and Chiller Lines for Ice Making Plant (QP defined PCA)

PCA QP3: Application of Winter De-Icing Agents (QP defined PCA)

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

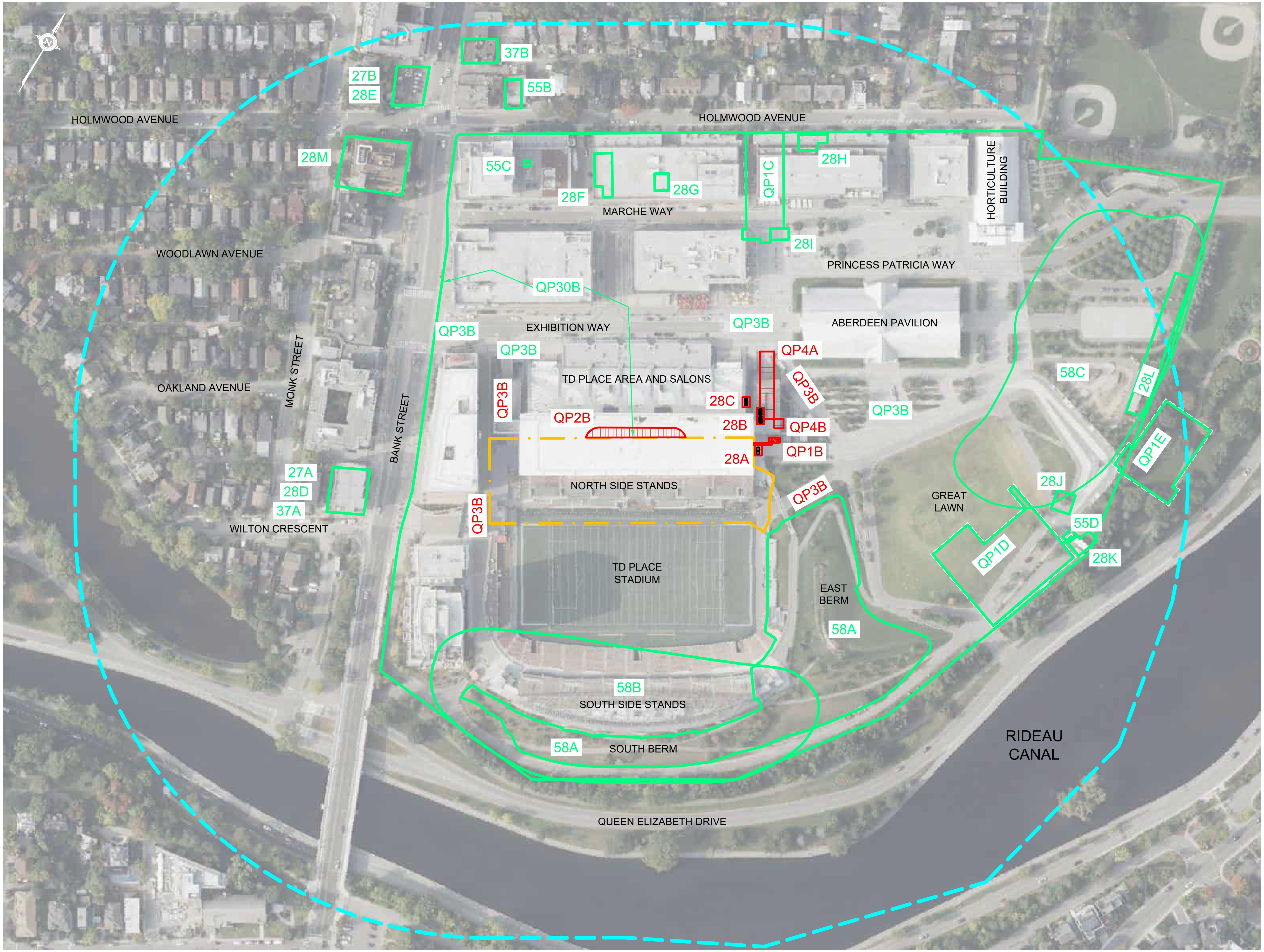
TITLE:
POTENTIALLY CONTAMINATING ACTIVITIES ON THE PHASE TWO PROPERTY

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 4A	

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



LEGEND

- - - PHASE TWO PROPERTY BOUNDARY

- - - PHASE ONE STUDY AREA

⬚ FORMER BUILDING (WHITE DASHED)

▬ ABOVEGROUND STORAGE TANK

▭ FORMER ABOVEGROUND STORAGE TANK

4A POTENTIALLY CONTAMINATING ACTIVITY

POTENTIALLY CONTAMINATING ACTIVITIES (See Table 6.3 in report for specific details):

PCA 27: Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles

PCA 28: Gasoline and Associated Products Storage in Fixed Tanks

PCA 30: Importation of Fill Material of Unknown Quality

PCA 37: Operation of Dry Cleaning Equipment (where chemicals are used)

PCA 55: Transformer Manufacturing, Processing and Use

PCA 58. Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste other than use of biosoils as soil conditioners

PCA QP1: Arena Ice Making Plant (QP defined PCA)

PCA QP2: Brine Distribution and Chiller Lines for Ice Making Plant (QP defined PCA)

PCA QP3: Application of Winter De-Icing Agents (QP defined PCA)

PCA QP4: Glycol Snow and Ice Melting Systems (QP defined PCA)

NOTES:
1. PCAs SHOWN IN RED RESULT IN AN APEC AT THE PHASE ONE PROPERTY
2. PCAs SHOWN IN GREEN DO NOT RESULT IN AN APEC AT THE PHASE ONE PROPERTY

25 0 25 50 75
METRES

TITLE:

POTENTIALLY CONTAMINATING ACTIVITIES IN THE PHASE ONE STUDY AREA

PROJECT:

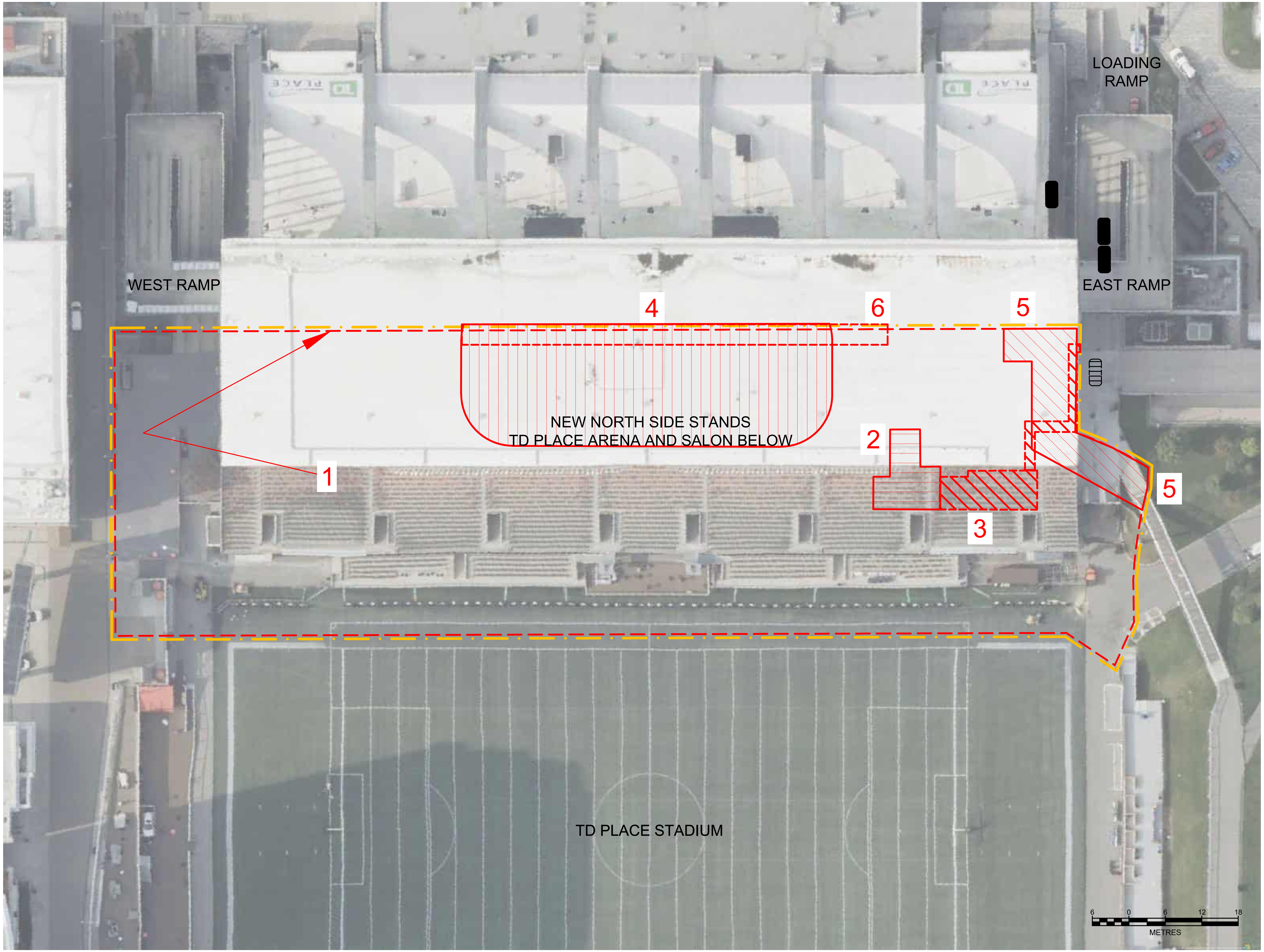
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 2,200

FIGURE NO:
4B

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ▬ ABOVEGROUND STORAGE TANK
- ▭ FORMER ABOVEGROUND STORAGE TANK
- 1 POTENTIALLY CONTAMINATING ACTIVITY

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (see Table 6.4 in report for specific details):

APEC1: Unknown fill quality - PCA 30A: Importation of Fill of Unknown Quality (Entire Phase One Property)

APEC 2: Oil-filled transformer in electrical room - PCA 55A: Transformer Manufacturing, Processing and Use

APEC 3: Arena ice making plant - PCA QP1A: Ice Making Plant

APEC 4: Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

APEC 5) Back-up generator and existing/former ASTs - PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks; Arena ice making plant - PCA QP1B: Arena Ice Making Plant; Loading ramp snow and ice melting system - PCAs QP4A and QP4B: Glycol Snow and Ice Melting Systems

APEC 6:Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

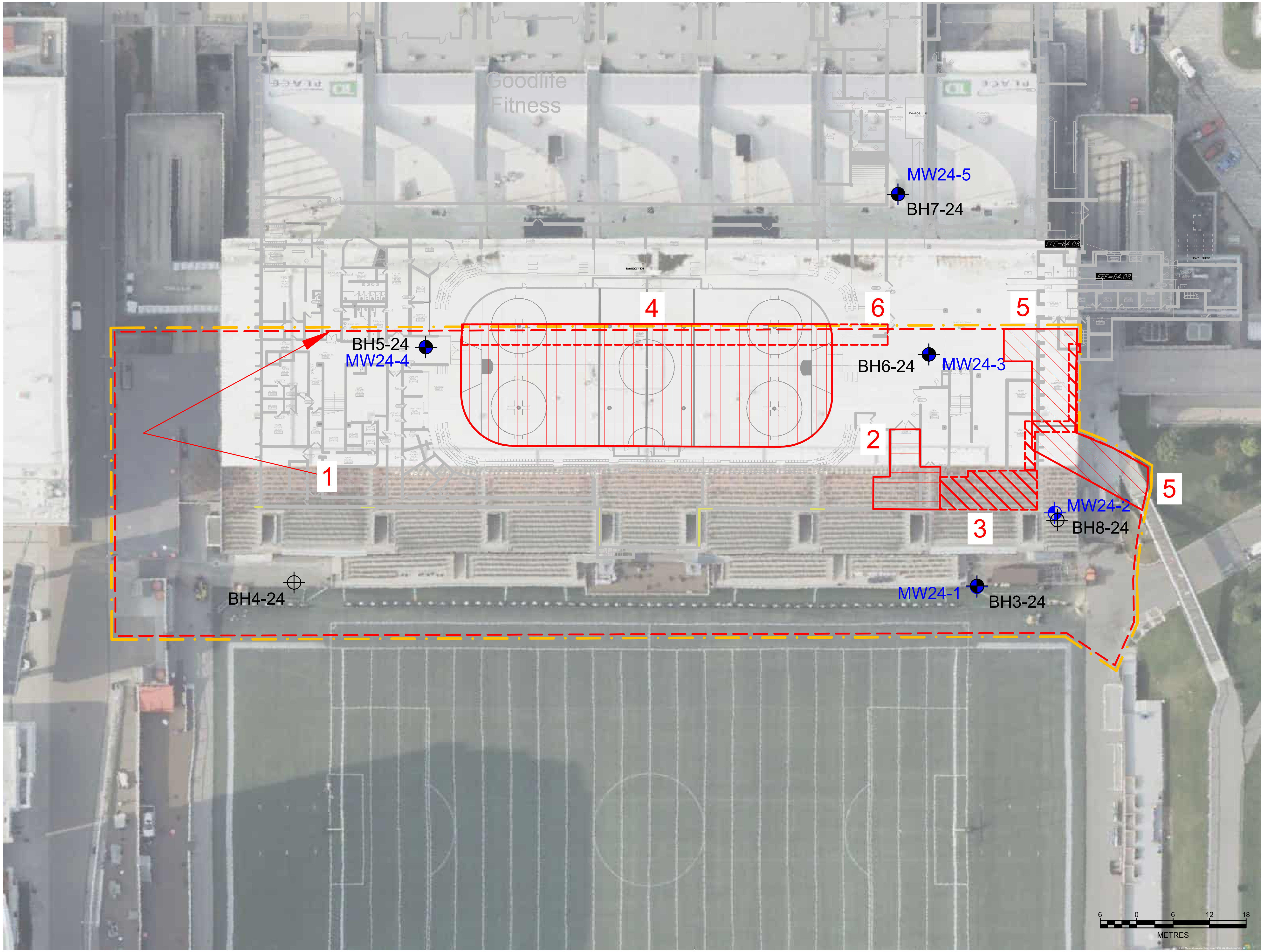
CLIENT:

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:

5

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ⌖ BOREHOLE
- ⌖ DEEP BOREHOLE WITH STANDPIPE
- ⌖ SHALLOW MONITORING WELL
- [1] AREA OF POTENTIAL ENVIRONMENTAL CONCERN

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (see Table 6.4 in report for specific details):

APEC1: Unknown fill quality - PCA 30A: Importation of Fill of Unknown Quality (Entire Phase One Property)

APEC 2: Oil-filled transformer in electrical room - PCA 55A: Transformer Manufacturing, Processing and Use

APEC 3: Arena ice making plant - PCA QP1A: Ice Making Plant

APEC 4: Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

APEC 5) Back-up generator and existing/former ASTs - PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks; Arena ice making plant - PCA QP1B: Arena Ice Making Plant; Loading ramp snow and ice melting system - PCAs QP4A and QP4B: Glycol Snow and Ice Melting Systems

APEC 6:Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

SAMPLE PLAN

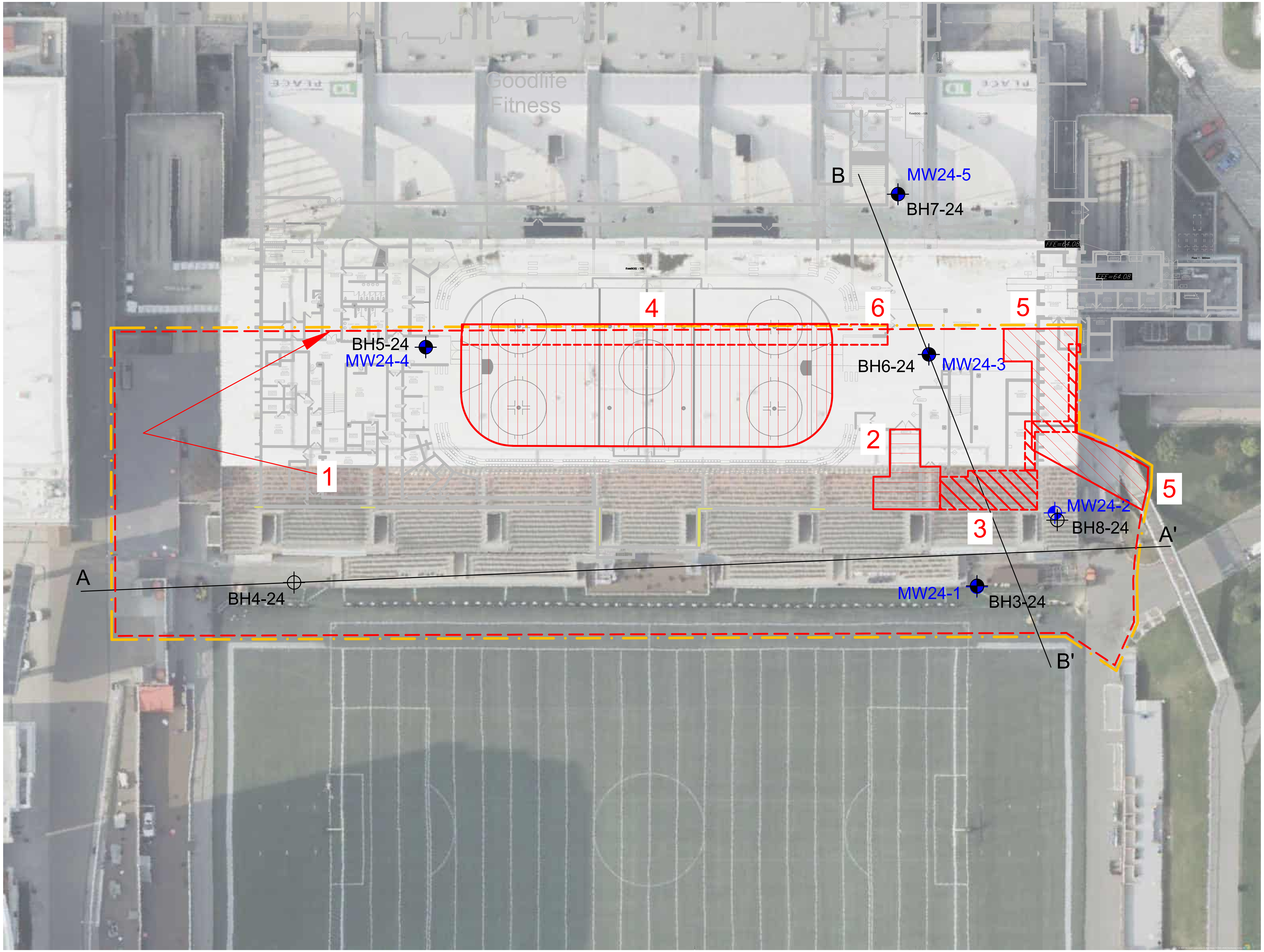
PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

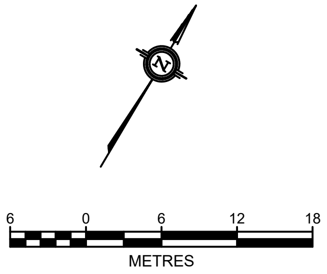
Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 6	



LEGEND

🟧	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⌖	DEEP BOREHOLE WITH STANDPIPE
⌖	SHALLOW MONITORING WELL
1	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
A A'	LINE OF CROSS SECTION



ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:

CROSS SECTION LOCATION PLAN

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANDSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

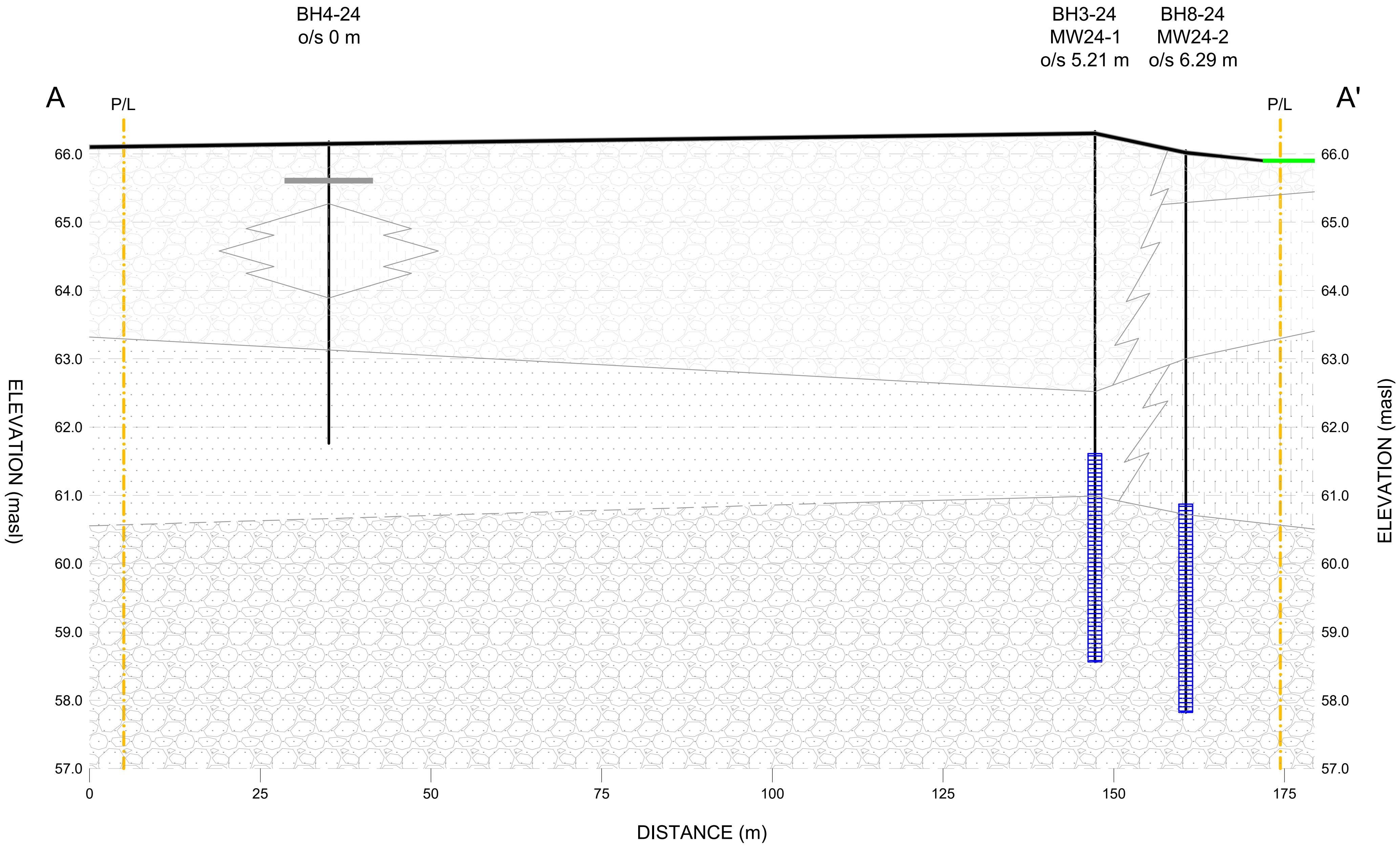
DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:

7A

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO SECTIONS.DWG



LEGEND

GEOLOGICAL CONTACT
GEOLOGICL CONTACT - INFERRED
ASPHALT
TURF / GRASS SOD
CONCRETE
FILL - GRAVEL
FILL - GRAVELLY SAND / SANDY GRAVEL
FILL - SILTY SAND
FILL - SILTY SAND AND GRAVEL
SILTY SAND AND GRAVEL
SAND
SANDY SILT
SILTY SAND

BH3-24	BOREHOLE ID
MW24-1	WELL ID
o/s 5.21 m	SECTION OFFSET
	BOREHOLE TRACE
▼	WATER LEVEL
▦	WELL SCREEN

ORIGINAL DRAWING SIZE 8.5" X 11"

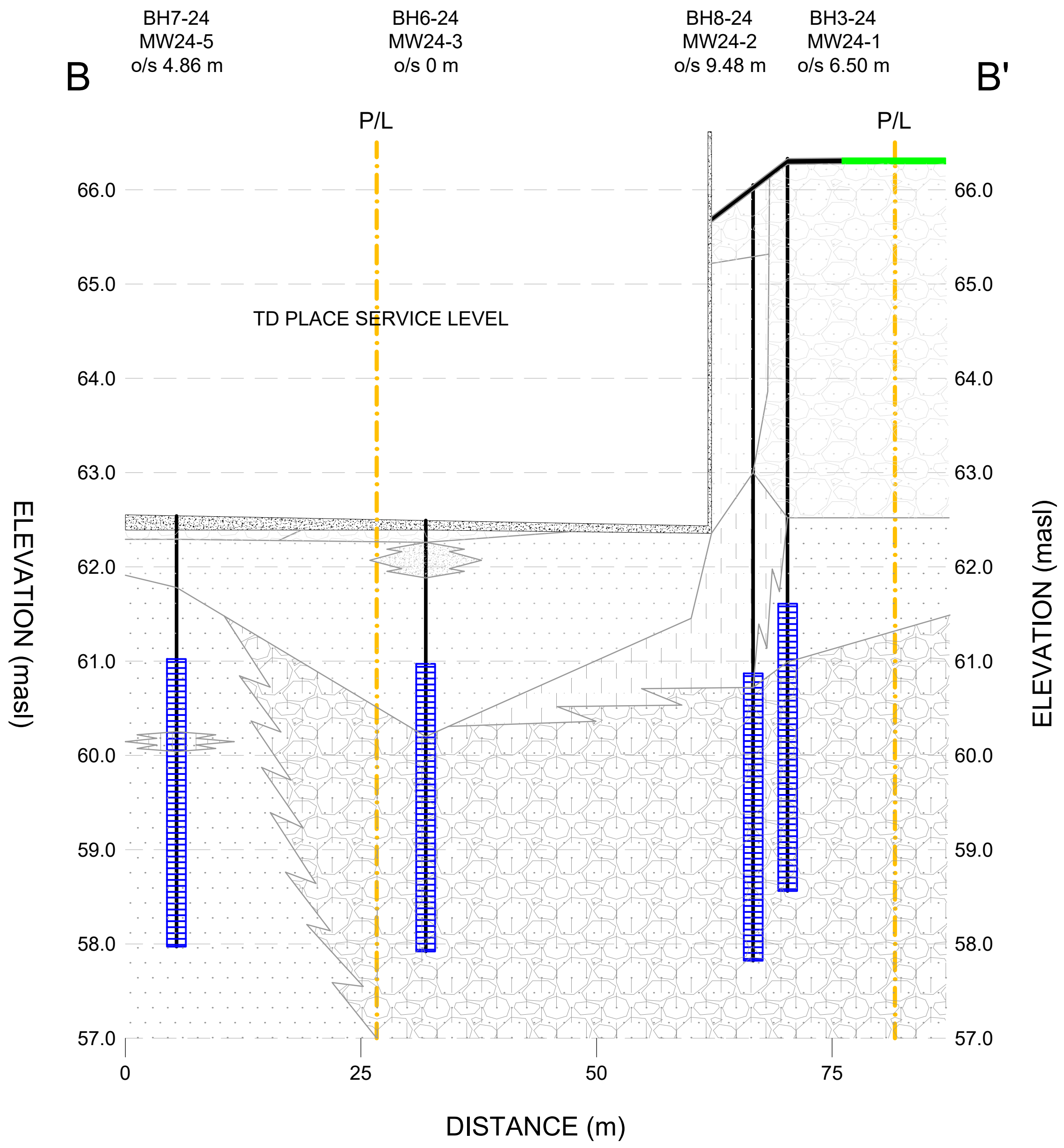
TITLE:
CROSS SECTION A-A'

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

DESIGN BY:	JFT
DRAWN BY:	JFT
CHECKED BY:	KDH
REVISION:	0
DATUM:	NAD83 CSRS 2010
PROJECTION:	MTM ZONE 9
PROJECT NO:	CA0045396.3464
DATE:	DECEMBER 2024
SCALE:	AS SHOWN
FIGURE NO:	7B

wsp



LEGEND

GEOLOGICAL CONTACT
GEOLOGICL CONTACT - INFERRED
ASPHALT
TURF / GRASS SOD
CONCRETE
FILL - GRAVEL
FILL - GRAVELLY SAND / SANDY GRAVEL
FILL - SILTY SAND
FILL - SILTY SAND AND GRAVEL
SILTY SAND AND GRAVEL
SAND
SANDY SILT
SILTY SAND

BH3-24 — BOREHOLE ID
MW24-1 — WELL ID
o/s 5.21 m — SECTION OFFSET
BOREHOLE TRACE
WATER LEVEL
WELL SCREEN

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:
CROSS SECTION B-B'

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

DESIGN BY: JFT	DRAWN BY: JFT	DATUM: NAD83 CSRS 2010	PROJECT NO: CA0045396.3464	FIGURE NO: 7C
CHECKED BY: KDH	REVISION: 0	PROJECTION: MTM ZONE 9	DATE: DECEMBER 2024	SCALE: AS SHOWN

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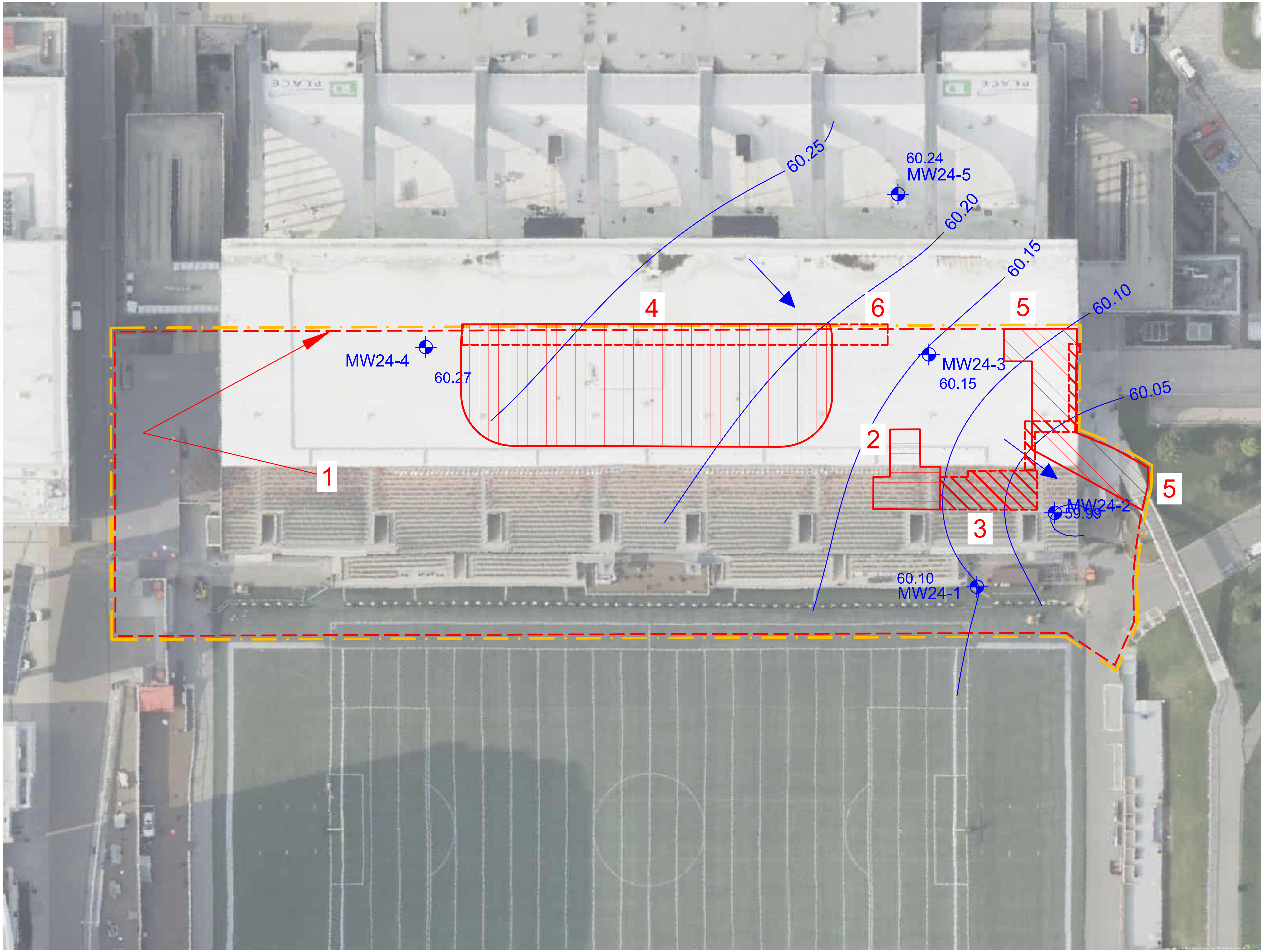


LEGEND

▬ ▬	PHASE TWO PROPERTY BOUNDARY
⌖	SHALLOW MONITORING WELL
—	GROUNDWATER ELEVATION CONTOUR
→	INFERRED DIRECTION OF GROUNDWATER FLOW

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:
GROUNDWATER ELEVATION CONTOUR PLAN
NOVEMBER 8, 2024

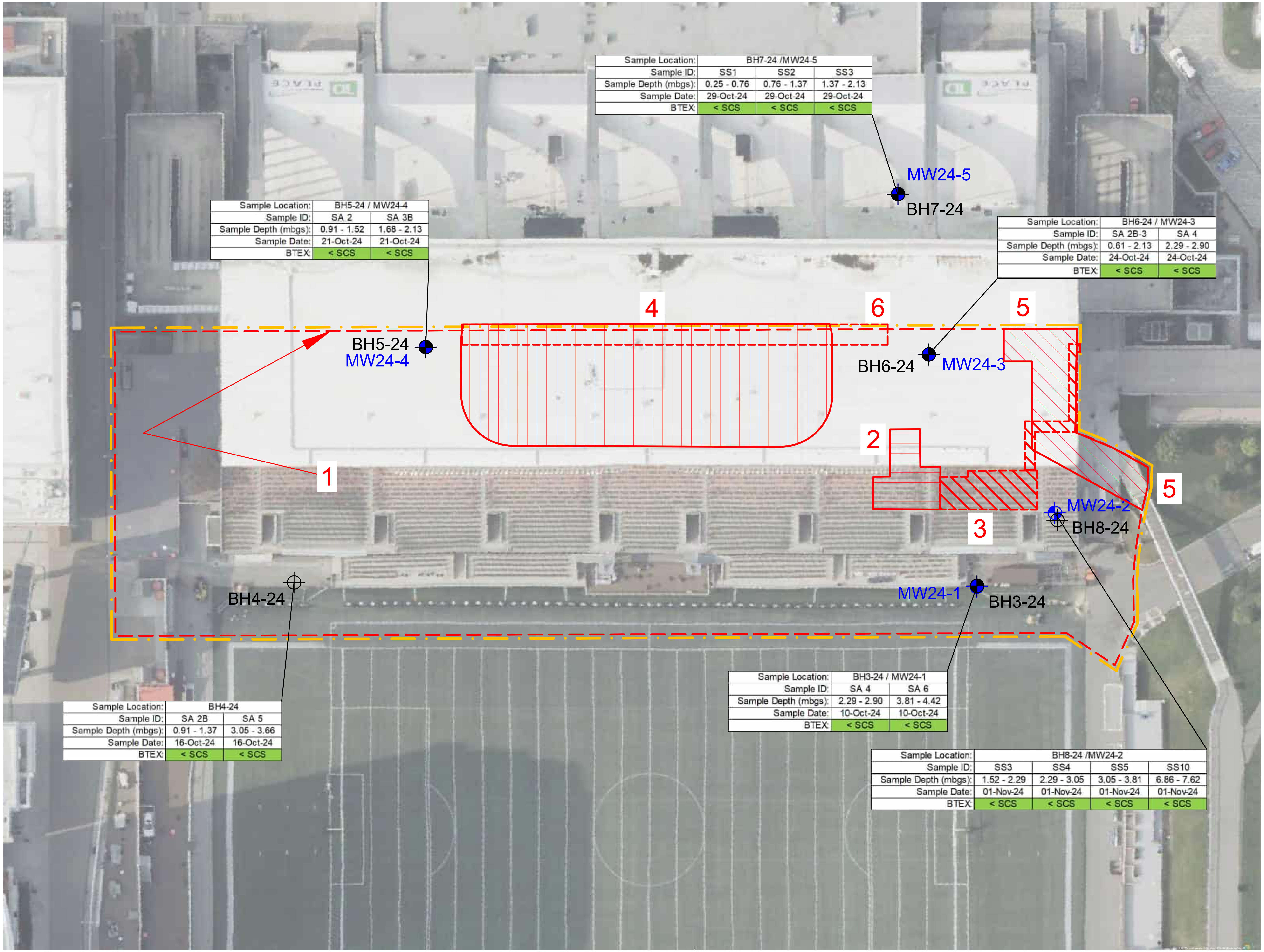
PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:
8

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
BTEX:	< SCS	< SCS	< SCS

Sample Location:	BH5-24 / MW24-4	
Sample ID:	SA 2	SA 3B
Sample Depth (mbgs):	0.91 - 1.52	1.68 - 2.13
Sample Date:	21-Oct-24	21-Oct-24
BTEX:	< SCS	< SCS

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
BTEX:	< SCS	< SCS

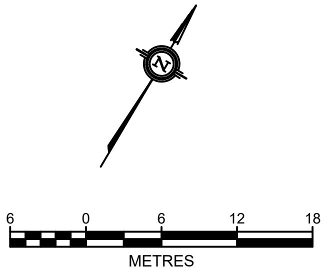
Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
BTEX:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
BTEX:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
BTEX:	< SCS	< SCS	< SCS	< SCS

LEGEND

▬ ▬	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⯁	DEEP BOREHOLE WITH STANDPIPE
⯁	SHALLOW MONITORING WELL
[1]	AREA OF POTENTIAL ENVIRONMENTAL CONCERN



ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

SOIL ANALYTICAL RESULTS - BTEX

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

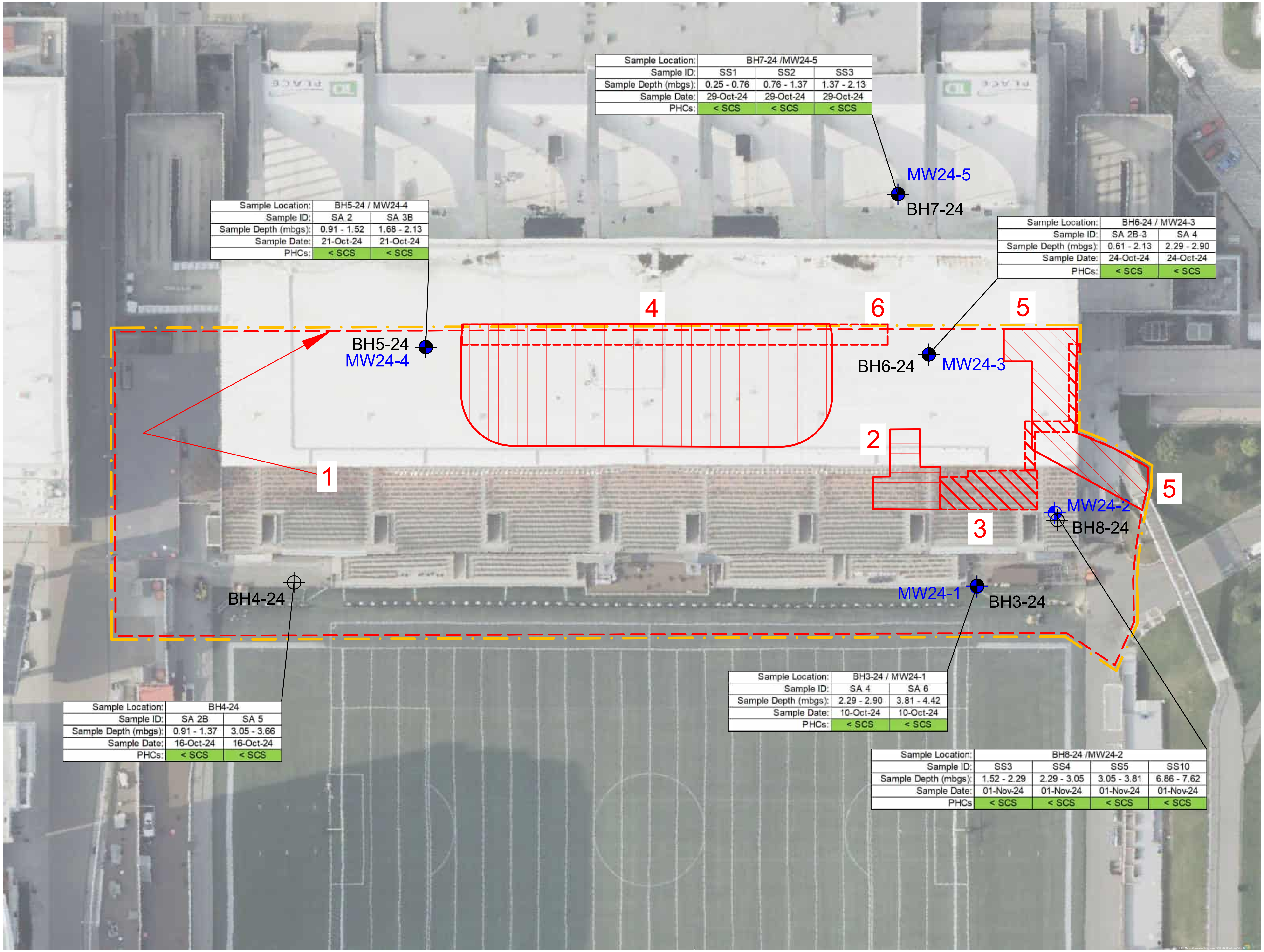
CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:

9



Sample Location:	BH5-24 / MW24-4	
Sample ID:	SA 2	SA 3B
Sample Depth (mbgs):	0.91 - 1.52	1.68 - 2.13
Sample Date:	21-Oct-24	21-Oct-24
PHCs:	< SCS	< SCS

Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
PHCs:	< SCS	< SCS	< SCS

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
PHCs:	< SCS	< SCS

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
PHCs:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
PHCs:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
PHCs	< SCS	< SCS	< SCS	< SCS

LEGEND

▬ ▬	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⌖	DEEP BOREHOLE WITH STANDPIPE
⌖	SHALLOW MONITORING WELL
1	AREA OF POTENTIAL ENVIRONMENTAL CONCERN

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

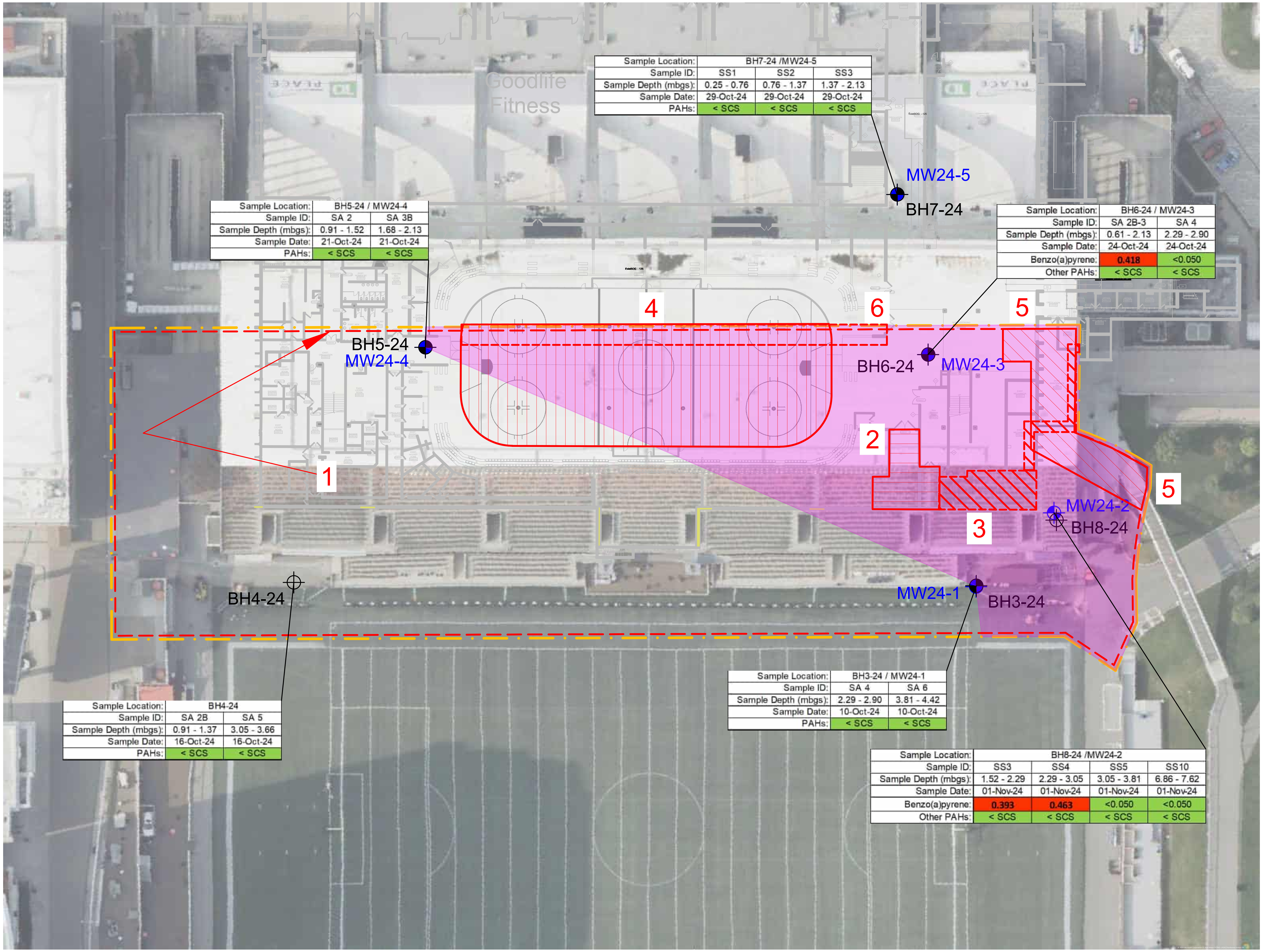
TITLE:
SOIL ANALYTICAL RESULTS - PHCs

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 10	

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
PAHs:	< SCS	< SCS	< SCS

Sample Location:	BH5-24 / MW24-4	
Sample ID:	SA 2	SA 3B
Sample Depth (mbgs):	0.91 - 1.52	1.68 - 2.13
Sample Date:	21-Oct-24	21-Oct-24
PAHs:	< SCS	< SCS

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
Benzo(a)pyrene:	**0.418**	<0.050
Other PAHs:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
PAHs:	< SCS	< SCS

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
PAHs:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
Benzo(a)pyrene:	**0.393**	**0.463**	<0.050	<0.050
Other PAHs:	< SCS	< SCS	< SCS	< SCS

LEGEND

- - -	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⌖	DEEP BOREHOLE WITH STANDPIPE
⌖	SHALLOW MONITORING WELL
[1]	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
▨	INFERRED AREA OF SOIL IMPACT EXCEEDING MECP TABLE 3 SCS

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:
SOIL ANALYTICAL RESULTS - PAHs

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

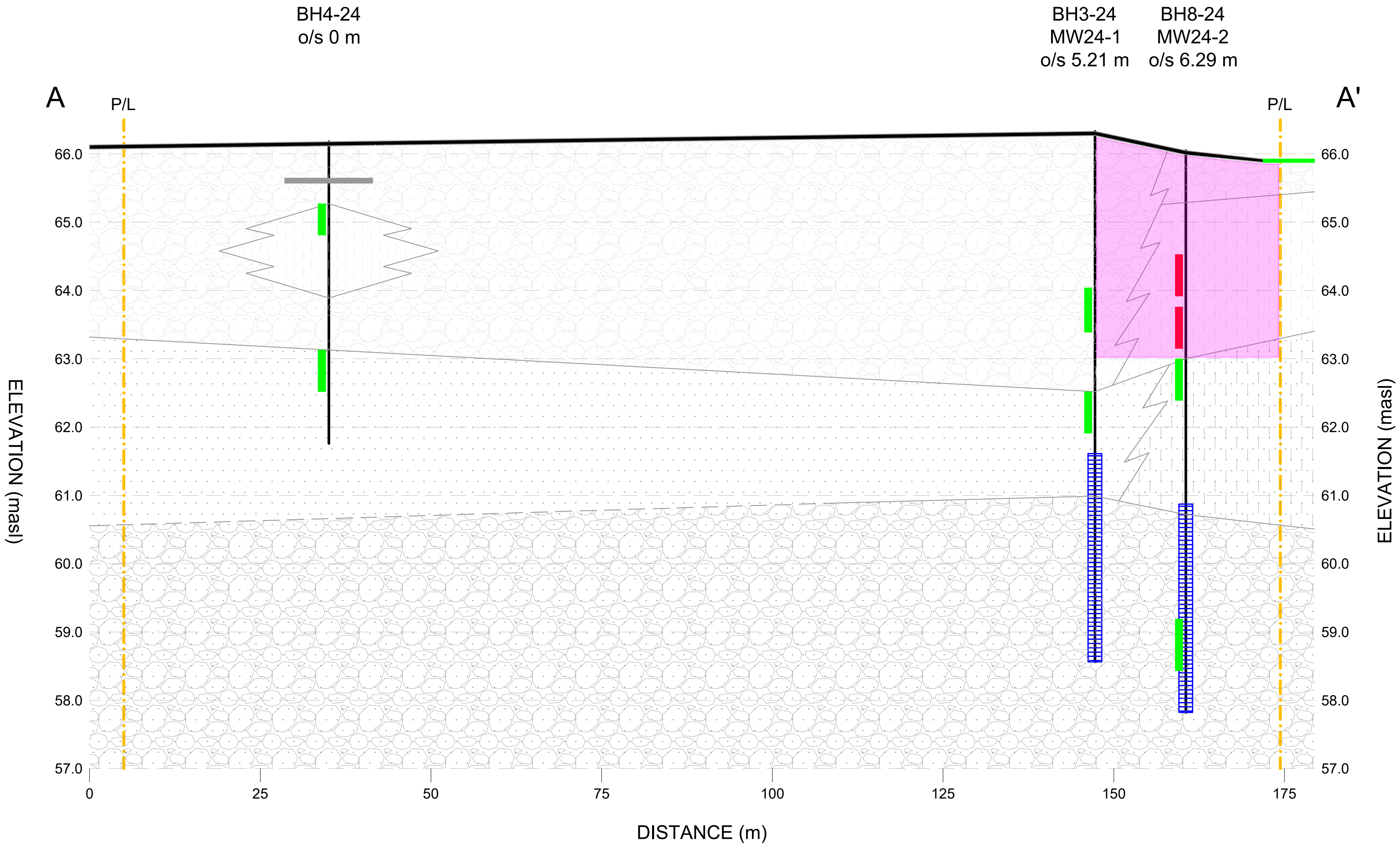
FIGURE NO:
11A

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
PAHs:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
PAHs:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
Benzo(a)pyrene:	0.393	0.463	<0.050	<0.050
Other PAHs:	< SCS	< SCS	< SCS	< SCS



LEGEND

☐	GEOLOGICAL CONTACT
☐	GEOLOGICL CONTACT - INFERRED
■	ASPHALT
🟩	TURF / GRASS SOD
▨	CONCRETE
▨	FILL - GRAVEL
▨	FILL - GRAVELLY SAND / SANDY GRAVEL
▨	FILL - SILTY SAND
▨	FILL - SILTY SAND AND GRAVEL
▨	SILTY SAND AND GRAVEL
▨	SAND
▨	SANDY SILT
▨	SILTY SAND
BH3-24 MW24-1 o/s 5.21 m	BOREHOLE ID WELL ID SECTION OFFSET
|	BOREHOLE TRACE
▼	WATER LEVEL
▦	WELL SCREEN
🟩	SOIL SAMPLE MEETING TABLE 3 SCS
🟥	SOIL SAMPLE EXCEEDING TABLE 3 SCS
▨	INFERRED ARE OF SOIL IMPACT EXCEEDING TABLE 3 SCS

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:
SOIL ANALYTICAL RESULTS - PAHs
CROSS SECTION A-A'

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

wsp

DESIGN BY: JFT	DRAWN BY: JFT	DATUM: NAD83 CSRS 2010	PROJECT NO: CA0045396.3464	FIGURE NO: 11B
CHECKED BY: KDH	REVISION: 0	PROJECTION: MTM ZONE 9	DATE: DECEMBER 2024 SCALE: AS SHOWN	

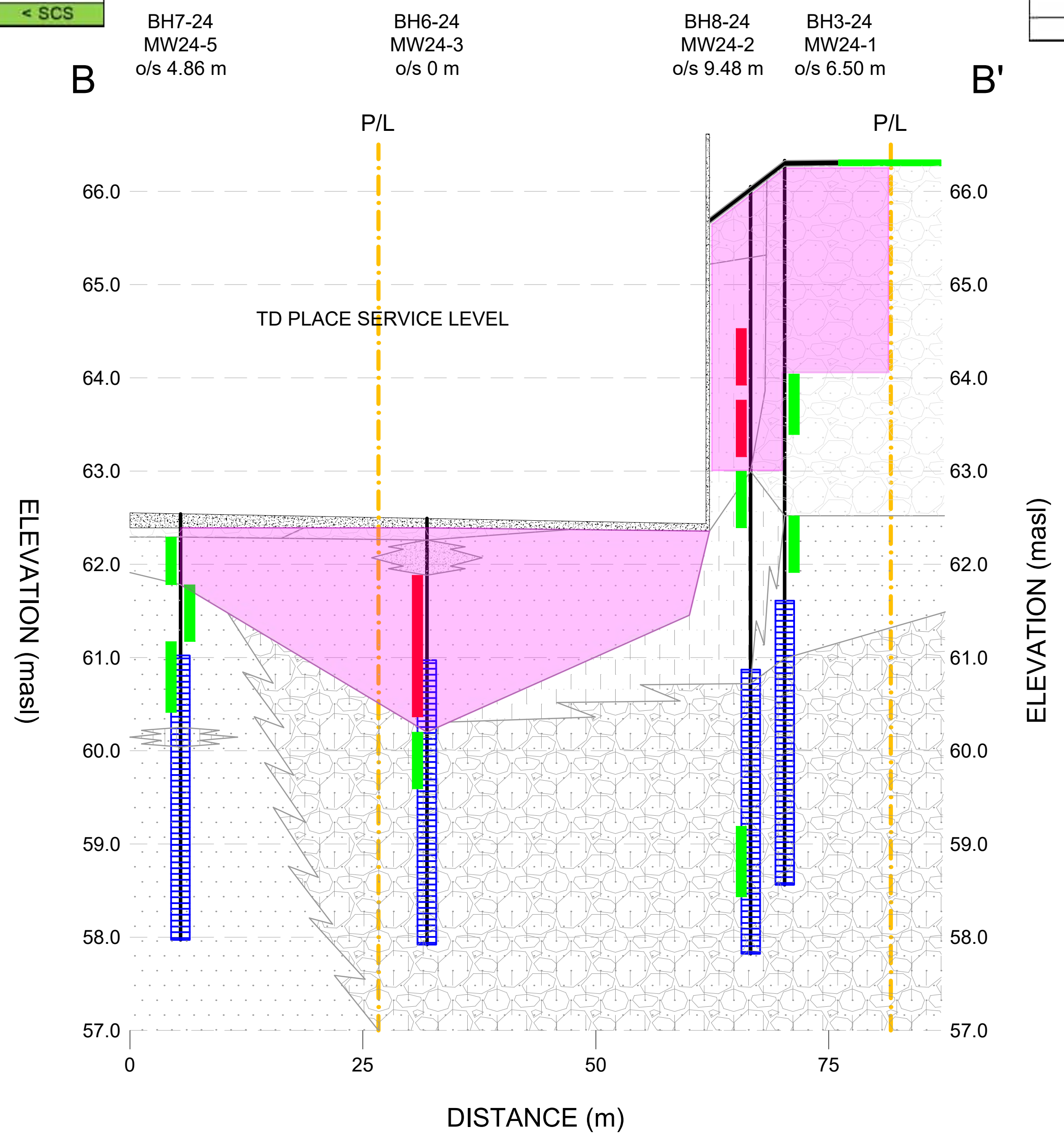
C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO SECTIONS.DWG

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
Benzo(a)pyrene:	🟥 0.418	🟩 <0.050
Other PAHs:	🟩 < SCS	🟩 < SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
Benzo(a)pyrene:	🟥 0.393	🟥 0.463	🟩 <0.050	🟩 <0.050
Other PAHs:	🟩 < SCS	🟩 < SCS	🟩 < SCS	🟩 < SCS

Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
PAHs:	🟩 < SCS	🟩 < SCS	🟩 < SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
PAHs:	🟩 < SCS	🟩 < SCS



LEGEND

▭	GEOLOGICAL CONTACT	▨	FILL - GRAVEL	▨	SILTY SAND AND GRAVEL
╌	GEOLOGICL CONTACT - INFERRED	▨	FILL - GRAVELLY SAND / SANDY GRAVEL	▨	SAND
▬	ASPHALT	▨	FILL - SILTY SAND	▨	SANDY SILT
🟩	TURF / GRASS SOD	▨	FILL - SILTY SAND AND GRAVEL	▨	SILTY SAND
▨	CONCRETE				

BH3-24 MW24-1 o/s 5.21 m	BOREHOLE ID WELL ID SECTION OFFSET
│	BOREHOLE TRACE
▼	WATER LEVEL
▦	WELL SCREEN
🟩	SOIL SAMPLE MEETING TABLE 3 SCS
🟥	SOIL SAMPLE EXCEEDING TABLE 3 SCS
▨	INFERRED ARE OF SOIL IMPACT EXCEEDING TABLE 3 SCS

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:
SOIL ANALYTICAL RESULTS - PAHs
CROSS SECTION B-B'

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

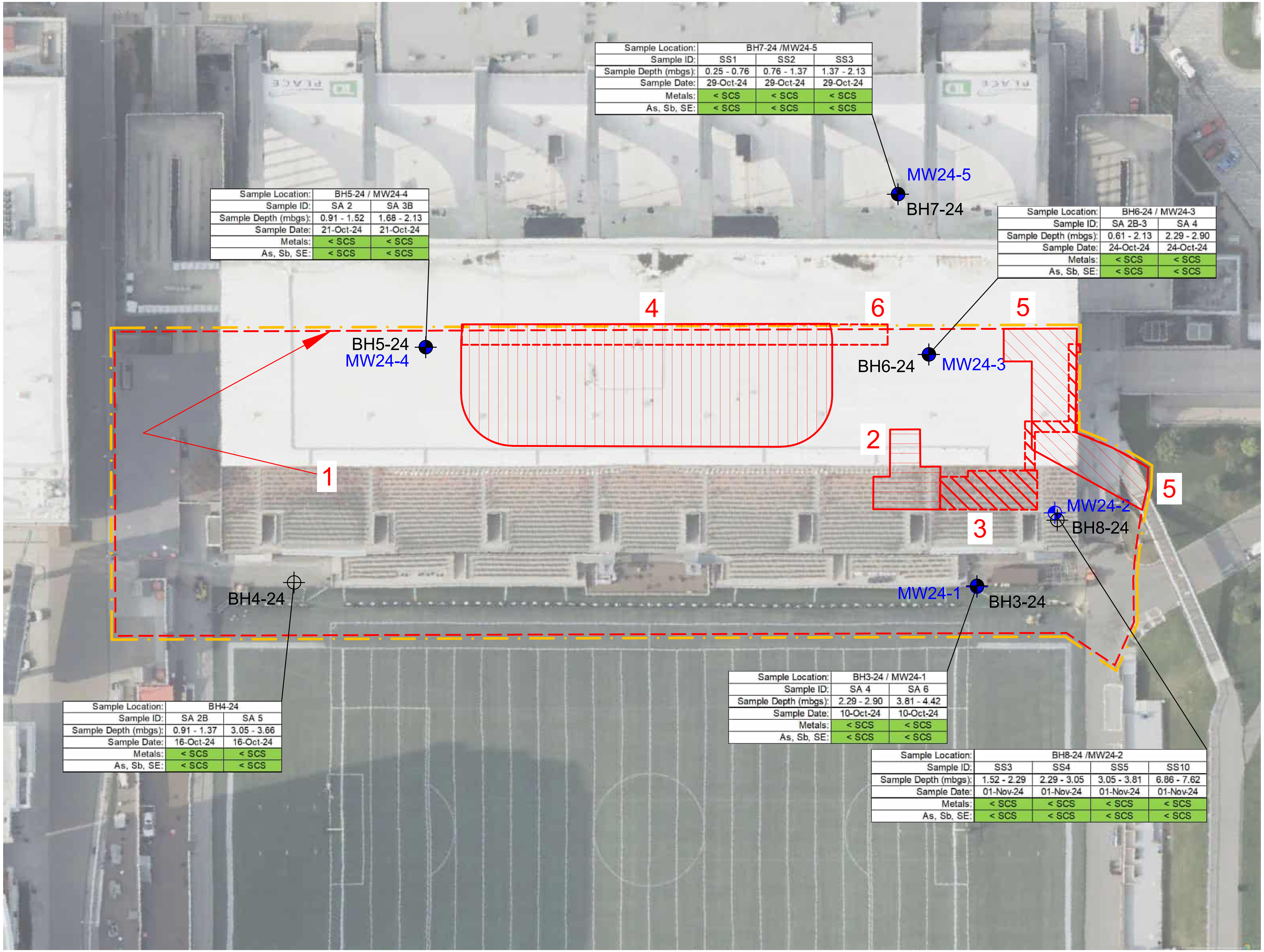
wsp

DESIGN BY: JFT
DRAWN BY: JFT
CHECKED BY: KDH
REVISION: 0
DATUM: NAD83 CSRS 2010
PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464
DATE: DECEMBER 2024
SCALE: AS SHOWN
FIGURE NO: 11C

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO SECTIONS.DWG

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ⌖ BOREHOLE
- ⌖ DEEP BOREHOLE WITH STANDPIPE
- ⌖ SHALLOW MONITORING WELL
- [1] AREA OF POTENTIAL ENVIRONMENTAL CONCERN



Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
Metals:	< SCS	< SCS	< SCS
As, Sb, SE:	< SCS	< SCS	< SCS

Sample Location:	BH5-24 / MW24-4	
Sample ID:	SA 2	SA 3B
Sample Depth (mbgs):	0.91 - 1.52	1.68 - 2.13
Sample Date:	21-Oct-24	21-Oct-24
Metals:	< SCS	< SCS
As, Sb, SE:	< SCS	< SCS

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
Metals:	< SCS	< SCS
As, Sb, SE:	< SCS	< SCS

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
Metals:	< SCS	< SCS
As, Sb, SE:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
Metals:	< SCS	< SCS
As, Sb, SE:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
Metals:	< SCS	< SCS	< SCS	< SCS
As, Sb, SE:	< SCS	< SCS	< SCS	< SCS

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:

SOIL ANALYTICAL RESULTS - METALS
(INCLUDES As, Sb, Se)

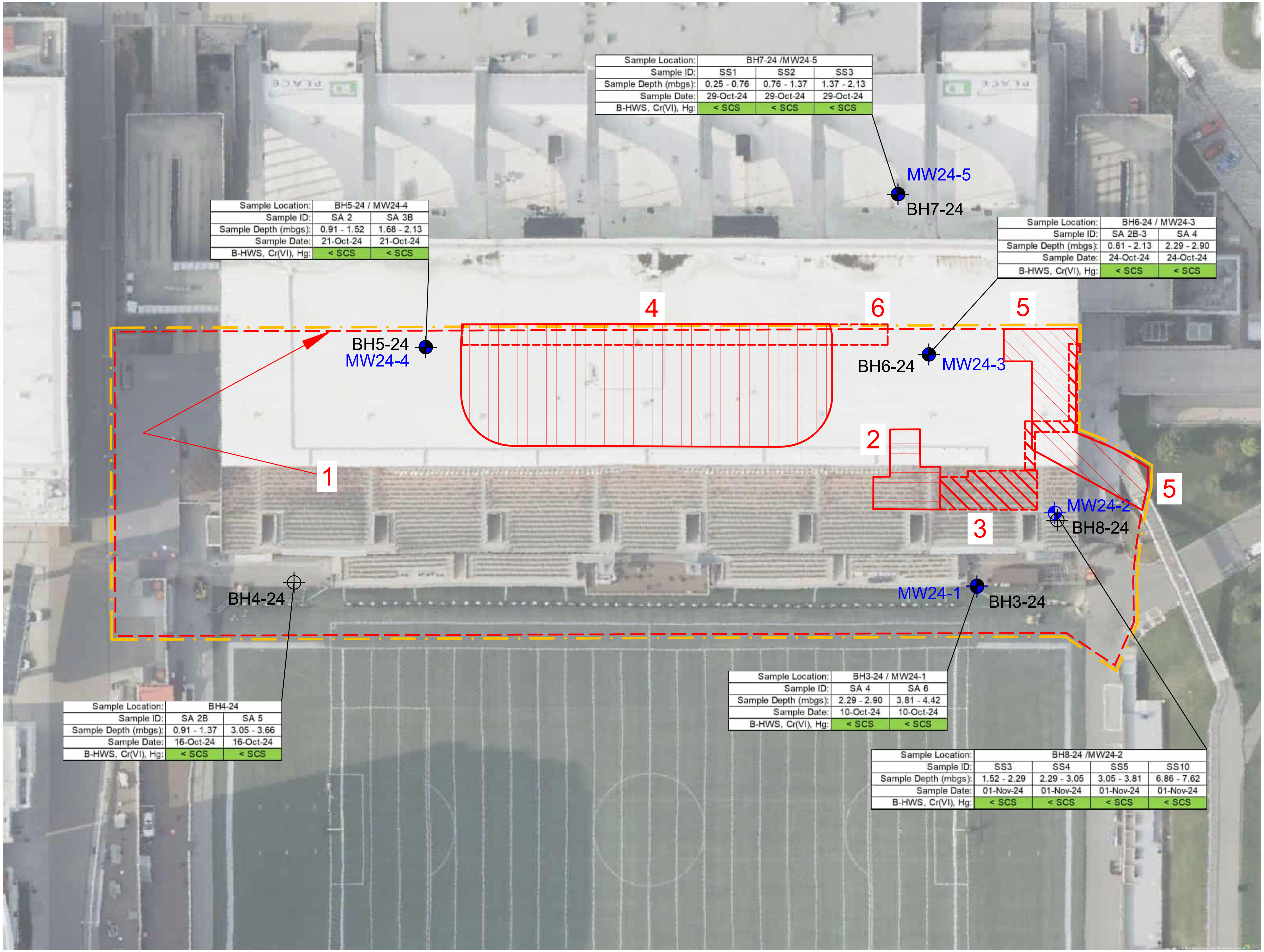
PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 12	

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
B-HWS, Cr(VI), Hg:	< SCS	< SCS	< SCS

Sample Location:	BH5-24 / MW24-4	
Sample ID:	SA 2	SA 3B
Sample Depth (mbgs):	0.91 - 1.52	1.68 - 2.13
Sample Date:	21-Oct-24	21-Oct-24
B-HWS, Cr(VI), Hg:	< SCS	< SCS

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
B-HWS, Cr(VI), Hg:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
B-HWS, Cr(VI), Hg:	< SCS	< SCS

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
B-HWS, Cr(VI), Hg:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
B-HWS, Cr(VI), Hg:	< SCS	< SCS	< SCS	< SCS

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ⌖ BOREHOLE
- ⌖ DEEP BOREHOLE WITH STANDPIPE
- ⌖ SHALLOW MONITORING WELL
- 1 AREA OF POTENTIAL ENVIRONMENTAL CONCERN

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:
SOIL ANALYTICAL RESULTS - ORPs
(INCLUDES B-HWS, Cr(VI), Hg)

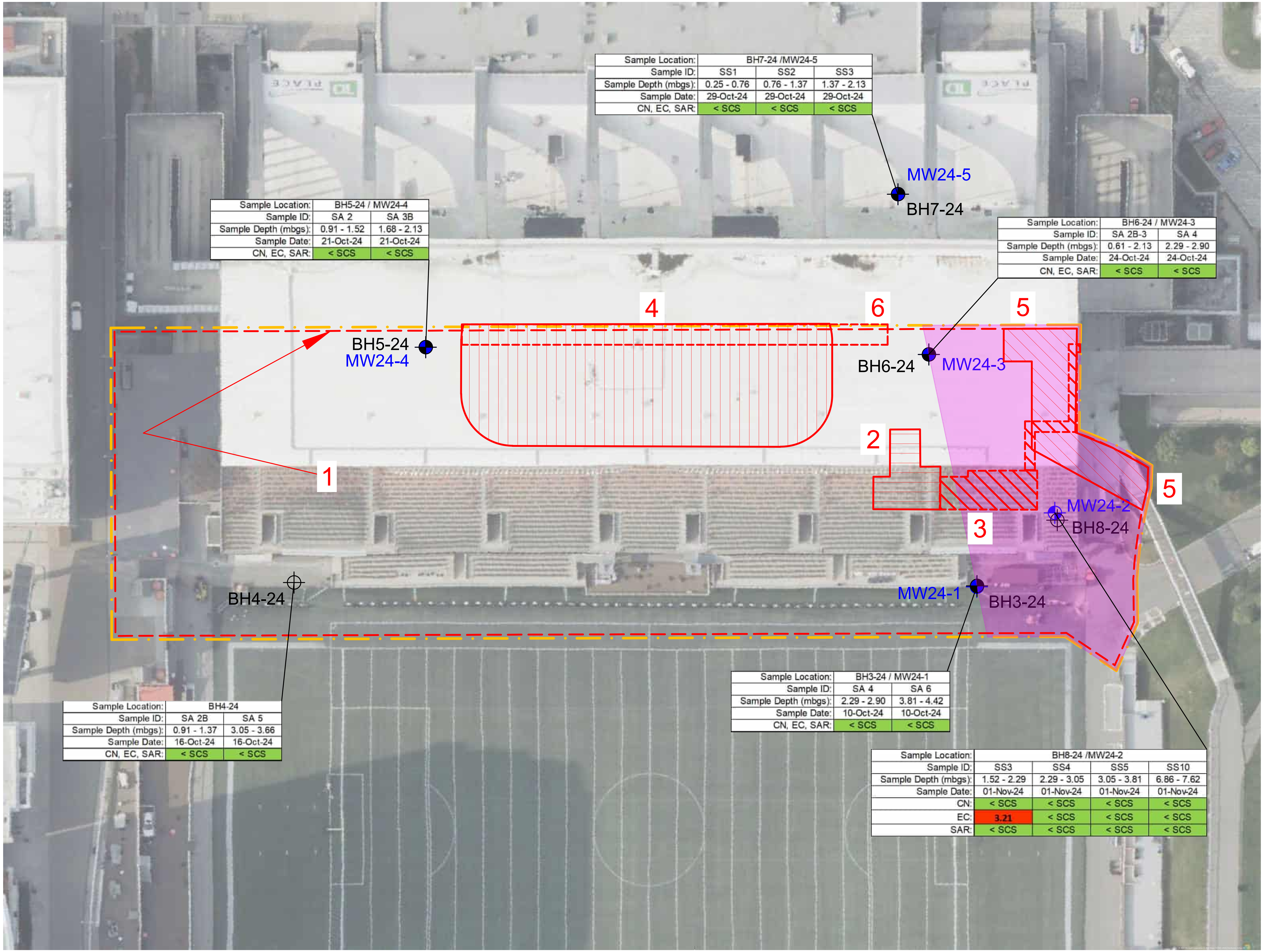
PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:
13

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
CN, EC, SAR:	< SCS	< SCS	< SCS

Sample Location:	BH5-24 / MW24-4	
Sample ID:	SA 2	SA 3B
Sample Depth (mbgs):	0.91 - 1.52	1.68 - 2.13
Sample Date:	21-Oct-24	21-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
CN:	< SCS	< SCS	< SCS	< SCS
EC:	**3.21**	< SCS	< SCS	< SCS
SAR:	< SCS	< SCS	< SCS	< SCS

LEGEND

- - -	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⌖	DEEP BOREHOLE WITH STANDPIPE
⌖	SHALLOW MONITORING WELL
1	AREA OF POTENTIAL ENVIRONMENTAL CONCERN
▨	INFERRED AREA OF SOIL IMPACT EXCEEDING MECP TABLE 3 SCS

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

SOIL ANALYTICAL RESULTS - ORPs
(INCLUDES CN, EC, SAR)

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:

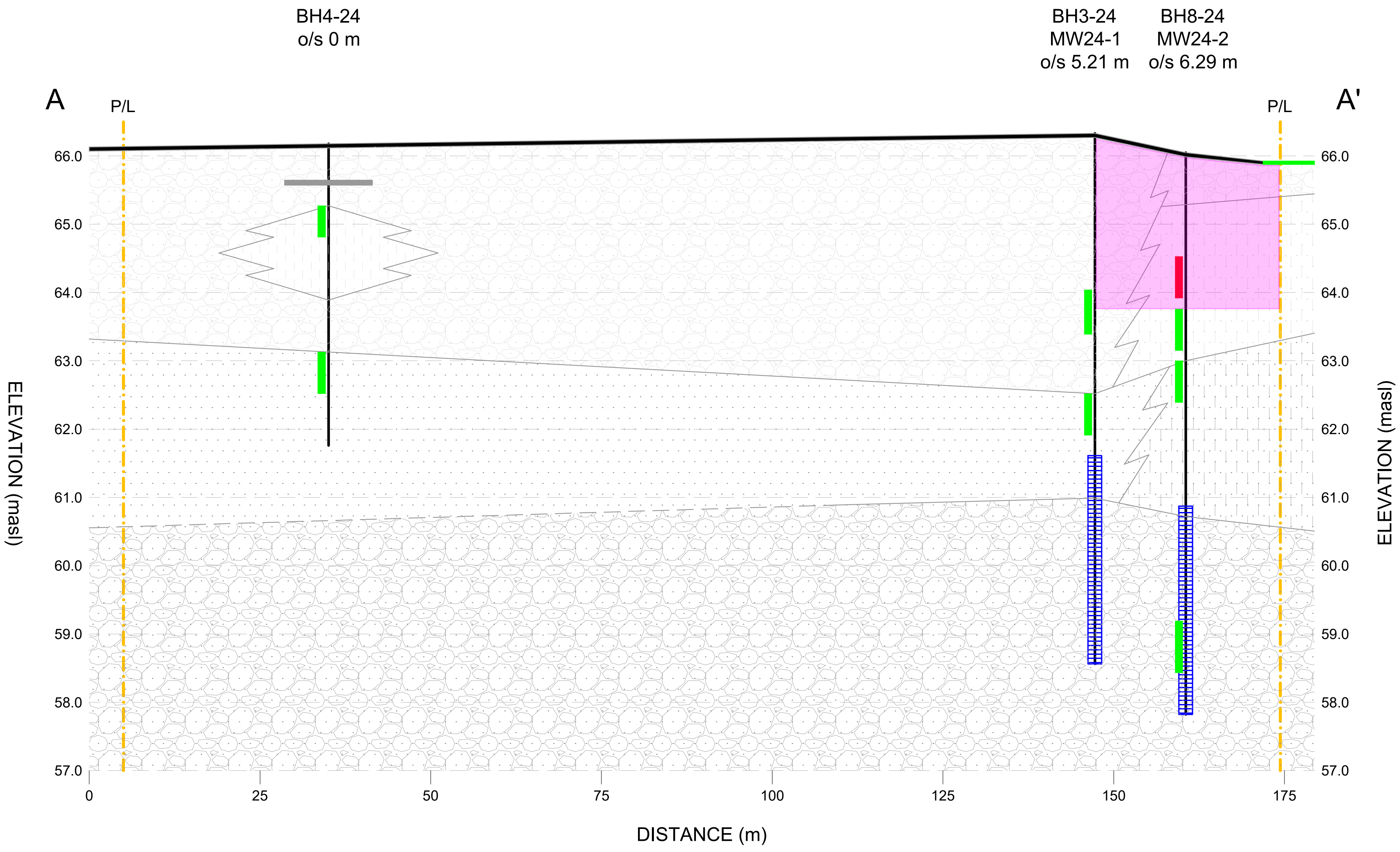
14A

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG

Sample Location:	BH4-24	
Sample ID:	SA 2B	SA 5
Sample Depth (mbgs):	0.91 - 1.37	3.05 - 3.66
Sample Date:	16-Oct-24	16-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
CN:	< SCS	< SCS	< SCS	< SCS
EC:	3.21	< SCS	< SCS	< SCS
SAR:	< SCS	< SCS	< SCS	< SCS



LEGEND

GEOLOGICAL CONTACT
GEOLOGICL CONTACT - INFERRED
ASPHALT
TURF / GRASS SOD
CONCRETE

FILL - GRAVEL
FILL - GRAVELLY SAND / SANDY GRAVEL
FILL - SILTY SAND
FILL - SILTY SAND AND GRAVEL

SILTY SAND AND GRAVEL
SAND
SANDY SILT
SILTY SAND

BH3-24 MW24-1 o/s 5.21 m — BOREHOLE ID WELL ID SECTION OFFSET
BOREHOLE TRACE
WATER LEVEL
WELL SCREEN

🟩 SOIL SAMPLE MEETING TABLE 3 SCS
🟥 SOIL SAMPLE EXCEEDING TABLE 3 SCS
INFERRED ARE OF SOIL IMPACT EXCEEDING TABLE 3 SCS

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:
SOIL ANALYTICAL RESULTS - ORPs
(INCLUDES CN, EC, SAR)
CROSS SECTION A-A'

PROJECT:
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

wsp

DESIGN BY: JFT	DRAWN BY: JFT	DATUM: NAD83 CSRS 2010	PROJECT NO: CA0045396.3464		FIGURE NO: 14B
CHECKED BY: KDH	REVISION: 0	PROJECTION: MTM ZONE 9	DATE: DECEMBER 2024	SCALE: AS SHOWN	

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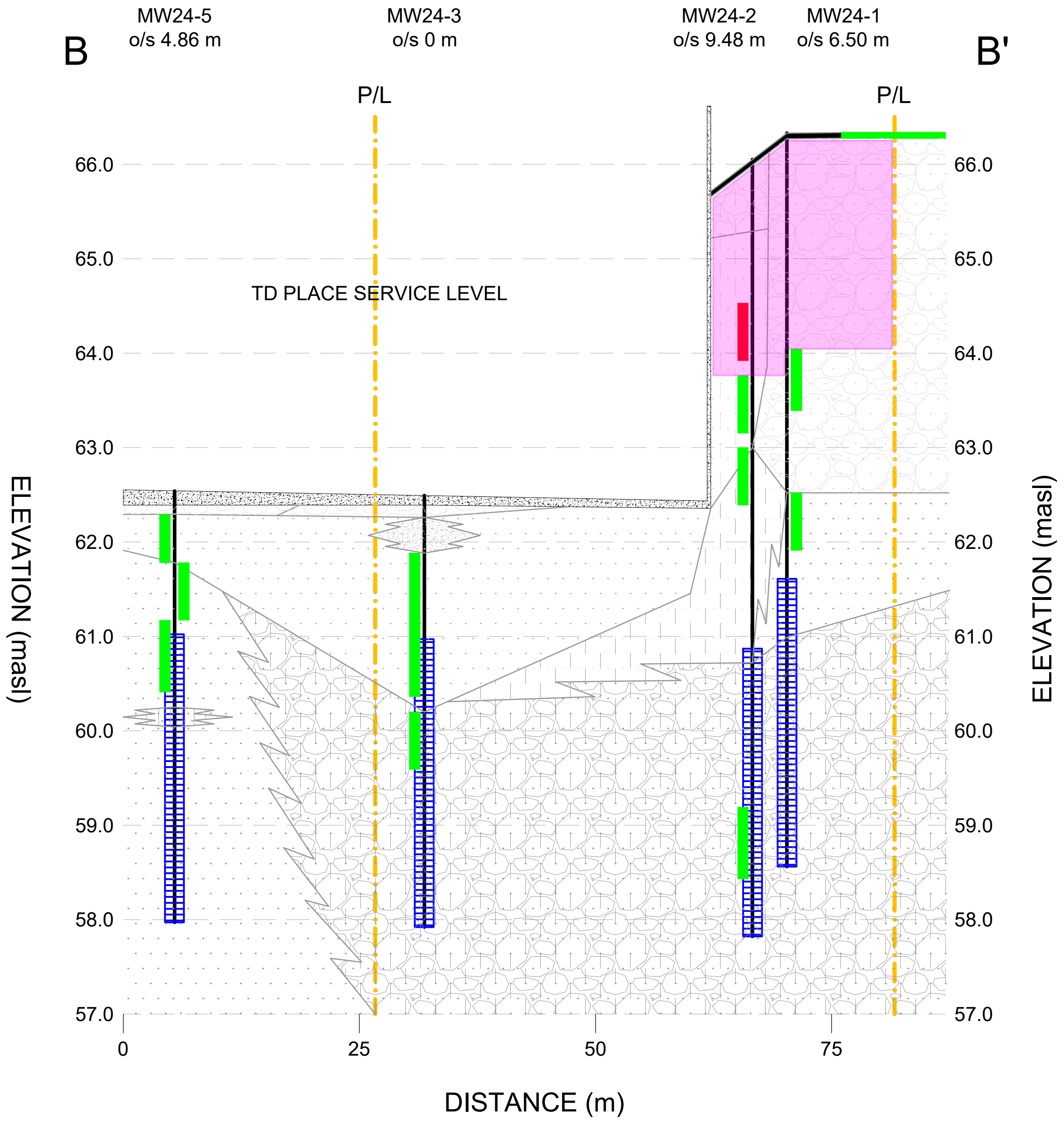
C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO SECTIONS.DWG

Sample Location:	BH6-24 / MW24-3	
Sample ID:	SA 2B-3	SA 4
Sample Depth (mbgs):	0.61 - 2.13	2.29 - 2.90
Sample Date:	24-Oct-24	24-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH3-24 / MW24-1	
Sample ID:	SA 4	SA 6
Sample Depth (mbgs):	2.29 - 2.90	3.81 - 4.42
Sample Date:	10-Oct-24	10-Oct-24
CN, EC, SAR:	< SCS	< SCS

Sample Location:	BH7-24 /MW24-5		
Sample ID:	SS1	SS2	SS3
Sample Depth (mbgs):	0.25 - 0.76	0.76 - 1.37	1.37 - 2.13
Sample Date:	29-Oct-24	29-Oct-24	29-Oct-24
CN, EC, SAR:	< SCS	< SCS	< SCS

Sample Location:	BH8-24 /MW24-2			
Sample ID:	SS3	SS4	SS5	SS10
Sample Depth (mbgs):	1.52 - 2.29	2.29 - 3.05	3.05 - 3.81	6.86 - 7.62
Sample Date:	01-Nov-24	01-Nov-24	01-Nov-24	01-Nov-24
CN:	< SCS	< SCS	< SCS	< SCS
EC:	3.21	< SCS	< SCS	< SCS
SAR:	< SCS	< SCS	< SCS	< SCS



LEGEND

	GEOLOGICAL CONTACT		FILL - GRAVEL		SILTY SAND AND GRAVEL	BH3-24 MW24-1 o/s 5.21 m	BOREHOLE ID WELL ID SECTION OFFSET	🟩	SOIL SAMPLE MEETING TABLE 3 SCS
	GEOLOGICL CONTACT - INFERRED		FILL - GRAVELLY SAND / SANDY GRAVEL		SAND		BOREHOLE TRACE	🟥	SOIL SAMPLE EXCEEDING TABLE 3 SCS
	ASPHALT		FILL - SILTY SAND		SANDY SILT	▼	WATER LEVEL		INFERRED ARE OF SOIL IMPACT EXCEEDING TABLE 3 SCS
🟩	TURF / GRASS SOD		FILL - SILTY SAND AND GRAVEL		SILTY SAND		WELL SCREEN		
	CONCRETE								

ORIGINAL DRAWING SIZE 8.5" X 11"

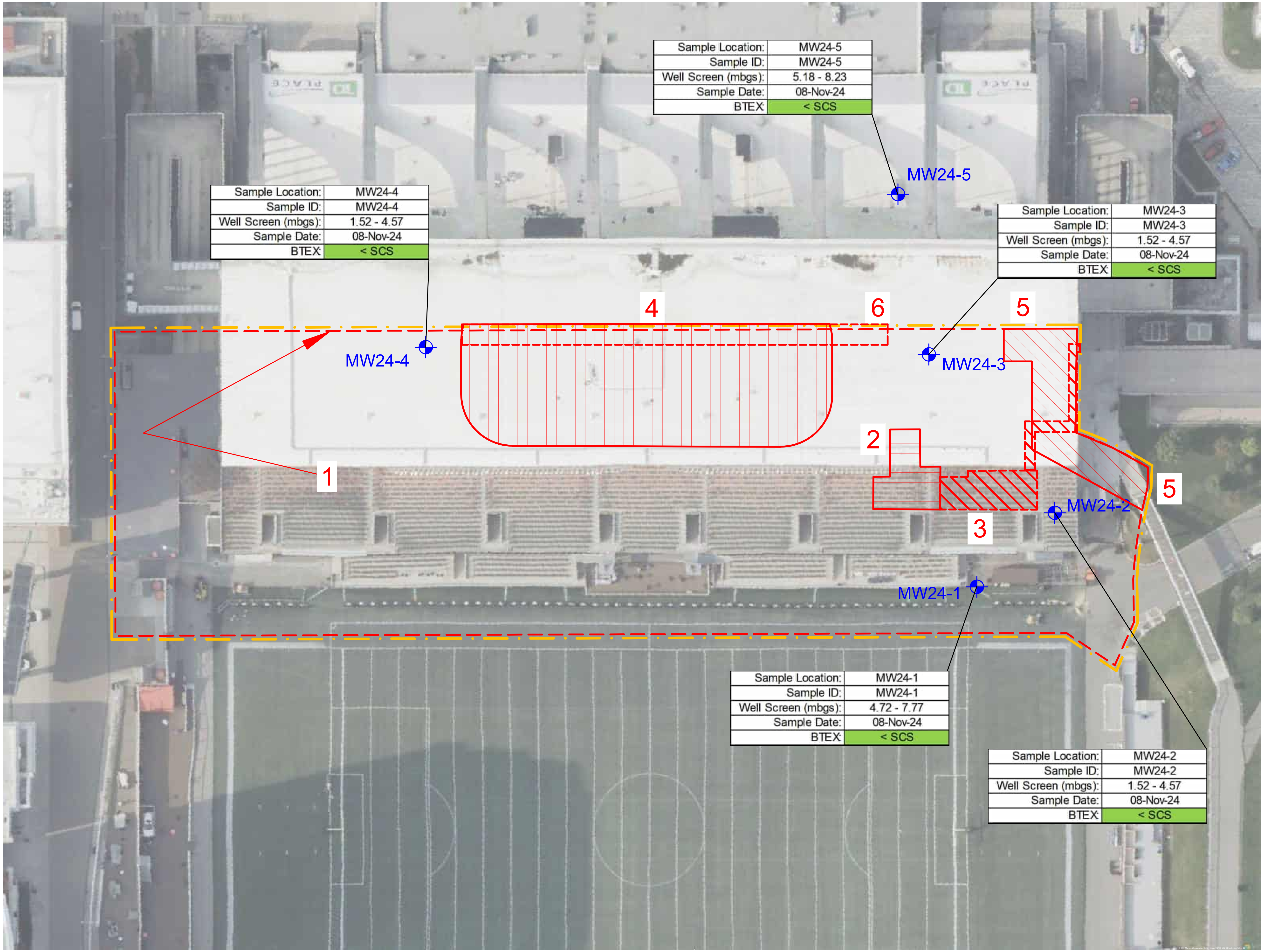
TITLE:
SOIL ANALYTICAL RESULTS - ORPs
(INCLUDES CN, EC, SAR)
CROSS SECTION B-B'

PROJECT:
PHASE TWO ENVIRONMENTAL SITE
ASSESSMENT
LANSDOWNE PARK - NORTH SIDE
STANDS

CLIENT:
Ottawa

wsp

DESIGN BY: JFT
DRAWN BY: JFT
CHECKED BY: KDH
REVISION: 0
DATUM: NAD83 CSRS 2010
PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464
DATE: DECEMBER 2024
SCALE: AS SHOWN
FIGURE NO: 14C



Sample Location:	MW24-5
Sample ID:	MW24-5
Well Screen (mbgs):	5.18 - 8.23
Sample Date:	08-Nov-24
BTEX	< SCS

Sample Location:	MW24-4
Sample ID:	MW24-4
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
BTEX	< SCS

Sample Location:	MW24-3
Sample ID:	MW24-3
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
BTEX	< SCS

Sample Location:	MW24-1
Sample ID:	MW24-1
Well Screen (mbgs):	4.72 - 7.77
Sample Date:	08-Nov-24
BTEX	< SCS

Sample Location:	MW24-2
Sample ID:	MW24-2
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
BTEX	< SCS

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LEGEND

- - -	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⌖	DEEP BOREHOLE WITH STANDPIPE
⌖	SHALLOW MONITORING WELL
[1]	AREA OF POTENTIAL ENVIRONMENTAL CONCERN

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:

GROUNDWATER ANALYTICAL RESULTS - BTEX

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

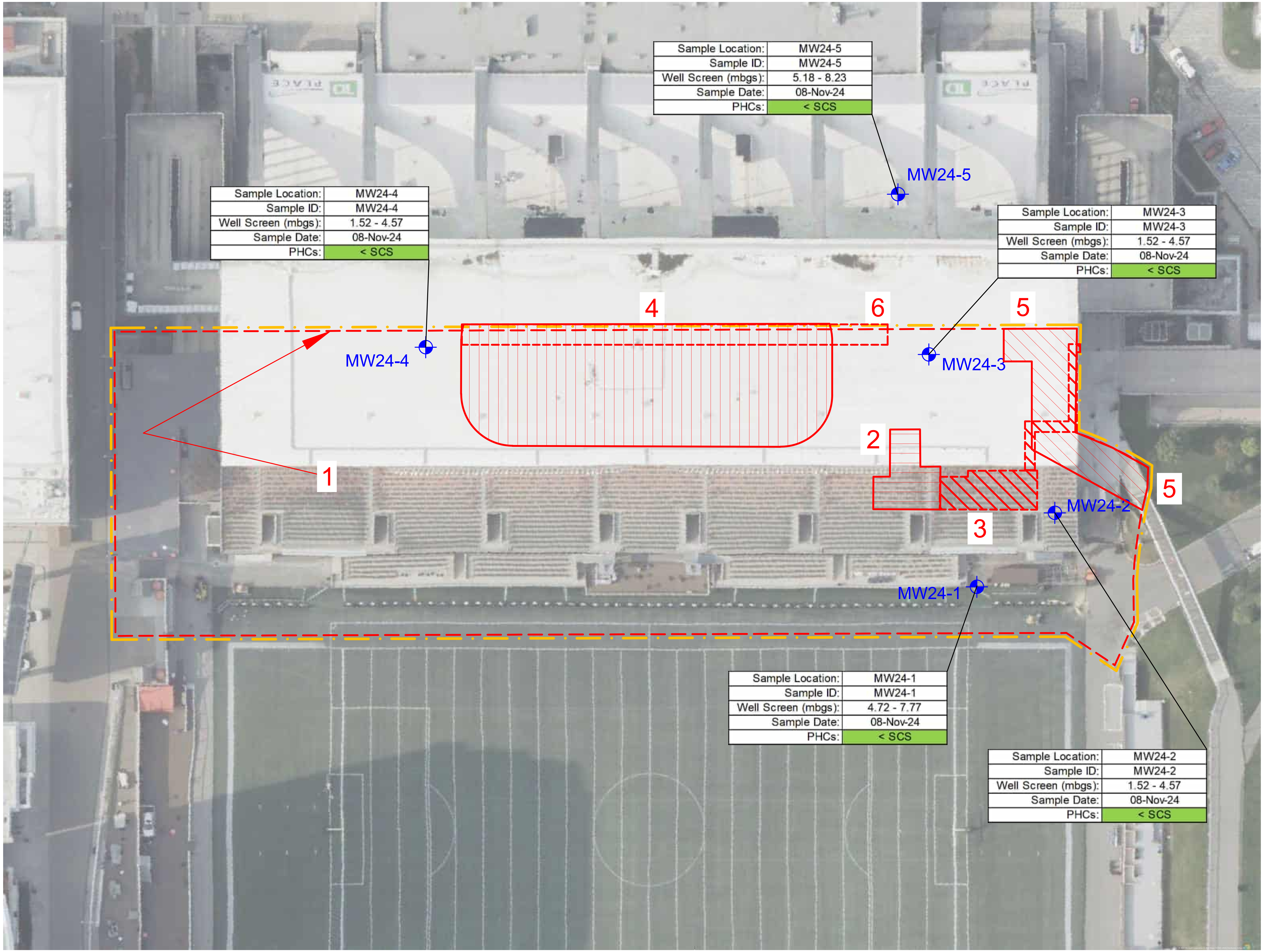
CLIENT:

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:

15

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



Sample Location:	MW24-5
Sample ID:	MW24-5
Well Screen (mbgs):	5.18 - 8.23
Sample Date:	08-Nov-24
PHCs:	< SCS

Sample Location:	MW24-4
Sample ID:	MW24-4
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
PHCs:	< SCS

Sample Location:	MW24-3
Sample ID:	MW24-3
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
PHCs:	< SCS

Sample Location:	MW24-1
Sample ID:	MW24-1
Well Screen (mbgs):	4.72 - 7.77
Sample Date:	08-Nov-24
PHCs:	< SCS

Sample Location:	MW24-2
Sample ID:	MW24-2
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
PHCs:	< SCS

LEGEND

- -	PHASE TWO PROPERTY BOUNDARY
⌖	BOREHOLE
⌖	DEEP BOREHOLE WITH STANDPIPE
⌖	SHALLOW MONITORING WELL
1	AREA OF POTENTIAL ENVIRONMENTAL CONCERN

6 0 6 12 18

METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

GROUNDWATER ANALYTICAL RESULTS - PHCs

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600

FIGURE NO:

16

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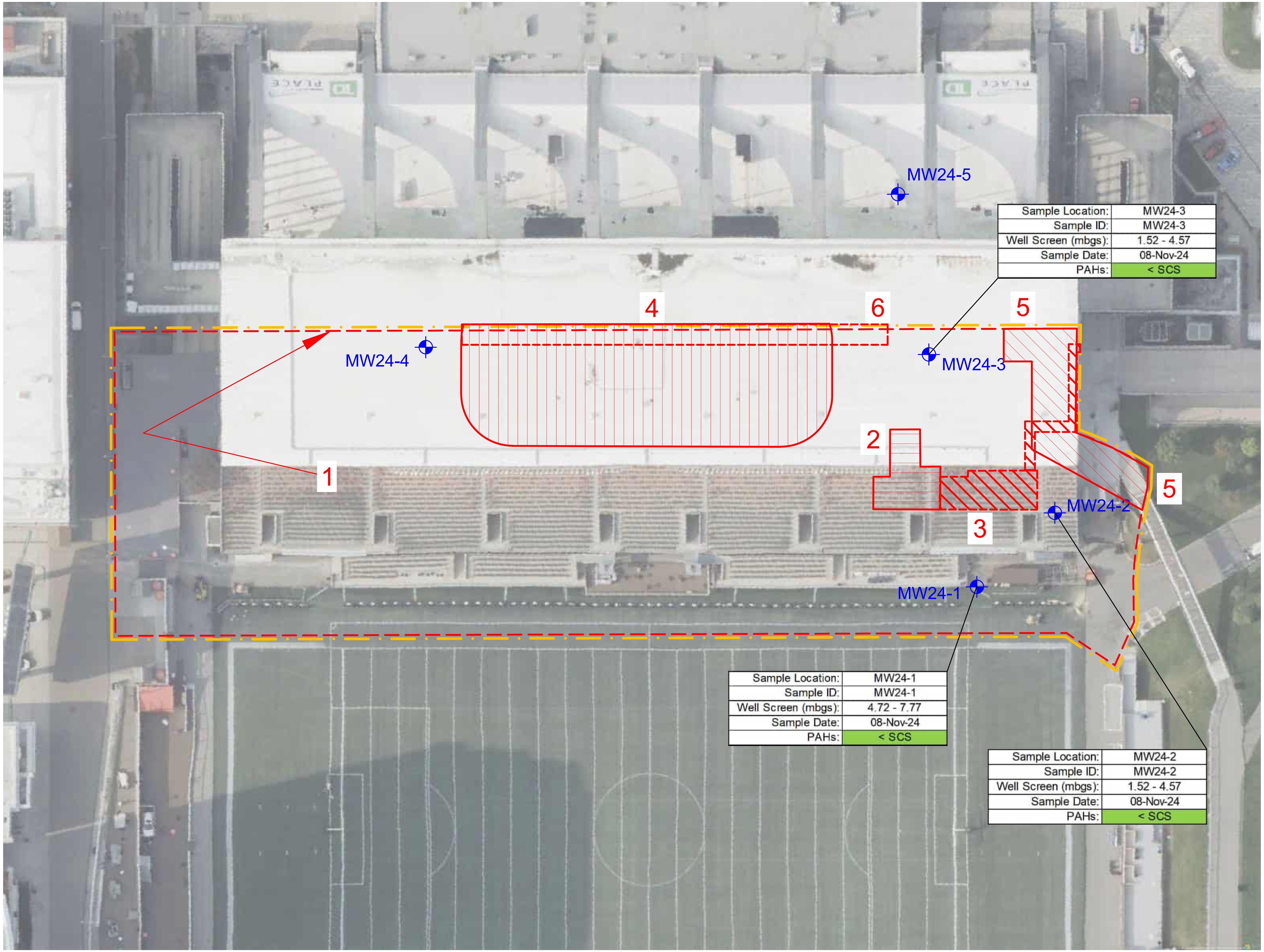

Sample Location:	MW24-3
Sample ID:	MW24-3
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
PAHs:	< SCS

Sample Location:	MW24-1
Sample ID:	MW24-1
Well Screen (mbgs):	4.72 - 7.77
Sample Date:	08-Nov-24
PAHs:	< SCS

Sample Location:	MW24-2
Sample ID:	MW24-2
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
PAHs:	< SCS

LEGEND

- - - PHASE TWO PROPERTY BOUNDARY
⊕ BOREHOLE
⊕ DEEP BOREHOLE WITH STANDPIPE
⊕ SHALLOW MONITORING WELL
[1] AREA OF POTENTIAL ENVIRONMENTAL CONCERN

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

GROUNDWATER ANALYTICAL RESULTS - PAHs

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 17	

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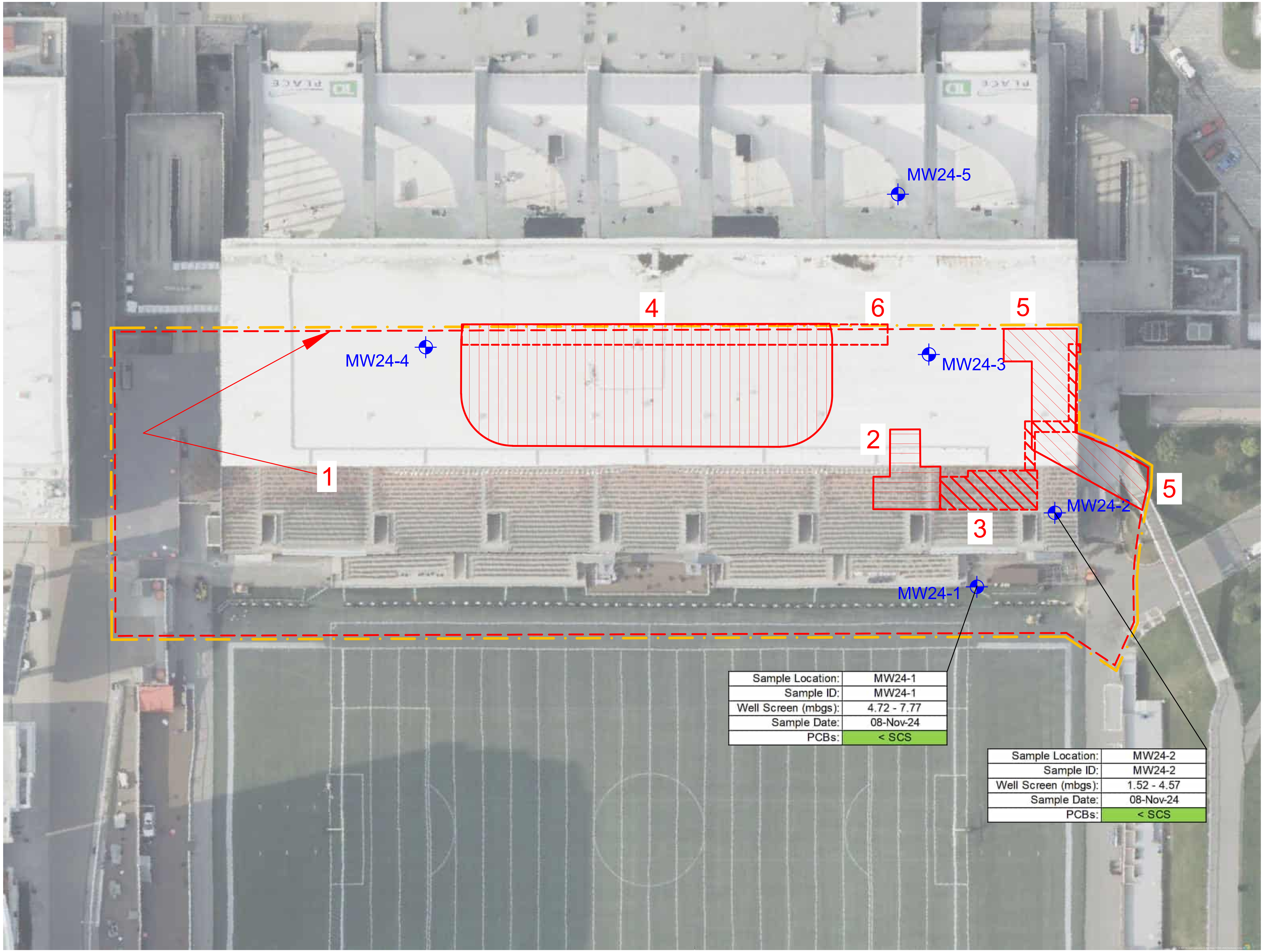


Sample Location:	MW24-1
Sample ID:	MW24-1
Well Screen (mbgs):	4.72 - 7.77
Sample Date:	08-Nov-24
PCBs:	< SCS

Sample Location:	MW24-2
Sample ID:	MW24-2
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
PCBs:	< SCS

LEGEND

- - PHASE TWO PROPERTY BOUNDARY
⌖ BOREHOLE
⌖ DEEP BOREHOLE WITH STANDPIPE
⌖ SHALLOW MONITORING WELL
[1] AREA OF POTENTIAL ENVIRONMENTAL CONCERN

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

GROUNDWATER ANALYTICAL RESULTS - PCBs

PROJECT:

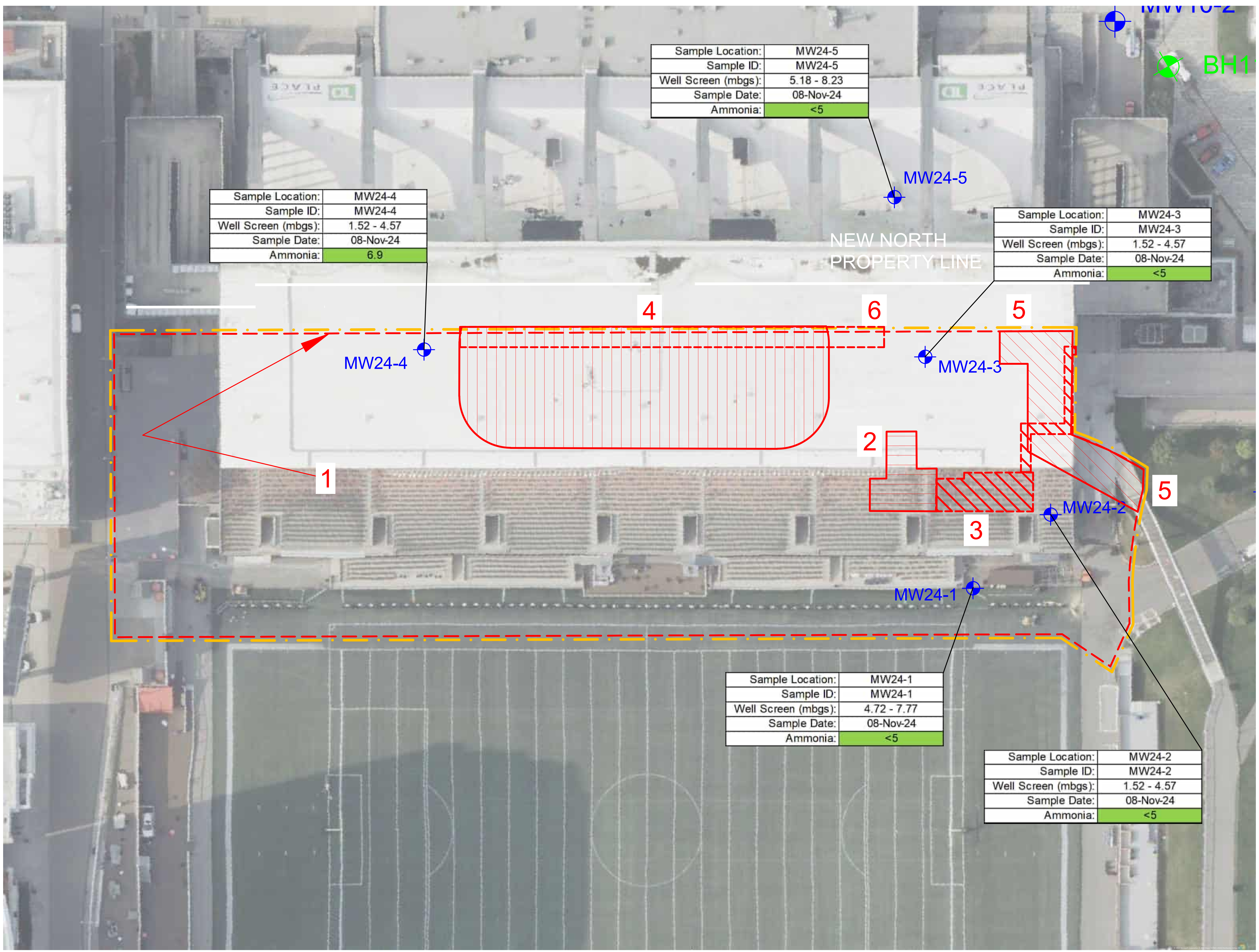
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 18	

C:\USERS\WDS_KEVIN.HICKS2\WSP O365\CA0045396.3464 CA-LANSDOWNE PARK 20 - NSS AND RSC PROPERTY PHASE TWO ESAS - PROJECT FOLDERS\05. TECHNICAL\CAD\LANSDOWNE 2.0 NSS PHASE TWO DRAWINGS.DWG



Sample Location:	MW24-5
Sample ID:	MW24-5
Well Screen (mbgs):	5.18 - 8.23
Sample Date:	08-Nov-24
Ammonia:	<5

Sample Location:	MW24-4
Sample ID:	MW24-4
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
Ammonia:	6.9

Sample Location:	MW24-3
Sample ID:	MW24-3
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
Ammonia:	<5

Sample Location:	MW24-1
Sample ID:	MW24-1
Well Screen (mbgs):	4.72 - 7.77
Sample Date:	08-Nov-24
Ammonia:	<5

Sample Location:	MW24-2
Sample ID:	MW24-2
Well Screen (mbgs):	1.52 - 4.57
Sample Date:	08-Nov-24
Ammonia:	<5

LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ⌖ BOREHOLE
- ⌖ DEEP BOREHOLE WITH STANDPIPE
- ⌖ SHALLOW MONITORING WELL
- [1] AREA OF POTENTIAL ENVIRONMENTAL CONCERN

6 0 6 12 18
METRES

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:

GROUNDWATER ANALYTICAL RESULTS - AMMONIA

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 19	

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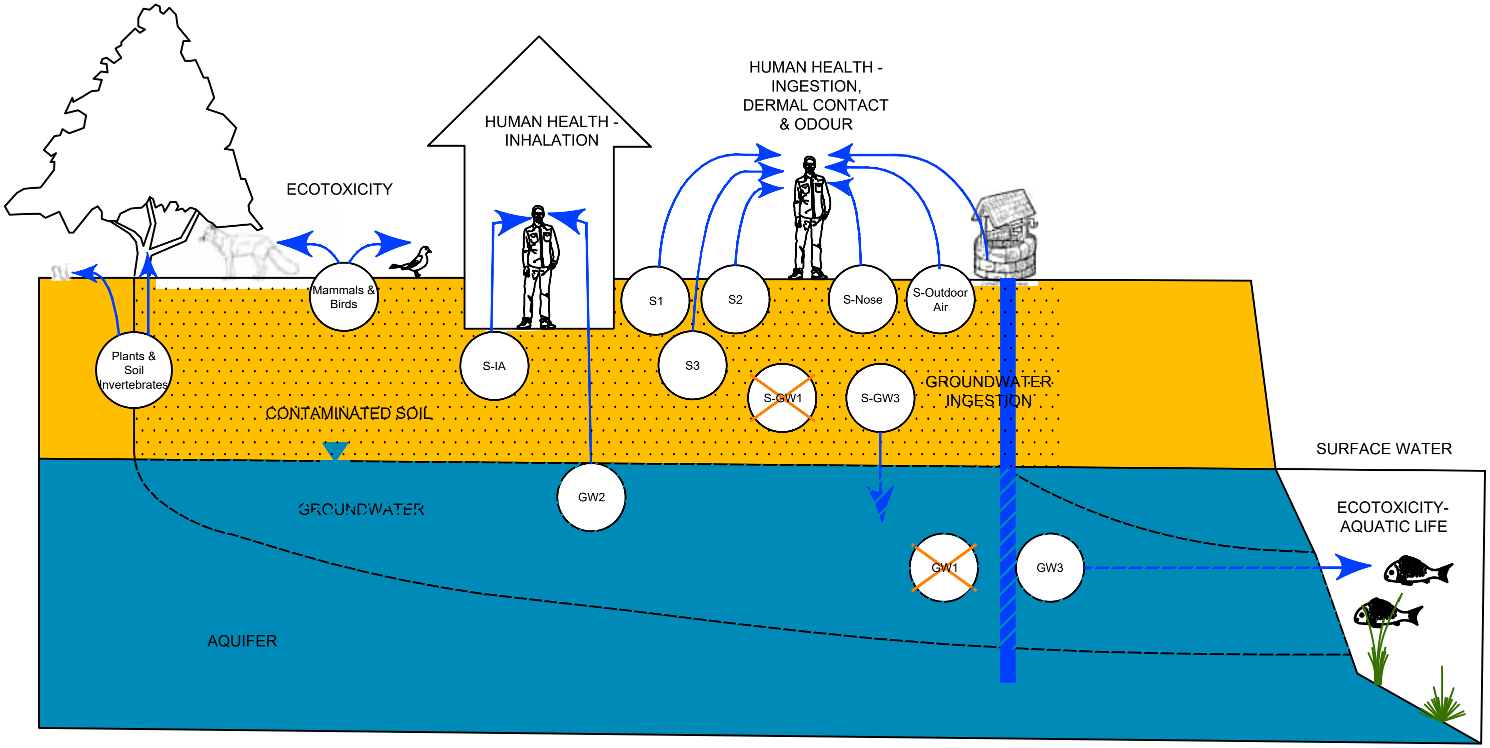


COMPONENT VALUE DESCRIPTIONS

S-IA: INHALATION OF INDOOR AIR CONTAINING SOIL VAPOUR SOURCED FROM SOIL CONTAMINANTS
S1: DIRECT CONTACT TO SOIL, PROTECTIVE OF RESIDENTIAL SCENARIO
S2: DIRECT CONTACT TO SOIL, PROTECTIVE OF COMMERCIAL/INDUSTRIAL SCENARIO
S3: DIRECT CONTACT TO SOIL, PROTECTIVE OF SUBSURFACE WORKER
S-NOSE: ODOUR FROM SURFACE SOIL
S-OUTDOOR AIR: INHALATION OF OUTDOOR AIR CONTAINING SOIL VAPOUR
S-GW1: EXPOSURE FOLLOWING LEACHING OF SOIL CONTAMINANT TO GROUND WATER AND INGESTION OF POTABLE GROUND WATER
S-GW3: EXPOSURE BY AQUATIC RECEPTORS FOLLOWING LEACHING OF SOIL CONTAMINANT TO GROUND WATER AND DISCHARGE TO SURFACE WATER
GW1: INGESTION OF POTABLE GROUND WATER
GW2: INHALATION OF INDOOR AIR CONTAINING SOIL VAPOUR SOURCED FROM GROUND WATER CONTAMINANTS
GW3: EXPOSURE BY AQUATIC RECEPTORS FOLLOWING GROUND WATER DISCHARGE TO SURFACE WATER

NOTES

RELEASE MECHANISMS: IMPORTATION OF POOR QUALITY FILL (PAHs); DE-ICING ACTIVITIES (EC).
CONTAMINANT TRANSPORT PATHWAYS: VOLATILIZATION FROM SOIL AND GROUNDWATER; UPTAKE BY PLANTS AND PREY; GROUNDWATER TO SURFACE WATER DISCHARGE; MOVEMENT IN THE FOOD WEB.
HUMAN RECEPTORS: RESIDENTS; LONG-TERM INDOOR WORKERS; LONG-TERM OUTDOOR WORKERS, SUBSURFACE WORKERS; TRESPASSERS.
ECOLOGICAL RECEPTORS: TERRESTRIAL BIRDS, MAMMALS, PLANTS; INVERTEBRATES; OFF-SITE AQUATIC RECEPTORS.
ROUTES OF EXPOSURE AND RECEPTOR EXPOSURE POINTS IN THE ABSENCE OF RISK MANAGEMENT:
TERRESTRIAL PLANTS: ROOT UPTAKE AND/OR ROOT CONTACT.
SOIL ORGANISMS: SOIL INGESTION; DIRECT CONTACT WITH THE SOIL; INGESTION OF PLANTS AND PREY.
BIRDS AND MAMMALS: SOIL INGESTION; INGESTION OF PLANTS AND PREY.
HUMAN RECEPTORS: DERMAL CONTACT WITH SOIL; INCIDENTAL INGESTION OF SOIL; INHALATION (INDOOR AIR, OUTDOOR AIR, TRENCH AIR AND/OR PARTICULATES).
OFF-SITE AQUATIC RECEPTORS: POTENTIAL EXPOSURE TO GROUNDWATER COCs FOLLOWING DISCHARGE TO SURFACE WATER

LEGEND

🟦	GROUNDWATER	GW2	COMPONENT
🟨	SOIL	GW1	PATHWAY IS INCOMPLETE
▒	CONTAMINATED SOIL		
▨	CONTAMINATED GROUNDWATER		
↗	EXPOSURE PATHWAY		

ORIGINAL DRAWING SIZE 8.5" X 11"

TITLE:
RECEPTORS AND EXPOSURE PATHWAYS DIAGRAM

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT - LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:
Ottawa

wsp

DATE: DECEMBER 2024		PROJECT NO: CA0045396.3464	FIGURE NO: 20
DRWN: JFT	CHK'D: CS	SCALE: NA	

Appendix A

Phase Two ESA Property Survey Plan

Appendix B

Sampling and Analysis Plan

MEMO

TO:	WSP Project Staff
COMPANY:	Internal – Project Related
FROM:	Kevin Hicks, M.Sc., P.Geo., QP(ESA)
DATE:	October 8, 2024
CC:	Jason Taylor, Project Manager
PROJECT NO.:	CA0045396.3464
SUBJECT:	**Phase Two ESA - Sampling and Analysis Plan** **North Site Stands, Lansdowne Park, 945-1015 Bank Street, Ottawa ON**

The City of Ottawa has retained WSP to undertake a Phase Two Environmental Site Assessment (ESA) of a portion of a larger property commonly known as Lansdowne Park located at 945-1015 Bank Street. The subject parcel comprises a near rectangular shaped area measuring 0.8527 hectares and currently occupied by TD Place North Side Stands (NSS) and part of TD Place Arena. A key plan showing the location of the Site is provided on Figure 1. The Phase Two ESA is required for internal due diligence purposes to support construction of a new North Side Stands structure with no change in property use. As such, a Record of Site Condition is not required.

The objective of the Phase Two ESA is to characterize the subsurface soil and groundwater conditions and quantitatively assess the Areas of Potential Environmental Concern (APEC) with respect to the associated contaminants of potential concern (COPC) identified at the Phase Two Property during the Phase One ESA. The Phase Two ESA drilling program will be completed concurrently with a geotechnical investigation being undertaken by Paterson Group.

This Technical Memorandum presents the Sampling and Analysis Plan (SAP) that has been developed in support of the Phase Two ESA. This SAP describes the scope of work to be undertaken and procedures to be followed during the field investigations to be carried out at the Phase Two Property to ensure that the work is performed in a manner to effectively characterize the site conditions and meet the data quality objectives.

1 BACKGROUND

The Phase Two Property is located on the south side of Exhibition Way, approximately 45 metres east of Bank Street. The Phase Two Property lies in a municipal urban setting in an area of mixed residential and commercial land uses. The Lansdowne Park property is mixed-use property including commercial retail and office and residential property uses (Zone A), mixed commercial and community uses including TD Place, the Aberdeen Pavilion and Horticulture Building (Zone B), and an Urban Park (Zone C). The Phase Two Property lies within Zone B of Lansdowne Park.

The Phase Two Property is currently developed with the North Side Stands and arena venue of TD Place, a multi-venue sports and entertainment facility including an indoor arena (home of the Ottawa 67's and Ottawa Charge hockey clubs and the Ottawa BlackJacks basketball club) and outdoor stadium (home of the Ottawa Redblacks football club and Atletico Ottawa soccer club).

WSP completed a Phase One ESA on the Phase Two Property in 2024. The Phase One ESA identified a number of Areas of Potential Environmental Concern (APECs) which will be assessed during the Phase Two ESA.

The overall objective of the investigation is to:

- Meet the O.Reg. 153/04 regulatory requirements.
- Complete field activities in accordance with WSP's Quality Assurance Plan.

A Phase One ESA was previously carried out at the Property by WSP, as documented in "Phase One Environmental Site Assessment, Lansdowne Park – North Side Stands, Ottawa, Ontario," updated December 19, 2024, (WSP, 2024). The Phase One ESA identified 8 APECs where COPC may be present in soil and/or groundwater at concentrations exceeding the applicable Site Condition Standards (SCS). The APEC are summarized in Table 1 below and their locations shown on Figure2.

Table 1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of APEC on Phase One Property	Potentially Contaminating Activity*	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
APEC-1: Unknown fill quality. Historic infilling and grading of the Phase One Property with fill of unknown quality prior to or during construction of the North Side Stands and TD Place Arena and Salons	Entire Phase One Property	PCA 30A: Importation of Fill Material of Unknown	On-site	PAHs, Metals, As, Sb, Se, B-HWS, Cr(VI), Hg, BTEX, PHCs, CN, EC, SAR	Soil
APEC-2: Oil filled transformer in electrical room.	Located centrally on the east portion of the service (lower) level of TD Place	PCA 55A: Transformer Manufacturing, Processing and Use	On-site	PHCs, PAHs, PCBs	Soil and Groundwater
APEC-3: Arena ice making plant. Located on the service (lower) level of TD Place and associated chiller pipelines beneath the arena surface	Located centrally on the east portion of the service (lower) level of TD Place	PCA QP1A: Arena Ice Making Plant (QP defined PCA)	On-site**	Ammonia, glycol (propylene and ethylene)	Groundwater
APEC 4: Brine distribution and chiller lines beneath ice rink	Located centrally on the north portion of the Site beneath the ice rink and extending to the ice making plant)	PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant (QP defined PCA)	On-site***	EC, SAR Na, Cl	Soil Groundwater

APEC-5A: Existing and former tanks including one 2,273 L gasoline AST and one 2,273 L diesel AST; one diesel back-up generator equipped with internal 5,791 L diesel AST; one former AST Located beneath the stadium ramp on the east side of TD Place APEC 5B: Arena ice making plant** Apec 5C: Glycol based snow and ice melting system for the Loading Ramp down to the service (lower) level of TD Place	Located near the northeast corner of the Phase One Property on the loading dock ramp.	PCA 28A, 28B, 28C: Gasoline and Associated Products Storage in Fixed Tanks and PCA QP1B: Arena Ice Making Plant (QP defined PCA) PCAs QP4A and QP4B: Glycol Snow and Ice Melting System (QP defined PCA)	Off-site	BTEX, PHCs, PAHs, Ammonia, glycol (propylene and ethylene) Glycol (propylene and ethylene)	Soil and Groundwater Groundwater Groundwater
APEC 6: Brine distribution and chiller lines beneath ice rink	Located centrally on the north portion of the Site beneath the ice rink and extending to the ice making plant)	PCA QP2B: Brine Distribution and Chiller Lines for Ice Making Plant (QP defined PCA)	off-site***	EC, SAR Na, Cl	Soil Groundwater
APEC 7: Application of winter de-icing agents. On sidewalks, stairways, pathways and laneways for pedestrian and vehicle safety	Pedestrian walkways north of Building J, stairs at northeast and northwest entrances to TD Area.	PCA QP3A: Application of Winter de-icing Agents (QP defined PCA)	On-site	EC, CN, SAR Na, Cl	Soil Groundwater
APEC 8: Application of winter de-icing agents. On roads, sidewalks, pathways and laneways for pedestrian and vehicle safety	Roadways, laneways and pathways immediately north, east and west of Phase One Property	PCA QP3B: Application of Winter de-icing Agents (QP defined PCA)	Off-site,	EC, CN, SAR Na, Cl	Soil Groundwater

PCA - *Potentially Contaminating Activity as provided in Schedule D of O.Reg. 153/04 as amended, where applicable, or as determined by the Qualified Person (QP).

** This PCA occurs both on-site (PCA QP1A) and off-site (PCA QP1B) as a continuous entity being represented the ice making plant within TD Place (PCA QP1A), the chiller unit on the building exterior (PCA QP1B) and ammonia and glycol supply and return lines running between the two (PCAs QP1A and QP1B).

*** This PCA occurs both on-site (PCA QP1A) and off-site (PCA QP1B) as a continuous entity being represented by the footprint of the arena ice surface and lines leading to it from the arena ice plant.

BTEX –Benzene, Toluene, Ethylbenzene and Xylenes
PAHs - Polycyclic Aromatic Hydrocarbons
PCBs – Polychlorinated Biphenyls
PHCs – Petroleum Hydrocarbons
Metals – Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mo, Ni, Ag, Tl, U, V, Zn
As, Sb, Se – Arsenic, Antimony and Selenium (hydride metals)
B – HWS – Boron, Hot Water Soluble
Cr (VI) –Hexavalent Chromium
Hg – Mercury
Na – Sodium
Cl$^-$ - Chloride
CN - Cyanide
EC – Electrical conductivity
SAR – Sodium adsorption Ratio

The overall objective of the investigation is to:

- Meet the O.Reg. 153/04 regulatory requirements.
- Complete field activities in accordance with WSP's Quality Assurance Plan.

A Phase One ESA was previously carried out at the Property by WSP, as documented in "Phase One Environmental Site Assessment, Lansdowne Park – North Side Stands, Ottawa, Ontario," dated December 4, 2024, (WSP, 2024). The Phase One ESA identified 8 APECs where COPC may be present in soil and/or groundwater at concentrations exceeding the applicable Site Condition Standards (SCS).

1.1 SITE ACCESS

The Phase Two Property is currently operated by Lansdowne Stadium Limited Partnership, a limited partnership between the City of Ottawa and the Ottawa Sports and Entertainment Group ("OSEG"), the latter of which manages the sports teams and is responsible for the operation and programing of the stadium and indoor arena.

Contact information for the owner of the Phase Two Property is provided below.

Table 2: Site Owner Contact Information

Phase One Property Owner	Owner Name	Contact Info
Client or Authorizing Agent (if different from the Phase One Property Owner)	City of Ottawa	Richard Barker Specialist, Environmental Remediation Environmental Remediation Unit Corporate Real Estate Office Planning, Infrastructure and Economic Development Tel: 613-580-2400 x12567 Email: richard.barker@ottawa.ca

1.2 PHASE TWO ESA

The Phase Two ESA will be carried out concurrently with a geotechnical investigation and will include the drilling of boreholes with installation of groundwater monitoring wells to facilitate the collection of representative soil and ground water samples. Laboratory analysis of soil and ground water samples will be performed to determine the concentrations of COPCs. The sampling programs will employ a judgmental sampling approach with borehole and monitoring wells being targeted to assess the APECs identified during the Phase One ESA. No sediment or surface water exists at the Site; therefore, sampling and analysis of these media is not required.

2 SCOPE OF WORK

The scope of work will include the following tasks:

- Develop a site-specific Health & Safety Plan (HASP) for the intrusive work at the Phase Two Property;

- Complete a review of all applicable existing environmental reports prepared in reference to the Phase Two property;
- Conduct a Site visit to evaluate access, borehole and monitoring well locations with the owner/tenants and contractors, and marking the location of all intrusive sampling locations for utility locating purposes;
- Undertake clearance of public underground utility services (i.e., Bell, Hydro, Gas, Cable and Sewer/Water) prior to commencement of any subsurface activities. WSP will also retain a private utility locate contractor to identify the location of any private services on the Phase Two Property;
- A subsurface soil sampling program including the drilling of six boreholes to facilitate the collection of fill and/or soil samples; logging and field screening for evidence of negative impact including the presence of "free flowing product", using visual, olfactory and sample headspace screening methods;
- Complete five boreholes as groundwater monitoring wells;
- Survey the locations (Easting and Northings) relative to the MTM reference grid and geodetic elevations of borehole and monitoring wells using a rod and level;
- Develop the newly installed monitoring wells by removing at least three well volumes or until the well is dry and allowed to recover;
- Conduct one groundwater monitoring event at the newly installed monitoring wells. Monitoring to include measuring groundwater levels, depth to bottom and checking for free-phase hydrocarbons/sheens;
- Purge the newly installed monitoring wells until stabilization of indicator parameters is achieved or until up to three (3) well water volumes of water are removed, whichever comes first. Purging to be carried out using a peristaltic pump. Field parameters including temperature, potential hydrogen (pH), conductivity, dissolved oxygen (DO) and oxidation reduction potential (ORP) will be measured throughout the purging and sampling process with samples being collected upon stabilization of the field parameters. Groundwater samples for metals analyses are to be field filtered using Waterra™ disposable field filters;
- Submit selected soil and groundwater samples for laboratory analysis of COPC;
- Evaluate the results of the chemical analyses with the applicable property use criteria outlined in the "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", as amended; and,
- Prepare a report documenting the findings of the Phase Two ESA.

2.1 RATIONALE

The investigation locations are shown on Figure 3 and were selected on the basis of the following considerations.

Table 3: Investigation Rationale

Sampling Location	Applicable APECs	Rationale
BH3-24 / MW24-1	APECs 1, 2 and 3	Located immediately south of the electrical transformers and ice making plant on Site
BH4-24	APEC 1	Coverage across area where largest fill thickness is present
BH5-24 / MW24-4	APECs 1 and 4	Located immediately west of the ice rink

Sampling Location	Applicable APECs	Rationale
BH6-24 / MW24-3	APECs 1, 4 and 6	Located immediately north of the electrical transformers and ice making plant on Site
BH7-24 / MW24-5	APEC 1	Located immediately north of the Phase Two Property
BH8-24 / MW24-2	APECs 1, 2, 3 and 5	Located in the eastern portion of the Site between the ice making equipment and AST

The QP has determined that APECs 7 and 8 are associated with activities where a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. As such, the applicable SCS that may be exceeded as a result of these activities would be deemed not to be exceeded for the purpose of Part XV.1 of the Act. APEC 7 and 8 have thus not been investigated

2.2 GENERAL REQUIREMENTS

- Calibration of field equipment should be checked at least once during each field day (record on field form).
- Clean disposable Nitrile™ gloves will be used at each sampling location to prevent cross-contamination.
- All non-dedicated sampling equipment (e.g., split spoons) will be decontaminated between sampling locations. Sampling equipment in contact with soil will be cleaned with a brush; washed with a laboratory-grade detergent solution (e.g., phosphate-free LiquiNox or AlcoNox) and thoroughly rinsed with analyte-free water.

2.3 BOREHOLE DRILLING

The program includes six (6) boreholes, five (5) of which will be completed as monitoring wells. The boreholes/monitoring wells will be advanced using a CME track mounted drill rig with rotary auger and split spoon sampling equipment. Soil samples collected during borehole drilling will be screened in the field for evidence of negative impact using visual/olfactory observations and soil sample headspace screening measurements of combustible and total organic vapours using a potable hydrocarbon surveyor (e.g., RKI Eagle) and a photoionization detector (e.g. MiniRAE 3000) or a combined instrument (e.g., RKI Eagle 2). Such instrument(s) shall be calibrated twice daily (at the start and end of the day) using known standards. Soil samples shall be submitted for analysis on the basis of the presence of fill material, visual or olfactory evidence of contamination, field screening results (hydrocarbons and VOCs), and proximity to the apparent water table.

Soil pH samples (excluding duplicates) shall include at least three (3) samples collected from <1.5 m below grade and at least three (3) collected from >1.5 m below grade. Representative samples will also be submitted for grain size analysis as part of the preliminary geotechnical investigation and will be used in the Phase Two ESA to determine soil texture.

Soil samples to be analyzed for BTEX / VOC / PHC F1 will be preserved in the field using methanol field preservation procedures in accordance with the Ministry of Environment, Conservation and Parks (MECP) document entitled Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004 as amended July 1, 2011.

- Confirm that every drilling location has been cleared by the public locates.

- Log “fill” materials as either “FILL (DISTURBED NATIVE)” or “FILL (IMPORTED)”.
- At each location, screen continuous soil samples at regular intervals (either 2.0 or 2.5 ft) using an RKI Eagle (both photoionization and combustible gas detectors).
- A summary of the sampling and analysis plan for soil is provided in Table 4.

Table 4: Sampling and Analysis Plan for Soil

APEC	Borehole ID	Borehole Depth (mbgs)	Sample Summary
APEC 1 (fill)	BH3-24[1] BH4-24 BH5-24[1] BH6-24[1] BH7-24[1] BH8-24[1]	7.5 4.5 5.0 4.5 4.5 8.0	BTEX, PHC, PAH, metals, As, Sb, Se; Hg, Cr (VI), B-HWS, CN, EC, SAR, pH: Collect samples from shallow fill material, inferred worst case condition and from inferred native material for vertical delineation
APEC 2 (electrical transformer)	BH3-24 BH8-24	7.5 8.0	PCBs: samples to be collected from shallow soil and from soil at/near the water table
APEC 4 (Brine piping)	BH5-24 BH6-24	5.0 4.5	EC, SAR: Collect samples from shallow fill material, inferred worst case condition and from inferred native material for vertical delineation
APEC 5 (fuel and diesel ASTs)	BH8-24	8.0	BTEX, PHC, PAH: Collect samples from shallow fill material, inferred worst case condition at/near water table and from inferred native material for vertical delineation
APEC 6 (Brine piping)	BH5-24 BH6-24	5.0 4.5	EC, SAR: Collect samples from shallow fill material, inferred worst case condition and from inferred native material for vertical delineation

2.4 MONITORING WELL INSTALLATION

Monitoring wells will be constructed using commercially available 51 mm diameter flush joint threaded 40 PVC monitoring well supplies with screens extending 3.0 m below ground surface, set to intersect the water table.

- Obtain water levels from surrounding monitoring wells prior to setting well screen. Send field log to Kevin Hicks, P.Geo., the QP(ESA), to discuss intended depth for well installation.
- As indicated in Table 3, install monitoring wells in accordance with SOP 11.

2.5 GROUNDWATER MONITORING AND SAMPLING

Ground water samples are to be collected after the wells have been both developed subsequent to installation and purged prior to sampling not less than 24 hours after development. Purging and sampling shall be by a low flow sampling technique. The rationale for concluding that well development is complete will be documented in the field notes.

- Develop monitoring wells in accordance with SOP 12.

- Using interface probe to determine depth to water and product thickness in accordance with SOP 13. If measurable product is present, use bailer to confirm. Do not collect groundwater samples in monitoring wells with measurable product.
- Collect groundwater samples in accordance with SOP 16. Avoid excessive disturbance of the water column.
- A summary of the sampling and analysis plan for groundwater is provided in Table 4.
- Investigation derived wastes (auger cuttings, decontamination fluids, well development and purge water) will be placed in 205-L steel drums pending classification and subsequent disposal/treatment (water) at off-site facilities.

Table 5: Sampling and Analysis Plan for Groundwater (O.Reg. 153/04)

APEC	Borehole ID	Screen Depth (mbgs)	Sample Summary
APEC 1 (fill)	MW24-1 MW24-2 MW23-3 MW24-4 MW24-5	7.5 mbgs (set to intersect water table) 8.0 mbgs (set to intersect water table) 4.5 mbgs (set to intersect water table) 4.5 mbgs (set to intersect water table) 4.5 mbgs (set to intersect water table)	BTEX, PHC
APEC 2 (electrical transformer)	MW24-1, MW24-2	7.5 mbgs (set to intersect water table) 8.0 mbgs (set to intersect water table)	PHC, PCB
APEC 3 (Use of Ammonia in Ice Making Operations)	MW24-1, MW24-2	7.5 mbgs (set to intersect water table) 8.0 mbgs (set to intersect water table)	Ammonia, glycol
APEC 4 (Brine Piping)	MW24-1 MW24-3 MW24-4	7.5 mbgs (set to intersect water table) 4.5 mbgs (set to intersect water table) 4.5 mbgs (set to intersect water table)	Na, Cl
APEC 5 (fuel and diesel ASTs)	MW24-1	8 mbgs (set to intersect water table)	BTEX, PHCs, PAHs
APEC 6 (Brine piping)	MW24-3 MW24-4	4.5 mbgs (set to intersect water table) 4.5 mbgs (set to intersect water table)	Na, Cl

2.6 SURVEYING

Coordinates/elevation of each sampling location shall be reference to the MTM reference grid, Zone 9, NAD83, CSRS 2010 and geodetic. Surveying will be performed by Paterson Group as part of the Geotechnical Investigation.

2.7 CHAIN-OF-CUSTODY

Chain-of-Custody Item	Information
Analytical Laboratory	ALS
Sample Delivery Instructions	All samples will be transported by WSP staff directly to the laboratory under continuous Chain of Custody documentation.
Standards (bulk chemistry and leachate)	Table 3 Commercial

Chain-of-Custody Item	Information
Use Record of Site Condition analytical procedure	Yes
Turn-around Time	Soil/Groundwater samples: Regular TAT
WSP Reporting Contact	Kevin Hicks
Project-specific quote number (if applicable)	City of Ottawa SOA
WSP Billing Contact	capayablesinvoice@wsp.com

2.8 MANAGEMENT OF INVESTIGATION DERIVED WASTE

Soil cuttings, decontamination liquids, development and purge water generated during well development and sampling will be stored in drums on the Phase Two Property pending the receipt of analytical results to determine disposal options. All drums must be documented in the field notes and located in a centrally accessible area of the Phase Two Property and labeled (use prepared labels) clearly with WSP's name and the phone number of the WSP Project Manager. The contents of each drum should be included in the label as well.

- Discuss best location to store drums with site supervisor/manager (should be secure as possible from public access).
- Record inventory of any waste containers on Daily Log.

3 QUALITY ASSURANCE/QUALITY CONTROL PLAN

The QA/QC plan includes a set of standard operating procedures or protocols to be followed throughout the investigations. To this end, WSP's field and QA/QC protocols have been developed to meet or exceed those defined in the MECP documents entitled Guideline for Phase II Environmental Site Assessments in Ontario (Draft, March 2006) and Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario (1996) and Canadian Council of Ministers of the Environment's (CCME) Guidance Manual Sampling, Analysis, and Data Management for Contaminated Sites (1993). The field QA/QC plan included the following components:

- The use of dedicated (1 pair per sample) latex/nitrile gloves for sample handling;
- Thorough documentation of all field activities and sample handling practices including field notes, photographs, chain of custody forms, memos to file, etc.;
- Thorough decontamination of all sampling equipment employed in all investigation phases;
- The incorporation of blind duplicate samples and travel blanks into the sampling and analytical programs to assess the validity of the data received from the analytical laboratory; and,
- The use of laboratory analytical protocols and method detection limits that have been established in accordance with regulatory requirements for the Province of Ontario.

The following WSP Standard Operating Procedures ("SOPs") are to be followed during the Project and are incorporated herein by reference:

- SOP No. 1: Field Deliverables
- SOP No. 2: Chain of Custody Completion

- SOP No. 3: Equipment Calibration
- SOP No. 4: Equipment Decontamination
- SOP No. 5: Test Pit Excavation
- SOP No. 6: Borehole Drilling
- SOP No. 7: Borehole and Test Pit Logging
- SOP No. 8: Soil Classification
- SOP No. 9: Soil Sample Collection
- SOP No. 10: Headspace Screening
- SOP No. 11: Monitoring Well Installation
- SOP No. 12: Monitoring Well Development
- SOP No. 13: Water Level and Product Measurement
- SOP No. 14: Single Well Hydraulic Testing
- SOP No. 15: Conventional Groundwater Sample Collection
- SOP No. 16: Low-flow Groundwater Sample Collection
- SOP No. 28: Determining Sample Location (GPS)

Specifications regarding sampling procedures, well installations, field note-taking, instrument calibration, filed measurements, surveying, collection of blind duplicate samples, etc., are provided in the SOPs. The remainder of this Section provides a brief summary of site-specific sampling procedures and selection rationale that are to be followed.

The SOPs cited previously specify decontamination procedures, protocols for the collection of duplicate samples, the use of trip blank samples and instrument calibration checks, etc. In addition, specific details regarding the quality assurance programs for soil and ground water sampling are provided in WSP training documents including Section 4 of “Borehole Drilling with Associated Soil Sampling and Handling”, Rev. 5.7 and Section 6 of “Ground Water Monitor Installation”, Rev. 3.6, respectively.

Dedicated sampling equipment, other than drilling equipment, will be used for all sampling work for this project unless the water table is more than 6 m below grade in which case a submersible pump may be used for low flow sampling subject to decontamination as outlined in WSP training document “Ground Water Monitoring and Sampling”, Rev. 1.7.

Where less than ten (10) discrete samples are being collected for analysis in any media at the site, one (1) blind field duplicate sample will be collected and submitted for analysis for each analytical group/parameter in all media for which that testing is carried out at the site. Where more than 10 samples are collected, blind field duplicate samples shall be collected on the basis of one (1) such sample for every ten (10) primary samples.

A brief description of the field sampling QA/QC procedures is outlined as follows.

The samples will be bottled for laboratory analysis and immediately labelled and placed in a cooler with ice. This method brings the temperature of the samples to below 10°C within a few hours (and normally below 4°C). The ice will be checked regularly and replenished as required between the time that the sample is placed in the cooler and the time that the samples are shipped or delivered to the laboratory. The samples will be shipped to the laboratory within one (1) business day of being collected. A custody seal will be placed on the cooler at the point of shipment and a completed Chain of Custody form will be included with the sample shipment.

4 LABORATORY ANALYSES

The field QA/QC program includes the use of Chain of Custody forms to document the transport and custody of the soil samples collected. Custody seals will be placed on all coolers used to transport samples to the laboratory. Blind duplicate samples will be collected for at least one (1) in 10 samples for all parameters analyzed. WSP will compare the analytical results of the blind duplicate samples and original sample to assess the validity of the laboratory data. Trip blanks will be reviewed to assess potential cross contamination during samples storage and transport.

All laboratory chemical analyses will be conducted by ALS. ALS is accredited by the Standards Council of Canada and has met the requirements of ISO/IEC 17025:2017 – General Requirements for the Competence of Testing and Calibration Laboratories for the contaminants of concern (COCs) at the Site. Laboratory analyses shall be carried out in accordance with Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act dated March 9, 2004, amended as of February 19, 2021. The proposed analytical program will include verification that the selected analytical methods will have minimum reporting detection limits (RDL) that are less than the applicable environmental quality criteria or standard on which the numerical comparison will be based. In instances where the laboratory detection limits have been raised and/or elevated above the applicable guidelines, discussion/rationale must be provided in the report to support these results.

5 DATA QUALITY OBJECTIVES

The data quality objectives (DQO) for the Phase Two ESA are to obtain unbiased analytical and field measurement data are of acceptable quality and are representative of actual soil, sediment and groundwater conditions at the Phase Two Property. To that end, the DQOs are as follows:

- To obtain soil, sediment and groundwater samples and other field measurements that provide data of acceptable quality that meets the objectives of the Phase Two ESA.
- To collect representative and unbiased (i.e., not contaminated by sample collection and storage and handling practices) samples, document sampling procedures, and to collect appropriate QC samples to provide a measure of sample reproducibility and accuracy.
- To collect field quality control samples at a rate that meets or exceeds those specified in Section 4.2.5, and to ensure that the results of those QC samples are satisfactory. The data quality objectives for all types of field data collected during the Phase Two ESA field investigation are set such that:
- Decision-making is not affected; and,
- The general (general) objectives of the investigation are met.

All soil and ground water sampling programs shall be carried out in strict accordance with the above noted WSP SOPs. Laboratory analyses shall be carried out in accordance with Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act dated March 9, 2004, amended as of July 1, 2011. The proposed lab program will include verification that the selected analytical methods will have minimum detection limits that are less than the applicable environmental quality criteria or standard on which the numerical comparison will be based. In instances where the laboratory detection limits have been raised and/or elevated above the applicable guidelines, discussion/rationale must be provided in the report to support these results.

6 LIMITATIONS

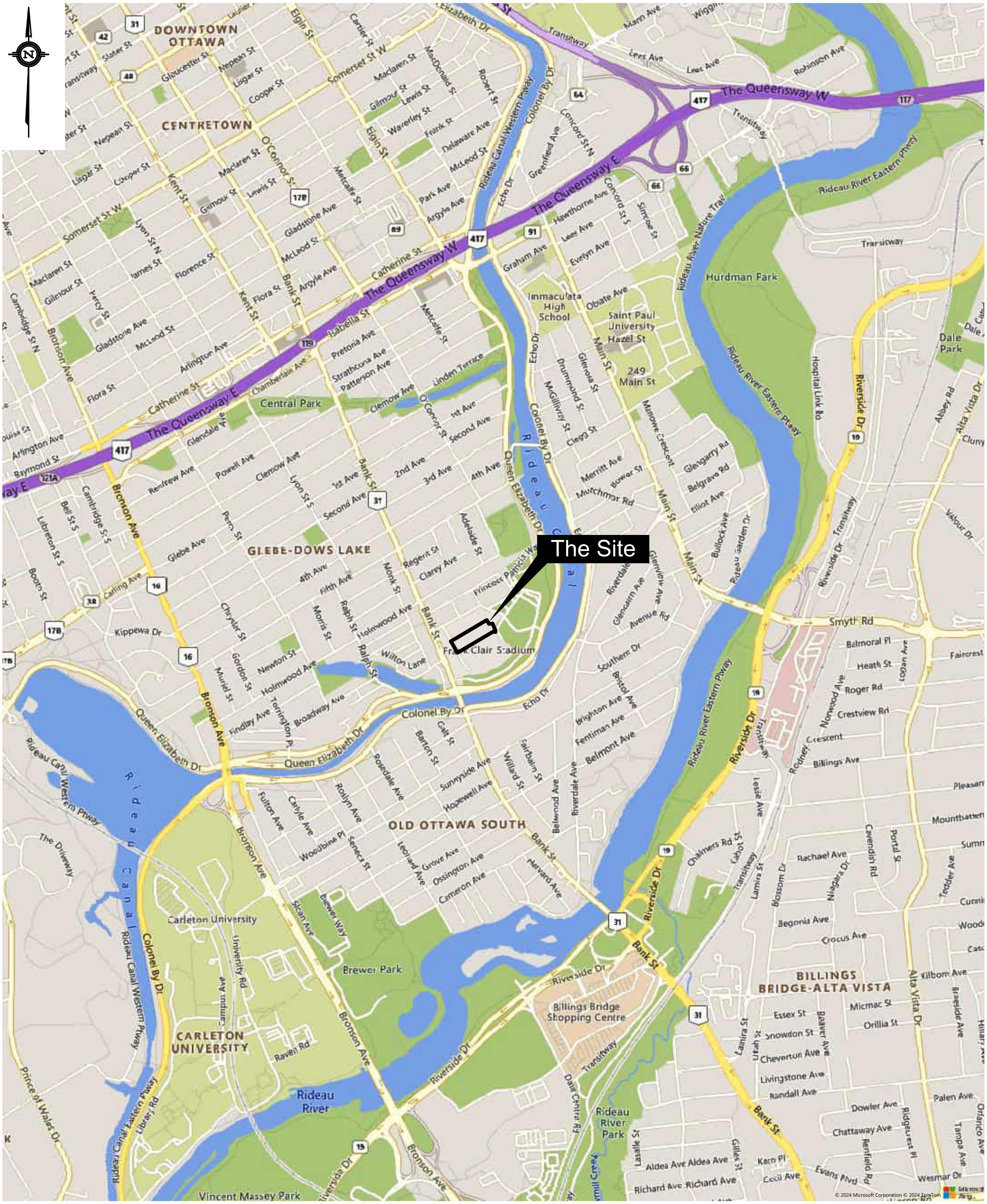
This report was prepared for the exclusive use of the City of Ottawa. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from WSP will be required. With respect to third parties, WSP has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

In evaluating the property, WSP has relied in good faith on information provided by other individuals noted in this report. WSP has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. WSP accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

WSP makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

Attach.

Figure 1. Site Location Plan
Figure 2. Areas of Potential Environmental Concern
Figure 3 Sample Plan



LEGEND

200 0 200 400 600

METRES

TITLE:

SITE LOCATION PLAN

CLIENT:

Ottawa

wsp

DATE: DECEMBER 2024		PROJECT NO: CA0045396.3464	FIGURE NO: 1
DRWN: JFT	CHK'D: KDH	SCALE: 1 : 20,000	

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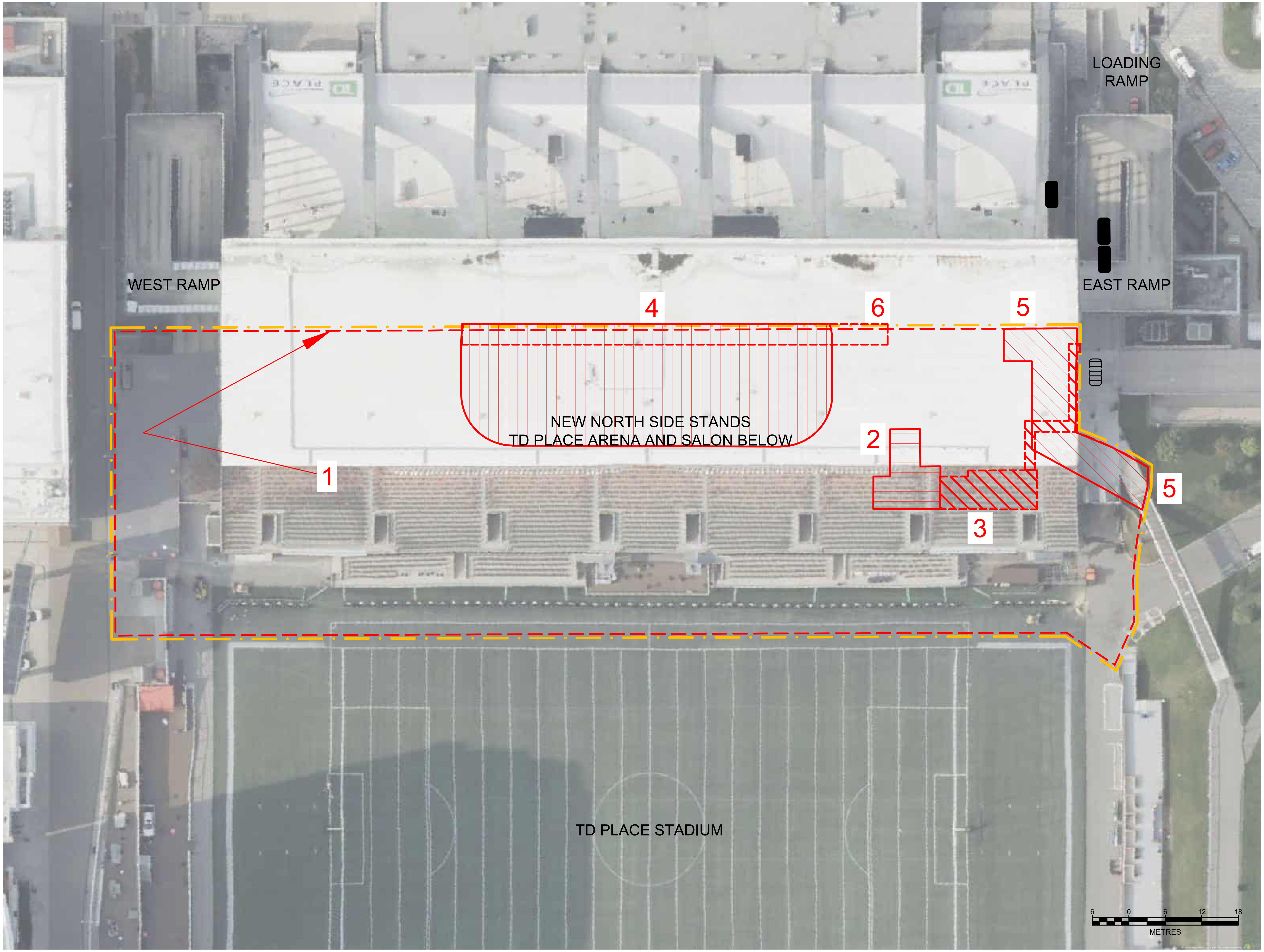


LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ▬ ABOVEGROUND STORAGE TANK
- ▭ FORMER ABOVEGROUND STORAGE TANK
- [1] POTENTIALLY CONTAMINATING ACTIVITY

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (see Table 6.4 in report for specific details):

APEC1: Unknown fill quality - PCA 30A: Importation of Fill of Unknown Quality (Entire Phase One Property)

APEC 2: Oil-filled transformer in electrical room - PCA 55A: Transformer Manufacturing, Processing and Use

APEC 3: Arena ice making plant - PCA QP1A: Ice Making Plant

APEC 4: Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

APEC 5) Back-up generator and existing/former ASTs - PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks; Arena ice making plant - PCA QP1B: Arena Ice Making Plant; Loading ramp snow and ice melting system - PCAs QP4A and QP4B: Glycol Snow and Ice Melting Systems

APEC 6:Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

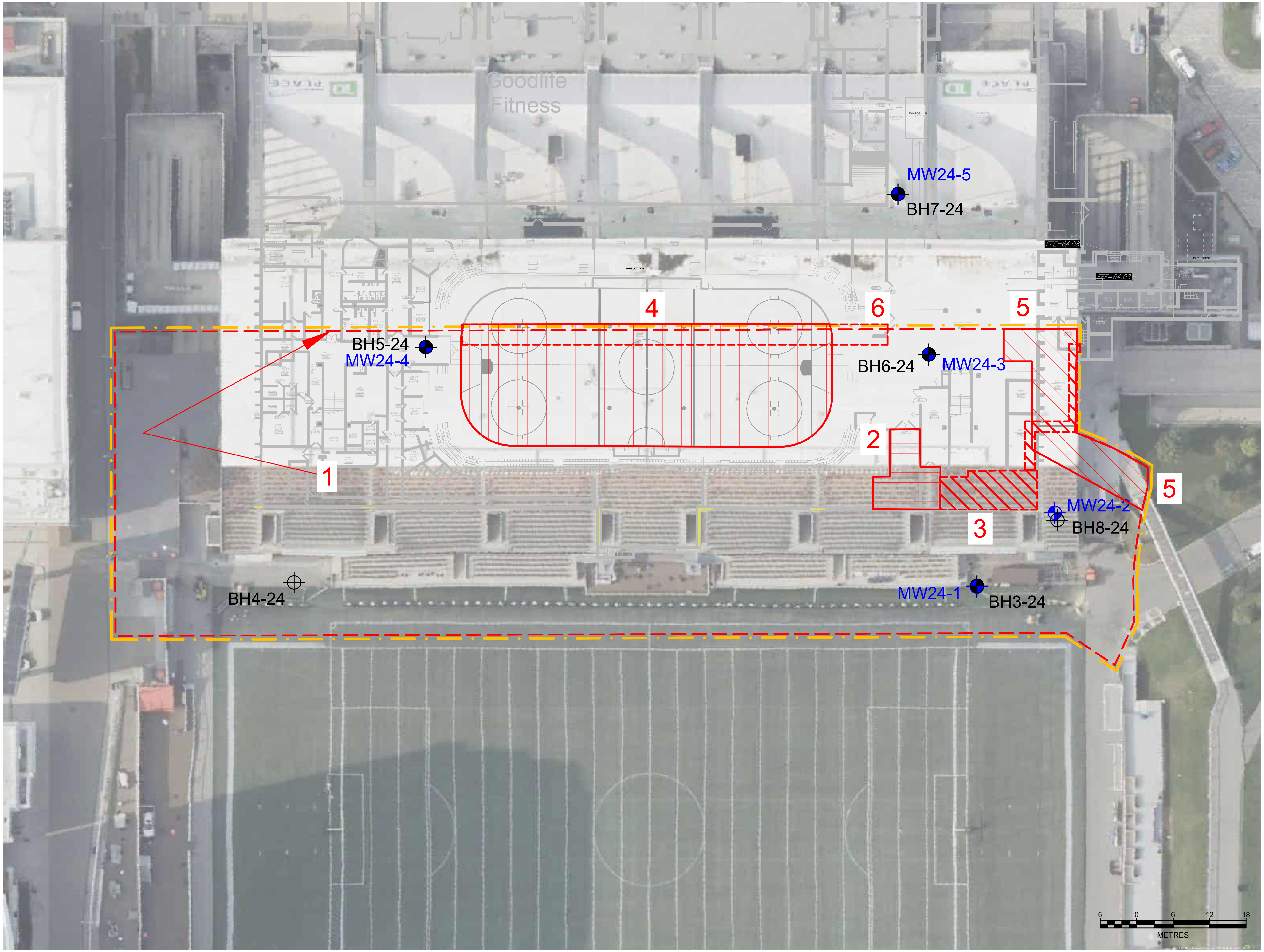
PROJECT:

SAMPLING AND ANALYSIS PLAN
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 2	



LEGEND

- PHASE TWO PROPERTY BOUNDARY
- ⌖ BOREHOLE
- ⌖ DEEP BOREHOLE WITH STANDPIPE
- ⌖ SHALLOW MONITORING WELL
- 1 AREA OF POTENTIAL ENVIRONMENTAL CONCERN

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (see Table 6.4 in report for specific details):

APEC1: Unknown fill quality - PCA 30A: Importation of Fill of Unknown Quality (Entire Phase One Property)

APEC 2: Oil-filled transformer in electrical room - PCA 55A: Transformer Manufacturing, Processing and Use

APEC 3: Arena ice making plant - PCA QP1A: Ice Making Plant

APEC 4: Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

APEC 5) Back-up generator and existing/former ASTs - PCAs 28A, 28B and 28C: Gasoline and Associated Products Storage in Fixed Tanks; Arena ice making plant - PCA QP1B: Arena Ice Making Plant; Loading ramp snow and ice melting system - PCAs QP4A and QP4B: Glycol Snow and Ice Melting Systems

APEC 6:Brine distribution and chiller lines beneath ice rink - PCA QP2A: Brine Distribution and Chiller Lines for Ice Making Plant

ORIGINAL DRAWING SIZE 8.5" X 11"

wsp

TITLE:

SAMPLE PLAN

PROJECT:

SAMPLING AND ANALYSIS PLAN
LANSDOWNE PARK - NORTH SIDE STANDS

CLIENT:

Ottawa

DESIGNED BY: JFT	DRAWN BY: JFT
CHECKED BY: KDH	DATE: DECEMBER 2024
DATUM: NAD83 CSRS 2010	PROJECTION: MTM ZONE 9
PROJECT NO: CA0045396.3464	SCALE: 1 : 600
FIGURE NO: 3	

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Appendix C

Stratigraphic and Instrumentation Logs

PROJECT: CA0039399.3386

LOCATION: N 5027476.80; E 446530.80

RECORD OF BOREHOLE: BH3-24/MW24-1

SHEET 1 OF 1

BORING DATE: October 16, 2024

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: CME LC 55- Rubber Track

HAMMER TYPE: AUTOMATIC

HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected: 100, 200, 300, 400

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] □ ND = Not Detected: 100, 200, 300, 400

HYDRAULIC CONDUCTIVITY, k, cm/s: 10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}

WATER CONTENT PERCENT: Wp ⊢—○W—⊣ Wl: 20, 40, 60, 80

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)
		GROUND SURFACE	66.33
0	Rotary Drill Wash Boring HW Casing	ASPHALTIC CONCRETE	0.00
		FILL - gravelly SAND, some silt to silty, angular; greyish brown; non-cohesive, moist to wet, dense	0.06
		FILL - gravelly SAND, some silt, sub-rounded; brown; fine to coarse, non-cohesive, moist to wet, compact to loose	65.57 0.76
		FILL - gravelly SAND, some silt to silty, sub-rounded; brown, silty clay layers; fine to coarse, non-cohesive, moist to wet, loose to compact	64.20 2.13
3	Rotary Drill Wash Boring NW Casing	(SW) SAND, trace to some gravel, trace silt, sub-rounded; brown; non-cohesive, moist to wet, compact to loose	63.28 3.05
		(SM/GM) SILTY gravelly SAND to SILTY sandy GRAVEL; brown	60.99 5.34
		END OF BOREHOLE	58.56 7.77

SAMPLES NUMBER	TYPE	BLOWS/0.3m	HEADSPACE	ADDITIONAL LAB. TESTING
1	SS	41	⊕ ND	
2	SS	12	⊕ ND	
3	SS	5	⊕ ND	
4	SS	6	⊕ □	BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
5	SS	24		
6	SS	14	⊕ ND	BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
7	SS	6	⊕ ND	
8	SS	36	⊕ ND	

PIEZOMETER OR STANDPIPE INSTALLATION:
- Flush Mount Casing
- Silica Sand
- Bentonite
- Silica Sand
- Bentonite
- Sillica Sand
- 32 mm Dia PVC #10 Slot Screen

DEPTH SCALE

1 : 50

LOGGED: RI

CHECKED: KDH

PROJECT: CA0039399.3386

LOCATION: N 5027472.50; E 446496.50

RECORD OF BOREHOLE: BH4-24

BORING DATE: October 16, 2024

DRILL RIG: CME LC 55- Rubber Track

SHEET 1 OF 1

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

HAMMER TYPE: AUTOMATIC

BORING METHOD: Rotary Drill Wash Boring; NW Casing

SOIL PROFILE DESCRIPTION	ELEV. / DEPTH (m)
GROUND SURFACE	66.18
ASPHALTIC CONCRETE	0.00
FILL - gravelly SAND, some silt, angular; grey, clustered stone; non-cohesive, moist, dense	0.06
FILL - gravelly SAND, trace silt, sub-rounded; brown; fine to coarse, non-cohesive, moist, dense	65.80 0.38
ASPHALTIC CONCRETE	0.53
FILL - gravelly SAND, trace silt,angular;grey, clustered stone; non-cohesive, moist, dense	0.61
FILL - SILTY SAND, trace to some gravel, contains cobbles and boulders; brown to dark brown, trace to some organics matters, thin bed of sand, thin lamination of silty clay, fine to medium, non-cohesive, moist to wet, washboring compact	65.27 0.91
FILL - gravelly SAND, trace silt; brown, module of gravelly silty sand; fine to coarse, non-cohesive, moist, dense	63.89 2.29
(SP) SAND, trace silt; brown, stratified; fine to medium, non-cohesive, moist, dense	63.13 3.05
(SW) SAND, trace silt, trace gravel; brown; fine to coarse, non-cohesive, wet, washboring, compact	62.37 3.81
END OF BOREHOLE	61.76 4.42

SAMPLE NUMBER	TYPE	BLOWS/0.3m	HEADSPACE	ADDITIONAL LAB. TESTING
1A				
1B	SS	46		
1C				
2A			ND	
	SS	21		
2B				BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
3	SS	50		
4	SS	37	ND	
5	SS	32		BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
6	SS	29		

HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕
ND = Not Detected
100 200 300 400

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ☐
ND = Not Detected
100 200 300 400

HYDRAULIC CONDUCTIVITY, k, cm/s
10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT
Wp W Wl
20 40 60 80

PIEZOMETER OR STANDPIPE INSTALLATION

DEPTH SCALE METRES: 0 1 2 3 4 5 6 7 8 9 10

DEPTH SCALE
1 : 50

LOGGED: RI

CHECKED: KDH

PROJECT: CA0039399.3386

LOCATION: N 5027463.00; E 446434.50

RECORD OF BOREHOLE: BH5-24/MW24-4

SHEET 1 OF 1

BORING DATE: October 21, 2024

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

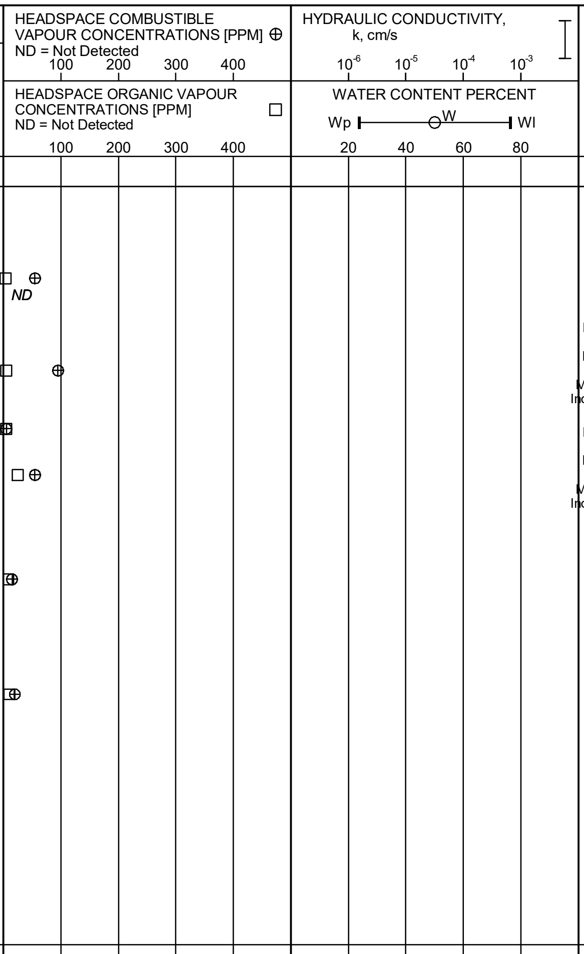
DRILL RIG: CME LC 55- Rubber Track

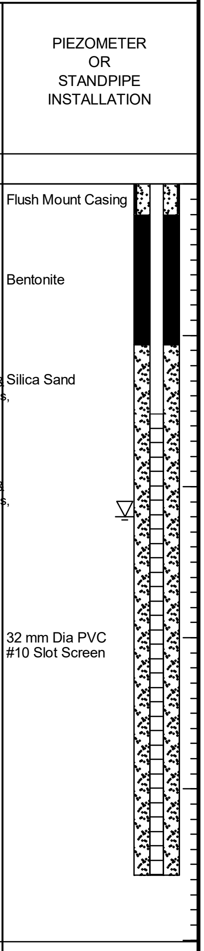
HAMMER TYPE: AUTOMATIC

BORING METHOD: Rotary Drill Wash Boring, NW Casing (0 to 5.01 m)

DESCRIPTION	ELEV. DEPTH (m)
GROUND SURFACE	62.54
CONCRETE	0.00
INSULATION	62.34 0.20
FILL - (SW) SAND, trace to some silt, trace to some gravel; brown; fine to coarse, non-cohesive, moist, compact to dense	0.33
(SM/GM) SILTY sandy GRAVEL to SILTY gravelly SAND; brown, possible cobbles and boulders; non-cohesive, moist to wet, washboring, dense	60.86 1.68
(SM/ML) gravelly SILTY SAND to sandy SILT, trace plastic fines; grey possible cobbles and boulders	58.73 3.81
END OF BOREHOLE	57.53 5.01

SAMPLES NUMBER	TYPE	BLOWS/0.3m	ADDITIONAL LAB. TESTING
1	SS	24	
2	SS	33	BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
3A			
3B	SS	77	BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
4	SS	56	
5	SS	80	
6	SS	35	
7	SS	61	





Note(s):

1. Water level measured at a depth of 2.20 m (Elev. 60.34 m) on Nov. 24, 2024.

DEPTH SCALE

1 : 50

LOGGED: RI

CHECKED: KDH

PROJECT: CA0039399.3386

LOCATION: N 5027532.10; E 446505.80

RECORD OF BOREHOLE: BH6-24/MW24-3

SHEET 1 OF 1

BORING DATE: October 24, 2024

DATUM: Geodetic

SPT/DCPT HAMMER: MASS, 64kg; DROP, 760mm

DRILL RIG: CME LC 55- Rubber Track

HAMMER TYPE: AUTOMATIC

BORING METHOD: Rotary Drill Wash Boring, NW Casing

DESCRIPTION	ELEV. DEPTH (m)
GROUND SURFACE	62.49
CONCRETE	0.00
FILL - sandy GRAVEL, angular; greyish brown; non-cohesive, moist	0.10
CONCRETE	0.23
FILL - SAND, some gravel, trace silt, with layers of silty sand; brown; fine to coarse, non-cohesive, moist to wet, wahboring, very dense to compact	61.88 0.61
(SM) SILTY gravelly SAND; brown, very thin beds of sand, fine to coarse (TILL); non-cohesive, moist to wet, washboring, very dense	60.20 2.29
END OF BOREHOLE	57.92 4.57

SAMPLE NUMBER	TYPE	BLOWS/0.3m	HEADSPACE	ADDITIONAL LAB. TESTING
1	SS	50	ND	
2A	SS	95		BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
2B				
3A	SS	20		
3B			ND	
4	SS	76		BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
5	SS	79		BTEX, PHC F1-F4, PAH, Metals & Inorganics, ORPs
6	SS	59		

HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected 100 200 300 400

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ☐ ND = Not Detected 100 200 300 400

HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3}

WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl 20 40 60 80

PIEZOMETER OR STANDPIPE INSTALLATION:
- Flush Mount Casing
- Bentonite
- Silica Sand
- ▽
- 32 mm Dia PVC #10 Slot Screen

Note(s):

1. Water level measured at a depth of 2.30 m (Elev. 60.19 m) on Nov. 24, 2024.

DEPTH SCALE

1 : 50

LOGGED: RI

CHECKED: KDH

PROJECT: CA0039399.3386
LOCATION: N ; E

RECORD OF BOREHOLE: BH7-24/MW24-5

SHEET 1 OF 1
DATUM: Geodetic

BORING DATE: October 29, 2024
DRILL RIG: CME LC 22

HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (100, 200, 300, 400)
HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ☐ ND = Not Detected (100, 200, 300, 400)
HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3})
WATER CONTENT PERCENT Wp ├──○W──┤ Wl (20, 40, 60, 80)

DEPTH SCALE METRES	SOIL PROFILE DESCRIPTION	ELEV. / DEPTH (m)	SAMPLE NUMBER	TYPE	BLOWS/0.3m	HEADSPACE	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
	GROUND SURFACE	62.54						
0	CONCRETE	0.00						Flush Mount Casing
	FILL - Crushed Stone	0.15						
	FILL - SAND, trace silt, trace crush stone, fine, moist	0.25	1	SS	26	⊕ ND	BTEX, PHC F1-F4, PAH, Metals & Inorganics ORPs	Bentonite
1	(SP) SAND, trace silt, possible native; brown; fine, moist	61.78 0.76	2	SS	34	⊕ ND	BTEX, PHC F1-F4, PAH, Metals & Inorganics ORPs	Silica Sand
2	(SP) SAND, trace gravel, possible native; brown; fine to medium, moist, compact	61.02 1.52	3	SS	24	⊕ ND	BTEX, PHC F1-F4, PAH, Metals, ORPs	▽
	(ML) sandy SILT; brown; compact	60.25 2.29	4	SS	29			
	(SP) SAND, some gravel; brown; medium, compact, moist	60.04 2.50						
3	SILTY gravelly SAND; brown; moist to wet	59.57 2.97	5	SS	62			32 mm Dia PVC #10 Slot Screen
4								
	END OF BOREHOLE	57.97 4.57						

Note(s):

1. Water level measured at a depth of 2.20 m (Elev. 60.34 m) on Nov. 24, 2024.

DEPTH SCALE
1 : 50

LOGGED: BC
CHECKED: KDH

PROJECT: CA0039399.3386

LOCATION: N 5027494.23; E 446539.64

RECORD OF BOREHOLE: BH8-24/MW24-2

BORING DATE: November 1, 2024

DRILL RIG: CME 55- Rubber Track

SHEET 1 OF 1

DATUM: Geodetic

HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected (100, 200, 300, 400)

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ☐ ND = Not Detected (100, 200, 300, 400)

HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6}, 10^{-5}, 10^{-4}, 10^{-3})

WATER CONTENT PERCENT Wp ⊢—○W—⊣ Wl (20, 40, 60, 80)

SOIL PROFILE DESCRIPTION	ELEV. DEPTH (m)
GROUND SURFACE	66.06
ASPHALTIC CONCRETE	0.00
FILL - SILTY SAND and GRAVEL; grey; fine to medium, dry - Bottom 0.08 m silty sand and gravel; brown	0.06
FILL - SILTY SAND, some gravel; brown, pieces of asphalt; fine to medium, dry - trace gravel, trace pieces of asphalt	65.30 0.76
(SM) SILTY SAND, trace gravel; brown; fine to medium, dry	63.01 3.05
(SM) SILTY SAND; brown; fine to medium, dry	61.49 4.57
(SM) SILTY SAND and GRAVEL; brown; fine to coarse	60.73 5.33
(SM) SILTY SAND and GRAVEL; brown to grey, pieces of rock; fine to coarse, wet	59.96 6.10
END OF BOREHOLE	57.83 8.23

SAMPLE NUMBER	TYPE	BLOWS/0.3m	HEADSPACE	ADDITIONAL LAB. TESTING
1	SS	-	ND	
2	SS	-	ND	
3	SS	-	ND	BTEX, PHC F2-F4, Metals & Inorganics, PAH
4	SS	-	ND	BTEX, PHC F2-F4, Metals & Inorganics, PAH
5	SS	-	ND	BTEX, PHC F2-F4, Metals & Inorganics, PAH
6	SS	-	ND	
7	SS	-	ND	
8	SS	-	ND	
9	SS	-	ND	
10	SS	-		BTEX, PHC F2-F4, Metals & Inorganics, PAH

PIEZOMETER OR STANDPIPE INSTALLATION:

- Flush Mount Casing
- Silica Sand
- Bentonite
- Silica Sand
- 32 mm Dia PVC #10 Slot Screen

Note(s):

1. Water level measured at a depth of 6.10 m (Elev. 59.96 m) on Nov. 24, 2024.

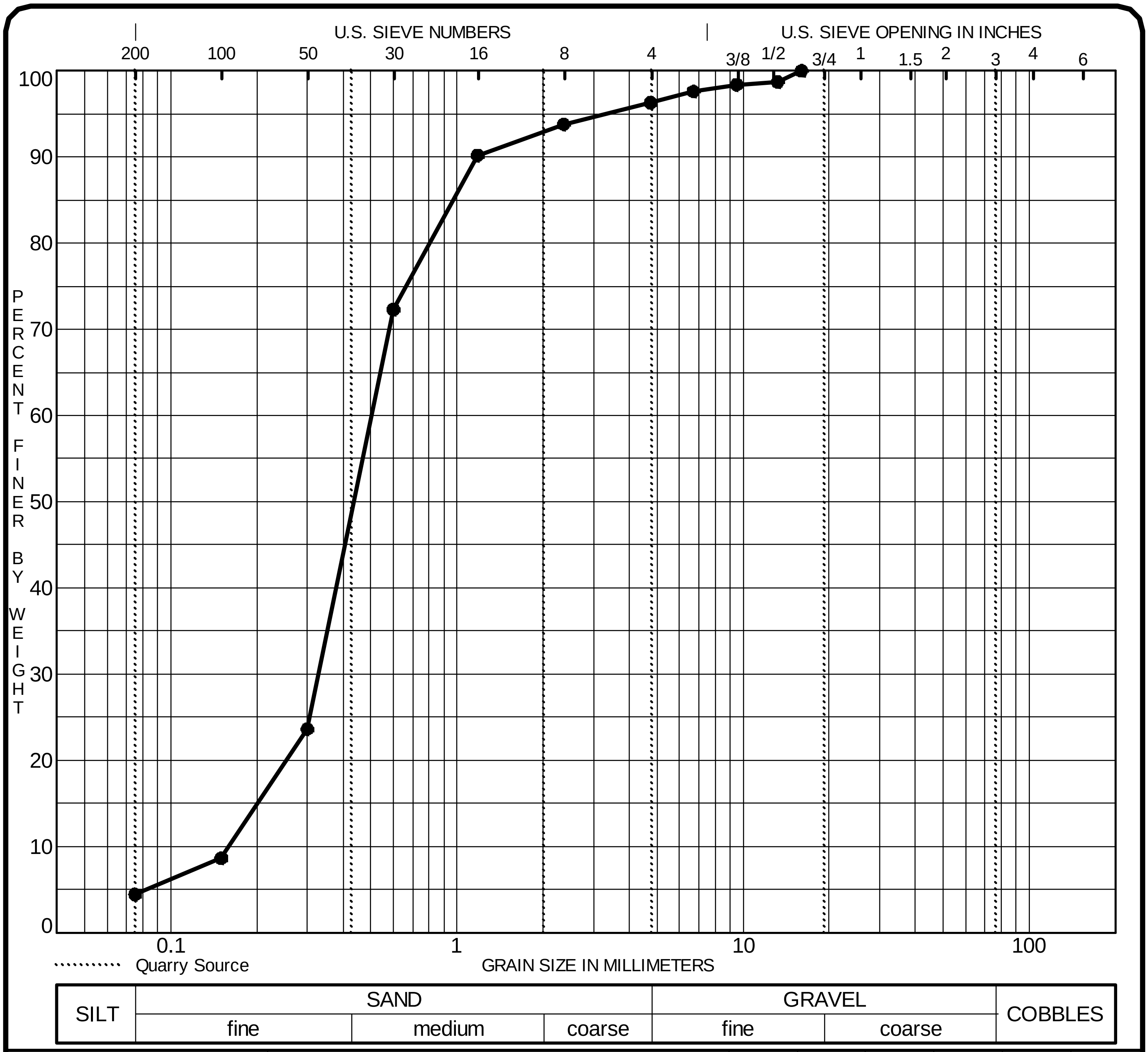
DEPTH SCALE 1 : 50

LOGGED: JFT

CHECKED: KDH

Appendix D

Grain Size Distribution



	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 4**	**SS 5**	**SP: Poorly Graded Sand**					**1.34**	**3.1**
⧗									
▲									
★									

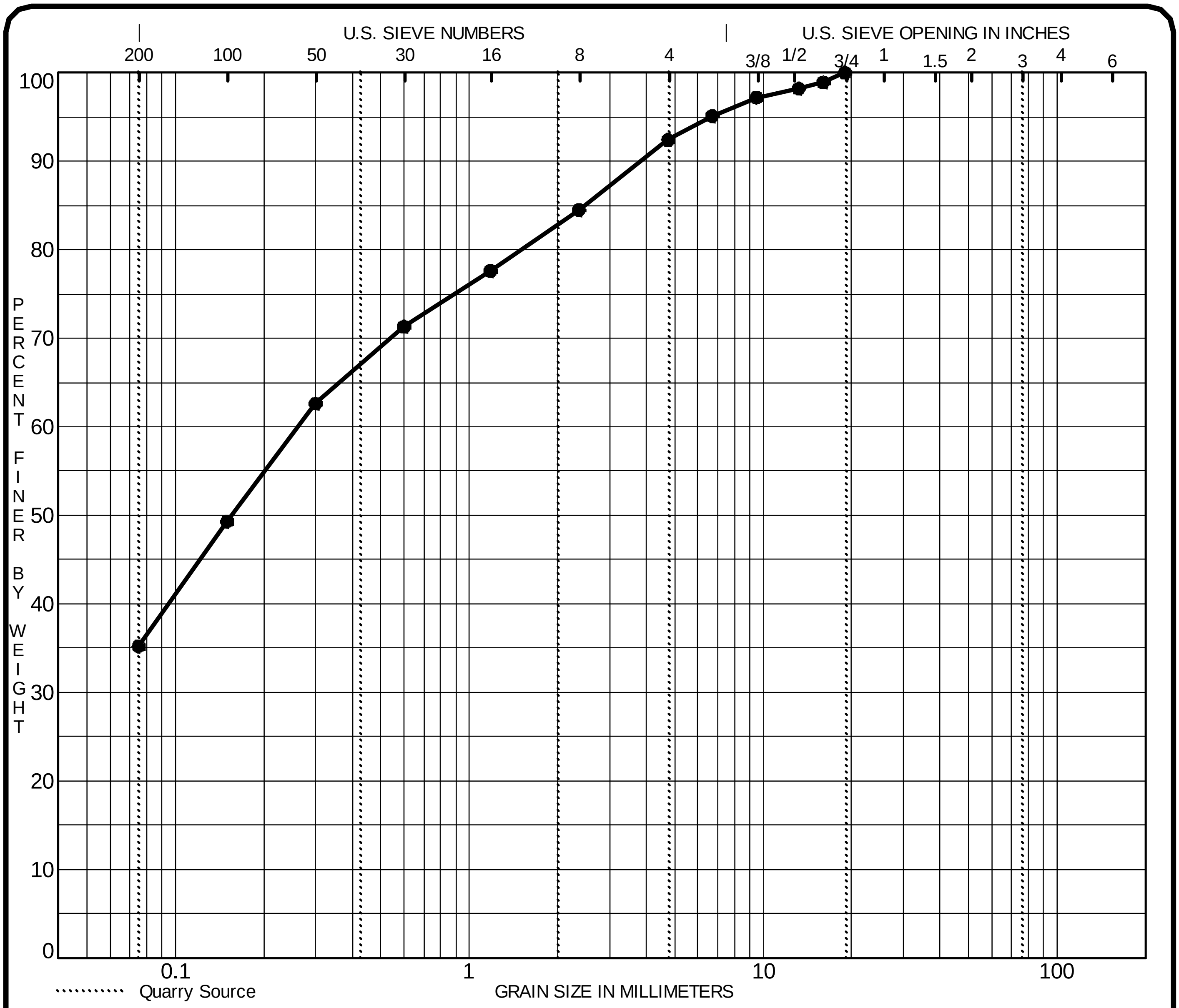
	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 4**	**SS 5**	**16.00**	**0.50**	**0.329**	**0.1600**	**3.7**	**91.9**	**4.4**	
⧗										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**
FILE NO. **PG1744**
PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**
DATE **5 Feb 10**

patersongroup **Consulting Engineers**

28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 5**	**AU 2**	**SM: Silty Sand**						
☒									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 5**	**AU 2**	**19.00**	**0.26**			**7.6**	**57.2**	**35.2**	
☒										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**

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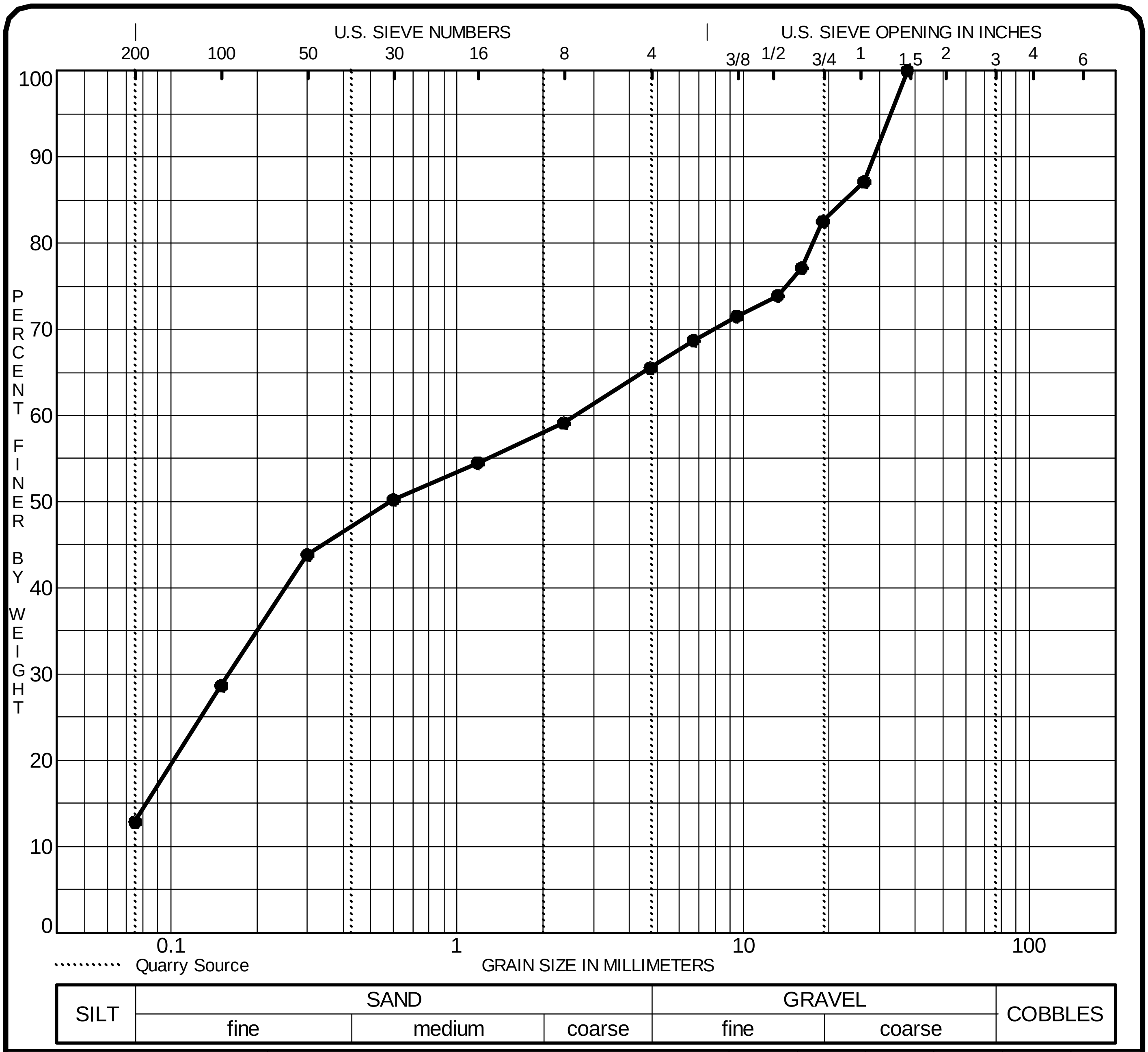
PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**

DATE **5 Feb 10**

patersongroup **Consulting Engineers**

28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 5**	**SS 4**	**SM: Silty Sand with Gravel**						
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 5**	**SS 4**	**37.50**	**2.60**	**0.160**		**34.5**	**52.7**	**12.8**	
⊠										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**

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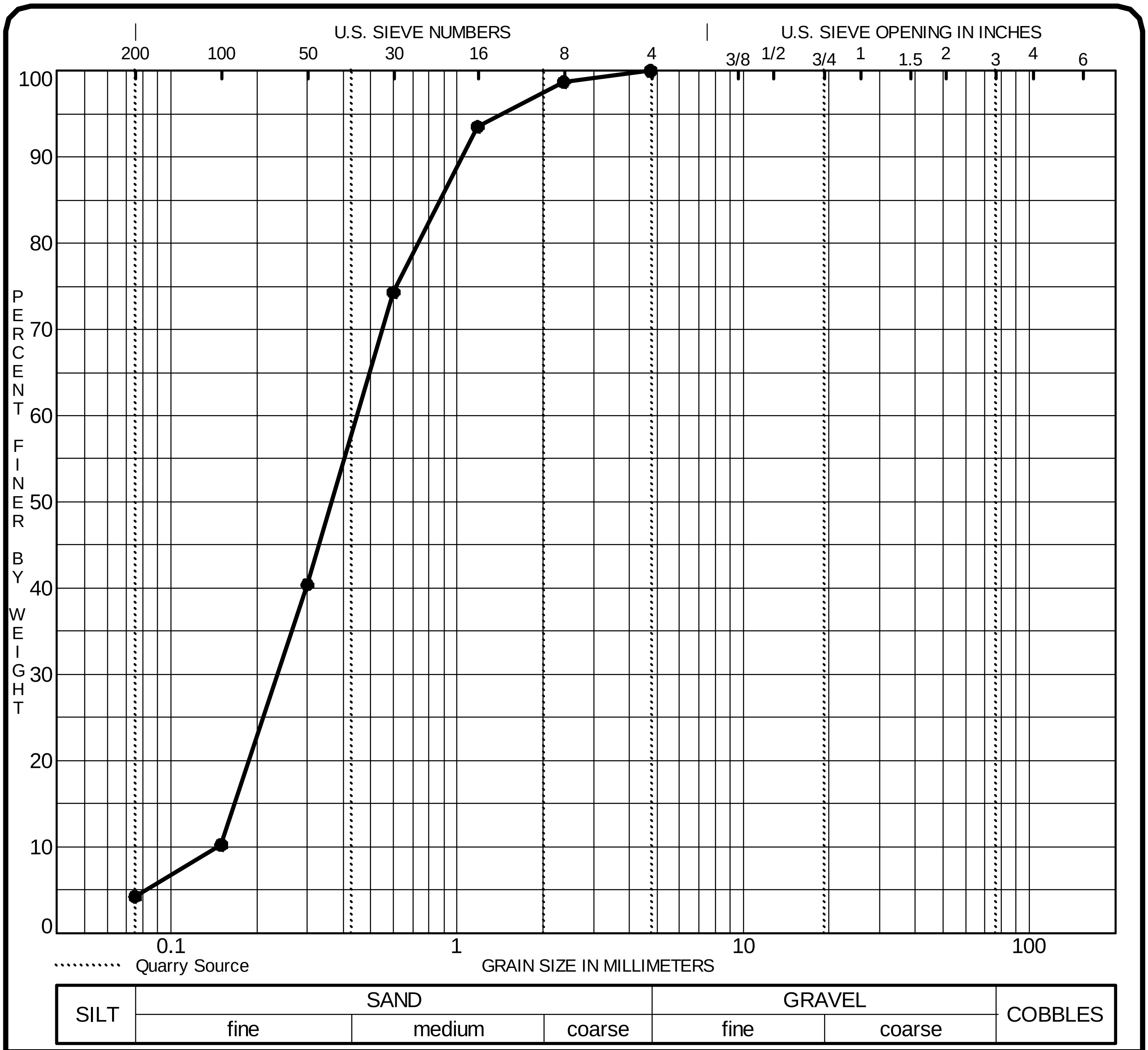
FILE NO. **PG1744**

DATE **5 Feb 10**

patersongroup **Consulting Engineers**

28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 6**	**SS 3**	**SP: Poorly Graded Sand**					**0.85**	**3.1**
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 6**	**SS 3**	**4.75**	**0.45**	**0.236**	**0.1466**	**0.0**	**95.8**	**4.2**	
⊠										
▲										
★										

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DATE **5 Feb 10**

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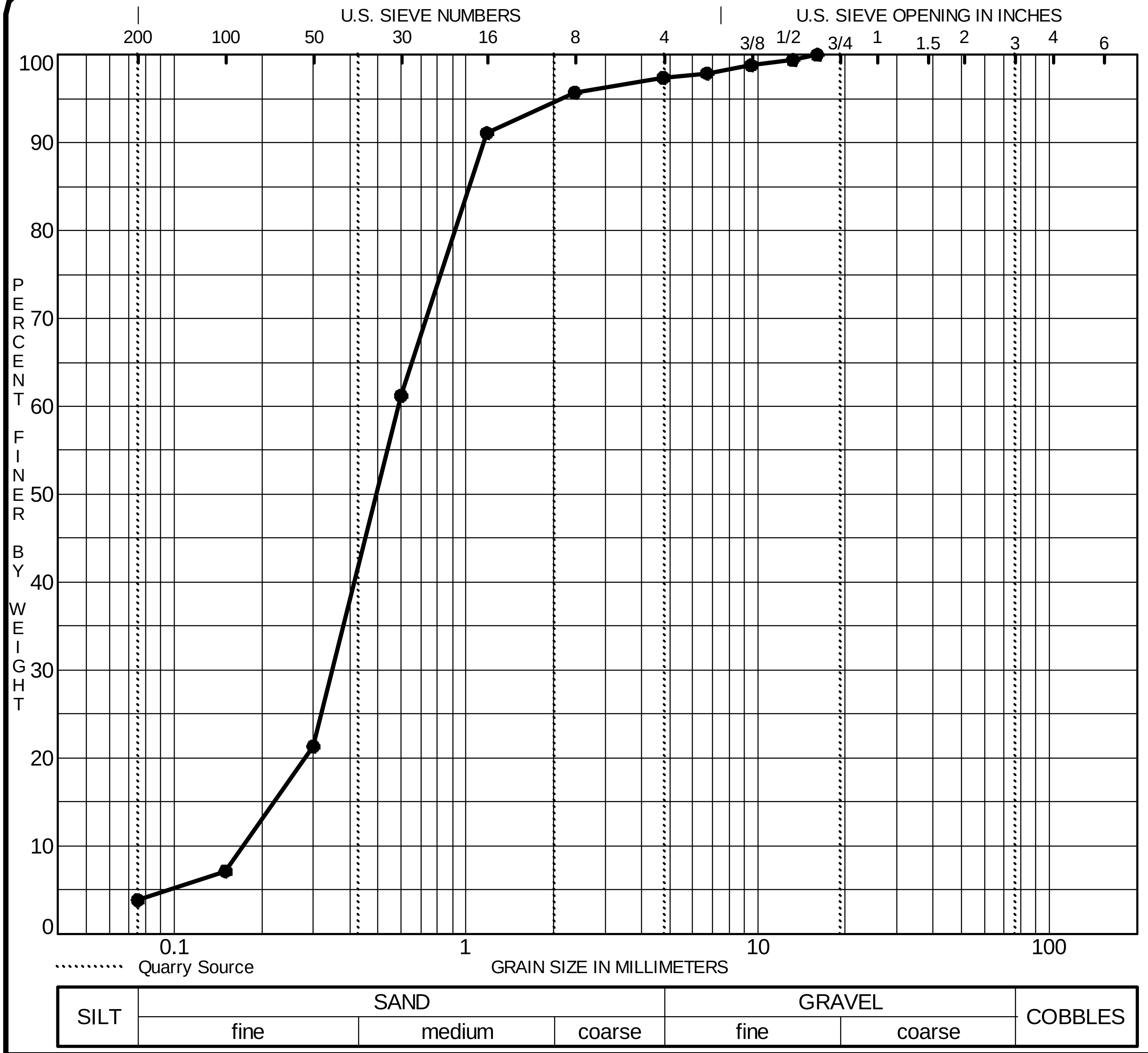
GRAIN SIZE DISTRIBUTION



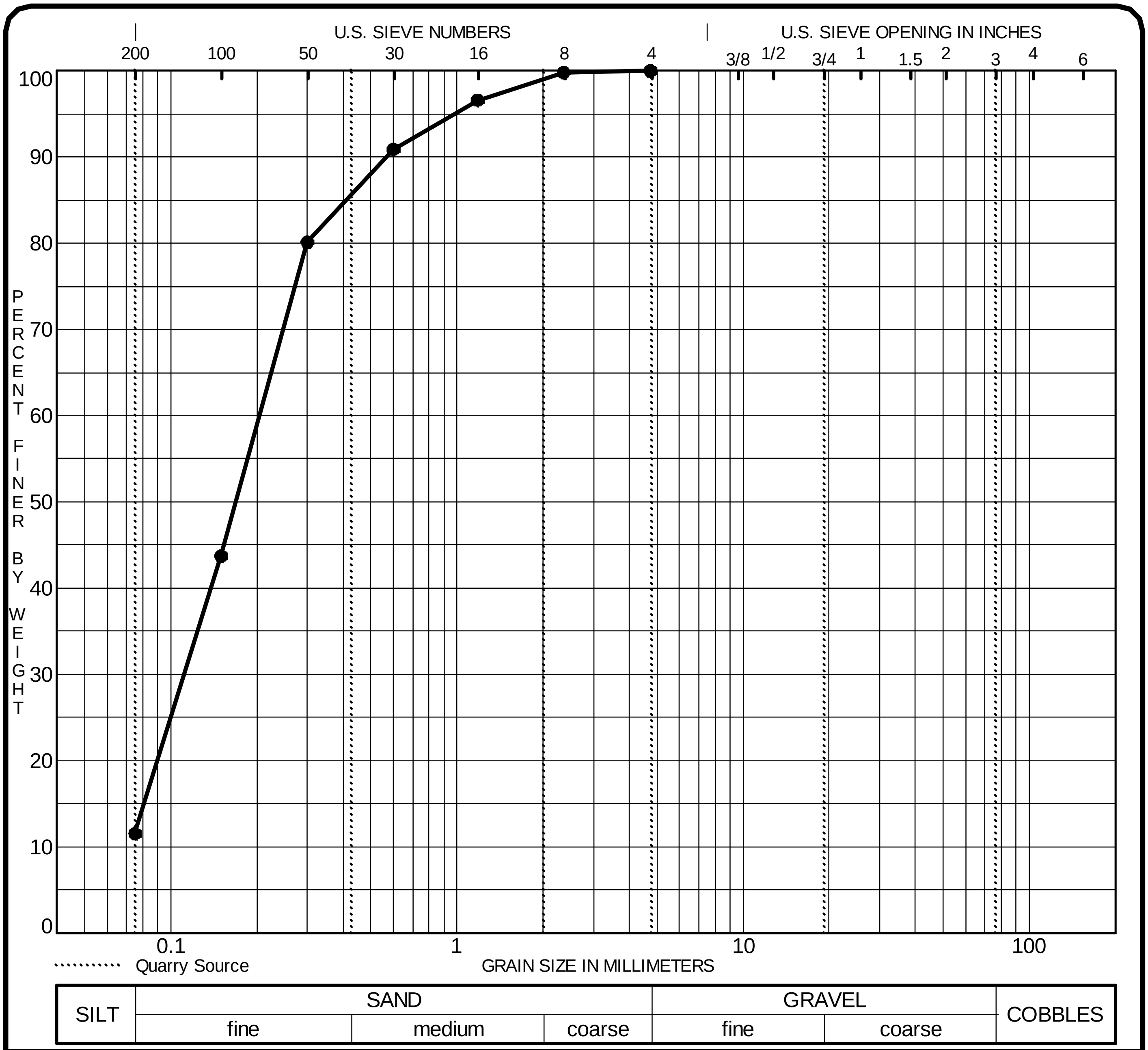
	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 9**	**SS 9**	**SP: Poorly Graded Sand**					**1.20**	**3.4**
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 9**	**SS 9**	**16.00**	**0.59**	**0.349**	**0.1728**	**2.6**	**93.6**	**3.8**	
⊠										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**
PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**
FILE NO. **PG1744**
DATE **9 Feb 10**

patersongroup **Consulting Engineers**
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH10**	**SS 7**	**SP-SM: Poorly Graded Sand with Silt**					**0.84**	**2.8**
⧗									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH10**	**SS 7**	**4.75**	**0.20**	**0.112**		**0.0**	**88.5**	**11.5**	
⧗										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**

FILE NO. **PG1744**

PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**

DATE **9 Feb 10**

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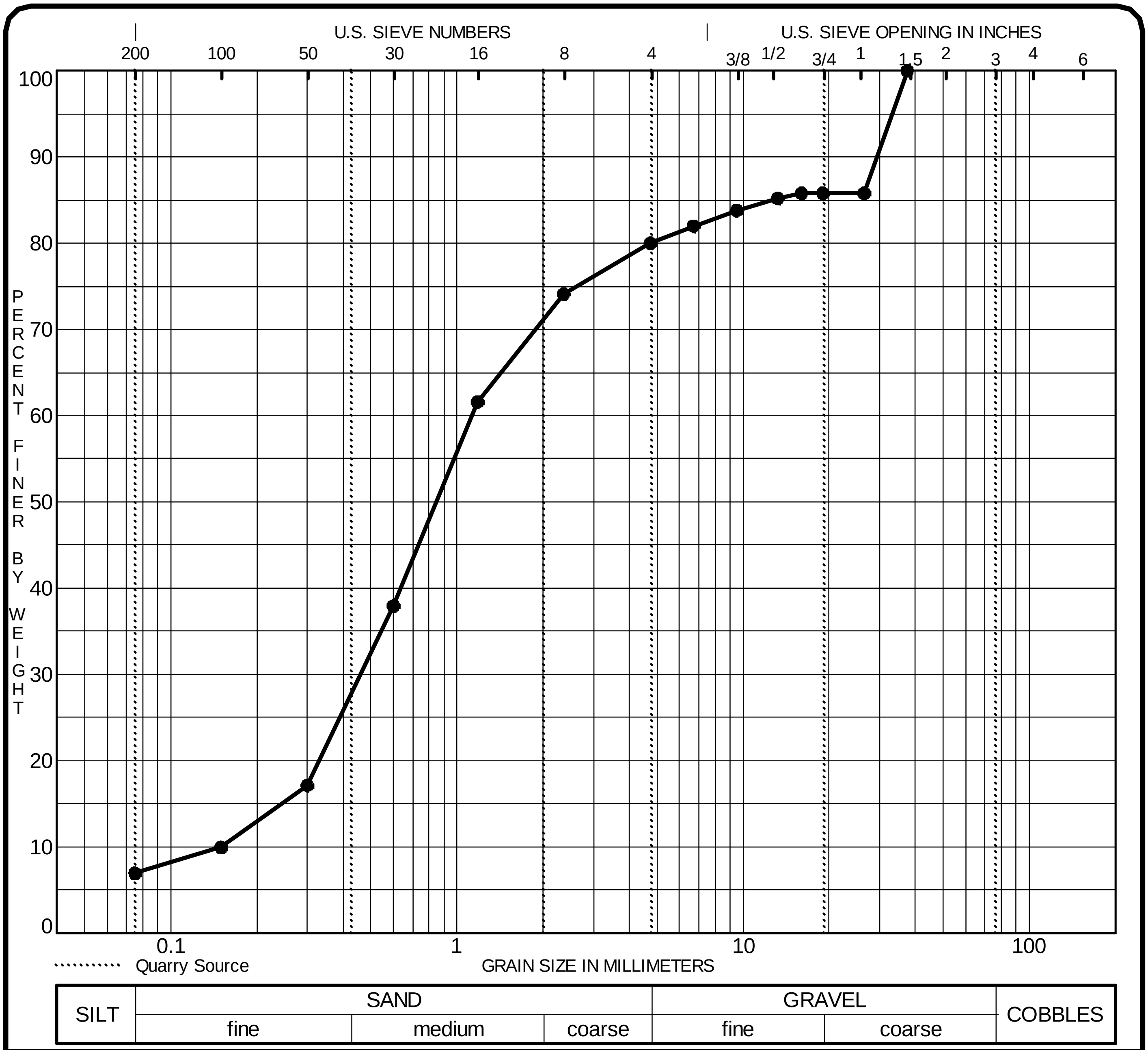
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH12**	**SS 8**	**SW-SM: Well-graded Sand with Silt & Gravel**					**1.25**	**7.4**
☒									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH12**	**SS 8**	**37.50**	**1.13**	**0.461**	**0.1515**	**20.0**	**73.1**	**6.9**	
☒										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**

PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**

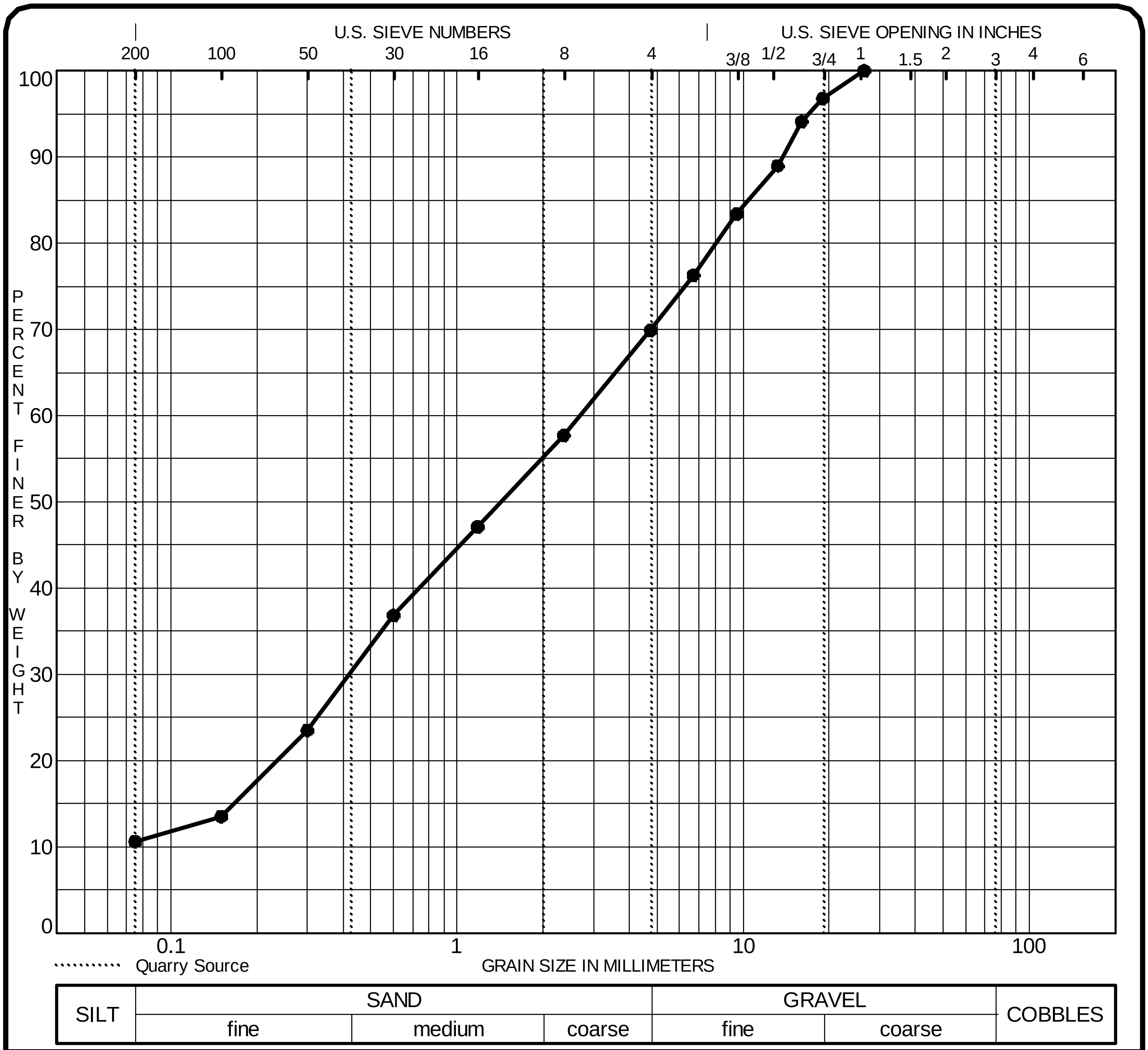
FILE NO. **PG1744**

DATE **10 Feb 10**

patersongroup **Consulting Engineers**

28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH14 AU 2**	**SW-SM: Well-graded Sand with Silt & Gravel**					**1.01**	**41.4**
⊠								
▲								
★								

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH14 AU 2**	**26.50**	**2.69**	**0.421**		**30.1**	**59.3**	**10.6**	
⊠									
▲									
★									

CLIENT **Ottawa Sports & Entertainment Group**

PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**

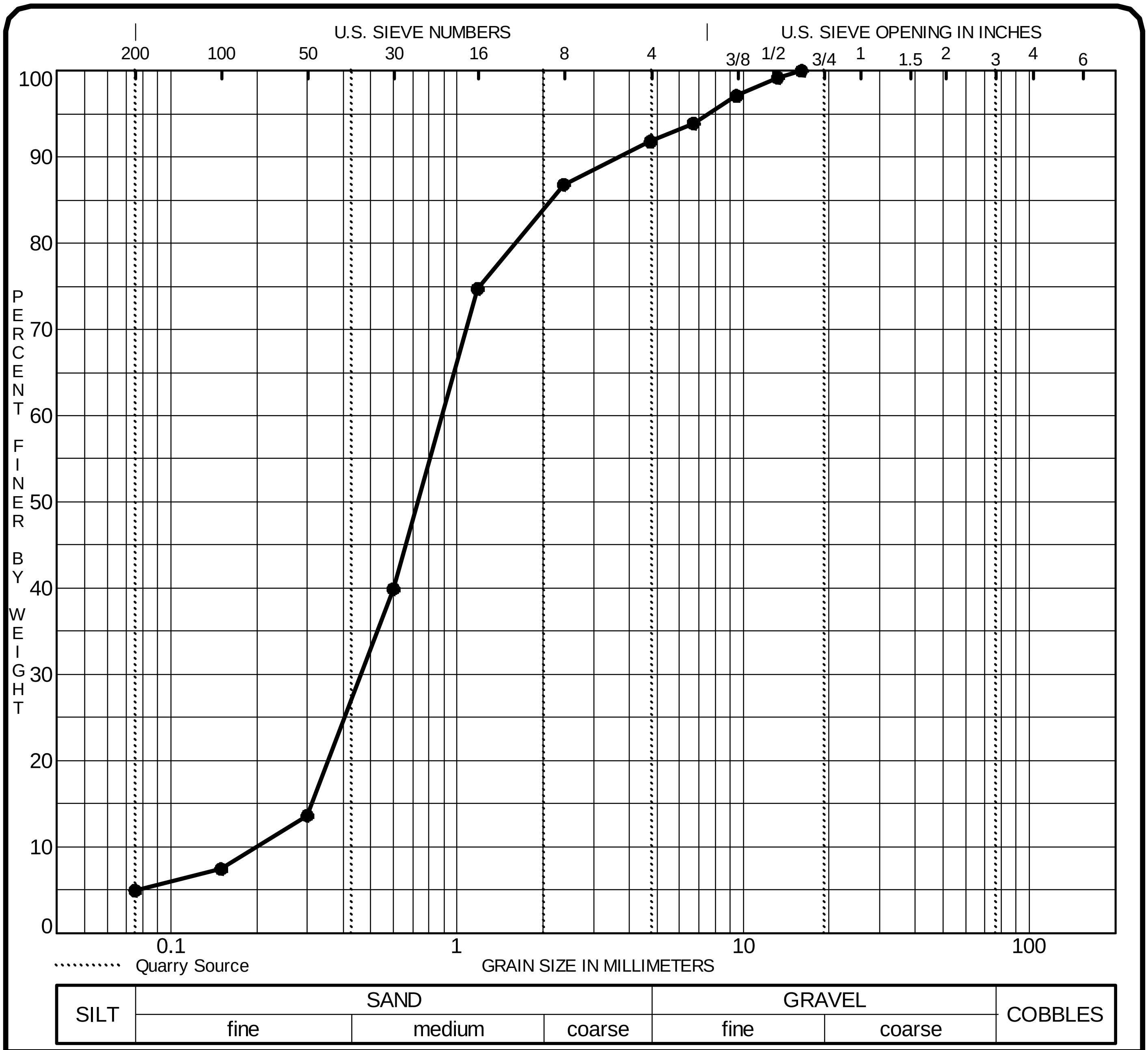
FILE NO. **PG1744**

DATE **10 Feb 10**

patersongroup **Consulting Engineers**

28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH15**	**SS 6**	**SP: Poorly Graded Sand**					**1.20**	**4.4**
⧗									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH15**	**SS 6**	**16.00**	**0.89**	**0.462**	**0.2006**	**8.2**	**86.9**	**4.9**	
⧗										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**

PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**

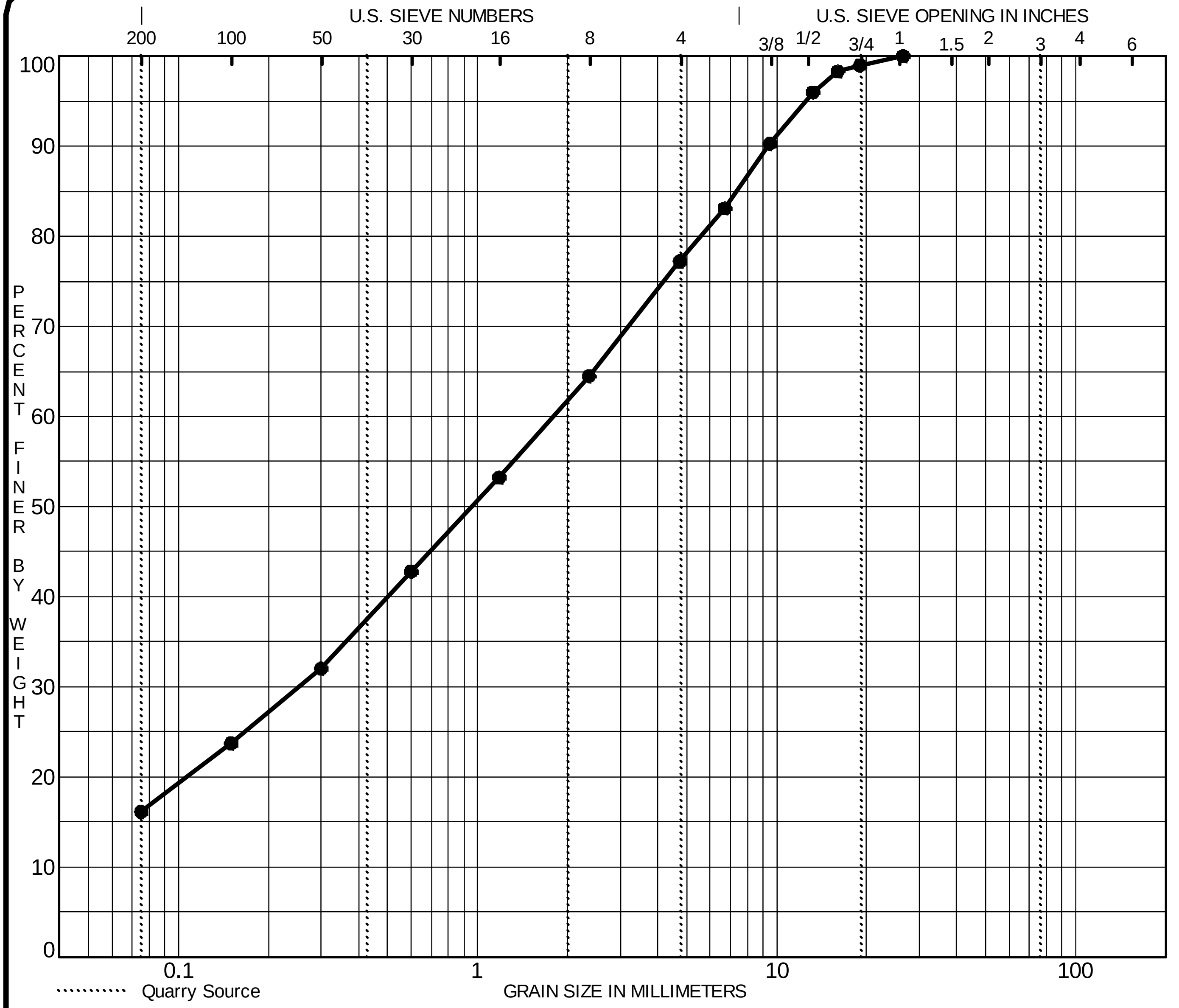
FILE NO. **PG1744**

DATE **10 Feb 10**

patersongroup **Consulting Engineers**

28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH18**	**AU 1**	**SM: Sitly Sand with Gravel**						
☒									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH18**	**AU 1**	**26.50**	**1.79**	**0.254**		**22.8**	**61.1**	**16.1**	
☒										
▲										
★										

CLIENT **Ottawa Sports & Entertainment Group**
PROJECT **Geotechnical Investigation - Lansdowne Park Redevelopment Project**
FILE NO. **PG1744**
DATE **11 Feb 10**

patersongroup **Consulting Engineers**
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

GRAIN SIZE DISTRIBUTION

Appendix E

Laboratory Reports of Analysis

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2430638**	Page	: 1 of 20
Amendment	: **1**		
Client	: **WSP Canada Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Jason Taylor	Account Manager	: Costas Farassoglou
Address	: 300-210 Colonnade Road South Ottawa ON Canada K2E 7L5	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 613 225 8279
Project	: CA0039399.3386 - City of Ottawa - Lansdowne Park	Date Samples Received	: 12-Oct-2024 11:00
PO	: 24422-98891-S01	Issue Date	: 28-Oct-2024 15:40
C-O-C number	: 22-		
Sampler	: ----		
Site	: City of Ottawa - Lansdowne Park		
Quote number	: Lansdowne Park c/o WSP		
No. of samples received	: 10		
No. of samples analysed	: 10		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Test sample Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result		Limits	Comment
Laboratory Control Sample (LCS) Recoveries									
Metals	QC-MRG2-1712967 002	----	Beryllium	7440-41-7	E440C	123 %	MES	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Regular Sample Surrogates

Sub-Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
Samples Submitted							
Polycyclic Aromatic Hydrocarbons Surrogates	WT2430638-005	BH2-24-A SA 3	Naphthalene-d8	1146-65-2	174 %	60.0-130 %	Recovery greater than upper data quality objective

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E336A	09-Oct-2024	17-Oct-2024	14 days	8 days	✓	18-Oct-2024	14 days	1 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E336A	10-Oct-2024	18-Oct-2024	14 days	8 days	✓	21-Oct-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E336A	10-Oct-2024	18-Oct-2024	14 days	8 days	✓	21-Oct-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E336A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E336A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E336A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E336A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	14 days	3 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH3-24 SA 6	E581.F1	10-Oct-2024	18-Oct-2024	14 days	7 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH3-24 SA 4	E581.F1	10-Oct-2024	18-Oct-2024	14 days	8 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH1-24 SA 3	E581.F1	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH1-24 SA 5	E581.F1	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH2-24 SA 2	E581.F1	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH2-24-A SA 3	E581.F1	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH2-24-A SA 4	E581.F1	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E601.SG-L	09-Oct-2024	18-Oct-2024	14 days	10 days	✓	21-Oct-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E601.SG-L	10-Oct-2024	18-Oct-2024	14 days	8 days	✓	21-Oct-2024	40 days	3 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E601.SG-L	10-Oct-2024	18-Oct-2024	14 days	8 days	✓	21-Oct-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E601.SG-L	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E601.SG-L	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E601.SG-L	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E601.SG-L	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E487	10-Oct-2024	22-Oct-2024	180 days	12 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E487	10-Oct-2024	22-Oct-2024	180 days	12 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E487	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	22-Oct-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E487	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	22-Oct-2024	180 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E487	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E487	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E487	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E510C	10-Oct-2024	22-Oct-2024	28 days	12 days	✓	23-Oct-2024	16 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E510C	10-Oct-2024	22-Oct-2024	28 days	12 days	✓	23-Oct-2024	16 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E510C	09-Oct-2024	22-Oct-2024	28 days	13 days	✓	22-Oct-2024	15 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E510C	09-Oct-2024	22-Oct-2024	28 days	13 days	✓	22-Oct-2024	15 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E510C	09-Oct-2024	22-Oct-2024	28 days	13 days	✓	23-Oct-2024	15 days	1 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E510C	09-Oct-2024	22-Oct-2024	28 days	13 days	✓	23-Oct-2024	15 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E510C	09-Oct-2024	22-Oct-2024	28 days	13 days	✓	23-Oct-2024	15 days	1 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E440C	10-Oct-2024	22-Oct-2024	180 days	12 days	✓	23-Oct-2024	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E440C	10-Oct-2024	22-Oct-2024	180 days	12 days	✓	23-Oct-2024	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E440C	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	22-Oct-2024	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E440C	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	22-Oct-2024	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E440C	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E440C	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E440C	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	14 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E484	10-Oct-2024	22-Oct-2024	180 days	12 days	✓	23-Oct-2024	180 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E484	10-Oct-2024	22-Oct-2024	180 days	12 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E484	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	22-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E484	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	22-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E484	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E484	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E484	09-Oct-2024	22-Oct-2024	180 days	13 days	✓	23-Oct-2024	180 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E100-L	10-Oct-2024	22-Oct-2024	30 days	12 days	✓	23-Oct-2024	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E100-L	10-Oct-2024	22-Oct-2024	30 days	12 days	✓	23-Oct-2024	30 days	13 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E100-L	09-Oct-2024	22-Oct-2024	30 days	13 days	✓	23-Oct-2024	30 days	14 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E100-L	09-Oct-2024	22-Oct-2024	30 days	13 days	✓	23-Oct-2024	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E100-L	09-Oct-2024	22-Oct-2024	30 days	13 days	✓	23-Oct-2024	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E100-L	09-Oct-2024	22-Oct-2024	30 days	13 days	✓	23-Oct-2024	30 days	14 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E100-L	09-Oct-2024	22-Oct-2024	30 days	13 days	✓	23-Oct-2024	30 days	14 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E144	10-Oct-2024	----	----	----		17-Oct-2024	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E144	09-Oct-2024	----	----	----		17-Oct-2024	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E144	09-Oct-2024	----	----	----		17-Oct-2024	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E144	09-Oct-2024	----	----	----		17-Oct-2024	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E144	10-Oct-2024	----	----	----		17-Oct-2024	----	8 days	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E144	09-Oct-2024	----	----	----		17-Oct-2024	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E144	09-Oct-2024	----	----	----		17-Oct-2024	----	9 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E108A	10-Oct-2024	18-Oct-2024	30 days	8 days	✓	21-Oct-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E108A	10-Oct-2024	18-Oct-2024	30 days	8 days	✓	21-Oct-2024	30 days	11 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E108A	09-Oct-2024	17-Oct-2024	30 days	8 days	✓	18-Oct-2024	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E108A	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E108A	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E108A	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	30 days	12 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E108A	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	30 days	12 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E641A	09-Oct-2024	18-Oct-2024	60 days	10 days	✓	21-Oct-2024	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E641A	10-Oct-2024	18-Oct-2024	60 days	8 days	✓	21-Oct-2024	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E641A	10-Oct-2024	18-Oct-2024	60 days	8 days	✓	21-Oct-2024	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E641A	09-Oct-2024	18-Oct-2024	60 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E641A	09-Oct-2024	18-Oct-2024	60 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E641A	09-Oct-2024	18-Oct-2024	60 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E641A	09-Oct-2024	18-Oct-2024	60 days	9 days	✓	21-Oct-2024	40 days	3 days	✓
Sample Data : Sample Hold Fee for Soil/Solid										
Glass soil methanol vial [ON MECP] BH3-24 SA7	HOLD	10-Oct-2024	----	----	----		15-Oct-2024	----	5 days	
Sample Data : Sample Hold Fee for Soil/Solid										
Glass soil methanol vial [ON MECP] BH1-24 SA 6	HOLD	09-Oct-2024	----	----	----		15-Oct-2024	----	6 days	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Sample Data : Sample Hold Fee for Soil/Solid										
Glass soil methanol vial [ON MECP] BH2-24-A SA 5	HOLD	09-Oct-2024	----	----	----		15-Oct-2024	----	6 days	
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 3	E532	09-Oct-2024	17-Oct-2024	30 days	8 days	✓	18-Oct-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 4	E532	10-Oct-2024	18-Oct-2024	30 days	8 days	✓	21-Oct-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH3-24 SA 6	E532	10-Oct-2024	18-Oct-2024	30 days	8 days	✓	21-Oct-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH1-24 SA 5	E532	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24 SA 2	E532	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 3	E532	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH2-24-A SA 4	E532	09-Oct-2024	18-Oct-2024	30 days	9 days	✓	21-Oct-2024	7 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH3-24 SA 6	E611A	10-Oct-2024	18-Oct-2024	14 days	7 days	✓	18-Oct-2024	40 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH3-24 SA 4	E611A	10-Oct-2024	18-Oct-2024	14 days	8 days	✓	18-Oct-2024	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH1-24 SA 3	E611A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH1-24 SA 5	E611A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH2-24 SA 2	E611A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH2-24-A SA 3	E611A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH2-24-A SA 4	E611A	09-Oct-2024	18-Oct-2024	14 days	9 days	✓	18-Oct-2024	40 days	1 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Boron-Hot Water Extractable by ICPOES	E487	1712966	3	35	8.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1715504	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1715505	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1712961	2	36	5.5	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1712965	3	49	6.1	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1712962	2	39	5.1	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1712967	3	46	6.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1712968	3	56	5.3	5.0	✓
Moisture Content by Gravimetry	E144	1715434	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1712960	2	31	6.4	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1712963	2	39	5.1	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1712964	3	49	6.1	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1712959	2	39	5.1	5.0	✓
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1712966	6	35	17.1	10.0	✓
BTEX by Headspace GC-MS	E611A	1715504	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1715505	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1712961	2	36	5.5	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1712965	6	49	12.2	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1712962	4	39	10.2	10.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1712967	6	46	13.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1712968	6	56	10.7	10.0	✓
Moisture Content by Gravimetry	E144	1715434	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1712960	2	31	6.4	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1712963	2	39	5.1	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1712964	6	49	12.2	10.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1712959	2	39	5.1	5.0	✓
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1712966	3	35	8.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1715504	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1715505	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1712961	2	36	5.5	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1712965	3	49	6.1	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1712962	2	39	5.1	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1712967	3	46	6.5	5.0	✓

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1712968	3	56	5.3	5.0	✓
Moisture Content by Gravimetry	E144	1715434	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1712960	2	31	6.4	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1712964	3	49	6.1	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1712959	2	39	5.1	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1715504	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1715505	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1712961	2	36	5.5	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1712960	2	31	6.4	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1712959	2	39	5.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Boron-Hot Water Extractable by ICPOES	E487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs in Soil/solid by Hex:Ace GC-MS	E641A ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.
Sample Hold Fee for Soil/Solid	HOLD ALS Environmental - Waterloo	Soil/Solid		Fee for storing sample to meet sample integrity requirements and holding times.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

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QUALITY CONTROL REPORT

Work Order : **WT2430638**
Amendment : **1**

Client : WSP Canada Inc.
Contact : Jason Taylor
Address : 800 Green Creek Drive
Ottawa ON Canada K1J 1A6
Telephone : ----
Project : CA0039399.3386 - City of Ottawa - Lansdowne Park
PO : 24422-98891-S01
C-O-C number : 22-
Sampler : ----
Site : City of Ottawa - Lansdowne Park
Quote number : Lansdowne Park c/o WSP
No. of samples received : 10
No. of samples analysed : 10

Page : 1 of 22

Laboratory : ALS Environmental - Waterloo
Account Manager : Costas Farassoglou
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : 613 225 8279
Date Samples Received : 12-Oct-2024 11:00
Date Analysis Commenced : 15-Oct-2024
Issue Date : 28-Oct-2024 15:40

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo VOC, Waterloo, Ontario
Chad Strachan	Account Manager Assistant	Waterloo Administration, Waterloo, Ontario
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Greg Pokocky	Manager - Inorganics	Waterloo Metals, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Josphin Masihi	Analyst	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1712963)											
WT2430623-002	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	9.12	8.93	2.10%	5%	----
Physical Tests (QC Lot: 1712965)											
WT2430623-009	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.452 mS/cm	431	4.76%	20%	----
Physical Tests (QC Lot: 1715434)											
HA2402546-001	Anonymous	Moisture	----	E144	0.25	%	5.59	4.99	11.4%	20%	----
Physical Tests (QC Lot: 1715694)											
TY2411631-001	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.255 mS/cm	267	4.60%	20%	----
Physical Tests (QC Lot: 1716012)											
WT2430638-004	BH2-24 SA 2	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.32	7.32	0.00%	5%	----
Physical Tests (QC Lot: 1716269)											
WT2430638-002	BH1-24 SA 5	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.114 mS/cm	111	2.67%	20%	----
Cyanides (QC Lot: 1712959)											
WT2430623-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Cyanides (QC Lot: 1716010)											
WT2430638-002	BH1-24 SA 5	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1712964)											
WT2430623-009	Anonymous	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	1.11	1.27	0.16	Diff <2x LOR	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	0.71	0.94	0.23	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	63.4	59.7	6.01%	30%	----
Metals (QC Lot: 1712966)											
WT2430623-009	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Metals (QC Lot: 1712967)											
WT2430623-001	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.146	0.131	10.6%	40%	----
Metals (QC Lot: 1712968)											
WT2430623-001	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	0.16	0.16	0.002	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	3.02	2.83	6.60%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	24.6	24.2	1.75%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.23	0.25	0.02	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	5.8	6.2	0.4	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.296	0.283	4.66%	30%	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1712968) - continued											
WT2430623-001	Anonymous	Chromium	7440-47-3	E440C	0.50	mg/kg	8.09	7.96	1.65%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	2.43	2.36	3.19%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	8.90	8.47	4.89%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	47.6	40.0	17.4%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.37	0.41	0.04	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	5.44	5.16	5.20%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440C	0.050	mg/kg	0.050	0.055	0.005	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.401	0.416	3.79%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	14.4	14.1	2.44%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	125	121	3.48%	30%	----
Metals (QC Lot: 1715695)											
TY2411631-001	Anonymous	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	1.36	1.53	0.17	Diff <2x LOR	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	0.54	0.60	0.07	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	28.3	31.5	10.7%	30%	----
Metals (QC Lot: 1715696)											
TY2411631-001	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0094	0.0104	0.0010	Diff <2x LOR	----
Metals (QC Lot: 1715697)											
TY2411631-001	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	2.11	2.27	7.59%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	28.8	30.5	5.72%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.16	0.18	0.01	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.065	0.065	0.00006	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	26.5	26.6	0.383%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	7.39	7.60	2.81%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	26.2	27.3	4.25%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	3.20	3.26	1.91%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.27	0.31	0.04	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	16.5	16.8	2.30%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440C	0.050	mg/kg	0.100	0.103	0.003	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1715697) - continued											
TY2411631-001	Anonymous	Uranium	7440-61-1	E440C	0.050	mg/kg	0.420	0.401	4.56%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	32.2	30.6	5.32%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	35.3	36.3	2.82%	30%	----
Metals (QC Lot: 1715698)											
WT2430638-004	BH2-24 SA 2	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	0.22	0.23	0.01	Diff <2x LOR	----
Metals (QC Lot: 1716268)											
WT2430638-002	BH1-24 SA 5	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	1.36	1.32	0.04	Diff <2x LOR	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	5.33	5.11	4.21%	30%	----
Metals (QC Lot: 1716270)											
WT2429326-008	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Metals (QC Lot: 1716271)											
WT2429326-008	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	2.05	2.06	0.607%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	32.5	34.0	4.52%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.25	0.26	0.008	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	6.9	7.6	0.7	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.066	0.064	0.002	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	8.99	9.47	5.22%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	3.27	3.31	1.01%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	8.40	8.59	2.31%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	4.29	4.48	4.34%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.18	0.17	0.01	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	7.19	7.23	0.494%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440C	0.050	mg/kg	0.057	0.058	0.0006	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.407	0.438	7.22%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	17.8	18.6	4.24%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	26.8	27.5	2.63%	30%	----
Metals (QC Lot: 1716272)											
WT2429326-008	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0073	0.0072	0.0002	Diff <2x LOR	----
Speciated Metals (QC Lot: 1712962)											
WT2430623-001	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Speciated Metals (QC Lot: 1716011)											
WT2430638-002	BH1-24 SA 5	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	0.14	0.15	0.008	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1715504)											
WT2430638-001	BH1-24 SA 3	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1712961)											
WT2430623-001	Anonymous	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1715419)											
WT2430638-002	BH1-24 SA 5	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1715505)											
WT2430638-001	BH1-24 SA 3	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1712960)											
WT2430623-001	Anonymous	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A	0.050	mg/kg	0.115	0.116	0.0005	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	0.212	0.242	12.9%	50%	----
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	0.162	0.182	0.020	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	0.190	0.216	12.8%	50%	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	0.070	0.076	0.006	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	0.108	0.110	0.003	Diff <2x LOR	----
		Chrysene	218-01-9	E641A	0.050	mg/kg	0.239	0.245	2.51%	50%	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	0.374	0.393	4.99%	50%	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	0.077	0.086	0.009	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Polycyclic Aromatic Hydrocarbons (QC Lot: 1712960) - continued											
WT2430623-001	Anonymous	Phenanthrene	85-01-8	E641A	0.050	mg/kg	0.251	0.253	0.790%	50%	----
		Pyrene	129-00-0	E641A	0.050	mg/kg	0.328	0.347	5.78%	50%	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1715420)											
WT2430638-002	BH1-24 SA 5	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Physical Tests (QCLot: 1712965)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 1715434)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 1715694)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 1716269)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Cyanides (QCLot: 1712959)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Cyanides (QCLot: 1716010)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 1712964)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1712966)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1712967)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1712968)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1712968) - continued						
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----
Metals (QCLot: 1715695)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1715696)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1715697)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----
Metals (QCLot: 1715698)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1716268)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Metals (QCLot: 1716268) - continued						
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1716270)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1716271)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----
Metals (QCLot: 1716272)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Speciated Metals (QCLot: 1712962)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Speciated Metals (QCLot: 1716011)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds (QCLot: 1715504)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Hydrocarbons (QCLot: 1712961)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons (QCLot: 1715419)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons (QCLot: 1715505)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1712960)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1715420)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1715420) - continued						
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1712963)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1712965)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	98.4	90.0	110	----
Physical Tests (QCLot: 1715434)									
Moisture	----	E144	0.25	%	50 %	99.4	90.0	110	----
Physical Tests (QCLot: 1715694)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	98.5	90.0	110	----
Physical Tests (QCLot: 1716012)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1716269)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	98.7	90.0	110	----
Cyanides (QCLot: 1712959)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	85.1	80.0	120	----
Cyanides (QCLot: 1716010)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	88.5	80.0	120	----
Metals (QCLot: 1712964)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	104	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	100	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	100	80.0	120	----
Metals (QCLot: 1712966)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	105	70.0	130	----
Metals (QCLot: 1712967)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	99.0	80.0	120	----
Metals (QCLot: 1712968)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	111	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	112	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	98.0	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	# 123	80.0	120	MES
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	120	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	106	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Metals (QCLot: 1712968) - continued									
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	105	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	96.8	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	103	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	113	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	100	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	103	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	109	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	93.4	80.0	120	----
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	108	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	108	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	108	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	102	80.0	120	----
Metals (QCLot: 1715695)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	109	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	104	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	109	80.0	120	----
Metals (QCLot: 1715696)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	87.0	80.0	120	----
Metals (QCLot: 1715697)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	102	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	104	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	101	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	95.8	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	92.6	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	95.7	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	99.7	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	99.1	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	98.7	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	98.2	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	98.7	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	97.6	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	89.5	80.0	120	----
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	95.9	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	96.1	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	101	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	***CAS Number***	***Method***	***LOR***	***Unit***	***Target Concentration***	***LCS***	***Low***	***High***	***Qualifier***
Metals (QCLot: 1715697) - continued									
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	97.0	80.0	120	----
Metals (QCLot: 1715698)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	105	70.0	130	----
Metals (QCLot: 1716268)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	101	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	98.0	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	97.4	80.0	120	----
Metals (QCLot: 1716270)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	106	70.0	130	----
Metals (QCLot: 1716271)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	101	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	104	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	92.3	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	98.8	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	99.0	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	101	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	97.7	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	91.4	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	96.8	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	105	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	91.7	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	96.8	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	101	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	88.1	80.0	120	----
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	100	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	102	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	99.2	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	94.9	80.0	120	----
Metals (QCLot: 1716272)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	98.0	80.0	120	----
Speciated Metals (QCLot: 1712962)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	100	80.0	120	----
Speciated Metals (QCLot: 1716011)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	96.7	80.0	120	----

Sub-Matrix: **Soil/Solid**

Laboratory Control Sample (LCS) Report

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Spike*	*Recovery (%)*	*Recovery Limits (%)*		*Qualifier*
					Target Concentration	*LCS*	*Low*	*High*	
Volatile Organic Compounds (QCLot: 1715504)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	101	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	84.5	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	84.5	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	83.7	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	86.1	70.0	130	----
Hydrocarbons (QCLot: 1712961)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	712 mg/kg	91.0	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1470 mg/kg	90.8	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	796 mg/kg	89.6	70.0	130	----
Hydrocarbons (QCLot: 1715419)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	712 mg/kg	97.8	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1470 mg/kg	103	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	796 mg/kg	105	70.0	130	----
Hydrocarbons (QCLot: 1715505)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	97.7	80.0	120	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1712960)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	89.1	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	86.6	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	83.0	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	76.9	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	82.0	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	79.1	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	91.9	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	92.0	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	103	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	90.8	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	90.1	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	89.0	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	79.6	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	90.4	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	86.6	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	80.1	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	82.7	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	85.9	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Polycyclic Aromatic Hydrocarbons (QCLot: 1715420)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	69.0	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	69.7	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	67.4	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	67.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	68.1	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	74.4	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	69.0	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	68.6	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	63.7	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	67.8	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	70.0	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	70.6	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	72.9	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	65.7	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	70.1	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	67.2	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	66.2	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	67.9	60.0	130	----

Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Cyanides (QCLot: 1712959)										
WT2430623-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	1.28 mg/kg	1.25 mg/kg	103	70.0	130	----
Cyanides (QCLot: 1716010)										
WT2430638-002	BH1-24 SA 5	Cyanide, weak acid dissociable	----	E336A	1.15 mg/kg	1.24 mg/kg	92.5	70.0	130	----
Volatile Organic Compounds (QCLot: 1715504)										
WT2430638-001	BH1-24 SA 3	Benzene	71-43-2	E611A	3.08 mg/kg	2.91 mg/kg	106	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.62 mg/kg	2.91 mg/kg	89.8	60.0	140	----
		Toluene	108-88-3	E611A	2.64 mg/kg	2.91 mg/kg	90.4	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	5.18 mg/kg	5.83 mg/kg	88.9	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.64 mg/kg	2.91 mg/kg	90.7	60.0	140	----
Hydrocarbons (QCLot: 1712961)										
WT2430623-001	Anonymous	F2 (C10-C16)	----	E601.SG-L	570 mg/kg	569 mg/kg	100	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1160 mg/kg	1180 mg/kg	98.8	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	631 mg/kg	636 mg/kg	99.2	60.0	140	----
Hydrocarbons (QCLot: 1715419)										
WT2430638-002	BH1-24 SA 5	F2 (C10-C16)	----	E601.SG-L	576 mg/kg	569 mg/kg	101	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1250 mg/kg	1180 mg/kg	106	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	684 mg/kg	636 mg/kg	107	60.0	140	----
Hydrocarbons (QCLot: 1715505)										
WT2430638-001	BH1-24 SA 3	F1 (C6-C10)	----	E581.F1	62.7 mg/kg	58.3 mg/kg	108	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1712960)										
WT2430623-001	Anonymous	Acenaphthene	83-32-9	E641A	0.358 mg/kg	0.399 mg/kg	89.6	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.360 mg/kg	0.399 mg/kg	90.2	50.0	140	----
		Anthracene	120-12-7	E641A	0.334 mg/kg	0.399 mg/kg	83.8	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.360 mg/kg	0.399 mg/kg	90.2	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.380 mg/kg	0.399 mg/kg	95.2	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.390 mg/kg	0.399 mg/kg	97.7	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.379 mg/kg	0.399 mg/kg	95.1	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.413 mg/kg	0.399 mg/kg	104	50.0	140	----
		Chrysene	218-01-9	E641A	0.404 mg/kg	0.399 mg/kg	101	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.374 mg/kg	0.399 mg/kg	93.6	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.372 mg/kg	0.399 mg/kg	93.3	50.0	140	----
		Fluorene	86-73-7	E641A	0.359 mg/kg	0.399 mg/kg	89.9	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.357 mg/kg	0.399 mg/kg	89.4	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.380 mg/kg	0.399 mg/kg	95.2	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.372 mg/kg	0.399 mg/kg	93.3	50.0	140	----
		Naphthalene	91-20-3	E641A	0.350 mg/kg	0.399 mg/kg	87.7	50.0	140	----

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	***Client sample ID***	***Analyte***	***CAS Number***	***Method***	***Concentration***	***Target***	***MS***	***Low***	***High***	***Qualifier***
Polycyclic Aromatic Hydrocarbons (QCLot: 1712960) - continued										
WT2430623-001	Anonymous	Phenanthrene	85-01-8	E641A	0.314 mg/kg	0.399 mg/kg	78.8	50.0	140	----
		Pyrene	129-00-0	E641A	0.372 mg/kg	0.399 mg/kg	93.3	50.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1715420)										
WT2430638-002	BH1-24 SA 5	Acenaphthene	83-32-9	E641A	0.338 mg/kg	0.398 mg/kg	85.1	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.342 mg/kg	0.398 mg/kg	85.8	50.0	140	----
		Anthracene	120-12-7	E641A	0.320 mg/kg	0.398 mg/kg	80.5	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.333 mg/kg	0.398 mg/kg	83.8	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.331 mg/kg	0.398 mg/kg	83.1	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.358 mg/kg	0.398 mg/kg	89.9	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.341 mg/kg	0.398 mg/kg	85.6	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.346 mg/kg	0.398 mg/kg	87.0	50.0	140	----
		Chrysene	218-01-9	E641A	0.318 mg/kg	0.398 mg/kg	79.8	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.335 mg/kg	0.398 mg/kg	84.3	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.337 mg/kg	0.398 mg/kg	84.8	50.0	140	----
		Fluorene	86-73-7	E641A	0.344 mg/kg	0.398 mg/kg	86.3	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.353 mg/kg	0.398 mg/kg	88.8	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.330 mg/kg	0.398 mg/kg	82.9	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.350 mg/kg	0.398 mg/kg	88.0	50.0	140	----
		Naphthalene	91-20-3	E641A	0.343 mg/kg	0.398 mg/kg	86.2	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.318 mg/kg	0.398 mg/kg	79.9	50.0	140	----
		Pyrene	129-00-0	E641A	0.327 mg/kg	0.398 mg/kg	82.1	50.0	140	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 1712965)									
QC-1712965-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	101	70.0	130	----
Physical Tests (QCLot: 1715694)									
QC-1715694-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	104	70.0	130	----
Physical Tests (QCLot: 1716269)									
QC-1716269-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	98.6	70.0	130	----
Metals (QCLot: 1712964)									
QC-1712964-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	104	70.0	130	----
QC-1712964-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	109	70.0	130	----
QC-1712964-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	105	70.0	130	----
Metals (QCLot: 1712966)									
QC-1712966-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	100	60.0	140	----
Metals (QCLot: 1712967)									
QC-1712967-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	99.8	70.0	130	----
Metals (QCLot: 1712968)									
QC-1712968-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	98.1	70.0	130	----
QC-1712968-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	102	70.0	130	----
QC-1712968-003	RM	Barium	7440-39-3	E440C	788 mg/kg	95.5	70.0	130	----
QC-1712968-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	119	70.0	130	----
QC-1712968-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	100	70.0	130	----
QC-1712968-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	100	70.0	130	----
QC-1712968-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	92.5	70.0	130	----
QC-1712968-003	RM	Copper	7440-50-8	E440C	969 mg/kg	104	70.0	130	----
QC-1712968-003	RM	Lead	7439-92-1	E440C	919 mg/kg	99.9	70.0	130	----
QC-1712968-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	95.1	70.0	130	----
QC-1712968-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	105	70.0	130	----
QC-1712968-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	102	60.0	140	----
QC-1712968-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	94.4	70.0	130	----
QC-1712968-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	98.2	70.0	130	----
QC-1712968-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	94.5	70.0	130	----
QC-1712968-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	99.6	70.0	130	----
QC-1712968-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	97.2	70.0	130	----
Metals (QCLot: 1715695)									

Sub-Matrix:

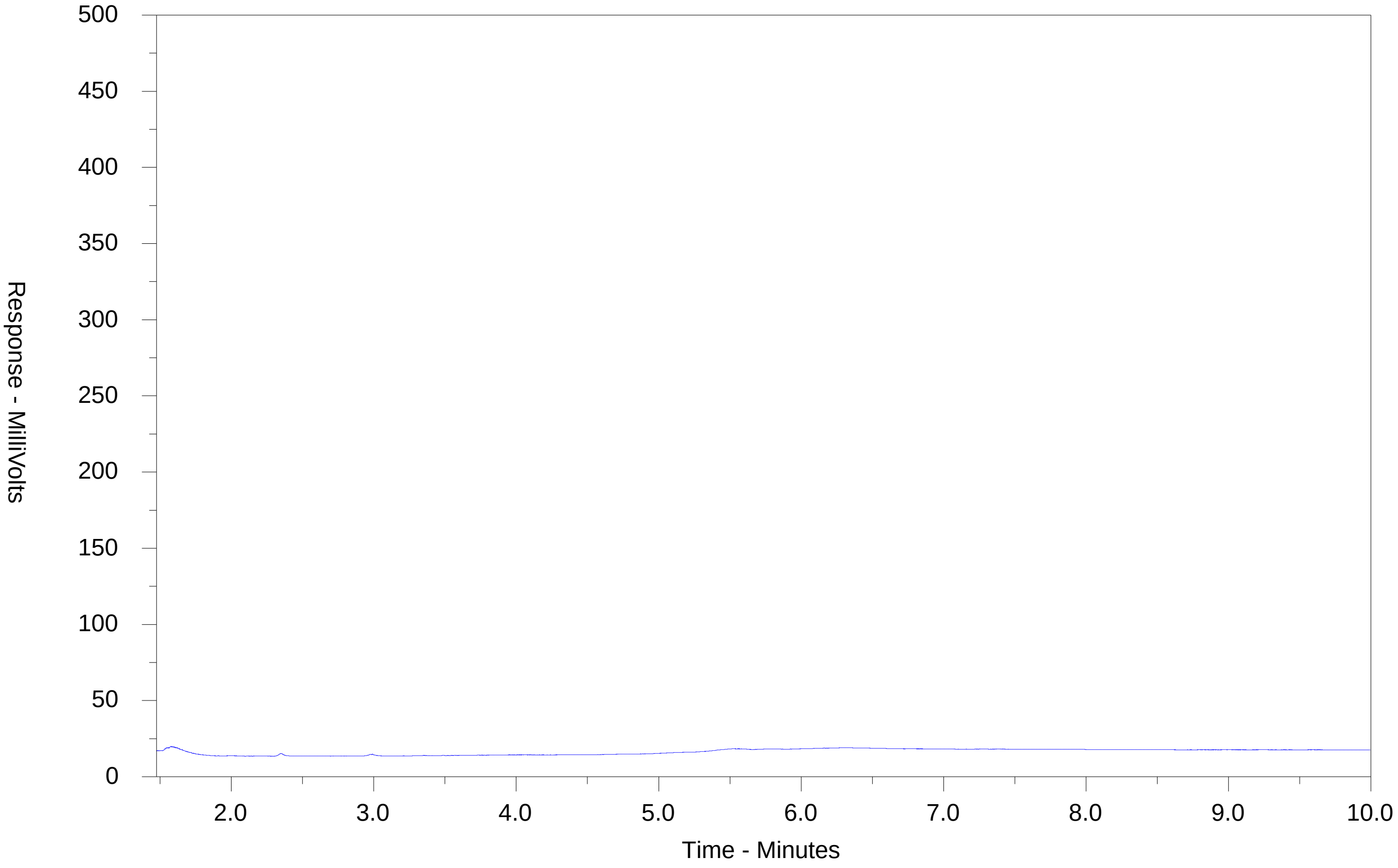
					Reference Material (RM) Report				
					RM Target	*Recovery (%)*	*Recovery Limits (%)*		
Laboratory sample ID	*Reference Material ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*RM*	*Low*	*High*	*Qualifier*
Metals (QCLot: 1715695) - continued									
QC-1715695-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	108	70.0	130	----
QC-1715695-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	108	70.0	130	----
QC-1715695-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	105	70.0	130	----
Metals (QCLot: 1715696)									
QC-1715696-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	88.4	70.0	130	----
Metals (QCLot: 1715697)									
QC-1715697-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	88.6	70.0	130	----
QC-1715697-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	97.3	70.0	130	----
QC-1715697-003	RM	Barium	7440-39-3	E440C	788 mg/kg	96.4	70.0	130	----
QC-1715697-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	94.6	70.0	130	----
QC-1715697-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	90.6	70.0	130	----
QC-1715697-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	98.2	70.0	130	----
QC-1715697-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	96.2	70.0	130	----
QC-1715697-003	RM	Copper	7440-50-8	E440C	969 mg/kg	101	70.0	130	----
QC-1715697-003	RM	Lead	7439-92-1	E440C	919 mg/kg	89.2	70.0	130	----
QC-1715697-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	95.2	70.0	130	----
QC-1715697-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	101	70.0	130	----
QC-1715697-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	101	60.0	140	----
QC-1715697-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	90.1	70.0	130	----
QC-1715697-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	88.3	70.0	130	----
QC-1715697-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	82.3	70.0	130	----
QC-1715697-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	96.2	70.0	130	----
QC-1715697-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	95.3	70.0	130	----
Metals (QCLot: 1715698)									
QC-1715698-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	102	60.0	140	----
Metals (QCLot: 1716268)									
QC-1716268-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	100	70.0	130	----
QC-1716268-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	102	70.0	130	----
QC-1716268-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	95.6	70.0	130	----
Metals (QCLot: 1716270)									
QC-1716270-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	108	60.0	140	----
Metals (QCLot: 1716271)									
QC-1716271-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	94.0	70.0	130	----
QC-1716271-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	102	70.0	130	----
QC-1716271-003	RM	Barium	7440-39-3	E440C	788 mg/kg	98.4	70.0	130	----
QC-1716271-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	104	70.0	130	----
QC-1716271-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	103	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1716271) - continued									
QC-1716271-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	99.3	70.0	130	----
QC-1716271-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	93.7	70.0	130	----
QC-1716271-003	RM	Copper	7440-50-8	E440C	969 mg/kg	107	70.0	130	----
QC-1716271-003	RM	Lead	7439-92-1	E440C	919 mg/kg	101	70.0	130	----
QC-1716271-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	92.6	70.0	130	----
QC-1716271-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	106	70.0	130	----
QC-1716271-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	107	60.0	140	----
QC-1716271-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	92.0	70.0	130	----
QC-1716271-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	98.4	70.0	130	----
QC-1716271-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	98.7	70.0	130	----
QC-1716271-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	100	70.0	130	----
QC-1716271-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	98.6	70.0	130	----
Metals (QCLot: 1716272)									
QC-1716272-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	102	70.0	130	----
Speciated Metals (QCLot: 1712962)									
QC-1712962-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	174 mg/kg	97.9	70.0	130	----
Speciated Metals (QCLot: 1716011)									
QC-1716011-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	174 mg/kg	89.4	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-001-E601.SG-L
Client Sample ID: BH1-24 SA 3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
	←Diesel/Jet Fuels→		

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

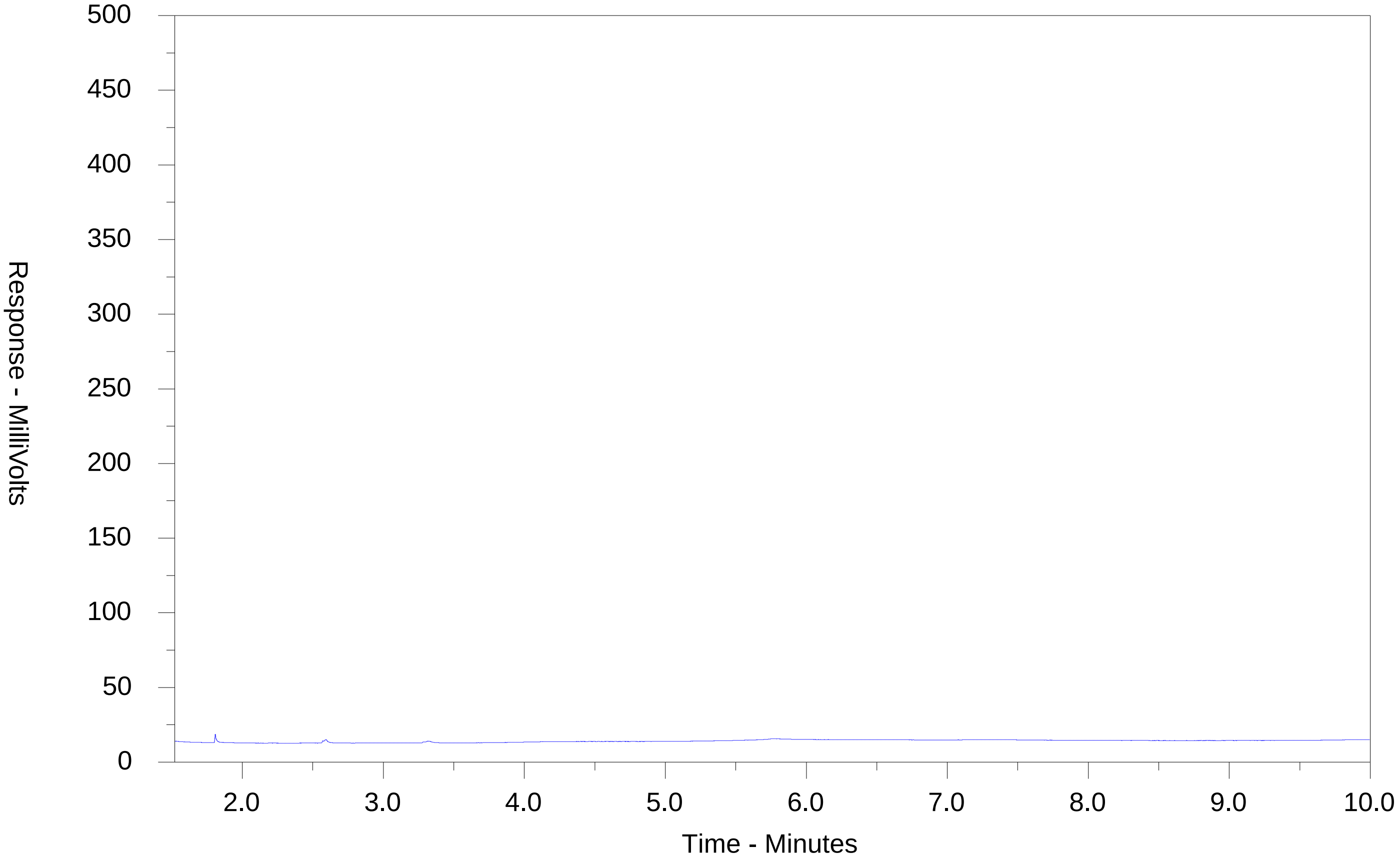
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-002-E601.SG-L
Client Sample ID: BH1-24 SA 5



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

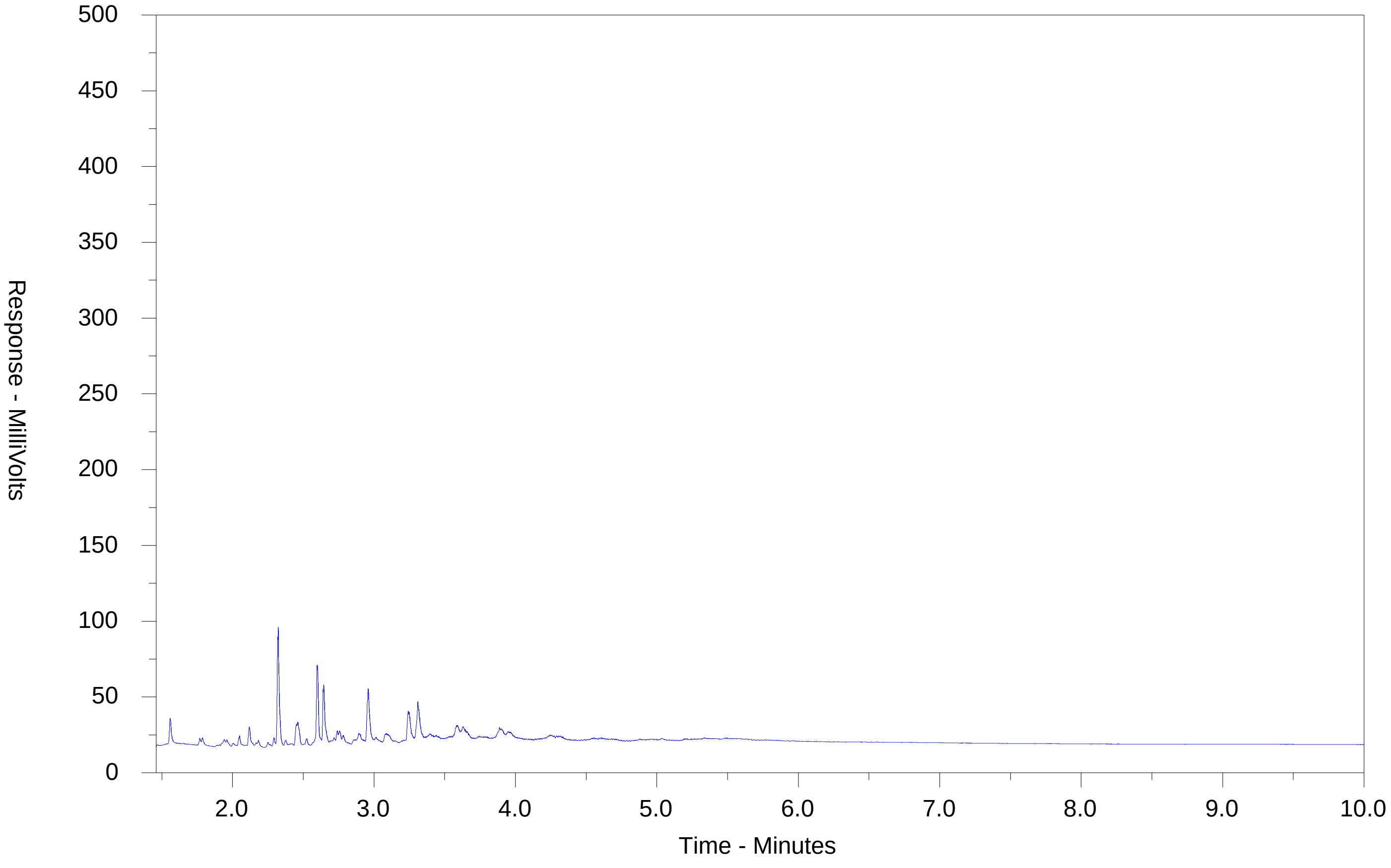
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-004-E601.SG-L
Client Sample ID: BH2-24 SA 2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

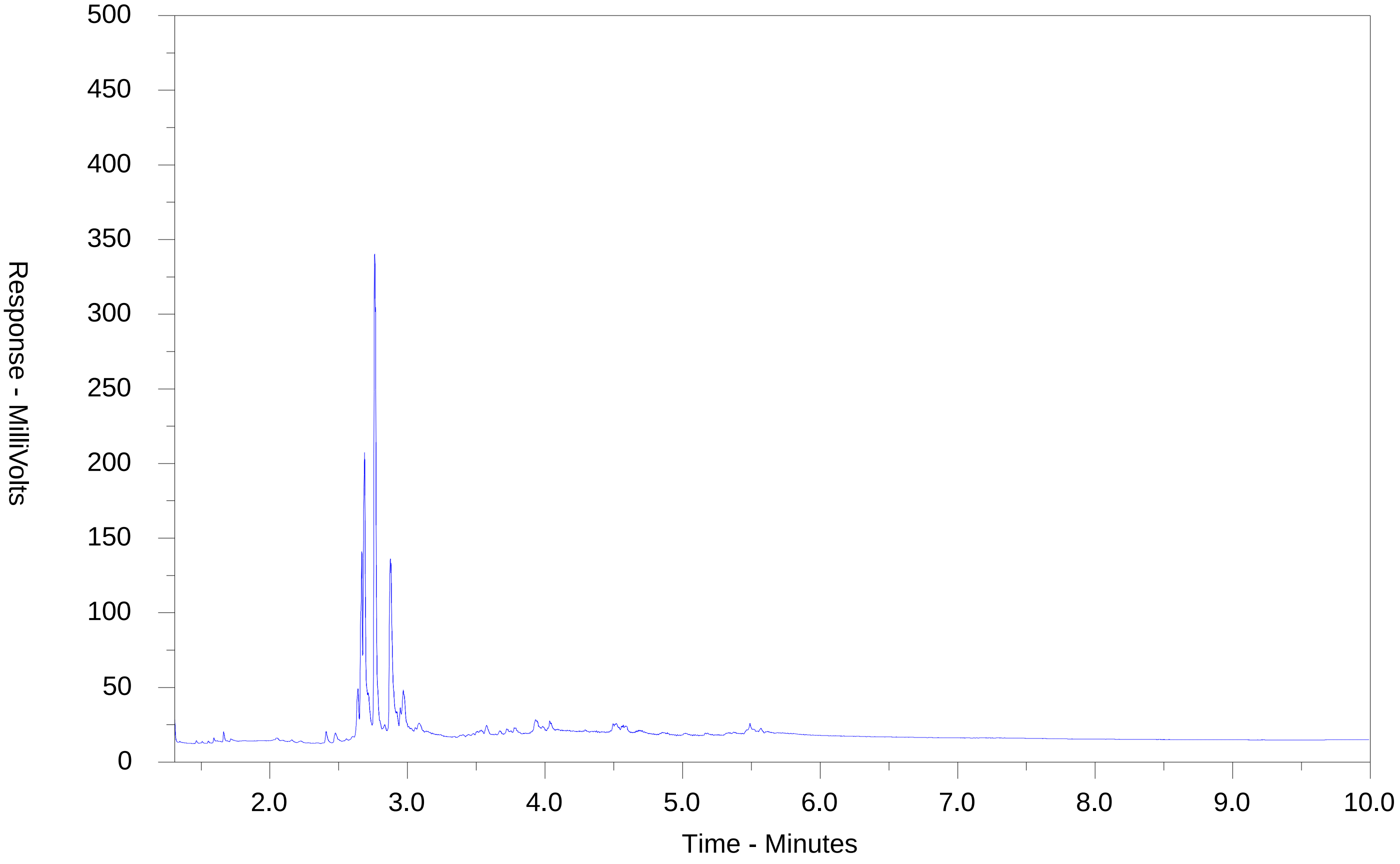
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-005-E601.SG-L
Client Sample ID: BH2-24-A SA 3



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

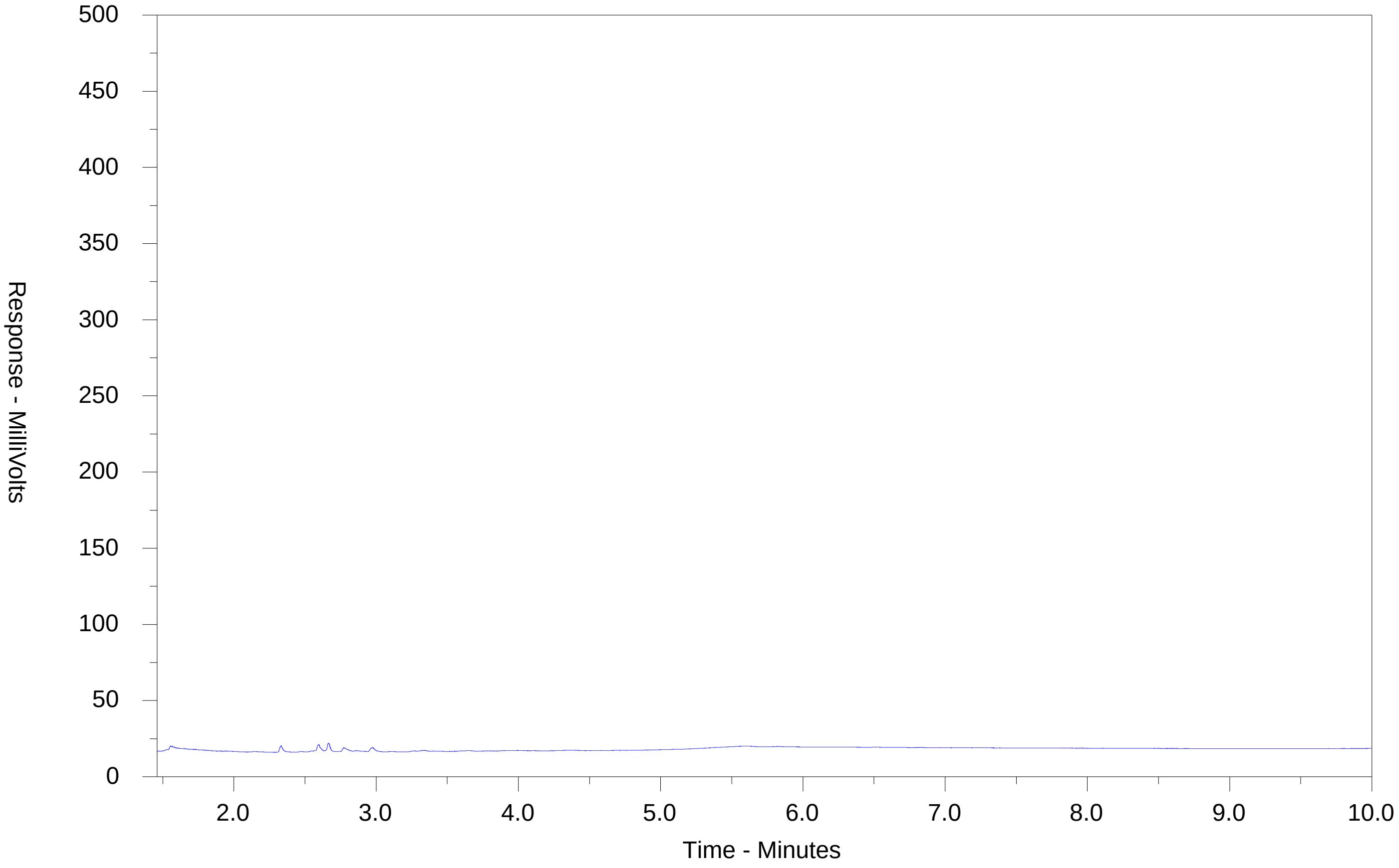
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-006-E601.SG-L
Client Sample ID: BH2-24-A SA 4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

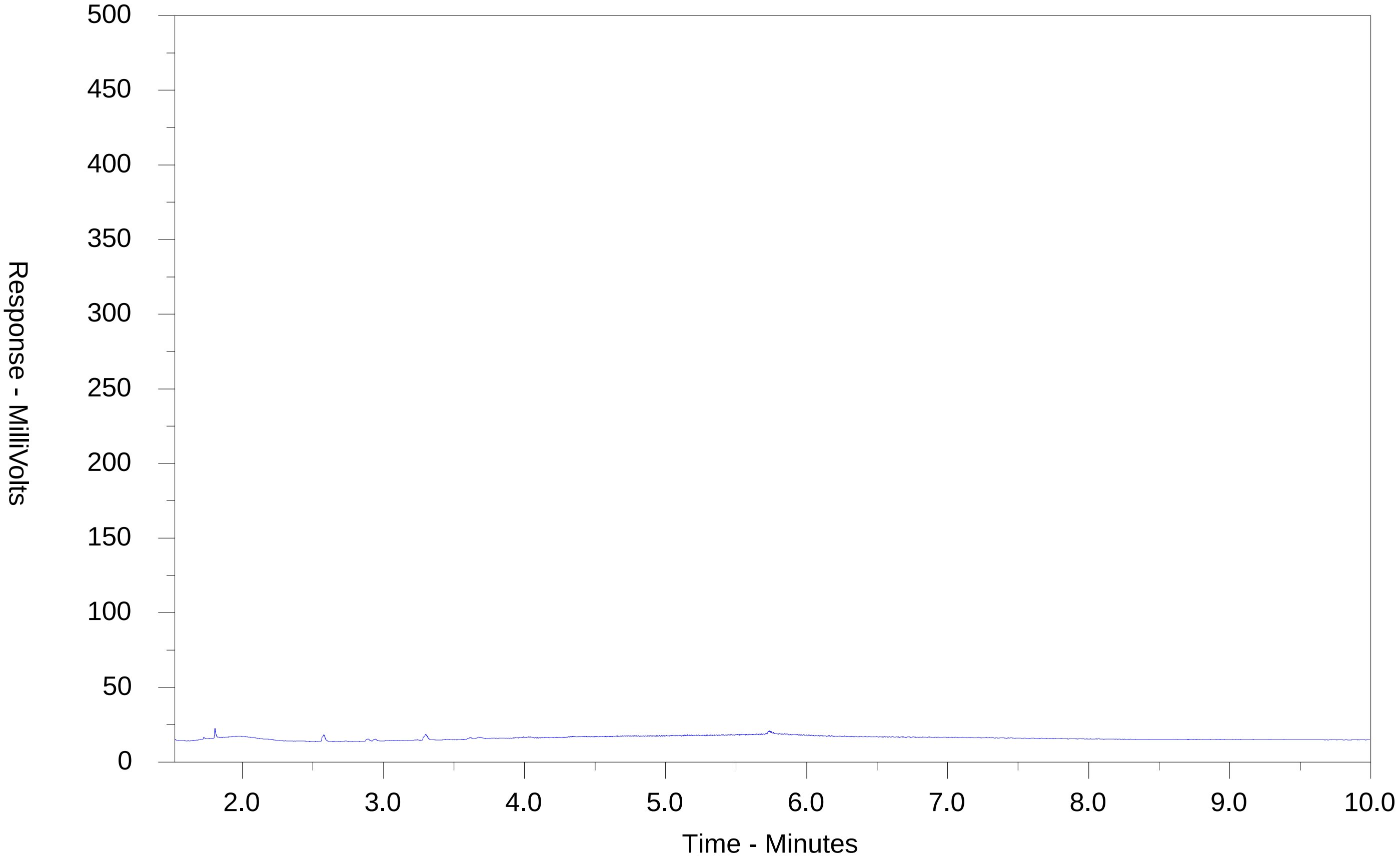
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-008-E601.SG-L
Client Sample ID: BH3-24 SA 4



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

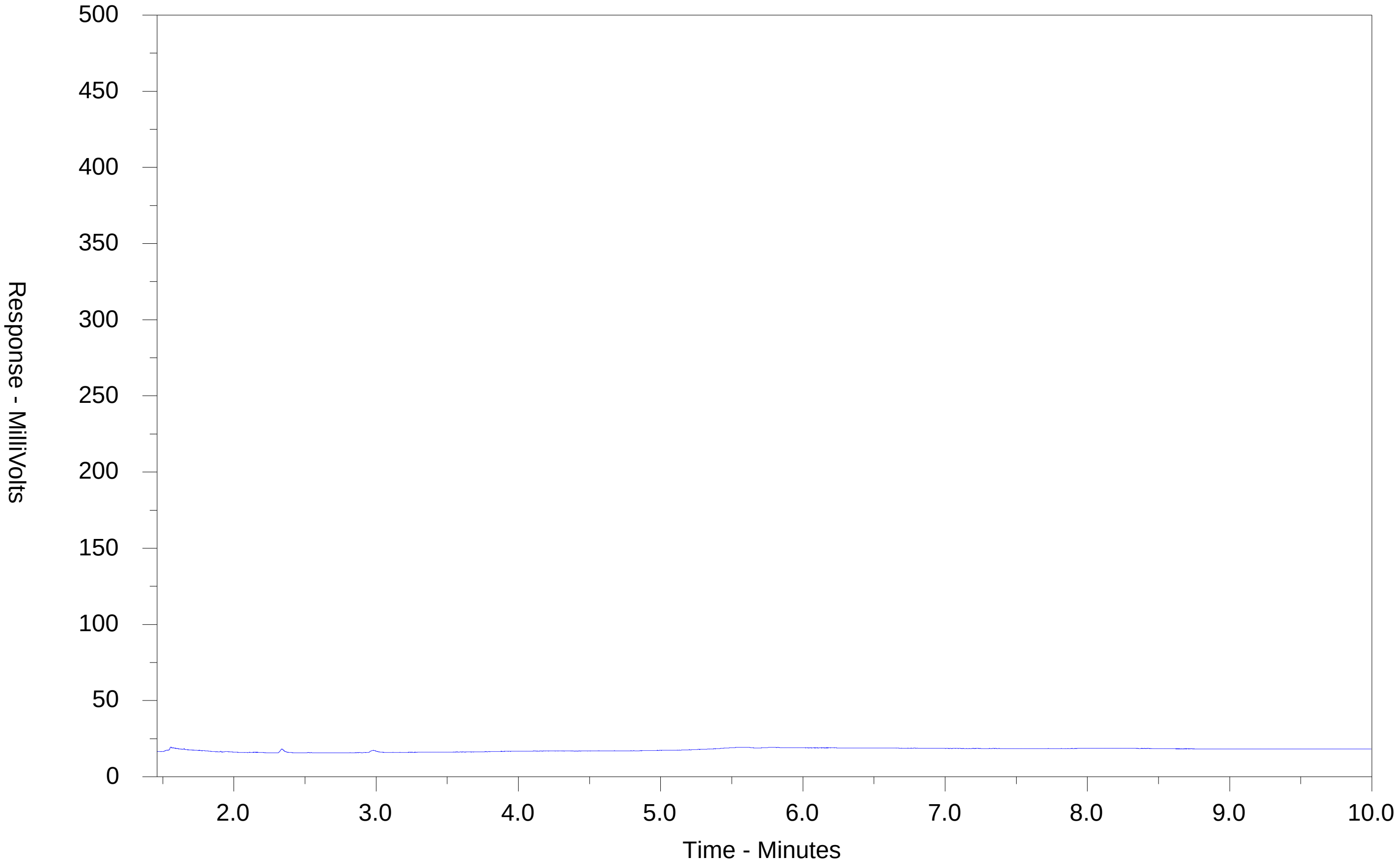
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2430638-009-E601.SG-L
Client Sample ID: BH3-24 SA 6



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: **22 -**

Page 1 of 1

Environmental Division
Waterloo
Work Order Reference
WT2430638

Telephone : + 1 519 886 6910

EL HERE

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

Company: City of Ottawa c/o WSP
Contact: Jason Taylor
Phone: 613-866-8199

Company address below will appear on the final report

Street: 800 Green Creek Drive
City/Province: Ottawa, ON
Postal Code: K1J 1K6

Invoice To Same as Report To ☐ YES ☐ NO
Copy of Invoice with Report ☐ YES ☐ NO
Company:
Contact:

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax richard.barker@ottawa.ca
Email 2 jason.taylor@wsp.com
Email 3 robert.ireland@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax
Email 2

Turnaround Time (TAT) Requ

☑ Routine [R] if received by 3pm M-F - no surchar
☐ 4 day [P4] if received by 3pm M-F - 20% rush su
☐ 3 day [P3] if received by 3pm M-F - 25% rush su
☐ 2 day [P2] if received by 3pm M-F - 50% rush su
☐ 1 day [E] if received by 3pm M-F - 100% rush su
☐ Same day [E2] if received by 10am M-S - 200% r

Additional fees may apply to rush requests

Date and Time Required for all E&P TATs:

For all tests with rush TATs request

Ana

Indicate Filtered (F), Preserved (P) or

Project Information

ALS Account # / Quote #: WT2024GMOW1000001
Job #: CA0039399.3386
PO / AFE:
LSD: City of Ottawa - Lansdowne Park

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): WT2430638

ALS Contact: Emily Smith **Sampler:** Rob Ireland

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX,F1-F4	PAHs (O. Reg 153)	Metals & Inorganics (O. Reg 153)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRE	SUSPECTED HAZARD (see notes)
	BH1-24 SA 3	9-Oct-24	8:40	Soil	3	R	R	R			
	BH1-24 SA 5	9-Oct-24	9:00	Soil	3	R	R	R			
	BH1-24 SA 6	9-Oct-24	9:10	Soil	3				Hold		
	BH2-24 SA 2	9-Oct-24	11:40	Soil	3	R	R	R			
	BH2-24-A SA 3	9-Oct-24	12:40	Soil	3	R	R	R			
	BH2-24-A SA 4	9-Oct-24	12:50	Soil	3	R	R	R			
	BH2-24-A SA 5	9-Oct-24	13:20	Soil	3				Hold		
	BH3-24 SA 4	10-Oct-24	10:40	Soil	3	R	R	R			
	BH3-24 SA 6	10-Oct-24	13:30	Soil	3	R	R	R			
	BH3-24 SA7	10-Oct-24	13:50	Soil	3				Hold		

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

Are samples taken from a Regulated DW System?
☐ YES ☐ NO

Are samples for human consumption/ use?
☐ YES ☐ NO

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

O. Reg 153 Table 3 RPI/ICC

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
8.4	7.7

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Rob Ireland	Date: 10/10/2024	Time: 16:20	Received by: Tammy Chartrand	Date: Oct 10th /24	Time: 4:25	Received by: VM	Date: 12-oct-24	Time: 11am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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

SO-773/774 VS-250

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2431125**	Page	: 1 of 11
Amendment	: **1**		
Client	: **WSP Canada Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Jason Taylor	Account Manager	: Costas Farassoglou
Address	: 300-210 Colonnade Road South Ottawa ON Canada K2E 7L5	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 613 225 8279
Project	: CA0039399.3386 - City of Ottawa - Lansdowne Park	Date Samples Received	: 16-Oct-2024 15:30
PO	: 24422-98891-SO1	Issue Date	: 25-Oct-2024 16:50
C-O-C number	: ----		
Sampler	: ----		
Site	: CITY OF OTTAWA - LANSDOWNE PARK		
Quote number	: Lansdowne Park c/o WSP		
No. of samples received	: 3		
No. of samples analysed	: 2		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E336A	16-Oct-2024	19-Oct-2024	14 days	3 days	✓	22-Oct-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E336A	16-Oct-2024	19-Oct-2024	14 days	3 days	✓	22-Oct-2024	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH4-24 SA 2B	E581.F1	16-Oct-2024	21-Oct-2024	14 days	5 days	✓	22-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH4-24 SA 5	E581.F1	16-Oct-2024	21-Oct-2024	14 days	5 days	✓	22-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E601.SG-L	16-Oct-2024	21-Oct-2024	14 days	5 days	✓	23-Oct-2024	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E601.SG-L	16-Oct-2024	21-Oct-2024	14 days	5 days	✓	23-Oct-2024	40 days	2 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E487	16-Oct-2024	23-Oct-2024	180 days	7 days	✓	23-Oct-2024	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E487	16-Oct-2024	23-Oct-2024	180 days	7 days	✓	23-Oct-2024	180 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E510C	16-Oct-2024	23-Oct-2024	28 days	7 days	✓	24-Oct-2024	28 days	8 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E510C	16-Oct-2024	23-Oct-2024	28 days	7 days	✓	24-Oct-2024	28 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E440C	16-Oct-2024	23-Oct-2024	180 days	7 days	✓	23-Oct-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E440C	16-Oct-2024	23-Oct-2024	180 days	7 days	✓	23-Oct-2024	180 days	7 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E484	16-Oct-2024	23-Oct-2024	180 days	7 days	✓	23-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E484	16-Oct-2024	23-Oct-2024	180 days	7 days	✓	23-Oct-2024	180 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E100-L	16-Oct-2024	23-Oct-2024	30 days	7 days	✓	24-Oct-2024	30 days	8 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E100-L	16-Oct-2024	23-Oct-2024	30 days	7 days	✓	24-Oct-2024	30 days	8 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation* *Preparation Date*	*Holding Times* *Rec*	*Actual*	*Eval*	*Analysis* *Analysis Date*	*Holding Times* *Rec*	*Actual*	*Eval*
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E144	16-Oct-2024	----	----	----		19-Oct-2024	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E144	16-Oct-2024	----	----	----		19-Oct-2024	----	3 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E108A	16-Oct-2024	19-Oct-2024	30 days	3 days	✓	22-Oct-2024	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E108A	16-Oct-2024	19-Oct-2024	30 days	3 days	✓	22-Oct-2024	30 days	6 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E641A	16-Oct-2024	21-Oct-2024	60 days	5 days	✓	23-Oct-2024	40 days	2 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E641A	16-Oct-2024	21-Oct-2024	60 days	5 days	✓	23-Oct-2024	40 days	2 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 2B	E532	16-Oct-2024	19-Oct-2024	30 days	3 days	✓	22-Oct-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH4-24 SA 5	E532	16-Oct-2024	19-Oct-2024	30 days	3 days	✓	22-Oct-2024	7 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH4-24 SA 2B	E611A	16-Oct-2024	21-Oct-2024	14 days	5 days	✓	22-Oct-2024	40 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH4-24 SA 5	E611A	16-Oct-2024	21-Oct-2024	14 days	5 days	✓	22-Oct-2024	40 days	1 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Boron-Hot Water Extractable by ICPOES	E487	1718328	1	19	5.2	5.0	✓
BTEX by Headspace GC-MS	E611A	1720537	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1720538	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1718323	1	20	5.0	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1718327	1	20	5.0	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1718321	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1718329	1	20	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1718330	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1718331	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1718324	1	20	5.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1718325	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1718326	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1718322	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1718328	2	19	10.5	10.0	✓
BTEX by Headspace GC-MS	E611A	1720537	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1720538	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1718323	1	20	5.0	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1718327	2	20	10.0	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1718321	2	20	10.0	10.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1718329	2	20	10.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1718330	2	20	10.0	10.0	✓
Moisture Content by Gravimetry	E144	1718331	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1718324	1	20	5.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1718325	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1718326	2	20	10.0	10.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1718322	1	20	5.0	5.0	✓
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1718328	1	19	5.2	5.0	✓
BTEX by Headspace GC-MS	E611A	1720537	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1720538	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1718323	1	20	5.0	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1718327	1	20	5.0	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1718321	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1718329	1	20	5.0	5.0	✓

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1718330	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1718331	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1718324	1	20	5.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1718326	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1718322	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1720537	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1720538	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1718323	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1718324	1	20	5.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1718322	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Boron-Hot Water Extractable by ICPOES	E487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs in Soil/solid by Hex:Ace GC-MS	E641A ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

QUALITY CONTROL REPORT

Work Order	: **WT2431125**	Page	: 1 of 13
Amendment	: **1**		
Client	: WSP Canada Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jason Taylor	Account Manager	: Costas Farassoglou
Address	: 800 Green Creek Drive Ottawa ON Canada K1J 1A6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 613 225 8279
Project	: CA0039399.3386 - City of Ottawa - Lansdowne Park	Date Samples Received	: 16-Oct-2024 15:30
PO	: 24422-98891-SO1	Date Analysis Commenced	: 19-Oct-2024
C-O-C number	: ----	Issue Date	: 25-Oct-2024 16:50
Sampler	: ----		
Site	: CITY OF OTTAWA - LANSDOWNE PARK		
Quote number	: Lansdowne Park c/o WSP		
No. of samples received	: 3		
No. of samples analysed	: 2		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Niral Patel		Waterloo Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1718325)											
WT2430817-002	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	8.00	8.00	0.00%	5%	----
Physical Tests (QC Lot: 1718327)											
WT2430817-004	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.932 mS/cm	981	5.12%	20%	----
Physical Tests (QC Lot: 1718331)											
WT2431125-001	BH4-24 SA 2B	Moisture	----	E144	0.25	%	14.3	15.0	5.01%	20%	----
Cyanides (QC Lot: 1718322)											
WT2430817-002	Anonymous	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1718326)											
WT2430817-004	Anonymous	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	1.24	1.29	0.05	Diff <2x LOR	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	166	172	3.55%	30%	----
Metals (QC Lot: 1718328)											
WT2430817-002	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	0.14	0.16	0.02	Diff <2x LOR	----
Metals (QC Lot: 1718329)											
WT2430817-001	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0100	0.0094	0.0006	Diff <2x LOR	----
Metals (QC Lot: 1718330)											
WT2430817-001	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	0.15	0.15	0.002	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	6.58	6.85	4.00%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	56.4	61.5	8.64%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.24	0.24	0.006	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	14.5	14.5	0.02	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.630	0.820	26.2%	30%	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	7.39	7.71	4.24%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	4.26	4.48	5.06%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	37.5	37.9	1.11%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	21.8	20.8	4.66%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.71	0.71	0.722%	40%	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	9.32	9.64	3.41%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1718330) - continued											
WT2430817-001	Anonymous	Thallium	7440-28-0	E440C	0.050	mg/kg	0.101	0.104	0.004	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.353	0.361	2.29%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	15.8	17.0	6.74%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	135	161	17.7%	30%	----
Speciated Metals (QC Lot: 1718321)											
WT2430817-002	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1720537)											
WT2430847-002	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1718323)											
WT2430817-001	Anonymous	F2 (C10-C16)	----	E601.SG-L	13	mg/kg	13	14	1	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	660	619	6.46%	40%	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	1700	1620	4.25%	40%	----
Hydrocarbons (QC Lot: 1720538)											
WT2430847-002	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1718324)											
WT2430817-001	Anonymous	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A	0.070	mg/kg	<0.070	<0.070	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	0.046	0.048	0.003	Diff <2x LOR	J
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	0.068	0.070	0.002	Diff <2x LOR	J

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Polycyclic Aromatic Hydrocarbons (QC Lot: 1718324) - continued											
WT2430817-001	Anonymous	Naphthalene	91-20-3	E641A	0.010	mg/kg	0.016	0.014	0.002	Diff <2x LOR	J
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----

Qualifiers

Qualifier	*Description*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Physical Tests (QCLot: 1718327)						
Conductivity (1:2 leachate)	----	E100-L	5	μS/cm	<5.00	----
Physical Tests (QCLot: 1718331)						
Moisture	----	E144	0.25	%	<0.25	----
Cyanides (QCLot: 1718322)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 1718326)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1718328)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1718329)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1718330)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Speciated Metals (QCLot: 1718321)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds (QCLot: 1720537)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1718323)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons (QCLot: 1720538)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1718324)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1718325)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1718327)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	99.4	90.0	110	----
Physical Tests (QCLot: 1718331)									
Moisture	----	E144	0.25	%	50 %	99.4	90.0	110	----
Cyanides (QCLot: 1718322)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	88.3	80.0	120	----
Metals (QCLot: 1718326)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	107	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	102	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	107	80.0	120	----
Metals (QCLot: 1718328)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	109	70.0	130	----
Metals (QCLot: 1718329)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	108	80.0	120	----
Metals (QCLot: 1718330)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	101	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	108	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	104	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	94.9	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	105	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	92.6	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	97.0	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	87.8	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	92.8	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	93.7	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	100	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	93.4	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	99.4	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	85.8	80.0	120	----

Sub-Matrix: **Soil/Solid**

Laboratory Control Sample (LCS) Report

					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Metals (QCLot: 1718330) - continued									
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	93.6	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	91.0	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	99.7	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	94.3	80.0	120	----
Speciated Metals (QCLot: 1718321)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	93.2	80.0	120	----
Volatile Organic Compounds (QCLot: 1720537)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	94.2	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	83.2	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	83.0	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	87.0	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	88.5	70.0	130	----
Hydrocarbons (QCLot: 1718323)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	712 mg/kg	102	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1470 mg/kg	98.2	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	796 mg/kg	94.8	70.0	130	----
Hydrocarbons (QCLot: 1720538)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	102	80.0	120	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1718324)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	94.3	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	94.7	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	92.1	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	98.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	89.3	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	99.7	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	103	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	94.4	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	100	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	92.7	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	94.9	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	93.8	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	99.3	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1718324) - continued									
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	89.5	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	98.1	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	91.2	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	91.0	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	93.2	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Cyanides (QCLot: 1718322)										
WT2430817-002	Anonymous	Cyanide, weak acid dissociable	----	E336A	1.16 mg/kg	1.25 mg/kg	92.5	70.0	130	----
Volatile Organic Compounds (QCLot: 1720537)										
WT2430847-002	Anonymous	Benzene	71-43-2	E611A	2.28 mg/kg	2.32 mg/kg	98.4	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.00 mg/kg	2.32 mg/kg	86.3	60.0	140	----
		Toluene	108-88-3	E611A	1.99 mg/kg	2.32 mg/kg	85.8	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.14 mg/kg	4.64 mg/kg	89.2	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.10 mg/kg	2.32 mg/kg	90.6	60.0	140	----
Hydrocarbons (QCLot: 1718323)										
WT2430817-001	Anonymous	F2 (C10-C16)	----	E601.SG-L	557 mg/kg	594 mg/kg	93.8	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1160 mg/kg	1230 mg/kg	94.7	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	ND mg/kg	----	ND	60.0	140	----
Hydrocarbons (QCLot: 1720538)										
WT2430847-002	Anonymous	F1 (C6-C10)	----	E581.F1	45.2 mg/kg	46.4 mg/kg	97.4	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1718324)										
WT2430817-001	Anonymous	Acenaphthene	83-32-9	E641A	0.407 mg/kg	0.419 mg/kg	97.1	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.404 mg/kg	0.419 mg/kg	96.5	50.0	140	----
		Anthracene	120-12-7	E641A	0.412 mg/kg	0.419 mg/kg	98.2	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.415 mg/kg	0.419 mg/kg	98.9	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.381 mg/kg	0.419 mg/kg	90.8	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.418 mg/kg	0.419 mg/kg	99.7	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.351 mg/kg	0.419 mg/kg	83.8	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.392 mg/kg	0.419 mg/kg	93.4	50.0	140	----
		Chrysene	218-01-9	E641A	0.398 mg/kg	0.419 mg/kg	94.9	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.408 mg/kg	0.419 mg/kg	97.3	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.401 mg/kg	0.419 mg/kg	95.6	50.0	140	----
		Fluorene	86-73-7	E641A	0.405 mg/kg	0.419 mg/kg	96.6	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.368 mg/kg	0.419 mg/kg	87.6	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.388 mg/kg	0.419 mg/kg	92.5	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.428 mg/kg	0.419 mg/kg	102	50.0	140	----
		Naphthalene	91-20-3	E641A	0.401 mg/kg	0.419 mg/kg	95.5	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.400 mg/kg	0.419 mg/kg	95.4	50.0	140	----
		Pyrene	129-00-0	E641A	0.402 mg/kg	0.419 mg/kg	95.8	50.0	140	----

Reference Material (RM) Report

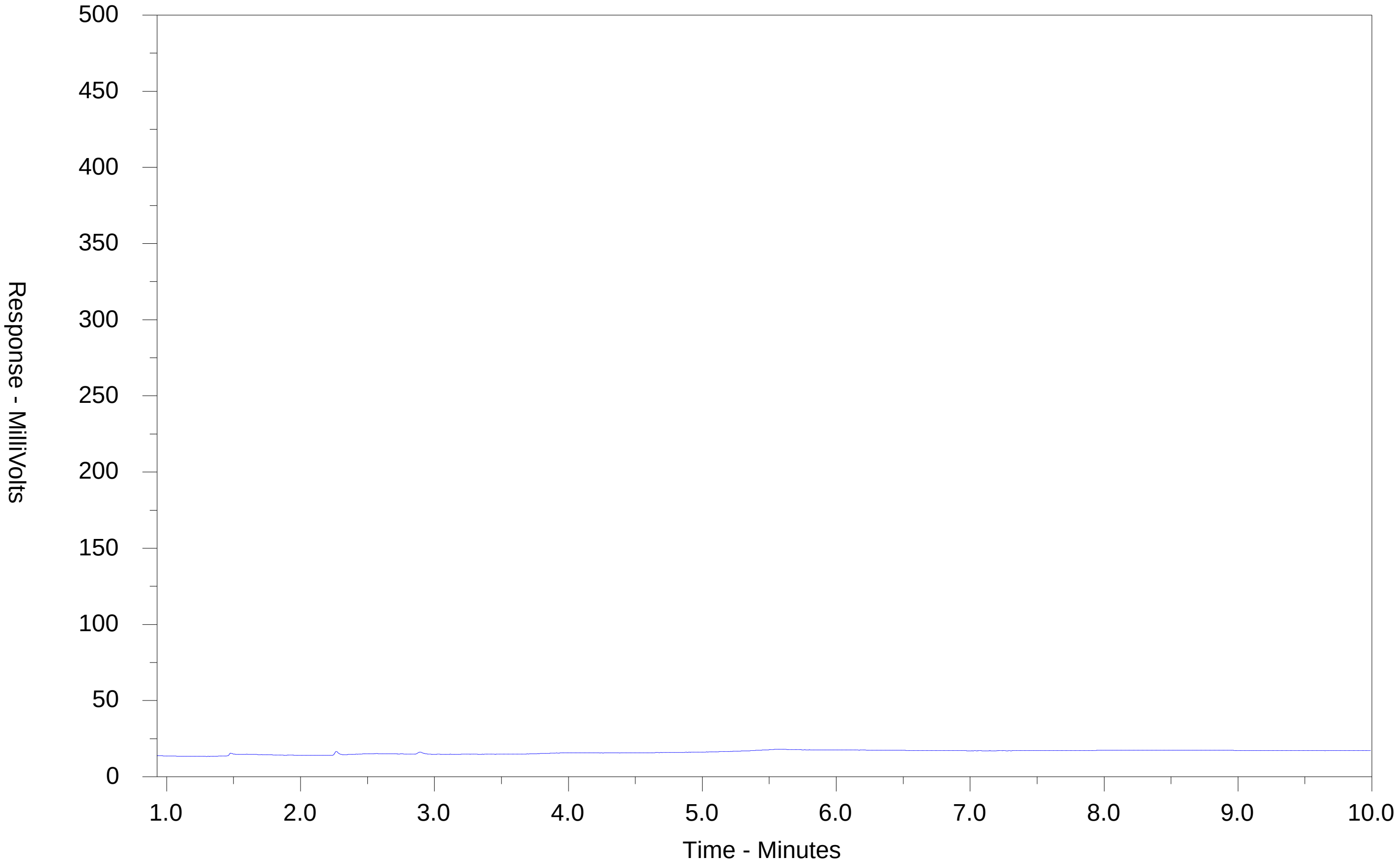
A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	*Recovery (%)*	*Recovery Limits (%)*		
Laboratory sample ID	*Reference Material ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*RM*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1718327)									
QC-1718327-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	97.1	70.0	130	----
Metals (QCLot: 1718326)									
QC-1718326-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	106	70.0	130	----
QC-1718326-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	107	70.0	130	----
QC-1718326-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	108	70.0	130	----
Metals (QCLot: 1718328)									
QC-1718328-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	83.6	60.0	140	----
Metals (QCLot: 1718329)									
QC-1718329-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	107	70.0	130	----
Metals (QCLot: 1718330)									
QC-1718330-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	86.9	70.0	130	----
QC-1718330-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	101	70.0	130	----
QC-1718330-003	RM	Barium	7440-39-3	E440C	788 mg/kg	96.4	70.0	130	----
QC-1718330-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	103	70.0	130	----
QC-1718330-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	102	70.0	130	----
QC-1718330-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	99.5	70.0	130	----
QC-1718330-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	91.2	70.0	130	----
QC-1718330-003	RM	Copper	7440-50-8	E440C	969 mg/kg	101	70.0	130	----
QC-1718330-003	RM	Lead	7439-92-1	E440C	919 mg/kg	95.3	70.0	130	----
QC-1718330-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	98.4	70.0	130	----
QC-1718330-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	105	70.0	130	----
QC-1718330-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	104	60.0	140	----
QC-1718330-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	92.6	70.0	130	----
QC-1718330-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	92.7	70.0	130	----
QC-1718330-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	87.8	70.0	130	----
QC-1718330-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	101	70.0	130	----
QC-1718330-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	97.2	70.0	130	----
Speciated Metals (QCLot: 1718321)									
QC-1718321-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	174 mg/kg	91.8	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2431125-001-E601.SG-L
Client Sample ID: BH4-24 SA 2B



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

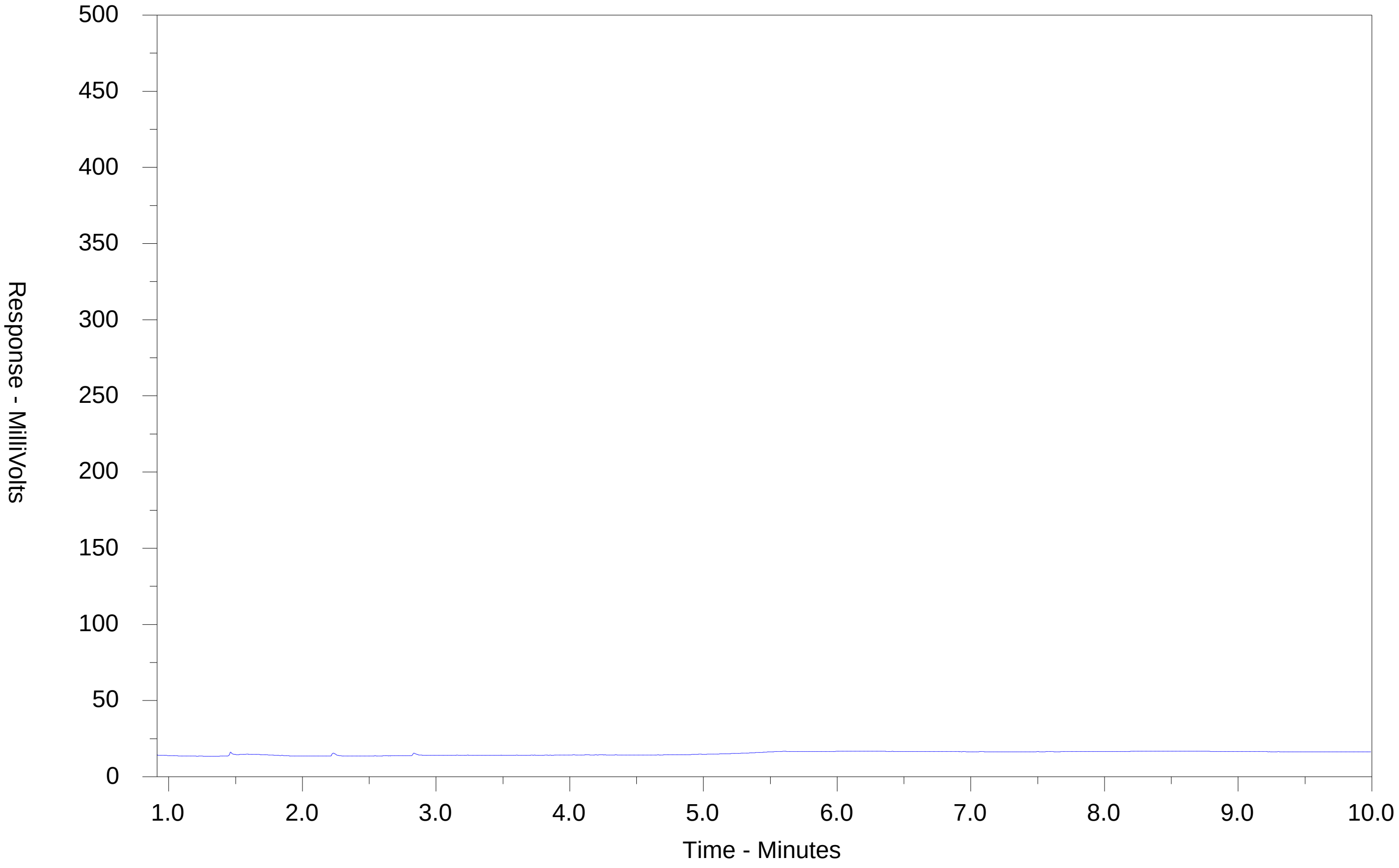
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2431125-002-E601.SG-L
Client Sample ID: BH4-24 SA 5



◄—F2—►	◄———F3———►	◄—F4—►	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease———→	
←——Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: **22 -**

Page 1 of 1

Environmental Division
Waterloo
Work Order Reference
WT2431125
Telephone : + 1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	City of Ottawa c/o WSP
Contact:	Jason Taylor
Phone:	613-866-8199
	Company address below will appear on the final report
Street:	800 Green Creek Drive
City/Province:	Ottawa, ON
Postal Code:	K1J 1K6
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax richard.barker@ottawa.ca
Email 2 jason.taylor@wsp.com
Email 3 robert.ireland@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax
Email 2

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge m
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge
☐ Same day [E2] if received by 10am M-S - 200% rush surc

Additional fees may apply to rush requests on wee

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, pl

Project Information

ALS Account # / Quote #:	WT2024GMOW1000001
Job #:	CA0039399.3386
PO / AFE:	
LSD:	City of Ottawa - Lansdowne Park

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): WT2431125

ALS Contact: Emily Smith

Sampler: Rob Ireland

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX,F1-F4	PAHs (O. Reg 153)	Metals & Inorganics (O. Reg 153)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH4-24 SA 2B	16-Oct-24	13:00	Soil	3	R	R	R			
	BH4-24 SA 5	16-Oct-24	13:55	Soil	3	R	R	R			
	BH4-24 SA 6	16-Oct-24	14:05	Soil	3				Hold		

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

Are samples taken from a Regulated DW System?
☐ YES ☐ NO

Are samples for human consumption/ use?
☐ YES ☐ NO

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

O. Reg 153 Table 3 RPI/ICC

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
13.1				9.8			

SHIPMENT RELEASE (client use)

Released by: Rob Ireland Date: 10/16/2024 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Cristal F Date: 16/10/24 Time: 15:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date: 10/18/24 Time: 1000

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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

VS-268 / SOL-838

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **WT2431879**
Client : **WSP Canada Inc.**
Contact : Jason Taylor
Address : 300-210 Colonnade Road South
Ottawa ON Canada K2E 7L5
Telephone : ----
Project : CA0039399.3386
PO : 24422-98891-S01
C-O-C number : ----
Sampler : RI
Site : City of Ottawa - Lansdowne Park
Quote number : Lansdowne Park c/o WSP
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 15
Laboratory : ALS Environmental - Waterloo
Account Manager : Costas Farassoglou
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : 613 225 8279
Date Samples Received : 24-Oct-2024 15:25
Issue Date : 31-Oct-2024 22:11

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E336A	24-Oct-2024	28-Oct-2024	14 days	4 days	✓	30-Oct-2024	14 days	2 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E336A	24-Oct-2024	28-Oct-2024	14 days	4 days	✓	30-Oct-2024	14 days	2 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E336A	21-Oct-2024	28-Oct-2024	14 days	7 days	✓	30-Oct-2024	14 days	2 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E336A	21-Oct-2024	28-Oct-2024	14 days	7 days	✓	30-Oct-2024	14 days	2 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH6-24 SA 2B-3	E581.F1	24-Oct-2024	29-Oct-2024	14 days	5 days	✓	29-Oct-2024	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH6-24 SA 4	E581.F1	24-Oct-2024	29-Oct-2024	14 days	5 days	✓	29-Oct-2024	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH5-24 SA 2	E581.F1	21-Oct-2024	29-Oct-2024	14 days	7 days	✓	29-Oct-2024	40 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH5-24 SA 3B	E581.F1	21-Oct-2024	29-Oct-2024	14 days	7 days	✓	29-Oct-2024	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E601.SG-L	24-Oct-2024	28-Oct-2024	14 days	4 days	✓	30-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E601.SG-L	24-Oct-2024	28-Oct-2024	14 days	4 days	✓	30-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E601.SG-L	21-Oct-2024	28-Oct-2024	14 days	7 days	✓	30-Oct-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E601.SG-L	21-Oct-2024	28-Oct-2024	14 days	7 days	✓	30-Oct-2024	40 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E487	24-Oct-2024	31-Oct-2024	180 days	6 days	✓	31-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E487	24-Oct-2024	31-Oct-2024	180 days	6 days	✓	31-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E487	21-Oct-2024	31-Oct-2024	180 days	9 days	✓	31-Oct-2024	180 days	1 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E487	21-Oct-2024	31-Oct-2024	180 days	9 days	✓	31-Oct-2024	180 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E510C	24-Oct-2024	30-Oct-2024	28 days	6 days	✓	31-Oct-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E510C	24-Oct-2024	30-Oct-2024	28 days	6 days	✓	31-Oct-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E510C	21-Oct-2024	30-Oct-2024	28 days	9 days	✓	31-Oct-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E510C	21-Oct-2024	30-Oct-2024	28 days	9 days	✓	31-Oct-2024	28 days	0 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E440C	24-Oct-2024	30-Oct-2024	180 days	6 days	✓	31-Oct-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E440C	24-Oct-2024	30-Oct-2024	180 days	6 days	✓	31-Oct-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E440C	21-Oct-2024	30-Oct-2024	180 days	9 days	✓	31-Oct-2024	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E440C	21-Oct-2024	30-Oct-2024	180 days	9 days	✓	31-Oct-2024	180 days	10 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E484	24-Oct-2024	31-Oct-2024	180 days	6 days	✓	31-Oct-2024	180 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E484	24-Oct-2024	31-Oct-2024	180 days	7 days	✓	31-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E484	21-Oct-2024	31-Oct-2024	180 days	9 days	✓	31-Oct-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E484	21-Oct-2024	31-Oct-2024	180 days	9 days	✓	31-Oct-2024	180 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E100-L	24-Oct-2024	31-Oct-2024	30 days	6 days	✓	31-Oct-2024	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E100-L	24-Oct-2024	31-Oct-2024	30 days	7 days	✓	31-Oct-2024	30 days	7 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E100-L	21-Oct-2024	31-Oct-2024	30 days	9 days	✓	31-Oct-2024	30 days	10 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E100-L	21-Oct-2024	31-Oct-2024	30 days	9 days	✓	31-Oct-2024	30 days	10 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E144	24-Oct-2024	----	----	----		28-Oct-2024	----	4 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E144	24-Oct-2024	----	----	----		28-Oct-2024	----	4 days	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E144	21-Oct-2024	----	----	----		28-Oct-2024	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E144	21-Oct-2024	----	----	----		28-Oct-2024	----	7 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E108A	24-Oct-2024	28-Oct-2024	30 days	4 days	✓	30-Oct-2024	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E108A	24-Oct-2024	28-Oct-2024	30 days	4 days	✓	30-Oct-2024	30 days	6 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E108A	21-Oct-2024	28-Oct-2024	30 days	7 days	✓	30-Oct-2024	30 days	9 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E108A	21-Oct-2024	28-Oct-2024	30 days	7 days	✓	30-Oct-2024	30 days	9 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E641A	24-Oct-2024	28-Oct-2024	60 days	4 days	✓	29-Oct-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E641A	24-Oct-2024	28-Oct-2024	60 days	4 days	✓	29-Oct-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E641A	21-Oct-2024	28-Oct-2024	60 days	7 days	✓	29-Oct-2024	40 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E641A	21-Oct-2024	28-Oct-2024	60 days	7 days	✓	29-Oct-2024	40 days	1 days	✓
Sample Data : Sample Hold Fee for Soil/Solid										
Glass soil methanol vial [ON MECP] BH6-24 SA 5	HOLD	24-Oct-2024	----	----	----		28-Oct-2024	----	4 days	
Sample Data : Sample Hold Fee for Soil/Solid										
Glass soil methanol vial [ON MECP] BH5-24 SA 4	HOLD	21-Oct-2024	----	----	----		28-Oct-2024	----	7 days	
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 2B-3	E532	24-Oct-2024	28-Oct-2024	30 days	4 days	✓	29-Oct-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH6-24 SA 4	E532	24-Oct-2024	28-Oct-2024	30 days	4 days	✓	29-Oct-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 2	E532	21-Oct-2024	28-Oct-2024	30 days	7 days	✓	29-Oct-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH5-24 SA 3B	E532	21-Oct-2024	28-Oct-2024	30 days	7 days	✓	29-Oct-2024	7 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH6-24 SA 2B-3	E611A	24-Oct-2024	29-Oct-2024	14 days	5 days	✓	29-Oct-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH6-24 SA 4	E611A	24-Oct-2024	29-Oct-2024	14 days	5 days	✓	29-Oct-2024	40 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH5-24 SA 2	E611A	21-Oct-2024	29-Oct-2024	14 days	7 days	✓	29-Oct-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH5-24 SA 3B	E611A	21-Oct-2024	29-Oct-2024	14 days	7 days	✓	29-Oct-2024	40 days	0 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Boron-Hot Water Extractable by ICPOES	E487	1736012	1	14	7.1	5.0	✓
BTEX by Headspace GC-MS	E611A	1736710	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1736711	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1736008	1	9	11.1	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1736010	1	14	7.1	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1736005	1	14	7.1	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1736015	1	9	11.1	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1736016	1	9	11.1	5.0	✓
Moisture Content by Gravimetry	E144	1736596	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1736007	1	9	11.1	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1736013	1	14	7.1	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1736011	1	14	7.1	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1736014	1	9	11.1	5.0	✓
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1736012	2	14	14.2	10.0	✓
BTEX by Headspace GC-MS	E611A	1736710	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1736711	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1736008	1	9	11.1	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1736010	2	14	14.2	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1736005	2	14	14.2	10.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1736015	2	9	22.2	10.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1736016	2	9	22.2	10.0	✓
Moisture Content by Gravimetry	E144	1736596	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1736007	1	9	11.1	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1736013	1	14	7.1	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1736011	2	14	14.2	10.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1736014	1	9	11.1	5.0	✓
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1736012	1	14	7.1	5.0	✓
BTEX by Headspace GC-MS	E611A	1736710	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1736711	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1736008	1	9	11.1	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1736010	1	14	7.1	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1736005	1	14	7.1	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1736015	1	9	11.1	5.0	✓

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1736016	1	9	11.1	5.0	✓
Moisture Content by Gravimetry	E144	1736596	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1736007	1	9	11.1	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1736011	1	14	7.1	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1736014	1	9	11.1	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1736710	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1736711	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1736008	1	9	11.1	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1736007	1	9	11.1	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1736014	1	9	11.1	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Boron-Hot Water Extractable by ICPOES	E487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs in Soil/solid by Hex:Ace GC-MS	E641A ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.
Sample Hold Fee for Soil/Solid	HOLD ALS Environmental - Waterloo	Soil/Solid		Fee for storing sample to meet sample integrity requirements and holding times.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry ’s law.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

QUALITY CONTROL REPORT

Work Order	: **WT2431879**	Page	: 1 of 14
Client	: WSP Canada Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jason Taylor	Account Manager	: Costas Farassoglou
Address	: 800 Green Creek Drive Ottawa ON Canada K1J 1A6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 613 225 8279
Project	: CA0039399.3386	Date Samples Received	: 24-Oct-2024 15:25
PO	: 24422-98891-S01	Date Analysis Commenced	: 28-Oct-2024
C-O-C number	: ----	Issue Date	: 31-Oct-2024 22:10
Sampler	: RI		
Site	: City of Ottawa - Lansdowne Park		
Quote number	: Lansdowne Park c/o WSP		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Danielle Gravel	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Karanpartap Singh	Project Manager Assistant	Waterloo Administration, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Niral Patel		Waterloo Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1736010)											
HA2402687-004	Anonymous	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	3.31 mS/cm	3380	2.09%	20%	----
Physical Tests (QC Lot: 1736013)											
HA2402687-002	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	6.81	6.80	0.147%	5%	----
Physical Tests (QC Lot: 1736596)											
HA2402687-004	Anonymous	Moisture	----	E144	0.25	%	17.3	16.4	5.31%	20%	----
Cyanides (QC Lot: 1736014)											
WT2431879-001	BH5-24 SA 2	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1736011)											
HA2402687-004	Anonymous	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	157	175	10.8%	30%	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	51.5	53.9	4.55%	30%	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	413	413	0.00%	30%	----
Metals (QC Lot: 1736012)											
HA2402687-002	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	5.23	4.61	12.7%	40%	----
Metals (QC Lot: 1736015)											
WT2431879-001	BH5-24 SA 2	Mercury	7439-97-6	E510C	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
Metals (QC Lot: 1736016)											
WT2431879-001	BH5-24 SA 2	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	0.87	0.82	6.00%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	31.4	28.3	10.4%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.20	0.16	0.04	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.021	0.022	0.0010	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	9.65	9.40	2.59%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	4.30	3.81	12.0%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	11.8	11.5	2.69%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	2.88	2.66	7.93%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.62	0.56	11.4%	40%	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	6.09	5.63	7.73%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1736016) - continued											
WT2431879-001	BH5-24 SA 2	Thallium	7440-28-0	E440C	0.050	mg/kg	0.067	0.058	0.008	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.442	0.514	15.1%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	18.7	18.0	3.45%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	16.2	14.9	8.40%	30%	----
Speciated Metals (QC Lot: 1736005)											
HA2402687-001	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1736710)											
WT2431737-002	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1736008)											
WT2431879-001	BH5-24 SA 2	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1736711)											
WT2431737-002	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1736007)											
WT2431879-001	BH5-24 SA 2	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	**Client sample ID**	**Analyte**	**CAS Number**	**Method**	**LOR**	**Unit**	**Original Result**	**Duplicate Result**	**RPD(%) or Difference**	**Duplicate Limits**	**Qualifier**
Polycyclic Aromatic Hydrocarbons (QC Lot: 1736007) - continued											
WT2431879-001	BH5-24 SA 2	Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1736010)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 1736596)						
Moisture	----	E144	0.25	%	<0.25	----
Cyanides (QCLot: 1736014)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 1736011)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1736012)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1736015)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1736016)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Speciated Metals (QCLot: 1736005)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds (QCLot: 1736710)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1736008)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons (QCLot: 1736711)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1736007)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1736010)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	93.5	90.0	110	----
Physical Tests (QCLot: 1736013)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1736596)									
Moisture	----	E144	0.25	%	50 %	99.5	90.0	110	----
Cyanides (QCLot: 1736014)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	92.6	80.0	120	----
Metals (QCLot: 1736011)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	104	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	102	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	100	80.0	120	----
Metals (QCLot: 1736012)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	105	70.0	130	----
Metals (QCLot: 1736015)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	102	80.0	120	----
Metals (QCLot: 1736016)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	100	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	106	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	105	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	97.1	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	96.1	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	97.2	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	100	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	99.5	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	102	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	100	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	98.2	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	102	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	98.6	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Metals (QCLot: 1736016) - continued									
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	99.9	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	97.7	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	103	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	96.6	80.0	120	----
Speciated Metals (QCLot: 1736005)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	94.3	80.0	120	----
Volatile Organic Compounds (QCLot: 1736710)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	100	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	88.3	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	85.5	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	93.8	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	95.3	70.0	130	----
Hydrocarbons (QCLot: 1736008)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	712 mg/kg	86.5	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1470 mg/kg	89.1	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	796 mg/kg	87.0	70.0	130	----
Hydrocarbons (QCLot: 1736711)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	100	80.0	120	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1736007)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	86.5	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	86.7	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	87.9	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	90.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	85.6	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	97.7	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	87.4	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	94.7	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	82.8	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	86.6	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	86.1	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	87.9	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	90.9	60.0	130	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1736007) - continued									
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	83.8	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	94.3	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	88.1	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	85.3	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	85.2	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Cyanides (QCLot: 1736014)										
WT2431879-001	BH5-24 SA 2	Cyanide, weak acid dissociable	----	E336A	1.19 mg/kg	1.23 mg/kg	96.8	70.0	130	----
Volatile Organic Compounds (QCLot: 1736710)										
WT2431737-002	Anonymous	Benzene	71-43-2	E611A	1.98 mg/kg	1.91 mg/kg	103	60.0	140	----
		Ethylbenzene	100-41-4	E611A	1.81 mg/kg	1.91 mg/kg	94.6	60.0	140	----
		Toluene	108-88-3	E611A	1.75 mg/kg	1.91 mg/kg	91.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	3.81 mg/kg	3.83 mg/kg	99.5	60.0	140	----
		Xylene, o-	95-47-6	E611A	1.92 mg/kg	1.91 mg/kg	100	60.0	140	----
Hydrocarbons (QCLot: 1736008)										
WT2431879-001	BH5-24 SA 2	F2 (C10-C16)	----	E601.SG-L	520 mg/kg	569 mg/kg	91.4	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1050 mg/kg	1180 mg/kg	89.2	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	594 mg/kg	636 mg/kg	93.3	60.0	140	----
Hydrocarbons (QCLot: 1736711)										
WT2431737-002	Anonymous	F1 (C6-C10)	----	E581.F1	36.7 mg/kg	38.3 mg/kg	95.9	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1736007)										
WT2431879-001	BH5-24 SA 2	Acenaphthene	83-32-9	E641A	0.376 mg/kg	0.399 mg/kg	94.1	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.372 mg/kg	0.399 mg/kg	93.0	50.0	140	----
		Anthracene	120-12-7	E641A	0.376 mg/kg	0.399 mg/kg	94.1	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.395 mg/kg	0.399 mg/kg	99.0	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.363 mg/kg	0.399 mg/kg	91.0	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.424 mg/kg	0.399 mg/kg	106	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.368 mg/kg	0.399 mg/kg	92.2	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.409 mg/kg	0.399 mg/kg	102	50.0	140	----
		Chrysene	218-01-9	E641A	0.368 mg/kg	0.399 mg/kg	92.3	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.372 mg/kg	0.399 mg/kg	93.3	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.369 mg/kg	0.399 mg/kg	92.4	50.0	140	----
		Fluorene	86-73-7	E641A	0.376 mg/kg	0.399 mg/kg	94.3	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.382 mg/kg	0.399 mg/kg	95.6	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.368 mg/kg	0.399 mg/kg	92.1	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.413 mg/kg	0.399 mg/kg	103	50.0	140	----
		Naphthalene	91-20-3	E641A	0.383 mg/kg	0.399 mg/kg	95.9	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.368 mg/kg	0.399 mg/kg	92.3	50.0	140	----
		Pyrene	129-00-0	E641A	0.365 mg/kg	0.399 mg/kg	91.3	50.0	140	----

Reference Material (RM) Report

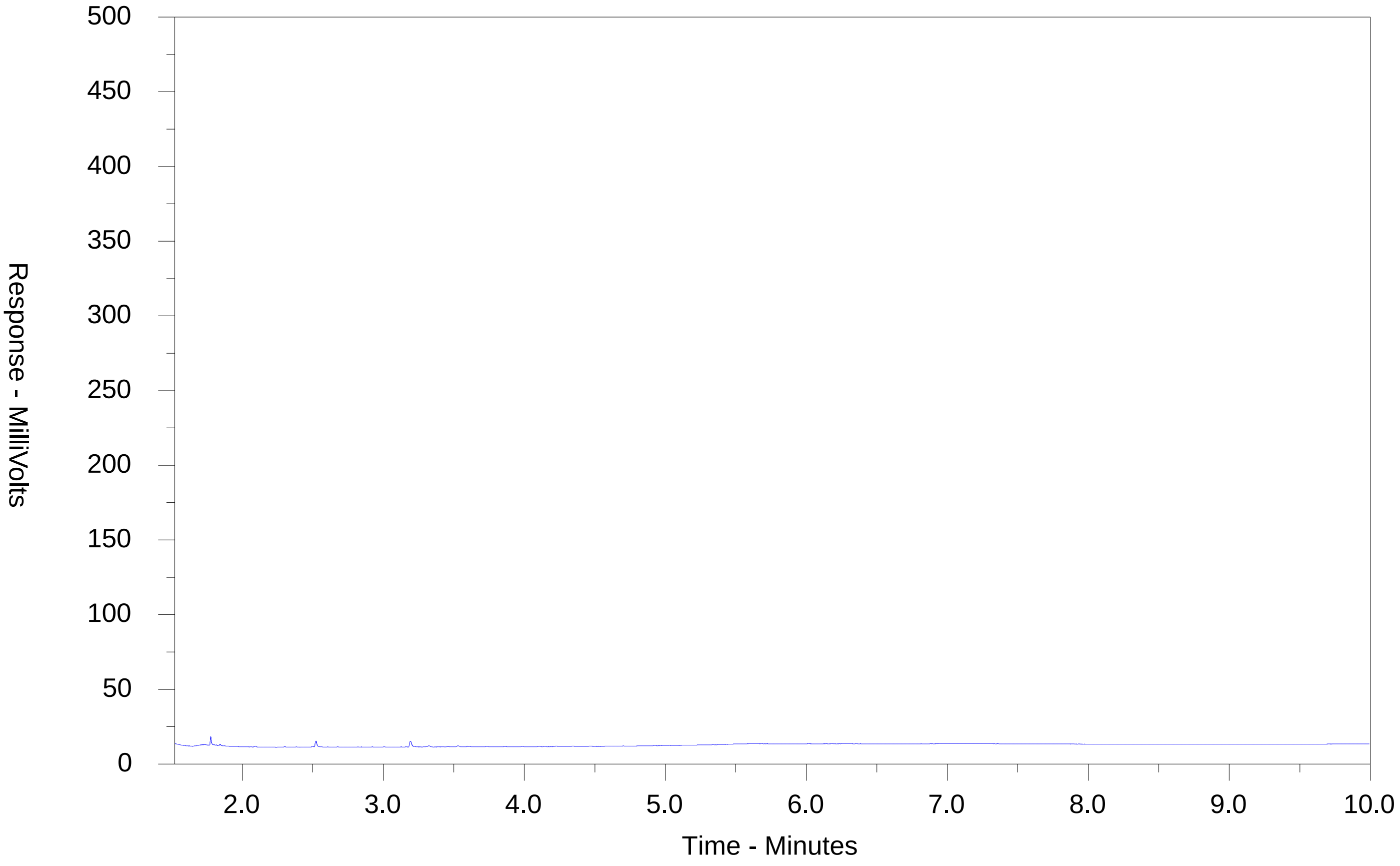
A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix**:**

					Reference Material (RM) Report				
					RM Target	*Recovery (%)*	*Recovery Limits (%)*		
Laboratory sample ID	*Reference Material ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*RM*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1736010)									
QC-1736010-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	99.5	70.0	130	----
Metals (QCLot: 1736011)									
QC-1736011-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	108	70.0	130	----
QC-1736011-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	111	70.0	130	----
QC-1736011-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	104	70.0	130	----
Metals (QCLot: 1736012)									
QC-1736012-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	101	60.0	140	----
Metals (QCLot: 1736015)									
QC-1736015-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	100	70.0	130	----
Metals (QCLot: 1736016)									
QC-1736016-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	87.1	70.0	130	----
QC-1736016-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	96.3	70.0	130	----
QC-1736016-003	RM	Barium	7440-39-3	E440C	788 mg/kg	104	70.0	130	----
QC-1736016-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	93.6	70.0	130	----
QC-1736016-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	100	70.0	130	----
QC-1736016-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	99.0	70.0	130	----
QC-1736016-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	97.8	70.0	130	----
QC-1736016-003	RM	Copper	7440-50-8	E440C	969 mg/kg	104	70.0	130	----
QC-1736016-003	RM	Lead	7439-92-1	E440C	919 mg/kg	93.4	70.0	130	----
QC-1736016-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	97.0	70.0	130	----
QC-1736016-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	109	70.0	130	----
QC-1736016-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	98.0	60.0	140	----
QC-1736016-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	91.0	70.0	130	----
QC-1736016-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	89.8	70.0	130	----
QC-1736016-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	91.8	70.0	130	----
QC-1736016-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	98.2	70.0	130	----
QC-1736016-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	96.0	70.0	130	----
Speciated Metals (QCLot: 1736005)									
QC-1736005-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	174 mg/kg	87.8	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID:	WT2431879-001-E601.SG-L
Client Sample ID:	BH5-24 SA 2



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

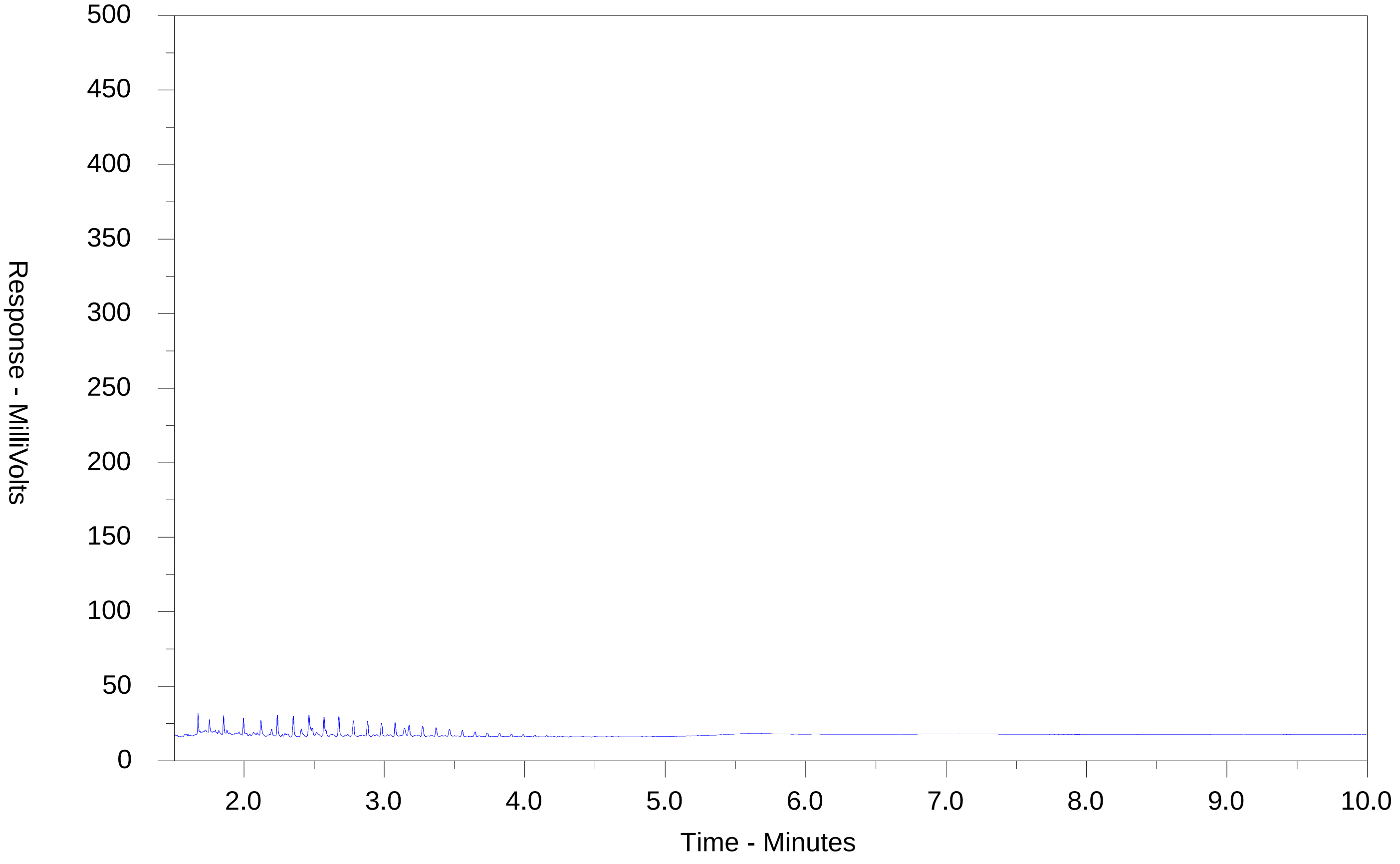
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2431879-002-E601.SG-L
Client Sample ID: BH5-24 SA 3B



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

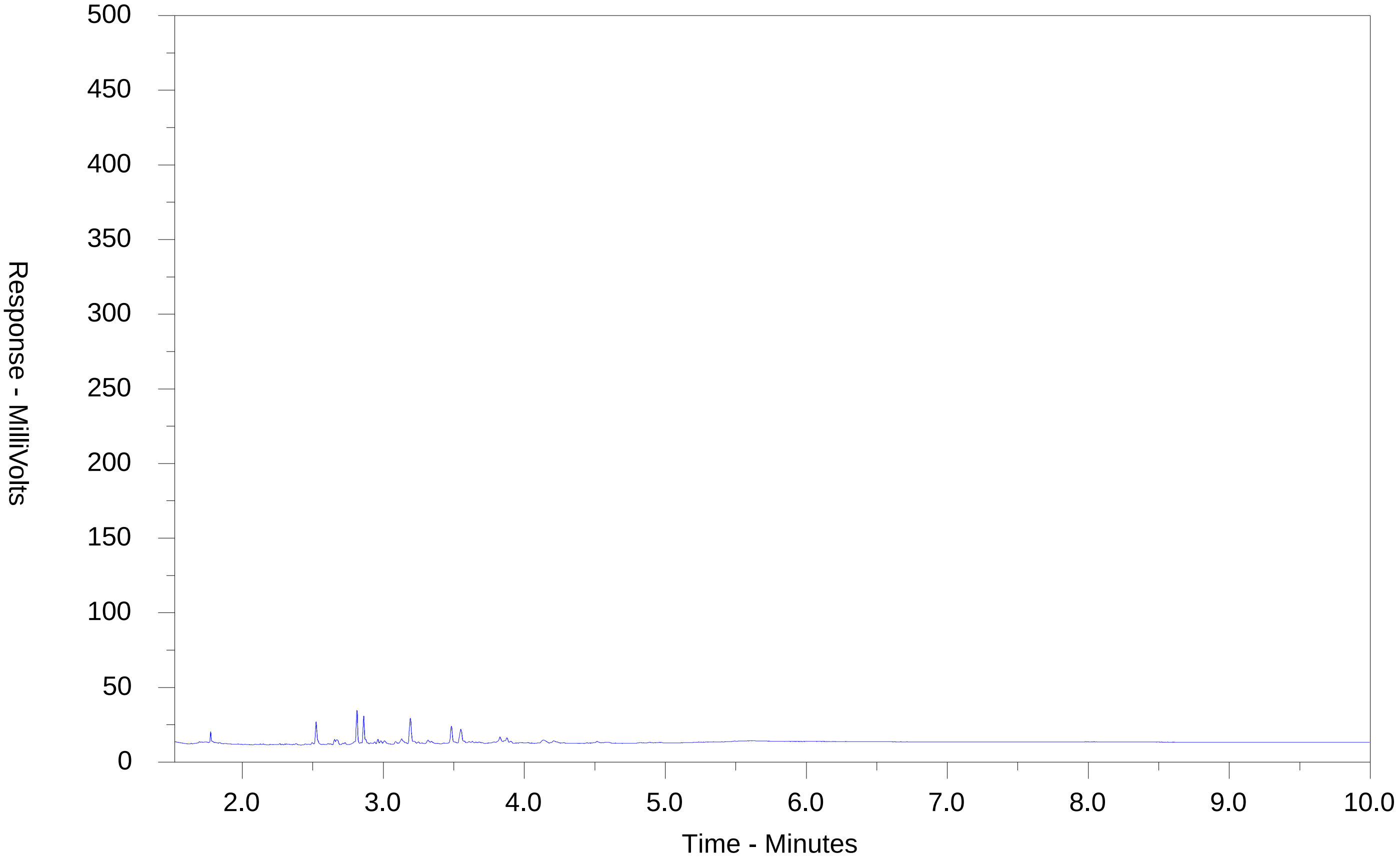
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2431879-004-E601.SG-L
Client Sample ID: BH6-24 SA 2B-3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

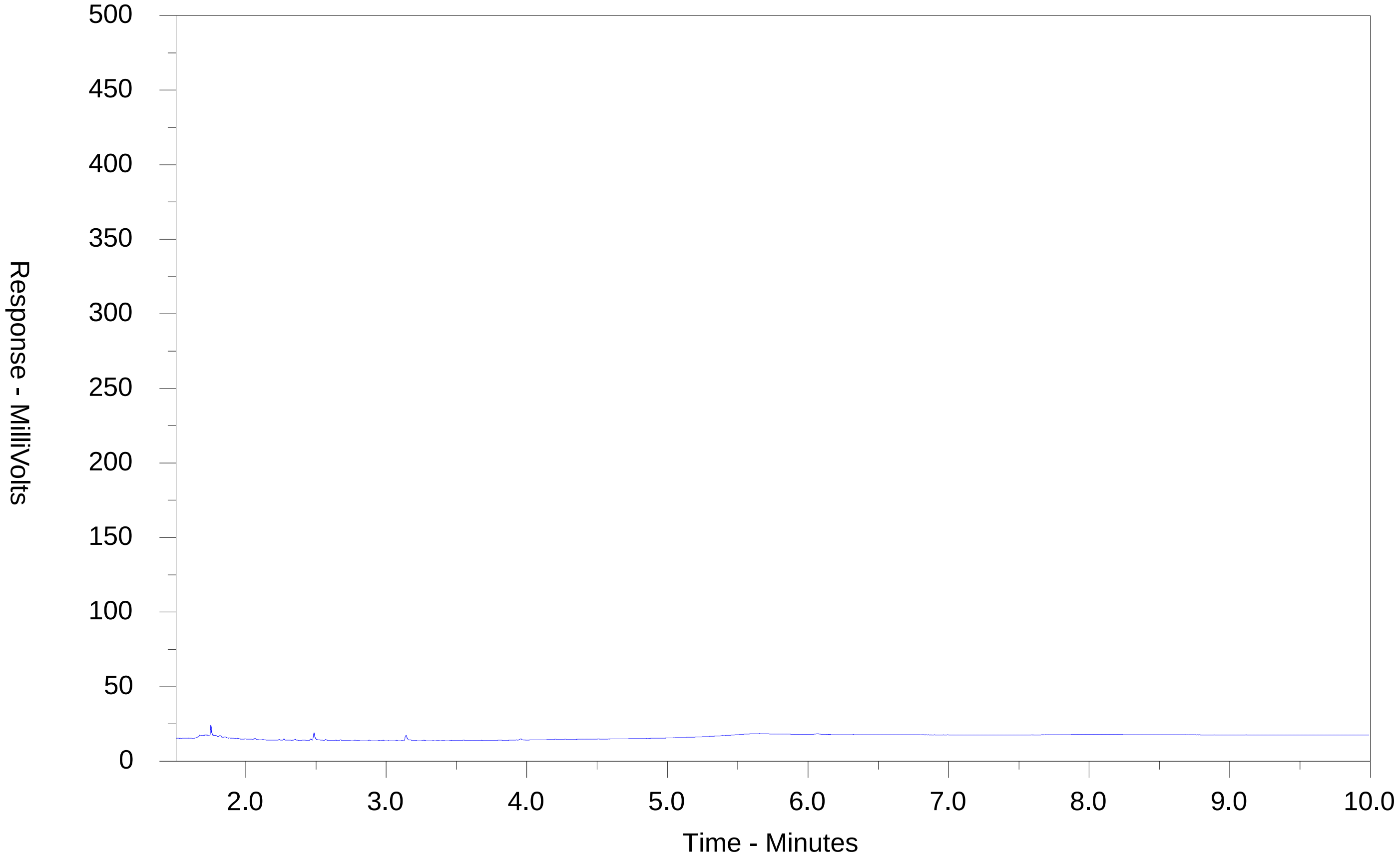
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2431879-005-E601.SG-L
Client Sample ID: BH6-24 SA 4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

ALS

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: **22 -**

Page 1 of 1

VM

Environmental Division
Waterloo
Work Order Reference
WT2431879

Telephone : +1 519 886 6910

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

Company:	City of Ottawa c/o WSP
Contact:	Jason Taylor
Phone:	613-866-8199

Company address below will appear on the final report

Street:	800 Green Creek Drive
City/Province:	Ottawa, ON
Postal Code:	K1J 1K6
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax richard.barker@ottawa.ca

Email 2 jason.taylor@wsp.com

Email 3 robert.ireland@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minir
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge min
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge mir
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge mir
- ☐ Same day [E2] if received by 10am M-S - 200% rush surchs

Additional fees may apply to rush requests on weeke

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, plea

Project Information

ALS Account # / Quote #:	WT2024GMOW1000001
Job #:	CA0039399.3386
PO / AFE:	
LSD:	City of Ottawa - Lansdowne Park

JD

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Emily Smith **Sampler:** Rob Ireland

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX,F1-F4	PAHs (O. Reg 153)	Metals & Inorganics (O. Reg 153)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRE	SUSPECTED HAZARD (see notes)
	BH5-24 SA 2	21-Oct-24	17:50	Soil	3	R	R	R			
	BH5-24 SA 3B	21-Oct-24	19:00	Soil	3	R	R	R			
	BH5-24 SA 4	21-Oct-24	20:00	Soil	3				Hold		
	BH6-24 SA 2B-3	24-Oct-24	13:00	Soil	3	R	R	R			
	BH6-24 SA 4	24-Oct-24	13:20	Soil	3	R	R	R			
	BH6-24 SA 5	24-Oct-24	13:40	Soil	3				Hold		

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

Are samples taken from a Regulated DW System?

☐ YES ☐ NO

Are samples for human consumption/ use?

☐ YES ☐ NO

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

O. Reg 153 Table 3 RPI/ICC

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☒ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INIITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
14.5				7.2			

SHIPMENT RELEASE (client use)

Released by: Rob Ireland Date: 10/24/2024 Time: 15:20

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Costa F Date: 24/10/24 Time: 15:25

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: AP Date: 25 OCT 24 Time: 10:02

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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

ALS Canada Ltd.

right solutions.
right partner.

CERTIFICATE OF ANALYSIS

Work Order	**WT2432203**		
Client	**City of Ottawa**	Laboratory	ALS Environmental - Waterloo
Contact	Richard Barker	Account Manager	Costas Farassoglou
Address	300-210 Colonnade Road South Ottawa Ontario Canada K2E 7L5	Address	60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	343 227 0233	Telephone	613 225 8279
Project	CA0039399	Date Samples Received	29-Oct-2024 13:45
PO	24422-98891-S01	Date Analysis Commenced	30-Oct-2024
C-O-C number	20-1010299	Issue Date	05-Nov-2024 18:42
Sampler	CLIENT		
Site	CITY OF OTTAWA-LANDSDOWNE PARK		
Quote number	Lansdowne Park c/o WSP		
No. of samples received	3		
No. of samples analysed	3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Niral Patel		Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key:

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/kg	milligrams per kilogram
-	no units
%	percent
mS/cm	millisiemens per centimetre
pH units	pH units
mg/L	milligrams per litre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

				Client sample ID	BH-AA/MW24-5 SS1	BH-AA/MW24-5 SS2	BH-AA/MW24-5 SS3	----	----
				Client sampling date / time	29-Oct-2024 00:00	29-Oct-2024 00:00	29-Oct-2024 00:00	----	----
Analyte	*CAS Number*	*Method/Lab/Accreditation*	*LOR*	*Unit*	WT2432203-001	WT2432203-002	WT2432203-003	----	----
					Result	Result	Result	----	----
Physical Tests									
Conductivity (1:2 leachate)	----	E100-L/WT	0.00500	mS/cm	0.694	0.130	0.0942	----	----
Moisture	----	E144/WT	0.25	%	7.64	16.4	10.9	----	----
pH (1:2 soil:CaCl2-aq)	----	E108A/WT	0.10	pH units	7.81	7.95	8.05	----	----
Cyanides									
Cyanide, weak acid dissociable	----	E336A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Fixed-Ratio Extractables									
Calcium, soluble ion content	7440-70-2	E484/WT	0.50	mg/L	25.0	1.70	1.57	----	----
Magnesium, soluble ion content	7439-95-4	E484/WT	0.50	mg/L	2.11	0.89	<0.50	----	----
Sodium, soluble ion content	17341-25-2	E484/WT	0.50	mg/L	91.3	8.39	2.95	----	----
Sodium adsorption ratio [SAR]	----	E484/WT	0.10	-	4.71	1.30	0.65	----	----
Metals									
Antimony	7440-36-0	E440C/WT	0.10	mg/kg	<0.10	<0.10	<0.10	----	----
Arsenic	7440-38-2	E440C/WT	0.10	mg/kg	1.23	0.65	1.18	----	----
Barium	7440-39-3	E440C/WT	0.50	mg/kg	44.6	18.0	44.6	----	----
Beryllium	7440-41-7	E440C/WT	0.10	mg/kg	0.26	0.11	0.24	----	----
Boron	7440-42-8	E440C/WT	5.0	mg/kg	5.8	<5.0	6.1	----	----
Boron, hot water soluble	7440-42-8	E487/WT	0.10	mg/kg	0.91	<0.10	<0.10	----	----
Cadmium	7440-43-9	E440C/WT	0.020	mg/kg	0.073	<0.020	0.036	----	----
Chromium	7440-47-3	E440C/WT	0.50	mg/kg	18.7	5.46	12.1	----	----
Cobalt	7440-48-4	E440C/WT	0.10	mg/kg	5.43	1.79	6.03	----	----
Copper	7440-50-8	E440C/WT	0.50	mg/kg	12.2	6.66	20.0	----	----

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	BH-AA/MW24-5 SS1	BH-AA/MW24-5 SS2	BH-AA/MW24-5 SS3	----	----
				Client sampling date / time	29-Oct-2024 00:00	29-Oct-2024 00:00	29-Oct-2024 00:00	----	----
					WT2432203-001	**WT2432203-002**	**WT2432203-003**	**----**	**----**
					Result	Result	Result	----	----
Metals									
Lead	7439-92-1	E440C/WT	0.50	mg/kg	7.60	1.52	4.21	----	----
Mercury	7439-97-6	E510C/WT	0.0050	mg/kg	0.0158	<0.0050	<0.0050	----	----
Molybdenum	7439-98-7	E440C/WT	0.10	mg/kg	0.35	0.31	0.69	----	----
Nickel	7440-02-0	E440C/WT	0.50	mg/kg	11.1	2.92	9.50	----	----
Selenium	7782-49-2	E440C/WT	0.20	mg/kg	<0.20	<0.20	<0.20	----	----
Silver	7440-22-4	E440C/WT	0.10	mg/kg	<0.10	<0.10	<0.10	----	----
Thallium	7440-28-0	E440C/WT	0.050	mg/kg	0.082	<0.050	0.098	----	----
Uranium	7440-61-1	E440C/WT	0.050	mg/kg	0.432	0.379	0.600	----	----
Vanadium	7440-62-2	E440C/WT	0.20	mg/kg	29.2	14.2	21.5	----	----
Zinc	7440-66-6	E440C/WT	2.0	mg/kg	32.1	8.3	23.2	----	----
Speciated Metals									
Chromium, hexavalent [Cr VI]	18540-29-9	E532/WT	0.10	mg/kg	0.14	<0.10	<0.10	----	----
Volatile Organic Compounds									
Benzene	71-43-2	E611A/WT	0.0050	mg/kg	<0.0050	<0.0050	<0.0050	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg	<0.015	<0.015	<0.015	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg	<0.030	<0.030	<0.030	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg	<0.030	<0.030	<0.030	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
BTEX, total	----	E611A/WT	0.10	mg/kg	<0.10	<0.10	<0.10	----	----

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

				Client sample ID	BH-AA/MW24-5 SS1	BH-AA/MW24-5 SS2	BH-AA/MW24-5 SS3	----	----
				Client sampling date / time	29-Oct-2024 00:00	29-Oct-2024 00:00	29-Oct-2024 00:00	----	----
Analyte	*CAS Number*	*Method/Lab/Accreditation*	*LOR*	*Unit*	**WT2432203-001**	**WT2432203-002**	**WT2432203-003**	**----**	**----**
					Result	Result	Result	----	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/WT	5.0	mg/kg	<5.0	<5.0	<5.0	----	----
F2 (C10-C16)	----	E601.SG-L/WT	10	mg/kg	<10	<10	<10	----	----
F3 (C16-C34)	----	E601.SG-L/WT	50	mg/kg	51	<50	<50	----	----
F4 (C34-C50)	----	E601.SG-L/WT	50	mg/kg	<50	<50	<50	----	----
F1-BTEX	----	EC580/WT	5.0	mg/kg	<5.0	<5.0	<5.0	----	----
F2-Naphthalene	----	EC600/WT	25	mg/kg	<25	<25	<25	----	----
F3-PAH	n/a	EC600/WT	50	mg/kg	50	<50	<50	----	----
Hydrocarbons, total (C6-C50)	n/a	EC581/WT	80	mg/kg	<80	<80	<80	----	----
Chromatogram to baseline at nC50	n/a	E601.SG-L/WT	-	-	YES	YES	YES	----	----
Hydrocarbons Surrogates									
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG-L/WT	1.0	%	96.4	99.8	94.7	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.F1/WT	1.0	%	83.3	108	91.2	----	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%	91.6	93.9	89.8	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%	95.6	91.0	90.3	----	----
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	83-32-9	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Acenaphthylene	208-96-8	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Anthracene	120-12-7	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Benz(a)anthracene	56-55-3	E641A/WT	0.050	mg/kg	0.054	<0.050	<0.050	----	----
Benzo(a)pyrene	50-32-8	E641A/WT	0.050	mg/kg	0.076	<0.050	<0.050	----	----

Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid)**

				Client sample ID	**BH-AA/MW24-5 SS1**	**BH-AA/MW24-5 SS2**	**BH-AA/MW24-5 SS3**	----	----
				Client sampling date / time	29-Oct-2024 00:00	29-Oct-2024 00:00	29-Oct-2024 00:00	----	----
Analyte	*CAS Number*	*Method/Lab/Accreditation*	*LOR*	*Unit*	**WT2432203-001**	**WT2432203-002**	**WT2432203-003**	----	----
					Result	Result	Result	----	----
Polycyclic Aromatic Hydrocarbons									
Benzo(b+j)fluoranthene	n/a	E641A/WT	0.050	mg/kg	0.106	<0.050	<0.050	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/WT	0.050	mg/kg	0.070	<0.050	<0.050	----	----
Benzo(k)fluoranthene	207-08-9	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Chrysene	218-01-9	E641A/WT	0.050	mg/kg	0.052	<0.050	<0.050	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Fluoranthene	206-44-0	E641A/WT	0.050	mg/kg	0.097	<0.050	<0.050	----	----
Fluorene	86-73-7	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/WT	0.050	mg/kg	0.071	<0.050	<0.050	----	----
Methylnaphthalene, 1-	90-12-0	E641A/WT	0.030	mg/kg	<0.030	<0.030	<0.030	----	----
Methylnaphthalene, 1+2-	----	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Methylnaphthalene, 2-	91-57-6	E641A/WT	0.030	mg/kg	<0.030	<0.030	<0.030	----	----
Naphthalene	91-20-3	E641A/WT	0.010	mg/kg	<0.010	<0.010	<0.010	----	----
Phenanthrene	85-01-8	E641A/WT	0.050	mg/kg	<0.050	<0.050	<0.050	----	----
Pyrene	129-00-0	E641A/WT	0.050	mg/kg	0.086	<0.050	<0.050	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
Acridine-d9	34749-75-2	E641A/WT	0.1	%	92.6	89.0	93.0	----	----
Chrysene-d12	1719-03-5	E641A/WT	0.1	%	87.8	87.3	91.3	----	----
Naphthalene-d8	1146-65-2	E641A/WT	0.1	%	93.6	94.1	95.0	----	----
Phenanthrene-d10	1517-22-2	E641A/WT	0.1	%	98.1	96.8	99.6	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **WT2432203**
Client : **WSP Canada Inc.**
Contact : Jason Taylor
Address : 300-210 Colonnade Road South
Ottawa ON Canada K2E 7L5
Telephone : ----
Project : CA0039399
PO : 24422-98891-S01
C-O-C number : 20-1010299
Sampler : CLIENT
Site : CITY OF OTTAWA-LANDSDOWNE PARK
Quote number : Lansdowne Park c/o WSP
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 13
Laboratory : ALS Environmental - Waterloo
Account Manager : Costas Farassoglou
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : 613 225 8279
Date Samples Received : 29-Oct-2024 13:45
Issue Date : 05-Nov-2024 19:02

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Polycyclic Aromatic Hydrocarbons	Anonymous	Anonymous	Benz(a)anthracene	56-55-3	E641A	50.7 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	Anonymous	Anonymous	Benzo(a)pyrene	50-32-8	E641A	51.9 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	Anonymous	Anonymous	Benzo(b+j)fluoranthene	n/a	E641A	52.0 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	Anonymous	Anonymous	Phenanthrene	85-01-8	E641A	51.1 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	*Description*
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E336A	29-Oct-2024	01-Nov-2024	14 days	4 days	✓	04-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E336A	29-Oct-2024	01-Nov-2024	14 days	4 days	✓	04-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E336A	29-Oct-2024	01-Nov-2024	14 days	4 days	✓	04-Nov-2024	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH-AA/MW24-5 SS1	E581.F1	29-Oct-2024	31-Oct-2024	40 days	3 days	✓	01-Nov-2024	40 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH-AA/MW24-5 SS2	E581.F1	29-Oct-2024	31-Oct-2024	40 days	3 days	✓	01-Nov-2024	40 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial BH-AA/MW24-5 SS3	E581.F1	29-Oct-2024	31-Oct-2024	40 days	3 days	✓	01-Nov-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E601.SG-L	29-Oct-2024	31-Oct-2024	14 days	2 days	✓	04-Nov-2024	40 days	4 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E601.SG-L	29-Oct-2024	31-Oct-2024	14 days	2 days	✓	04-Nov-2024	40 days	4 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E601.SG-L	29-Oct-2024	31-Oct-2024	14 days	2 days	✓	04-Nov-2024	40 days	4 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E487	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E487	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E487	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E510C	29-Oct-2024	05-Nov-2024	28 days	7 days	✓	05-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E510C	29-Oct-2024	05-Nov-2024	28 days	7 days	✓	05-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E510C	29-Oct-2024	05-Nov-2024	28 days	7 days	✓	05-Nov-2024	28 days	0 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E440C	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	8 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E440C	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	8 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E440C	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	8 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E484	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E484	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	1 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E484	29-Oct-2024	05-Nov-2024	180 days	7 days	✓	05-Nov-2024	180 days	1 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E100-L	29-Oct-2024	05-Nov-2024	30 days	7 days	✓	05-Nov-2024	30 days	8 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E100-L	29-Oct-2024	05-Nov-2024	30 days	7 days	✓	05-Nov-2024	30 days	8 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E100-L	29-Oct-2024	05-Nov-2024	30 days	7 days	✓	05-Nov-2024	30 days	8 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E144	29-Oct-2024	----	----	----		01-Nov-2024	----	4 days	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E144	29-Oct-2024	----	----	----		01-Nov-2024	----	4 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E144	29-Oct-2024	----	----	----		01-Nov-2024	----	4 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E108A	29-Oct-2024	30-Oct-2024	30 days	2 days	✓	04-Nov-2024	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E108A	29-Oct-2024	30-Oct-2024	30 days	2 days	✓	04-Nov-2024	30 days	7 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E108A	29-Oct-2024	30-Oct-2024	30 days	2 days	✓	04-Nov-2024	30 days	7 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E641A	29-Oct-2024	31-Oct-2024	14 days	2 days	✓	01-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E641A	29-Oct-2024	31-Oct-2024	14 days	2 days	✓	01-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E641A	29-Oct-2024	31-Oct-2024	14 days	2 days	✓	01-Nov-2024	40 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS1	E532	29-Oct-2024	31-Oct-2024	30 days	2 days	✓	01-Nov-2024	7 days	1 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS2	E532	29-Oct-2024	31-Oct-2024	30 days	2 days	✓	01-Nov-2024	7 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap BH-AA/MW24-5 SS3	E532	29-Oct-2024	31-Oct-2024	30 days	2 days	✓	01-Nov-2024	7 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH-AA/MW24-5 SS1	E611A	29-Oct-2024	31-Oct-2024	40 days	3 days	✓	01-Nov-2024	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH-AA/MW24-5 SS2	E611A	29-Oct-2024	31-Oct-2024	40 days	3 days	✓	01-Nov-2024	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH-AA/MW24-5 SS3	E611A	29-Oct-2024	31-Oct-2024	40 days	3 days	✓	01-Nov-2024	40 days	3 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Boron-Hot Water Extractable by ICPOES	E487	1740029	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1743546	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1743547	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1740019	1	8	12.5	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1740023	1	19	5.2	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1741940	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1740030	1	8	12.5	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1740031	1	8	12.5	5.0	✓
Moisture Content by Gravimetry	E144	1745402	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1740018	1	8	12.5	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1740021	1	19	5.2	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1740022	1	19	5.2	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1744976	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1740029	2	8	25.0	10.0	✓
BTEX by Headspace GC-MS	E611A	1743546	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1743547	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1740019	1	8	12.5	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1740023	2	19	10.5	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1741940	2	20	10.0	10.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1740030	2	8	25.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1740031	2	8	25.0	10.0	✓
Moisture Content by Gravimetry	E144	1745402	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1740018	1	8	12.5	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1740021	1	19	5.2	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1740022	2	19	10.5	10.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1744976	1	20	5.0	5.0	✓
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1740029	1	8	12.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1743546	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1743547	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1740019	1	8	12.5	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1740023	1	19	5.2	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1741940	1	20	5.0	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1740030	1	8	12.5	5.0	✓

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1740031	1	8	12.5	5.0	✓
Moisture Content by Gravimetry	E144	1745402	1	20	5.0	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1740018	1	8	12.5	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1740022	1	19	5.2	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1744976	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1743546	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1743547	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1740019	1	8	12.5	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1740018	1	8	12.5	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1744976	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Boron-Hot Water Extractable by ICPOES	E487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs in Soil/solid by Hex:Ace GC-MS	E641A ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

QUALITY CONTROL REPORT

Work Order	:**WT2432203**	Page	: 1 of 13
Client	:WSP Canada Inc.	Laboratory	:ALS Environmental - Waterloo
Contact	:Jason Taylor	Account Manager	:Costas Farassoglou
Address	:800 Green Creek Drive Ottawa ON Canada K1J 1A6	Address	:60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	:----	Telephone	:613 225 8279
Project	:CA0039399	Date Samples Received	:29-Oct-2024 13:45
PO	:24422-98891-S01	Date Analysis Commenced	:30-Oct-2024
C-O-C number	:20-1010299	Issue Date	:05-Nov-2024 18:43
Sampler	:CLIENT		
Site	:CITY OF OTTAWA-LANDSDOWNE PARK		
Quote number	:Lansdowne Park c/o WSP		
No. of samples received	:3		
No. of samples analysed	:3		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Niral Patel		Waterloo Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1740021)											
WT2432046-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	8.61	8.79	2.07%	5%	----
Physical Tests (QC Lot: 1740023)											
WT2432203-003	BH-AA/MW24-5 SS3	Conductivity (1:2 leachate)	----	E100-L	5.00	µS/cm	0.0942 mS/cm	87.5	7.37%	20%	----
Physical Tests (QC Lot: 1745402)											
CG2416117-002	Anonymous	Moisture	----	E144	0.25	%	16.3	16.0	1.95%	20%	----
Cyanides (QC Lot: 1744976)											
TY2412313-003	Anonymous	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1740022)											
WT2432203-003	BH-AA/MW24-5 SS3	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	1.57	1.52	0.05	Diff <2x LOR	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	2.95	2.45	0.50	Diff <2x LOR	----
Metals (QC Lot: 1740029)											
WT2432203-002	BH-AA/MW24-5 SS2	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	<0.10	<0.10	0.0008	Diff <2x LOR	----
Metals (QC Lot: 1740030)											
WT2432046-001	Anonymous	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0270	0.0309	13.8%	40%	----
Metals (QC Lot: 1740031)											
WT2432046-001	Anonymous	Antimony	7440-36-0	E440C	0.10	mg/kg	0.24	0.22	0.02	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	4.41	4.30	2.50%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	62.7	63.2	0.854%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.36	0.36	0.006	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	13.0	12.7	0.3	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	1.10	1.10	0.470%	30%	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	23.4	23.6	0.736%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	3.43	3.40	0.721%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	14.8	15.5	4.92%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	100	101	0.595%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	1.39	1.47	5.11%	40%	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	9.26	9.60	3.69%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1740031) - continued											
WT2432046-001	Anonymous	Thallium	7440-28-0	E440C	0.050	mg/kg	0.108	0.101	0.007	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.732	0.734	0.348%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	23.2	23.0	0.661%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	635	688	8.00%	30%	----
Speciated Metals (QC Lot: 1741940)											
KS2404290-005	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	0.17	0.18	0.01	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1743546)											
WT2432551-001	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1740019)											
WT2432046-001	Anonymous	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	403	435	7.63%	40%	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	1110	1100	0.768%	40%	----
Hydrocarbons (QC Lot: 1743547)											
WT2432551-001	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1740018)											
WT2432046-001	Anonymous	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	0.109	0.059	Diff <2x LOR	J
		Anthracene	120-12-7	E641A	0.050	mg/kg	0.127	0.225	0.098	Diff <2x LOR	J
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	0.641	1.08	50.7%	50%	DUP-H
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	0.741	1.26	51.9%	50%	DUP-H
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	1.03	1.75	52.0%	50%	DUP-H
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	0.619	0.887	35.6%	50%	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	0.405	0.670	49.3%	50%	----
		Chrysene	218-01-9	E641A	0.050	mg/kg	0.635	1.02	46.4%	50%	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	0.129	0.205	0.076	Diff <2x LOR	J
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	1.23	1.83	39.4%	50%	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	0.597	0.919	42.5%	50%	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
					Laboratory Duplicate (DUP) Report						
Polycyclic Aromatic Hydrocarbons (QC Lot: 1740018) - continued											
WT2432046-001	Anonymous	Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	0.363	0.612	51.1%	50%	DUP-H
		Pyrene	129-00-0	E641A	0.050	mg/kg	1.06	1.56	38.7%	50%	----

Qualifiers

Qualifier	*Description*
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1740023)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Physical Tests (QCLot: 1745402)						
Moisture	----	E144	0.25	%	<0.25	----
Cyanides (QCLot: 1744976)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 1740022)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1740029)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1740030)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1740031)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Speciated Metals (QCLot: 1741940)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds (QCLot: 1743546)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1740019)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons (QCLot: 1743547)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1740018)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1740021)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1740023)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	98.2	90.0	110	----
Physical Tests (QCLot: 1745402)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Cyanides (QCLot: 1744976)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	88.8	80.0	120	----
Metals (QCLot: 1740022)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	106	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	103	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	102	80.0	120	----
Metals (QCLot: 1740029)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	103	70.0	130	----
Metals (QCLot: 1740030)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	100	80.0	120	----
Metals (QCLot: 1740031)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	100	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	103	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	97.0	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	87.9	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	88.7	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	93.6	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	96.1	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	94.3	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	95.2	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	97.2	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	101	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	95.0	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	98.8	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	98.0	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Metals (QCLot: 1740031) - continued									
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	95.2	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	93.3	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	98.6	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	92.3	80.0	120	----
Speciated Metals (QCLot: 1741940)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	82.2	80.0	120	----
Volatile Organic Compounds (QCLot: 1743546)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	92.9	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	84.1	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	86.2	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	89.6	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	87.9	70.0	130	----
Hydrocarbons (QCLot: 1740019)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	712 mg/kg	100	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1470 mg/kg	98.7	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	796 mg/kg	98.3	70.0	130	----
Hydrocarbons (QCLot: 1743547)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	96.4	80.0	120	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1740018)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	90.3	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	86.6	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	84.7	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	106	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	79.4	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	103	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	96.7	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	98.4	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	100	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	85.9	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	84.5	60.0	130	----
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	86.1	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	93.4	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1740018) - continued									
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	86.3	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	96.7	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	89.6	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	84.0	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	83.7	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		*Recovery (%)*	*Recovery Limits (%)*		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Cyanides (QCLot: 1744976)										
TY2412313-003	Anonymous	Cyanide, weak acid dissociable	----	E336A	1.10 mg/kg	1.26 mg/kg	87.9	70.0	130	----
Volatile Organic Compounds (QCLot: 1743546)										
WT2432551-001	Anonymous	Benzene	71-43-2	E611A	2.14 mg/kg	2.21 mg/kg	96.8	60.0	140	----
		Ethylbenzene	100-41-4	E611A	1.92 mg/kg	2.21 mg/kg	87.3	60.0	140	----
		Toluene	108-88-3	E611A	1.96 mg/kg	2.21 mg/kg	89.0	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.09 mg/kg	4.41 mg/kg	92.7	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.02 mg/kg	2.21 mg/kg	91.5	60.0	140	----
Hydrocarbons (QCLot: 1740019)										
WT2432046-001	Anonymous	F2 (C10-C16)	----	E601.SG-L	563 mg/kg	567 mg/kg	99.3	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1160 mg/kg	1170 mg/kg	99.1	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	ND mg/kg	----	ND	60.0	140	----
Hydrocarbons (QCLot: 1743547)										
WT2432551-001	Anonymous	F1 (C6-C10)	----	E581.F1	42.8 mg/kg	44.1 mg/kg	97.0	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1740018)										
WT2432046-001	Anonymous	Acenaphthene	83-32-9	E641A	0.340 mg/kg	0.397 mg/kg	85.6	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.334 mg/kg	0.397 mg/kg	84.2	50.0	140	----
		Anthracene	120-12-7	E641A	0.362 mg/kg	0.397 mg/kg	91.1	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	ND mg/kg	----	ND	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	ND mg/kg	----	ND	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	ND mg/kg	----	ND	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	ND mg/kg	----	ND	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.359 mg/kg	0.397 mg/kg	90.5	50.0	140	----
		Chrysene	218-01-9	E641A	ND mg/kg	----	ND	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.311 mg/kg	0.397 mg/kg	78.4	50.0	140	----
		Fluoranthene	206-44-0	E641A	ND mg/kg	----	ND	50.0	140	----
		Fluorene	86-73-7	E641A	0.341 mg/kg	0.397 mg/kg	86.0	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	ND mg/kg	----	ND	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.318 mg/kg	0.397 mg/kg	80.2	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.359 mg/kg	0.397 mg/kg	90.5	50.0	140	----
		Naphthalene	91-20-3	E641A	0.337 mg/kg	0.397 mg/kg	85.0	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.361 mg/kg	0.397 mg/kg	90.9	50.0	140	----
		Pyrene	129-00-0	E641A	ND mg/kg	----	ND	50.0	140	----

Reference Material (RM) Report

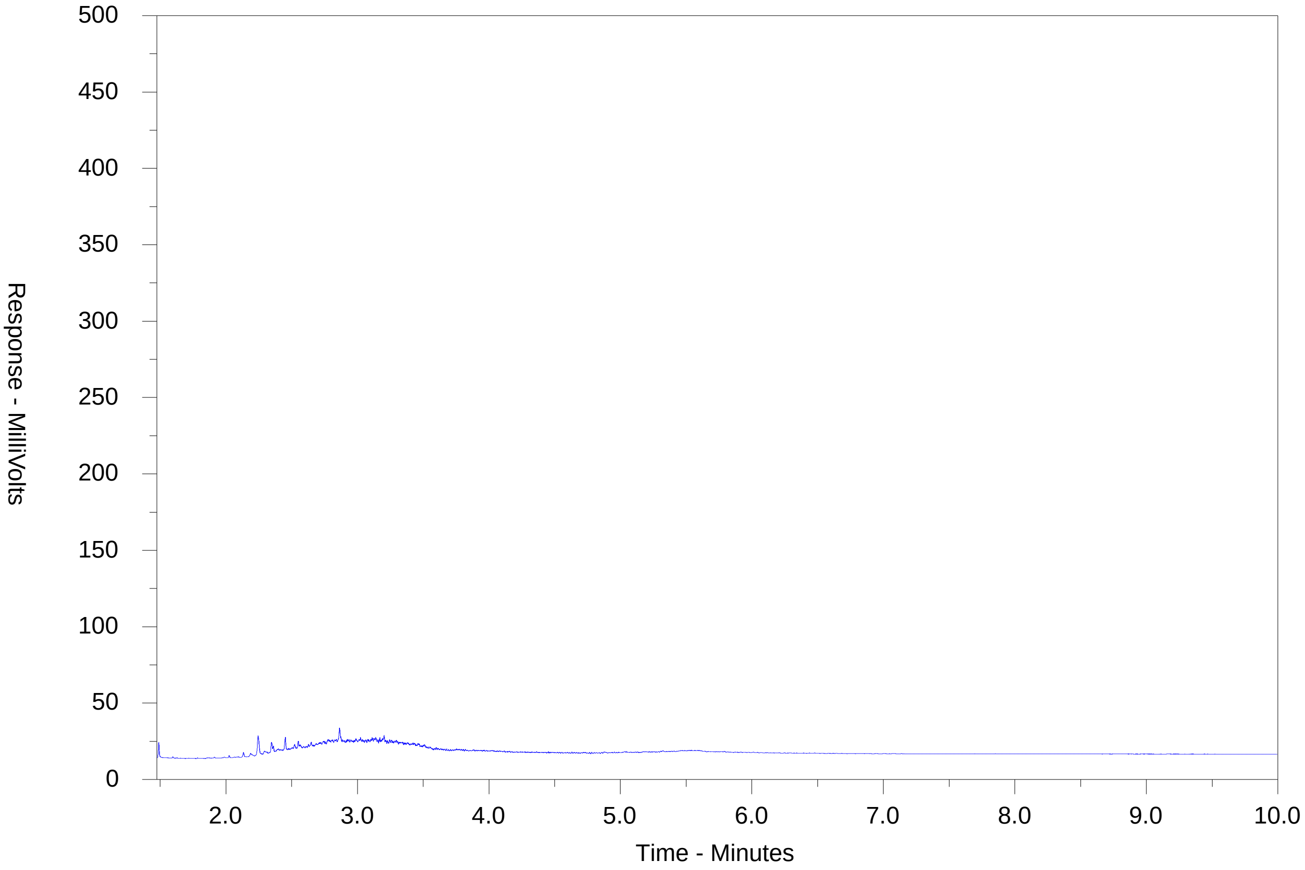
A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Physical Tests (QCLot: 1740023)									
QC-1740023-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	106	70.0	130	----
Metals (QCLot: 1740022)									
QC-1740022-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	115	70.0	130	----
QC-1740022-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	115	70.0	130	----
QC-1740022-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	104	70.0	130	----
Metals (QCLot: 1740029)									
QC-1740029-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	115	60.0	140	----
Metals (QCLot: 1740030)									
QC-1740030-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	97.7	70.0	130	----
Metals (QCLot: 1740031)									
QC-1740031-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	94.5	70.0	130	----
QC-1740031-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	99.5	70.0	130	----
QC-1740031-003	RM	Barium	7440-39-3	E440C	788 mg/kg	100.0	70.0	130	----
QC-1740031-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	90.4	70.0	130	----
QC-1740031-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	96.8	70.0	130	----
QC-1740031-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	96.3	70.0	130	----
QC-1740031-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	95.6	70.0	130	----
QC-1740031-003	RM	Copper	7440-50-8	E440C	969 mg/kg	102	70.0	130	----
QC-1740031-003	RM	Lead	7439-92-1	E440C	919 mg/kg	91.9	70.0	130	----
QC-1740031-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	97.6	70.0	130	----
QC-1740031-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	106	70.0	130	----
QC-1740031-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	96.4	60.0	140	----
QC-1740031-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	92.6	70.0	130	----
QC-1740031-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	91.7	70.0	130	----
QC-1740031-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	89.1	70.0	130	----
QC-1740031-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	97.6	70.0	130	----
QC-1740031-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	94.0	70.0	130	----
Speciated Metals (QCLot: 1741940)									
QC-1741940-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	174 mg/kg	90.4	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432203-001-E601.SG-L
Client Sample ID: BH-AA/MW24-5 SS1



←F2→←F3→←F4→

nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F

Gasoline → ← Motor Oils/Lube Oils/Grease →
← Diesel/Jet Fuels →

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

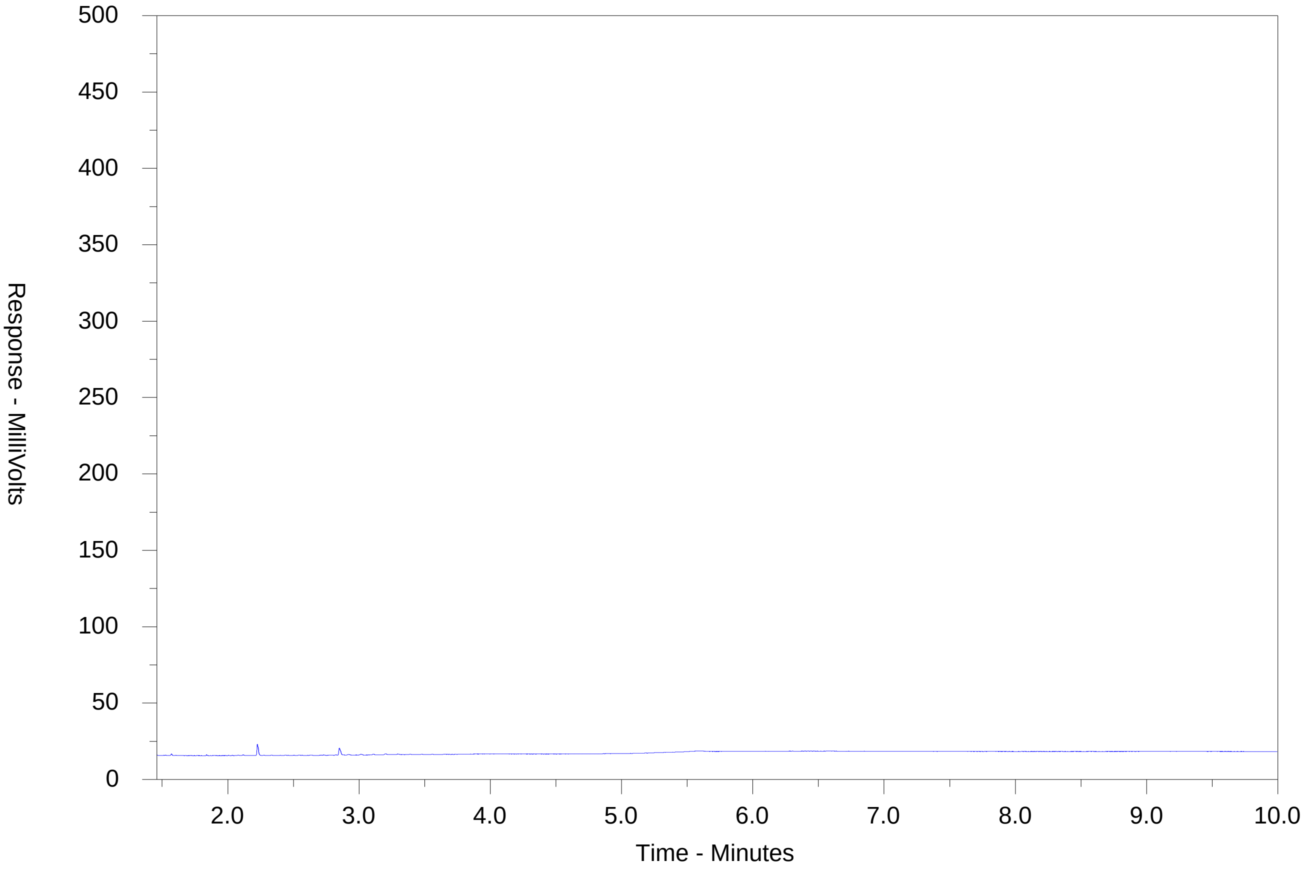
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432203-002-E601.SG-L
Client Sample ID: BH-AA/MW24-5 SS2



←F2→←F3→←F4→

nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F

Gasoline → ← Motor Oils/Lube Oils/Grease →

← Diesel/Jet Fuels →

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

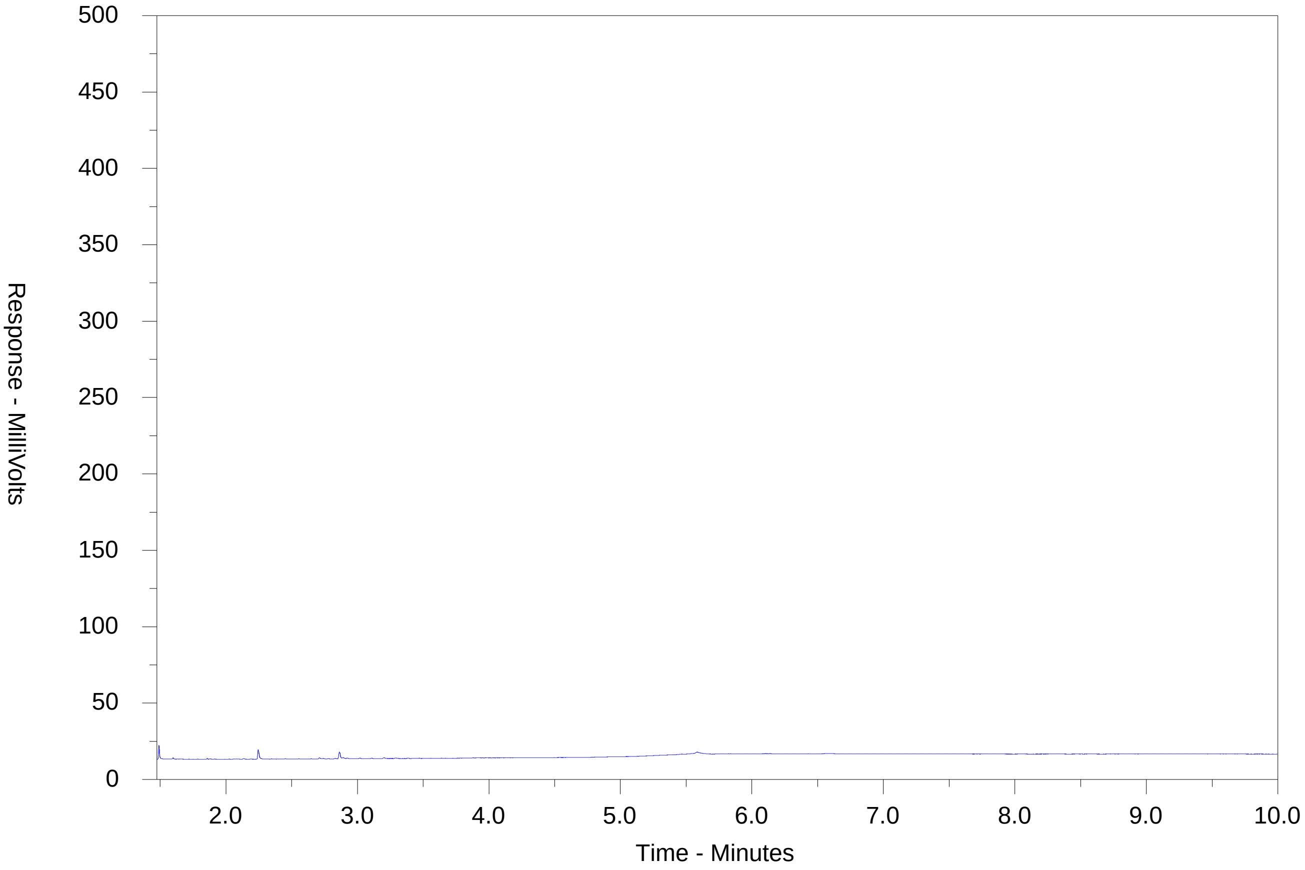
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432203-003-E601.SG-L
Client Sample ID: BH-AA/MW24-5 SS3



←F2→	←	F3→	←F4→
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease→	
← Diesel/Jet Fuels→			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 1010299

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Pag

Environmental Division
Waterloo
Work Order Reference
WT2432203

Telephone : +1 519 886 6910

Report To Contact and company name below will appear on the final report
Company: City of Ottawa c/o WSP
Contact: Jason Taylor
Phone: 613.866.8199
Company address below will appear on the final report
Street: 800 Green Creek Drive
City/Province: Ottawa, ON
Postal Code: K1J 1K6

Invoice To Same as Report To ☐ YES ☐ NO
Copy of Invoice with Report ☐ YES ☐ NO
Company:
Contact:

Reports / Recipients
Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
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Turnaround Time (TAT) Requested
☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minim
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minin
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minin
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minin
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. A may apply to rush requests on weekends, statutory holidays and non

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, pleas

Project Information
ALS Account # / Quote #: WT2024GMOW100001
Job #: CA0039399
PO / AFE:
LSD: City of Ottawa - Lansdowne Park

ALS Lab Work Order # (ALS use only): WT2432203

Oil and Gas Required Fields (client use)
AFE/Cost Center:
PO#
Major/Minor Code:
Routing Code:
Requisitioner:
Location:
ALS Contact:
Sampler:

Analysis R

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX, F1-F4	PAHs (0.20g/153)	Metals+inorganics (0.20g/153)											SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH-AA/MW24-5 SS1	29.10.24		S	3	X	X	X													
	BH-AA/MW24-5 SS2	29.10.24		S	3	X	X	X													
	BH-AA/MW24-5 SS3	29.10.24		S	3	X	X	X													

Drinking Water (DW) Samples[1] (client use)
Are samples taken from a Regulated DW System?
☐ YES ☐ NO
Are samples for human consumption/ use?
☐ YES ☐ NO

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

SAMPLE RECEIPT DETAILS (ALS use only)
Cooling Method: ☐ NONE ☐ ICE ☒ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A
INITIAL COOLER TEMPERATURES °C: 18.2
FINAL COOLER TEMPERATURES °C: 3.2

SHIPMENT RELEASE (client use)
Released by: Brian Clark
Date:
Time:

INITIAL SHIPMENT RECEPTION (ALS use only)
Received by: Gustav F
Date: 29/10/24
Time: 13:45

FINAL SHIPMENT RECEPTION (ALS use only)
Received by:
Date: 10/30/24
Time: 1000

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SOL009, VS004

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2432752**	Page	: 1 of 18
Client	: **WSP Canada Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Jason Taylor	Account Manager	: Costas Farassoglou
Address	: 300-210 Colonnade Road South Ottawa ON Canada K2E 7L5	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 613 225 8279
Project	: CA0039399.3386	Date Samples Received	: 01-Nov-2024 15:20
PO	: 24422-98891-S01	Issue Date	: 07-Nov-2024 19:44
C-O-C number	: ----		
Sampler	: Client		
Site	: City of Ottawa - Lansdowne Park		
Quote number	: Lansdowne Park c/o WSP		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E336A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E336A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E336A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E336A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E336A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	14 days	3 days	✓
Cyanides : WAD Cyanide (0.01M NaOH Extraction)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E336A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	14 days	3 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH8-24-SS10	E581.F1	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH8-24-SS3	E581.F1	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH8-24-SS4	E581.F1	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] BH8-24-SS5	E581.F1	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] DUP-24-1	E581.F1	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass soil methanol vial [ON MECP] DUP-24-2	E581.F1	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F4G by Gravimetry (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E601.F4G-L	01-Nov-2024	04-Nov-2024	14 days	4 days	✓	07-Nov-2024	40 days	3 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E601.SG-L	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E601.SG-L	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E601.SG-L	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	40 days	2 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*	*Analysis Date*	*Holding Times* *Rec*	*Holding Times* *Actual*	*Eval*
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E601.SG-L	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E601.SG-L	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	40 days	2 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E601.SG-L	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	06-Nov-2024	40 days	2 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E487	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E487	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E487	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E487	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E487	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Boron-Hot Water Extractable by ICPOES										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E487	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E510C	01-Nov-2024	07-Nov-2024	28 days	6 days	✓	07-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E510C	01-Nov-2024	07-Nov-2024	28 days	6 days	✓	07-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E510C	01-Nov-2024	07-Nov-2024	28 days	6 days	✓	07-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E510C	01-Nov-2024	07-Nov-2024	28 days	6 days	✓	07-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E510C	01-Nov-2024	07-Nov-2024	28 days	6 days	✓	07-Nov-2024	28 days	0 days	✓
Metals : Mercury in Soil/Solid by CVAAS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E510C	01-Nov-2024	07-Nov-2024	28 days	6 days	✓	07-Nov-2024	28 days	0 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E440C	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E440C	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E440C	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	7 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method **Container / Client Sample ID(s)**	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E440C	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E440C	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS (<355 µm)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E440C	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	7 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E484	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E484	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E484	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E484	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E484	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓
Metals : Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E484	01-Nov-2024	07-Nov-2024	180 days	6 days	✓	07-Nov-2024	180 days	0 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E100-L	01-Nov-2024	07-Nov-2024	30 days	6 days	✓	07-Nov-2024	30 days	6 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E100-L	01-Nov-2024	07-Nov-2024	30 days	6 days	✓	07-Nov-2024	30 days	6 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E100-L	01-Nov-2024	07-Nov-2024	30 days	6 days	✓	07-Nov-2024	30 days	6 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E100-L	01-Nov-2024	07-Nov-2024	30 days	6 days	✓	07-Nov-2024	30 days	6 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E100-L	01-Nov-2024	07-Nov-2024	30 days	6 days	✓	07-Nov-2024	30 days	6 days	✓
Physical Tests : Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E100-L	01-Nov-2024	07-Nov-2024	30 days	6 days	✓	07-Nov-2024	30 days	6 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E144	01-Nov-2024	----	----	----		03-Nov-2024	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E144	01-Nov-2024	----	----	----		03-Nov-2024	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E144	01-Nov-2024	----	----	----		03-Nov-2024	----	3 days	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E144	01-Nov-2024	----	----	----		03-Nov-2024	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E144	01-Nov-2024	----	----	----		03-Nov-2024	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E144	01-Nov-2024	----	----	----		03-Nov-2024	----	3 days	
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E108A	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	05-Nov-2024	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E108A	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	05-Nov-2024	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E108A	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	05-Nov-2024	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E108A	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	05-Nov-2024	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E108A	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	05-Nov-2024	30 days	5 days	✓
Physical Tests : pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E108A	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	05-Nov-2024	30 days	5 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E641A	01-Nov-2024	04-Nov-2024	60 days	3 days	✓	05-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E641A	01-Nov-2024	04-Nov-2024	60 days	3 days	✓	05-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E641A	01-Nov-2024	04-Nov-2024	60 days	3 days	✓	05-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E641A	01-Nov-2024	04-Nov-2024	60 days	3 days	✓	05-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E641A	01-Nov-2024	04-Nov-2024	60 days	3 days	✓	05-Nov-2024	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs in Soil/solid by Hex:Ace GC-MS										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E641A	01-Nov-2024	04-Nov-2024	60 days	3 days	✓	05-Nov-2024	40 days	1 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS10	E532	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	07-Nov-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS3	E532	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	07-Nov-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS4	E532	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	07-Nov-2024	7 days	3 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] BH8-24-SS5	E532	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	07-Nov-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-1	E532	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	07-Nov-2024	7 days	3 days	✓
Speciated Metals : Hexavalent Chromium (Cr VI) by IC										
Glass soil jar/Teflon lined cap [ON MECP] DUP-24-2	E532	01-Nov-2024	04-Nov-2024	30 days	3 days	✓	07-Nov-2024	7 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH8-24-SS10	E611A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH8-24-SS3	E611A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH8-24-SS4	E611A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] BH8-24-SS5	E611A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] DUP-24-1	E611A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial [ON MECP] DUP-24-2	E611A	01-Nov-2024	04-Nov-2024	14 days	3 days	✓	04-Nov-2024	40 days	0 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: ✗ = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Boron-Hot Water Extractable by ICPOES	E487	1749605	1	15	6.6	5.0	✓
BTEX by Headspace GC-MS	E611A	1747882	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1747883	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	1753993	0	4	0.0	5.0	✗
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1747853	1	16	6.2	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1749604	1	15	6.6	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1747852	1	16	6.2	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1749606	1	15	6.6	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1749607	1	15	6.6	5.0	✓
Moisture Content by Gravimetry	E144	1747856	1	16	6.2	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1747854	1	10	10.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1747851	1	16	6.2	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1749603	1	15	6.6	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1747855	1	16	6.2	5.0	✓
Laboratory Control Samples (LCS)							
Boron-Hot Water Extractable by ICPOES	E487	1749605	2	15	13.3	10.0	✓
BTEX by Headspace GC-MS	E611A	1747882	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1747883	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	1753993	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1747853	1	16	6.2	5.0	✓
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1749604	2	15	13.3	10.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1747852	2	16	12.5	10.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1749606	2	15	13.3	10.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1749607	2	15	13.3	10.0	✓
Moisture Content by Gravimetry	E144	1747856	1	16	6.2	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1747854	1	10	10.0	5.0	✓
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A	1747851	1	16	6.2	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1749603	2	15	13.3	10.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1747855	1	16	6.2	5.0	✓
Method Blanks (MB)							
Boron-Hot Water Extractable by ICPOES	E487	1749605	1	15	6.6	5.0	✓
BTEX by Headspace GC-MS	E611A	1747882	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1747883	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	1753993	1	4	25.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1747853	1	16	6.2	5.0	✓

Matrix: **Soil/Solid**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L	1749604	1	15	6.6	5.0	✓
Hexavalent Chromium (Cr VI) by IC	E532	1747852	1	16	6.2	5.0	✓
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C	1749606	1	15	6.6	5.0	✓
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C	1749607	1	15	6.6	5.0	✓
Moisture Content by Gravimetry	E144	1747856	1	16	6.2	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1747854	1	10	10.0	5.0	✓
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484	1749603	1	15	6.6	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1747855	1	16	6.2	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1747882	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	1747883	1	20	5.0	5.0	✓
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L	1753993	0	4	0.0	5.0	×
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L	1747853	1	16	6.2	5.0	✓
PAHs in Soil/solid by Hex:Ace GC-MS	E641A	1747854	1	10	10.0	5.0	✓
WAD Cyanide (0.01M NaOH Extraction)	E336A	1747855	1	16	6.2	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Soil (1:2 Soil:Water Extraction) (Low Level)	E100-L ALS Environmental - Waterloo	Soil/Solid	CSSS Ch. 15 (mod)/APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a soil sample that has been added in a defined ratio of soil to deionized water, then shaken well and allowed to settle. Conductance is measured in the fluid that is observed in the upper layer.
pH by Meter (1:2 Soil:0.01M CaCl2 Extraction) - As Received	E108A ALS Environmental - Waterloo	Soil/Solid	MECP E3530	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C) and is carried out in accordance with procedures described in the Analytical Protocol (prescriptive method). A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling, or decanting and then analyzed using a pH meter and electrode. This method is equivalent to ASTM D4972 and is acceptable for topsoil analysis.
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
WAD Cyanide (0.01M NaOH Extraction)	E336A ALS Environmental - Waterloo	Soil/Solid	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined after extraction by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Metals in Soil/Solid by CRC ICPMS (<355 µm)	E440C ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 355 µm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Sodium Adsorption Ratio (SAR) - 1:2 Soil:Water (Dry)	E484 ALS Environmental - Waterloo	Soil/Solid	SW846 6010C	A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Boron-Hot Water Extractable by ICPOES	E487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).
Mercury in Soil/Solid by CVAAS (<355 µm)	E510C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Waterloo	Soil/Solid	APHA 3500-CR C	Instrumental analysis is performed by ion chromatography with UV detection.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F4G by Gravimetry (Low Level)	E601.F4G-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	A portion of the silica gel treated sample extract is filtered and dried at 105°C and the mass of the residual gravimetric heavy hydrocarbons (F4G) is determined gravimetrically. Where both F4 and F4G are reported, the greater of both results must be used for comparison to CWS PHC F4 guidelines.
CCME PHCs - F2-F4 by GC-FID (Low Level)	E601.SG-L ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
PAHs in Soil/solid by Hex:Ace GC-MS	E641A ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
F1-BTEX	EC580 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Sum F1 to F4 (C6-C50)	EC581 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fractions F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50). F4G-sg is not used within this calculation due to overlap with other fractions.
F2 to F3 minus PAH	EC600 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	F2-Naphthalene = CCME Fraction 2 (C10-C16) minus Naphthalene F3-PAH = CCME Fraction 3 (C16-C34) minus sPhenanthrene, Fluoranthene, Pyrene, Benz(a)anthracene, benzo(b+j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, and Dibenz(a,h)anthracene.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Leach 1:2 Soil:Water for pH/EC	EP108 ALS Environmental - Waterloo	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.
Leach 1:2 Soil : 0.01CaCl2 - As Received for pH	EP108A ALS Environmental - Waterloo	Soil/Solid	MOEE E3137A	A minimum 10g portion of the sample, as received, is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil by centrifuging, settling or decanting and then analyzed using a pH meter and electrode.
Cyanide Extraction for CFA (0.01M NaOH)	EP333A ALS Environmental - Waterloo	Soil/Solid	ON MECP E3015 (mod)	Extraction for various cyanide analysis is by rotary extraction of the soil with 0.01M Sodium Hydroxide.
Digestion for Metals and Mercury (355 µm Sieve)	EP440C ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are sieved through a 355 µm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
Boron-Hot Water Extractable	EP487 ALS Environmental - Waterloo	Soil/Solid	HW EXTR, EPA 6010B	A dried solid sample is extracted with weak calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES. Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011)
Preparation of Hexavalent Chromium (Cr VI) for IC	EP532 ALS Environmental - Waterloo	Soil/Solid	EPA 3060A	Field moist samples are digested with a sodium hydroxide/sodium carbonate solution as described in EPA 3060A.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

QUALITY CONTROL REPORT

Work Order : **WT2432752**

Client : WSP Canada Inc.
Contact : Jason Taylor
Address : 800 Green Creek Drive
Ottawa ON Canada K1J 1A6
Telephone : ----
Project : CA0039399.3386
PO : 24422-98891-S01
C-O-C number : ----
Sampler : Client
Site : City of Ottawa - Lansdowne Park
Quote number : Lansdowne Park c/o WSP
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 13
Laboratory : ALS Environmental - Waterloo
Account Manager : Costas Farassoglou
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : 613 225 8279
Date Samples Received : 01-Nov-2024 15:20
Date Analysis Commenced : 03-Nov-2024
Issue Date : 07-Nov-2024 19:44

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Metals, Waterloo, Ontario
Niral Patel		Waterloo Centralized Prep, Waterloo, Ontario
Rachel Cameron	Supervisor - Semi-Volatile Extractions	Waterloo Organics, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1747851)											
WT2432560-001	Anonymous	pH (1:2 soil:CaCl2-aq)	----	E108A	0.10	pH units	7.48	7.53	0.666%	5%	----
Physical Tests (QC Lot: 1747856)											
WT2432648-002	Anonymous	Moisture	----	E144	0.25	%	8.58	8.64	0.681%	20%	----
Physical Tests (QC Lot: 1749604)											
WT2432752-003	BH8-24-SS5	Conductivity (1:2 leachate)	----	E100-L	5.00	μS/cm	0.572 mS/cm	571	0.175%	20%	----
Cyanides (QC Lot: 1747855)											
WT2432648-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
Metals (QC Lot: 1749603)											
WT2432752-003	BH8-24-SS5	Calcium, soluble ion content	7440-70-2	E484	0.50	mg/L	9.82	9.57	2.58%	30%	----
		Magnesium, soluble ion content	7439-95-4	E484	0.50	mg/L	1.03	1.00	0.04	Diff <2x LOR	----
		Sodium, soluble ion content	17341-25-2	E484	0.50	mg/L	77.8	78.2	0.513%	30%	----
Metals (QC Lot: 1749605)											
WT2432738-001	Anonymous	Boron, hot water soluble	7440-42-8	E487	0.10	mg/kg	0.31	0.28	0.02	Diff <2x LOR	----
Metals (QC Lot: 1749606)											
WT2432752-003	BH8-24-SS5	Mercury	7439-97-6	E510C	0.0050	mg/kg	0.0060	0.0059	0.00005	Diff <2x LOR	----
Metals (QC Lot: 1749607)											
WT2432752-003	BH8-24-SS5	Antimony	7440-36-0	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Arsenic	7440-38-2	E440C	0.10	mg/kg	0.86	1.12	25.5%	30%	----
		Barium	7440-39-3	E440C	0.50	mg/kg	27.7	31.0	11.1%	40%	----
		Beryllium	7440-41-7	E440C	0.10	mg/kg	0.15	0.21	0.06	Diff <2x LOR	----
		Boron	7440-42-8	E440C	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440C	0.020	mg/kg	0.024	0.026	0.002	Diff <2x LOR	----
		Chromium	7440-47-3	E440C	0.50	mg/kg	9.33	12.1	25.8%	30%	----
		Cobalt	7440-48-4	E440C	0.10	mg/kg	3.42	3.76	9.50%	30%	----
		Copper	7440-50-8	E440C	0.50	mg/kg	9.01	10.0	10.4%	30%	----
		Lead	7439-92-1	E440C	0.50	mg/kg	2.64	3.59	30.4%	40%	----
		Molybdenum	7439-98-7	E440C	0.10	mg/kg	0.19	0.27	0.08	Diff <2x LOR	----
		Nickel	7440-02-0	E440C	0.50	mg/kg	5.78	6.62	13.6%	30%	----
		Selenium	7782-49-2	E440C	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Silver	7440-22-4	E440C	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1749607) - continued											
WT2432752-003	BH8-24-SS5	Thallium	7440-28-0	E440C	0.050	mg/kg	<0.050	0.062	0.012	Diff <2x LOR	----
		Uranium	7440-61-1	E440C	0.050	mg/kg	0.404	0.534	27.7%	30%	----
		Vanadium	7440-62-2	E440C	0.20	mg/kg	22.2	24.3	9.38%	30%	----
		Zinc	7440-66-6	E440C	2.0	mg/kg	16.0	16.5	3.13%	30%	----
Speciated Metals (QC Lot: 1747852)											
WT2432648-001	Anonymous	Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1747882)											
WT2432582-001	Anonymous	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050 µg/g	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015 µg/g	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050 µg/g	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030 µg/g	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030 µg/g	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1747853)											
WT2432738-005	Anonymous	F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	<10	0	Diff <2x LOR	----
		F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
		F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	<50	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1747883)											
WT2432582-001	Anonymous	F1 (C6-C10)	----	E581.F1	5.0	mg/kg	<5.0 µg/g	<5.0	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1747854)											
WT2432738-005	Anonymous	Acenaphthene	83-32-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A	0.050	mg/kg	0.160	0.163	0.003	Diff <2x LOR	J
		Benz(a)anthracene	56-55-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A	0.050	mg/kg	0.212	0.234	10.3%	50%	----
		Fluorene	86-73-7	E641A	0.050	mg/kg	0.086	0.086	0.0003	Diff <2x LOR	J
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Polycyclic Aromatic Hydrocarbons (QC Lot: 1747854) - continued											
WT2432738-005	Anonymous	Naphthalene	91-20-3	E641A	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A	0.050	mg/kg	0.413	0.423	2.33%	50%	----
		Pyrene	129-00-0	E641A	0.050	mg/kg	0.136	0.151	0.015	Diff <2x LOR	J

Qualifiers

Qualifier	*Description*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Physical Tests (QCLot: 1747856)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 1749604)						
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	<5.00	----
Cyanides (QCLot: 1747855)						
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	<0.050	----
Metals (QCLot: 1749603)						
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	<0.50	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	<0.50	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	<0.50	----
Metals (QCLot: 1749605)						
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	<0.10	----
Metals (QCLot: 1749606)						
Mercury	7439-97-6	E510C	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1749607)						
Antimony	7440-36-0	E440C	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440C	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440C	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440C	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440C	0.5	mg/kg	<0.50	----
Lead	7439-92-1	E440C	0.5	mg/kg	<0.50	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440C	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440C	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440C	0.1	mg/kg	<0.10	----
Thallium	7440-28-0	E440C	0.05	mg/kg	<0.050	----
Uranium	7440-61-1	E440C	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440C	2	mg/kg	<2.0	----

Sub-Matrix: **Soil/Solid**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Speciated Metals (QCLot: 1747852)						
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	<0.10	----
Volatile Organic Compounds (QCLot: 1747882)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1747853)						
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	<10	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	<50	----
Hydrocarbons (QCLot: 1747883)						
F1 (C6-C10)	----	E581.F1	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 1753993)						
F4G-sg	----	E601.F4G-L	250	mg/kg	<250	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1747854)						
Acenaphthene	83-32-9	E641A	0.05	mg/kg	<0.050	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	<0.050	----
Anthracene	120-12-7	E641A	0.05	mg/kg	<0.050	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	<0.050	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	<0.050	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	<0.050	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	<0.050	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	<0.050	----
Chrysene	218-01-9	E641A	0.05	mg/kg	<0.050	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	<0.050	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	<0.050	----
Fluorene	86-73-7	E641A	0.05	mg/kg	<0.050	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	<0.050	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	<0.030	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	<0.030	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	<0.050	----
Pyrene	129-00-0	E641A	0.05	mg/kg	<0.050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	*Recovery (%)*	*Recovery Limits (%)*		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Physical Tests (QCLot: 1747851)									
pH (1:2 soil:CaCl2-aq)	----	E108A	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1747856)									
Moisture	----	E144	0.25	%	50 %	99.9	90.0	110	----
Physical Tests (QCLot: 1749604)									
Conductivity (1:2 leachate)	----	E100-L	5	µS/cm	1410 µS/cm	100	90.0	110	----
Cyanides (QCLot: 1747855)									
Cyanide, weak acid dissociable	----	E336A	0.05	mg/kg	1.25 mg/kg	97.4	80.0	120	----
Metals (QCLot: 1749603)									
Calcium, soluble ion content	7440-70-2	E484	0.5	mg/L	300 mg/L	102	80.0	120	----
Magnesium, soluble ion content	7439-95-4	E484	0.5	mg/L	50 mg/L	99.8	80.0	120	----
Sodium, soluble ion content	17341-25-2	E484	0.5	mg/L	50 mg/L	101	80.0	120	----
Metals (QCLot: 1749605)									
Boron, hot water soluble	7440-42-8	E487	0.1	mg/kg	2 mg/kg	104	70.0	130	----
Metals (QCLot: 1749606)									
Mercury	7439-97-6	E510C	0.005	mg/kg	0.1 mg/kg	112	80.0	120	----
Metals (QCLot: 1749607)									
Antimony	7440-36-0	E440C	0.1	mg/kg	100 mg/kg	104	80.0	120	----
Arsenic	7440-38-2	E440C	0.1	mg/kg	100 mg/kg	108	80.0	120	----
Barium	7440-39-3	E440C	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Beryllium	7440-41-7	E440C	0.1	mg/kg	10 mg/kg	98.6	80.0	120	----
Boron	7440-42-8	E440C	5	mg/kg	100 mg/kg	101	80.0	120	----
Cadmium	7440-43-9	E440C	0.02	mg/kg	10 mg/kg	103	80.0	120	----
Chromium	7440-47-3	E440C	0.5	mg/kg	25 mg/kg	103	80.0	120	----
Cobalt	7440-48-4	E440C	0.1	mg/kg	25 mg/kg	100	80.0	120	----
Copper	7440-50-8	E440C	0.5	mg/kg	25 mg/kg	99.8	80.0	120	----
Lead	7439-92-1	E440C	0.5	mg/kg	50 mg/kg	96.6	80.0	120	----
Molybdenum	7439-98-7	E440C	0.1	mg/kg	25 mg/kg	96.9	80.0	120	----
Nickel	7440-02-0	E440C	0.5	mg/kg	50 mg/kg	101	80.0	120	----
Selenium	7782-49-2	E440C	0.2	mg/kg	100 mg/kg	92.4	80.0	120	----
Silver	7440-22-4	E440C	0.1	mg/kg	10 mg/kg	90.3	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Target Concentration*	*LCS*	*Low*	*High*	*Qualifier*
Metals (QCLot: 1749607) - continued									
Thallium	7440-28-0	E440C	0.05	mg/kg	100 mg/kg	96.7	80.0	120	----
Uranium	7440-61-1	E440C	0.05	mg/kg	0.5 mg/kg	95.9	80.0	120	----
Vanadium	7440-62-2	E440C	0.2	mg/kg	50 mg/kg	103	80.0	120	----
Zinc	7440-66-6	E440C	2	mg/kg	50 mg/kg	98.8	80.0	120	----
Speciated Metals (QCLot: 1747852)									
Chromium, hexavalent [Cr VI]	18540-29-9	E532	0.1	mg/kg	0.8 mg/kg	98.3	80.0	120	----
Volatile Organic Compounds (QCLot: 1747882)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.48 mg/kg	95.2	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.48 mg/kg	86.7	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.48 mg/kg	88.3	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	93.2	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.48 mg/kg	91.5	70.0	130	----
Hydrocarbons (QCLot: 1747853)									
F2 (C10-C16)	----	E601.SG-L	10	mg/kg	699 mg/kg	105	70.0	130	----
F3 (C16-C34)	----	E601.SG-L	50	mg/kg	1460 mg/kg	102	70.0	130	----
F4 (C34-C50)	----	E601.SG-L	50	mg/kg	810 mg/kg	87.9	70.0	130	----
Hydrocarbons (QCLot: 1747883)									
F1 (C6-C10)	----	E581.F1	5	mg/kg	69.2 mg/kg	105	80.0	120	----
Hydrocarbons (QCLot: 1753993)									
F4G-sg	----	E601.F4G-L	250	mg/kg	1300 mg/kg	86.8	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1747854)									
Acenaphthene	83-32-9	E641A	0.05	mg/kg	0.5 mg/kg	87.2	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.05	mg/kg	0.5 mg/kg	86.5	60.0	130	----
Anthracene	120-12-7	E641A	0.05	mg/kg	0.5 mg/kg	88.2	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.05	mg/kg	0.5 mg/kg	93.2	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.05	mg/kg	0.5 mg/kg	88.9	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.05	mg/kg	0.5 mg/kg	96.1	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.05	mg/kg	0.5 mg/kg	97.0	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.05	mg/kg	0.5 mg/kg	93.4	60.0	130	----
Chrysene	218-01-9	E641A	0.05	mg/kg	0.5 mg/kg	93.9	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.05	mg/kg	0.5 mg/kg	96.2	60.0	130	----
Fluoranthene	206-44-0	E641A	0.05	mg/kg	0.5 mg/kg	88.2	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1747854) - continued									
Fluorene	86-73-7	E641A	0.05	mg/kg	0.5 mg/kg	87.3	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.05	mg/kg	0.5 mg/kg	96.9	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A	0.03	mg/kg	0.5 mg/kg	81.8	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.03	mg/kg	0.5 mg/kg	89.2	60.0	130	----
Naphthalene	91-20-3	E641A	0.01	mg/kg	0.5 mg/kg	82.2	60.0	130	----
Phenanthrene	85-01-8	E641A	0.05	mg/kg	0.5 mg/kg	86.0	60.0	130	----
Pyrene	129-00-0	E641A	0.05	mg/kg	0.5 mg/kg	87.0	60.0	130	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*Concentration*	*Target*	*MS*	*Low*	*High*	*Qualifier*
Cyanides (QCLot: 1747855)										
WT2432648-001	Anonymous	Cyanide, weak acid dissociable	----	E336A	1.14 mg/kg	1.25 mg/kg	91.9	70.0	130	----
Volatile Organic Compounds (QCLot: 1747882)										
WT2432582-001	Anonymous	Benzene	71-43-2	E611A	2.06 mg/kg	2.22 mg/kg	92.9	60.0	140	----
		Ethylbenzene	100-41-4	E611A	1.90 mg/kg	2.22 mg/kg	85.6	60.0	140	----
		Toluene	108-88-3	E611A	1.92 mg/kg	2.22 mg/kg	86.6	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.06 mg/kg	4.44 mg/kg	91.6	60.0	140	----
		Xylene, o-	95-47-6	E611A	1.99 mg/kg	2.22 mg/kg	89.9	60.0	140	----
Hydrocarbons (QCLot: 1747853)										
WT2432738-005	Anonymous	F2 (C10-C16)	----	E601.SG-L	581 mg/kg	557 mg/kg	104	60.0	140	----
		F3 (C16-C34)	----	E601.SG-L	1220 mg/kg	1160 mg/kg	104	60.0	140	----
		F4 (C34-C50)	----	E601.SG-L	676 mg/kg	646 mg/kg	104	60.0	140	----
Hydrocarbons (QCLot: 1747883)										
WT2432582-001	Anonymous	F1 (C6-C10)	----	E581.F1	34.8 mg/kg	44.4 mg/kg	78.3	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1747854)										
WT2432738-005	Anonymous	Acenaphthene	83-32-9	E641A	0.353 mg/kg	0.397 mg/kg	89.1	50.0	140	----
		Acenaphthylene	208-96-8	E641A	0.336 mg/kg	0.397 mg/kg	84.7	50.0	140	----
		Anthracene	120-12-7	E641A	0.415 mg/kg	0.397 mg/kg	104	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A	0.376 mg/kg	0.397 mg/kg	94.7	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A	0.356 mg/kg	0.397 mg/kg	89.6	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A	0.389 mg/kg	0.397 mg/kg	98.2	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A	0.340 mg/kg	0.397 mg/kg	85.7	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A	0.369 mg/kg	0.397 mg/kg	93.1	50.0	140	----
		Chrysene	218-01-9	E641A	0.381 mg/kg	0.397 mg/kg	96.0	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A	0.360 mg/kg	0.397 mg/kg	90.7	50.0	140	----
		Fluoranthene	206-44-0	E641A	0.425 mg/kg	0.397 mg/kg	107	50.0	140	----
		Fluorene	86-73-7	E641A	0.380 mg/kg	0.397 mg/kg	95.9	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.362 mg/kg	0.397 mg/kg	91.4	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A	0.320 mg/kg	0.397 mg/kg	80.8	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A	0.338 mg/kg	0.397 mg/kg	85.2	50.0	140	----
		Naphthalene	91-20-3	E641A	0.320 mg/kg	0.397 mg/kg	80.8	50.0	140	----
		Phenanthrene	85-01-8	E641A	0.504 mg/kg	0.397 mg/kg	127	50.0	140	----
		Pyrene	129-00-0	E641A	0.394 mg/kg	0.397 mg/kg	99.5	50.0	140	----

Reference Material (RM) Report

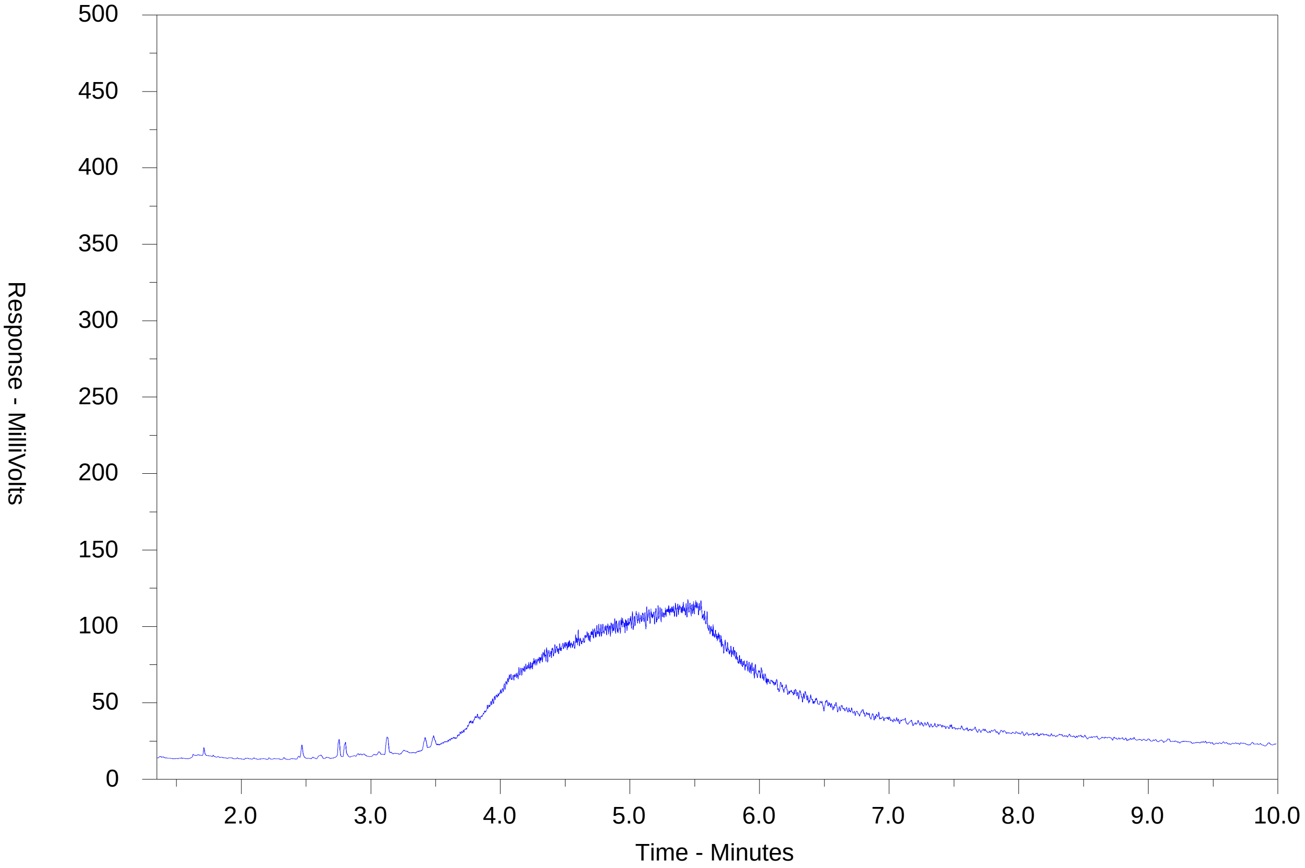
A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	RM Target Concentration	Recovery (%) RM	Recovery Limits (%) Low	High	Qualifier
Physical Tests (QCLot: 1749604)									
QC-1749604-003	RM	Conductivity (1:2 leachate)	----	E100-L	3310 µS/cm	99.5	70.0	130	----
Metals (QCLot: 1749603)									
QC-1749603-003	RM	Calcium, soluble ion content	7440-70-2	E484	174 mg/L	101	70.0	130	----
QC-1749603-003	RM	Magnesium, soluble ion content	7439-95-4	E484	63.5 mg/L	104	70.0	130	----
QC-1749603-003	RM	Sodium, soluble ion content	17341-25-2	E484	113 mg/L	110	70.0	130	----
Metals (QCLot: 1749605)									
QC-1749605-003	RM	Boron, hot water soluble	7440-42-8	E487	1.82 mg/kg	119	60.0	140	----
Metals (QCLot: 1749606)									
QC-1749606-003	RM	Mercury	7439-97-6	E510C	0.068 mg/kg	114	70.0	130	----
Metals (QCLot: 1749607)									
QC-1749607-003	RM	Antimony	7440-36-0	E440C	24.8 mg/kg	84.9	70.0	130	----
QC-1749607-003	RM	Arsenic	7440-38-2	E440C	21.2 mg/kg	102	70.0	130	----
QC-1749607-003	RM	Barium	7440-39-3	E440C	788 mg/kg	102	70.0	130	----
QC-1749607-003	RM	Beryllium	7440-41-7	E440C	1.82 mg/kg	98.5	70.0	130	----
QC-1749607-003	RM	Cadmium	7440-43-9	E440C	2.15 mg/kg	102	70.0	130	----
QC-1749607-003	RM	Chromium	7440-47-3	E440C	56.9 mg/kg	105	70.0	130	----
QC-1749607-003	RM	Cobalt	7440-48-4	E440C	32 mg/kg	101	70.0	130	----
QC-1749607-003	RM	Copper	7440-50-8	E440C	969 mg/kg	107	70.0	130	----
QC-1749607-003	RM	Lead	7439-92-1	E440C	919 mg/kg	92.6	70.0	130	----
QC-1749607-003	RM	Molybdenum	7439-98-7	E440C	25.1 mg/kg	89.2	70.0	130	----
QC-1749607-003	RM	Nickel	7440-02-0	E440C	1000 mg/kg	105	70.0	130	----
QC-1749607-003	RM	Selenium	7782-49-2	E440C	1.04 mg/kg	113	60.0	140	----
QC-1749607-003	RM	Silver	7440-22-4	E440C	8.98 mg/kg	86.8	70.0	130	----
QC-1749607-003	RM	Thallium	7440-28-0	E440C	0.907 mg/kg	90.9	70.0	130	----
QC-1749607-003	RM	Uranium	7440-61-1	E440C	3.97 mg/kg	83.3	70.0	130	----
QC-1749607-003	RM	Vanadium	7440-62-2	E440C	66.2 mg/kg	104	70.0	130	----
QC-1749607-003	RM	Zinc	7440-66-6	E440C	828 mg/kg	104	70.0	130	----
Speciated Metals (QCLot: 1747852)									
QC-1747852-003	RM	Chromium, hexavalent [Cr VI]	18540-29-9	E532	174 mg/kg	86.8	70.0	130	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432752-001-E601.SG-L
Client Sample ID: BH8-24-SS3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

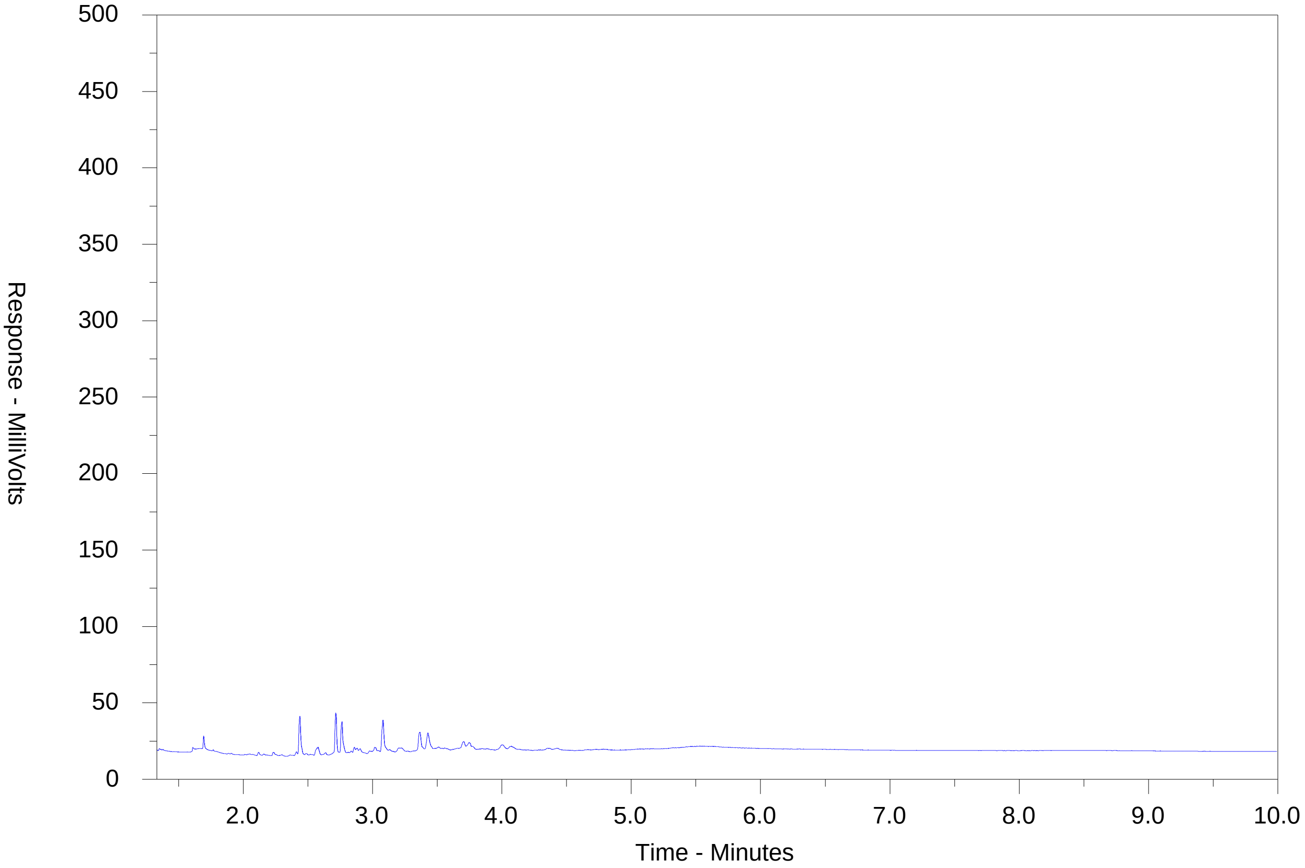
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432752-002-E601.SG-L
Client Sample ID: BH8-24-SS4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

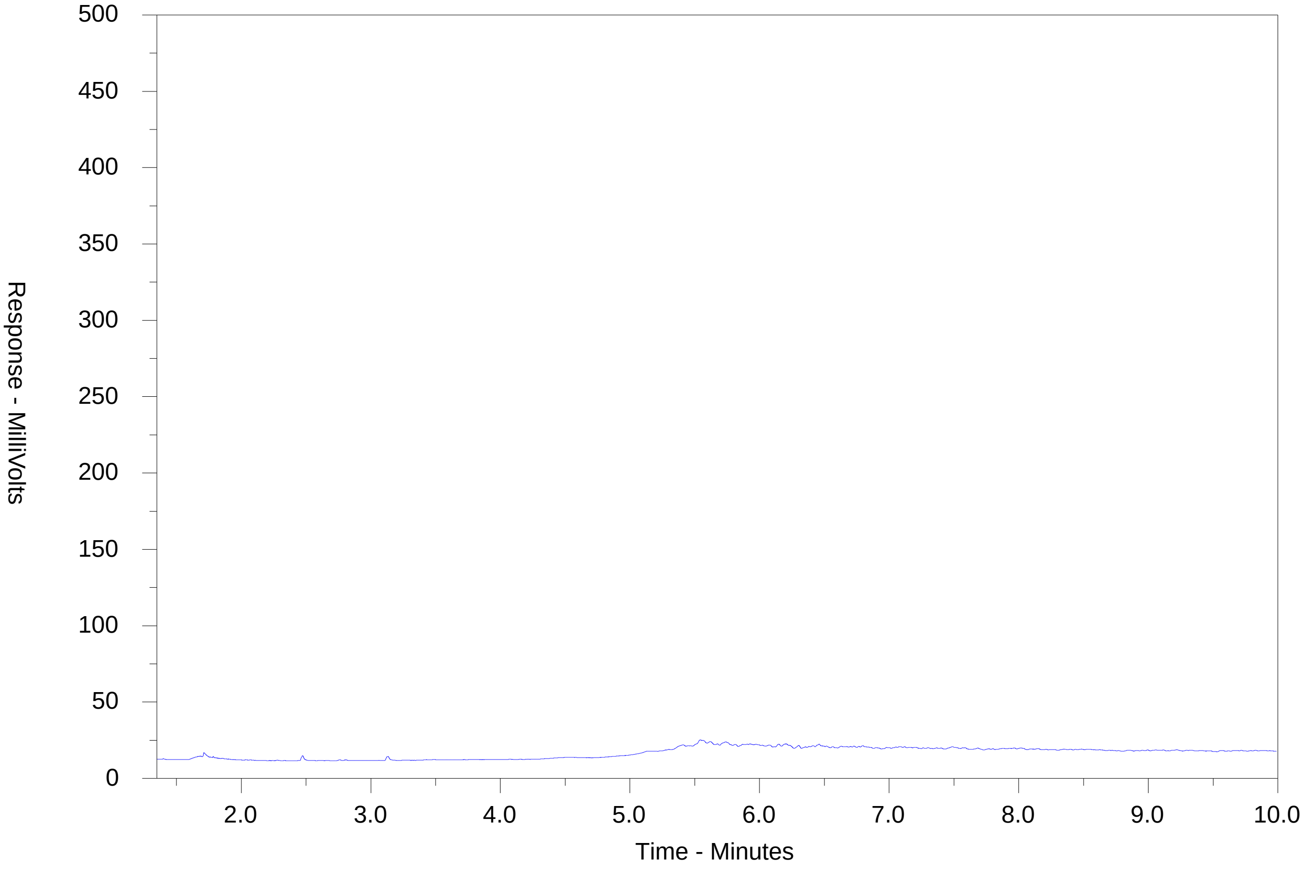
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432752-003-E601.SG-L
Client Sample ID: BH8-24-SS5



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease	→
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

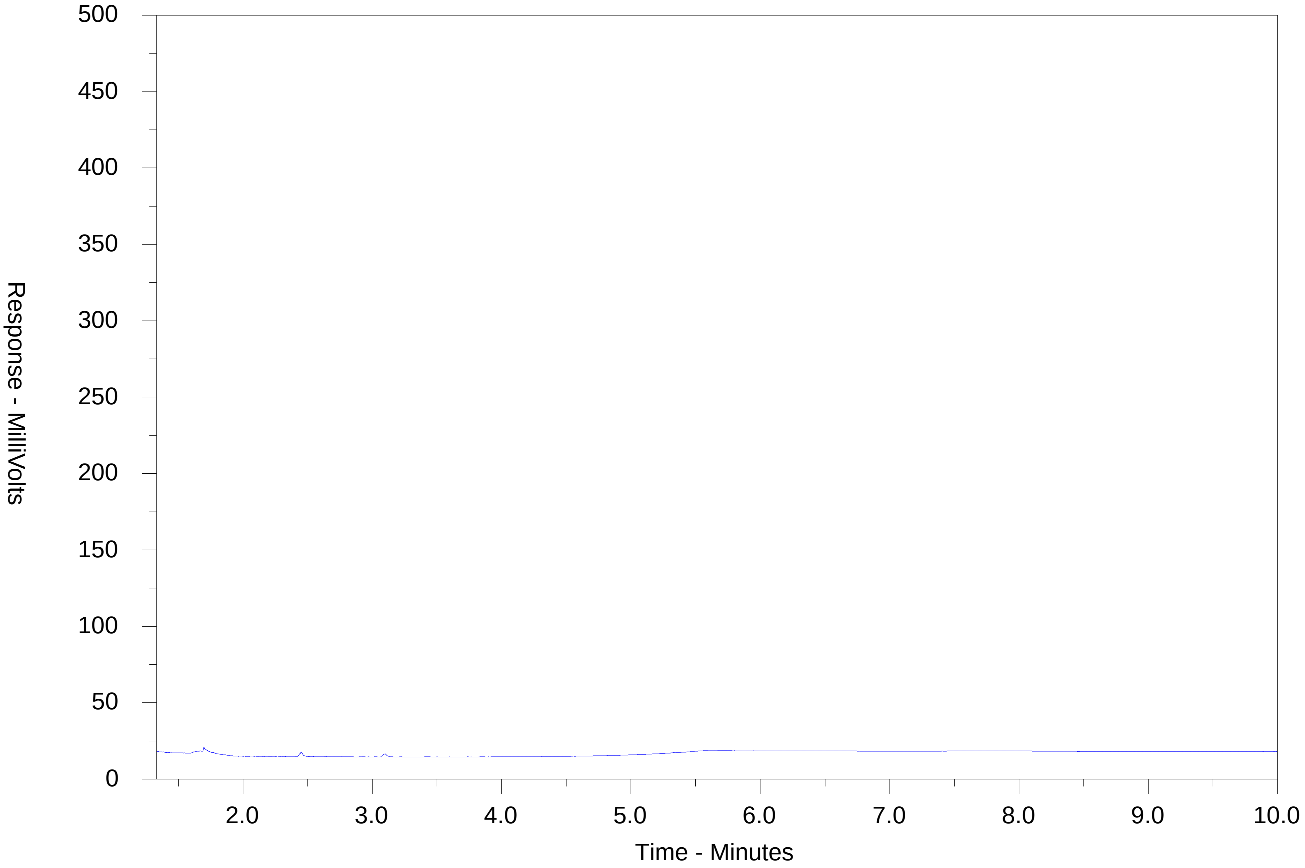
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID:	WT2432752-004-E601.SG-L
Client Sample ID:	BH8-24-SS10



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

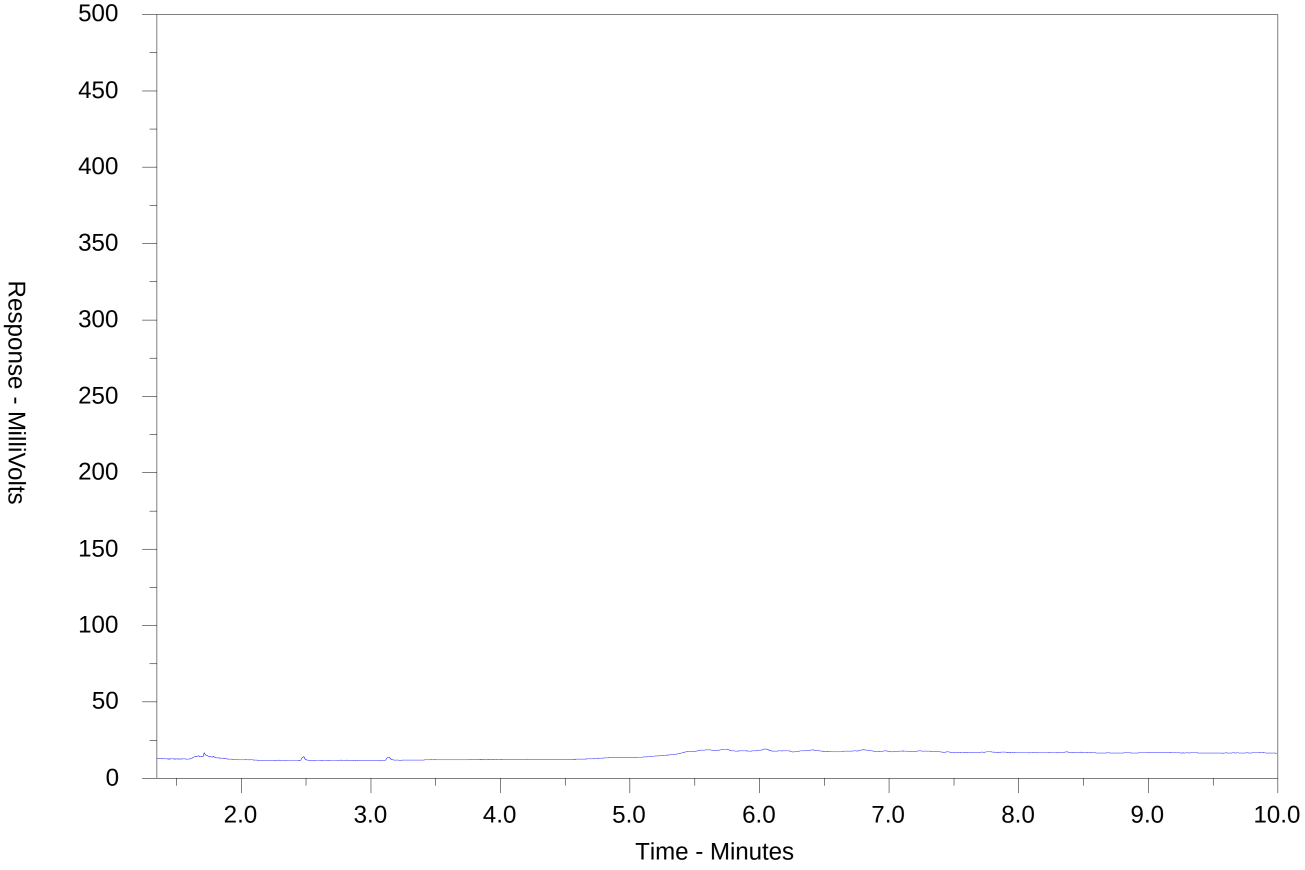
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432752-005-E601.SG-L
Client Sample ID: DUP-24-1



◄—F2—►◄———F3———►◄—F4—►

nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F

Gasoline → ◄— Motor Oils/Lube Oils/Grease ——►
◄—— Diesel/Jet Fuels →

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

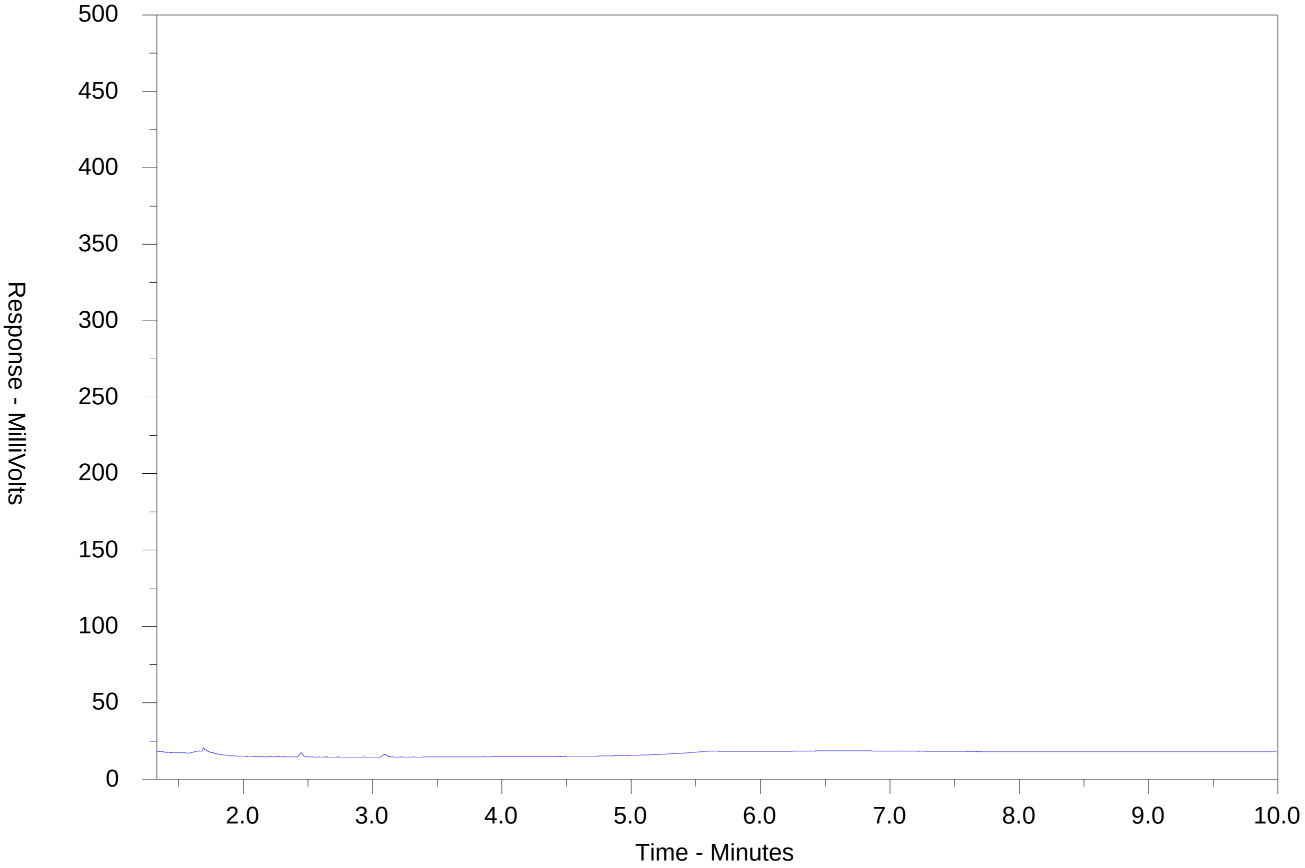
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2432752-006-E601.SG-L
Client Sample ID: DUP-24-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F

Gasoline → ← Motor Oils/Lube Oils/Grease →
← Diesel/Jet Fuels →

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

VM

Chain of Custody (COC) / Analytical Request Form

COC Number: **22 -**

Page of

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Environmental Division
Waterloo
Work Order Reference
WT2432752

Telephone: +1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	City of Ottawa c/o WSP
Contact:	Jason Taylor
Phone:	613-866-8199
	Company address below will appear on the final report
Street:	800 Green Creek Drive
City/Province:	Ottawa, ON
Postal Code:	K1J 1K6
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Project Information

ALS Account # / Quote #:	WT2024GMOW1000001
Job #:	CA0039399.3386
PO / AFE:	
LSD:	City of Ottawa - Lansdowne Park

ALS Lab Work Order # (ALS use only): WT2432752 R

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☑ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax richard.barker@ottawa.ca

Email 2 jason.taylor@wsp.com

Email 3 ~~robert.ireland@wsp.com~~

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax

Email 2

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Contact: Emily Smith

Sampler:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply

☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimu

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minim

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minim

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minim

☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please cor

Analysis Requ

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX,F1-F4	PAHs (O. Reg 153)	Metals & Inorganics (O. Reg 153)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	BH8-24-SS3	01-11-24		SS		X	X	X			
	BH8-24-SS4	01-11-24		SS		X	X	X			
	BH8-24-SS5	01-11-24		SS		X	X	X			
	BH8-24-SS10	01-11-24		SS		X	X	X			
	DUP-24-1	01-11-24		SS		X	X	X			
	DUP-24-2	01-11-24		SS		X	X	X			

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

Are samples taken from a Regulated DW System?

☐ YES ☐ NO

Are samples for human consumption/ use?

☐ YES ☐ NO

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

O. Reg 153 Table 3 RPI/ICC

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C: 12.3

FINAL COOLER TEMPERATURES °C: 7.9

SHIPMENT RELEASE (client use)

Released by: Jason Taylor Date: Nov 1, 2024 Time:

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: Tammy Chartrand Date: Nov 1st /24 Time: 3:20

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: R Date: 02-Nov-24 Time: 10:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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

VS-017,018 SOL-068

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order : **WT2433595**
Client : **WSP Canada Inc.**
Contact : Jason Taylor
Address : 300-210 Colonnade Road South
Ottawa ON Canada K2E 7L5
Telephone : ----
Project : CA0039399.3386
PO : 24422-98891-S01
C-O-C number : ----
Sampler : BC
Site : CITY OF OTTAWA-LANSDOWNE PARK
Quote number : Lansdowne Park c/o WSP
No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 8
Laboratory : ALS Environmental - Waterloo
Account Manager : Costas Farassoglou
Address : 60 Northland Road, Unit 1
Waterloo, Ontario Canada N2V 2B8
Telephone : 613 225 8279
Date Samples Received : 08-Nov-2024 12:30
Issue Date : 15-Nov-2024 16:01

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] DUP-1	E298	08-Nov-2024	11-Nov-2024	28 days	3 days	✓	13-Nov-2024	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW24-1	E298	08-Nov-2024	11-Nov-2024	28 days	3 days	✓	13-Nov-2024	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW24-2	E298	08-Nov-2024	11-Nov-2024	28 days	3 days	✓	13-Nov-2024	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW24-3	E298	08-Nov-2024	11-Nov-2024	28 days	3 days	✓	13-Nov-2024	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW24-4	E298	08-Nov-2024	11-Nov-2024	28 days	4 days	✓	13-Nov-2024	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) [ON MECP] MW24-5	E298	08-Nov-2024	11-Nov-2024	28 days	4 days	✓	13-Nov-2024	28 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) DUP-1	E581.F1-L	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) MW24-1	E581.F1-L	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) MW24-2	E581.F1-L	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) MW24-3	E581.F1-L	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) MW24-4	E581.F1-L	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID (Low Level)										
Glass vial (sodium bisulfate) MW24-5	E581.F1-L	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) DUP-1	E601.SG	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	15-Nov-2024	40 days	2 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW24-1	E601.SG	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	14-Nov-2024	40 days	2 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW24-2	E601.SG	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	14-Nov-2024	40 days	2 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW24-3	E601.SG	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	14-Nov-2024	40 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
Container / Client Sample ID(s)			*Preparation Date*	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW24-4	E601.SG	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	14-Nov-2024	40 days	2 days	✓
Hydrocarbons : Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) MW24-5	E601.SG	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	14-Nov-2024	40 days	2 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) DUP-1	E611A	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW24-1	E611A	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW24-2	E611A	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW24-3	E611A	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW24-4	E611A	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) MW24-5	E611A	08-Nov-2024	12-Nov-2024	14 days	4 days	✓	12-Nov-2024	14 days	4 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			*Count*		*Frequency (%)*		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	1760800	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1761612	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1761611	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	1760800	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1761612	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1761611	1	20	5.0	5.0	✓
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG	1761905	2	27	7.4	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	1760800	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1761612	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1761611	1	20	5.0	5.0	✓
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG	1761905	2	27	7.4	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1760800	1	17	5.8	5.0	✓
BTEX by Headspace GC-MS	E611A	1761612	1	20	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L	1761611	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
CCME PHC - F1 by Headspace GC-FID (Low Level)	E581.F1-L ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1 (mod)	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
Silica Gel Treated CCME PHCs - F2-F4sg by GC-FID	E601.SG ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1 (mod)	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
F1-BTEX	EC580 ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
SUM F1 to F4 where F2-F4 is SG treated	EC581SG ALS Environmental - Waterloo	Water	CCME PHC in Soil - Tier 1	Hydrocarbons, total (C6-C50) is the sum of CCME Fraction F1(C6-C10), F2(C10-C16), F3(C16-C34), and F4(C34-C50), where F2-F4 have been treated with silica gel. F4G-sg is not used within this calculation due to overlap with other fractions.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.

QUALITY CONTROL REPORT

Work Order	: **WT2433595**	Page	: 1 of 5
Client	: WSP Canada Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Jason Taylor	Account Manager	: Costas Farassoglou
Address	: 800 Green Creek Drive Ottawa ON Canada K1J 1A6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: ----	Telephone	: 613 225 8279
Project	: CA0039399.3386	Date Samples Received	: 08-Nov-2024 12:30
PO	: 24422-98891-S01	Date Analysis Commenced	: 11-Nov-2024
C-O-C number	: ----	Issue Date	: 15-Nov-2024 16:00
Sampler	: BC		
Site	: CITY OF OTTAWA-LANSDOWNE PARK		
Quote number	: Lansdowne Park c/o WSP		
No. of samples received	: 6		
No. of samples analysed	: 6		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 1760800)											
WT2433433-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0728	0.0697	4.35%	20%	----
Volatile Organic Compounds (QC Lot: 1761612)											
TY2412761-003	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1761611)											
TY2412761-003	Anonymous	F1 (C6-C10)	----	E581.F1-L	25	µg/L	<25	<25	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	*CAS Number*	*Method*	*LOR*	*Unit*	*Result*	*Qualifier*
Anions and Nutrients (QCLot: 1760800)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Volatile Organic Compounds (QCLot: 1761612)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1761611)						
F1 (C6-C10)	----	E581.F1-L	25	µg/L	<25	----
Hydrocarbons (QCLot: 1761905)						
F2 (C10-C16)	----	E601.SG	100	µg/L	<100	----
F3 (C16-C34)	----	E601.SG	250	µg/L	<250	----
F4 (C34-C50)	----	E601.SG	250	µg/L	<250	----
Hydrocarbons (QCLot: 1761942)						
F2 (C10-C16)	----	E601.SG	100	µg/L	<100	----
F3 (C16-C34)	----	E601.SG	250	µg/L	<250	----
F4 (C34-C50)	----	E601.SG	250	µg/L	<250	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	***Recovery (%)***	***Recovery Limits (%)***		
Analyte	***CAS Number***	***Method***	***LOR***	***Unit***	***Target Concentration***	***LCS***	***Low***	***High***	***Qualifier***
Anions and Nutrients (QCLot: 1760800)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.2	85.0	115	----
Volatile Organic Compounds (QCLot: 1761612)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	97.0	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	92.6	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	91.3	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	99.4	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	99.3	70.0	130	----
Hydrocarbons (QCLot: 1761611)									
F1 (C6-C10)	----	E581.F1-L	25	µg/L	2000 µg/L	95.7	80.0	120	----
Hydrocarbons (QCLot: 1761905)									
F2 (C10-C16)	----	E601.SG	100	µg/L	3920 µg/L	96.2	70.0	130	----
F3 (C16-C34)	----	E601.SG	250	µg/L	8200 µg/L	110	70.0	130	----
F4 (C34-C50)	----	E601.SG	250	µg/L	4550 µg/L	89.8	70.0	130	----
Hydrocarbons (QCLot: 1761942)									
F2 (C10-C16)	----	E601.SG	100	µg/L	3920 µg/L	95.7	70.0	130	----
F3 (C16-C34)	----	E601.SG	250	µg/L	8200 µg/L	99.6	70.0	130	----
F4 (C34-C50)	----	E601.SG	250	µg/L	4550 µg/L	89.0	70.0	130	----

Matrix Spike (MS) Report

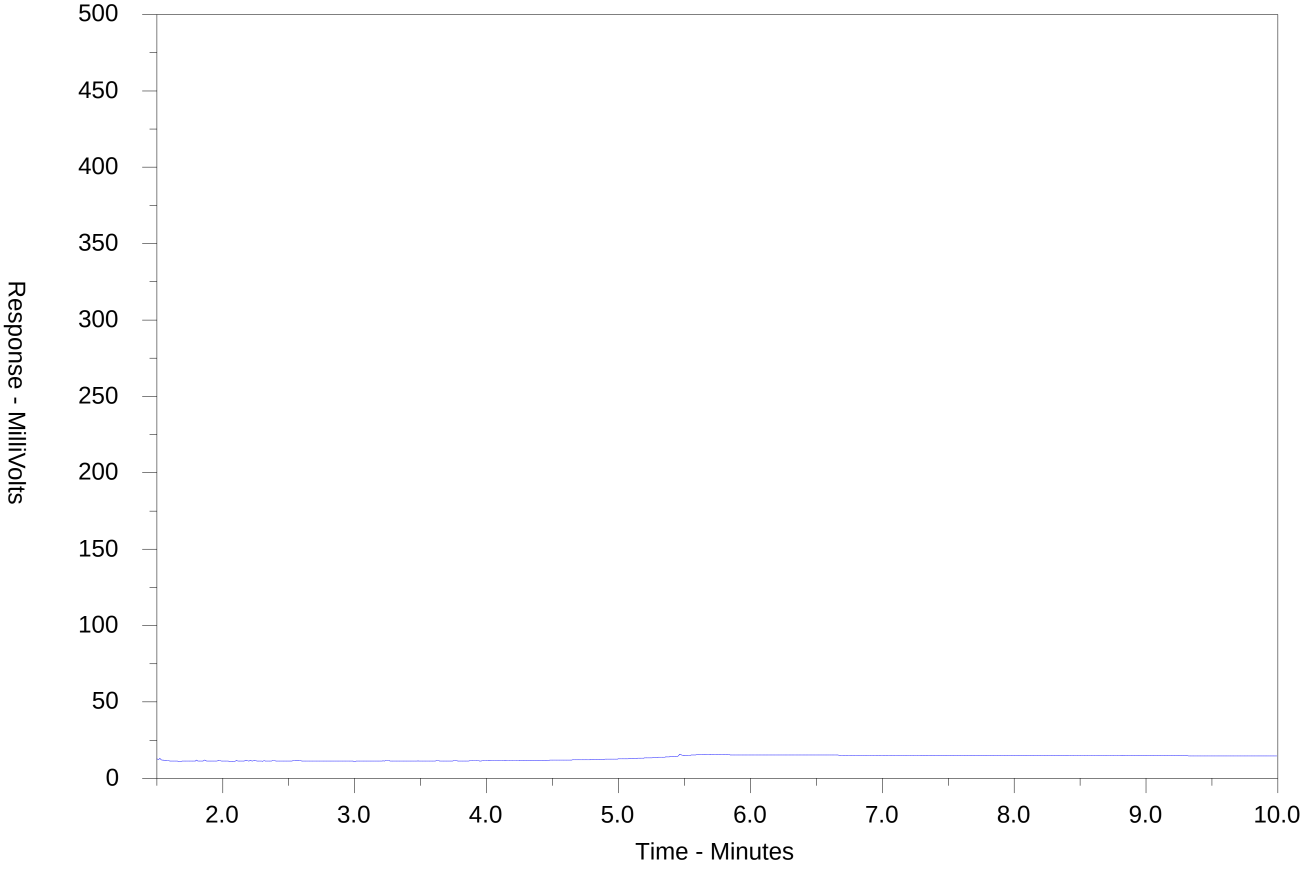
A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1760800)										
WT2433433-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0973 mg/L	0.1 mg/L	97.3	75.0	125	----
Volatile Organic Compounds (QCLot: 1761612)										
TY2412761-003	Anonymous	Benzene	71-43-2	E611A	97.6 µg/L	100 µg/L	97.6	60.0	140	----
		Ethylbenzene	100-41-4	E611A	95.5 µg/L	100 µg/L	95.5	60.0	140	----
		Toluene	108-88-3	E611A	93.2 µg/L	100 µg/L	93.2	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	205 µg/L	200 µg/L	102	60.0	140	----
		Xylene, o-	95-47-6	E611A	99.4 µg/L	100 µg/L	99.4	60.0	140	----
Hydrocarbons (QCLot: 1761611)										
TY2412761-003	Anonymous	F1 (C6-C10)	----	E581.F1-L	1800 µg/L	2000 µg/L	90.1	60.0	140	----

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2433595-001-E601.SG
Client Sample ID: MW24-1



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F

Gasoline →
← Motor Oils/Lube Oils/Grease →
← Diesel/Jet Fuels →

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

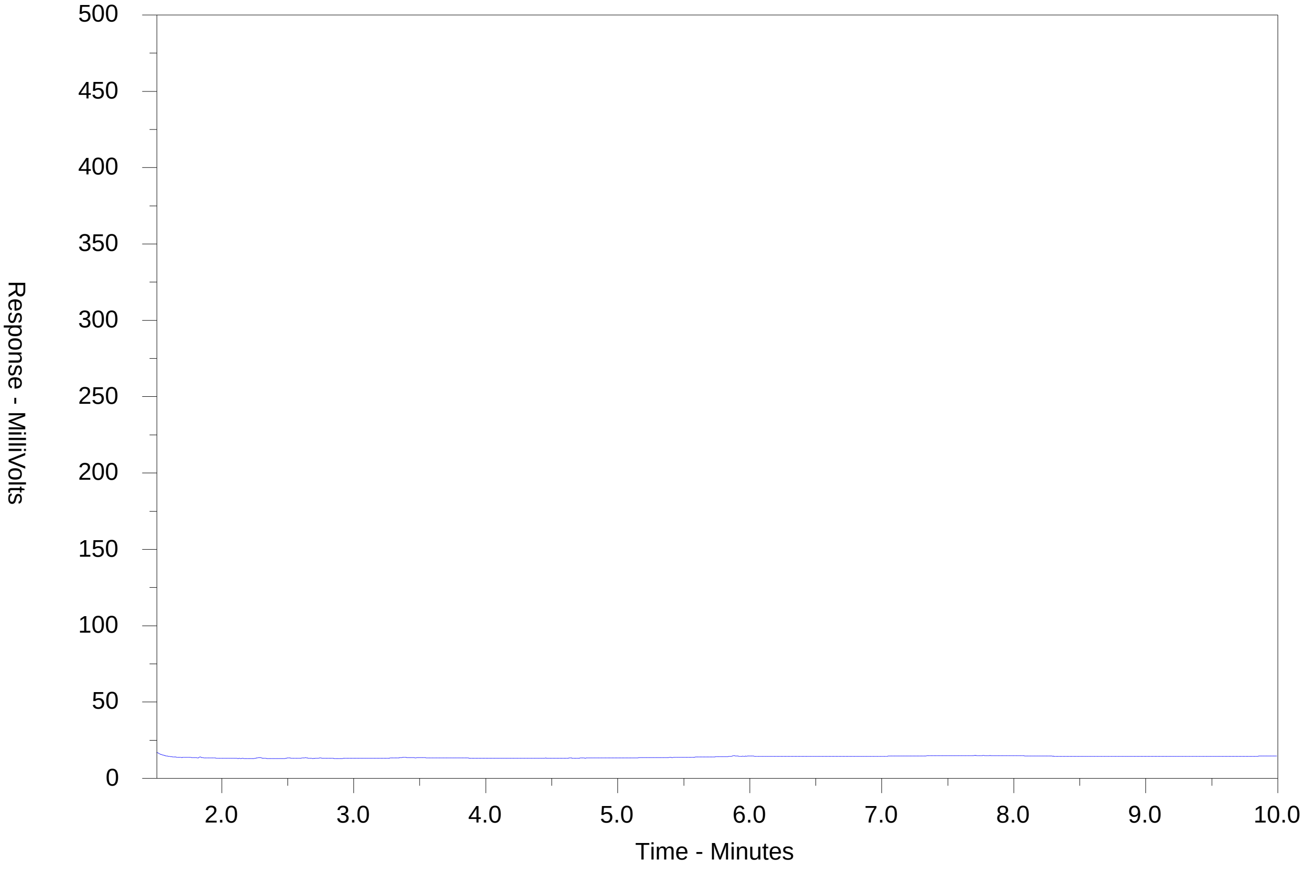
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2433595-002-E601.SG
Client Sample ID: MW24-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

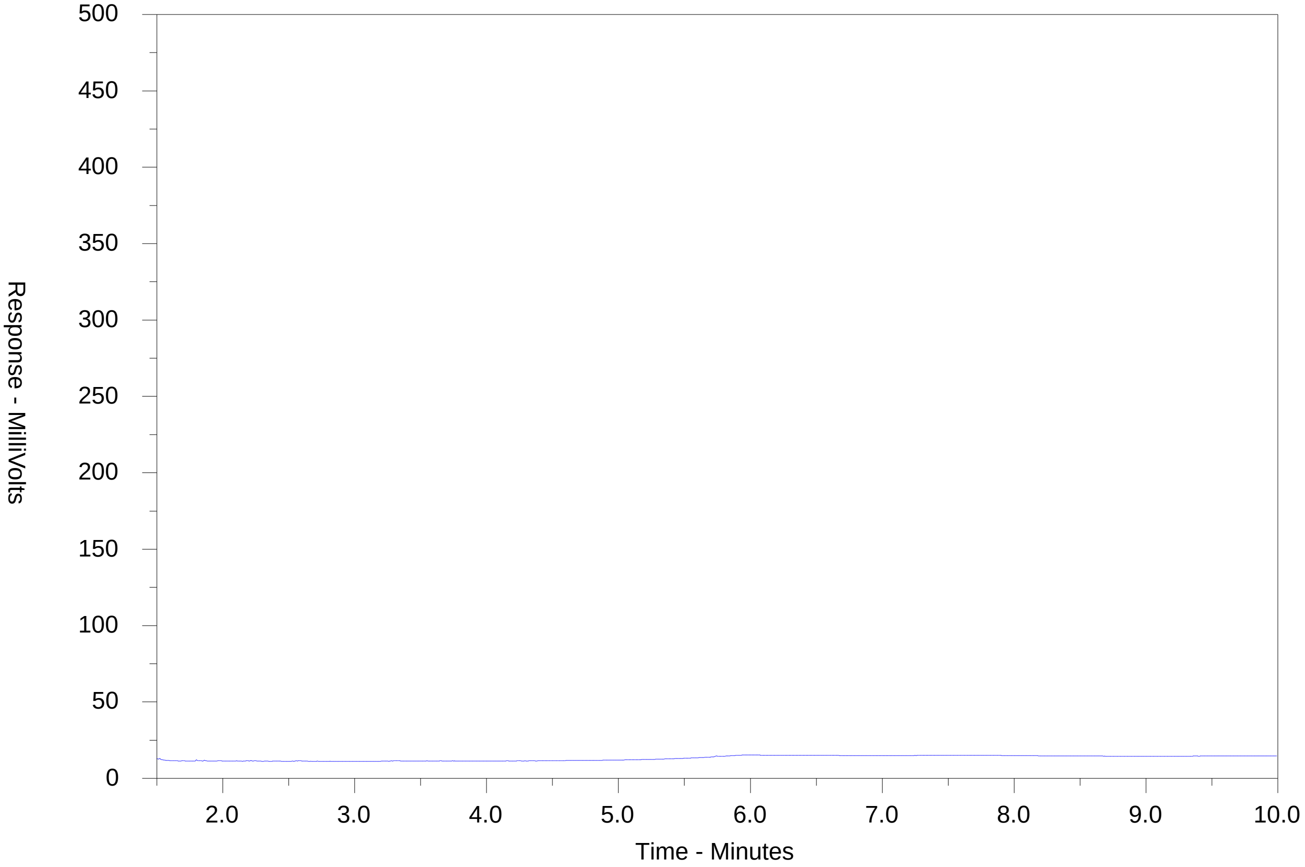
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2433595-003-E601.SG
Client Sample ID: MW24-3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease	→
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

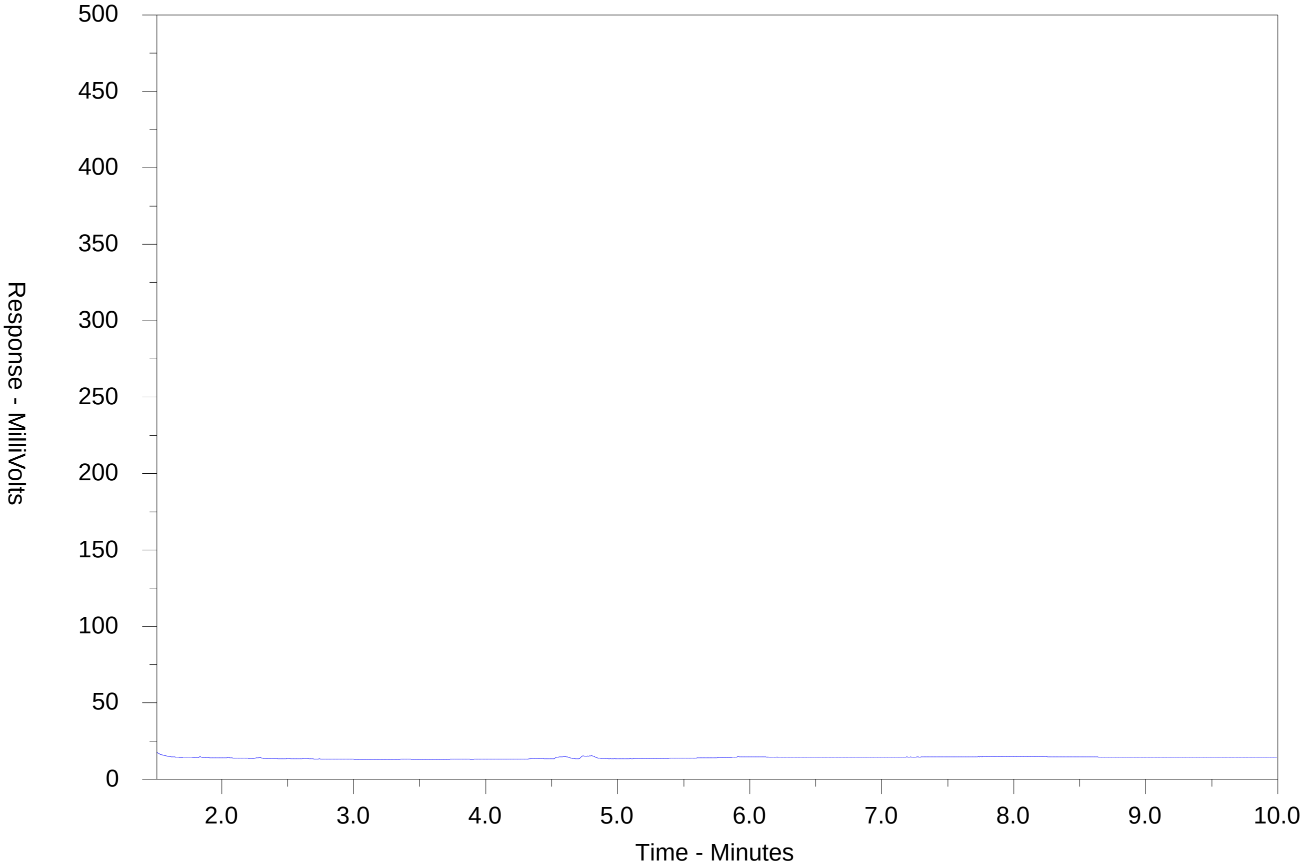
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2433595-004-E601.SG
Client Sample ID: MW24-4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

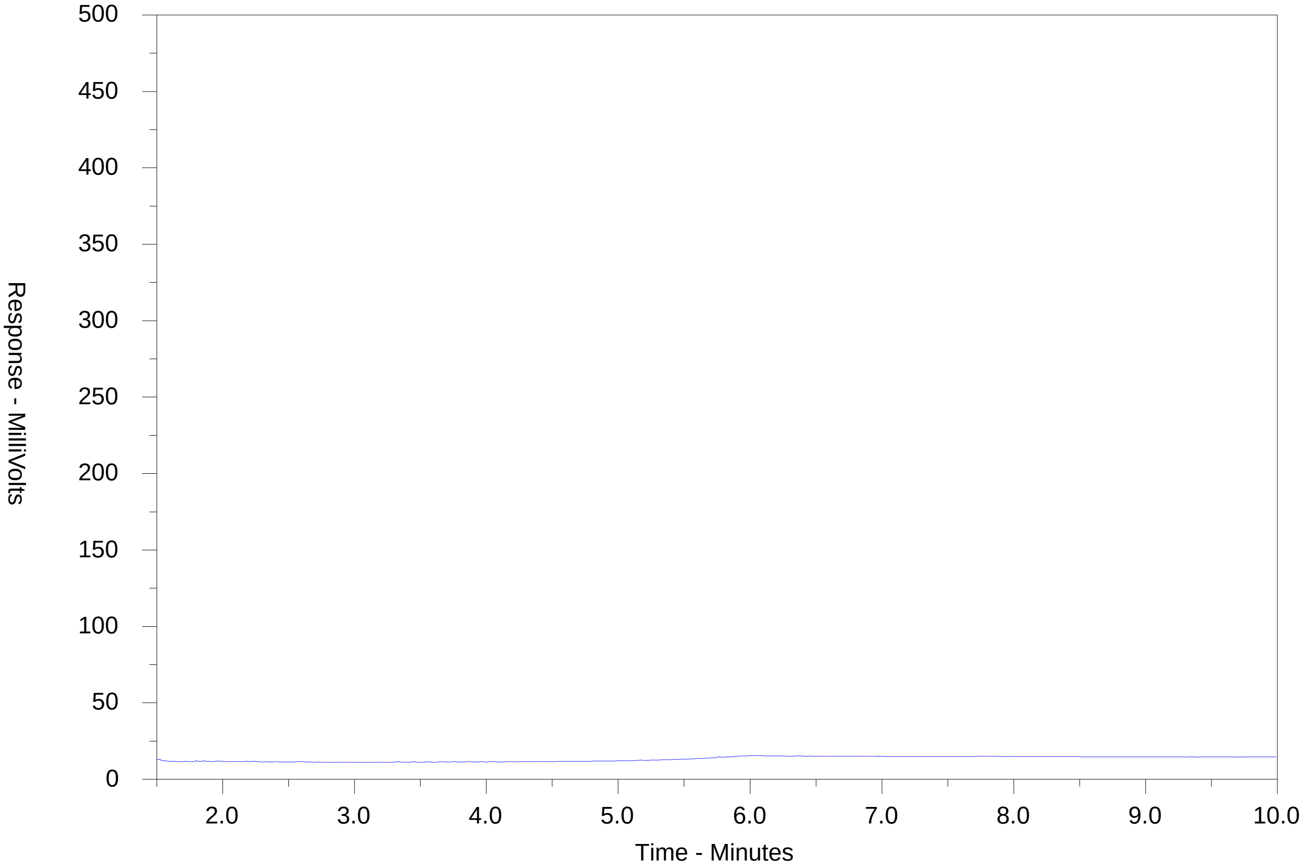
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2433595-005-E601.SG
Client Sample ID: MW24-5



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizin hydrocarbon products that may be present in your sample.

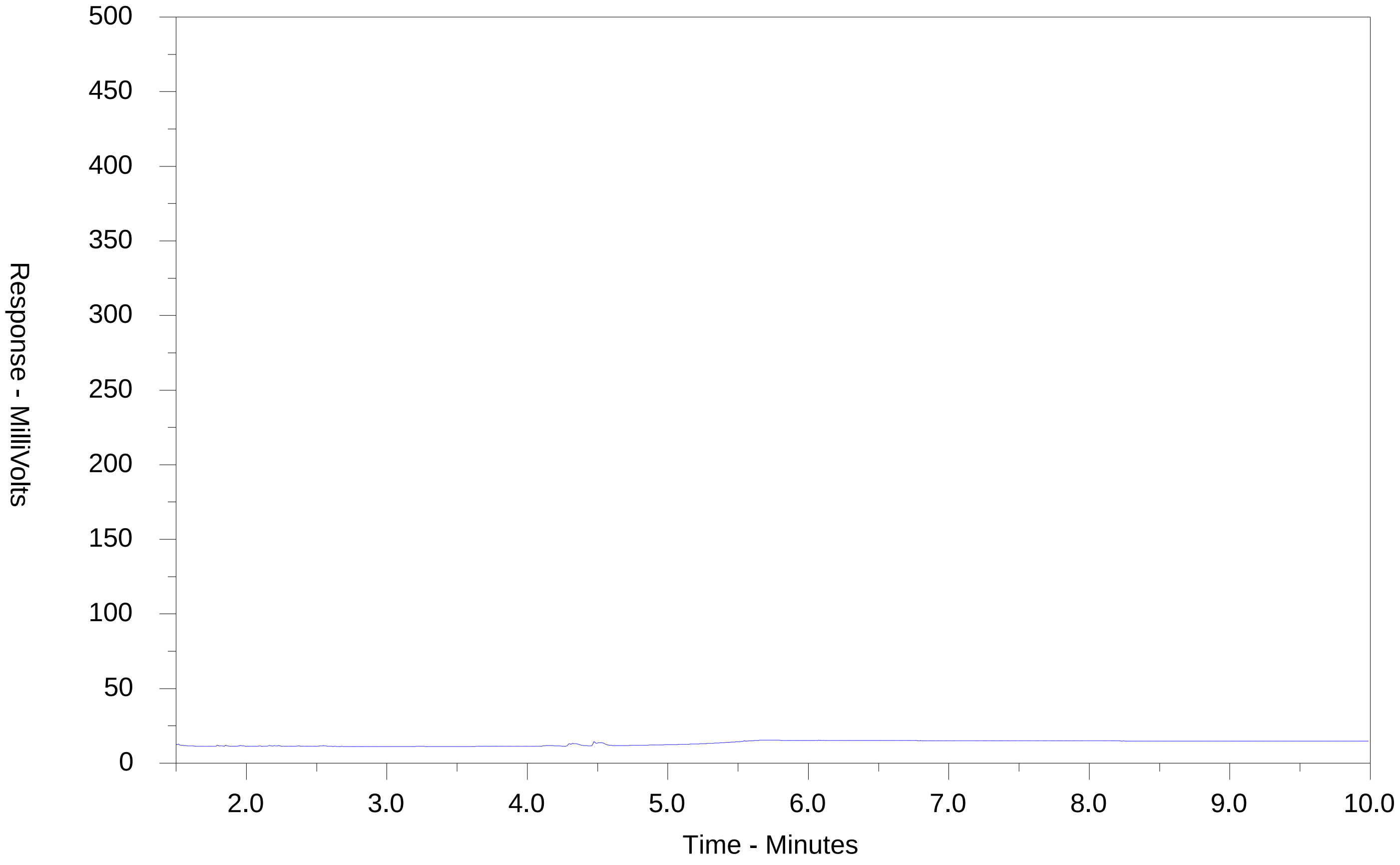
The scale at the bottom of the chromatogram indicates the approximate retention times of commo petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary betwee samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, th sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms fro common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: WT2433595-006-E601.SG
Client Sample ID: DUP-1



←F2→	←F3→		←F4→
nC10	nC16	nC34	nC50
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: **22 -**

Page 1 of 1

Environmental Division
Waterloo
Work Order Reference
WT2433595

Telephone : + 1 519 886 6910

Report To	Contact and company name below will appear on the final report
Company:	City of Ottawa c/o WSP
Contact:	Jason Taylor
Phone:	613-866-8199
	Company address below will appear on the final report
Street:	800 Green Creek Drive
City/Province:	Ottawa, ON
Postal Code:	K1J 1K6
Invoice To	Same as Report To ☐ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax richard.barker@ottawa.ca
Email 2 jason.taylor@wsp.com
Email 3 robert.ireland@wsp.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax
Email 2

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, sta

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #: WT2024GMOW1000001
Job #: CA0039399.3386
PO / AFE:
LSD: City of Ottawa - Lansdowne Park

ALS Lab Work Order # (ALS use only): WT2433595

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Contact: Emily Smith Sampler: BC

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	BTEX,F1-F4	NH3	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	MW24-1	8.11.24	11:02		5	X	X			
	MW24-2		11:34		5	X	X			
	MW24-3		10:23		5	X	X			
	MW24-4		9:00		5	X	X			
	MW24-5		9:42		5	X	X			
	Dup.1				5	X	X			

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

Are samples taken from a Regulated DW System?
☐ YES ☐ NO

Are samples for human consumption/ use?
☐ YES ☐ NO

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

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
11.3	19.1

SHIPMENT RELEASE (client use)

Released by: Brian Clark Date: 8-11-24 Time: 12:26

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: CSTAT F Date: 8/11/24 Time: 12:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: AP Date: 11 NOV 24 Time: 900

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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

JAN 2023 FRONT

VW-272 N-4089

Appendix F

Summary of Soil and Groundwater QA/QC Analysis

Notes on Soil Analytical QA/QC Summary Tables

All Units in Micrograms per Gram (µg/g) Except Where Indicated Otherwise.

RDL = Laboratory Analytical Reporting Detection Limit.

RL = MECP 2021 Analytical Protocol Reporting Limit.

- = Not Analyzed or No Published Value.

DUP = Quality Assurance/Quality Control Duplicate Sample.

RPD = Relative Percent Difference (Between Primary and Duplicate Samples).

* Denotes RPD Exceeds Recommended Alert Criterion Exceeded, However, Parameter Concentration Less than 5 Times Laboratory RDL.

< = Less Than Laboratory Analytical Method Detection Limit or Reporting Detection Limit.

(a) F1 Fraction Does Not Include BTEX; However, the Proponent has the Choice as to Whether or not to Subtract BTEX from the Analytical Result.

(d) The Methylnaphthalene Standards are Applicable to Both 1-Methyl Naphthalene and 2-Methyl Naphthalene, with the Provision that if Both are Detected the Sum of the Two Must not Exceed the Standard.

(h) MECP Standard for Boron Based on Hot Water Extract.

(i) Analysis for Methyl Mercury is Required When the MECP Standard for Mercury (total) is Exceeded.

55	Parameter Concentration May Exceed Applicable Standard or Guideline Due to Elevated Reporting Detection Limit.
797	Parameter Concentration Exceeds MECP Table 3 Full Depth SCS for Industrial/Commercial/Community (I/C/C) Property Use, Coarse Textured Soil.
1024	Denotes Relative Percent Difference (RPD) Exceeded Recommended Alert Criteria

MECP Standards = Soil Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ministry of the Environment, Conservation and Parks, April 15, 2011.

Table F1. Summary of Soil QA/QC Blind Duplicate Analyses

			Sample Location	MECP Standards	BH8-24 / MW24-2	BH8-24 / MW24-2	BH8-24 / MW24-2	BH8-24 / MW24-2
			Sample No.	Full Depth	SS5	DUP-24-1	SS5	SS5
			Sample Depth (m)	Non-Potable	3.05 - 3.81	3.05 - 3.81	DUP-24-1	DUP-24-1
			Laboratory Name	Table 3	ALS	ALS	Average	RPD
			Laboratory Work Order No.	I/C/C Use	WT2432752	WT2432752		(%)
			Laboratory Sample ID	Coarse	WT2432752-003	WT2432752-005		
			Sample Date		01-Nov-2024	01-Nov-2024		
			Analysis Date					
Parameters	**Units**	**RDL**	**RL**					
Petroleum Hycrocarbons								
Benzene	µg/g	0.005	0.02	0.32	<0.0050	<0.0050	<0.0050	-
Ethylbenzene	µg/g	0.015	0.05	9.5	<0.015	<0.015	<0.015	-
Toluene	µg/g	0.05	0.2	68	<0.050	<0.050	<0.050	-
Xylenes, m,p-	µg/g	0.03	-	-	<0.030	<0.030	<0.030	-
Xylene, o-	µg/g	0.03	-	-	<0.030	<0.030	<0.030	-
Total Xylenes	µg/g	0.05	0.05	26	<0.050	<0.050	<0.050	-
PHC F1 (C6 - C10) [a]	µg/g	5	10	55	<5.0	<5.0	<5.0	-
PHC F2 (>C10 - C16)	µg/g	10	10	230	<10	<10	<10	-
PHC F3 (>C16 - C34)	µg/g	50	50	1700	<50	<50	<50	-
PHC F4 (>C34)	µg/g	50	50	3300	<50	<50	<50	-
PHC F4 Gravimetric	µg/g	80	50	3300	-	-	-	-
Polynuclear Aromatic Hydrocarbons								
Acenaphthene	µg/g	0.05	0.05	96	<0.050	<0.050	<0.050	-
Acenaphthylene	µg/g	0.05	0.05	0.15	<0.050	<0.050	<0.050	-
Anthracene	µg/g	0.05	0.05	0.67	<0.050	<0.050	<0.050	-
Benzo[a]anthracene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	-
Benzo[a]pyrene	µg/g	0.05	0.05	0.3	<0.050	<0.050	<0.050	-
Benzo[b]fluoranthene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	-
Benzo[g,h,i]perylene	µg/g	0.05	0.1	9.6	<0.050	<0.050	<0.050	-
Benzo[k]fluoranthene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	-
Chrysene	µg/g	0.05	0.05	9.6	<0.050	<0.050	<0.050	-
Dibenzo[a,h]anthracene	µg/g	0.05	0.1	0.1	<0.050	<0.050	<0.050	-
Fluoranthene	µg/g	0.05	0.05	9.6	<0.050	<0.050	<0.050	-
Fluorene	µg/g	0.05	0.05	62	<0.050	<0.050	<0.050	-
Indeno[1,2,3-cd]pyrene	µg/g	0.05	0.1	0.76	<0.050	<0.050	<0.050	-
Methylnaphthalene, 1-, 2- d	µg/g	0.05	-	76	<0.050	<0.050	<0.050	-
Methylnaphthalene, 1- [d]	µg/g	0.03	0.05	-	<0.030	<0.030	<0.030	-
Methylnaphthalene, 2- [d]	µg/g	0.03	-	-	<0.030	<0.030	<0.030	-
Naphthalene	µg/g	0.01	0.05	9.6	<0.010	<0.010	<0.010	-
Phenanthrene	µg/g	0.05	0.05	12	<0.050	<0.050	<0.050	-
Pyrene	µg/g	0.05	0.05	96	<0.050	<0.050	<0.050	-
Metals								
Antimony	µg/g	0.1	1	40	<0.10	<0.10	<0.10	-
Arsenic	µg/g	0.1	1	18	0.86	1.02	0.94	17.0%
Barium	µg/g	0.5	5	670	27.7	25	26.35	10.2%
Beryllium	µg/g	0.1	2	8	0.15	0.16	0.155	6.45%
Boron (total)	µg/g	5	5	120	<5.0	<5.0	<5.0	-
Boron (Available) [g]	µg/g	0.1	0.5	2	<0.10	<0.10	<0.10	-
Cadmium	µg/g	0.02	1	1.9	0.024	0.022	0.023	8.70%
Chromium (Total)	µg/g	0.5	5	160	9.33	8.33	8.83	11.3%
Chromium (vi)	µg/g	0.1	0.2	8	<0.10	<0.10	<0.10	-
Cobalt	µg/g	0.1	2	80	3.42	3.15	3.285	8.22%
Copper	µg/g	0.5	5	230	9.01	8.08	8.545	10.9%
Lead	µg/g	0.5	10	120	2.64	2.66	2.65	0.75%
Mercury [h]	µg/g	0.005	0.1	3.9	0.006	<0.0050	<0.0050	-
Molybdenum	µg/g	0.1	2	40	0.19	0.22	0.205	14.6%
Nickel	µg/g	0.5	5	270	5.78	5.39	5.585	6.98%
Selenium	µg/g	0.2	1	5.5	<0.20	<0.20	<0.20	-
Silver	µg/g	0.1	0.5	40	<0.10	<0.10	<0.10	-
Thallium	µg/g	0.05	1	3.3	<0.050	<0.050	<0.050	-
Uranium	µg/g	0.05	1	33	0.404	0.508	0.456	22.8%
Vanadium	µg/g	0.2	10	86	22.2	20	21.1	10.4%
Zinc	µg/g	2	30	340	16	13.9	14.95	14.0%
Inorganic Parameters								
pH (range)	-	0.1	-	-	7.86	7.92	7.89	0.76%
Cyanide (CN-)	µg/g	0.05	0.05	0.051	<0.050	<0.050	<0.050	-
Electrical Conductivity (EC)	mS/cm	0.005	0.005	1.4	0.572	0.554	0.563	3.20%
Sodium Adsorption Ration (SAR)	-	0.1	-	12	6.31	6.68	6.495	5.70%

Table F1. Summary of Soil QA/QC Blind Duplicate Analyses

Sample Location				MECP Standards	BH8-24 / MW24-2	BH8-24 / MW24-2	BH8-24 / MW24-2	BH8-24 / MW24-2
Sample No.				Full Depth	SS10	DUP-24-2	SS10	SS10
Sample Depth (m)				Non-Potable	6.86 - 7.62	6.86 - 7.62	DUP-24-2	DUP-24-2
Laboratory Name				Table 3	ALS	ALS	Average	RPD
Laboratory Work Order No.				I/C/C Use	WT2432752	WT2432752		(%)
Laboratory Sample ID				Coarse	WT2432752-004	WT2432752-006		
Sample Date					01-Nov-2024	01-Nov-2024		
Analysis Date								
Parameters	**Units**	**RDL**	**RL**					
Petroleum Hycrocarbons								
Benzene	µg/g	0.005	0.02	0.32	<0.0050	<0.0050	<0.0050	-
Ethylbenzene	µg/g	0.015	0.05	9.5	<0.015	<0.015	<0.015	-
Toluene	µg/g	0.05	0.2	68	<0.050	<0.050	<0.050	-
Xylenes, m,p-	µg/g	0.03	-	-	<0.030	<0.030	<0.030	-
Xylene, o-	µg/g	0.03	-	-	<0.030	<0.030	<0.030	-
Total Xylenes	µg/g	0.05	0.05	26	<0.050	<0.050	<0.050	-
PHC F1 (C6 - C10) [a]	µg/g	5	10	55	<5.0	<5.0	<5.0	-
PHC F2 (>C10 - C16)	µg/g	10	10	230	<10	<10	<10	-
PHC F3 (>C16 - C34)	µg/g	50	50	1700	<50	<50	<50	-
PHC F4 (>C34)	µg/g	50	50	3300	<50	<50	<50	-
PHC F4 Gravimetric	µg/g	80	50	3300	-	-	-	-
Polynuclear Aromatic Hydrocarbons								
Acenaphthene	µg/g	0.05	0.05	96	<0.050	<0.050	<0.050	-
Acenaphthylene	µg/g	0.05	0.05	0.15	<0.050	<0.050	<0.050	-
Anthracene	µg/g	0.05	0.05	0.67	<0.050	<0.050	<0.050	-
Benzo[a]anthracene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	-
Benzo[a]pyrene	µg/g	0.05	0.05	0.3	<0.050	<0.050	<0.050	-
Benzo[b]fluoranthene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	-
Benzo[g,h,i]perylene	µg/g	0.05	0.1	9.6	<0.050	<0.050	<0.050	-
Benzo[k]fluoranthene	µg/g	0.05	0.05	0.96	<0.050	<0.050	<0.050	-
Chrysene	µg/g	0.05	0.05	9.6	<0.050	<0.050	<0.050	-
Dibenzo[a,h]anthracene	µg/g	0.05	0.1	0.1	<0.050	<0.050	<0.050	-
Fluoranthene	µg/g	0.05	0.05	9.6	<0.050	<0.050	<0.050	-
Fluorene	µg/g	0.05	0.05	62	<0.050	<0.050	<0.050	-
Indeno[1,2,3-cd]pyrene	µg/g	0.05	0.1	0.76	<0.050	<0.050	<0.050	-
Methylnaphthalene, 1-, 2- d	µg/g	0.05	-	76	<0.050	<0.050	<0.050	-
Methylnaphthalene, 1- [d]	µg/g	0.03	0.05	-	<0.030	<0.030	<0.030	-
Methylnaphthalene, 2- [d]	µg/g	0.03	-	-	<0.030	<0.030	<0.030	-
Naphthalene	µg/g	0.01	0.05	9.6	<0.010	<0.010	<0.010	-
Phenanthrene	µg/g	0.05	0.05	12	<0.050	<0.050	<0.050	-
Pyrene	µg/g	0.05	0.05	96	<0.050	<0.050	<0.050	-
Metals								
Antimony	µg/g	0.1	1	40	<0.10	<0.10	<0.10	-
Arsenic	µg/g	0.1	1	18	1.66	1.72	1.69	3.55%
Barium	µg/g	0.5	5	670	55.7	58	56.85	4.05%
Beryllium	µg/g	0.1	2	8	0.32	0.35	0.335	8.96%
Boron (total)	µg/g	5	5	120	13.7	14.5	14.1	5.67%
Boron (Available) [g]	µg/g	0.1	0.5	2	0.11	0.11	0.11	0.00%
Cadmium	µg/g	0.02	1	1.9	0.024	<0.020	<0.022	-
Chromium (Total)	µg/g	0.5	5	160	14.7	15	14.85	2.02%
Chromium (vi)	µg/g	0.1	0.2	8	0.11	0.11	0.11	0.00%
Cobalt	µg/g	0.1	2	80	5.71	6.03	5.87	5.45%
Copper	µg/g	0.5	5	230	14.6	15	14.8	2.70%
Lead	µg/g	0.5	10	120	5.07	5.56	5.315	9.22%
Mercury [h]	µg/g	0.005	0.1	3.9	0.0098	0.0102	0.01	4.00%
Molybdenum	µg/g	0.1	2	40	0.7	0.8	0.75	13.3%
Nickel	µg/g	0.5	5	270	11.9	12.4	12.15	4.12%
Selenium	µg/g	0.2	1	5.5	<0.20	<0.20	<0.20	-
Silver	µg/g	0.1	0.5	40	<0.10	<0.10	<0.10	-
Thallium	µg/g	0.05	1	3.3	0.16	0.167	0.1635	4.28%
Uranium	µg/g	0.05	1	33	0.458	0.484	0.471	5.52%
Vanadium	µg/g	0.2	10	86	19	19.5	19.25	2.60%
Zinc	µg/g	2	30	340	21.3	21.7	21.5	1.86%
Inorganic Parameters								
pH (range)	-	0.1	-	-	7.84	7.81	7.82	0.38%
Cyanide (CN-)	µg/g	0.05	0.05	0.051	<0.050	<0.050	<0.050	-
Electrical Conductivity (EC)	mS/cm	0.005	0.005	1.4	0.162	0.168	0.165	3.64%
Sodium Adsorption Ration (SAR)	-	0.1	-	12	0.87	1.13	1	26.0%

Notes on Groundwater Analytical QA/QC Summary Tables

All Units in Micrograms per Litre (µg/L) Except Where Indicated Otherwise.

RDL = Laboratory Analytical Reporting Detection Limit.

RL = MECP 2021 Analytical Protocol Reporting Limit.

- = Not Analyzed or No Published Value.

DUP = Quality Assurance/Quality Control Duplicate Sample.

RPD = Relative Percent Difference (Between Primary and Duplicate Samples).

* Denotes RPD Exceeds Recommended Alert Criterion Exceeded, However, Parameter Concentration Less than 5 Times Laboratory RDL.

< = Less Than Laboratory Analytical Method Detection Limit or Reporting Detection Limit.

55	Parameter Concentration May Exceed Applicable Standard or Guideline Due to Elevated Reporting Detection Limit.
797	Parameter Concentration Exceeds MECP Table 3 Full Depth Site Condition Standards for Non-Potable Ground Water Situation and Coarse Textured Soil
1024	Denotes Relative Percent Difference (RPD) Exceeded Recommended Alert Criteria

(a) F1 Fraction Does Not Include BTEX; However, the Proponent has the Choice as to Whether or not to Subtract BTEX from the Analytical Result.

(c) For a Site to Meet the MECP Standard There Must be no Evidence of Free Product, Including but not Limited to, Visible Petroleum Hydrocarbon Film or Sheen Present on Groundwater, Surface Water or in any Groundwater or Surface Water Samples.

MECP Standards = Soil Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ministry of the Environment, Conservation and Parks, April 15, 2011.

Table F2 Summary of Groundwater QA/QC Blind Duplicate Analyses

			Sample Location	MECP Standards	Property Specific	MW24-4	MW24-4	MW24-4	MW24-4	MW24-2	MW24-2	MW24-2	MW24-2
			Sample ID	Full Depth	Standards	MW24-4	DUP-1	MW24-4	MW24-4	MW24-2	DUP-1	MW24-2	MW24-2
			Laboratory Name	Non-Potable	(as per Certificate	ALS	ALS	DUP-1	DUP-1	ALS	ALS	DUP-1	DUP-1
			Laboratory Work Order No.	Table 3	of Property Use	WT2433595	WT2433595	Average	RPD	WT2435977	WT2435977	Average	RPD
			Laboratory Sample ID	Coarse	0371-8TYQMY)	-004	-006		(%)	-002	-004		(%)
			Sample Date			8-Nov-24	8-Nov-24			2-Dec-24	2-Dec-24		
			Analysis Date			13-Nov-24	13-Nov-24			9-Dec-24	9-Dec-24		
Parameters	**Units**	**RDL**	**RL**										
Petrolum Hydrocarbons													
Benzene	µg/L	0.5	0.5	44	-	<0.50	<0.50	<0.50	-	-	-	-	-
Ethylbenzene	µg/L	0.5	0.5	18000	-	<0.50	<0.50	<0.50	-	-	-	-	-
Toluene	µg/L	0.5	0.5	2300	-	<0.50	<0.50	<0.50	-	-	-	-	-
Xylenes, m,p-	µg/L	0.4	-	-	-	<0.40	<0.40	<0.40	-	-	-	-	-
Xylene, o-	µg/L	0.3	-	-	-	<0.30	<0.30	<0.30	-	-	-	-	-
Total Xylenes	µg/L	0.5	0.5	4200	-	<0.50	<0.50	<0.50	-	-	-	-	-
PHC F1 (C6-C10)[a]	µg/L	25	25	750[c]	-	<25	<25	<25	-	-	-	-	-
PHC F2 (>C10 - C16)	µg/L	100	100	150[c]	-	<100	<100	<100	-	-	-	-	-
PHC F3 (>C16 - C34)	µg/L	250	500	500[c]	-	<250	<250	<250	-	-	-	-	-
PHC F4 (>C34)	µg/L	250	500	500[c]	-	<250	<250	<250	-	-	-	-	-
General Inorganic Parameters													
Ammonia (as N, Total)	mg/L		-	-	4.524	0.0069	0.0089	0.0079	-	-	-	-	-
Polynuclear Aromatic Hydrocarbons													
Acenaphthene	µg/L		1	600	-	-	-	-	-	<0.010	<0.010	<0.010	-
Acenaphthylene	µg/L		1	1.8	-	-	-	-	-	<0.010	<0.010	<0.010	-
Anthracene	µg/L		0.1	2.4	-	-	-	-	-	<0.010	<0.010	<0.010	-
Benzo[a]anthracene	µg/L		0.2	4.7	-	-	-	-	-	0.022	0.018	0.02	-
Benzo[a]pyrene	µg/L		0.01	0.81	-	-	-	-	-	0.0252	0.0195	0.02235	-
Benzo[b+j]fluoranthene	µg/L		-	-	-	-	-	-	-	0.027	0.021	0.024	-
Benzo[g,h,i]perylene	µg/L		0.2	0.2	-	-	-	-	-	0.018	0.012	0.015	-
Benzo[k]fluoranthene	µg/L		0.1	0.4	-	-	-	-	-	0.015	0.013	0.014	-
Chrysene	µg/L		0.1	1	-	-	-	-	-	0.027	0.021	0.024	-
Dibenzo[a,h]anthracene	µg/L		0.2	0.52	-	-	-	-	-	<0.0050	<0.0050	<0.0050	-
Fluoranthene	µg/L		0.4	130	-	-	-	-	-	0.048	0.037	0.0425	-
Fluorene	µg/L		0.5	400	-	-	-	-	-	<0.010	<0.010	<0.010	-
Indeno[1,2,3-cd]pyrene	µg/L		0.2	0.2	-	-	-	-	-	0.017	0.012	0.0145	-
Methylnaphthalene, 1-[e]	µg/L		2	1800	-	-	-	-	-	<0.010	<0.010	<0.010	-
Methylnaphthalene, 2-[e]	µg/L		2	1800	-	-	-	-	-	<0.010	<0.010	<0.010	-
Methylnaphthalene, 1-,2-[e]	µg/L		2	1800	-	-	-	-	-	<0.015	<0.015	<0.015	-
Naphthalene	µg/L		2	1400	-	-	-	-	-	<0.050	<0.050	<0.050	-
Phenanthrene	µg/L		0.1	580	-	-	-	-	-	0.023	<0.020	0.0215	-
Pyrene	µg/L		0.2	68	-	-	-	-	-	0.045	0.034	0.0395	-
Polychlorinated Biphenyls													
Polychlorinated Biphenyls	µg/L		0.2	7.8	-	-	-	-	-	<0.060	<0.060	<0.060	-

Appendix G

Limitations

LIMITATIONS

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
   a. The Standard Terms and Conditions which form a part of our Professional Services Contract;
   b. The Scope of Services;
   c. Time and Budgetary limitations as described in our Contract; and
   d. The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the Site and attendant structures. Our conclusions cannot and are not extended to include those portions of the Site or structures, which are not reasonably available, in WSP's opinion, for direct observation.
4. The environmental conditions at the Site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the Site with any applicable local, provincial or federal bylaws, orders-in-council, legislative enactments and regulations was not performed.
5. The Site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on-site and may be revealed by different or other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, WSP must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of WSP's services during the implementation of any remedial measures will allow WSP to observe compliance with the conclusions and recommendations contained in the report. WSP's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. WSP accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of WSP.
11. Provided that the report is still reliable, and less than 12 months old, WSP will issue a third-party reliance letter to parties that the client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on WSP's report, by such reliance agree to be bound by our proposal and WSP's standard reliance letter. WSP's standard reliance letter indicates that in no event shall WSP be liable for any damages,

howsoever arising, relating to third-party reliance on WSP's report. No reliance by any party is permitted without such agreement.