File Number A00-03-15 945 BANK

25 March 2022

Ministry of the Environment, Conservation and Parks
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1

Attention: Tracy Hart, Ottawa District Manager

Dear Ms. Hart,

Re: 2021 Annual Report, Certificate of Property Use (CPU 0371-8TYQMY)
Lansdowne Park, Urban Park (Zone C)
450 Queen Elizabeth Drive (Part of 945 Bank Street),
Ottawa, Ontario

Pleased find enclosed one (1) digital copy of the 2021 Annual Report in accordance with the reporting requirements as identified in Section 4.2.10 of the Certificate of Property Use No. 0371-8TYQMY for Zone C, Urban Park, Lansdowne Park. A hard copy of the report can also be provided at your request.

Should you have any questions, please do not hesitate to contact me.

Best regards,

Richard Barker
Specialist (A), Environmental Remediation
Corporate Real Estate Office

City Of Ottawa
Planning, Real Estate and Economic Development
Corporate Real Estate Office
110 Laurier Avenue West, 5th Floor W
Ottawa, ON K1P 1J1
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2021 Annual Report - Certificate of Property Use No. 0371-8TYQMY

Lansdowne Park- Urban Park (Zone C)
450 Queen Elizabeth Driveway (Part of 945 Bank Street), Ottawa, Ontario
Project No. TZ10100106

Prepared for:
Ontario Ministry of the Environment, Conservation and Parks Ottawa District Office

2430 Don Reid Drive, Ottawa, Ontario K1H 1E1

Prepared by:
Wood Environment and Infrastructure Solutions
a Division of Wood Canada Limited
210 Colonnade Road, Unit 300
Ottawa, Ontario K2E 7L5
Canada
T: +1 613-727-0658

March 2022

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25 March 2022

Reference No. TZ10100106

VIA EMAIL

Ontario Ministry of the Environment, Conservation and Parks
Ottawa District Office
2430 Don Reid Drive
Ottawa, Ontario K1H 1E1

Attention: Tracy Hart
Ottawa District Manager

Dear Ms. Hart;

RE: Report – 2021 Annual Report - Certificate of Property Use No. 0371-8TYQMY
Lansdowne Park- Urban Park (Zone C)
450 Queen Elizabeth Driveway (Part of 945 Bank Street), Ottawa, Ontario

Please find enclosed an electronic copy, in PDF format, of the 2021 Annual Report prepared in reference to the above noted property. The report has been prepared on behalf of the City of Ottawa to meet the annual reporting requirements stipulated under condition 4.2.10 of Certificate of Property Use No. 0371-8TYQMY.

Should you have any questions or require any additional information, please do not hesitate to contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions,
A Division of Wood Canada Limited

Kevin D. Hicks, M.Sc., P.Geo., QP_{ESA}
Principal Hydrogeologist

Enclosure (1)

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2021 Annual Report - Certificate of Property Use No. 0371-8TYQMY

Lansdowne Park- Urban Park (Zone C)
450 Queen Elizabeth Driveway (Part of 945 Bank Street), Ottawa, Ontario
Project No. TZ10100106

Prepared for:

Ontario Ministry of the Environment, Conservation and Parks Ottawa District Office
2430 Don Reid Drive, Ottawa, K1H 1E1

Prepared by:

Wood Environment & Infrastructure Solutions
A Division of Wood Canada Limited
210 Colonnade Road, Unit 300
Ottawa, Ontario K2E 7L5
Canada
T: 613-727-0658
March 2022

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Third-party disclaimer

Executive Summary

Certificate of Property Use (CPU) No. 0371-8TYQMY was issued by the Ontario Ministry of Environment and Climate Change (MOECC), now the Ministry of Environment, Conservation and Parks (MECP), to the City of Ottawa (the "City") for the Lansdowne Park – Urban Park (Zone C) property located at 450 Queen Elizabeth Driveway (part of 945 Bank Street) in Ottawa, Ontario (hereinafter referred to as the "CPU Property") on November 25, 2013.

Condition 4.2.10 of the CPU stipulates that an annual report shall be prepared each year to document the activities carried out by the Owner in relation to the Risk Management Measures (RMM) that have been implemented and that are to be maintained at the CPU Property, and the report submitted to the MECP by March 31 of the following year. This report has been prepared by Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited ("Wood"), on behalf of the City of Ottawa (the "City") to meet the annual reporting requirements for 2021 as stipulated by Condition 4.2.10 of the CPU.

Inspections of the RMM implemented at the CPU Property were conducted in 2021 in accordance with the IMP. The geotechnical investigation which included areas of the East Berm required the advancement of boreholes through the clean soil cover of the East Berm and into the impacted soils beneath. Steps were taken prior to and throughout the drilling activities to protect the integrity of the clean soil cap and underlying geotextile demarcation layer. Once drilling activities were complete the clean soil cap and geotextile were restored to conform with specifications under the CPU.

Visual inspections undertaken in 2021 in other areas of the Site noted findings similar to those reported during previous inspections with respect to areas of bare soil in high traffic areas of the Site, stressed areas from temporary placement of equipment during entertainment events, as well as several areas of soil erosion identified throughout the South Berm as evidenced by surface rutting, areas of soil washout, bare patches, and areas of down slope sediment accumulation. The observed areas are not considered to result in any increase in the levels of risk to potential receptors at the CPU Property, however, reparations to these areas should be undertaken to prevent continued erosion due to loss of stabilizing vegetation in these areas.

The 2021 groundwater monitoring and sampling program was conducted on a semi-annual basis in accordance with the GWMP. Results of the groundwater monitoring inferred groundwater flow patterns beneath the CPU Property similar to those observed since inception of the groundwater monitoring program in 2015. Shallow groundwater, beneath the southern half of the CPU property, generally flows to the east and northeast in a quasi-inward radial flow pattern towards a groundwater low in the vicinity of the former McElroy Building. Mounding near the northeast corner of the CPU property results in localized outward radial flow to the west and south and is likely due to leakage from the Rideau Canal migrating to the west within the historic fill materials placed within the former inlet of the Rideau Canal that extends beneath the CPU Property.

All groundwater samples collected from the monitoring well network located at the CPU property in 2021 reported parameter concentrations below 2011 Table 3 SCS for residential / parkland / institutional property use and coarse textured soil, where established, and for ammonia, chloroform and iron, below the Property Specific Standards (PSS) derived from the Risk Assessment as provided in CPU 0371-8TYQMY.

Methane concentrations measured at the landfill gas probes located at the CPU Property in 2021 as per the MMP were below the methane concentrations limits as outlined in O.Reg. 232/98 and the recommended methane alert levels provided in Procedure D-4-1: Assessing Methane Hazards from Landfill (MOE, 1987).

No revisions were deemed necessary to the SMP or the HASP.

Based on the results of the GWMP, MMP and IMP completed in 2021, no contingency measures were deemed necessary at the CPU Property and therefore no such measures or activities were implemented in 2021. Routine inspections did not identify significant deterioration of the RMM that would result in an increase in potential risk to human health at the CPU property and therefore no immediate site restoration activities were deemed necessary at the CPU Property in 2021.

Based on the results of both monitoring programs to date, groundwater quality at the Site continues to meet applicable standards with only a few isolated exceptions reported early on in the program and methane generation is limited to within the limits of the former landfill and at concentrations that are also below applicable trigger criteria. It is Wood's opinion that the GWMP and MMP RMM are no longer required and a formal request to discontinue the programs was submitted to the MECP in 2021.

Table of Contents

List of Tables (in order after text)

List of Figures (in order after tables)

List of Appendices

List of Acronyms and Abbreviations

BOD	Biochemical Oxygen Demand
COC	Contaminant of Concern
COD	Chemical Oxygen Demand
CPU	Certificate of Property Use
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
GWMP	Groundwater Monitoring Program
HASP	Health and Safety Plan
IMP	Inspection and Maintenance Plan
LFG	Landfill Gas
LSLP	Lansdowne Stadium Limited Partnership Ltd.
MDL	Method Detection Limit
MMP	Methane Monitoring Plan
MOE	Ministry of the Environment
MECP	Ministry of the Environment, Conservation and Parks
MOECC	Ministry of the Environment and Climate Change
OHSA	Occupational Health and Safety Act
ORP	Oxidation-Reduction Potential
OSEG	Ottawa Sports and Entertainment Group
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PHC	Petroleum Hydrocarbons
PSS	Property Specific Standards
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
QP	Qualified Person
RA	Risk Assessment
RL	Reporting Limit
RMM	Risk Management Measure
RMP	Risk Management Plan
RPD	Relative Percent Difference
RSC	Record of Site Condition
SCS	Site Condition Standards
SMP	Soil Management Plan
SOP	Standards Operating Procedure
VOC	Volatile Organic Compound

1.0 Introduction

On November 25, 2013 Certificate of Property Use (CPU) No. 0371-8TYQMY was issued by the Ontario Ministry of the Environment and Climate Change (MOECC), now the Ministry of the Environment, Conservation and Parks (MECP), for the Lansdowne Park – Urban Park (Zone C) property located at 450 Queen Elizabeth Driveway (part of 945 Bank Street) in Ottawa, Ontario (hereinafter referred to as the "CPU Property"). A key plan showing the location of the CPU Property is provided on Figure 1.

The CPU Property is legally described as Part of Lots 20, 21 and 22 (Block 6), Part of Lot 29 (Block 7) and Part of O'Connor Street (Formerly Mary Street) (closed by Judge's Order Instrument LT1245216) on Plan 26085, Part of Lots 57, 58, 59 and 60 and Part of Lansdowne Avenue (closed by Judge's Order Instrument LT1245216) on Plan 35722, Part of Lots 45 to 50 (Inclusive) on Plan 30307 and Part of Lots I and K, Concession C (Rideau Front), Nepean, being Parts 1, 16, 17, 32 and 33 on Plan 4R-26535; City Of Ottawa and being all of PIN 04139-0264.

Condition 4.2.10 of the CPU stipulates that an annual report shall be prepared each year to document the activities carried out by the Owner in relation to the Risk Management Measures (RMM) that have been implemented and are to be maintained at the CPU Property and submitted to the MECP by March 31 of the following year. This report has been prepared by Wood Environment & Infrastructure Solutions ("Wood"), on behalf of the City of Ottawa (the "City") to meet the annual reporting requirements stipulated by Condition 4.2.10 of CPU No. 0371-8TYQMY for 2021.

1.1 Background

Lansdowne Park, which also includes the former adjacent Sylvia Holden Commemorative Park, comprises an area of 15.64 hectares located on the east side of Bank Street in the Glebe neighbourhood of the City of Ottawa, Ontario. Lansdowne Park is bordered by Bank Street to the west, Holmwood Avenue to the north and Queen Elizabeth Driveway followed by the Rideau Canal to the east and south.

Lansdowne Park was a historic exhibition, sports and entertainment facility originally developed in the mid-1800s as an agricultural fairground. Through well over 100 years of continuous use the site has undergone numerous changes including both the site infrastructure and physiography.

In 2007 the City of Ottawa initiated a review to redevelop Lansdowne Park. The Ottawa Sports and Entertainment Group (OSEG) proposed a public-private partnership with the City to rebuild the stadium and redevelop Lansdowne Park. The redevelopment plan was initiated in 2012 and included three major components:

- Constructing a mixed-use area that includes retail, office, and residential property uses along the north and west portions of the site (Zone A);
- Refurbishing Frank Clair Stadium (sports stadium) / Civic Centre (arena complex) and re-locating and refurbishing the Horticultural Building (Zone B); and,

- Creating a large urban park along the east and south portions of the site (Zone C).

The CPU Property (i.e., Zone C) portion of the redevelopment was completed in the summer of 2015. A generalized site plan depicting the redeveloped Lansdowne Park is provided on Figure 2.

2.0 Certificate of Property Use

In recognition of the redevelopment to a more sensitive property use within Zone C, Wood (2012) submitted a Risk Assessment (RA) to the Environmental Assessment and Approvals Branch of the MECP on March 16, 2012 in support of the filing of a Record of Site Condition (RSC). The RA (3678-8JPR93) was accepted by the Director in its letter to the City of Ottawa dated April 20, 2012. In recognition of its acceptance of the RA for Zone C, CPU No. 0371-8TYQMY was issued by the MECP on November 25, 2013. CPU No. 0371-8TYQMY addresses the RMM to be implemented and maintained at the CPU Property to mitigate unacceptable risks to human health as described in the Risk Assessment (RA) and/or Part 4 of the CPU. The CPU also provides Property-Specific Standards (PSS) for specific contaminants of concern (COC) present in soil and groundwater beneath the CPU Property.

2.1 Risk Management Measures

The RMM to be implemented and maintained at the CPU Property are generalized as follows:

1. **Geotechnical Engineering:** Quality assurance and quality control for such earthworks as the placement and compaction of geotechnical materials and soils impacted by any COC shall be carried out by the representative of the geotechnical engineering firm responsible for the supervision of construction based on professional judgment.
2. **Former Eastern Landfill:** Construction of a non-woven geotextile marker horizon overlain by a combination soft soil and hard cap barrier, both extending 5 metres outward beyond the periphery of the former Eastern Landfill. The hard cap shall consist of approved structural elements. The soft soil cap shall include 0.5 to 1.5 metres of clean soil meeting the 2011 Table 3 Site Conditions Standards (SCS) for residential / parkland / institutional property use as provided in *Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act* (MOE, 2011a).
3. **East Berm:** Construction of an earthen berm to contain impacted soil excavated from Zone A. The berm shall be underlain by non-woven geotextile to demarcate the elevation above which impacted soils have been placed. The contoured surface of the impacted soils shall be covered with a non-woven geotextile to demarcate the zone of impacted soils present underneath and covered with a minimum of one metre of clean soil meeting the 2011 Table 3 SCS for residential / parkland / institutional property use and/or other approved structural elements.
4. **Former McElroy Building:** Construction of a non-woven geotextile marker horizon overlain by a combination soft soil and hard cap barrier over the east portion of the footprint of the Former McElroy Building. The hard cap shall consist of approved structural elements. The soft soil cap shall include 0.5 to 1.5 metres of clean soil meeting the 2011 Table 3 SCS for residential / parkland / institutional property use.
5. **Soil Management Plan:** Development and implementation of a Soil Management Plan (SMP) to establish best practices and procedures to mitigate adverse effects and potential exposure risks associated with the excavation, transportation, storage and handling of soil at the CPU Property. This includes earthworks undertaken during site redevelopment as well as during any post-development construction activities while the RMM are required to be maintained in place.

6. **Health and Safety Plan:** Development and implementation of a Health and Safety Plan (HASP) to provide guidance for the protection of workers from potential exposure to the COC known to be present at the CPU Property.
7. **Groundwater Monitoring Program:** Development and implementation of a Groundwater Monitoring Program (GWMP), for a minimum of five years, to identify any changes in the hydrological components and groundwater quality resulting from implementation of the risk management measures and establishing trigger levels and contingency activities in the event that the monitoring results show any concentration(s) greater than the PSS.
8. **Methane Monitoring Program:** Development and implementation of a Methane Monitoring Program (MMP), for a minimum of five years, to address the influence of seasonal variations on landfill gas concentrations in the vicinity of the former Eastern Landfill and related RMM and establishing trigger levels and contingency activities in case monitoring results show any concentration greater than the PSS that are or may be related to the production of landfill gas.
9. **Inspection and Maintenance Plan:** Development and implementation of an Inspection and Maintenance Plan (IMP) to assess the integrity of the RMM on a routine and as-needed basis and identify any depreciation or failure of the RMM requiring repair or reinstatement.
10. **Annual Report:** An annual report shall be submitted to the MECP by no later than March 31 of each year to document activities carried out by the Owner in relation to the RMM during the previous calendar year, including any activities in relation to: East Berm, former Eastern Landfill, Former McElroy Building, SMP, HASP, GWMP, MMP and IMP.

A copy of the CPU is available on request.

3.0 RMM Implementation

3.1 East and South Berm RMM

The construction of the East Berm was initiated in the summer of 2012 using impacted soil exceeding 2011 Table 3 SCS for residential / parkland / institutional property use excavated from within Zone A. The impacted soil was excavated concurrently with the areas excavated to construct underground parking structure located within Zones A and B. Following removal of the impacted soil a generic RSC was obtained for Zone A. COC present in soil excavated from within Zone A exceeding the applicable 2011 Table 3 SCS included various metals, polycyclic aromatic hydrocarbons (PAH) and petroleum hydrocarbons (PHC). Impacted soil which could not be accommodated in the East Berm were temporarily stockpiled within Zone C while awaiting placement in the South Berm, a western extension of the East Berm located south of the Stadium.

Construction of the South Berm began in the spring of 2013 using soil sourced from the temporary stockpile of impacted soil as well as non-impacted soil sourced from areas excavated to construct the underground parking structures. Impacted soil that could not be accommodated in the berms due to on-site temporary storage/stockpile limitations or other site logistics was transported and disposed off-site in accordance with applicable legislation.

While constructing the East and South Berms the following RMM were implemented:

- The existing ground surface beneath the berms was prepared by removing the existing asphalt where present, levelling and covering by eight-ounce non-woven geotextile fabric. The geotextile was placed to demarcate the interface between clean and impacted soil and to mitigate the potential for soil mixing.
- Soil known or suspected of being impacted was placed, compacted and contoured to a maximum elevation of at least 1 metre less than the final design elevation of the berms.
- Impacted soil contained within the East and South Berm was covered by eight-ounce non-woven geotextile fabric. The geotextile was installed per the manufacturer's instructions. At the toe of the berms, both the bottom and overlying geotextiles were placed in an anchor trench measuring 0.5 wide by 0.5 m deep. The anchor trench was then backfilled with clean sand. Based on a design slope of 3H:1V, the geotextile and impacted soil is set-back of approximately 2.56 metres from the toe of the berms.
- The geotextile overlying the impacted soil was covered with no less than 1 metre of clean fill (i.e., soil meeting *Table 3 Site Condition Standards in a Non-Potable Groundwater Condition - Residential/Parkland/Institutional Property Use*), which includes an upper layer of topsoil sufficient to support landscaping needs.
- In areas where trees were planted, sufficient soil depth was maintained around the rooting zones such that the roots of the mature trees would not have the potential for penetrating the underlying geotextile. At a minimum, trees were planted on compacted soil to prevent downward growth of

rootmass. No plant species with tap root systems were placed above or within 5 metres of any areas subject to soil capping.

- To ensure that migration of contaminants does not occur, utility trenches installed through the area of impacted soil contained within the berms were sealed with clay plugs at the transition from impacted to non-impacted soil. The clay seals were constructed to a minimum thickness of 100 cm and extended from the base of the utility trench to the sub-base.
- With respect to utility conduit materials, concrete or polyvinyl chloride (PVC) conduits are generally not affected by the COC at the site. Therefore, either concrete or PVC conduits were used as utility conduits at the site. Gaskets used to connect conduct pipe sections within the area of impact were composed of chemically resistant materials, such as nitrile or fluorocarbon.
- As-built surveys were made during construction of the berms to ensure compliance with the design requirements stipulated in the CPU and that the berms were constructed with the required minimum thicknesses of clean cover soil.
- The East and South Berms will be surveyed on an annual basis for two consecutive years following construction to assess any differential settlement or consolidation of materials that could result in unwanted thinning of the clean cover. The survey will note and record any areas showing evidence of erosion of surficial soil, slope failure and/or soil caving. Any areas subject to settlement greater than 0.10 metres will be subject to restoration using clean fill/topsoil. The first of these surveys was conducted in November of 2016 and the second was conducted in December of 2018.
- The as-built survey and annual settlement/consolidation surveys will be maintained by the City per Section 3.12 of the Risk Management Plan provided in Appendix I the Risk Assessment (AMEC, 2012).

In 2021, Wood conducted inspections of the RMM implemented in the area of the East and South Berms as part of the Inspection and Maintenance Plan developed for the Site to satisfy the requirements of Condition 4.2.8 of the CPU. Details of the inspections including photo logs are provided in the Risk Management Measures Inspection Logs in Appendix B. The extent of the RMM for the Berm areas is provided on Figure 3.

3.2 Former Eastern Landfill RMM

In addition to putrescible and non-putrescible waste, COC in soil requiring risk management in the area of the former Eastern Landfill include various metals, PAH and PHC. Based on the pre-construction grades, the zone impacted soil and/or waste extended from approximately 0.8 metres below ground surface to 4.8 mbgs. Potential risks were mitigated via capping the impacted soil and waste with a combination soft soil cap and hard cap. A non-woven geotextile was placed between the cap and the underlying impacted soil/waste to demarcate the transition between the two. Capping of the former Eastern Landfill was initiated in September 2013 and was conducted concurrently with the redevelopment construction activities. The capping was completed over several stages due to limited space availability during the construction works.

Utilities were installed prior to the installation of the overlying geotextile and capping materials. The extent of the former landfill was verified through visual inspection of deleterious materials in the soil and locating the physical limits of the former landfill observed as being the wood cribbing of the former inlet to the Rideau Canal. Final soft soil and hard caps placement over areas of the former Eastern Landfill was completed in the summer 2015. Excess impacted soil excavated during utility trenching and cap placement was transported and disposed off-site in accordance with applicable legislation.

The following RMM were implemented during the construction of the soft soil and hard caps over the former Eastern Landfill:

- The existing surface cover consisting of asphalt and granular subbase was removed to the required depth. The surface was contoured to accommodate the final design grades and placement of eight-ounce non-woven geotextile fabric. The geotextile was placed to demarcate the separation between underlying waste / impacted soil and the overlying soft soil and hard caps. The eight-ounce non-woven geotextile was extended a minimum of 5 metres beyond the limits of the former Eastern Landfill.
- The geotextile was capped with a soft soil cover consisting of clean soil (i.e., soil meeting *Table 3 Site Condition Standards in a Non-Potable Groundwater Condition - Residential/Parkland/Institutional Property Use*), a hard surface cap (i.e., asphalt, concrete or interlocking pavers and granular subbase), or a combination thereof. The thickness of the soft soil cap overlying the geotextile was determined based on landscaping needs but was not less than 500 millimetres inclusive of topsoil and grass sod. Examples of the different hard cap surface treatments include;
  - Concrete Unit Paving on Grade;
  - Granite Paving;
  - Reinforced and coloured asphalt paving;
  - Resilient Play Surface; and,
  - Refrigerated Concrete Slab for skating rink.
- Where features were constructed that penetrated the geotextile such as foundations for light standards or playground equipment, at the point of penetration, the geotextile was placed to extend 0.3 m up and around the penetration point.
- In areas where trees were planted, sufficient soil depth was maintained around the rooting zones such that the roots of the mature trees would not have the potential for penetrating the underlying geotextile. At a minimum, trees were planted on compacted soil to prevent downward growth of rootmass. No plant species with tap root systems were placed above or within 5 metres of any areas subject to soil capping.
- To ensure that migration of contaminants does not occur, utility trenches installed through the area of impacted soil contained within the berms were sealed with clay plugs at the transition from impacted to non-impacted soil. The clay seals were constructed to a minimum thickness of 100 cm and extended from the base of the utility trench to the sub-base.

- With respect to utility conduit materials, concrete or PVC conduits are generally not affected by the COC at the site. Therefore, either concrete or PVC conduits were used as utility conduits at the site. Gaskets used to connect conduct pipe sections within the area of impact were composed of chemically resistant materials, such as nitrile or fluorocarbon.
- The on-site storm water management system includes an underground stormwater retention tank encroaching the western limit of the former Eastern Landfill. The retention tank was installed such that the geotextile liner was placed along the side of the tank and secured in place with backfilled soil. Trenches for any storm sewers flowing into or out of the tank passing through the impacted soil were sealed as noted above. Soil excavated during the installation of the tank was managed as per the risk management plan.
- Once completed, the boundaries defined by the RMM developed for the former Eastern Landfill were surveyed. An as-built drawing will be maintained by the City as per the risk management plan.

In 2021, Wood conducted inspections of the RMM implemented in the area of the former Eastern Landfill as part of the Inspection and Maintenance Plan developed for the Site to satisfy the requirements of Condition 4.2.8 of the CPU. Details of the inspections including photo logs are provided in the Risk Management Measures Inspection Logs in Appendix B. The extent of the RMM for the former Eastern Landfill area is provided on Figure 3.

3.3 Former McElroy Building RMM

In the area of the former McElroy Building, COC requiring risk management included PAHs in soil. Contaminants in soil were managed via covering the impacted soil with non-woven geotextile that was overlain with a combination soft soil cap and hard cap (i.e., soil and paving structures and granular subbase). In October 2014 a test pit sampling program was completed to further delineate the extent of the PAH impacted soil. The extent of the RMM was based on the refined extent of the impacted soil.

The following RMM were implemented during the construction of the soft and/or hard cap over the Former McElroy Building:

- The existing surface cover consisting of asphalt and granular subbase was removed to the required depth. The surface was contoured to accommodate the final design grades and placement of eight-ounce non-woven geotextile fabric. The geotextile was placed to demarcate the separation between underlying waste / impacted soil and the overlying soft soil and hard caps. The eight-ounce non-woven geotextile was placed to extend a minimum of 5 metres beyond the limits of the define limits of the impacted soil.
- The geotextile was capped with a soft soil cover consisting of clean soil (i.e., soil meeting *Table 3 Site Condition Standards in a Non-Potable Groundwater Condition - Residential/Parkland/Institutional Property Use*), a hard surface cap (i.e., asphalt, concrete or interlocking pavers and granular subbase), or a combination thereof. The thickness of the soft soil cap overlying the geotextile was determined based on landscaping needs but was not less than 500 millimetres inclusive of topsoil and grass sod.

- Where features were constructed that penetrated the geotextile such as foundations for light standards, at the point of penetration, the geotextile was placed to extend 0.3 m up and around the penetration point.
- In areas where trees were planted, sufficient soil depth was maintained around the rooting zones such that the roots of the mature trees would not have the potential for penetrating the underlying geotextile. At a minimum, trees were planted on compacted soil to prevent downward growth of rootmass. No plant species with tap root systems were placed above or within 5 metres of any areas subject to soil capping.
- To ensure that migration of contaminants does not occur, utility trenches installed through the area of impacted soil contained within the berms were sealed with clay plugs at the transition from impacted to non-impacted soil. The clay seals were a minimum of 100 cm thick and extended from the base of the utility trench to the sub-base.
- With respect to utility conduit materials, concrete or PVC conduits are generally not affected by the COC at the site. Therefore, either concrete or PVC conduits were used as utility conduits at the site. Gaskets used to connect conduct pipe sections within the area of impact were composed of chemically resistant materials, such as nitrile or fluorocarbon.
- Once completed, the boundaries defined by the risk management measures developed for the McElroy Building were surveyed. An as-built drawing will be maintained by the City as per the risk management plan.

In 2021, Wood conducted inspections of the RMM implemented in the area of the former McElroy Building as part of the Inspection and Maintenance Plan developed for the Site to satisfy the requirements of Condition 4.2.8 of the CPU. Details of the inspections including photo logs are provided in the Risk Management Measures Inspection Logs in Appendix B. The extent of the RMM for the former McElroy Building area is provided on Figure 3.

4.0 Soil Management Plan

A SMP was developed in support of the Lansdowne Park redevelopment project in February 2012. The SMP was revised in May 2014 (AMEC, 2014a) to meet Condition 4.2.5 of the CPU. The objectives of the SMP for the RA RSC Property are as follows:

- Ensure that impacted soil and groundwater encountered during any earthworks are managed in compliance with all applicable environmental laws including a CPU specific to the RA RSC Property portion of the site. In this context, "impacted" soil is interpreted to mean soil that does not meet the standards for soil as laid out in the 2011 MOE document entitled "*Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act*", Table 3 Full Depth Generic SCS in a Non-Potable Groundwater Condition for Residential/Parkland/Institutional (R/P/I) Land Use, coarse soil type (2011 Table 3 SCS);
- Provide a process to manage impacted soil and/or groundwater, including any excess soil;
- Provide a contingency plan to identify and manage any unknown contamination identified during the construction process or produced due to a spill or release during construction;
- Support the execution of the site health and safety plan as it relates to the safety of the construction workforce and the neighbouring community where contamination is encountered;
- Outline the methodology and procedures to minimize dust created during the excavation, loading and importation, placement and compaction of soil;
- Outline the procedures for notification and reporting; and,
- Integrate into other management plans and procedures that could include quality, environmental management, emergency response, and sustainability.

The revised SMP to meet the requirements of Condition 4.2.5 of the CPU was submitted to the MECP on June 2, 2014. The SMP was included in contract documents and provided to contractors during the redevelopment project and Wood was retained by the City to ensure implementation of the SMP during construction works. No changes or amendments to the SMP were made in 2021.

5.0 Health and Safety Plan

The health and safety requirements mandated under the *Occupational Health and Safety Act* (OHSA), including the development and implementation of any Health and Safety Plan (HASP) is the responsibility of the Constructor deemed to be in charge of any works being undertaken at the site. This includes contractors retained by the owner working on its behalf. To assist contractors working at the CPU Property, a HASP addendum was developed to establish the health and safety requirements and provide guidance for the protection of workers from potential exposure to the COC known to be present at the CPU Property. The HASP addendum does not address other Health and Safety requirements.

The HASP addendum identifies the COC present at the CPU Property and the potential exposure pathways through which workers at the CPU Property may be exposed to those COC. Recommendations for personal protective equipment (PPE), personal hygiene and fugitive dust control are also provided in the addendum.

The HASP addendum was developed in July 2013 (AMEC, 2013). No changes or amendments to the HASP were made in 2021.

6.0 Inspection and Maintenance Plan

An IMP outlining the monitoring program to be implemented at the site to satisfy the requirements of Condition 4.2.8 of the CPU was submitted to the MECP on June 30, 2014 (AMEC, 2014b). The primary objectives of the IMP include, but are not necessarily limited to, addressing the following items:

1. Inspection and maintenance during construction activities;
2. Inspection frequencies and routine maintenance requirements for the non-woven geotextile, and for the final surfaces of each of the East Berm, the former Eastern Landfill and the Former McElroy Building;
3. Event-specific inspection and maintenance;
4. Weather-related inspection and maintenance, and,
5. Non-routine and incident inspection and maintenance.

In 2021 Wood conducted inspections, as per the IMP, of the RMM implemented at the CPU property including; prominent drainage features, the cap over the East Berm and its extension referred to as the South Berm as well as the cap over the former Eastern Landfill and former McElroy Building areas.

The following inspections were conducted in 2021:

1. May 19, 2021 – Routine spring inspection that included all RMM;
2. September 30, 2021 – Routine fall inspection, following the CityFolk music festival (September 16th-18th), the Bluesfest music festival (September 23rd-25th) and a rainfall event of 31.8 mm on September 22nd, that included all RMM; and,
3. October 25th through November 16th, 2021 – A total of 10 inspections were conducted during a geotechnical investigation which included the advancement of boreholes and instrumentation of groundwater monitoring wells in proximity to and within the limits of RMM implemented in the area of the East Berm. Inspections were conducted any time the planned work included disturbance of the RMM, namely the clean soil cap or the underlying geotextile demarcation layer.

Details of the inspections including photo logs are provided in the Risk Management Measures Inspection Logs in Appendix B.

Conditions observed during routine spring and fall 2021 inspections included small areas of bare soil and stressed vegetation primarily in high traffic areas around the ice rink and children's Garden/Skate Park as well as on top of the East Berm. The events held on the Great Lawn and south of the Water Plaza left areas of bare soil and stressed vegetation where temporary structures and equipment were placed. In addition, the majority of the South Berm continued to have areas of bare soil with evidence of soil erosion and transport. Observations were similar to those previously observed at the Site with no significant deterioration in 2021.

The geotechnical investigation was conducted by Paterson Group Inc. ("Paterson") and included the advancement of seven (7) boreholes in the vicinity of the East Berm, four (4) of which were advanced through the clean soil cap and geotextile overlying the East Berm. Two (2) borehole locations were instrumented with groundwater monitoring wells including one (1) location within the East Berm footprint. A plan depicting the borehole and groundwater monitoring well locations is provided in the RMM inspection report in Appendix B. Proposed borehole locations were sub-excavated through the clean soil cap and down to the geotextile on October 26, 2021, using a mini excavator. Once the geotextile at the base of the clean soil cap was exposed, it was cut and pulled back to provide an area to drill through the cap without damaging the geotextile. Once the geotextile was pulled back, the centre of the hole was marked using a stake and the excavation backfilled with the clean soil stockpiled from the excavation in order to allow the drilling contractors to safely work around the borehole locations.

Boreholes located on the East Berm were advanced by George Downing Estate Drilling Ltd. ("Downing") between October 26th and November 12th, 2021. Boreholes were advanced through the clean soil cap into the underlying impacted soils. Drilling operations through the clean soil cap and geotextile were monitored closely in order to ensure the auger did not disturb the geotextile. Paterson was informed that soil beneath the geotextile layer was to be treated as contaminated soil. Any excess drill cuttings from beneath the geotextile layer were to be segregated and placed in drums to be disposed of at a licensed landfill.

Following the drilling activities, reinstatement of the clean soil cap and geotextile was completed by Paterson on November 16th, 2021. Reinstatement activities included re-excavating the borehole areas down to the geotextile using a mini excavator to expose the geotextile, folding the geotextile back down and then placing a patch of new geotextile over the cuts in the existing geotextile. The specifications of the geotextile used to patch the holes was verified and met the requirements of the CPU. In locations where a groundwater monitoring well was installed, the geotextile was brought up and around the well's protective casing. Once the geotextile was patched the hole was backfilled with the clean soil removed to expose the geotextile. Reinstatement of the clean soil cap and geotextile conformed with specifications under the CPU.

There was no significant deterioration of the RMM that would result in an increase in potential risk to human health on the CPU property observed during any of the inspections conducted in 2021 and therefore no immediate actions were recommended throughout the year. No changes or amendments to the IMP were made in 2021.

7.0 Groundwater Monitoring Program

A proposed GWMP outlining the proposed monitoring program to satisfy the requirements of Condition 4.2.7 of the CPU was submitted to the MECP for its approval on September 2, 2014 (AMEC, 2014c). Communication from the MECP indicating that the City should proceed with the GWMP was provided in its letter to the City dated March 20, 2015. The primary objectives of the GWMP include, but are not necessarily limited to, addressing the following:

1. Identifying changes in the hydrological components having a direct interaction with the CPU Property soils including well water levels, groundwater flow details, infiltration rates and interflow details;
2. Identifying any changes in groundwater quality resulting from establishing the RMM;
3. Establishing the location and installation details of all groundwater monitoring wells to be included in the program;
4. Establishing the frequency of all groundwater sampling and monitoring events;
5. Establishing an itemized list of chemical parameters to be analyzed at each monitoring well location, including those identified in Schedule 5, Column 2 – Indicator List for Groundwater and Leachate contained in the Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites (PIBS 7792e) published by the MOE and dated January 2012, as it may be amended from time to time; and,
6. Establishing trigger levels and contingency activities in the event that the monitoring results show any concentration(s) greater than the PSS.

7.1 Groundwater Monitoring Well Construction

As per the GWMP, a total of twelve (12) monitoring wells (MW15-1 to MW15-12) were installed at strategic locations to facilitate monitoring and sampling of the near surface groundwater beneath the CPU Property. As the GWMP was designed to detect changes to both physical flow characteristics and groundwater quality, the monitoring well locations were selected in consideration of the groundwater flow patterns previously identified at the Site and the proposed locations of the RMM implemented at the Site. Monitoring locations were therefore established both upgradient and downgradient of the RMM as well as within the immediate areas of the RMM. The groundwater monitoring well locations are shown on Figure 4.

The groundwater monitoring well construction details are summarized in Table 1. Monitoring wells were constructed by Strata Drilling Group from October 21 to 23, 2015 in accordance with the monitoring well construction details provided in the GWMP. Details of the borehole drilling and monitoring well installations are shown on the stratigraphic and instrumentation logs provided in Appendix C.

All groundwater monitoring wells installed at the Site were instrumented with dedicated Waterra inertial lift pumps and sufficient lengths of 12 mm inside diameter low density polyethylene (LDPE) tubing to

facilitate well development and purging requirements. Following a minimum period of 48 hours after 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, improve connectivity between the well and the formation, and restore groundwater that may have been disturbed or otherwise altered during the drilling and well installation process. Once developed, the wells were instrumented with 6 mm inside diameter LDPE tubing to facilitate low-flow sampling using a peristaltic pump.

7.2 Groundwater Monitoring and Sampling

Groundwater monitoring was conducted on May 27th, 2021 and December 1st, 2021 and included all twelve (12) monitoring wells installed at the CPU Property. In addition to these monitoring wells, five (5) monitoring wells located on the National Capital Commission (NCC) property to the immediate east were also monitored during the May 27th and December 1st monitoring events. The locations of the NCC monitoring wells are shown on Figure 4 and their construction details provided in Table 1.

The depths to groundwater and the static groundwater elevations recorded at the monitoring wells are summarized in Table 2. In the spring, groundwater was present at depths ranging from 3.123 metres below ground surface (mbgs) at MW15-1 to 6.028 mbgs at MW15-2. Water table elevations recorded at the monitoring wells varied between 59.200 metres above sea level (masl) at MW15-2 and 62.369 masl at MW15-1. A groundwater elevation contour plan for the May 27, 2021 monitoring event depicting the inferred groundwater flow pattern beneath the CPU Property is provided on Figure 5a.

In the fall, groundwater was present at depths ranging from 3.298 mbgs at MW09-3 to 5.864 mbgs at MW15-12. Water table elevations recorded at the monitoring wells varied between 59.497 masl at MW09-5 and 62.164 masl at MW09-1. A groundwater elevation contour plan for the December 1, 2021 monitoring event depicting the inferred groundwater flow pattern beneath the CPU Property is provided on Figure 5b.

The inferred groundwater flow patterns beneath the CPU Property observed during the spring and fall monitoring events are generally similar to those observed during previous monitoring events conducted since inception in 2015. Shallow groundwater beneath the southern half of the CPU property generally flows to the east and northeast in a quasi-inward radial flow pattern to a groundwater low located in the vicinity of the former McElroy Building. Mounding near the northeast corner of the CPU property results in localized outward radial flow to the west and south and is likely due to water originating from the portion of the Rideau Canal located north of the Site migrating within the fill materials placed within the reclaimed former inlet of the Rideau Canal.

Groundwater samples were collected on May 28 and 31, 2021 during the spring sampling event and on December 2, 8, 13 and 14, 2021 during the fall sampling event. Groundwater samples were collected from each of the monitoring wells installed at the CPU Property, with the exception of MW15-4, MW15-6 and MW15-10 during the spring sampling event due to insufficient water in the wells.

Groundwater samples were collected using low-flow sampling techniques in order to minimize potential sample biasing due to sediment entrainment. Groundwater field parameters measured during sampling including pH, temperature, dissolved oxygen (DO), conductivity and oxidation-reduction potential (ORP) and general observations made during sampling are provided in Table 3. Each of the groundwater samples collected was analyzed for the following COC: PAH, PHC F1 - F4, chloroform, metals and landfill leachate indicator parameters as identified in Schedule 5, Column 2 – Indicator List for Groundwater and Leachate contained in the *Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites* (PIBS 7792e) including alkalinity, ammonia, calcium, chloride, conductivity, iron, magnesium, nitrate (as N), pH, sodium, total dissolved solids (TDS), sulphate, biochemical oxygen demand (BOD), chemical oxygen demand (COD), dissolved organic carbon (DOC). Samples collected for metals analysis were field filtered using 0.45 µm disposable filter capsules. With the exception of chloride, 2011 Table 3 SCS do not exist for these landfill indicator parameters. A PSS was developed for ammonia as it was identified as a COC resulting from former ice making plants at the former Curl-o-Drome and former McElroy Building. These parameters have been analyzed to facilitate the identification of any trends which may be indicative of the deterioration of groundwater quality resulting from the implementation of the RMM.

One (1) blind duplicate sample was collected during the spring event while two (2) were collected in the fall for analysis of one or more COC including PAHs, PHC F1-F4, chloroform, metals, and landfill leachate indicator parameters for quality assurance / quality control (QA/QC) purposes. Sample DUP-1 is a blind duplicate sample of MW15-12 for the spring sampling event and samples DUP-1 and DUP-2 are blind duplicate samples of MW15-1 and MW15-7, respectively, for the fall sampling event. Two (2) trip blanks were used during both the spring and fall sampling events, for analysis of chloroform and/or PHC F1 to assess potential cross contamination during sample storage and transport.

7.3 Groundwater Sample Analysis

Groundwater sample analyses were performed by Paracel Laboratories Ltd. of Ottawa, Ontario under contract to the City of Ottawa =. Analytical results for groundwater samples collected from the monitoring wells located on the CPU Property were evaluated through comparison with the 2011 Table 3 SCS for residential / parkland / institutional property use and coarse textured soil, where established, and for ammonia, chloroform and iron, to the PSS derived from the Risk Assessment as provided in CPU 0371-8TYQMY.

The MECP recently released the document entitled *Guidance for Addressing Chloroform at a Record of Site Condition Property* ("Chloroform Guidance"). The purpose of the document is to provide guidance which can be used by Qualified Persons (QP) and property owners where an RSC is being sought under *Ontario Regulation 153/04 – Records of Site Condition, as amended* ("O.Reg. 153/04") at a property and when addressing chloroform in soil and/or groundwater where the source of the chloroform is from a treated municipal water supply.

The Chloroform Guidance states that if two criteria can be met and documented in the Conceptual Site Model (CSM) as part of a RA and/or RSC submission, then the applicable SCS for chloroform need not be considered to be exceeded. The two criteria are:

1. The source of chloroform is only associated with water from a treated municipal water supply; and,
2. All soil and groundwater concentrations are numerically equal to or lower than the values listed in Table A of this guidance.

As the chloroform groundwater impacts identified beneath the CPU Property were attributed to leaking municipal infrastructure, the groundwater value for chloroform provided in Table A of the Chloroform Guidance was adopted for the CPU property replacing the Table 3 SCS. The groundwater value for chloroform for non-potable groundwater situations, residential / parkland / institutional property use, and coarse textured soil is 240 µg/L.

O.Reg. 153/04 was subject to various amendments via O.Reg. 407/19 filed on December 4, 2019. Section 49.1 was amended to include provisions to address certain exceedances of applicable site conditions standards at a property. One such provision was provided for chloroform, whereby if the qualified person has determined, based on a phase one environmental site assessment or a phase two environmental site assessment, that there has been a discharge of drinking water within the meaning of the Safe Drinking Water Act, 2002, then the applicable site condition standard is deemed not to be exceeded for the purpose of Part XV.1 of the Act.

The results of the spring and fall groundwater sample analyses, and their respective 2011 Table 3 SCS and PSS derived from the Risk Assessment are summarized in Table 4a and 4b respectively.

Copies of the Certificates of Analysis issued by the laboratory are provided in Appendix D.

7.3.1 Spring Monitoring Event

Ten (10) groundwater samples, including one (1) blind QA/QC duplicate sample, were collected from on-Site monitoring wells in the spring on May 28th and 31st. Samples could not be collected from MW15-4, MW15-6 and MW15-10 due to insufficient water in the wells. The results of the analysis are summarized in Table 4a.

7.3.1.1 Petroleum Hydrocarbons

PHC were not detected in any of the groundwater samples. Based on the analytical method detection limits (MDL) reported by the laboratory, all samples are deemed to be below the applicable 2011 Table 3 SCS.

7.3.1.2 Chloroform

Chloroform was detected in groundwater samples collected from two (2) monitoring wells located on the CPU Property including MW15-2 and MW15-3 at reported concentrations of 1.9 µg/L and 1.1 µg/L, respectively. These concentrations are below the PSS value of 22 µg/L and well below the applicable Table A Chloroform Guidance value of 240 µg/L. All other groundwater samples collected reported concentrations of chloroform below analytical MDL, and therefore below the PSS and Table A Chloroform Guidance value.

7.3.1.3 Polynuclear Aromatic Hydrocarbons

Up to eleven (11) PAHs, including acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, chrysene, fluoranthene, indeno(1,2,3,c,d)pyrene, phenanthrene and pyrene were detected in groundwater samples collected from monitoring wells MW15-3 and MW15-8 located on the CPU property. The concentrations reported for the eleven (11) PAH parameters were below their respective 2011 Table 3 SCS. Samples reporting PAH concentrations below MDL are deemed to be below the applicable 2011 Table 3 SCS based on the MDL reported by the laboratory.

7.3.1.4 Metals

Up to fifteen (15) metals including six (6) or more of barium, boron, calcium, cobalt, copper, iron, lead, magnesium, molybdenum, nickel, selenium, silver, sodium, uranium, and zinc were detected in each of the groundwater samples. All groundwater samples collected reported metals concentrations below their respective 2011 Table 3 SCS where established or the PSS for iron.

7.3.1.5 General Chemistry Parameters

None of the general chemistry parameters exceeded their 2011 Table 3 SCS or PSS, where established, during the spring monitoring event.

7.3.2 Fall Monitoring Event

Fourteen (14) groundwater samples, including two blind QA/QC duplicate sample, were collected from on-Site monitoring wells in the fall on December 2nd, 8th, 13th, and 14th, 2021. The results of the analysis are summarized in Table 4b.

7.3.2.1 Petroleum Hydrocarbons

PHC were not detected in any of the groundwater samples. Based on the analytical MDL reported by the laboratory, all samples are deemed to be below the applicable 2011 Table 3 SCS.

7.3.2.2 Chloroform

Chloroform was detected in groundwater samples collected from two (2) monitoring wells located on the CPU Property including MW15-2 and MW15-3 at reported concentrations of 2.6 µg/L and 1.3 µg/L, respectively. These concentrations are below the PSS value of 22 µg/L and well below the applicable Table A Chloroform Guidance value of 240 µg/L. All other groundwater samples collected reported concentrations of chloroform below analytical MDL, and therefore below the PSS and Table A Chloroform Guidance value.

7.3.2.3 Polynuclear Aromatic Hydrocarbons

Up to fourteen (14) PAHs, including acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, fluoranthene, fluorene, indeno(1,2,3,c,d)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene and pyrene, were detected in groundwater samples collected from monitoring well MW15-3. The concentrations for the reported PAHs were all below their applicable 2011 Table 3 SCS. All other PAHs reported during the fall monitoring event reported concentrations below MDL. Concentrations below MDL are deemed to be below the applicable 2011 Table 3 SCS based on the MDL reported by the laboratory.

7.3.2.4 Metals

Up to sixteen (16) metals including six (6) or more of barium, boron, calcium, cobalt, copper, iron, lead, magnesium, molybdenum, nickel, selenium, silver, sodium, uranium, vanadium and zinc were detected in each of the groundwater samples. All groundwater samples collected reported metals concentrations below their respective 2011 Table 3 SCS where established or the PSS for iron.

7.3.2.5 General Chemistry Parameters

None of the general chemistry parameters exceeded their 2011 Table 3 SCS or PSS, where established, during the fall monitoring event.

7.4 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 and trip blanks. Blind duplicate samples were collected at the rate of one (1) duplicate samples for every ten (10) samples (i.e., 10%). In some cases, less than 10% soil duplicate

samples were collected due to poor soil recovery during drilling. Trips blanks were employed at a rate of one trip blank for each sample cooler shipped containing volatile analytes (e.g., VOC and/or PHC F1).

7.4.1 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. 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 MDL in both the primary and duplicate samples. Lower precision in the RPD calculation is expected when concentrations are less than five (5) times the MDL.

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 MDL or were less than fine times the reported MDL and thus not considered statistically significant. Where RPD was calculated values were within the acceptable limits, with the exception of ammonia in the primary sample and its duplicate collected from MW15-5 in the fall. Duplicate samples consist of discrete samples collected independent of one another. As such, the observed discrepancies, while relatively minor, may represent some variability with regards to ammonia; however, all other parameters from this location were within acceptable limits.

7.4.2 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 employed during the spring and fall sampling programs reported non-detect concentrations for chloroform. PHC F1 was not detected in either trip blank in the spring and was not analyzed for either trip blanks in the fall. PHC F1 has not been detected in any of the wells since sampling began in 2015.

7.5 Laboratory QA/QC Program

7.5.1 Laboratory Accreditation

The analytical laboratory employed to perform the laboratory analyses (Paracel) 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* dated 15 April 2011.

7.5.2 Performance Criteria

The *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act* (the "Analytical Protocol"), dated March 9, 2004 (amended as of July 1, 2011), 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) and specified precision required when analyzing laboratory duplicate and spike/controlled reference material samples.

7.5.3 Laboratory Data Validation

Sample analysis dates provided on the reports of analysis issued by Paracel indicate that all sample analyses were performed within the required sample/extract hold times. The RLs were met for all tested parameters.

Laboratory Blank Samples

Laboratory blank samples include method blanks and blank spikes. 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. Method blanks are also used to monitor cross contamination of carry-over between samples, notable when high concentrations of the target analytes are present.

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. Spike blanks 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, laboratory sample blank analyses met MECP requirements.

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, with the exception of the spike recoveries for up to two (2) metals on certificates of analysis 2122544 (cadmium and selenium), 2123129 (boron and lead) and 2151181 (lead) which were below acceptable recover limits. The batches were accepted base on other acceptable quality control data.

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.

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.

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

7.5.4 QA/QC Summary

In summary, the laboratory and field QA/QC data indicate that the groundwater data have met the performance criteria of the 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.

8.0 Methane Monitoring Program

A proposed MMP outlining the proposed monitoring program to satisfy the requirements of Condition 4.2.8 of the CPU was submitted to the MECP for its approval on September 2, 2014 (AMEC, 2014d). Communication from the MECP indicating that the City should proceed with the MMP was provided in its letter to the City dated March 20, 2015. The primary objectives of the MMP include, but are not necessarily limited to, addressing the following:

- the influence of seasonal variations on landfill gas concentrations in the vicinity of the former Eastern Landfill and related risk management measures at the Property;
- location and installation details of all boreholes and landfill gas probes included in the program;
- frequency of all sampling and monitoring events;
- trigger levels and contingency activities in case monitoring results show any concentration greater than the PSS that are or may be related to the production of landfill gas; and,
- the correlation between methane measured at the Property and changes in concentration for the chemical parameters identified in Schedule 5, Column 2 – Indicator List for Groundwater and Leachate contained in the Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites (PIBS 7792e) published by the MOECC and dated January 2012, as it may be amended from time to time.

The MMP shall be overseen by a QP as defined by O. Reg. 153/04.

8.1 Landfill Gas Probe Installations

As per the MMP, a total of ten (10) LFG probes were installed either independently (GP15-4 through GP15-7) or as a nested couplet with groundwater monitoring wells (GP15-1 through GP 15-3 and GP15-8 through GP15-10) to permit monitoring of LFG composition and subsurface pressure, to verify the current levels of methane in the subsoil environment and to identify areas of potential gas impingement. Each LFG probe was constructed as per the details provided in the MMP.

The locations of the LFG probes are shown on Figure 6 while the LFG probe construction details are shown on the stratigraphic and instrumentation logs provided in Appendix C.

8.2 LFG Regulatory Requirements

The concern with methane gas is that it creates an explosion hazard under certain conditions. Methane monitoring is therefore required to ensure that elevated methane concentrations are detected before they present an explosion hazard. The concentration level at which methane has the potential to explode is called the explosive limit. Methane is explosive when mixed with air at concentrations between 5% by volume in air (vol. %) and 15 vol. %. At concentrations below 5 vol. % and above 15 vol. %, methane is not explosive. Therefore, the Lower Explosive Limit (LEL) of methane is 5 vol. % and the Upper Explosive Limit

(UEL) is defined at 15 vol. %. Methane is lighter than air and is likely to dissipate unless trapped inside enclosed spaces.

Ontario Regulation 232/98 – Landfilling Sites, as amended ("O. Reg. 232/98"), provides threshold criteria for landfill gas concentrations at new or expanding landfill sites. While this regulation does not apply to the former Eastern Landfill as it was closed before the regulation came into effect, the criteria outlined in O. Reg. 232/98 provide a basis for assessing the potential impacts due to landfill gas migration. The concentration limits specified in O.Reg. 232/98 are:

- Less than 2.5% methane by volume in the subsurface at the property boundary;
- Less than 1.0% methane by volume in any on-site building, and in the area immediately outside the foundation if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition; and,
- Less than 0.05% methane by volume in any off-site building, and in the area immediately outside the foundation if the building or structure is accessible to any person or contains electrical equipment or a potential source of ignition.

Guidance on assessment and management of methane gas is provided by the MOECC under *Guideline D-4: Land Use on or Near Landfills and Dumps* (revised April 1994) and Appendix A - Assessing Methane Hazards from Landfill Sites (Procedure D-4-1; November 1987) provided therein. In accordance with the Procedure D-4-1, methane cannot cause an explosion unless it enters an enclosed space and methane accumulates to a concentration above its LEL, and the gas has a high entry rate and high enough accumulation time, such that the methane concentration will be still above the LEL, after dilution by ventilation of the enclosed space. Procedure D-4-1 considers that methane concentrations in air (or in an enclosed space) greater than 20% LEL (equivalent to 1% by volume) may be associated with still higher concentrations, exceeding the LEL. Therefore, methane concentrations greater than 20% LEL warn of conditions which could be potentially hazardous in enclosed structures and gas control systems should be designed to maintain methane concentrations below this level.

8.3 Landfill Gas Monitoring

Landfill gas monitoring was performed on a quarterly basis on February 25th, May 4th, August 26th and December 1st, 2021. Prior to monitoring, the condition of all LFG probes was verified in the field. Each LFG probe was inspected to determine its condition and whether or not it was capable of yielding LFG monitoring data representative of the subsurface conditions (i.e., the stopcock valve was in the closed position to prevent subsurface gas from readily venting via the LFG probe). GP15-8 and GP15-10 could not be monitored during the February monitoring event due to snow cover in their respective areas. Pressure measurements were taken prior to the gas composition measurement by connecting the hose barb on the stopcock to a magnehelic differential pressure gauge and opening the stopcock to record the pressure or vacuum on the pressure gauge.

Gas composition including percent by volume methane (CH_4), oxygen (O_2), carbon dioxide (CO_2) and balance gases and percentage of the lower explosive limit (%LEL) were measured using a Landtec GEM 2000 or 5000 Landfill Gas Monitor. The GEM was calibrated by the equipment provider prior to use in the field. Initial, peak and stabilized gas readings were measured. Initial readings were taken immediately after connecting the monitor to the LFG probe and opening the stopcock. Stabilized readings were taken after the probe had been purged a volume equal to one to three times the combined volume of the probe filter pack.

The results of the LFG monitoring program including LFG composition and subsurface pressure are summarized in Table 5 and are shown on Figure 7. Stable methane concentrations were detected at GP15-2 (0.2 vol. % in February), GP15-4 (0.2 vol. % in February) and GP15-6 (0.2 vol. % in February). Based on the methane concentrations noted above, the Site meets the on-site methane concentrations limits as outlined in O.Reg. 232/98 and the recommended methane alert levels provided in Procedure D-4-1.

8.4 Landfill Gas Data Analyses

The presence of low level initial and stable methane concentrations measured at GP15-6 and GP15-4 reported in February indicate that methane impacts are predominantly confined within the footprint of the former Eastern Landfill. The methane concentrations recorded suggest that any methane present is closely associated with waste deposits and is likely present as pockets trapped beneath less permeable materials. A slight positive pressure was recorded during at least one (1) monitoring event at each LFG probe location with the exception of GP15-5, GP15-8 and GP15-10. The slight positive pressures observed suggests that the subsurface methane is not likely to migrate beyond the immediate areas in which it is encountered. With the exception of a slight methane detection at GP15-2 in February 2021, the lack of consistent detectable methane at the LFG probes surrounding the former Eastern Landfill footprint indicates that the subsurface methane is not likely migrating beyond the boundaries of the former landfill.

9.0 Contingency Measures

Based on the results of the GWMP, MMP and IMP completed in 2021, no contingency measures were deemed necessary and therefore no such measures were implemented at the CPU Property in 2021.

10.0 Site Restoration Activities

A geotechnical investigation including the advancement of seven (7) boreholes was conducted in the vicinity of the East Berm. Four (4) of the boreholes were advanced through the clean soil cap and geotextile demarcation layer overlying the East Berm. The borehole locations were sub-excavated through the clean soil cap and down to the geotextile on October 26, 2021, using a mini excavator. Once the geotextile at the base of the clean soil cap was exposed, it was cut in the shape of an "X" and the tabs pulled back to provide an area to drill through the cap without damaging the geotextile. Once the geotextile was pulled back, the centre of the hole was marked using a stake and the excavation backfilled with the clean soil stockpiled from the excavation in order to allow the drilling contractors to safely work around the borehole locations. Boreholes were then advanced through the clean soil cap into the underlying impacted soils. Drilling operations through the clean soil cap and geotextile were monitored closely in order to ensure the auger did not disturb the geotextile.

Following completion of the drilling activities, reinstatement of the clean soil cap and geotextile was completed on November 16th, 2021. Reinstatement activities included re-excavating the borehole areas down to the geotextile using a mini excavator to expose the geotextile, unfolding the geotextile tabs back into place and then placing a patch of new geotextile over the "X" cuts in the existing geotextile. The specifications of the geotextile used to patch the holes was verified and met the requirements of the CPU. In locations where a groundwater monitoring well was installed, the geotextile was brought up and around and secured to the well's protective casing. Once the geotextile was patched, the hole was backfilled with the clean soil removed to expose the geotextile. Reinstatement of the clean soil cap and geotextile conformed with specifications under the CPU.

Visual inspections undertaken in 2021 noted findings similar to those of reported during previous inspections with respect to several areas of soil erosion identified throughout the South Berm as evidenced by surface rutting, areas of soil washout, bare patches, and areas of down slope sediment accumulation. The observed areas are not considered to result in any increase in the levels of risk to potential receptors at the CPU Property, however, reparations to these areas should be undertaken to prevent continued erosion due to loss of stabilizing vegetation in these areas.

Based on inspections conducted as per the IMP no significant deterioration of the RMM that would result in an increase in potential risk to human health on the CPU property was observed and therefore no immediate site restoration activities were deemed necessary at the CPU Property in 2021.

11.0 Conclusions and Recommendations

The findings and results of the monitoring, sampling and inspection programs carried out at the CPU Property in 2021 to meet the annual reporting requirements are as follows:

- Inspections of the RMM implemented at the CPU Property were conducted in 2021 in accordance with the IMP. The geotechnical investigation which included areas of the East Berm required the advancement of boreholes through the clean soil cover of the East Berm and into the impacted soils beneath. Steps were taken prior to and throughout the drilling activities to protect the integrity of the clean soil cap and underlying geotextile demarcation layer. Once drilling activities were complete the clean soil cap and geotextile were restored to conform with specifications under the CPU.
- Visual inspections undertaken in 2021 in other areas of the Site noted findings similar to those reported during previous inspections with respect to areas of bare soil in high traffic areas of the Site, stressed areas from temporary placement of equipment during entertainment events, as well as several areas of soil erosion identified throughout the South Berm as evidenced by surface rutting, areas of soil washout, bare patches, and areas of down slope sediment accumulation. The observed areas are not considered to result in any increase in the levels of risk to potential receptors at the CPU Property, however, reparations to these areas should be undertaken to prevent continued erosion due to loss of stabilizing vegetation in these areas.
- The 2021 groundwater monitoring and sampling program was conducted on a semi-annual basis in accordance with the GWMP. Results of the groundwater monitoring inferred groundwater flow patterns beneath the CPU Property similar to those observed since inception of the groundwater monitoring program in 2015. Shallow groundwater, beneath the southern half of the CPU property, generally flows to the east and northeast in a quasi-inward radial flow pattern towards a groundwater low in the vicinity of the former McElroy Building. Mounding near the northeast corner of the CPU property results in localized outward radial flow to the west and south and is likely due to leakage from the Rideau Canal migrating to the west within the historic fill materials placed within the former inlet of the Rideau Canal that extends beneath the CPU Property.
- All groundwater samples collected from the monitoring well network located at the CPU property in 2021 reported parameter concentrations below 2011 Table 3 SCS for residential / parkland / institutional property use and coarse textured soil, where established, and for ammonia, chloroform and iron, below the Property Specific Standards (PSS) derived from the Risk Assessment as provided in CPU 0371-8TYQMY.
- Methane concentrations measured at the landfill gas probes located at the CPU Property in 2021 as per the MMP were below the methane concentrations limits as outlined in O.Reg. 232/98 and the recommended methane alert levels provided in Procedure D-4-1: Assessing Methane Hazards from Landfill (MOE, 1987).
- No revisions were deemed necessary to the SMP or the HASP.

Based on the results of the GWMP, MMP and IMP completed in 2021, no contingency measures were deemed necessary at the CPU Property and therefore no such measures or activities were implemented in

2021. Routine inspections did not identify significant deterioration of the RMM that would result in an increase in potential risk to human health at the CPU property and therefore no immediate site restoration activities were deemed necessary at the CPU Property in 2021.

Based on the results of both monitoring programs to date, groundwater quality at the Site continues to meet applicable standards with only a few isolated exceptions reported early on in the program and methane generation is limited to within the limits of the former landfill and at concentrations that are also below applicable trigger criteria. It is Wood's opinion that the GWMP and MMP RMM are no longer required and a formal request to discontinue the programs was submitted to the MECP in 2021.

12.0 Closure

This report was prepared for the exclusive use of Ontario Ministry of the Environment, Conservation and Parks Ottawa District Office, and is intended to provide a 2021 Annual Report - Certificate of Property Use No. 0371-8TYQMY on the property located at 450 Queen Elizabeth Driveway (Part of 945 Bank Street), Ottawa, Ontario at the time of the Site field work performed on the dates set out in this report. 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 Wood will be required. With respect to third parties, Wood 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.

The investigation activities undertaken by Wood with respect to this report and any conclusions and/or recommendations made in this report reflect Wood's judgment based on the Site conditions observed at the time of the Site investigations and on information available at the time of preparation of this report. This report has been prepared for specific application to this Site and it is based, in part, upon visual observation of the Site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future Site conditions, portions of the Site, which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Wood has used its professional judgment in analyzing this information and formulating these conclusions.

In evaluating the property, Wood has relied in good faith on information provided by other individuals noted in this report. Wood 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. Wood 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.

Wood 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.

This Report is also subject to the further Standard Limitations contained in Appendix G.

We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

Respectfully Submitted,

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A Division of Wood Canada Limited

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13.0 References

AMEC Environment & Infrastructure (2014d): Methane Monitoring Program, Certificate of Property Use 0371-8TYQMY, Lansdowne Park – Urban Park (Zone C), 945 Bank Street, Ottawa, Ontario; prepared for the City of Ottawa, August 2014.

AMEC Environment & Infrastructure (2014c): Groundwater Monitoring Program, Certificate of Property Use 0371-8TYQMY, Lansdowne Park – Urban Park (Zone C), 945 Bank Street, Ottawa, Ontario; prepared for the City of Ottawa, August 2014.

AMEC Environment & Infrastructure (2014b): Inspection and Maintenance Plan, Certificate of Property Use 0371-8TYQMY, Lansdowne Park – Urban Park (Zone C), 945 Bank Street, Ottawa, Ontario; prepared for the City of Ottawa, June 2014.

AMEC Environment & Infrastructure (2014a): Soil Management Plan, Certificate of Property Use 0371-8TYQMY, Lansdowne Park – Urban Park (Zone C), 945 Bank Street, Ottawa, Ontario; prepared for the City of Ottawa, May 2014.

AMEC Environment & Infrastructure (2013): Health and Safety Plan Addendum, Working with Contaminated Soil, Lansdowne Park, Ottawa, Ontario; prepared for the City of Ottawa, July 2013.

AMEC Environment & Infrastructure (2012): Risk Assessment for Lansdowne Park & Sylvia Holden Commemorative Park, Ottawa, Ontario – Final; Submitted to the Director, Environmental Assessment and Approvals Branch, Ontario Ministry of the Environment, on Behalf of the City of Ottawa, April 30, 2012.

Ontario Ministry of the Environment (2011b): Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004, amended as of July 1, 2011, PIBS 4696e01.

Ontario Ministry of the Environment (2011a): Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, April 15, 2011, PIBS # 7382e01.

Ontario Ministry of the Environment (1994): *Guideline D-4: Land Use on or Near Landfills and Dumps,* revised April 1994.

Ontario Ministry of the Environment (1987): Appendix A – Procedure D-4-1: Assessing Methane Hazards from Landfill Sites, November 1987, PIBS # 2158-01.

Ontario Ministry of the Environment and Climate Change (undated): Guidance for Addressing Chloroform at a Record of Site Condition Property.

Tables

Table 1. Groundwater Monitoring Well Construction Details

Monitor Well I.D.	MTM Coordinates		Date of Construction (mm/dd/yy)	Well Constructed By	Borehole and Groundwater Monitoring Interval Construction Data								
	Easting	Northing			Ground Surface Elevation (m)	Borehole Depth (m)	Borehole Bottom Elevation (m)	Top of Casing Elevation (m)	Casing Stick-up (m)	Depth to Bottom of Well Screen (m)	Well Screen Interval (masl)	Well Screen Length (m)	Geologic Media Intersected by Well Screen
CPU Property													
MW15-1	368902.89	5029395.41	10/23/2015	WOOD	65.492	6.10	59.39	65.409	-0.08	6.10	62.44 - 59.39	3.05	Loam/Sand
MW15-2	368835.26	5029365.16	10/23/2015	WOOD	65.228	6.71	58.52	65.085	-0.14	6.71	61.57 - 58.52	3.05	Loamy Sand/Sand
MW15-3	368835.69	5029306.22	10/23/2015	WOOD	65.067	6.71	58.36	64.899	-0.17	6.71	61.41 - 58.36	3.05	Fill/Sand
MW15-4	368865.77	5029240.86	10/23/2015	WOOD	65.319	6.10	59.22	65.256	-0.06	6.10	62.27 - 59.22	3.05	Fill No Recovery
MW15-5	368950.93	5029210.49	10/22/2015	WOOD	64.924	6.10	58.82	64.895	-0.03	6.10	61.87 - 58.82	3.05	Sand
MW15-6	368843.81	5029183.52	10/21/2015	WOOD	64.680	5.18	59.50	64.615	-0.07	5.18	62.55 - 59.50	3.05	Fill/Sand
MW15-7	368911.90	5029169.41	10/21/2015	WOOD	64.513	6.10	58.41	64.431	-0.08	5.48	62.08 - 59.03	3.05	Fill/Sand
MW15-8	368937.69	5029125.60	10/22/2015	WOOD	64.898	6.10	58.80	64.815	-0.08	6.10	61.85 - 58.80	3.05	Fill/Sand
MW15-9	368798.39	5029125.38	10/21/2015	WOOD	65.253	6.10	59.15	65.148	-0.11	6.10	62.20 - 59.15	3.05	Fill/Sand/Loamy Sand
MW15-10	368878.44	5029083.95	10/22/2015	WOOD	65.043	6.10	58.94	64.979	-0.06	6.10	61.99 - 58.94	3.05	Fill/Sand
MW15-11	368858.74	5028968.82	10/22/2015	WOOD	64.571	6.10	58.47	64.447	-0.12	6.10	61.52 - 58.47	3.05	Fill/Sand
MW15-12	368792.98	5028926.01	10/22/2015	WOOD	65.596	6.71	58.89	65.498	-0.10	6.71	61.94 - 58.89	3.05	Fill/Sand/Loamy Sand
NCC Property													
MW09-1	368942.54	5029353.62	10/29/2009	Stantec	65.718	4.89	60.83	65.658	-0.06	4.89	63.88 - 60.83	3.05	Silty Sand
MW09-2	368953.24	5029331.60	10/29/2009	Stantec	65.667	4.89	60.78	65.601	-0.07	4.89	63.83 - 60.78	3.05	Silty Sand
MW09-3	368947.29	5029323.87	10/29/2009	Stantec	65.426	4.89	60.54	65.368	-0.06	4.89	63.59 - 60.54	3.05	Silty Sand
MW09-5	368959.68	5029265.39	10/29/2009	Stantec	65.108	6.10	59.01	65.061	-0.05	6.10	62.06 - 59.01	3.05	Sand
MW09-6	368962.89	5029235.74	10/29/2009	Stantec	65.232	6.10	59.13	65.202	-0.03	6.10	62.18 - 59.13	3.05	Silty Sand/Sand

Notes:
Survey Data Provided by City of Ottawa Surveys and Mapping Unit.
MTM Coordinates Reference to Modified Transverse Mercator (MTM) Projection, Zone 9, NAD83 (CSRS).
All Elevations Referenced to Geodetic.
masl = Metres Above Sea Level.

Table 2. Groundwater Measurement and Elevation Data

Monitoring Well I.D.	Ground Surface Elevation (masl)	Top of Casing Elevation (masl)	Bottom of Well Screen Elevation (mbtoc)	May 27, 2021			December 1, 2021		
				Depth to Water (mbtoc)	Depth to Water (mbgs)	Static Elevation (masl)	Depth to Water (mbtoc)	Depth to Water (mbgs)	Static Elevation (masl)
CPU Property									
MW15-1	65.492	65.409	59.392	3.040	3.123	62.369	4.199	4.282	61.210
MW15-2	65.228	65.085	58.518	5.885	6.028	59.200	5.523	5.666	59.562
MW15-3	65.067	64.899	58.357	5.629	5.797	59.270	5.310	5.478	59.589
MW15-4	65.319	65.256	59.219	5.780	5.843	59.476	4.419	4.482	60.837
MW15-5	64.924	64.895	58.824	5.585	5.614	59.310	5.333	5.362	59.562
MW15-6	64.680	64.615	59.500	Dry	-	-	4.926	4.991	59.689
MW15-7	64.513	64.431	59.033	5.065	5.147	59.366	4.825	4.907	59.606
MW15-8	64.898	64.815	58.798	5.452	5.535	59.363	5.276	5.359	59.539
MW15-9	65.253	65.148	59.153	5.647	5.752	59.501	5.461	5.566	59.687
MW15-10	65.043	64.979	58.943	Dry	-	-	5.203	5.267	59.776
MW15-11	64.571	64.447	58.471	4.860	4.984	59.587	4.855	4.979	59.592
MW15-12	65.596	65.498	58.886	5.781	5.879	59.717	5.766	5.864	59.732
NCC Property									
MW09-1	65.718	65.658	60.828	3.381	3.441	62.277	3.494	3.554	62.164
MW09-2	65.667	65.601	60.777	3.499	3.565	62.102	3.460	3.526	62.141
MW09-3	65.426	65.368	60.536	3.424	3.482	61.944	3.240	3.298	62.128
MW09-5	65.108	65.061	59.008	5.845	5.892	59.216	5.564	5.611	59.497
MW09-6	65.232	65.202	59.132	5.956	5.986	59.246	5.698	5.728	59.504

Notes:

masl = Metres Above Sea Level.

mbtoc = Metres Below Top of Casing.

mbgs = Metres Below Ground Surface.

All Elevations Referenced to Geodetic.

Table 3. Groundwater Field Parameter Data and Observations

Monitoring Well ID	Sampling Date (mm/dd/yy)	Water Level Data								Laboratory Analyses					General Observations
		Initial Depth to Water (mbtoc)	Final Depth to Water (mbtoc)	Total Drawdown (m)	pH (pH units)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	Temperature (°C)	Oxidation Reduction Potential (ORP) (mV)	PHC	PAH	Metals	GWC	Chloroform	
MW15-1	05/31/21	2.960	2.988	0.028	6.77	1457	0.46	11.60	182.0	✓	✓	✓	✓	✓	Cloudy brown with little sediment, no sheen/odour
MW15-1	12/02/21	4.010	4.123	0.113	6.60	1550	0.44	12.81	31.4	✓	✓	✓	✓	✓	Clear, no sediment, no sheen/odour
MW15-2	05/31/21	5.811	5.820	0.009	7.17	1499	6.89	11.90	221.9	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-2	12/02/21	5.290	5.492	0.002	7.22	2357	6.50	15.36	128.4	✓	✓	✓	✓	✓	Clear, no sediment, no sheen/odour
MW15-3	05/31/21	5.559	5.561	0.002	7.10	2212	6.27	13.30	309.7	✓	✓	✓	✓	✓	Cloudy brown with some sediment, no sheen/odour
MW15-3	12/08/21	5.327	5.327	0.000	7.21	2442	5.29	11.68	216.6	✓	✓	✓	✓	✓	Light brown, little sediment, no sheen/odour
MW15-4	05/31/21	Insufficient water to sample													
MW15-4	12/13/21	4.142	> 30cm	Failed drawdown						✓	✓	✓	✓	✓	Clear with orange globules, no sheen/odour
MW15-5	05/31/21	5.489	5.500	0.011	6.59	1463	6.59	12.10	315.0	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-5	12/08/21	5.392	5.407	0.015	7.00	1532	0.65	11.81	213.9	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-6	05/31/21	Insufficient water to sample													
MW15-6	12/13/21	5.042	5.048	0.004	6.86	658	7.11	9.51	218.1	✓	✓	✓	✓	✓	Clear, no sediment, no sheen/odour
MW15-7	05/28/21	5.037	5.040	0.003	6.88	1616	4.14	11.10	153.1	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-7	12/08/21	4.578	4.580	0.002	6.88	1416	2.61	12.15	210	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-8	05/28/21	5.419	5.430	0.011	7.05	1039	3.12	11.24	147	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-8	12/02/21	5.270	5.281	0.011	7.32	869	3.69	13.65	105.6	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-9	05/28/21	5.619	5.665	0.046	7.33	6789	6.50	14.42	150.3	✓	✓	✓	✓	✓	Cloudy brown with little sediment, no sheen/odour
MW15-9	12/14/21	5.552	5.558	0.006	7.68	4959	5.88	10.35	193.4	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-10	05/31/21	Insufficient water to sample													
MW15-10	12/08/21	5.257	5.327	0.070	6.79	1495	1.57	10.97	205.1	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-11	05/28/21	4.825	4.827	0.002	7.23	939	2.65	12.25	147.2	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-11	12/08/21	4.850	4.850	0.000	7.18	1168	1.58	11.66	204.6	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-12	05/27/21	5.781	5.783	0.002	7.10	2765	8.48	11.88	192.7	✓	✓	✓	✓	✓	Clear with little sediment, no sheen/odour
MW15-12	12/02/21	5.766	5.770	0.004	7.25	1453	1.07	13.51	140.4	✓	✓	✓	✓	✓	Clear, no sediment, no sheen/odour

Notes:

Water Level Data as Recorded During Low-Flow Sampling.

Field Parameters Measured using a YSI 556 Multi-Parameter Water Quality Monitoring Instrument.

mbtoc = Metres Below Top of Casing.

PHC = Petroleum Hydrocarbons.

PAH = Polynuclear Aromatic Hydrocarbons.

Metals = Sb, As, Ba, Be, B, Cd, Ca, Cr, Cr(vi), Co, Cu, Fe, Pb, Mg, Hg, Mo, Ni, Se, Ag, Na, Th, V, Zn.

GWC = General Water Chemistry (pH, alkalinity, ammonia, conductivity, chloride, nitrate, sulphate, biochemical oxygen demand [BOD], chemical oxygen demand [COD], dissolved organic carbon [DOC], total dissolved solids [TDS]).

Notes on Ground Water Analytical Summary Tables

All Units Reported in Micrograms per Litre (µg/L) or Milligrams per Litre (mg/L) as Indicated .

RDL = Laboratory Analytical Method Reporting Detection Limit.

RL = MOE 2011 Analytical Protocol Reporting Limit.

DUP = Quality Assurance/Quality Control Duplicate Sample.

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

* Denotes Recommended RPD Alert Criterion Exceeded, However, Parameter Concentration Less than 10 Times Laboratory RDL.

PHC = Petroleum Hydrocarbons.

< = Less Than Laboratory Analytical Method Detection Limit.

¯= Not Analyzed or No Published Value.

55	Parameter Concentration May Exceed EPA Table 3 Site Condition Standard for Non-Potable Groundwater Use due to Elevated MDL Reported by the Laboratory.
183	Parameter Concentration Exceeds EPA Table 3 Site Condition Standard for Non-Potable Groundwater Use (Table 3).
2630	Parameter Concentration Exceeds Property Specific Standard as per Certificate of Property Use 0731-8TYQMY.

a = For a Site to Meet This 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.

b = The Methyl Naphthalene 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.

c = Value adopted from Table A of Guidance for Addressing Chloroform at a Record of Site Condition Property (MOECC, undated).

2011 EPA Standards = Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ontario Ministry of the Environment (MOE), April 15, 2011.

Property Specific Standards as per Certificate of Property Use 0371-8TYQMY issued by the MECP on November 25, 2013.

Table 4a. Summary of Groundwater Analyses - Spring 2021

Parameters	RDL	RL	Full Depth Site Condition Standards Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-1 MW15-1 CPU Property 2123129-01 5/31/2021	MW15-2 MW15-2 CPU Property 2123129-02 5/31/2021	MW15-3 MW15-3 CPU Property 2123129-03 5/31/2021	MW15-5 MW15-5 CPU Property 2123129-04 5/31/2021	MW15-7 MW15-7 CPU Property 2122544-01] 5/28/2021	MW15-8 MW15-8 CPU Property 2122544-02 5/28/2021	MW15-9 MW15-9 CPU Property 2122544-03 5/28/2021	MW15-11 MW15-11 CPU Property 2122544-04 5/28/2021	MW15-12 MW15-12 CPU Property 2122544-05 5/28/2021	MW15-12 DUP-1 CPU Property 2122544-06 5/28/2021	MW15-12 Average	MW15-12 RPD (%)	Trip Blank Trip Blank 2122544-07 5/25/2021	Trip Blank TB 2123129-05 5/25/2021
General Inorganic Parameters (mg/L)																		
pH (pH units)	0.1	-	-	-	7.4	7.8	7.8	7.6	7.4	7.7	7.7	7.8	7.8	7.8	7.8	0.00%	-	-
Alkalinity (CaCO3)	5	-	-	-	383	250	227	403	414	394	268	258	317	319	318	0.63%	-	-
Ammonia	0.01	-	-	4.524	0.79	0.01	0.06	0.43	0.04	0.06	0.1	0.05	0.04	0.05	0.05	22.2%	-	-
Conductivity (µS/cm)	5	-	-	-	1850	1940	2790	1930	2260	1460	6330	1500	3890	3970	3930	2.04%	-	-
Chloride	1	1	2300	-	313	300	581	202	341	166	1610	222	738	733	736	0.68%	-	-
Nitrate (N)	0.1	0.1	-	-	< 0.1	6.2	3.5	0.3	2.8	0.3	3.8	0.5	1.3	1.3	1.3	0.00%	-	-
Sulphate	1	-	-	-	37	203	179	266	163	84	376	67	469	462	466	1.50%	-	-
Biological Oxygen Demand (BOD)	2	-	-	-	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2	-	-	-
Chemical Oxygen Demand (COD)	10	-	-	-	< 10	< 10	26	< 10	< 10	< 10	30	< 10	< 10	< 10	< 10	-	-	-
Dissolved Organic Carbon	0.5	-	-	-	2.7	1.1	1.7	3.8	4.1	2.6	2.4	1.8	3.1	2.7	2.9	13.8%	-	-
Hardness	-	-	-	-	353	503	528	455	483	375	1160	310	615	619	617	0.65%	-	-
Total Dissolved Solids	10	-	-	-	992	1180	1710	1110	1310	790	3840	764	2340	2300	2320	1.72%	-	-
Volatile Organic Compounds (µg/L)																		
Chloroform	0.5	1	240 [c]	22	< 0.5	1.9	1.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5
Petroleum Hydrocarbons (µg/L)																		
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	-	< 25	< 25
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-
Polynuclear Aromatic Hydrocarbons (µg/L)																		
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	-
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	-
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	0.12	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	-
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	0.16	< 0.01	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	-
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-	-
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	0.16	< 0.01	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	-	-
Metals (µg/L)																		
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-	-
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-
Barium	1	2	29000	-	436	104	198	122	126	70	93	96	115	116	116	0.87%	-	-
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-	-
Boron	10	10	45000	-	39	32	21	53	37	33	39	22	31	31	31	0.00%	-	-
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-
Calcium	100	-	-	-	111000	155000	164000	149000	157000	117000	354000	94000	181000	183000	182000	1.10%	-	-
Chromium	1	10	810	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	-	-
Cobalt	0.5	1	66	-	< 0.5	< 0.5	< 0.5	1.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-	-
Copper	0.5	5	87	-	< 0.5	1.4	2.5	2.6	2.9	3.2	1.8	0.9	2.7	2.7	2.7	0.00%	-	-
Iron	100	-	-	24240	14100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	-	-
Lead	0.1	1	25	-	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-
Magnesium	200	-	-	-	18300	27900	28600	19800	22100	20200	66800	18400	39600	39400	39500	0.51%	-	-
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-
Molybdenum	0.5	0.5	9200	-	< 0.5	4.3	0.9	< 0.5	1.6	0.5	12.2	0.6	1	1	< 0.5	-	-	-
Nickel	1	1	490	-	< 1	< 1	< 1	3.0	1	1	2	< 1	< 1	< 1	< 1	-	-	-
Selenium	1	5	63	-	< 1	1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	-	-
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-
Sodium	200	5000	2300000	-	200000	153000	311000	192000	244000	117000	726000	125000	524000	528000	526000	0.76%	-	-
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-	-
Uranium	0.1	2	420	-	< 0.1	2.2	1.2	0.9	1	0.7	3.1	0.7	2.4	2.3	2.4	4.26%	-	-
Vanadium	0.5	0.5	250	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-	-
Zinc	5	5	1100	-	< 5	< 5	< 5	< 5	< 5	7	< 5	< 5	6	< 5	< 5	-	-	-

Table 4b. Summary of Groundwater Analyses - Fall 2021

Sample Location Sample ID Property Location Laboratory ID Sample Date			Full Depth Site Condition Standards Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-1 MW15-1 CPU Property 2149456-01 12/2/2021	MW15-1 DUP-1 CPU Property 2149456-05 12/2/2021	MW15-1 Average	MW15-1 RPD (%)	MW15-2 MW15-2 CPU Property 2149456-02 12/2/2021	MW15-3 MW15-3 CPU Property 2150402-01 12/8/2021	MW15-4 MW15-4 CPU Property 2151099-01 12/13/2021	MW15-5 MW15-5 CPU Property 2150402-02 12/8/2021	MW15-6 MW15-6 CPU Property 2151099-02 12/13/2021	MW15-7 MW15-7 CPU Property 2150402-03 12/8/2021	MW15-7 DUP-2 CPU Property 2150402-06 12/8/2021	MW15-7 Average	MW15-7 RPD (%)	MW15-8 MW15-8 CPU Property 2149456-03 12/2/2021
Parameters	**RDL**	**RL**																
General Inorganic Parameters (mg/L)																		
pH (pH units)	0.1	-	-	-	7.0	7.1	7.1	1.42%	7.6	8.1	7.4	7.9	7.9	7.7	7.9	7.8	2.56%	7.7
Alkalinity (CaCO3)	5	-	-	-	401	401	401	0.00%	301	269	695	363	268	431	430	431	0.23%	303
Ammonia	0.01	-	-	4.524	0.68	0.66	0.67	2.99%	< 0.01	0.02	2.96	0.16	0.37	0.02	0.03	0.03	-	0.01
Conductivity (µS/cm)	5	-	-	-	1820	1890	1855	3.77%	2680	2620	2530	1890	1510	1770	1740	1755	1.71%	1060
Chloride	1	1	2300	-	345	350	348	1.44%	504	558	321	200	270	220	221	221	0.45%	116
Nitrate (N)	0.1	0.1	-	-	< 0.1	< 0.1	< 0.1	-	3.6	3.4	< 0.1	0.5	0.6	2.6	2.6	2.6	0.00%	0.8
Sulphate	1	-	-	-	13	13	13	0.00%	256	157	305	330	51	145	142	144	2.09%	61
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	-	< 2	< 2	5	< 2	5	< 2	< 2	< 2	-	< 2
Chemical Oxygen Demand (COD)	10	-	-	-	14	13	14	7.41%	< 10	15	31	< 10	33	< 10	< 10	< 10	-	< 10
Dissolved Organic Carbon	0.5	-	-	-	3.2	3.1	3.2	3.17%	2.5	3.0	9.1	3.7	10.3	3.7	4.1	3.9	10.3%	2
Hardness	-	-	-	-	328	323	326	1.54%	384	246	859	533	84.6	483	472	478	2.30%	257
Total Dissolved Solids	10	-	-	-	1070	1030	1050	3.81%	1520	1370	1740	1120	832	922	974	948	5.49%	592
Volatile Organic Compounds (µg/L)																		
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	-	2.6	1.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5
Petroleum Hydrocarbons (µg/L)																		
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	-	< 25
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	-	< 100
Polynuclear Aromatic Hydrocarbons (µg/L)																		
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.15	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	-	< 0.01	0.17	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	< 0.01
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	-	< 0.01	0.11	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	< 0.01
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	-	< 0.01	0.12	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	< 0.01
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.12	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	< 0.01	-	< 0.01	0.16	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	< 0.01
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.18	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.27	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.36	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.14	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	-	< 0.05	0.52	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	< 0.01	-	< 0.01	0.27	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	-	< 0.01
Metals (µg/L)																		
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5
Arsenic	1	1	1900	-	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1
Barium	1	2	29000	-	399	402	401	0.75%	106	88	-	121	-	122	115	119	5.91%	57
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	-	< 0.5	-	< 0.5	< 0.5	< 0.5	-	< 0.5
Boron	10	10	45000	-	51	53	52	3.85%	42	25	78	43	18	39	38	39	2.60%	31
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1
Calcium	100	-	-	-	108000	104000	106000	3.77%	124000	81200	267000	177000	28600	162000	158000	160000	2.50%	81700
Chromium	1	10	810	-	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	-	< 10
Cobalt	0.5	1	66	-	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	0.7	0.9	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5
Copper	0.5	5	87	-	< 0.5	< 0.5	< 0.5	-	1.6	3.4	0.6	2.4	10.8	3.2	2.7	3.0	16.9%	1.7
Iron	100	-	-	24240	9300	9270	9285	0.32%	< 100	< 100	11600	< 100	< 100	133	< 100	133	-	< 100
Lead	0.1	1	25	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1
Magnesium	200	-	-	-	14500	15000	14750	3.39%	17900	10600	46400	22200	3220	18800	18900	18850	0.53%	12800
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1
Molybdenum	0.5	0.5	9200	-	< 0.5	< 0.5	< 0.5	-	10.1	2.2	1.5	< 0.5	8.2	0.7	0.6	0.7	15.4%	0.7
Nickel	1	1	490	-	< 1	< 1	< 1	-	< 1	< 1	2	2.0	7.0	51	49	50	4.00%	< 1
Selenium	1	5	63	-	< 1	< 1	< 1	-	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	-	< 0.1	0.4	< 0.1	0.2	< 0.1	0.2	< 0.1	0.2	-	< 0.1
Sodium	200	5000	2300000	-	197000	203000	200000	3.00%	307000	423000	166000	285000	325000	221000	227000	224000	2.68%	95100
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1
Uranium	0.1	2	420	-	< 0.1	< 0.1	< 0.1	-	2.3	1.1	0.7	1.0	2.5	0.8	0.9	0.9	11.8%	0.5
Vanadium	0.5	0.5	250	-	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	< 0.5
Zinc	5	5	1100	-	< 5	< 5	< 5	-	< 5	9	55	< 5	10	25	24	25	4.08%	< 5

Table 4b. Summary of Groundwater Analyses - Fall 2021

Sample Location Sample ID Property Location Laboratory ID Sample Date			Full Depth Site Condition Standards Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-9 MW15-9 CPU Property 2151181-01 12/14/2021	MW15-10 MW15-10 CPU Property 2150402-04 12/8/2021	MW15-11 MW15-11 CPU Property 2150402-05 12/8/2021	MW15-12 MW15-12 CPU Property 2149456-04 12/2/2021	Trip Blank Trip Blank 2149456-06 11/29/2021	Trip Blank TRIP BLANK 2150402-07 11/29/2021								
Parameters	**RDL**	**RL**																
General Inorganic Parameters (mg/L)																		
pH (pH units)	0.1	-	-	-	7.8	7.7	8.0	7.5	-	-								
Alkalinity (CaCO3)	5	-	-	-	229	392	292	265	-	-								
Ammonia	0.01	-	-	4.524	0.04	0.23	0.05	0.02	-	-								
Conductivity (µS/cm)	5	-	-	-	6270	1720	1400	1690	-	-								
Chloride	1	1	2300	-	1710	93	217	293	-	-								
Nitrate (N)	0.1	0.1	-	-	0.4	0.6	1	0.9	-	-								
Sulphate	1	-	-	-	138	375	74	194	-	-								
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 2	-	-								
Chemical Oxygen Demand (COD)	10	-	-	-	57.0	36	< 10	< 10	-	-								
Dissolved Organic Carbon	0.5	-	-	-	4.8	15.9	7.7	3.5	-	-								
Hardness	-	-	-	-	291	498	320	473	-	-								
Total Dissolved Solids	10	-	-	-	3510	1090	726	1050	-	-								
Volatile Organic Compounds (µg/L)																		
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5								
Petroleum Hydrocarbons (µg/L)																		
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	-	-								
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	-	-								
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	-	-								
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	-	-								
Polynuclear Aromatic Hydrocarbons (µg/L)																		
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	< 0.01	-	-								
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	-	-								
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	-	-								
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	< 0.01	< 0.01	-	-								
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	-	-								
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	< 0.01	< 0.01	-	-								
Metals (µg/L)																		
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	-	-								
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	-	-								
Barium	1	2	29000	-	64	70	75	97	-	-								
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	-	-								
Boron	10	10	45000	-	31	36	22	29	-	-								
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	-	-								
Calcium	100	-	-	-	91800	163000	102000	150000	-	-								
Chromium	1	10	810	-	< 1	< 1	< 1	< 1	-	-								
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	-	-								
Cobalt	0.5	1	66	-	0.9	0.8	< 0.5	< 0.5	-	-								
Copper	0.5	5	87	-	4.1	5.4	2.2	1.5	-	-								
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	-	-								
Lead	0.1	1	25	-	< 0.1	0.1	< 0.1	< 0.1	-	-								
Magnesium	200	-	-	-	15100	22100	16100	24100	-	-								
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	-	-								
Molybdenum	0.5	0.5	9200	-	17.5	< 0.5	0.9	0.7	-	-								
Nickel	1	1	490	-	3.0	166	9	< 1	-	-								
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	-	-								
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	-	-								
Sodium	200	5000	2300000	-	1020000	254000	184000	138000	-	-								
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	-	-								
Uranium	0.1	2	420	-	1.2	2.6	0.9	0.7	-	-								
Vanadium	0.5	0.5	250	-	< 0.5	0.7	< 0.5	0.5	-	-								
Zinc	5	5	1100	-	81	55	75	< 5	-	-								

Notes on Landfill Gas Monitoring Results

Relative pressure readings for October 28, 2015 monitoring taken on November 17, 2015.

masl = Metres above sea level.

mbgs = Metres below ground surface.

LEL = Lower Exposive Limit

Monitoring performed using a Landtec GEM 2000 or 5000 Landfill Gas Analyzer.

>>> = Methane over Detectable Range of the Instrument.

2.5	Percent Methane by Volume Exceeds MOE Regulation 232/98 for Landfill Property Boundary Subsurface.
1	Percent Methane by Volume Exceeds MOE Regulation 232/98 for Landfill On-Site Building or Foundation.
0.05	Percent Methane by Volume Exceeds MOE Regulation 232/98 for Landfill Off-Site Building or Foundation.

Table 5 - Historical Landfill Gas Monitoring Data

Monitor ID	MTM Coordinates		Ground Surface Elevation (masl)	Screen Interval (mbgs)	Geologic Media Intersected by Screen	Monitoring Date	In-Situ Measurements							Comments (Status of Landfill Gas Probes)
	Easting	Northing					Methane (CH_4)			Carbon Dioxide (%)	Oxygen (%)	Balance Gases (%)	Relative Pressure (Inches of Water)	
							% v/v		% LEL					
							Initial and/or Peak	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable		
GP15-1	368878.435	5029083.949	65.043	1.52 - 3.05	Overburden	25-Feb-21	0.0	0.0	0.0	3.6	14.2	82.1	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	5.7	11.1	83.1	0.2	Good Condition
						26-Aug-21	0.0	0.0	0.0	7.0	13.5	79.5	-0.2	Good Condition
						1-Dec-21	0.0	0.0	0.0	8.0	6.8	85.2	0.0	Good Condition
GP15-2	368835.264	5029365.156	65.228	1.52 - 3.05	Overburden	25-Feb-21	0.2	0.2	0.0	0.7	20.1	76.8	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	2.1	17.1	81.1	0.1	Good Condition
						26-Aug-21	0.0	0.0	0.0	5.2	10.3	84.5	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.2	13.1	82.7	-3.383	Good Condition
GP15-3	368835.685	5029306.220	65.067	1.52 - 3.05	Overburden	25-Feb-21	0.1	0.0	0.0	2.6	17.9	79.3	0.2	Good Condition
						4-May-21	0.0	0.0	0.0	0.7	19.2	80.1	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	3.8	13.2	83.0	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	0.6	20.4	79.0	0.0	Good Condition
GP15-4	368893.417	5029339.143	-	1.52 - 3.05	Overburden	25-Feb-21	0.3	0.2	0.0	8.1	0.8	91.0	0.1	Good Condition
						4-May-21	0.0	0.0	0.0	7.9	7.5	84.5	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	16.2	3.0	80.8	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	13.0	2.6	84.4	-0.014	Good Condition
GP15-5	368837.499	5029252.218	-	0.91 - 2.44	Overburden	25-Feb-21	0.1	0.0	0.0	2.2	19.7	78.0	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	2.2	17.7	80.1	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	4.6	10.2	85.2	-0.1	Good Condition
						1-Dec-21	0.0	0.0	0.0	2.8	15.7	81.5	-2.666	Good Condition
GP15-6	368875.492	5029271.998	-	0.61 - 2.13	Overburden	25-Feb-21	0.2	0.2	0.0	4.4	0.3	95.2	0.1	Good Condition
						4-May-21	0.0	0.0	0.0	5.1	2.2	92.8	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	8.9	2.3	88.8	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.7	5.3	90.0	>-4	Good Condition
GP15-7	368931.653	5029294.223	-	0.91 - 2.44	Overburden	25-Feb-21	0.0	0.0	0.0	3.9	0.4	94.1	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	2.7	18.1	79.1	0.2	Good Condition
						26-Aug-21	0.0	0.0	0.0	5.3	16.1	78.6	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	3.7	18.2	78.1	-3.580	Good Condition
GP15-8	368865.766	5029240.857	65.319	1.52 - 3.05	Overburden	25-Feb-21	-	-	-	-	-	-	-	Could not access due to snow cover
						4-May-21	0.0	0.0	0.0	4.6	5.6	88.8	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	6.4	10.9	82.7	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	2.3	16.7	80.0	-2.334	Good Condition
GP15-9	368950.930	5029210.490	64.924	1.52 - 3.05	Overburden	25-Feb-21	0.1	0.0	0.0	0.2	21.5	78.1	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	4.0	17.3	78.7	0.1	Good Condition
						26-Aug-21	0.0	0.0	0.0	7.0	14.7	78.3	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.8	16.4	78.8	-1.285	Good Condition
GP15-10	368843.807	5029183.520	64.680	0.91 - 2.13	Overburden	25-Feb-21	-	-	-	-	-	-	-	Could not access due to snow cover
						4-May-21	0.0	0.0	0.0	1.3	20.0	78.7	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	9.3	2.5	88.2	-0.1	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.5	16.3	79.2	-2.362	Good Condition

Figures

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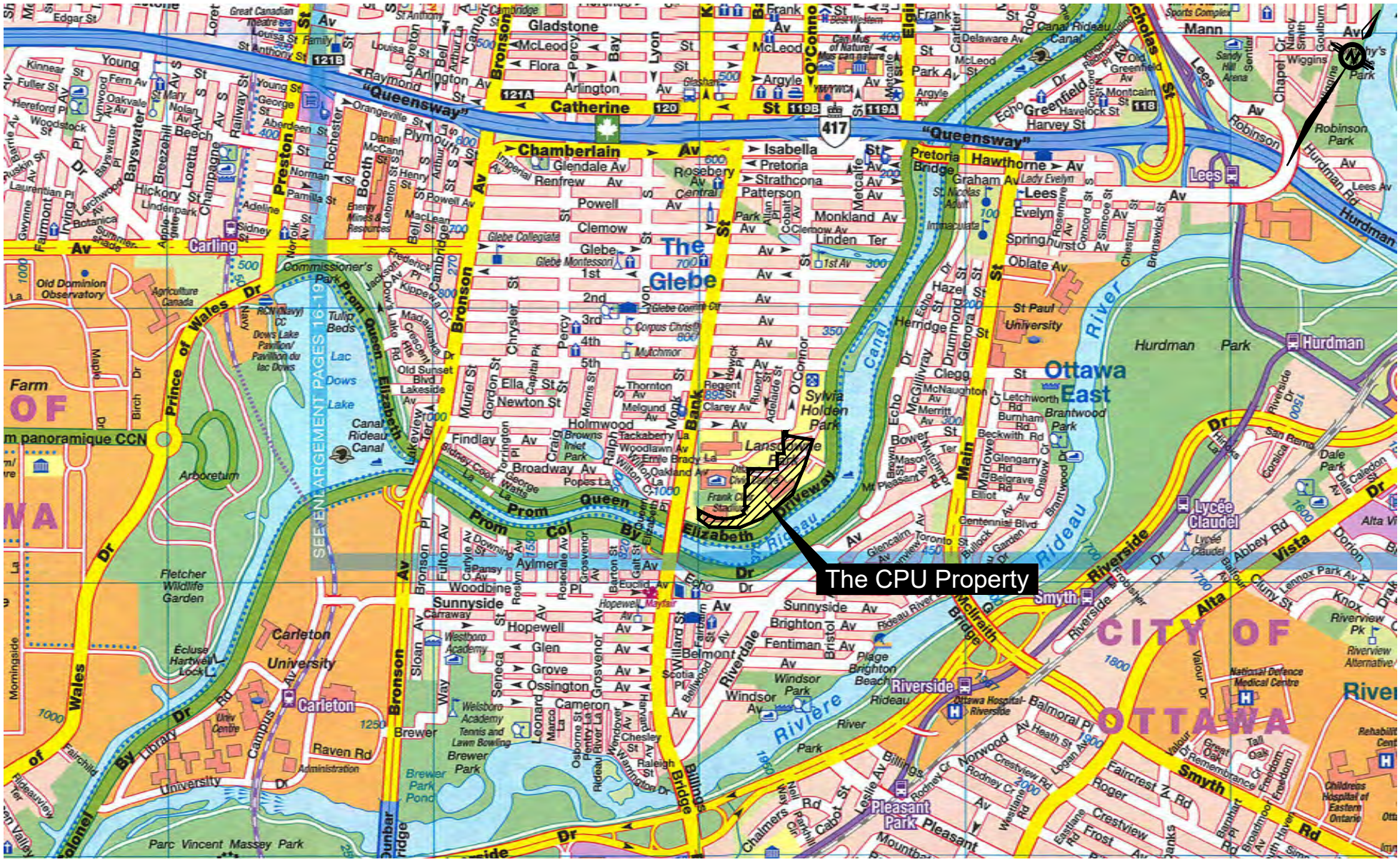
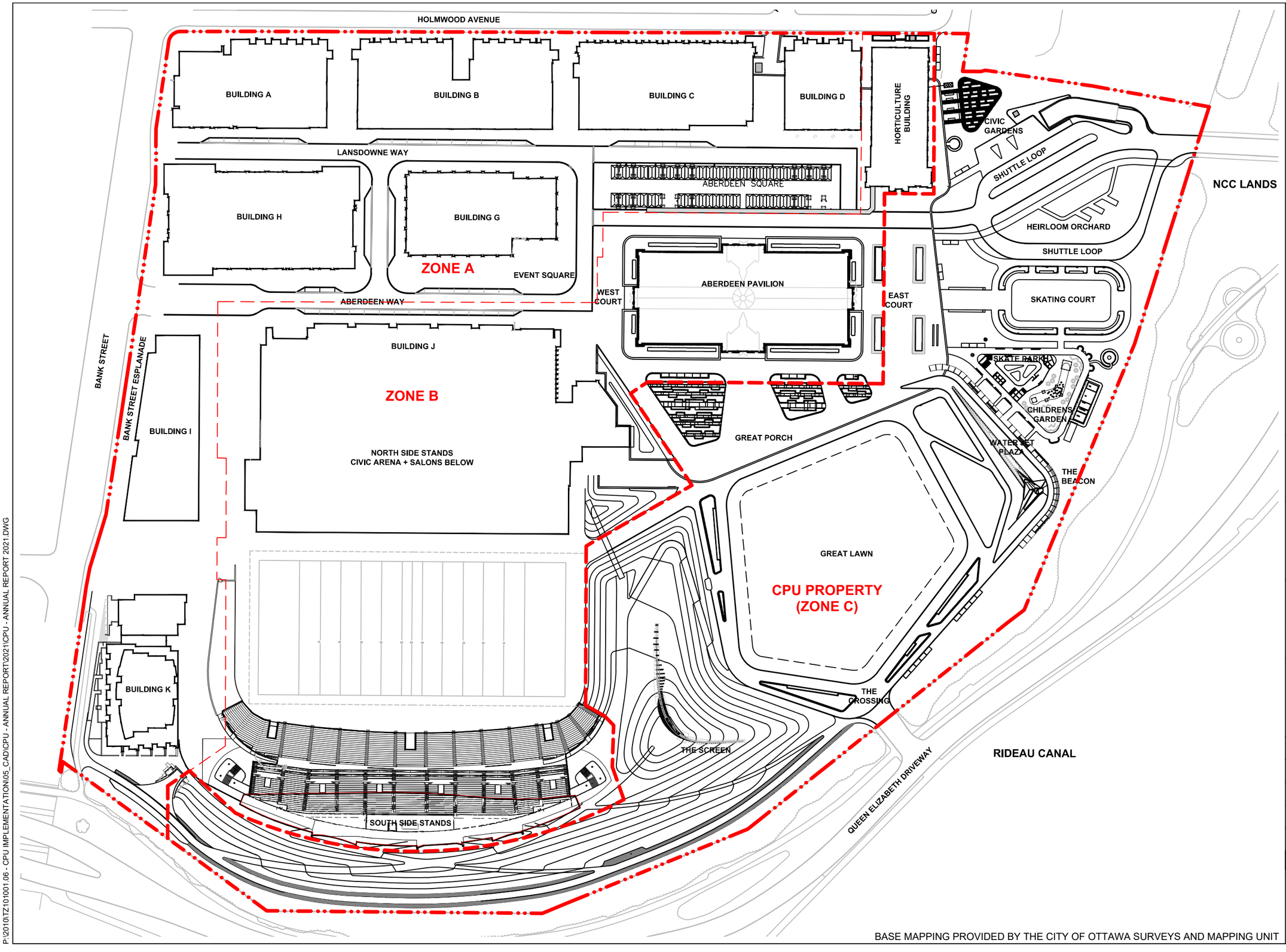


SOURCE: STREET ATLAS OF OTTAWA AND ENVIRONS, MAPART, 2010

200 0 200 400 600
METRES

TITLE: KEY PLAN 2021 ANNUAL REPORT LANSDOWNE PARK - ZONE C CPU No. 0371-8TYQMY 450 QUEEN ELIZABETH DRIVEWAY OTTAWA, ONTARIO		CLIENT: Ottawa	wood.
DATE: MARCH 2022		PROJECT NO: TZ10100106	FIGURE NO: 1
DRAWN BY: JFT	CHECKED BY: KDH	SCALE: 1 : 20,000	



LEGEND

- LANSDOWNE PARK PROPERTY BOUNDARY
- URBAN PARK (ZONE C) BOUNDARY
- ZONES A-B BOUNDARY

15 0 15 30 45
METRES

wood.

TITLE:

GENERALIZED SITE PLAN

PROJECT:

2021 ANNUAL REPORT

LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

Ottawa

DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	MARCH 2022
SCALE:	1 : 1,600
PROJECT NO:	TZ10100106
FIGURE NO:	2

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

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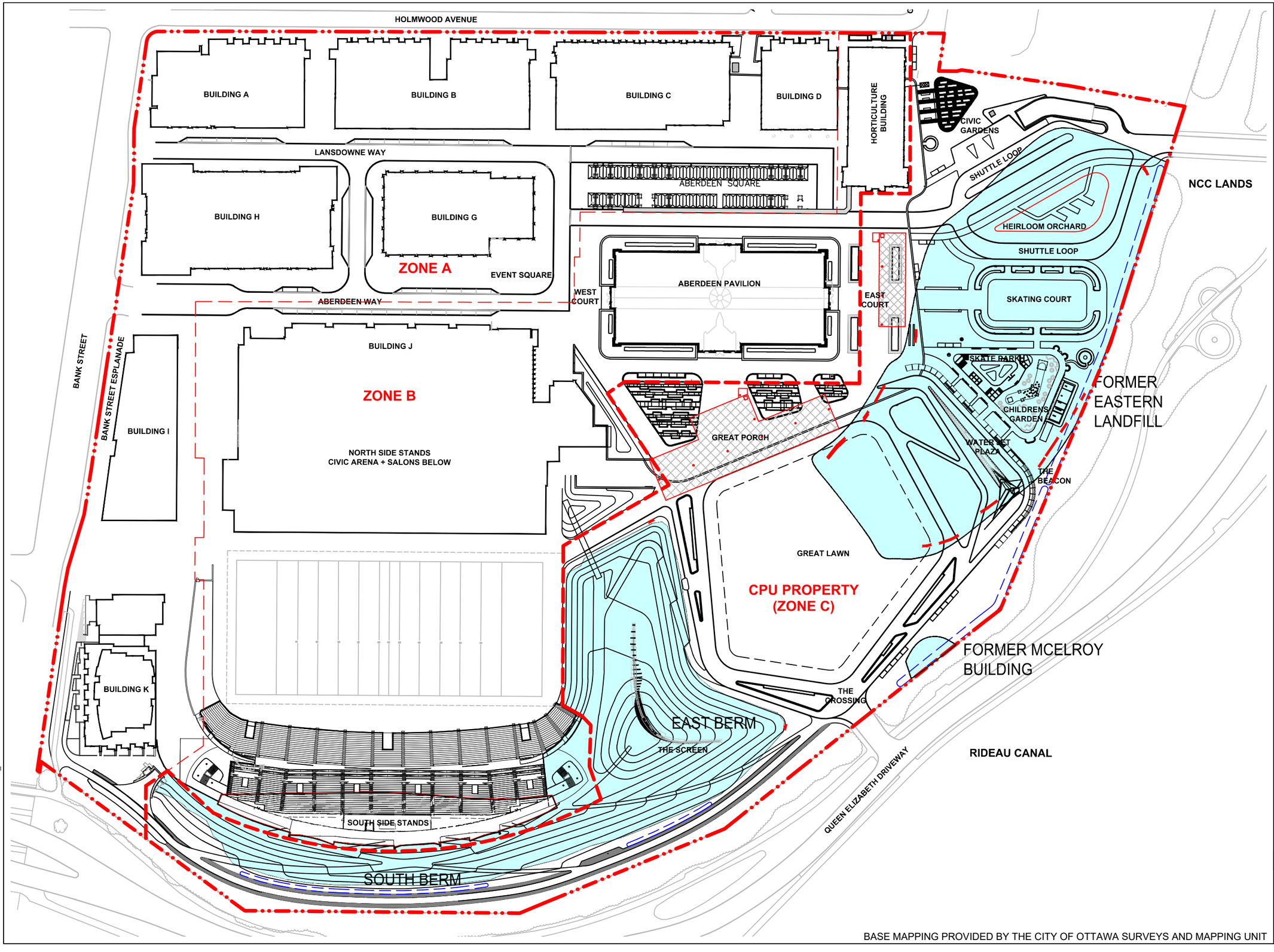

LEGEND

- LANSDOWNE PARK PROPERTY BOUNDARY
- URBAN PARK (ZONE C) BOUNDARY
- EXTENT OF NON-WOVEN GEOTEXTILE AND SOFT SOIL OR HARD CAP
- LOCATION OF CLAY SEAL IN SUBSURFACE UTILITY
- PERIMETER DRAINAGE SWALE
- UNDERGROUND STORMWATER TANK

15 0 15 30 45
METRES

wood.

TITLE:

RISK MANAGEMENT MEASURES

PROJECT:

2021 ANNUAL REPORT

LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

Ottawa

DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	MARCH 2022
SCALE:	1 : 1,600
PROJECT NO:	TZ10100106
FIGURE NO:	3

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

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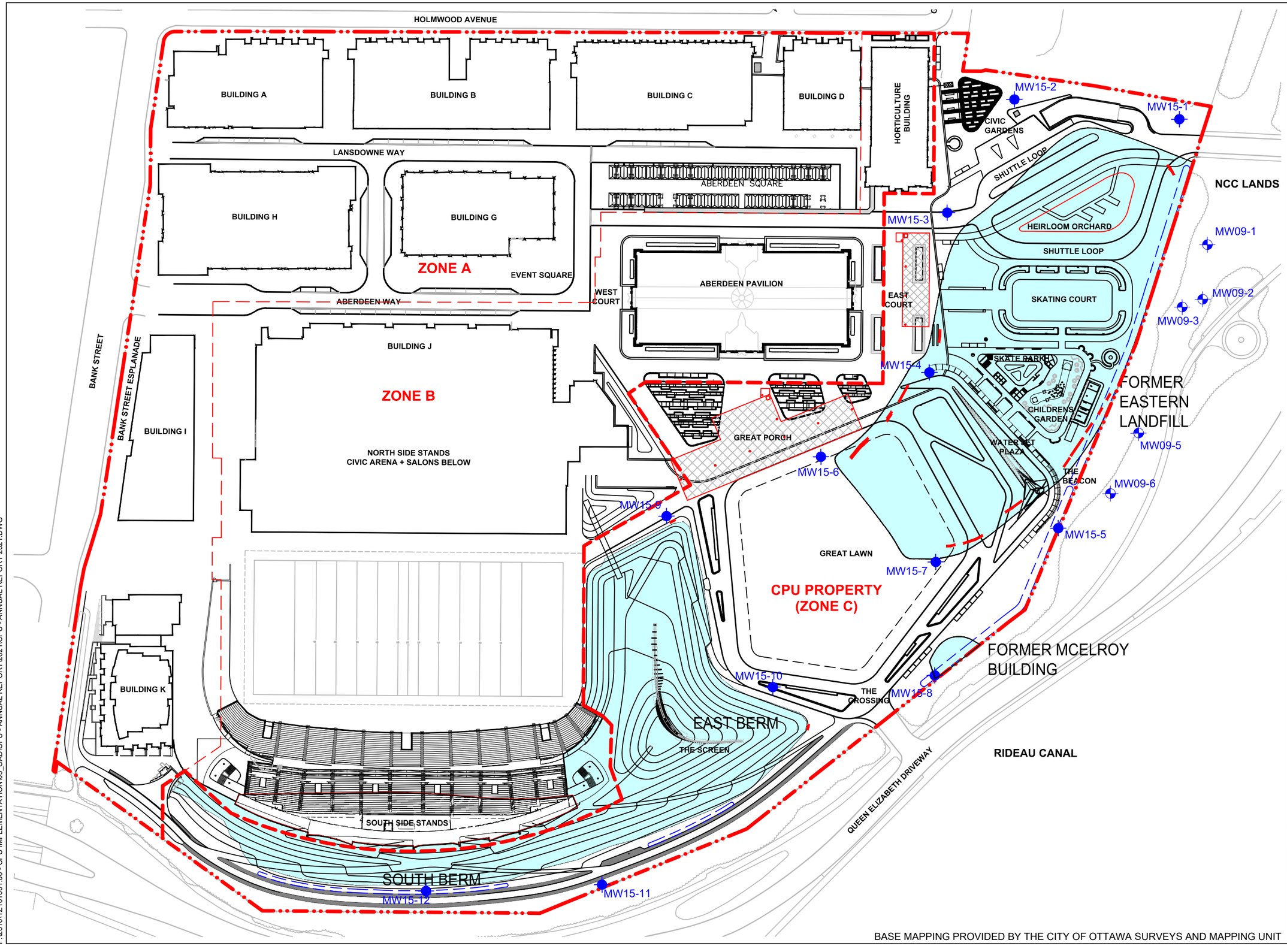

LEGEND

- LANSDOWNE PARK PROPERTY BOUNDARY
- URBAN PARK (ZONE C) BOUNDARY
- EXTENT OF NON-WOVEN GEOTEXTILE AND SOFT SOIL OR HARD CAP
- LOCATION OF CLAY SEAL IN SUBSURFACE UTILITY
- PERIMETER DRAINAGE SWALE
- UNDERGROUND STORMWATER TANK
- MW9-6 NCC PROPERTY GROUND WATER MONITORING WELL
- MW15-5 ON-SITE GROUND WATER MONITORING WELL

15 0 15 30 45
METRES

wood.

TITLE:

GROUNDWATER MONITORING WELL LOCATION PLAN

PROJECT:

2021 ANNUAL REPORT

LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

Ottawa

DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	MARCH 2022
SCALE:	1 : 1,600
PROJECT NO:	TZ10100106
FIGURE NO:	4

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

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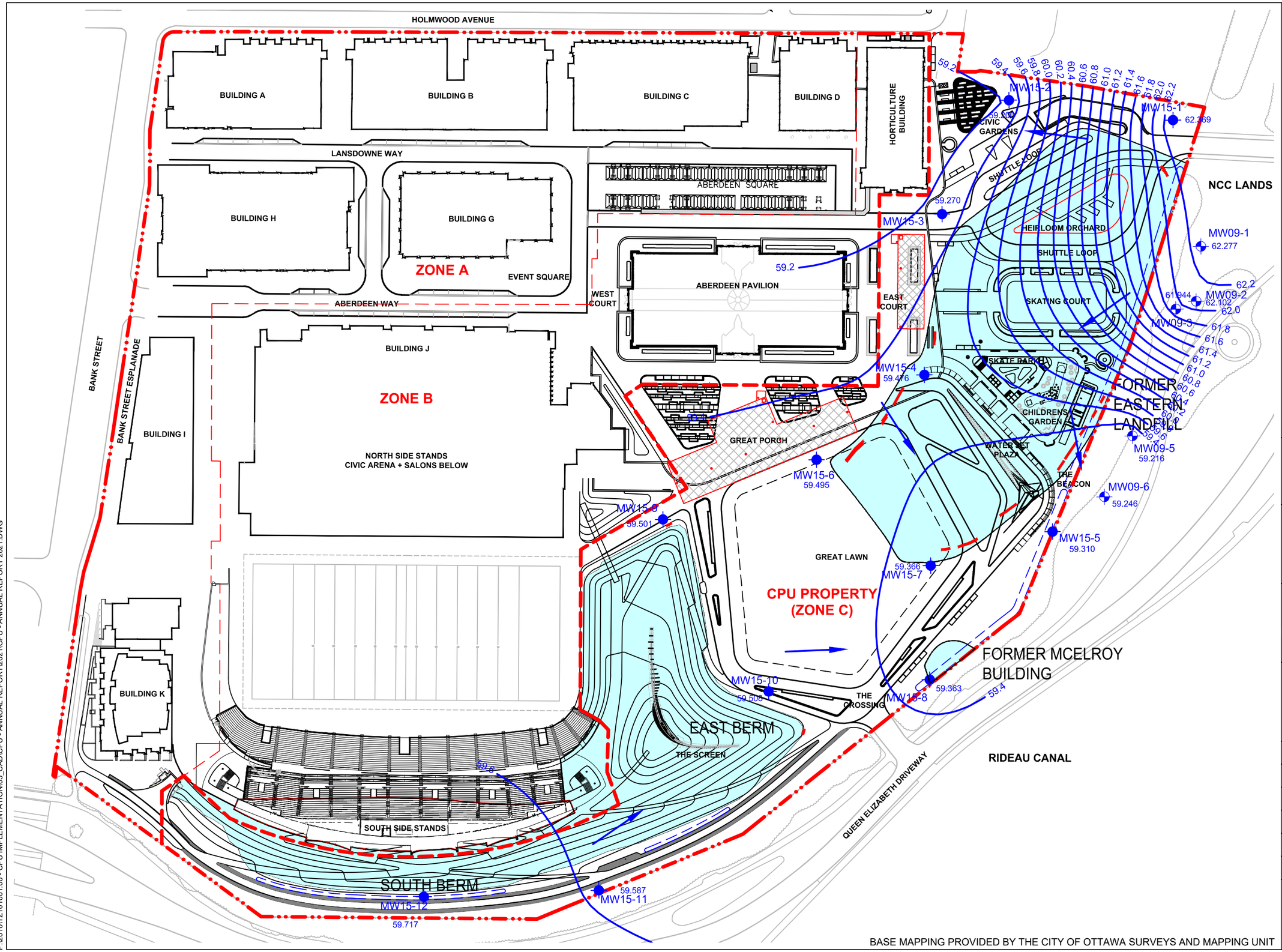

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

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LEGEND

— · —	LANSDOWNE PARK PROPERTY BOUNDARY
— —	URBAN PARK (ZONE C) BOUNDARY
▭	EXTENT OF NON-WOVEN GEOTEXTILE AND SOFT SOIL OR HARD CAP
■	LOCATION OF CLAY SEAL IN SUBSURFACE UTILITY
◯	PERIMETER DRAINAGE SWALE
▨	UNDERGROUND STORMWATER TANK
MW9-6 ⊕	NCC PROPERTY GROUND WATER MONITORING WELL
MW15-5 ●	ON-SITE GROUND WATER MONITORING WELL
—	GROUND WATER ELEVATION CONTOUR
→	INFERRED DIRECTION OF GROUND WATER FLOW

15 0 15 30 45
METRES

wood.

TITLE:

GROUNDWATER ELEVATION CONTOUR PLAN - MAY 27, 2021

PROJECT:

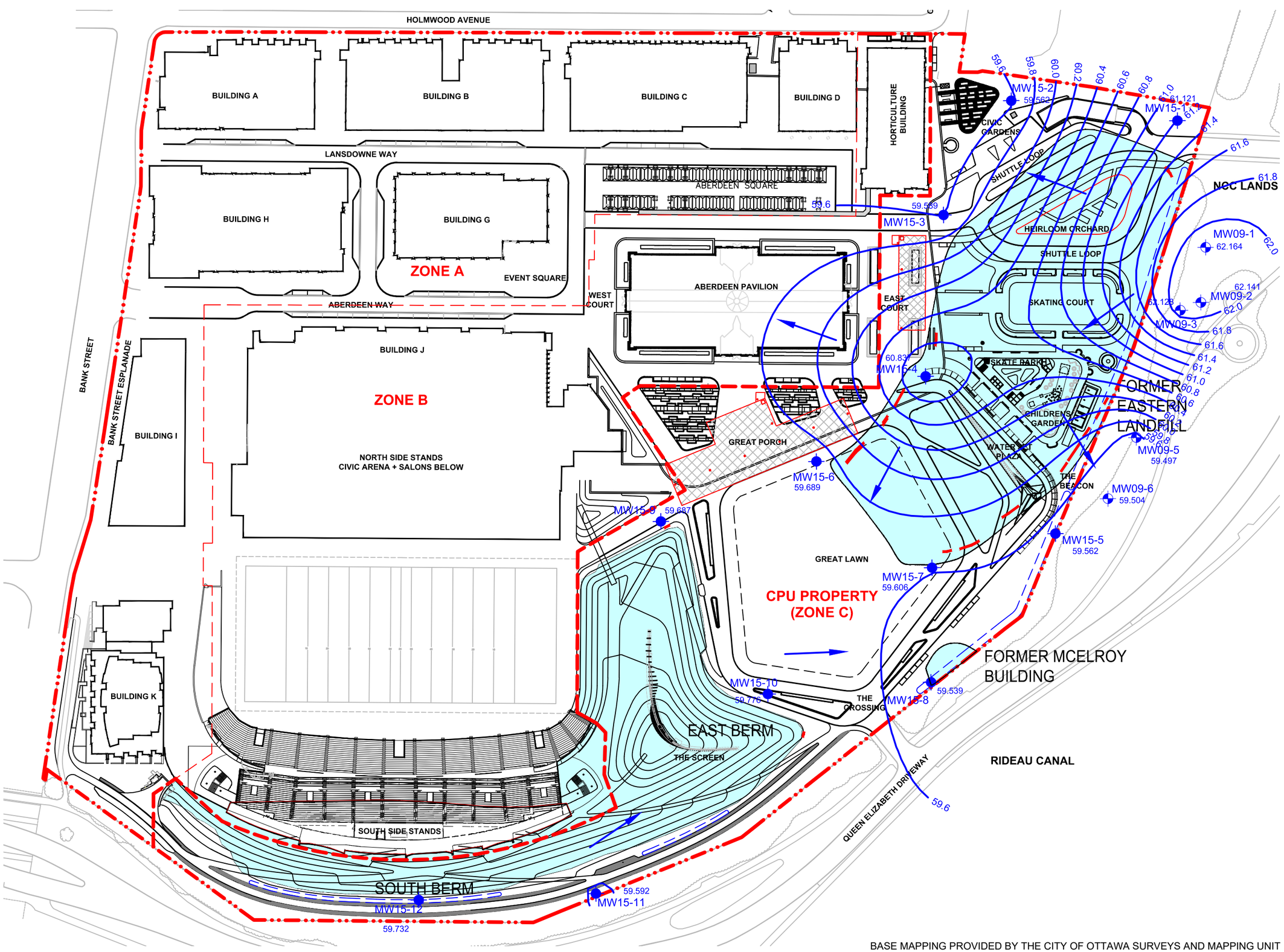
2021 ANNUAL REPORT

LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

Ottawa

DESIGNED BY: KDH
DRAWN BY: JFT
CHECKED BY: KDH
DATE: MARCH 2022
SCALE: 1 : 1,600
PROJECT NO: TZ10100106
FIGURE NO: 5a



LEGEND

- LANSDOWNE PARK PROPERTY BOUNDARY
- URBAN PARK (ZONE C) BOUNDARY
- EXTENT OF NON-WOVEN GEOTEXTILE AND SOFT SOIL OR HARD CAP
- LOCATION OF CLAY SEAL IN SUBSURFACE UTILITY
- PERIMETER DRAINAGE SWALE
- UNDERGROUND STORMWATER TANK
- MW9-6 NCC PROPERTY GROUND WATER MONITORING WELL
- MW15-5 ON-SITE GROUND WATER MONITORING WELL
- GROUND WATER ELEVATION CONTOUR
- INFERRED DIRECTION OF GROUND WATER FLOW

15 0 15 30 45
METRES

wood.

TITLE:

GROUNDWATER ELEVATION CONTOUR PLAN - DECEMBER 1, 2021

PROJECT:

2021 ANNUAL REPORT

LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

Ottawa

DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	MARCH 2022
SCALE:	1 : 1,600
PROJECT NO:	TZ10100106
FIGURE NO:	5b

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

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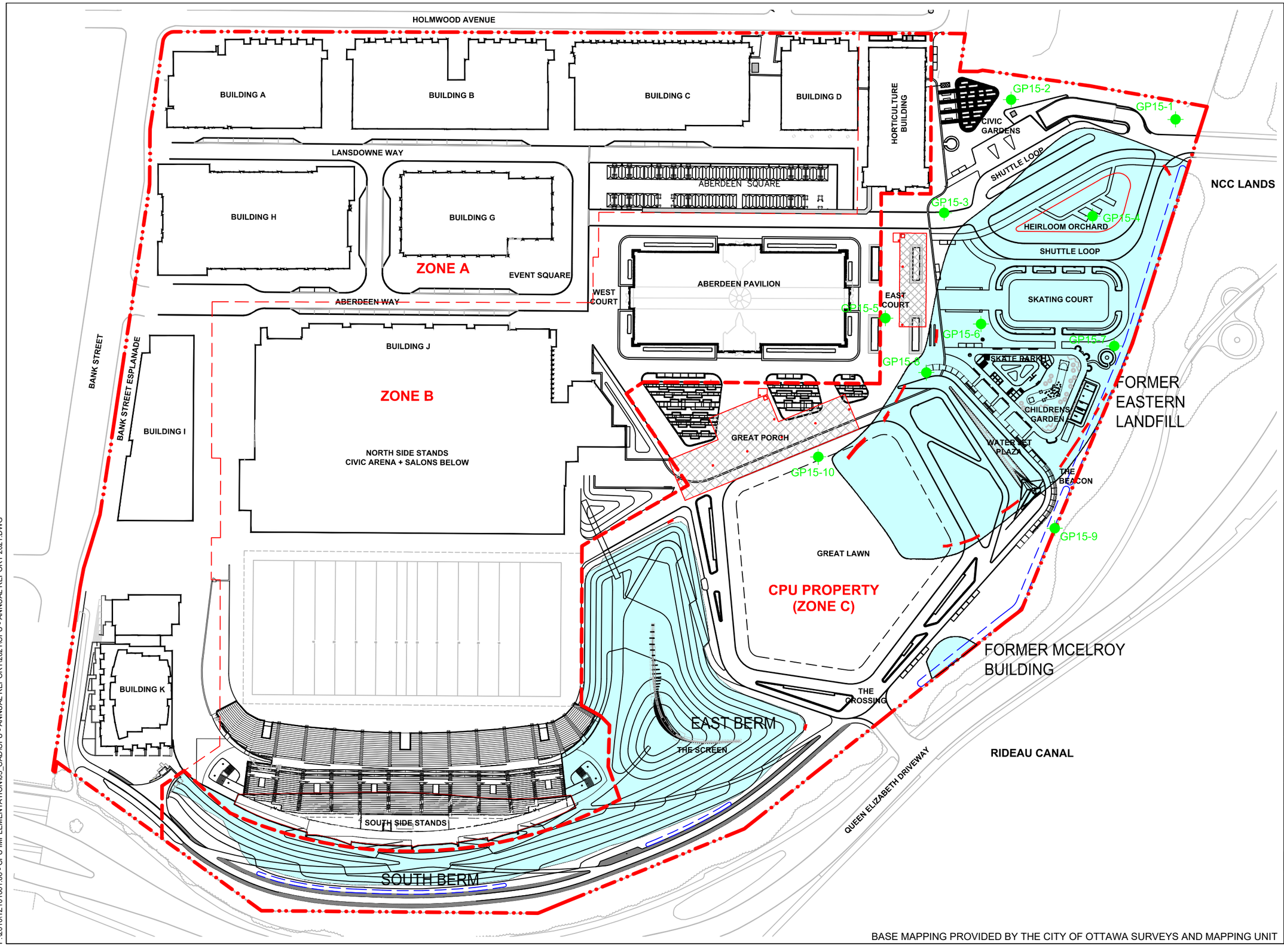

LEGEND

- LANSDOWNE PARK PROPERTY BOUNDARY
- URBAN PARK (ZONE C) BOUNDARY
- EXTENT OF NON-WOVEN GEOTEXTILE AND SOFT SOIL OR HARD CAP
- LOCATION OF CLAY SEAL IN SUBSURFACE UTILITY
- PERIMETER DRAINAGE SWALE
- UNDERGROUND STORMWATER TANK
- GP15-1 LANDFILL GAS PROBE

15 0 15 30 45
METRES

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

TITLE:
LANDFILL GAS PROBE LOCATION PLAN

PROJECT:
2021 ANNUAL REPORT
LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	MARCH 2022
SCALE:	1 : 1,600
PROJECT NO:	TZ10100106
FIGURE NO:	6

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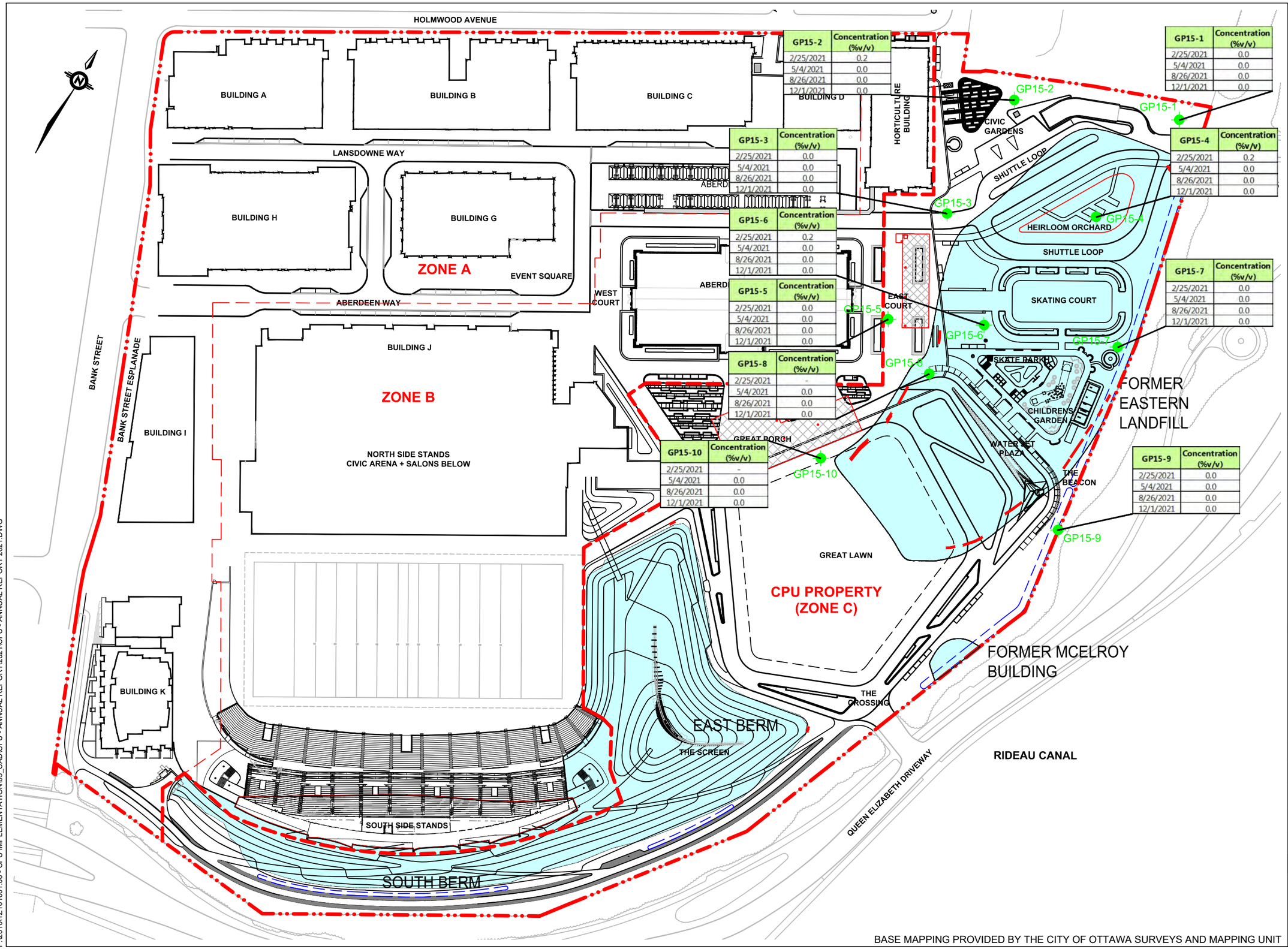

GP15-2	Concentration (%v/v)
2/25/2021	0.2
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-1	Concentration (%v/v)
2/25/2021	0.0
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-3	Concentration (%v/v)
2/25/2021	0.0
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-4	Concentration (%v/v)
2/25/2021	0.2
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-6	Concentration (%v/v)
2/25/2021	0.2
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-7	Concentration (%v/v)
2/25/2021	0.0
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-5	Concentration (%v/v)
2/25/2021	0.0
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-8	Concentration (%v/v)
2/25/2021	-
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-10	Concentration (%v/v)
2/25/2021	-
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

GP15-9	Concentration (%v/v)
2/25/2021	0.0
5/4/2021	0.0
8/26/2021	0.0
12/1/2021	0.0

LEGEND

- LANSDOWNE PARK PROPERTY BOUNDARY
- URBAN PARK (ZONE C) BOUNDARY
- EXTENT OF NON-WOVEN GEOTEXTILE AND SOFT SOIL OR HARD CAP
- LOCATION OF CLAY SEAL IN SUBSURFACE UTILITY
- PERIMETER DRAINAGE SWALE
- UNDERGROUND STORMWATER TANK
- GP15-1 LANDFILL GAS PROBE

NOTES ON METHANE CONCENTRATIONS:

BOLD: METHANE CONCENTRATION EXCEEDS ONTARIO REGULATION 232/98 FOR OFF-SITE BUILDING OR FOUNDATION.

BOLD/YELLOW SHADING: METHANE CONCENTRATION EXCEEDS ONTARIO REGULATION 232/98 FOR ON-SITE BUILDING OR FOUNDATION.

BOLD/YELLOW SHADING/UNDERLINED: METHANE CONCENTRATION EXCEEDS MOECC REGULATION 232/98 FOR LANDFILL PROPERTY BOUNDARY SUBSURFACE.

15 0 15 30 45
METRES

wood.

TITLE:

SUBSURFACE METHANE CONCENTRATIONS AT LANDFILL GAS PROBES

PROJECT:

2021 ANNUAL REPORT

LANSDOWNE PARK - CPU PROPERTY
450 QUEEN ELIZABETH DRIVEWAY
OTTAWA, ONTARIO

CLIENT:

Ottawa

DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	MARCH 2022
SCALE:	1 : 1,600
PROJECT NO:	TZ10100106
FIGURE NO:	7

BASE MAPPING PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

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Appendix A
Certificate of Property Use
(Available Upon Request)

Appendix B
Risk Management Measures Inspection Logs

Inspection Log
Risk Management Measures
Lansdowne Park – Urban Park

This log form is to be used to document inspections of the Risk Management Measures (RMM) in place at the East and South Berms, former Eastern Landfill and former McElroy Building to mitigate potentially unacceptable health risks associated with the exposure to contaminated soil as required by Certificate of Property Use (CPU) 0371-8TYQMY. Routine inspections are to be carried out during the spring and fall of each year following the spring thaw and prior to the winter ground frost and snow cover. Weather, event and incident inspections are to be carried out subsequent to the appropriate trigger initiating the need for inspection. Inspections shall be carried out as needed until such time that the RMM are no longer required at the site.

1) General Information

Inspection Date (mm/dd/yy): 05/19/21 Inspected by: Jason Taylor

Time in (hh/mm): 13:00 Time out (hh/mm): 14:30

Weather (current): Sunny 30°C

Precipitation in last 24 hours? Yes ☐ No ☒ Rainfall quantity if available _____ mm

2) Inspection Type

Routine (semi-annual) ☐ Spring ☒ Fall ☐ (if semi-annual, proceed to Section 4)

Construction (provide details below) ☐ Weather-related (provide details below) ☐

Event-specific (provide details below) ☐ Incident-related (provide details below) ☐

3) Location of Event or Incident (Check all that apply)

East Berm	☒	South Berm	☒
Shuttle Loop / Eastern Landfill	☒	Heirloom Orchard / Eastern Landfill	☒
East Court / Eastern Landfill	☒	Skating Court / Eastern Landfill	☒
Skate Park / Eastern Landfill	☒	Water Jet Plaza / Eastern Landfill	☒
Children's Garden / Eastern Landfill	☒	Great Lawn / Eastern Landfill	☒
Former McElroy Building	☒		

Details of event or incident: Routine Spring inspection.

4) East Berm

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☒	No	☐
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☒	No	☐
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Areas of bare soil were observed in high traffic areas of the berm including flat areas At the top of the berm and around the Art Screen. An area of soil erosion and transport was observed at the east side of the berm near the entrance of the pedestrian pathway.

5) South Berm

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☒	No	☐
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Areas of exposed soil and soil transport were observed throughout the south berm, particularly in areas with steep slopes. Bare soil was observed on either side of pathways on the berm, inferred to be from pedestrian and vehicular traffic.

6) South Drainage Swales

The south drainage swales are located on the north and south side of the fire access route at the toe of the South Berm

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☒	No	☐
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Road base material as well as portions of the northern slope of the swale were observed to be eroding into the swale.

7) Former Eastern Landfill

The former Eastern Landfill includes the Heirloom Orchard, Skating Court, Skate Park, Children's Garden, Water Jet Plaza, and the northeast portion of the Great Lawn.

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☐	No	☒
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Several small areas of bare soil and stressed vegetation were observed in high traffic areas around the ice rink and children's Garden/Skate Park area. Areas of bare soil and stressed vegetation were also observed in high traffic areas north of the ring road south of the Water Plaza and south of the ring road at the north end of the Great Lawn.

8) Former McElroy Building

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☐	No	☒
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: A large portion of this area was resurfaced with granular materials in 2019. Bare soil and tire ruts were observed in areas adjacent the granular covered area. Temporary stockpiles of topsoil and mulch were observed north of the gravel covered area with areas of bare soil where stockpiled material has been removed.

9) East Perimeter Drainage Swale

The east perimeter drainage is located along the east property extending from the northeast entrance from Queen Elizabeth Driveway to the southeast corner of the Great Lawn

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☐	No	☒
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: In 2019, a large portion of the swale south of the Water Plaza, was resurfaced with granular materials. North of the Water Plaza, conditions were similar to those previously observed with some areas of bare soil overlying the trench excavated to run electrical conduits to the sign at the entrance to the Site from Queen Elizabeth Driveway.

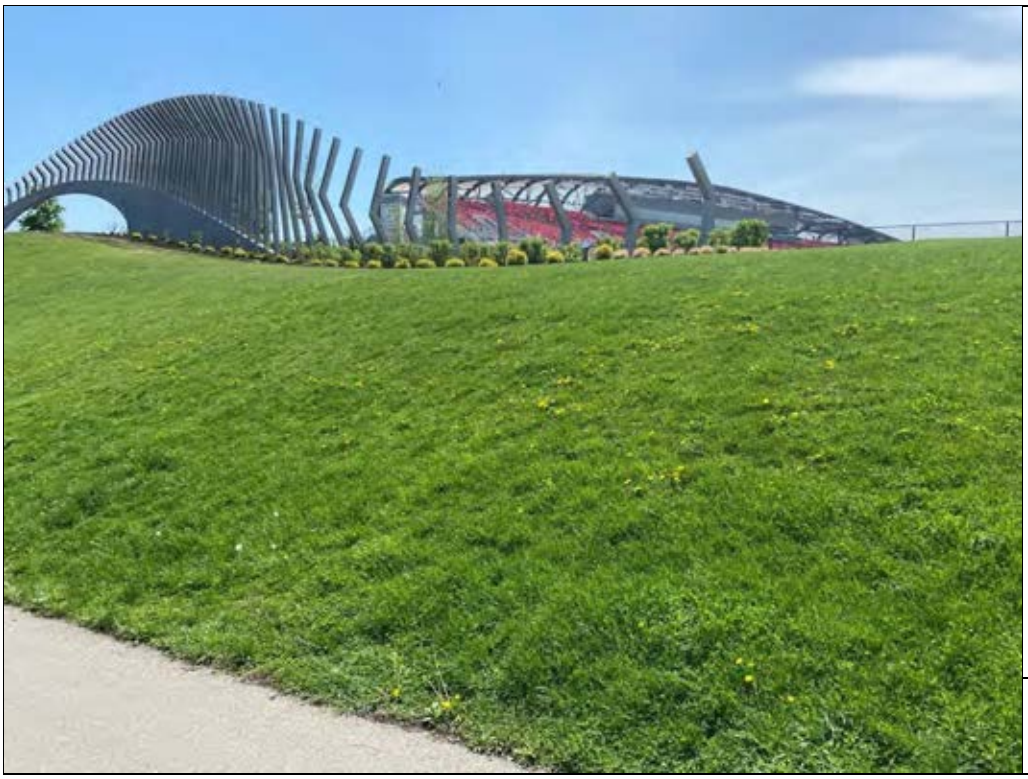


Photo 1:
East Berm: General view of the east side of the berm.

Direction:
Southwest

Photo 2:
East Berm: Small areas of bare soil were observed on steeper sloped areas along the pedestrian pathway on the east side of the berm.

Direction:
South

Photo 3:
East Berm: Areas of bare soil were observed at the top of the berm east and west of the Art Screen.

Direction:
Southwest

Photo 4:
East Berm: Bare soil and stressed vegetation were observed on the flat areas east of the Art screen inferred to be from foot traffic.

Direction:
Northwest

Photo 5:
East Berm: The area north of the pedestrian path at the north end berm had been reseeded.

Direction:
North

Photo 6:
East Berm: Area of bare soil and stressed vegetation at the north end of the Art screen inferred to be from foot traffic.

Direction:
Southeast

	**Photo 7:** South Berm: General view of berm conditions. Areas of bare soil were observed throughout the berm.
	Direction: northwest
	**Photo 8:** South Berm: Bare soil observed on the western potion of the berm near the top.
	Direction: West

Photo 9:
South Berm: Clumps of soil eroding from areas near the top of the of the central portion of the berm.

Direction:
North

Photo 10:
South Berm: Areas of bare soil and tire ruts along paths on the berm.

Direction:
West

Photo 11:
South Drainage Swale: General view of the swale. Road base material has eroded into the swale.

Direction:
East

Photo 12:
Former Eastern Landfill: Bare soil and stressed vegetation along pathways at the north end of the former landfill west of the Orchard.

Direction:
East

Photo 13:
Former Eastern Landfill: Small areas of bare soil and stressed vegetation along the paths around the ice rink.

Direction:
East

Photo 14:
South Drainage Swale: Area of bare soil in high traffic area north of the ice rink.

Direction:
Northeast

Photo 15:
Former Eastern Landfill: The cover in the area of the Orchard is in good condition.

Direction:
North

Photo 16:
Former Eastern Landfill: Small areas of bare soil and stressed vegetation were observed in high traffic areas around the Skate Park and Children's Garden.

Direction:
Southwest

	**Photo 17:** Former Eastern Landfill: Areas of bare soil and stressed vegetation south of the ring road at the north end the Great Lawn. **Direction:** East
	**Photo 18:** Former Eastern Landfill: Area of bare soil and stressed vegetation at the northeast end of the Great Lawn. **Direction:** East

	**Photo 19:** Former Eastern Landfill: The soft landscaped area south of the Water Plaza are in fair to good condition.
	Direction: West
	**Photo 20:** Former Eastern Landfill: Area of bare soil and stressed vegetation southwest of Water Plaza.
	Direction: West

Photo 21:
Former McElroy Building: This area is used as a staging area for vehicles and material. Bare soil and stressed vegetation was observed in areas as used to stockpile landscaping materials.

Direction:
Southeast

Photo 22:
Eastern Perimeter Drainage Swale: Some areas of bare soil and tire ruts were observed adjacent the granular resurfaced area.

Direction:
Southeast

Photo 23:
Eastern Perimeter Drainage Swale: General view of the swale east of the Ice Rink and Heirloom Orchard. Areas of bare soil were observed in the area of the utility trench previously excavated within the swale.

Direction:
Northwest

Photo 24:
Eastern Perimeter Drainage Swale: General view of the swale east of the Water Plaza. Some areas of bare soil were observed along the property boundary.

Direction:
Southeast

Inspection Log
Risk Management Measures
Lansdowne Park – Urban Park

This log form is to be used to document inspections of the Risk Management Measures (RMM) in place at the East and South Berms, former Eastern Landfill and former McElroy Building to mitigate potentially unacceptable health risks associated with the exposure to contaminated soil as required by Certificate of Property Use (CPU) 0371-8TYQMY. Routine inspections are to be carried out during the spring and fall of each year following the spring thaw and prior to the winter ground frost and snow cover. Weather, event and incident inspections are to be carried out subsequent to the appropriate trigger initiating the need for inspection. Inspections shall be carried out as needed until such time that the RMM are no longer required at the site.

1) General Information

Inspection Date (mm/dd/yy): 09/30/21 Inspected by: Jason Taylor

Time in (hh/mm): 9:30 Time out (hh/mm): 11:00

Weather (current): Sunny 15°C

Precipitation in last 24 hours? Yes ☐ No ☒ Rainfall quantity if available _____ mm

2) Inspection Type

Routine (semi-annual) ☒ Spring ☐ Fall ☒ (if semi-annual, proceed to Section 4)

Construction (provide details below) ☐ Weather-related (provide details below) ☒

Event-specific (provide details below) ☒ Incident-related (provide details below) ☐

3) Location of Event or Incident (Check all that apply)

East Berm	☒	South Berm	☒
Shuttle Loop / Eastern Landfill	☒	Heirloom Orchard / Eastern Landfill	☒
East Court / Eastern Landfill	☒	Skating Court / Eastern Landfill	☒
Skate Park / Eastern Landfill	☒	Water Jet Plaza / Eastern Landfill	☒
Children's Garden / Eastern Landfill	☒	Great Lawn / Eastern Landfill	☒
Former McElroy Building	☒		

Details of event or incident: Fall inspection following the CityFolk music festival (September 16th-18th), the Bluesfest music festival (September 23rd-25th) and a rainfall event of 31.8 mm on September 22nd.

4) East Berm

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☒	No	☐
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☒	No	☐
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Areas of bare soil were observed in high traffic areas of the berm primarily at the top of the berm.

5) South Berm

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☒	No	☐
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Areas of exposed soil and soil transport were observed throughout the south berm, particularly in areas with steep slopes. Bare soil was observed on either side of pathways on the berm, inferred to be from pedestrian and vehicular traffic.

6) South Drainage Swales

The south drainage swales are located on the north and south side of the fire access route at the toe of the South Berm

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☒	No	☐
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Road base material as well as portions of the northern slope of the swale were observed to be eroding into the swale.

7) Former Eastern Landfill

The former Eastern Landfill includes the Heirloom Orchard, Skating Court, Skate Park, Children's Garden, Water Jet Plaza, and the northeast portion of the Great Lawn.

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☐	No	☒
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: Several small areas of bare soil and stressed vegetation were observed in high traffic areas around the ice rink and children's Garden/Skate Park area. Areas of bare soil and stressed vegetation were also observed in areas of the Great Lawn and south of the Water Plaza from use during the CityFolk and Bluesfest music festivals. At the time of the inspection Saunders Farm was setting up "The Sawmill" attraction on the Great Lawn which will be disturbing a large area of the lawn.

8) Former McElroy Building

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Do roads/pathways show evidence of uneven settlement, cracking or buckling?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☐	No	☒
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: A large portion of this area was resurfaced with granular materials in 2019. Bare soil and tire ruts were observed in areas adjacent the granular covered area. Base soil was observed in areas where stockpiles of topsoil and mulch were observed during the Spring 2021 inspection.

9) East Perimeter Drainage Swale

The east perimeter drainage is located along the east property extending from the northeast entrance from Queen Elizabeth Driveway to the southeast corner of the Great Lawn

Are there any areas of worn or stressed vegetation?	Yes	☒	No	☐
Are there any areas of bare or exposed soil?	Yes	☒	No	☐
Are there any areas of uneven settlement?	Yes	☐	No	☒
Are any shear or tension cracks present on any sloped areas?	Yes	☐	No	☒
Is there any evidence of soil erosion, transport and sedimentation?	Yes	☐	No	☒
Has the non-woven geotextile been exposed in any area?	Yes	☐	No	☒

Other observations: In 2019, a large portion of the swale south of the Water Plaza, was resurfaced with granular materials. North of the Water Plaza, conditions were similar to those previously observed with some areas of bare soil overlying the trench excavated to run electrical conduits to the sign at the entrance to the Site from Queen Elizabeth Driveway.

Photo 1:
East Berm: General view of the east side of the berm.

Direction:
Southwest

Photo 2:
East Berm: General view of the steeper sloped areas along the pedestrian pathway on the east side of the berm.

Direction:
South

Photo 3:
East Berm: Areas of bare soil were observed at the top of the berm east and west of the Art Screen.

Direction:
Southwest

Photo 4:
East Berm: Conditions have generally improved around Art Screen with areas of bare soil primarily near the top of the berm.

Direction:
Northwest

Photo 5:
East Berm: Conditions at the north of the pedestrian path at the north end berm have improved after efforts to reseed the area in the spring.

Direction:
North

Photo 6:
East Berm: General view of the north end of the Art Screen.

Direction:
Southeast

	**Photo 7:** South Berm: General view of berm conditions. Areas of bare soil were observed throughout the berm.
	Direction: West
	**Photo 8:** South Berm: Bare soil observed on the western potion of the berm near the top.
	Direction: Northwest

Photo 9:
South Berm: Clumps of soil eroding from areas near the top of the of the central portion of the berm.

Direction:
North

Photo 10:
South Berm: Areas of bare soil and tire ruts along paths on the berm.

Direction:
East

Photo 11:
South Drainage Swale: General view of the swale. Road base material has eroded into the swale.

Direction:
Southwest

Photo 12:
Former Eastern Landfill: Bare soil and stressed vegetation along pathways at the north end of the former landfill west of the Orchard.

Direction:
East

Photo 13:
Former Eastern Landfill: Small areas of bare soil and stressed vegetation along the paths around the ice rink.

Direction:
East

Photo 14:
South Drainage Swale: Area of bare soil in high traffic area north of the ice rink.

Direction:
Northeast

Photo 15:
Former Eastern Landfill: The cover in the area of the Orchard is in good condition.

Direction:
North

Photo 16:
Former Eastern Landfill: Small areas of bare soil and stressed vegetation were observed in high traffic areas around the Skate Park and Children's Garden.

Direction:
Southwest

Photo 15:
Former Eastern Landfill: Areas of bare soil and stressed vegetation south of the ring road at the north end the Great Lawn. This area was recently disturbed by CityFolk and Bluesfest music festivals. "The Sawmill" attraction by Saunders Farm was being setup in the Great Lawn.

Direction:
East

Photo 16:
Former Eastern Landfill: Area of bare soil and stressed vegetation at the northeast end of the Great Lawn.

Direction:
East

Photo 17:
Former Eastern Landfill: Bare soil and stressed vegetation at the soft landscaped area south of the Water Plaza. This area was used for CityFolk and Bluesfest music festivals.

Direction:
West

Photo 18:
Former Eastern Landfill: Area of bare soil and stressed vegetation southwest of Water Plaza. This area was used for CityFolk and Bluesfest music festivals.

Direction:
East

	**Photo 19:** Former McElroy Building: This area is used as a staging area for vehicles and material. Bare soil and stressed vegetation was observed in areas used to stockpile landscaping materials.
	Direction: Southeast
	**Photo 20:** Eastern Perimeter Drainage Swale: Some areas of bare soil and tire ruts were observed adjacent the granular resurfaced area.
	Direction: Northwest

Photo 21:
Eastern Perimeter Drainage Swale: General view of the swale east of the Ice Rink and Heirloom Orchard. Small areas of bare soil were observed in the area of the utility trench previously excavated within the swale.

Direction:
Northwest

Photo 22:
Eastern Perimeter Drainage Swale: General view of the swale east of the Water Plaza. Some areas of bare soil were observed along the property boundary.

Direction:
Southeast

Wood Environment & Infrastructure Solutions,
a Division of Wood Canada Limited
210 Colonnade Road South, Unit 300
Ottawa, Ontario K2E 7L5
Canada
T: 613-727-0658
www.woodplc.com

22 December 2021

Reference No. OESAO2129

VIA EMAIL

Trinity Development Group Inc.
Agent for Lansdowne Retail Limited Partners
77 Bloor Street W, Suite 1601
Toronto, Ontario
M5S 1M2

Attention: Michael Bottigoni
Senior Vice President Construction

Dear Mr. Bottigoni;

RE: Risk Management Measure Inspections
Certificate of Property Use (CPU 0371-8TYQMY)
Lansdowne Park, Urban Park (Zone C)
450 Queen Elizabeth Drive (Part of 945 Bank Street),
Ottawa, Ontario

Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited ("Wood"), was retained by Trinity Development Group Inc. in its capacity as agent for Lansdowne Retail Limited Partners ("Trinity") to carry out inspections during a recent geotechnical investigation at Lansdowne Park – Urban Park (Zone C) property located at 450 Queen Elizabeth Driveway (part of 945 Bank Street) in Ottawa, Ontario (hereinafter referred to as the "Site"). The inspections were undertaken to ensure the geotechnical investigation was conducted in a way to preserve and protect the Risk Management Measure (RMM) implemented at the Site as mandated under the Certificate of Property Use (CPU) No. 0371-8TYQMY, including the clean soil cap and underlying geotextile overlying the East Berm. Inspections were also completed during reinstatement activities to ensure they were conducted in accordance with the requirements set forth in the CPU.

The geotechnical investigation was conducted by Paterson Group Inc. ("Paterson") and included the advancement of seven (7) boreholes in the vicinity of the East Berm four (4) of which were advanced through the clean soil cap and geotextile overlying the East Berm. Two (2) borehole locations were instrumented with groundwater monitoring wells including one (1) location within the East Berm footprint. A plan depicting the borehole and groundwater monitoring well locations is provided in Figure 1. Proposed borehole locations were sub-excavated through the clean soil cap and down to the geotextile on October 26, 2021, using a mini excavator. Once the geotextile at the base of the clean soil cap was exposed, it was cut and pulled back to provide an area to drill through the cap without damaging the geotextile. Once the geotextile was pulled back, the centre of the hole was marked using a stake and

the excavation backfilled with the clean soil stockpiled from the excavation in order to allow the drilling contractors to safely work around the borehole locations.

Boreholes located on the East Berm were advanced by George Downing Estate Drilling Ltd. ("Downing") between October 26th and November 12th, 2021. Boreholes were advanced through the clean soil cap into the underlying impacted soils. Drilling operations through the clean soil cap and geotextile were monitored closely in order to ensure the auger did not disturb the geotextile. Paterson was informed that soil beneath the geotextile layer was to be treated as contaminated soil. Any excess drill cuttings from beneath the geotextile layer were to be segregated and placed in drums to be disposed of at a licensed landfill.

Following the drilling activities, reinstatement of the clean soil cap and geotextile was completed by Paterson on November 16th, 2021. Reinstatement activities included re-excavating the borehole areas down to the geotextile using a mini excavator to expose the geotextile, folding the geotextile back down and then placing a patch of new geotextile over the cuts in the existing geotextile. The specifications of the geotextile used to patch the holes was verified and met the requirements of the CPU. In locations where a groundwater monitoring well was installed, the geotextile was brought up and around the well's protective casing. Once the geotextile was patched the hole was backfilled with the clean soil removed to expose the geotextile. Reinstatement of the clean soil cap and geotextile conformed with specifications under the CPU.

A photo log is enclosed showing the general steps of the investigation and reinstatement activities.

We trust the above information is satisfactory. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions,
A Division of Wood Canada Limited

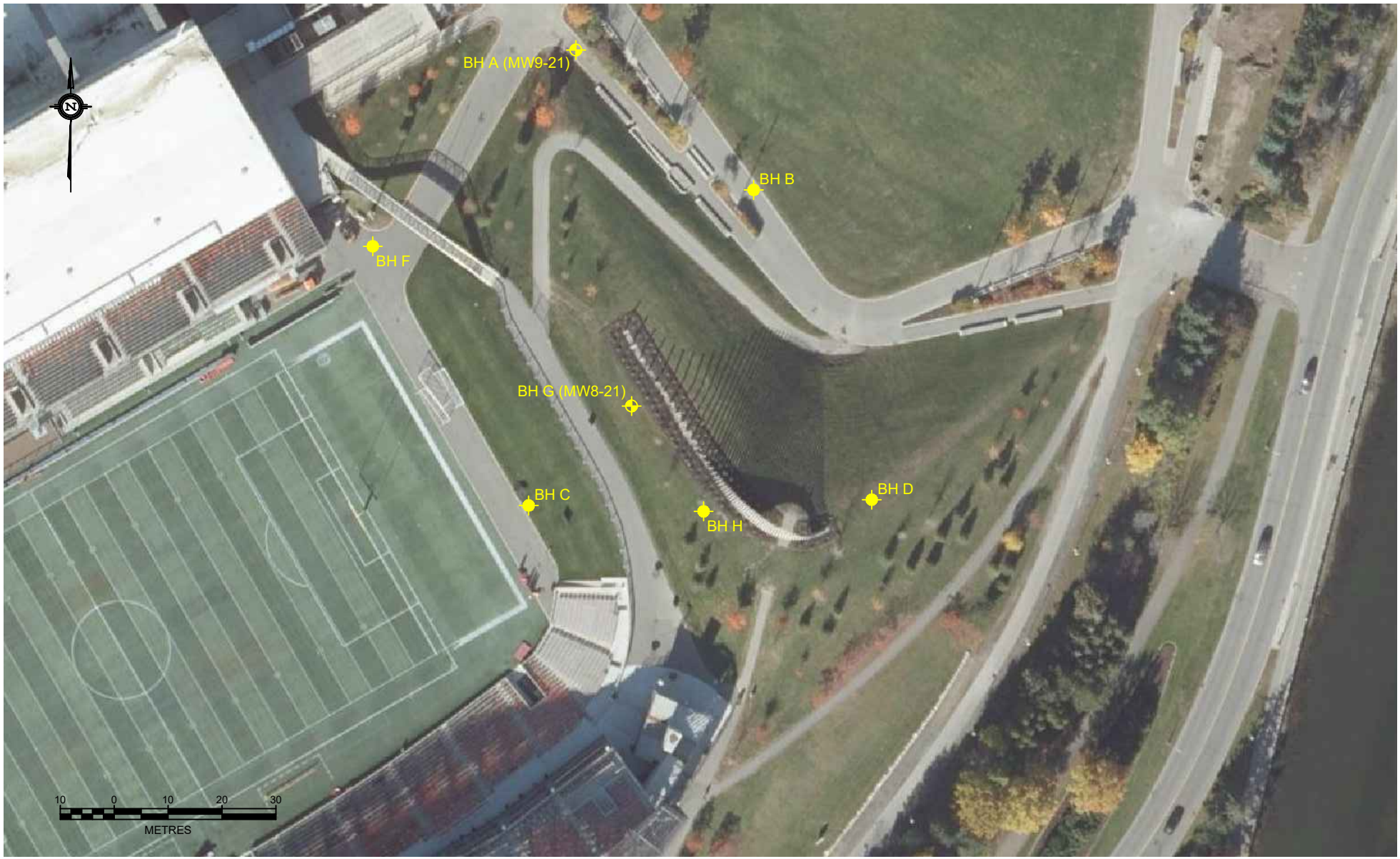
Jason Taylor, B.SC. (Hon)
Senior Environmental Scientist

Kevin D. Hicks, M.Sc., P.Geo., QP_{ESA}
Principal Hydrogeologist

JFT/jft

Attachment (2)
Figure 1 – Borehole and Groundwater Monitoring Well Locations
Photo Log

\\OTT-FS1\PROJECTS\2021\PROJECTS\OESAO2129_TRINITY DEVELOPMENT_LANSDOWNE PARK DRILLING OVERSIGHT\CAD\OESAO2129 - LANSDOWNE PARK.DWG



LEGEND

- GROUNDWATER MONITORING WELL (PATERSON, 2021)
- BOREHOLE (PATERSON, 2021)

BASE MAP COURTESY: CITY OF OTTAWA (maps.ottawa.ca/geoottawamaps)

TITLE: BOREHOLE AND GROUNDWATER MONITORING WELL LOCATION PLAN LANSDOWNE PARK		CLIENT: TRINITY DEVELOPMENT GROUP INC. AGENT FOR LANSDOWNE RETAIL LIMITED PARTNERS	wood.
DATE: DECEMBER 2021		PROJECT NO: OESAO2129	FIGURE NO: 1
DRWN: JFT	CHK'D: KDH	SCALE: 1:1,000	

Photo 1:

General view of the initial excavation to expose the geotextile at one of the proposed borehole locations.

Photo 2:

Exposing geotextile by hand.

Photo 3:

Cutting back the geotextile and marking the centre of the hole.

Photo 4:

Backfilling the hole in preparation for drilling.

Photo 5:

Inspection during drilling activities to ensure the geotextile was not disturbed by the auger.

Photo 6:

General view of a borehole location after being drilled.

Photo 7:

General view of reinstatement activities. Borehole location was re-excavated, and geotextile was folded back down.

Photo 8:

General view of geotextile patch. New geotextile was brought up around the groundwater monitoring well protective casing and placed over cuts in the geotextile.

Appendix C
Stratigraphic and Instrumentation Logs

Stratigraphic and Instrumentation Log: MW15-1 / GP15-1

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 23, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) 20 40 60 80 / Total Organic Vapour (ppm) 20 40 60 80	WELLS GP	WELLS MW	Remarks
0 / 0		Ground Surface	65.5									
0		**TOPSOIL**	0.0									
1			65.1									
2		**FILL** Fine grained sand and gravel Sandy loam, dark grey	0.4	SS	1			80				
3 / 1												
4												
5		Very fine to fine grained loamy sand, brown/grey										
6												
7 / 2		Fine grained sandy loam, trace gravel, dark grey		SS	2			62				
8												
9												
10 / 3												
11		Loamy sand, dark grey, moist/wet										
12			61.8									
13 / 4		**LOAM** Loam, trace gravel, dark grey	3.7	SS	3			75				
14												
15			60.9									
16 / 5		**Sand** Fine to coarse grained sand, trace gravel, grey, wet	4.6									
17				SS	4			29				
18												
19												
20 / 6												
21			59.1									
22		**END OF BOREHOLE**	6.4									
23 / 7												

Elevation: 65.492 masl
Easting: 368902.891
Northing: 5029395.411

Casing Elevation: 65.409 masl
Well Casing Size: MW: 50.8 mm GP: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-2 / GP15-2

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 23, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) 20 40 60 80 / Total Organic Vapour (ppm) 20 40 60 80	WELLS GP	WELLS MW	Remarks
0 / 0		Ground Surface	65.2									
0		**TOPSOIL**	0.0									
			64.5									
3 / 1		**FILL** Sandy loam and gravel	0.8									
4				SS	1			90				
		Loamy sand and gravel										
5		Pieces of rock										
6 / 2		Fine to medium grained loamy sand and gravel, brown										
7		Pieces of rock		SS	2			55				
8		Fine to medium grained loamy sand and gravel, brown										
9												
10 / 3												
11		Very fine to fine grained loamy sand and trace gravel										
12		Pieces of rock										
13 / 4				SS	3			38				
			61.1									
14		**LOAMY SAND** Fine to medium grained loamy sand and gravel	4.1									
15												
16			60.4									
		SAND Fine to coarse grained sand, some gravel, wet	4.9									
17 / 5												
18												
19				SS	4							
20 / 6												
21												
22			58.5									
		END OF BOREHOLE	6.7									
23 / 7												

Elevation: 65.228
Easting: 368835.264
Northing: 5029365.156

Casing Elevation: 65.085 masl
Well Casing Size: MW: 50.8 mm GP: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-3 / GP15-3

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 23, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) 20 40 60 80 / Total Organic Vapour (ppm) 20 40 60 80	WELLS GP	WELLS MW	Remarks
0 / 0	Ground Surface	65.1									
0	**ASPHALT**	0.0									
1		64.7									
1	**FILL** Subbase granulars, sand and gravel, grey	0.4									
4 / 1	Fine to medium grained loamy sand, some gravel, brown		SS	1			46				
7 / 2	Fine to coarse grained sand, some gravel		SS	2			35				
10 / 3	Fine grained sandy loam		SS	3			45				
13 / 4	Clay, wet										
15	Fine to medium grained sand, grey, dry	60.5									
15	**SAND** Fine to coarse grained sand, some gravel, brown, wet	4.6									
18 / 5			SS	4			53				
22 / 6		58.4									
22	**END OF BOREHOLE**	6.7									
23 / 7											

Elevation: 65.067 masl
Easting: 368835.685
Northing: 5029306.220

Casing Elevation: 64.899 masl
Well Casing Size: MW: 50.8 mm GP: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-4 / GP15-8

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 23, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft)	Depth (m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) 20 40 60 80 / Total Organic Vapour (ppm) 20 40 60 80	WELLS GP	WELLS MW	Remarks
0	0		Ground Surface	65.3									
0	0		**INTERLOCK STONE**	0.0									
1				64.9									
2			**FILL** Loamy sand and gravel	0.4									
3	1				SS	1			59				
4													
5			Pieces of rock										
6			Sandy loam and gravel and waste, grey										
7	2				SS	2			43				
8			Grey clay and waste										
9			Loamy sand, grey Waste: ash, coal, cinder, glass, wood										
10	3												
11													
12					SS	3			5				
13	4												
14													
15				60.7									
15			**NO RECOVERY**	4.6									
16	5												
17					SS	4			0				
18													
19													
20	6			59.2									
20			**END OF BOREHOLE**	6.1									
21													
22													
23	7												

Elevation: 65.319 masl
Easting: 368865.766
Northing: 5029240.857

Casing Elevation: 65.256 masl
Well Casing Size: MW: 50.8 mm GP: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-5 / GP15-9

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 22, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft)	Depth (m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) 20 40 60 80 / Total Organic Vapour (ppm) 20 40 60 80	WELLS GP	WELLS MW	Remarks
			Ground Surface	64.9									
0	0		**TOPSOIL**	0.0									
1				64.5									
2			**FILL** Sandy loam and gravel, dark brown	0.4									
3	1		Very fine loamy sand, light brown		SS	1			23				
4													
5			Layers of very fine to fine grained loamy sand and very fine grained sandy loam										
6	2				SS	2			67				
7													
8													
9													
10	3		Moist										
				61.7									
11			**SAND** Fine to medium grained sand, dry	3.2									
12													
13	4				SS	3			58				
14													
15			Fine to coarse grained sand, trace gravel										
16	5												
17					SS	4			57				
18													
19													
20	6			58.8									
			END OF BOREHOLE	6.1									
21													
22													
23	7												

Elevation: 64.924 masl
Easting: 368950.930
Northing: 5029210.490

Casing Elevation: 64.895 masl
Well Casing Size: MW: 50.8 mm GP: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-6 / GP15-10

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 21, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) 20 40 60 80 / Total Organic Vapour (ppm) 20 40 60 80	WELLS GP	WELLS MW	Remarks
0 / 0		Ground Surface	64.9									
0		**TOPSOIL**	0.0	SS								
1			64.5									
2		**FILL** Fine grained loamy sand, trace gravel, dark brown	0.4	SS	1			45				
3 / 1												
4												
5				SS	2			65				
6 / 2												
7												
8		Very fine grained sandy loam, dark brown, moist										
9		Brownish grey, wet										
10 / 3												
11												
12		Fine to medium grained sand, grey										
13 / 4		Trace gravel		SS	3			43				
14												
15		Fine to medium grained sandy loam and gravel	60.2									
16		**SAND** Fine to coarse grained sand, trace gravel	4.7									
17 / 5			59.7									
18		**END OF BOREHOLE**	5.2									
19												
20 / 6												
21												
22												
23 / 7												

Elevation: 64.924 masl
Easting: 368843.807
Northing: 5029183.520

Casing Elevation: 64.615 masl
Well Casing Size: MW: 50.8 mm GP: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-7

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 21, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Sample Data: Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 60 100 140 180	Monitoring Well Details	Remarks
0 / 0		Ground Surface	64.51								
0 / 0		**TOPSOIL**	0.00								
1 /			64.12								
2 /		**FILL** Gravel and sand, grey	0.40								
3 / 1		Fine loamy sand, greyish brown		SS	1			68			
4 /											
5 /											
6 / 2				SS	2			70			
7 /		Wet									
8 /											
9 /		Fine to medium grained sand, brown									
10 / 3											
11 /											
12 /		Fine grained sandy loam	60.80								
13 / 4		**SAND** Fine to coarse grained sand, trace gravel, brown, wet	3.71	SS	3			65			
14 /											
15 /		Trace silt									
16 / 5											
17 /		Slightly grey		SS	4			55			
18 /											
19 /											
20 / 6			58.42								
20 /		**END OF BOREHOLE**	6.10								
21 /											
22 /											
23 / 7											

Elevation: 64.513 masl
Easting: 368911.901
Northing: 5029169.410

Casing Elevation: 64.431 masl
Well Casing Size / Slot Size: 50.8 m
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-8

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 22, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 60 100 140 180	Monitoring Well Details	Remarks
0 / 0		Ground Surface	65.25								
0		**TOPSOIL**	0.00								
1			64.86								
1		**FILL** Fine to medium grained brown sand	0.40								
3 / 1				SS	1			46			
5											
6 / 2		Trace gravel									
7		Moist		SS	2			77			
8											
9		Very fine to fine grained loamy sand, brown, wet									
10 / 3		Very fine to fine grained sand									
11		Very fine to fine grained loamy sand									
12		Very fine to fine grained sand, moist/dry									
13 / 4		Very fine to fine grained loamy sand, moist	61.17	SS	3			52			
14		**SAND** Fine to medium grained sand, some gravel, some rock, moist	4.08								
15											
16 / 5											
17		Medium to coarse grained sand, trace gravel, wet		SS	4			47			
18											
19											
20 / 6			59.16								
20		**END OF BOREHOLE**	6.10								
21											
22											
23 / 7											

Elevation: 65.253 masl
Easting: 368937.987
Northing: 5029125.596

Casing Elevation: 64.815 masl
Well Casing Size / Slot Size: 50.8 m
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-9

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 21, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 60 100 140 180	Monitoring Well Details	Remarks
0 / 0		Ground Surface	65.25								
0 / 0		**ASPHALT**	0.00								
1 /			64.86								
1 /		**FILL** Fine to medium grained loamy sand, trace gravel, brown	0.40								
2 /											
3 / 1				SS	1			68.1			
4 /											
5 /		Fine to medium grained sand, trace coarse grained sand, brown									
6 / 2				SS	2			70			
7 /											
8 /		Brownish grey									
9 /											
10 / 3		Damp/moist Fine to medium grained sand									
11 /											
12 /				SS	3			65			
13 / 4		Medium to coarse grained sand, moist/wet									
14 /		Very fine to fine grained sand, grey									
15 /			60.68								
15 /		**SAND** Fine to coarse grained sand, trace gravel, grey, wet	4.57								
16 / 5											
17 /			60.07								
17 /		**LOAMY SAND** Fine to medium grained loamy sand and gravel, some pieces of rock	5.18	SS	4			55			
18 /											
19 /											
19 / 6			59.16								
20 /		**END OF BOREHOLE**	6.10								
21 /											
22 /											
23 / 7											

Elevation: 65.253 masl
Easting: 368798.392
Northing: 5029125.377

Casing Elevation: 65.148 masl
Well Casing Size / Slot Size: 50.8 m
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-10

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 22, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 60 100 140 180	Monitoring Well Details	Remarks
0 / 0		Ground Surface	64.04								
0		**TOPSOIL**	0.00								
1			63.65								
2		**FILL** Very fine to fine grained loamy sand, brown	0.40								
3 / 1		Very fine to fine grained sand		SS	1			68			
4											
5											
6 / 2		Very fine sandy loam, dark brown									
7		Very fine grained loamy sand, brown		SS	2			85			
8		Very fine grained sandy loam									
9		Very fine grained loamy sand									
10 / 3		Very fine to fine grained loamy sand									
11		Very fine grained sandy loam, brown, moist/wet									
12		Very fine to fine grained loamy sand									
13 / 4		Very fine grained sandy loam		SS	3			85			
13 / 4		Very fine to fine grained sand	59.93								
14		**SAND** Fine to medium grained, trace coarse grained sand, some gravel, some rock	4.11								
15											
16 / 5											
17				SS	4			43			
18		Medium to coarse grained sand, some gravel									
19											
20 / 6			57.95								
20		**END OF BOREHOLE**	6.10								
21											
22											
23 / 7											

Elevation: 64.043 masl
Easting: 368878.435
Northing: 5029083.949

Casing Elevation: 64.979 masl
Well Casing Size / Slot Size: 50.8 m
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-11

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 22, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Monitoring Well Details	Remarks
0 / 0		Ground Surface	64.57							
0 / 0		**TOPSOIL**	0.00 64.17							
2 / 1		**FILL** Very fine to fine grained sand, trace silt, grey/brown	0.40	SS	1			66		
6 / 2		Very fine to medium grained sand, brown/grey		SS	2			58		
10 / 3		Fine to medium grained loamy sand and gravel, moist		SS	3			52		
14 / 4		Gravelly loamy sand, some pieces of rock Wet	60.00							
15 / 4		**SAND** Fine to medium and trace grained sand, some gravel	4.57	SS	4			33		
18 / 5		Coarse sand and gravel	58.47							
20 / 6		**END OF BOREHOLE**	6.10							

Combustible Vapour (ppm): ○ 250 ○ 750 ○ 1250
Total Organic Vapour (ppm): ● 20 ● 60 ● 100 ● 140 ● 180

Elevation: 64.571 masl
Easting: 368858.743
Northing: 5028968.821

Casing Elevation: 64.447 masl
Well Casing Size / Slot Size: 50.8 m
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: MW15-12

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 22, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Monitoring Well Details	Remarks
	Ground Surface	65.60							
0 / 0	**TOPSOIL**	0.00							
		65.20							
1 /	**FILL** Fine to medium loamy sand and gravel, brown	0.40							
2 /	Brick								
3 / 1			SS	1			70		
4 /									
5 /									
6 /									
7 / 2			SS	2			57		
8 /	Fine grained sand, trace silt, trace gravel, brown								
9 /	Fine to coarse grained sand, trace silt, trace gravel								
10 / 3	Very fine to fine grained loamy sand, moist								
11 /	Trace grace, trace rock								
12 /									
13 / 4			SS	3			47		
14 /									
15 /									
16 /	Wet								
17 / 5		60.51							
	SAND Medium and coarse grained sand, trace gravel	5.09							
18 /									
		59.80	SS	4			42		
19 /	**LOAMY SAND** Fine to coarse grained loamy sand and gravel	5.79							
20 / 6									
21 /									
		58.89							
22 /	**END OF BOREHOLE**	6.71							
23 / 7									

Combustible Vapour (ppm): ○ 250 750 1250
Total Organic Vapour (ppm): ● 20 60 100 140 180

Elevation: 65.596 masl
Easting: 368792.976
Northing: 5028923.010

Casing Elevation: 65.498 masl
Well Casing Size / Slot Size: 50.8 m
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: GP15-4

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 23, 2015
Hole Size: 127 mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 40 60 80	Gas Probe Details	Remarks
0 / 0		Ground Surface	0.00								
0		**TOPSOIL**	0.00								
1			-0.46								
2		**FILL** Fine to medium grained sandy loam and gravel, brownish grey	0.46								
3 / 1				SS	1			48			
4											
5											
6 / 2											
7											
8		Sandy loam, grey Waste: ash, cinder, coal, glass, wood		SS	2			80			
9											
10 / 3											
11											
12			-3.66								
		END OF BOREHOLE	3.66								
13 / 4											
14											
15											
16 / 5											
17											
18											
19											
20 / 6											
21											
22											
23 / 7											

Elevation: N/A
Easting: 368893.417
Northing: 5029339.143

Casing Elevation: N/A
Gas Probe Diameter / Mesh Size: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: GP15-5

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 21, 2015
Hole Size: 82.55 mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 40 60 80	Gas Probe Details	Remarks
0 / 0		Ground Surface	0.00								
0 / 0		**INTERLOCK STONE**	0.00 -0.41								
2 / 1		**FILL** Loamy sand and gravel, dark grey	0.41	SS	1			59			
5 / 2		**SAND** Fine to medium grained sand and gravel, brown Moist/wet	-1.52 1.52	SS	2			37			
10 / 3		**END OF BOREHOLE**	-3.05 3.05								

Elevation: N/A
Easting: 368837.499
Northing: 5029252.218

Casing Elevation: N/A
Gas Probe Diameter / Mesh Size: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: GP15-6

Project No: TZ10100106
Location: 945 Bank Street, Ottawa, Ontario
Logged By: JFT
Drill Date: October 21, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 40 60 80	Gas Probe Details	Remarks
0 / 0		Ground Surface	0.00								
0		**FILL** Loamy sand and gravel, trace pieces of rock, dark grey	0.00								
3 / 1				SS	1			68			
5		Sandy loam, dark grey, moist Waste: ash, cinders, pieces of metal, coal									
7 / 2				SS	2			55			
8		Wet									
10 / 3			-3.05								
		END OF BOREHOLE	3.05								
13 / 4											
16 / 5											
19 / 6											
23 / 7											

Elevation: N/A
Easting: 368875.492
Northing: 5029271.998

Casing Elevation: N/A
Gas Probe Diameter / Mesh Size: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Stratigraphic and Instrumentation Log: GP15-7

Project No: TZ10100106
Location: 945 Bank Street, Ottawa
Logged By: JFT
Drill Date: October 22, 2015
Hole Size: 127mm

Project Name: CPU Ground Water Monitoring Program
Client: City of Ottawa
Entered By: KYLT
Drill Method: 7822DT
Drilled By: Strata Drilling Group

amec foster wheeler
300-210 Colonnade Road
Ottawa, Ontario K2E 7L5

Depth (ft / m)	Symbol	Description	Elevation (m)	Type	Number	Sample	N or RQD	Recovery (%)	Combustible Vapour (ppm) ○ 250 750 1250 / Total Organic Vapour (ppm) ● 20 40 60 80	Gas Probe Details	Remarks
0 / 0		Ground Surface	0.00								
0		**TOPSOIL**	0.00								
3 / 1		**FILL** Loam, some gravel, dark grey	-0.83 0.83	SS	1			84			
5		Fine to medium grained sand, some gravel, brown									
6 / 2		Silt and trace gravel, grey		SS	2			62			
8		Ash & cinders, wood, coal									
9		Wet									
10 / 3		**END OF BOREHOLE**	-3.05 3.05								
23 / 7											

Elevation: N/A
Easting: 368931.653
Northing: 5029294.223

Casing Elevation: N/A
Gas Probe Diameter / Mesh Size: 12.7 mm
Vapour Unit: N/A

Datum: Geodetic
Checked by: KDH
Sheet: 1 of 1

Appendix D
Laboratory Certificates of Analysis

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Lansdowne Park
Custody: 129556

Report Date: 10-May-2021
Order Date: 7-May-2021

Order #: 2119487

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

Paracel ID	Client ID
2119487-01	MW09-1
2119487-02	MW09-2
2119487-03	MW09-3
2119487-04	Trip Blank

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chloroform	EPA 624 - P&T GC-MS	7-May-21	8-May-21
PHC F1	CWS Tier 1 - P&T GC-FID	7-May-21	8-May-21

Certificate of Analysis

Report Date: 10-May-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 7-May-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW09-1	MW09-2	MW09-3	Trip Blank
	Sample Date:	07-May-21 09:00	07-May-21 09:00	07-May-21 09:00	01-May-21 09:00
	Sample ID:	2119487-01	2119487-02	2119487-03	2119487-04
	MDL/Units	Water	Water	Water	Water
Volatiles					
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromofluoromethane	Surrogate	101%	103%	111%	102%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	-	-	-	<25

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*87.3*		*ug/L*		*109*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	543	25	ug/L	536			1.3	30	
Volatiles									
Chloroform	ND	0.5	ug/L	ND			NC	30	
Surrogate: Dibromofluoromethane	*86.2*		*ug/L*		*108*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2240	25	ug/L	ND	112	68-117			
Volatiles									
Chloroform	43.6	0.5	ug/L	ND	109	60-130			
Surrogate: Dibromofluoromethane	*84.6*		*ug/L*		*106*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD

Paracel ID: 2119487

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2119487	№ 129556

Client Name: Wood	Project Ref: Lansdowne Park		Page 1 of 1
Contact Name: Jason Taylor	Quote #: City of Ottawa, SOA		**Turnaround Time**
Address: 300-210 Colonnade Rd South Ottawa, ON K2E 7L5	PO #: TZ10100106		☐ 1 day ☐ 3 day
	E-mail: jason.taylor@woodplc.com		☐ 2 day ☒ Regular
Telephone: 613-727-0658			Date Required:

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

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Date	Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	PHC F1 + Chloroform	Chloroform				
1	MW09-1 BG0843	GW		2	5-7-21										X				
2	MW09-2 844	GW		2	↓										X				
3	MW09-3 845	GW		2	↓										X				
4	Trip Blank 846.	GW		1	May 07, 2021.									X					
5																			
6																			
7																			
8																			
9																			
10																			

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign): [signature]	Received By Driver/Depot:	Received at Lab: Sunnepavm Dhmai	Verified By: [signature]
Relinquished By (Print): Brian Clark	Date/Time:	Date/Time: May 07, 2021 09.30	Date/Time: May 7/21 11:22a
Date/Time: 5-7-21	Temperature: °C	Temperature: 12.7 °C	pH Verified: ☐ By: N/A

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Landsdowne Park
Custody: 61599

Report Date: 7-Jun-2021
Order Date: 28-May-2021

Order #: 2122544

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

Paracel ID	Client ID
2122544-01	MW15-7
2122544-02	MW15-8
2122544-03	MW15-9
2122544-04	MW15-11
2122544-05	MW15-12
2122544-06	DUP-1
2122544-07	Trip Blank

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	31-May-21	31-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	31-May-21	31-May-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	31-May-21	7-Jun-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	31-May-21	31-May-21
Chloroform	EPA 624 - P&T GC-MS	31-May-21	1-Jun-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	31-May-21	31-May-21
Hardness	Hardness as CaCO3	31-May-21	31-May-21
Conductivity	EPA 9050A- probe @25 °C	31-May-21	31-May-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	31-May-21	31-May-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	31-May-21	3-Jun-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	31-May-21	31-May-21
pH	EPA 150.1 - pH probe @25 °C	31-May-21	31-May-21
PHC F1	CWS Tier 1 - P&T GC-FID	31-May-21	31-May-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Jun-21	5-Jun-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	31-May-21	31-May-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	4-Jun-21	5-Jun-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	31-May-21	2-Jun-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	31-May-21	31-May-21

Certificate of Analysis

Report Date: 07-Jun-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 28-May-2021

Client PO:

Project Description: TZ10100106/Landsdowne Park

	Client ID:	MW15-7	MW15-8	MW15-9	MW15-11
	Sample Date:	28-May-21 09:00	28-May-21 09:00	28-May-21 09:00	28-May-21 09:00
	Sample ID:	2122544-01	2122544-02	2122544-03	2122544-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	414	394	268	258
Ammonia as N	0.01 mg/L	0.04	0.06	0.10	0.05
BOD	2 mg/L	<2	<2	<2	<2
Chemical Oxygen Demand	10 mg/L	<10	<10	30	<10
Dissolved Organic Carbon	0.5 mg/L	4.1	2.6	2.4	1.8
Conductivity	5 uS/cm	2260	1460	6330	1500
Hardness	mg/L	483	375	1160	310
pH	0.1 pH Units	7.4	7.7	7.7	7.8
Phosphorus, total	0.01 mg/L	0.01	<0.01	0.07	0.04
Total Dissolved Solids	10 mg/L	1310	790	3840	764
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	0.2	0.3	0.3
Anions					
Chloride	1 mg/L	341	166	1610	222
Nitrate as N	0.1 mg/L	2.8	0.3	3.8	0.5
Sulphate	1 mg/L	163	84	376	67
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	<1
Barium	1 ug/L	126	70	93	96
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	37	33	39	22
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	157000	117000	354000	94000
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.9	3.2	1.8	0.9
Iron	100 ug/L	<100	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	22100	20200	66800	18400
Molybdenum	0.5 ug/L	1.6	0.5	12.2	0.6
Nickel	1 ug/L	1	1	2	<1
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	0.2	<0.1

Certificate of Analysis

Report Date: 07-Jun-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 28-May-2021

Client PO:

Project Description: TZ10100106/Landsdowne Park

	Client ID:	MW15-7	MW15-8	MW15-9	MW15-11
	Sample Date:	28-May-21 09:00	28-May-21 09:00	28-May-21 09:00	28-May-21 09:00
	Sample ID:	2122544-01	2122544-02	2122544-03	2122544-04
	MDL/Units	Water	Water	Water	Water
Sodium	200 ug/L	244000	117000	726000	125000
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	1.0	0.7	3.1	0.7
Vanadium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Zinc	5 ug/L	<5	7	<5	<5
Volatiles					
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromofluoromethane	Surrogate	121%	102%	106%	106%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	0.05	<0.01	<0.01
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Pyrene	0.01 ug/L	<0.01	0.05	<0.01	<0.01
2-Fluorobiphenyl	Surrogate	106%	95.3%	82.9%	77.0%
Terphenyl-d14	Surrogate	121%	118%	111%	119%

Certificate of Analysis

Report Date: 07-Jun-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 28-May-2021

Client PO:

Project Description: TZ10100106/Landsdowne Park

	Client ID:	MW15-12	DUP-1	Trip Blank	-
	Sample Date:	28-May-21 09:00	28-May-21 09:00	25-May-21 09:00	-
	Sample ID:	2122544-05	2122544-06	2122544-07	-
	MDL/Units	Water	Water	Water	-
General Inorganics					
Alkalinity, total	5 mg/L	317	319	-	-
Ammonia as N	0.01 mg/L	0.04	0.05	-	-
BOD	2 mg/L	<2	<2	-	-
Chemical Oxygen Demand	10 mg/L	<10	<10	-	-
Dissolved Organic Carbon	0.5 mg/L	3.1	2.7	-	-
Conductivity	5 uS/cm	3890	3970	-	-
Hardness	mg/L	615	619	-	-
pH	0.1 pH Units	7.8	7.8	-	-
Phosphorus, total	0.01 mg/L	0.07	0.06	-	-
Total Dissolved Solids	10 mg/L	2340	2300	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.3	0.3	-	-
Anions					
Chloride	1 mg/L	738	733	-	-
Nitrate as N	0.1 mg/L	1.3	1.3	-	-
Sulphate	1 mg/L	469	462	-	-
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	-	-
Antimony	0.5 ug/L	<0.5	<0.5	-	-
Arsenic	1 ug/L	<1	<1	-	-
Barium	1 ug/L	115	116	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	-	-
Boron	10 ug/L	31	31	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	181000	183000	-	-
Chromium	1 ug/L	<1	<1	-	-
Chromium (VI)	10 ug/L	<10	<10	-	-
Cobalt	0.5 ug/L	<0.5	<0.5	-	-
Copper	0.5 ug/L	2.7	2.7	-	-
Iron	100 ug/L	<100	<100	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	39600	39400	-	-
Molybdenum	0.5 ug/L	1.0	1.0	-	-
Nickel	1 ug/L	<1	<1	-	-
Selenium	1 ug/L	<1	<1	-	-
Silver	0.1 ug/L	<0.1	<0.1	-	-

Certificate of Analysis

Report Date: 07-Jun-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 28-May-2021

Client PO:

Project Description: TZ10100106/Landsdowne Park

	Client ID:	MW15-12	DUP-1	Trip Blank	-
	Sample Date:	28-May-21 09:00	28-May-21 09:00	25-May-21 09:00	-
	Sample ID:	2122544-05	2122544-06	2122544-07	-
	MDL/Units	Water	Water	Water	-
Sodium	200 ug/L	524000	528000	-	-
Thallium	0.1 ug/L	<0.1	<0.1	-	-
Uranium	0.1 ug/L	2.4	2.3	-	-
Vanadium	0.5 ug/L	<0.5	<0.5	-	-
Zinc	5 ug/L	6	<5	-	-
Volatiles					
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Dibromofluoromethane	Surrogate	95.8%	107%	107%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	-	-
Acenaphthylene	0.05 ug/L	<0.05	<0.05	-	-
Anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Chrysene	0.05 ug/L	<0.05	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	-	-
Fluoranthene	0.01 ug/L	<0.01	<0.01	-	-
Fluorene	0.05 ug/L	<0.05	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	-	-
Naphthalene	0.05 ug/L	<0.05	<0.05	-	-
Phenanthrene	0.05 ug/L	<0.05	<0.05	-	-
Pyrene	0.01 ug/L	<0.01	<0.01	-	-
2-Fluorobiphenyl	Surrogate	78.6%	72.5%	-	-
Terphenyl-d14	Surrogate	122%	112%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Conductivity	ND	5	uS/cm						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*15.6*		*ug/L*		*78.0*	*50-140*			
Surrogate: Terphenyl-d14	*22.1*		*ug/L*		*110*	*50-140*			
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*84.3*		*ug/L*		*105*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	336	5	mg/L	341			1.4	10	
Nitrate as N	2.85	0.1	mg/L	2.84			0.2	10	
Sulphate	167	1	mg/L	163			2.4	10	
General Inorganics									
Alkalinity, total	407	5	mg/L	414			1.7	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
BOD	3680	2	mg/L	3850			4.5	20	
Chemical Oxygen Demand	ND	10	mg/L	ND			NC	12	
Dissolved Organic Carbon	7.9	0.5	mg/L	8.2			3.4	37	
Conductivity	2240	5	uS/cm	2260			1.2	5	
pH	7.4	0.1	pH Units	7.4			0.7	3.3	
Phosphorus, total	0.018	0.01	mg/L	0.018			1.9	15	
Total Dissolved Solids	1250	10	mg/L	1310			4.7	10	
Total Kjeldahl Nitrogen	0.59	0.1	mg/L	0.62			5.5	16	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	1.09	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	81.7	1	ug/L	81.7			0.0	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	148	10	ug/L	150			1.6	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	78400	100	ug/L	79600			1.5	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	20.9	0.5	ug/L	21.1			0.9	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	0.13	0.1	ug/L	0.14			3.7	20	
Magnesium	16200	200	ug/L	16200			0.4	20	
Molybdenum	2.07	0.5	ug/L	1.99			NC	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	58400	200	ug/L	59600			2.1	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	1.9	0.1	ug/L	1.9			1.6	20	
Vanadium	0.78	0.5	ug/L	0.79			1.1	20	
Zinc	12	5	ug/L	ND			NC	20	
Volatiles									
Chloroform	ND	0.5	ug/L	ND			NC	30	
Surrogate: Dibromofluoromethane	*86.3*		*ug/L*		*108*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.20	1	mg/L	ND	92.0	85-115			
Nitrate as N	3.79	0.1	mg/L	2.84	95.2	79-120			
Sulphate	171	1	mg/L	163	83.4	74-126			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
BOD	217	2	mg/L	ND	108	71-121			
Chemical Oxygen Demand	197	10	mg/L	ND	98.5	85-111			
Dissolved Organic Carbon	18.8	0.5	mg/L	8.2	105	60-133			
Phosphorus, total	0.494	0.01	mg/L	0.018	95.2	80-120			
Total Dissolved Solids	98.0	10	mg/L	ND	98.0	75-125			
Total Kjeldahl Nitrogen	2.62	0.1	mg/L	0.62	99.8	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	1830	25	ug/L	ND	91.3	68-117			
F2 PHCs (C10-C16)	1400	100	ug/L	ND	87.5	60-140			
F3 PHCs (C16-C34)	3740	100	ug/L	ND	95.4	60-140			
F4 PHCs (C34-C50)	2390	100	ug/L	ND	96.5	60-140			
Metals									
Mercury	3.42	0.1	ug/L	ND	114	70-130			
Antimony	43.2	0.5	ug/L	ND	85.5	80-120			
Arsenic	43.4	1	ug/L	ND	86.1	80-120			
Barium	45.7	1	ug/L	ND	91.3	80-120			
Beryllium	40.5	0.5	ug/L	ND	80.9	80-120			
Boron	44	10	ug/L	ND	86.2	80-120			
Cadmium	38.3	0.1	ug/L	ND	76.6	80-120			QM-07
Calcium	9030	100	ug/L	ND	90.3	80-120			
Chromium (VI)	195	10	ug/L	ND	97.5	70-130			
Chromium	52.5	1	ug/L	ND	104	80-120			
Cobalt	50.9	0.5	ug/L	ND	102	80-120			
Copper	47.4	0.5	ug/L	ND	94.8	80-120			
Iron	2340	100	ug/L	ND	92.8	80-120			
Lead	42.8	0.1	ug/L	0.14	85.3	80-120			
Magnesium	8850	200	ug/L	ND	88.5	80-120			
Molybdenum	51.8	0.5	ug/L	1.99	99.7	80-120			
Nickel	47.5	1	ug/L	ND	93.6	80-120			
Selenium	33.3	1	ug/L	ND	66.2	80-120			QM-07
Silver	41.3	0.1	ug/L	ND	82.6	80-120			
Sodium	8490	200	ug/L	ND	84.8	80-120			
Thallium	40.4	0.1	ug/L	ND	80.8	80-120			
Uranium	45.6	0.1	ug/L	1.9	87.3	80-120			
Vanadium	54.5	0.5	ug/L	0.79	107	80-120			
Zinc	49	5	ug/L	ND	91.8	80-120			
Semi-Volatiles									
Acenaphthene	5.14	0.05	ug/L	ND	103	50-140			
Acenaphthylene	4.13	0.05	ug/L	ND	82.7	50-140			
Anthracene	4.61	0.01	ug/L	ND	92.2	50-140			
Benzo [a] anthracene	4.11	0.01	ug/L	ND	82.1	50-140			
Benzo [a] pyrene	4.98	0.01	ug/L	ND	99.6	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	4.80	0.05	ug/L	ND	96.1	50-140			
Benzo [g,h,i] perylene	4.46	0.05	ug/L	ND	89.2	50-140			
Benzo [k] fluoranthene	4.51	0.05	ug/L	ND	90.3	50-140			
Chrysene	5.05	0.05	ug/L	ND	101	50-140			
Dibenzo [a,h] anthracene	4.78	0.05	ug/L	ND	95.6	50-140			
Fluoranthene	4.26	0.01	ug/L	ND	85.2	50-140			
Fluorene	4.46	0.05	ug/L	ND	89.2	50-140			
Indeno [1,2,3-cd] pyrene	4.77	0.05	ug/L	ND	95.5	50-140			
1-Methylnaphthalene	3.76	0.05	ug/L	ND	75.2	50-140			
2-Methylnaphthalene	3.88	0.05	ug/L	ND	77.6	50-140			
Naphthalene	4.06	0.05	ug/L	ND	81.1	50-140			
Phenanthrene	4.67	0.05	ug/L	ND	93.3	50-140			
Pyrene	4.48	0.01	ug/L	ND	89.5	50-140			
Surrogate: 2-Fluorobiphenyl	*16.6*		*ug/L*		*82.9*	*50-140*			
Surrogate: Terphenyl-d14	*23.8*		*ug/L*		*119*	*50-140*			
Volatiles									
Chloroform	33.0	0.5	ug/L	ND	82.4	60-130			
Surrogate: Dibromofluoromethane	*78.1*		*ug/L*		*97.6*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

Paracel ID: 2122544

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2122544	No 61599

Client Name: Wood	Project Ref: Lansdowne Park
Contact Name: Jason Taylor	Quote #: City of Ottawa, SOA
Address: 300-210 Colonnade Rd. South, Ottawa, ON K2E	PO #: TL10100106
Telephone: 613-727-0658	E-mail: jason.taylor@woodplc.com

Page 1 of 1

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

Date Required:

☐ REG 153/04 ☐ REG 406/19

☐ Table 1 ☐ Res/Park ☐ Med/Fine
☐ Table 2 ☐ Ind/Comm ☐ Coarse
☒ Table 3 ☐ Agri/Other
☐ Table

For RSC: ☐ Yes ☐ No

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

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

Required Analysis: PAH #09; PHC F1-F4 #104; Chloroform; Reg 153 Metals #105; Landfill Leachate; PHC F1+Chloroform

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PAH #09	PHC F1-F4 #104	Chloroform	Reg 153 Metals #105	Landfill Leachate	PHC F1+Chloroform
1	MW15-7	BJM018	GW		12		May 28, 21	X	X	X	X	X	
2	MW15-8	019											
3	MW15-9	020											
4	MW15-11	021											
5	MW15-12	022											
6	Dup-1	023											
7	Trip Blank	024			2	May 25, 2021							X
8													
9													
10													

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Brian Clark	Date/Time: May 28/21	Date/Time: May 28/21 2:54pm	Date/Time: May 28, 2021 15:36
Date/Time: 5:28:21	Temperature: 14.5 °C	Temperature: 9.8 °C	pH Verified: ☑ By:

Chain of Custody (Blank).xlsx

Revision 4.0

13:21

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Lansdowne Park
Custody: 129555

Report Date: 8-Jun-2021
Order Date: 31-May-2021

Order #: 2123129

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

Paracel ID	Client ID
2123129-01	MW15-1
2123129-02	MW15-2
2123129-03	MW15-3
2123129-04	MW15-5
2123129-05	TB

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Report Date: 08-Jun-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 31-May-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	2-Jun-21	2-Jun-21
Ammonia, as N	EPA 351.2 - Auto Colour	3-Jun-21	3-Jun-21
Anions	EPA 300.1 - IC	2-Jun-21	2-Jun-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	2-Jun-21	7-Jun-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	1-Jun-21	2-Jun-21
Chloroform	EPA 624 - P&T GC-MS	2-Jun-21	2-Jun-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	1-Jun-21	2-Jun-21
Hardness	Hardness as CaCO3	3-Jun-21	3-Jun-21
Conductivity	EPA 9050A- probe @25 °C	2-Jun-21	2-Jun-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	2-Jun-21	2-Jun-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	7-Jun-21	8-Jun-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Jun-21	3-Jun-21
pH	EPA 150.1 - pH probe @25 °C	2-Jun-21	2-Jun-21
PHC F1	CWS Tier 1 - P&T GC-FID	2-Jun-21	2-Jun-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	8-Jun-21	8-Jun-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	2-Jun-21	2-Jun-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	7-Jun-21	7-Jun-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	3-Jun-21	4-Jun-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	2-Jun-21	2-Jun-21

Certificate of Analysis

Report Date: 08-Jun-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 31-May-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-1	MW15-2	MW15-3	MW15-5
	Sample Date:	31-May-21 00:00	31-May-21 00:00	31-May-21 00:00	31-May-21 00:00
	Sample ID:	2123129-01	2123129-02	2123129-03	2123129-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	383	250	227	403
Ammonia as N	0.01 mg/L	0.79	0.01	0.06	0.43
BOD	2 mg/L	<2	<2	<2	<2
Chemical Oxygen Demand	10 mg/L	<10	<10	26	<10
Dissolved Organic Carbon	0.5 mg/L	2.7	1.1	1.7	3.8
Conductivity	5 uS/cm	1850	1940	2790	1930
Hardness	mg/L	353	503	528	455
pH	0.1 pH Units	7.4	7.8	7.8	7.6
Phosphorus, total	0.01 mg/L	0.26	<0.01	0.55	0.03
Total Dissolved Solids	10 mg/L	992	1180	1710	1110
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	0.2	0.5	0.7
Anions					
Chloride	1 mg/L	313	300	581	202
Nitrate as N	0.1 mg/L	<0.1	6.2	3.5	0.3
Sulphate	1 mg/L	37	203	179	266
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	<1
Barium	1 ug/L	436	104	198	122
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	39	32	21	53
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	111000	155000	164000	149000
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.0
Copper	0.5 ug/L	<0.5	1.4	2.5	2.6
Iron	100 ug/L	14100	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	0.2	<0.1
Magnesium	200 ug/L	18300	27900	28600	19800
Molybdenum	0.5 ug/L	<0.5	4.3	0.9	<0.5
Nickel	1 ug/L	<1	<1	<1	3
Selenium	1 ug/L	<1	1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1

Certificate of Analysis

Report Date: 08-Jun-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 31-May-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-1	MW15-2	MW15-3	MW15-5
	Sample Date:	31-May-21 00:00	31-May-21 00:00	31-May-21 00:00	31-May-21 00:00
	Sample ID:	2123129-01	2123129-02	2123129-03	2123129-04
	MDL/Units	Water	Water	Water	Water
Sodium	200 ug/L	200000	153000	311000	192000
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	<0.1	2.2	1.2	0.9
Vanadium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Chloroform	0.5 ug/L	<0.5	1.9	1.1	<0.5
Dibromofluoromethane	Surrogate	91.8%	92.7%	108%	98.9%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	0.04	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	0.07	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	0.12	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	0.10	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	0.10	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	0.08	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	<0.01	0.16	<0.01
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	0.08	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	0.06	<0.05
Pyrene	0.01 ug/L	<0.01	<0.01	0.16	<0.01
2-Fluorobiphenyl	Surrogate	117%	98.5%	96.4%	101%
Terphenyl-d14	Surrogate	121%	121%	109%	114%

Certificate of Analysis

Report Date: 08-Jun-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 31-May-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	TB	-	-	-
	Sample Date:	25-May-21 00:00	-	-	-
	Sample ID:	2123129-05	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromofluoromethane	Surrogate	95.4%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Conductivity	ND	5	uS/cm						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*16.1*		*ug/L*		*80.3*	*50-140*			
Surrogate: Terphenyl-d14	*24.4*		*ug/L*		*122*	*50-140*			
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*55.6*		*ug/L*		*69.5*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	310	5	mg/L	313			1.1	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Sulphate	37.3	1	mg/L	37.5			0.4	10	
General Inorganics									
Alkalinity, total	32.5	5	mg/L	32.6			0.2	14	
Ammonia as N	1.87	0.04	mg/L	1.98			5.9	18	
Chemical Oxygen Demand	ND	10	mg/L	ND			NC	12	
Dissolved Organic Carbon	3.5	0.5	mg/L	3.8			9.7	37	
Conductivity	352	5	uS/cm	357			1.3	5	
pH	6.9	0.1	pH Units	6.9			0.4	3.3	
Phosphorus, total	0.045	0.01	mg/L	0.042			6.7	15	
Total Dissolved Solids	912	10	mg/L	992			8.4	10	
Total Kjeldahl Nitrogen	0.80	0.1	mg/L	0.83			3.6	16	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.55	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	235	1	ug/L	228			2.9	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	32	10	ug/L	31			4.1	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	96700	100	ug/L	97500			0.8	20	
Chromium (VI)	63	10	ug/L	64			1.6	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	7.74	0.5	ug/L	7.85			1.4	20	
Copper	2.11	0.5	ug/L	2.18			3.2	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	0.17	0.1	ug/L	ND			NC	20	
Magnesium	12800	200	ug/L	13000			1.0	20	
Molybdenum	5.18	0.5	ug/L	5.10			1.5	20	
Nickel	6.5	1	ug/L	6.8			3.6	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	354000	200	ug/L	380000			7.1	20	
Thallium	0.21	0.1	ug/L	0.15			NC	20	
Uranium	0.8	0.1	ug/L	0.8			1.2	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Chloroform	9.95	0.5	ug/L	13.3			28.5	30	
Surrogate: Dibromofluoromethane	*78.6*		*ug/L*		*98.2*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	8.71	1	mg/L	ND	87.1	85-115			
Nitrate as N	0.97	0.1	mg/L	ND	96.6	79-120			
Sulphate	46.6	1	mg/L	37.5	91.0	74-126			
General Inorganics									
Ammonia as N	0.244	0.01	mg/L	ND	97.5	81-124			
BOD	193	2	mg/L	ND	96.5	71-121			
Chemical Oxygen Demand	193	10	mg/L	ND	96.5	85-111			
Dissolved Organic Carbon	14.0	0.5	mg/L	3.8	102	60-133			
Phosphorus, total	0.514	0.01	mg/L	0.042	94.5	80-120			
Total Dissolved Solids	94.0	10	mg/L	ND	94.0	75-125			
Total Kjeldahl Nitrogen	2.86	0.1	mg/L	0.83	102	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	1910	25	ug/L	ND	95.3	68-117			
F2 PHCs (C10-C16)	1360	100	ug/L	ND	85.1	60-140			
F3 PHCs (C16-C34)	3360	100	ug/L	ND	85.8	60-140			
F4 PHCs (C34-C50)	1710	100	ug/L	ND	68.9	60-140			
Metals									
Mercury	3.63	0.1	ug/L	ND	121	70-130			
Antimony	52.1	0.5	ug/L	ND	104	80-120			
Arsenic	53.2	1	ug/L	ND	106	80-120			
Barium	272	1	ug/L	228	88.9	80-120			
Beryllium	42.9	0.5	ug/L	ND	85.8	80-120			
Boron	66	10	ug/L	31	71.2	80-120			QM-07
Cadmium	45.7	0.1	ug/L	ND	91.3	80-120			
Calcium	9760	100	ug/L	ND	97.6	80-120			
Chromium (VI)	257	10	ug/L	64	96.5	70-130			
Chromium	57.3	1	ug/L	ND	114	80-120			
Cobalt	60.7	0.5	ug/L	7.85	106	80-120			
Copper	51.0	0.5	ug/L	2.18	97.7	80-120			
Iron	2500	100	ug/L	ND	98.9	80-120			
Lead	39.1	0.1	ug/L	ND	78.1	80-120			QM-07
Magnesium	22300	200	ug/L	13000	93.3	80-120			
Molybdenum	52.8	0.5	ug/L	5.10	95.4	80-120			
Nickel	56.8	1	ug/L	6.8	100	80-120			
Selenium	44.4	1	ug/L	ND	87.1	80-120			
Silver	45.7	0.1	ug/L	ND	91.5	80-120			
Sodium	8990	200	ug/L	ND	89.9	80-120			
Thallium	46.3	0.1	ug/L	0.15	92.3	80-120			
Uranium	44.1	0.1	ug/L	0.8	86.7	80-120			
Vanadium	59.1	0.5	ug/L	ND	118	80-120			
Zinc	45	5	ug/L	ND	82.9	80-120			
Semi-Volatiles									
Acenaphthene	5.19	0.05	ug/L	ND	104	50-140			
Acenaphthylene	4.19	0.05	ug/L	ND	83.8	50-140			
Anthracene	4.75	0.01	ug/L	ND	95.0	50-140			
Benzo [a] anthracene	4.65	0.01	ug/L	ND	93.1	50-140			
Benzo [a] pyrene	5.44	0.01	ug/L	ND	109	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	5.51	0.05	ug/L	ND	110	50-140			
Benzo [g,h,i] perylene	4.79	0.05	ug/L	ND	95.7	50-140			
Benzo [k] fluoranthene	5.27	0.05	ug/L	ND	105	50-140			
Chrysene	5.50	0.05	ug/L	ND	110	50-140			
Dibenzo [a,h] anthracene	5.03	0.05	ug/L	ND	101	50-140			
Fluoranthene	4.58	0.01	ug/L	ND	91.5	50-140			
Fluorene	3.98	0.05	ug/L	ND	79.7	50-140			
Indeno [1,2,3-cd] pyrene	4.79	0.05	ug/L	ND	95.9	50-140			
1-Methylnaphthalene	4.21	0.05	ug/L	ND	84.2	50-140			
2-Methylnaphthalene	4.61	0.05	ug/L	ND	92.1	50-140			
Naphthalene	4.42	0.05	ug/L	ND	88.4	50-140			
Phenanthrene	4.71	0.05	ug/L	ND	94.3	50-140			
Pyrene	4.55	0.01	ug/L	ND	91.1	50-140			
Surrogate: 2-Fluorobiphenyl	*19.1*		*ug/L*		*95.4*	*50-140*			
Surrogate: Terphenyl-d14	*25.4*		*ug/L*		*127*	*50-140*			
Volatiles									
Chloroform	39.2	0.5	ug/L	ND	98.0	60-130			
Surrogate: Dibromofluoromethane	*80.3*		*ug/L*		*100*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PAR LABORAT

Paracel ID: 2123129

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-2319 St. Laurent Blvd.
awa, Ontario K1G 4J8
-800-749-1947
aracel@paracellabs.com
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Paracel Order Number (Lab Use Only): 2123129

Chain Of Custody (Lab Use Only) № 129555

Client Name: Wood	Project Ref: Lansdowne Park
Contact Name: Jason Taylor	Quote #: City of Ottawa, SOA
Address: 300-210 Colonnade Rd South Ottawa, ON, K2E 7L5	PO #: TZ10100106
Telephone: 613.727.0658	E-mail: jason.taylor@woodplc.com

Page 1 of 1

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

Date Required:

Regulation 153/04: ☐ Table 1 ☐ Res/Park ☐ Med/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☒ Table 3 ☐ Agri/Other ☐ Table — For RSC: ☐ Yes ☐ No

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

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

Required Analysis

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+~~BTEX~~	~~VOCs~~ Chlorinated	PAHs 2799	Metals by ICP #105	Hg	CrVI	B (HWS)	Landfill Leachate PHC F1 + Chlorinated						
1	MW15-1	BJM 025	Gw		12	5.31.21		X		X	X				X						
2	MW15-2	026						X		X	X				X						
3	MW15-3	027						X		X	X				X						
4	MW15-5	028			V			X		X	X				X						
5	TB	029	V		2	M 5/25										X					
6																					
7																					
8																					
9																					
10																					

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Brian Clark	Date/Time: May 31/21	Date/Time: Jun 1/21 1338	Date/Time: Jun 1/21 1333
Date/Time: 5.31.21	Temperature: 18.1 °C	Temperature: 7.8 °C	pH Verified: ☐ By:

14:55

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Lansdowne Park
Custody: 134550

Report Date: 10-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149456

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

Paracel ID	Client ID
2149456-01	MW15-1
2149456-02	MW15-2
2149456-03	MW15-8
2149456-04	MW15-12
2149456-05	DUP-1
2149456-06	Trip Blank

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	3-Dec-21	3-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	6-Dec-21	6-Dec-21
Anions	EPA 300.1 - IC	3-Dec-21	3-Dec-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	3-Dec-21	8-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	3-Dec-21	3-Dec-21
Chloroform	EPA 624 - P&T GC-MS	3-Dec-21	3-Dec-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	3-Dec-21	3-Dec-21
Hardness	Hardness as CaCO3	3-Dec-21	3-Dec-21
Conductivity	EPA 9050A- probe @25 °C	3-Dec-21	3-Dec-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	3-Dec-21	3-Dec-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	3-Dec-21	3-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Dec-21	3-Dec-21
pH	EPA 150.1 - pH probe @25 °C	3-Dec-21	3-Dec-21
PHC F1	CWS Tier 1 - P&T GC-FID	3-Dec-21	3-Dec-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	3-Dec-21	6-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	3-Dec-21	3-Dec-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	9-Dec-21	9-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	3-Dec-21	3-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	3-Dec-21	3-Dec-21

PARACEL LABORATORIES LTD.

Order #: 2149456

Certificate of Analysis

Report Date: 10-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 2-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-1	MW15-2	MW15-8	MW15-12
	Sample Date:	02-Dec-21 10:24	02-Dec-21 12:10	02-Dec-21 13:42	02-Dec-21 14:52
	Sample ID:	2149456-01	2149456-02	2149456-03	2149456-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	401	301	303	265
Ammonia as N	0.01 mg/L	0.68	<0.01	0.01	0.02
BOD	2 mg/L	<2	<2	<2	<2
Chemical Oxygen Demand	10 mg/L	14	<10	<10	<10
Dissolved Organic Carbon	0.5 mg/L	3.2	2.5	2.0	3.5
Conductivity	5 uS/cm	1820	2680	1060	1690
Hardness	mg/L	328	384	257	473
pH	0.1 pH Units	7.0	7.6	7.7	7.5
Phosphorus, total	0.01 mg/L	0.20	<0.01	<0.01	0.04
Total Dissolved Solids	10 mg/L	1070	1520	592	1050
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	0.1	0.2	0.3
Anions					
Chloride	1 mg/L	345	504	116	293
Nitrate as N	0.1 mg/L	<0.1	3.6	0.8	0.9
Sulphate	1 mg/L	13	256	61	194
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	<1
Barium	1 ug/L	399	106	57	97
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	51	42	31	29
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	108000	124000	81700	150000
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	<0.5	1.6	1.7	1.5
Iron	100 ug/L	9300	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	14500	17900	12800	24100
Molybdenum	0.5 ug/L	<0.5	10.1	0.7	0.7
Nickel	1 ug/L	<1	<1	<1	<1
Selenium	1 ug/L	<1	1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1

Certificate of Analysis

Report Date: 10-Dec-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 2-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-1	MW15-2	MW15-8	MW15-12
	Sample Date:	02-Dec-21 10:24	02-Dec-21 12:10	02-Dec-21 13:42	02-Dec-21 14:52
	Sample ID:	2149456-01	2149456-02	2149456-03	2149456-04
	MDL/Units	Water	Water	Water	Water
Sodium	200 ug/L	197000	307000	95100	138000
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	<0.1	2.3	0.5	0.7
Vanadium	0.5 ug/L	<0.5	<0.5	<0.5	0.5
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Chloroform	0.5 ug/L	<0.5	2.6	<0.5	<0.5
Dibromofluoromethane	Surrogate	99.6%	99.1%	96.5%	98.1%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Pyrene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
2-Fluorobiphenyl	Surrogate	76.7%	95.2%	87.6%	85.2%
Terphenyl-d14	Surrogate	112%	115%	114%	108%

Certificate of Analysis

Report Date: 10-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 2-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	DUP-1	Trip Blank	-	-
	Sample Date:	02-Dec-21 09:00	29-Nov-21 09:00	-	-
	Sample ID:	2149456-05	2149456-06	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	401	-	-	-
Ammonia as N	0.01 mg/L	0.66	-	-	-
BOD	2 mg/L	<2	-	-	-
Chemical Oxygen Demand	10 mg/L	13	-	-	-
Dissolved Organic Carbon	0.5 mg/L	3.1	-	-	-
Conductivity	5 uS/cm	1890	-	-	-
Hardness	mg/L	323	-	-	-
pH	0.1 pH Units	7.1	-	-	-
Phosphorus, total	0.01 mg/L	0.20	-	-	-
Total Dissolved Solids	10 mg/L	1030	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	-	-	-
Anions					
Chloride	1 mg/L	350	-	-	-
Nitrate as N	0.1 mg/L	<0.1	-	-	-
Sulphate	1 mg/L	13	-	-	-
Metals					
Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	<1	-	-	-
Barium	1 ug/L	402	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	53	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	104000	-	-	-
Chromium	1 ug/L	<1	-	-	-
Chromium (VI)	10 ug/L	<10	-	-	-
Cobalt	0.5 ug/L	<0.5	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	9270	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	15000	-	-	-
Molybdenum	0.5 ug/L	<0.5	-	-	-
Nickel	1 ug/L	<1	-	-	-
Selenium	1 ug/L	<1	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-

Certificate of Analysis

Report Date: 10-Dec-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 2-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	DUP-1	Trip Blank	-	-
	Sample Date:	02-Dec-21 09:00	29-Nov-21 09:00	-	-
	Sample ID:	2149456-05	2149456-06	-	-
	MDL/Units	Water	Water	-	-
Sodium	200 ug/L	203000	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	<0.1	-	-	-
Vanadium	0.5 ug/L	<0.5	-	-	-
Zinc	5 ug/L	<5	-	-	-
Volatiles					
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Dibromofluoromethane	Surrogate	97.7%	102%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	<0.01	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	<0.01	-	-	-
2-Fluorobiphenyl	Surrogate	82.0%	-	-	-
Terphenyl-d14	Surrogate	120%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Conductivity	ND	5	uS/cm						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*17.9*		*ug/L*		*89.4*	*50-140*			
Surrogate: Terphenyl-d14	*22.0*		*ug/L*		*110*	*50-140*			
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*58.7*		*ug/L*		*73.4*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	507	5	mg/L	504			0.6	10	
Nitrate as N	3.58	0.1	mg/L	3.57			0.3	10	
Sulphate	258	5	mg/L	256			0.9	10	
General Inorganics									
Alkalinity, total	398	5	mg/L	401			0.9	14	
Ammonia as N	0.744	0.02	mg/L	0.676			9.7	18	
BOD	3900	2	mg/L	4050			3.7	20	
Chemical Oxygen Demand	ND	10	mg/L	ND			NC	12	
Dissolved Organic Carbon	1.8	0.5	mg/L	1.7			9.6	37	
Conductivity	328	5	uS/cm	322			1.7	5	
pH	7.7	0.1	pH Units	7.7			0.4	3.3	
Phosphorus, total	0.385	0.01	mg/L	0.393			1.9	15	
Total Dissolved Solids	986	10	mg/L	1070			8.2	10	
Total Kjeldahl Nitrogen	0.99	0.1	mg/L	1.05			6.3	16	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.86	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	20.3	1	ug/L	20.9			2.6	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	19	10	ug/L	19			1.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	30000	100	ug/L	30100			0.3	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.94	0.5	ug/L	0.95			1.5	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	7440	200	ug/L	7310			1.9	20	
Molybdenum	1.86	0.5	ug/L	1.81			2.6	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	13900	200	ug/L	13500			3.0	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	ND	0.1	ug/L	ND			NC	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	9	5	ug/L	10			11.7	20	
Volatiles									
Chloroform	ND	0.5	ug/L	ND			NC	30	
Surrogate: Dibromofluoromethane	*76.4*		*ug/L*		*95.6*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.68	1	mg/L	ND	96.8	85-115			
Nitrate as N	4.54	0.1	mg/L	3.57	97.5	79-120			
Sulphate	9.43	1	mg/L	ND	94.3	86-114			
General Inorganics									
Ammonia as N	0.556	0.01	mg/L	0.342	85.6	81-124			
BOD	201	2	mg/L	ND	100	71-121			
Chemical Oxygen Demand	211	10	mg/L	ND	106	85-111			
Dissolved Organic Carbon	12.3	0.5	mg/L	1.7	106	60-133			
Phosphorus, total	0.881	0.01	mg/L	0.393	97.6	80-120			
Total Dissolved Solids	110	10	mg/L	ND	110	75-125			
Total Kjeldahl Nitrogen	3.01	0.1	mg/L	1.05	97.7	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	1810	25	ug/L	ND	90.4	68-117			
F2 PHCs (C10-C16)	1640	100	ug/L	ND	103	60-140			
F3 PHCs (C16-C34)	3990	100	ug/L	ND	102	60-140			
F4 PHCs (C34-C50)	3280	100	ug/L	ND	132	60-140			
Metals									
Mercury	3.46	0.1	ug/L	ND	115	70-130			
Antimony	49.0	0.5	ug/L	ND	97.9	80-120			
Arsenic	49.6	1	ug/L	ND	98.4	80-120			
Barium	68.4	1	ug/L	20.9	95.1	80-120			
Beryllium	45.4	0.5	ug/L	ND	90.8	80-120			
Boron	40	10	ug/L	ND	80.3	80-120			
Cadmium	48.5	0.1	ug/L	ND	97.1	80-120			
Calcium	38300	100	ug/L	30100	82.5	80-120			
Chromium (VI)	194	10	ug/L	ND	97.0	70-130			
Chromium	45.8	1	ug/L	ND	91.2	80-120			
Cobalt	45.2	0.5	ug/L	ND	90.4	80-120			
Copper	44.9	0.5	ug/L	0.95	87.9	80-120			
Iron	2190	100	ug/L	ND	86.0	80-120			
Lead	43.2	0.1	ug/L	ND	86.2	80-120			
Magnesium	15600	200	ug/L	7310	83.4	80-120			
Molybdenum	45.6	0.5	ug/L	1.81	87.6	80-120			
Nickel	45.7	1	ug/L	ND	90.5	80-120			
Selenium	47.8	1	ug/L	ND	95.5	80-120			
Silver	45.2	0.1	ug/L	ND	90.5	80-120			
Sodium	21500	200	ug/L	13500	80.3	80-120			
Thallium	45.9	0.1	ug/L	ND	91.8	80-120			
Uranium	42.1	0.1	ug/L	ND	84.3	80-120			
Vanadium	46.6	0.5	ug/L	ND	93.0	80-120			
Zinc	53	5	ug/L	10	85.9	80-120			
Semi-Volatiles									
Acenaphthene	3.58	0.05	ug/L	ND	71.6	50-140			
Acenaphthylene	3.36	0.05	ug/L	ND	67.3	50-140			
Anthracene	4.22	0.01	ug/L	ND	84.5	50-140			
Benzo [a] anthracene	3.02	0.01	ug/L	ND	60.4	50-140			
Benzo [a] pyrene	3.03	0.01	ug/L	ND	60.5	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	3.33	0.05	ug/L	ND	66.7	50-140			
Benzo [g,h,i] perylene	3.01	0.05	ug/L	ND	60.2	50-140			
Benzo [k] fluoranthene	3.44	0.05	ug/L	ND	68.8	50-140			
Chrysene	3.76	0.05	ug/L	ND	75.2	50-140			
Dibenzo [a,h] anthracene	3.14	0.05	ug/L	ND	62.7	50-140			
Fluoranthene	3.42	0.01	ug/L	ND	68.4	50-140			
Fluorene	3.66	0.05	ug/L	ND	73.1	50-140			
Indeno [1,2,3-cd] pyrene	3.09	0.05	ug/L	ND	61.7	50-140			
1-Methylnaphthalene	4.01	0.05	ug/L	ND	80.2	50-140			
2-Methylnaphthalene	4.22	0.05	ug/L	ND	84.3	50-140			
Naphthalene	3.74	0.05	ug/L	ND	74.7	50-140			
Phenanthrene	3.43	0.05	ug/L	ND	68.6	50-140			
Pyrene	3.61	0.01	ug/L	ND	72.2	50-140			
Surrogate: 2-Fluorobiphenyl	*16.0*		*ug/L*		*80.2*	*50-140*			
Surrogate: Terphenyl-d14	*20.3*		*ug/L*		*101*	*50-140*			
Volatiles									
Chloroform	33.8	0.5	ug/L	ND	84.6	60-130			
Surrogate: Dibromofluoromethane	*90.5*		*ug/L*		*113*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container and COC sample IDs don't match - COC reads: "MW.." Bottle reads: "MW15.."

Applies to samples: MW15-1, MW15-2, MW15-8, MW15-12

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PARACE LABORATORIES LTD

Paracel ID: 2149456

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2149451	№ 134550

Client Name: WOOD	Project Ref: LANSDOWNE PARK	Page 1 of 1
Contact Name: JASON TAYLOR	Quote #: CITY OF OTTAWA SOA	Turnaround Time
Address: 300-210 Colonnade Rd South Ottawa, ON K2E 7L5	PO #: T210100106	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-727-0658	E-mail: JASON.TAYLOR@WOOD.COM	Date Required:

☒ REG 153/04 ☐ REG 406/19

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

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

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

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Chloroform	Inorganics
1	MW-1	BH6 718	GW	/	12	12/02/21	1024	X	X	X	X	X				X
2	MW-2	719	GW	/	12	12/02/21	1210	X	X	X	X	X				X
3	MW-8	720	GW	/	12	12/02/21	1342	X	X	X	X	X				X
4	MW-12	721	GW	/	12	12/02/21	1452	X	X	X	X	X				X
5	DUP-1	722	GW	/	12	12/02/21		X	X	X	X	X				X
6	TRIP BLANK	723		/	1										X	
7																
8																
9																
10																

Comments:

Method of Delivery: Dropbox

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): BRANT TW	Date/Time:	Date/Time: Dec 3 2021 9:15	Date/Time: Dec 3 2021 5:18
Date/Time: 12/02/21	Temperature: °C	Temperature: 7.3 °C	pH Verified: ☐ By:

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Lansdowne Park
Custody: 63985

Report Date: 17-Dec-2021
Order Date: 8-Dec-2021

Order #: 2150402

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

Paracel ID	Client ID
2150402-01	MW15-3
2150402-02	MW15-5
2150402-03	MW15-7
2150402-04	MW15-10
2150402-05	MW15-11
2150402-06	DUP-2
2150402-07	TRIP BLANK

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	13-Dec-21	13-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	15-Dec-21	15-Dec-21
Anions	EPA 300.1 - IC	10-Dec-21	10-Dec-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	10-Dec-21	15-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	10-Dec-21	10-Dec-21
Chloroform	EPA 624 - P&T GC-MS	10-Dec-21	11-Dec-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	10-Dec-21	10-Dec-21
Hardness	Hardness as CaCO3	13-Dec-21	13-Dec-21
Conductivity	EPA 9050A- probe @25 °C	13-Dec-21	13-Dec-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	13-Dec-21	13-Dec-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	13-Dec-21	14-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	13-Dec-21	13-Dec-21
pH	EPA 150.1 - pH probe @25 °C	13-Dec-21	13-Dec-21
PHC F1	CWS Tier 1 - P&T GC-FID	10-Dec-21	11-Dec-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	13-Dec-21	14-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	13-Dec-21	14-Dec-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	15-Dec-21	16-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	13-Dec-21	14-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	13-Dec-21	13-Dec-21

Certificate of Analysis

Report Date: 17-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 8-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-3	MW15-5	MW15-7	MW15-10
	Sample Date:	08-Dec-21 09:36	08-Dec-21 12:48	08-Dec-21 11:10	08-Dec-21 15:35
	Sample ID:	2150402-01	2150402-02	2150402-03	2150402-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	269	363	431	392
Ammonia as N	0.01 mg/L	0.02	0.16	0.02	0.23
BOD	2 mg/L	<2	<2	<2	<2
Chemical Oxygen Demand	10 mg/L	15	<10	<10	36
Dissolved Organic Carbon	0.5 mg/L	3.0	3.7	3.7	15.9
Conductivity	5 uS/cm	2620	1890	1770	1720
Hardness	mg/L	246	533	483	498
pH	0.1 pH Units	8.1	7.9	7.7	7.7
Phosphorus, total	0.01 mg/L	0.03	<0.01	<0.01	0.10
Total Dissolved Solids	10 mg/L	1370	1120	922	1090
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	0.3	0.2	0.8
Anions					
Chloride	1 mg/L	558	200	220	93
Nitrate as N	0.1 mg/L	3.4	0.5	2.6	0.6
Sulphate	1 mg/L	157	330	145	375
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	<1
Barium	1 ug/L	88	121	122	70
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	25	43	39	36
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	81200	177000	162000	163000
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	<0.5	0.9	<0.5	0.8
Copper	0.5 ug/L	3.4	2.4	3.2	5.4
Iron	100 ug/L	<100	<100	133	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Magnesium	200 ug/L	10600	22200	18800	22100
Molybdenum	0.5 ug/L	2.2	<0.5	0.7	<0.5
Nickel	1 ug/L	<1	2	51	166
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	0.4	0.2	0.2	<0.1

Certificate of Analysis

Report Date: 17-Dec-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 8-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-3	MW15-5	MW15-7	MW15-10
	Sample Date:	08-Dec-21 09:36	08-Dec-21 12:48	08-Dec-21 11:10	08-Dec-21 15:35
	Sample ID:	2150402-01	2150402-02	2150402-03	2150402-04
	MDL/Units	Water	Water	Water	Water
Sodium	200 ug/L	423000	285000	221000	254000
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	1.1	1.0	0.8	2.6
Vanadium	0.5 ug/L	<0.5	<0.5	<0.5	0.7
Zinc	5 ug/L	9	<5	25	55
Volatiles					
Chloroform	0.5 ug/L	1.3	<0.5	<0.5	<0.5
Dibromofluoromethane	Surrogate	117%	118%	118%	118%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.05 ug/L	0.15	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	0.17	<0.01	<0.01	<0.01
Benzo [a] anthracene	0.01 ug/L	0.11	<0.01	<0.01	<0.01
Benzo [a] pyrene	0.01 ug/L	0.12	<0.01	<0.01	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	0.08	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	0.12	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	0.16	<0.01	<0.01	<0.01
Fluorene	0.05 ug/L	0.18	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	0.06	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	0.27	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	0.36	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	0.63	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	0.14	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	0.52	<0.05	<0.05	<0.05
Pyrene	0.01 ug/L	0.27	<0.01	<0.01	<0.01
2-Fluorobiphenyl	Surrogate	90.4%	85.0%	74.1%	83.2%
Terphenyl-d14	Surrogate	103%	111%	92.6%	101%

Certificate of Analysis

Report Date: 17-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 8-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-11	DUP-2	TRIP BLANK	-
	Sample Date:	08-Dec-21 17:10	08-Dec-21 09:00	29-Nov-21 09:00	-
	Sample ID:	2150402-05	2150402-06	2150402-07	-
	MDL/Units	Water	Water	Water	-
General Inorganics					
Alkalinity, total	5 mg/L	292	430	-	-
Ammonia as N	0.01 mg/L	0.05	0.03	-	-
BOD	2 mg/L	<2	<2	-	-
Chemical Oxygen Demand	10 mg/L	<10	<10	-	-
Dissolved Organic Carbon	0.5 mg/L	7.7	4.1	-	-
Conductivity	5 uS/cm	1400	1740	-	-
Hardness	mg/L	320	472	-	-
pH	0.1 pH Units	8.0	7.9	-	-
Phosphorus, total	0.01 mg/L	0.02	<0.01	-	-
Total Dissolved Solids	10 mg/L	726	974	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.2	0.3	-	-
Anions					
Chloride	1 mg/L	217	221	-	-
Nitrate as N	0.1 mg/L	0.9	2.6	-	-
Sulphate	1 mg/L	74	142	-	-
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	-	-
Antimony	0.5 ug/L	<0.5	<0.5	-	-
Arsenic	1 ug/L	<1	<1	-	-
Barium	1 ug/L	75	115	-	-
Beryllium	0.5 ug/L	<0.5	<0.5	-	-
Boron	10 ug/L	22	38	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	102000	158000	-	-
Chromium	1 ug/L	<1	<1	-	-
Chromium (VI)	10 ug/L	<10	<10	-	-
Cobalt	0.5 ug/L	<0.5	<0.5	-	-
Copper	0.5 ug/L	2.2	2.7	-	-
Iron	100 ug/L	<100	<100	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	16100	18900	-	-
Molybdenum	0.5 ug/L	0.9	0.6	-	-
Nickel	1 ug/L	9	49	-	-
Selenium	1 ug/L	<1	<1	-	-
Silver	0.1 ug/L	<0.1	<0.1	-	-

Certificate of Analysis

Report Date: 17-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 8-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-11	DUP-2	TRIP BLANK	-
	Sample Date:	08-Dec-21 17:10	08-Dec-21 09:00	29-Nov-21 09:00	-
	Sample ID:	2150402-05	2150402-06	2150402-07	-
	MDL/Units	Water	Water	Water	-
Sodium	200 ug/L	184000	227000	-	-
Thallium	0.1 ug/L	<0.1	<0.1	-	-
Uranium	0.1 ug/L	0.9	0.9	-	-
Vanadium	0.5 ug/L	<0.5	<0.5	-	-
Zinc	5 ug/L	75	24	-	-
Volatiles					
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	-
Dibromofluoromethane	Surrogate	116%	114%	116%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	-	-
Acenaphthylene	0.05 ug/L	<0.05	<0.05	-	-
Anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Chrysene	0.05 ug/L	<0.05	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	-	-
Fluoranthene	0.01 ug/L	<0.01	<0.01	-	-
Fluorene	0.05 ug/L	<0.05	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	-	-
Naphthalene	0.05 ug/L	<0.05	<0.05	-	-
Phenanthrene	0.05 ug/L	<0.05	<0.05	-	-
Pyrene	0.01 ug/L	<0.01	<0.01	-	-
2-Fluorobiphenyl	Surrogate	68.8%	78.6%	-	-
Terphenyl-d14	Surrogate	97.9%	98.3%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Conductivity	ND	5	uS/cm						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*13.4*		*ug/L*		*67.2*	*50-140*			
Surrogate: Terphenyl-d14	*20.8*		*ug/L*		*104*	*50-140*			
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*82.5*		*ug/L*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	223	5	mg/L	221			0.8	10	
Nitrate as N	2.59	0.1	mg/L	2.57			0.8	10	
Sulphate	144	1	mg/L	142			1.7	10	
General Inorganics									
Alkalinity, total	265	5	mg/L	269			1.5	14	
Ammonia as N	0.022	0.01	mg/L	0.022			2.3	18	
Chemical Oxygen Demand	12	10	mg/L	15			NC	12	
Dissolved Organic Carbon	2.0	0.5	mg/L	2.0			1.7	37	
Conductivity	626	5	uS/cm	638			2.0	5	
pH	8.0	0.1	pH Units	8.0			0.1	3.3	
Phosphorus, total	ND	0.01	mg/L	ND			NC	15	
Total Dissolved Solids	640	10	mg/L	706			9.8	10	
Total Kjeldahl Nitrogen	0.30	0.1	mg/L	0.34			12.6	16	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.82	0.5	ug/L	0.57			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	228	1	ug/L	222			2.5	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	836	10	ug/L	841			0.7	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	136000	100	ug/L	135000			0.4	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	10.2	0.5	ug/L	10.6			3.6	20	
Copper	6.80	0.5	ug/L	7.18			5.5	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	66100	200	ug/L	69300			4.7	20	
Molybdenum	117	0.5	ug/L	119			2.0	20	
Nickel	39.8	1	ug/L	40.1			0.7	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	0.31			NC	20	
Sodium	ND	200	ug/L	409000			NC	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	0.8	0.1	ug/L	0.8			4.2	20	
Vanadium	1.33	0.5	ug/L	1.33			0.3	20	
Zinc	6	5	ug/L	6			1.3	20	
Volatiles									
Chloroform	15.3	0.5	ug/L	15.1			1.3	30	
Surrogate: Dibromofluoromethane	*92.4*		*ug/L*		*116*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	231	1	mg/L	221	94.2	77-123			
Nitrate as N	3.54	0.1	mg/L	2.57	97.2	79-120			
Sulphate	150	1	mg/L	142	81.6	74-126			
General Inorganics									
Ammonia as N	0.287	0.01	mg/L	0.022	106	81-124			
BOD	210	2	mg/L	ND	105	71-121			
Chemical Oxygen Demand	202	10	mg/L	15	93.5	85-111			
Dissolved Organic Carbon	12.5	0.5	mg/L	2.0	104	60-133			
Phosphorus, total	0.488	0.01	mg/L	ND	97.5	80-120			
Total Dissolved Solids	90.0	10	mg/L	ND	90.0	75-125			
Total Kjeldahl Nitrogen	2.22	0.1	mg/L	0.34	93.7	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	2020	25	ug/L	ND	101	68-117			
F2 PHCs (C10-C16)	1380	100	ug/L	ND	86.0	60-140			
F3 PHCs (C16-C34)	3960	100	ug/L	ND	101	60-140			
F4 PHCs (C34-C50)	2960	100	ug/L	ND	119	60-140			
Metals									
Mercury	3.14	0.1	ug/L	ND	105	70-130			
Antimony	46.8	0.5	ug/L	0.57	92.4	80-120			
Arsenic	59.7	1	ug/L	ND	118	80-120			
Barium	195	1	ug/L	138	114	80-120			
Beryllium	44.7	0.5	ug/L	ND	89.4	80-120			
Boron	49	10	ug/L	ND	97.6	80-120			
Cadmium	48.7	0.1	ug/L	ND	97.3	80-120			
Calcium	10300	100	ug/L	ND	103	80-120			
Chromium (VI)	187	10	ug/L	ND	93.5	70-130			
Chromium	54.4	1	ug/L	ND	109	80-120			
Cobalt	66.7	0.5	ug/L	10.6	112	80-120			
Copper	58.4	0.5	ug/L	7.18	102	80-120			
Iron	2640	100	ug/L	ND	105	80-120			
Lead	42.4	0.1	ug/L	ND	84.7	80-120			
Magnesium	67500	200	ug/L	58100	94.5	80-120			
Molybdenum	166	0.5	ug/L	119	93.1	80-120			
Nickel	92.8	1	ug/L	40.1	106	80-120			
Selenium	49.0	1	ug/L	ND	97.7	80-120			
Silver	41.5	0.1	ug/L	ND	82.9	80-120			
Sodium	8370	200	ug/L	ND	83.7	80-120			
Thallium	44.6	0.1	ug/L	ND	89.0	80-120			
Uranium	46.8	0.1	ug/L	0.8	92.0	80-120			
Vanadium	57.6	0.5	ug/L	ND	115	80-120			
Zinc	49	5	ug/L	6	85.9	80-120			
Semi-Volatiles									
Acenaphthene	3.78	0.05	ug/L	ND	75.6	50-140			
Acenaphthylene	3.44	0.05	ug/L	ND	68.9	50-140			
Anthracene	4.63	0.01	ug/L	ND	92.5	50-140			
Benzo [a] anthracene	4.70	0.01	ug/L	ND	94.0	50-140			
Benzo [a] pyrene	5.04	0.01	ug/L	ND	101	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	5.81	0.05	ug/L	ND	116	50-140			
Benzo [g,h,i] perylene	3.71	0.05	ug/L	ND	74.3	50-140			
Benzo [k] fluoranthene	5.87	0.05	ug/L	ND	117	50-140			
Chrysene	5.39	0.05	ug/L	ND	108	50-140			
Dibenzo [a,h] anthracene	4.41	0.05	ug/L	ND	88.2	50-140			
Fluoranthene	3.66	0.01	ug/L	ND	73.3	50-140			
Fluorene	4.10	0.05	ug/L	ND	82.0	50-140			
Indeno [1,2,3-cd] pyrene	4.33	0.05	ug/L	ND	86.6	50-140			
1-Methylnaphthalene	5.45	0.05	ug/L	ND	109	50-140			
2-Methylnaphthalene	5.76	0.05	ug/L	ND	115	50-140			
Naphthalene	4.98	0.05	ug/L	ND	99.5	50-140			
Phenanthrene	4.18	0.05	ug/L	ND	83.6	50-140			
Pyrene	4.07	0.01	ug/L	ND	81.4	50-140			
Surrogate: 2-Fluorobiphenyl	*16.9*		*ug/L*		*84.5*	*50-140*			
Surrogate: Terphenyl-d14	*22.8*		*ug/L*		*114*	*50-140*			
Volatiles									
Chloroform	37.9	0.5	ug/L	ND	94.8	60-130			
Surrogate: Dibromofluoromethane	*95.4*		*ug/L*		*119*	*50-140*			

Qualifier Notes:

QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

Paracel ID: 2150402

PARACEL LABORATORIES

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Paracel Order Number (Lab Use Only): 2150402

Chain Of Custody

(Lab Use Only)

№ 63985

Page 1 of 1

Client Name: WOOD	Project Ref: LANSDOWNE PARK
Contact Name: JASON TAYLOR	Quote #: CITYOFOTTAWA SOA
Address: 300-210 Colonnade Rd South OTTAWA, ON K2E 7L5	PO #: TZ101 00106
Telephone: 613-727-0658	E-mail: JASON.TAYLOR@WOODPLC.COM

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

Date Required:

☒ REG 153/04 ☐ REG 406/19

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

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

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

Required Analysis

	Sample ID/Location Name		Matrix	Air Volume	# of Containers	Date	Time	VOC, PHC F1-F4	PAH	METALS W INORGANICS	CRVI	CHLOROFORM							
1	MW15-3	BK6 729	GW	/	12	12/08/21	0936	X	X	X	X								
2	MW15-5	730	GW	/	12	12/08/21	1248	X	X	X	X								
3	MW15-7	731	GW	/	12	12/08/21	1110	X	X	X	X								
4	MW15-10	732	GW	/	12	12/08/21	1535	X	X	X	X								
5	MW15-11	733	GW	/	12	12/08/21	1710	X	X	X	X								
6	DUP-2	734	GW	/	12	12/08/21		X	X	X	X								
7	TRIP BLANK	735		/	1	Nov 29, 21						X							
8																			
9																			
10																			

Comments: ALL METALS FILTERED

Method of Delivery: Dropbox

Relinquished By (Sign): [signature]	Received By Driver/Depot:	Received at Lab: [signature]	Verified By: [signature]
Relinquished By (Print): BRYANT OGW	Date/Time:	Date/Time: Dec 8 2021 6:50	Date/Time: Dec 9 2021 1640
Date/Time: 12/08/21	Temperature: °C	Temperature: 5.6 °C	pH Verified: ☐ By:

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Lansdowne Park
Custody: 63916

Report Date: 21-Dec-2021
Order Date: 13-Dec-2021

Order #: 2151099

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

Paracel ID	Client ID
2151099-01	MW15-4
2151099-02	MW15-6

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 13-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	14-Dec-21	14-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	15-Dec-21	15-Dec-21
Anions	EPA 300.1 - IC	14-Dec-21	14-Dec-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	15-Dec-21	20-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	15-Dec-21	15-Dec-21
Chloroform	EPA 624 - P&T GC-MS	14-Dec-21	14-Dec-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	14-Dec-21	14-Dec-21
Hardness	Hardness as CaCO3	14-Dec-21	14-Dec-21
Conductivity	EPA 9050A- probe @25 °C	14-Dec-21	14-Dec-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	14-Dec-21	14-Dec-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	14-Dec-21	14-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	14-Dec-21	14-Dec-21
pH	EPA 150.1 - pH probe @25 °C	14-Dec-21	14-Dec-21
PHC F1	CWS Tier 1 - P&T GC-FID	14-Dec-21	14-Dec-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	16-Dec-21	16-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	14-Dec-21	14-Dec-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	20-Dec-21	20-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	15-Dec-21	16-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	14-Dec-21	14-Dec-21

Certificate of Analysis

Report Date: 21-Dec-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 13-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-4	MW15-6	-	-
	Sample Date:	13-Dec-21 09:00	13-Dec-21 09:00	-	-
	Sample ID:	2151099-01	2151099-02	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	695	268	-	-
Ammonia as N	0.01 mg/L	2.96	0.37	-	-
BOD	2 mg/L	5	5	-	-
Chemical Oxygen Demand	10 mg/L	31	33	-	-
Dissolved Organic Carbon	0.5 mg/L	9.1	10.3	-	-
Conductivity	5 uS/cm	2530	1510	-	-
Hardness	mg/L	859	84.6	-	-
pH	0.1 pH Units	7.4	7.9	-	-
Phosphorus, total	0.01 mg/L	0.67	0.61	-	-
Total Dissolved Solids	10 mg/L	1740	832	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	3.9	1.5	-	-
Anions					
Chloride	1 mg/L	321	270	-	-
Nitrate as N	0.1 mg/L	<0.1	0.6	-	-
Sulphate	1 mg/L	305	51	-	-
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	-	-
Antimony	0.5 ug/L	<0.5	<0.5	-	-
Arsenic	1 ug/L	<1	<1	-	-
Boron	10 ug/L	78	18	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	267000	28600	-	-
Chromium	1 ug/L	<1	<1	-	-
Chromium (VI)	10 ug/L	<10	<10	-	-
Cobalt	0.5 ug/L	0.7	<0.5	-	-
Copper	0.5 ug/L	0.6	10.8	-	-
Iron	100 ug/L	11600	<100	-	-
Lead	0.1 ug/L	0.3	<0.1	-	-
Magnesium	200 ug/L	46400	3220	-	-
Molybdenum	0.5 ug/L	1.5	8.2	-	-
Nickel	1 ug/L	2	7	-	-
Selenium	1 ug/L	<1	<1	-	-
Silver	0.1 ug/L	<0.1	<0.1	-	-
Sodium	200 ug/L	166000	325000	-	-
Thallium	0.1 ug/L	<0.1	<0.1	-	-

Certificate of Analysis

Report Date: 21-Dec-2021

Client: Wood Environment & Infrastructure (Ottawa)

Order Date: 13-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-4	MW15-6	-	-
	Sample Date:	13-Dec-21 09:00	13-Dec-21 09:00	-	-
	Sample ID:	2151099-01	2151099-02	-	-
	MDL/Units	Water	Water	-	-
Uranium	0.1 ug/L	0.7	2.5	-	-
Vanadium	0.5 ug/L	<0.5	<0.5	-	-
Zinc	5 ug/L	55	10	-	-
Volatiles					
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Dibromofluoromethane	Surrogate	85.3%	83.6%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	-	-
Acenaphthylene	0.05 ug/L	<0.05	<0.05	-	-
Anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	-	-
Chrysene	0.05 ug/L	<0.05	<0.05	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	-	-
Fluoranthene	0.01 ug/L	<0.01	<0.01	-	-
Fluorene	0.05 ug/L	<0.05	<0.05	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	-	-
Naphthalene	0.05 ug/L	<0.05	<0.05	-	-
Phenanthrene	0.05 ug/L	<0.05	<0.05	-	-
Pyrene	0.01 ug/L	<0.01	<0.01	-	-
2-Fluorobiphenyl	Surrogate	77.1%	79.1%	-	-
Terphenyl-d14	Surrogate	119%	103%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Conductivity	ND	5	uS/cm						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*17.8*		*ug/L*		*89.2*	*50-140*			
Surrogate: Terphenyl-d14	*21.1*		*ug/L*		*105*	*50-140*			
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*65.0*		*ug/L*		*81.2*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	268	5	mg/L	270			0.9	10	
Nitrate as N	0.61	0.1	mg/L	0.62			1.5	10	
Sulphate	50.2	1	mg/L	50.9			1.4	10	
General Inorganics									
Alkalinity, total	157	5	mg/L	158			1.2	14	
Ammonia as N	0.022	0.01	mg/L	0.022			2.3	18	
BOD	512	2	mg/L	532			3.7	20	
Chemical Oxygen Demand	31	10	mg/L	31			0.0	12	
Dissolved Organic Carbon	9.4	0.5	mg/L	9.1			2.5	37	
Conductivity	2580	5	uS/cm	2530			1.9	5	
pH	7.9	0.1	pH Units	7.9			0.5	3.3	
Phosphorus, total	0.249	0.01	mg/L	0.242			2.9	15	
Total Dissolved Solids	862	10	mg/L	934			8.0	10	
Total Kjeldahl Nitrogen	2.02	0.1	mg/L	2.05			1.1	16	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.79	0.5	ug/L	0.54			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	230	1	ug/L	220			4.4	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	154	10	ug/L	162			4.5	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	248000	380	ug/L	253000			1.9	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	1.3	1	ug/L	1.3			1.6	20	
Cobalt	1.36	0.5	ug/L	1.35			0.3	20	
Copper	4.26	0.5	ug/L	4.34			1.9	20	
Iron	754	100	ug/L	770			2.1	20	
Lead	2.18	0.1	ug/L	2.09			4.5	20	
Magnesium	41800	200	ug/L	43200			3.2	20	
Molybdenum	5.94	0.5	ug/L	5.73			3.6	20	
Nickel	3.3	1	ug/L	3.4			1.2	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	241000	760	ug/L	267000			10.3	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	2.3	0.1	ug/L	2.1			7.8	20	
Vanadium	2.57	0.5	ug/L	2.68			4.2	20	
Zinc	7	5	ug/L	10			NC	20	
Volatiles									
Chloroform	2.28	0.5	ug/L	2.38			4.3	30	
Surrogate: Dibromofluoromethane	*67.2*		*ug/L*		*84.1*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.41	1	mg/L	ND	94.1	85-115			
Nitrate as N	1.61	0.1	mg/L	0.62	99.0	79-120			
Sulphate	59.0	1	mg/L	50.9	81.5	74-126			
General Inorganics									
Ammonia as N	0.287	0.01	mg/L	0.022	106	81-124			
BOD	210	2	mg/L	ND	105	71-121			
Chemical Oxygen Demand	230	10	mg/L	31	99.5	85-111			
Dissolved Organic Carbon	20.0	0.5	mg/L	9.1	109	60-133			
Phosphorus, total	0.735	0.01	mg/L	0.242	98.6	80-120			
Total Dissolved Solids	108	10	mg/L	ND	108	75-125			
Total Kjeldahl Nitrogen	4.25	0.1	mg/L	2.05	110	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	1640	25	ug/L	ND	81.9	68-117			
F2 PHCs (C10-C16)	1580	100	ug/L	ND	98.9	60-140			
F3 PHCs (C16-C34)	4310	100	ug/L	ND	110	60-140			
F4 PHCs (C34-C50)	3440	100	ug/L	ND	139	60-140			
Metals									
Mercury	3.27	0.1	ug/L	ND	109	70-130			
Antimony	46.5	0.5	ug/L	ND	92.9	80-120			
Arsenic	54.8	1	ug/L	ND	108	80-120			
Barium	269	1	ug/L	220	98.8	80-120			
Beryllium	40.8	0.5	ug/L	ND	81.5	80-120			
Boron	53	10	ug/L	ND	106	80-120			
Cadmium	43.1	0.1	ug/L	ND	86.1	80-120			
Calcium	9060	100	ug/L	ND	90.6	80-120			
Chromium (VI)	173	10	ug/L	ND	86.5	70-130			
Chromium	54.4	1	ug/L	1.3	106	80-120			
Cobalt	53.0	0.5	ug/L	1.35	103	80-120			
Copper	50.0	0.5	ug/L	4.34	91.3	80-120			
Iron	2860	100	ug/L	770	83.8	80-120			
Lead	48.9	0.1	ug/L	ND	97.8	80-120			
Magnesium	8300	200	ug/L	ND	83.0	80-120			
Molybdenum	52.9	0.5	ug/L	5.73	94.4	80-120			
Nickel	50.1	1	ug/L	3.4	93.5	80-120			
Selenium	46.7	1	ug/L	ND	92.9	80-120			
Silver	50.4	0.1	ug/L	ND	101	80-120			
Sodium	8450	200	ug/L	ND	84.5	80-120			
Thallium	41.4	0.1	ug/L	ND	82.7	80-120			
Uranium	50.7	0.1	ug/L	ND	101	80-120			
Vanadium	61.5	0.5	ug/L	2.68	118	80-120			
Zinc	52	5	ug/L	ND	104	80-120			
Semi-Volatiles									
Acenaphthene	4.08	0.05	ug/L	ND	81.6	50-140			
Acenaphthylene	3.50	0.05	ug/L	ND	70.1	50-140			
Anthracene	4.32	0.01	ug/L	ND	86.5	50-140			
Benzo [a] anthracene	4.40	0.01	ug/L	ND	88.1	50-140			
Benzo [a] pyrene	4.77	0.01	ug/L	ND	95.3	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	6.08	0.05	ug/L	ND	122	50-140			
Benzo [g,h,i] perylene	4.00	0.05	ug/L	ND	79.9	50-140			
Benzo [k] fluoranthene	5.96	0.05	ug/L	ND	119	50-140			
Chrysene	5.43	0.05	ug/L	ND	109	50-140			
Dibenzo [a,h] anthracene	4.25	0.05	ug/L	ND	85.0	50-140			
Fluoranthene	4.30	0.01	ug/L	ND	86.0	50-140			
Fluorene	4.30	0.05	ug/L	ND	85.9	50-140			
Indeno [1,2,3-cd] pyrene	4.36	0.05	ug/L	ND	87.2	50-140			
1-Methylnaphthalene	5.30	0.05	ug/L	ND	106	50-140			
2-Methylnaphthalene	5.21	0.05	ug/L	ND	104	50-140			
Naphthalene	4.43	0.05	ug/L	ND	88.7	50-140			
Phenanthrene	4.09	0.05	ug/L	ND	81.8	50-140			
Pyrene	4.49	0.01	ug/L	ND	89.8	50-140			
Surrogate: 2-Fluorobiphenyl	*16.2*		*ug/L*		*80.9*	*50-140*			
Surrogate: Terphenyl-d14	*22.4*		*ug/L*		*112*	*50-140*			
Volatiles									
Chloroform	35.2	0.5	ug/L	ND	88.0	60-130			
Surrogate: Dibromofluoromethane	*79.8*		*ug/L*		*99.7*	*50-140*			

Qualifier Notes:

Login Qualifiers :

Container(s) - Labeled improperly/insufficient information - PAH bottle is missing the sample ID

Applies to samples: MW15-4

QC Qualifiers :

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

Paracel ID: 2151099

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
	№ 63916

Client Name: Wood	Project Ref: Lansdowne Park	Page 1 of 1
Contact Name: Jason Taylor	Quote #: City of Ottawa SOA	Turnaround Time
Address: 300-210 Colonnade Rd S, Ottawa ON K2E 7L5	PO #: TZ101001106	☐ 1 day ☐ 3 day ☐ 2 day ☑ Regular
Telephone: 727-0658	E-mail: jason.taylor@woodplc.com	Date Required:

☐ REG 153/04 ☐ REG 406/19

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

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

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: VOC+PHC F1-F4	PAH	Metals+inorganics	Cr(VI)
1	MW15-4 BK6778	GW		12	13-Dec-21		X	X	X	X
2	MW15-6 BK6779	GW		12	13-Dec-21		X	X	X	X
3										
4										
5										
6										
7										
8										
9										
10										

Comments:

Method of Delivery: drop box

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Spencer Oklobdzija	Date/Time:	Date/Time: Dec 13 2021 7:00	Date/Time: Dec 13 2021 907
Date/Time: 13-Dec-21 17:00	Temperature: °C	Temperature: °C	pH Verified: ☐ By:

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Certificate of Analysis

Wood Environment & Infrastructure (Ottawa)

300-210 Colonnade Rd. S
Ottawa, ON K2E 7L5
Attn: Jason Taylor

Client PO:
Project: TZ10100106/Lansdowne Park
Custody: 63486

Report Date: 22-Dec-2021
Order Date: 14-Dec-2021

Order #: 2151181

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

Paracel ID	Client ID
2151181-01	MW15-9

Approved By:

Dale Robertson, BSc
Laboratory Director

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	15-Dec-21	15-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	15-Dec-21	15-Dec-21
Anions	EPA 300.1 - IC	15-Dec-21	15-Dec-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	15-Dec-21	20-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	15-Dec-21	15-Dec-21
Chloroform	EPA 624 - P&T GC-MS	15-Dec-21	16-Dec-21
Chromium, hexavalent - water	MOE E3056 - colourimetric	17-Dec-21	17-Dec-21
Hardness	Hardness as CaCO3	14-Dec-21	15-Dec-21
Conductivity	EPA 9050A- probe @25 °C	15-Dec-21	15-Dec-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	16-Dec-21	16-Dec-21
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	15-Dec-21	15-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	14-Dec-21	15-Dec-21
pH	EPA 150.1 - pH probe @25 °C	15-Dec-21	15-Dec-21
PHC F1	CWS Tier 1 - P&T GC-FID	15-Dec-21	16-Dec-21
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	16-Dec-21	16-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	15-Dec-21	16-Dec-21
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	20-Dec-21	20-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	15-Dec-21	16-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	15-Dec-21	16-Dec-21

Certificate of Analysis

Report Date: 22-Dec-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 14-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-9	-	-	-
	Sample Date:	14-Dec-21 09:00	-	-	-
	Sample ID:	2151181-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	229	-	-	-
Ammonia as N	0.01 mg/L	0.04	-	-	-
BOD	2 mg/L	<2	-	-	-
Chemical Oxygen Demand	10 mg/L	57	-	-	-
Dissolved Organic Carbon	0.5 mg/L	4.8	-	-	-
Conductivity	5 uS/cm	6270	-	-	-
Hardness	mg/L	291	-	-	-
pH	0.1 pH Units	7.8	-	-	-
Phosphorus, total	0.01 mg/L	0.06	-	-	-
Total Dissolved Solids	10 mg/L	3510	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	-	-	-
Anions					
Chloride	1 mg/L	1710	-	-	-
Nitrate as N	0.1 mg/L	0.4	-	-	-
Sulphate	1 mg/L	138	-	-	-
Metals					
Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	<1	-	-	-
Barium	1 ug/L	64	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	31	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	91800	-	-	-
Chromium	1 ug/L	<1	-	-	-
Chromium (VI)	10 ug/L	<10	-	-	-
Cobalt	0.5 ug/L	0.9	-	-	-
Copper	0.5 ug/L	4.1	-	-	-
Iron	100 ug/L	<100	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	15100	-	-	-
Molybdenum	0.5 ug/L	17.5	-	-	-
Nickel	1 ug/L	3	-	-	-
Selenium	1 ug/L	<1	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-

Certificate of Analysis

Report Date: 22-Dec-2021

Client: **Wood Environment & Infrastructure (Ottawa)**

Order Date: 14-Dec-2021

Client PO:

Project Description: TZ10100106/Lansdowne Park

	Client ID:	MW15-9	-	-	-
	Sample Date:	14-Dec-21 09:00	-	-	-
	Sample ID:	2151181-01	-	-	-
	MDL/Units	Water	-	-	-
Sodium	200 ug/L	1020000	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	1.2	-	-	-
Vanadium	0.5 ug/L	<0.5	-	-	-
Zinc	5 ug/L	81	-	-	-
Volatiles					
Chloroform	0.5 ug/L	<0.5	-	-	-
Dibromofluoromethane	Surrogate	114%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	-	-	-
Acenaphthylene	0.05 ug/L	<0.05	-	-	-
Anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] anthracene	0.01 ug/L	<0.01	-	-	-
Benzo [a] pyrene	0.01 ug/L	<0.01	-	-	-
Benzo [b] fluoranthene	0.05 ug/L	<0.05	-	-	-
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	-	-	-
Benzo [k] fluoranthene	0.05 ug/L	<0.05	-	-	-
Chrysene	0.05 ug/L	<0.05	-	-	-
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	-	-	-
Fluoranthene	0.01 ug/L	<0.01	-	-	-
Fluorene	0.05 ug/L	<0.05	-	-	-
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	-	-	-
1-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
2-Methylnaphthalene	0.05 ug/L	<0.05	-	-	-
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	-	-	-
Naphthalene	0.05 ug/L	<0.05	-	-	-
Phenanthrene	0.05 ug/L	<0.05	-	-	-
Pyrene	0.01 ug/L	<0.01	-	-	-
2-Fluorobiphenyl	Surrogate	88.9%	-	-	-
Terphenyl-d14	Surrogate	113%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Conductivity	ND	5	uS/cm						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*17.8*		*ug/L*		*89.2*	*50-140*			
Surrogate: Terphenyl-d14	*21.1*		*ug/L*		*105*	*50-140*			
Volatiles									
Chloroform	ND	0.5	ug/L						
Surrogate: Dibromofluoromethane	*85.3*		*ug/L*		*107*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	1700	10	mg/L	1710			0.4	10	
Nitrate as N	0.45	0.1	mg/L	0.44			1.9	10	
Sulphate	143	1	mg/L	138			3.3	10	
General Inorganics									
Alkalinity, total	228	5	mg/L	229			0.2	14	
Ammonia as N	0.022	0.01	mg/L	0.022			2.3	18	
BOD	512	2	mg/L	532			3.7	20	
Chemical Oxygen Demand	31	10	mg/L	31			0.0	12	
Dissolved Organic Carbon	2.9	0.5	mg/L	3.2			8.0	37	
Conductivity	6200	5	uS/cm	6270			1.1	5	
pH	8.0	0.1	pH Units	8.0			0.1	3.3	
Phosphorus, total	0.036	0.01	mg/L	0.041			13.0	15	
Total Dissolved Solids	862	10	mg/L	934			8.0	10	
Total Kjeldahl Nitrogen	4.45	0.2	mg/L	4.55			2.2	16	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.53	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	63.6	1	ug/L	63.2			0.7	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	33	10	ug/L	32			3.0	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	83500	100	ug/L	87800			5.1	20	
Chromium (VI)	ND	10	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	0.78	0.5	ug/L	0.86			9.6	20	
Copper	3.72	0.5	ug/L	3.89			4.4	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	13600	200	ug/L	14700			8.3	20	
Molybdenum	17.2	0.5	ug/L	17.6			2.6	20	
Nickel	2.5	1	ug/L	2.7			5.7	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	918000	200	ug/L	962000			4.7	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	1.5	0.1	ug/L	1.4			1.0	20	
Vanadium	ND	0.5	ug/L	ND			NC	20	
Zinc	76	5	ug/L	79			3.8	20	
Volatiles									
Chloroform	ND	0.5	ug/L	ND			NC	30	
Surrogate: Dibromofluoromethane	*89.0*		*ug/L*		*111*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	9.71	1	mg/L	ND	97.1	85-115			
Nitrate as N	1.46	0.1	mg/L	0.44	102	79-120			
Sulphate	147	1	mg/L	138	92.3	74-126			
General Inorganics									
Ammonia as N	0.287	0.01	mg/L	0.022	106	81-124			
BOD	210	2	mg/L	ND	105	71-121			
Chemical Oxygen Demand	230	10	mg/L	31	99.5	85-111			
Dissolved Organic Carbon	14.5	0.5	mg/L	3.2	113	60-133			
Phosphorus, total	0.531	0.01	mg/L	0.041	98.1	80-120			
Total Dissolved Solids	108	10	mg/L	ND	108	75-125			
Total Kjeldahl Nitrogen	1.79	0.1	mg/L	ND	89.3	81-126			
Hydrocarbons									
F1 PHCs (C6-C10)	2190	25	ug/L	ND	110	68-117			
F2 PHCs (C10-C16)	1580	100	ug/L	ND	98.9	60-140			
F3 PHCs (C16-C34)	4310	100	ug/L	ND	110	60-140			
F4 PHCs (C34-C50)	3440	100	ug/L	ND	139	60-140			
Metals									
Mercury	3.11	0.1	ug/L	ND	104	70-130			
Antimony	44.6	0.5	ug/L	ND	89.3	80-120			
Arsenic	48.1	1	ug/L	ND	95.9	80-120			
Barium	105	1	ug/L	63.2	84.2	80-120			
Beryllium	46.1	0.5	ug/L	ND	92.2	80-120			
Boron	44	10	ug/L	ND	87.4	80-120			
Cadmium	50.0	0.1	ug/L	ND	100	80-120			
Calcium	8840	100	ug/L	ND	88.4	80-120			
Chromium (VI)	193	10	ug/L	ND	96.5	70-130			
Chromium	54.3	1	ug/L	ND	107	80-120			
Cobalt	50.0	0.5	ug/L	0.86	98.2	80-120			
Copper	46.8	0.5	ug/L	3.89	85.8	80-120			
Iron	2240	100	ug/L	ND	89.2	80-120			
Lead	37.2	0.1	ug/L	ND	74.3	80-120			QM-07
Magnesium	23000	200	ug/L	14700	82.9	80-120			
Molybdenum	65.8	0.5	ug/L	17.6	96.5	80-120			
Nickel	47.8	1	ug/L	2.7	90.2	80-120			
Selenium	46.5	1	ug/L	ND	93.0	80-120			
Silver	48.3	0.1	ug/L	ND	96.6	80-120			
Sodium	8820	200	ug/L	ND	88.2	80-120			
Thallium	41.6	0.1	ug/L	ND	83.1	80-120			
Uranium	42.9	0.1	ug/L	1.4	82.9	80-120			
Vanadium	57.0	0.5	ug/L	ND	113	80-120			
Zinc	47	5	ug/L	ND	94.2	80-120			
Semi-Volatiles									
Acenaphthene	4.08	0.05	ug/L	ND	81.6	50-140			
Acenaphthylene	3.50	0.05	ug/L	ND	70.1	50-140			
Anthracene	4.32	0.01	ug/L	ND	86.5	50-140			
Benzo [a] anthracene	4.40	0.01	ug/L	ND	88.1	50-140			
Benzo [a] pyrene	4.77	0.01	ug/L	ND	95.3	50-140			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Benzo [b] fluoranthene	6.08	0.05	ug/L	ND	122	50-140			
Benzo [g,h,i] perylene	4.00	0.05	ug/L	ND	79.9	50-140			
Benzo [k] fluoranthene	5.96	0.05	ug/L	ND	119	50-140			
Chrysene	5.43	0.05	ug/L	ND	109	50-140			
Dibenzo [a,h] anthracene	4.25	0.05	ug/L	ND	85.0	50-140			
Fluoranthene	4.30	0.01	ug/L	ND	86.0	50-140			
Fluorene	4.30	0.05	ug/L	ND	85.9	50-140			
Indeno [1,2,3-cd] pyrene	4.36	0.05	ug/L	ND	87.2	50-140			
1-Methylnaphthalene	5.30	0.05	ug/L	ND	106	50-140			
2-Methylnaphthalene	5.21	0.05	ug/L	ND	104	50-140			
Naphthalene	4.43	0.05	ug/L	ND	88.7	50-140			
Phenanthrene	4.09	0.05	ug/L	ND	81.8	50-140			
Pyrene	4.49	0.01	ug/L	ND	89.8	50-140			
Surrogate: 2-Fluorobiphenyl	*16.2*		*ug/L*		*80.9*	*50-140*			
Surrogate: Terphenyl-d14	*22.4*		*ug/L*		*112*	*50-140*			
Volatiles									
Chloroform	41.6	0.5	ug/L	ND	104	60-130			
Surrogate: Dibromofluoromethane	*86.8*		*ug/L*		*108*	*50-140*			

Qualifier Notes:

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

PAR LABORAT

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Paracel Order Number (Lab Use Only): 215187

Chain Of Custody (Lab Use Only) Nº 63486

Client Name: Wood
Contact Name: Jason Taylor
Address: 300-210 Colonnade Rd S, Ottawa ON K2E 7L5
Telephone: 613-727-0658

Project Ref: Lansdowne Park
Quote #: City of Ottawa SOA
PO #: TZ1010106
E-mail: jason.taylor@woodplc.com

Page __ of __

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

☐ REG 153/04 ☐ REG 406/19

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

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

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: VOC+PHC F1-F4	PAH	metals + inorganics	Cr(VI)
1	MW15-9 BKG777	GW		12	14-Dec-21		X	X	X	X
2										
3										
4										
5										
6										
7										
8										
9										
10										

Comments:

Method of Delivery: dropped

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Spencer Oklobdzija	Date/Time:	Date/Time: Dec 14 2021 12:15	Date/Time: Dec 14 2021 14:13
Date/Time: 14-Dec-21 12:00	Temperature: °C	Temperature: 13.7 °C	pH Verified: ☐

Appendix E
Historical Groundwater Quality Data

Notes on Ground Water Analytical Summary Tables

All Units Reported in Micrograms per Litre (µg/L) or Milligrams per Litre (mg/L) as Indicated .

RDL = Laboratory Analytical Method Reporting Detection Limit.

RL = MOE 2011 Analytical Protocol Reporting Limit.

DUP = Quality Assurance/Quality Control Duplicate Sample.

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

* Denotes Recommended RPD Alert Criterion Exceeded, However, Parameter Concentration Less than 10 Times Laboratory RDL.

PHC = Petroleum Hydrocarbons.

< = Less Than Laboratory Analytical Method Detection Limit.

¯= Not Analyzed or No Published Value.

55	Parameter Concentration May Exceed EPA Table 3 Site Condition Standard for Non-Potable Groundwater Use due to Elevated MDL Reported by the Laboratory.
183	Parameter Concentration Exceeds EPA Table 3 Site Condition Standard for Non-Potable Groundwater Use (Table 3).
2630	Parameter Concentration Exceeds Property Specific Standard as per Certificate of Property Use 0731-8TYQMY.

a = For a Site to Meet This 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.

b = The Methyl Naphthalene 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.

c = Value adopted from Table A of Guidance for Addressing Chloroform at a Record of Site Condition Property (MOECC, undated).

2011 EPA Standards = Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Ontario Ministry of the Environment (MOE), April 15, 2011.

Property Specific Standards as per Certificate of Property Use 0371-8TYQMY issued by the MECP on November 25, 2013.

Historical Groundwater Quality Data - MW15-12

Sample Location / Sample ID / Property Location / Laboratory ID / Sample Date / Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-1 MW15-1 CPU Property 1545012-06 30/10/2015	MW15-1 MW15-1 CPU Property 1623214-01 5/31/2016	MW15-1 MW15-1 CPU Property 1645002-01 10/28/2016	MW15-1 MW15-1 CPU Property 1718037-01 4/28/2017	MW15-1 MW15-1 CPU Property 1743286-01 10/24/2017	MW15-1 DUP-1 CPU Property 1743286-03 10/24/2017	MW15-1 MW15-1 CPU Property 1822570-01 5/31/2018	MW15-1 MW15-1 CPU Property 1846110-01 11/12/2018	MW15-1 MW15-1 CPU Property 1922365-01 5/29/2019	MW15-1 MW15-1 CPU Property 1943543-01 10/24/2019	MW15-1 MW15-1 CPU Property 2021397-01 5/22/2020	MW15-1 MW15-1 CPU Property 2043549-01 10/22/2020	MW15-1 DUP-2 CPU Property 2043549-08 10/22/2020	MW15-1 MW15-1 CPU Property 2123129-01 5/31/2021	MW15-1 MW15-1 CPU Property 2149456-01 12/2/2021	
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.5	7.3	7.2	7	7.3	7.5	7.2	7.1	7.5	7.1	7.4	7.2	7.3	7.4	7.05	
Alkalinity (CaCO3)	5	-	-	-	357	378	410	400	440	439	430	497	394	411	382	407	403	383	401	
Ammonia	0.01	-	-	4.524	1.81	1.72	1.38	1.11	1.23	1.24	1.32	1.17	1.08	1.02	0.89	0.95	0.88	0.79	0.67	
Conductivity (µS/cm)	5	-	-	-	2280	2800	2340	2210	2400	2370	3360	2890	2730	2120	2500	2170	2170	1850	1855	
Chloride	1	1	2300	-	530	648	482	492	562	540	814	703	676	450	593	453	464	313	347.5	
Nitrate (N)	0.1	0.1	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Sulphate	1	-	-	-	13	126	38	70	44	44	96	31	104	14	27	10	10	37	13	
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	4	< 2	< 2	3	< 2	< 2	< 2	< 2	3.0	< 2	< 2.0	< 2	
Chemical Oxygen Demand (COD)	10	-	-	-	13	27	21	14	< 10	16	12	16	15	< 10	< 10	< 10	14.0	< 10	13.5	
Dissolved Organic Carbon	0.5	-	-	-	1.3	2.7	4	3.1	2.1	2.6	1.7	2.2	2.3	3.1	17.6	3.8	3.9	2.7	3.15	
Hardness	-	-	-	-	-	559	463	456	415	414	614	480	516	416	447	340	344	353	325.5	
Total Dissolved Solids	10	-	-	-	1120	1590	1210	1270	1300	1290	1980	1540	1580	1180	1290	1150	1130	992	1050	
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	< 0.01	< 0.01	0.08	0.23	< 0.01	< 0.01	0.04	0.04	0.04	0.04	< 0.01	< 0.01	< 0.01	
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	< 0.01	< 0.01	0.07	0.21	< 0.01	< 0.01	0.04	0.04	0.04	0.04	< 0.01	< 0.01	< 0.01	
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Barium	1	2	29000	-	662	675	637	651	544	559	756	663	619	98	504	459	446	436	401	
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Boron	10	10	45000	-	69	40	66	36	70	71	66	69	45	48	44	57	55	39	52	
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Calcium	100	-	-	-	142000	174000	147000	147000	135000	135000	193000	152000	161000	130000	140000	108000	110000	111000	106000	
Chromium	1	10	810	-	< 1	5	11	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Cobalt	0.5	1	66	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Copper	0.5	5	87	-	< 0.5	5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	2.2	< 0.5	0.5	< 0.5	< 0.5	< 0.5	
Iron	100	-	-	24240	13000	12400	7960	13100	11500	11600	19500	12200	19400	< 100	15700	10100	10500	14100	9285	
Lead	0.1	1	25	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Magnesium	200	-	-	-	20500	30000	23100	21600	19000	19000	32000	24300	27500	21900	23900	16800	16800	18300	14750	
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Molybdenum	0.5	0.5	9200	-	< 0.5	< 0.5	1.4	< 0.5	< 0.5	< 0.5	0.6	3.2	< 0.5	8.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Nickel	1	1	490	-	< 1	4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1.0	< 1.0	< 1	< 1	
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1.0	< 1	< 1	< 1	< 1	< 1	
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Sodium	200	5000	2300000	-	276000	33900	293000	290000	300000	302000	459000	385000	395000	203000	288000	293000	312000	200000	200000	
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Uranium	0.1	2	420	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.1	< 0.1	2.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Vanadium	0.5	0.5	250	-	< 0.5	4.7	3.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Zinc	5	5	1100	-	9	6	< 5	< 5	< 5	< 5	6	< 5	9	< 5	< 5	< 5	< 5	< 5	< 5	

Historical Groundwater Quality Data - MW15-12

Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-2 MW15-2 CPU Property 1545012-07 30/10/2015	MW15-2 MW15-2 CPU Property 1623214-02 5/31/2016	MW15-2 MW15-2 CPU Property 1645002-02 10/28/2016	MW15-2 MW15-2 CPU Property 1718037-02 4/28/2017	MW15-2 DUP-2 CPU Property 1718037-12 4/28/2017	MW15-2 MW15-2 CPU Property 1743286-02 10/24/2017	MW15-2 MW15-2 CPU Property 1822570-02 5/31/2018	MW15-2 MW15-2 CPU Property 1846110-02 11/12/2018	MW15-2 MW15-2 CPU Property 1922365-02 5/29/2019	MW15-2 MW15-2 CPU Property 1943543-02 10/24/2019	MW15-2 MW15-2 CPU Property 2021397-02 5/22/2020	MW15-2 MW15-2 CPU Property 2043549-02 10/22/2020	MW15-2 MW15-2 CPU Property 2123129-02 5/31/2021	MW15-2 MW15-2 CPU Property 2149456-02 12/2/2021		
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.6	7.6	7.4	7.3	7.6	7.7	7.5	7.6	7.8	7.4	7.7	7.4	7.8	7.6		
Alkalinity (CaCO3)	5	-	-	-	252	221	277	278	279	292	299	329	267	275	280	287	250	301		
Ammonia	0.01	-	-	4.524	0.1	0.15	0.06	0.03	0.18	0.02	0.06	0.03	0.03	0.06	0.05	0.36	0.01	< 0.01		
Conductivity (µS/cm)	5	-	-	-	2380	2280	2050	1310	1440	2070	2630	2150	2230	1910	2220	2220	1940	2680		
Chloride	1	1	2300	-	483	278	370	130	135	445	467	414	329	348	430	419	300	504		
Nitrate (N)	0.1	0.1	-	-	3.8	3.4	3.3	2.2	2.1	4.4	4.6	3.9	5	3.9	4.1	3.3	6.2	3.6		
Sulphate	1	-	-	-	229	600	179	250	243	167	406	186	461	169	368	193	203	256		
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.0	< 2		
Chemical Oxygen Demand (COD)	10	-	-	-	11	36	< 10	< 10	13	< 10	< 10	12	< 10	< 10	11.0	18.0	< 10	< 10		
Dissolved Organic Carbon	0.5	-	-	-	1.7	1.6	2.5	2.1	3	1	< 0.5	0.9	0.6	1.9	14.4	2.1	1.1	2.5		
Hardness	-	-	-	-	-	836	453	561	582	449	830	398	483	511	518	454	503	384		
Total Dissolved Solids	10	-	-	-	1250	1590	1110	868	854	1210	1860	1210	1470	1090	1310	1250	1180	1520		
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	2.6	2.1	1.6	< 0.5	< 0.5	1.4	1.6	2.4	4.3	1.8	3.4	2.1	1.9	2.6		
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25		
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Anthracene	0.05	0.1	2.4	-	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	0.01	0.2	4.7	-	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	0.01	0.01	0.81	-	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	0.01	0.1	0.75	-	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Fluoranthene	0.01	0.4	130	-	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Naphthalene	0.05	2	1400	-	0.09	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Pyrene	0.01	0.2	68	-	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Barium	1	2	29000	-	191	109	91	177	175	121	186	85	116	133	191	124	104	106		
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Boron	10	10	45000	-	59	48	53	34	40	50	56	45	29	45	33	44	32	42		
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Calcium	100	-	-	-	171000	245000	146000	189000	196000	147000	264000	129000	154000	151000	163000	142000	155000	124000		
Chromium	1	10	810	-	< 1	3	8	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		
Cobalt	0.5	1	66	-	1.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Copper	0.5	5	87	-	3	3.7	6.5	0.5	3.4	2.2	1.8	1.8	1.8	3.4	1.1	2.1	1.4	1.6		
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
Lead	0.1	1	25	-	< 0.1	< 0.1	0.2	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Magnesium	200	-	-	-	22800	54400	21500	21400	22400	19700	41600	18700	23900	32400	26800	24000	27900	17900		
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Molybdenum	0.5	0.5	9200	-	7.5	2.7	7.7	3.2	2.9	8.5	3.7	11.9	4.2	4.1	4.5	11.7	4.3	10.1		
Nickel	1	1	490	-	3	6	1	< 1	< 1	< 1	1	1	1	< 1	< 1	< 1	< 1	< 1		
Selenium	1	5	63	-	1	2	2	< 1	< 1	2	< 1	1	1	< 1	< 1	1	1	1		
Silver	0.1	0.3	1.5	-	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Sodium	200	5000	2300000	-	278000	17000	227000	66600	64100	230000	203000	289000	308000	558000	261000	272000	153000	307000		
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Uranium	0.1	2	420	-	2.6	2.3	1.9	2.2	1.9	1.8	3	2.5	2.7	2.2	2.2	1.8	2.2	2.3		
Vanadium	0.5	0.5	250	-	< 0.5	1.7	2.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Zinc	5	5	1100	-	20	7	< 5	< 5	15	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5		

Historical Groundwater Quality Data - MW15-12

Sample Location / Sample ID / Property Location / Laboratory ID / Sample Date / Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-3 MW15-3 CPU Property 1544375-01 29/10/2015	MW15-3 MW15-3 CPU Property 1623214-03 5/31/2016	MW15-3 MW15-3 CPU Property 1645002-03 10/28/2016	MW15-3 MW15-3 CPU Property 1647139-01 11/15/2016	MW15-3 MW15-3 CPU Property 1718037-03 4/28/2017	MW15-3 MW15-3 CPU Property 1743465-01 10/26/2017	MW15-3 MW15-3 CPU Property 1822570-03 5/31/2018	MW15-3 DUP-2 CPU Property 1822570-08 5/31/2018	MW15-3 MW15-3 CPU Property 1846110-03 11/12/2018	MW15-3 MW15-3 CPU Property 1922365-03 5/29/2019	MW15-3 MW15-3 CPU Property 1943543-03 10/24/2019	MW15-3 MW15-3 CPU Property 2021397-03 5/22/2020	MW15-3 MW15-3 CPU Property 2043549-03 10/22/2020	MW15-3 MW15-3 CPU Property 2123129-03 5/31/2021	MW15-3 MW15-3 CPU Property 2150402-01 12/8/2021	
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.7	7.6	7.6	-	7.5	7.8	7.6	7.8	7.6	7.8	7.5	7.8	7.6	7.8	8.1	
Alkalinity (CaCO3)	5	-	-	-	241	255	249	-	261	251	274	274	306	230	307	240	229	227	269	
Ammonia	0.01	-	-	4.524	0.03	0.29	0.02	-	0.1	0.04	0.04	0.14	0.04	0.07	0.06	0.14	0.04	0.06	0.02	
Conductivity (µS/cm)	5	-	-	-	3590	3080	3910	-	3200	3820	2940	2940	3010	3190	3620	2680	3040	2790	2620	
Chloride	1	1	2300	-	863	687	927	-	782	1030	666	665	712	820	829	686	721	581	558	
Nitrate (N)	0.1	0.1	-	-	5.5	5.5	6.2	-	5.8	5.8	4.3	4.3	2.9	5	4.7	3.7	4.6	3.5	3.4	
Sulphate	1	-	-	-	349	258	321	-	244	278	206	206	188	260	276	227	192	179	157	
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.0	< 2	
Chemical Oxygen Demand (COD)	10	-	-	-	35	24	26	-	14	< 10	36	< 10	14	45	29.0	< 10	31.0	26.0	15	
Dissolved Organic Carbon	0.5	-	-	-	0.8	1.4	1.6	-	1.6	1.6	< 0.5	< 0.5	< 0.5	< 0.5	2.3	9.8	2.3	1.7	3.0	
Hardness	-	-	-	-	-	649	906	-	726	753	547	602	428	699	780	477	525	528	246	
Total Dissolved Solids	10	-	-	-	2230	1880	2280	-	2010	2370	1750	1750	1570	2070	2130	1480	1810	1710	1370	
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	1.0	0.9	-	0.8	1.0	< 0.5	< 0.5	1.2	2.2	1.7	0.9	1	1.1	1.3	
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	**1310**	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.15	
Anthracene	0.05	0.1	2.4	-	0.04	0.04	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	0.03	0.04	0.17	
Benzo(a)anthracene	0.01	0.2	4.7	-	0.12	0.06	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.07	< 0.01	< 0.01	0.06	0.07	0.11	
Benzo(a)pyrene	0.01	0.01	0.81	-	0.14	0.08	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.08	< 0.01	< 0.01	0.09	0.12	0.12	
Benzo(b)fluoranthene	0.01	0.1	0.75	-	0.14	0.07	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.11	< 0.05	< 0.05	0.09	0.1	< 0.05	
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	0.15	0.06	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	0.09	0.1	0.08	
Benzo(k)fluoranthene	0.05	0.1	0.4	-	0.08	0.09	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	0.05	0.1	1	-	0.12	0.08	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05	0.08	0.08	0.12	
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	0.01	0.4	130	-	0.21	0.15	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.13	0.05	< 0.01	0.12	0.16	0.16	
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.18	
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	0.11	0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	0.06	0.08	0.06	
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.27	
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.36	
Naphthalene	0.05	2	1400	-	0.07	< 0.05	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.14	
Phenanthrene	0.05	0.1	580	-	0.09	0.08	< 0.05	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06	0.52	
Pyrene	0.01	0.2	68	-	0.2	0.14	< 0.01	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.13	0.05	< 0.01	0.12	0.16	0.27	
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Arsenic	1	1	1900	-	< 1	< 1	< 1	-	< 1	< 1	< 1	< 1	< 1	< 1	4.0	< 1	< 1	< 1	< 1	
Barium	1	2	29000	-	207	110	190	-	171	211	100	98	81	150	206	124	168	198	88	
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Boron	10	10	45000	-	44	28	42	-	31	36	44	42	35	39	91	24	28	21	25	
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Calcium	100	-	-	-	276000	208000	295000	-	238000	244000	172000	185000	132000	226000	242000	149000	165000	164000	81200	
Chromium	1	10	810	-	< 1	6	7	-	< 1	< 1	< 1	< 1	< 1	3	< 1	< 1	< 1	< 1	< 1	
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Cobalt	0.5	1	66	-	0.9	< 0.5	< 0.5	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	< 0.5	< 0.5	< 0.5	< 0.5	
Copper	0.5	5	87	-	1.2	6	2.9	-	0.8	1.5	1.4	1.2	1.6	2.5	0.8	1.5	1.5	2.5	3.4	
Iron	100	-	-	24240	< 100	< 100	< 100	-	< 100	< 100	< 100	< 100	< 100	< 100	13800.0	< 100	< 100	< 100	< 100	
Lead	0.1	1	25	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	0.2	< 0.1	
Magnesium	200	-	-	-	41500	31600	40900	-	31700	35100	28300	33700	23700	32600	42900	25200	27700	28600	10600	
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Molybdenum	0.5	0.5	9200	-	10.9	0.7	3	-	0.6	0.8	1.4	1.3	1.6	1	2.0	1.3	1.1	0.9	2.2	
Nickel	1	1	490	-	3	6	2	-	< 1	< 1	< 1	< 1	< 1	< 1	3.0	< 1	< 1	< 1	< 1	
Selenium	1	5	63	-	2	2	1	-	2	1	< 1	< 1	< 1	2	< 1	< 1	1	< 1	< 1	
Silver	0.1	0.3	1.5	-	1.5	0.2	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4	
Sodium	200	5000	2300000	-	418000	38000	514000	-	407000	484000	371000	446000	421000	414000	103000	336000	401000	311000	423000	
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Uranium	0.1	2	420	-	2.4	1.5	1.7	-	1.5	1.4	1.4	1.3	1.4	1.7	1.0	1.3	1.1	1	1.1	
Vanadium	0.5	0.5	250	-	< 0.5	1.9	1.8	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Zinc	5	5	1100	-	17	< 5	< 5	-	7	< 5	< 5	< 5	< 5	< 5	98.0	< 5	< 5	< 5	9	

Historical Groundwater Quality Data - MW15-12

Sample Location / Sample ID / Property Location / Laboratory ID / Sample Date			Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-4 MW15-4 CPU Property 1544375-02 29/10/2015	MW15-4 MW15-4 CPU Property 1623214-04 5/31/2016	MW15-4 MW15-4 CPU Property 1645002-04 10/28/2016	MW15-4 MW15-4 CPU Property 1718037-04 4/28/2017	MW15-4 CPU Property 10/26/2017	MW15-4 MW15-4 CPU Property 1822570-04 5/31/2018	MW15-4 MW15-4 CPU Property 1846213-01 11/13/2018	MW15-4 MW15-4 CPU Property 1922365-04 5/29/2019	MW15-4 MW15-4 CPU Property 1943543-04 10/24/2019	MW15-4 MW15-4 CPU Property 2021397-04 5/22/2020	MW15-4 DUP-2 CPU Property 2021397-05 5/22/2020	MW15-4 MW15-4 CPU Property 2043549-04 10/22/2020	MW15-4 CPU Property 5/31/2021	MW15-4 MW15-4 CPU Property 2151099-01 12/13/2021		
Parameters	**RDL**	**RL**																		
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.5	7.5	7.5	7.2		7.6	7.4	7.6	7.3	7.5	7.6	7.4		7.4		
Alkalinity (CaCO3)	5	-	-	-	578	487	623	556		524	672	562	593	549	550	622		695		
Ammonia	0.01	-	-	4.524	3.41	2.84	2.95	3.2		3.63	2.8	3	2.95	1.94	1.91	3.46		2.96		
Conductivity (µS/cm)	5	-	-	-	1920	1550	1840	2200		2670	1700	2890	1800	2190	2230	2030		2530		
Chloride	1	1	2300	-	146	103	117	201		300	119	488	123	229	225	184		321		
Nitrate (N)	0.1	0.1	-	-	< 0.1	< 0.1	< 0.1	< 0.1	Insufficient	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	Insufficient	< 0.1		
Sulphate	1	-	-	-	306	230	268	502	Water to Sample	564	207	405	249	445	439	259	Water to Sample	305		
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 2		< 2	3	< 2	< 2	< 2	< 2	< 2		5		
Chemical Oxygen Demand (COD)	10	-	-	-	20	32	31	32		27	27	17	11	15.0	19.0	50.0		31		
Dissolved Organic Carbon	0.5	-	-	-	3.6	5.6	9.7	8.3		7.1	5.6	4.6	7.0	36.2	48.5	18.7		9.1		
Hardness	-	-	-	-	-	590	788	983		953	871	1040	578	916	921	806		859		
Total Dissolved Solids	10	-	-	-	1150	956	1080	1540		1820	1130	1960	1140	1430	1430	1280		1740		
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25		< 25	< 25	< 25	< 25	< 25	< 25	< 25		< 25		
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100		< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100		< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100		< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Fluoranthene	0.01	0.4	130	-	0.04	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Methylnaphthalene, 1-[b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Methylnaphthalene, 2-[b]	0.05	2		-	0.07	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Naphthalene	0.05	2	1400	-	0.2	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Pyrene	0.01	0.2	68	-	0.05	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	0.6	< 0.5	< 0.5	2.2		< 0.5	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		
Arsenic	1	1	1900	-	10	3	5	2		2	< 1	2	< 1	1.0	1.0	2		< 1		
Barium	1	2	29000	-	146	59	189	49		82	125	87	150	76	73	167		-		
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		-		
Boron	10	10	45000	-	101	64	91	77		94	86	79	50	64	64	85		78		
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Calcium	100	-	-	-	217000	186000	254000	318000		298000	283000	326000	177000	285000	288000	255000		267000		
Chromium	1	10	810	-	< 1	2	7	< 1		< 1	< 1	< 1	1	< 1	< 1	< 1		< 1		
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10		< 10	< 10	< 10	< 10	< 10	< 10	< 10		< 10		
Cobalt	0.5	1	66	-	1.6	0.8	0.6	2.4		1.2	0.5	1.8	2.7	1.2	1.2	1.1		0.7		
Copper	0.5	5	87	-	< 0.5	1.6	< 0.5	0.6		0.8	7.8	0.7	7.9	1.3	0.9	3.8		0.6		
Iron	100	-	-	24240	16800	7720	10700	10500		21000	112	14200	< 100	13500.0	13400.0	10800		11600		
Lead	0.1	1	25	-	1.2	0.3	< 0.1	0.3		0.2	0.2	0.3	< 0.1	0.2	0.2	0.1		0.3		
Magnesium	200	-	-	-	36600	30500	37400	46100		50800	39800	55600	33200	49600	49400	41200		46400		
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Molybdenum	0.5	0.5	9200	-	6.2	1.7	3.3	1.5		1.8	1.7	2.1	1.7	1.2	1.2	1.9		1.5		
Nickel	1	1	490	-	5	7	2	6		4	2	4	14	3.0	3.0	3		2		
Selenium	1	5	63	-	< 1	< 1	< 1	< 1		< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1		
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Sodium	200	5000	2300000	-	146000	9980	135000	156000		242000	108000	307000	930000	136000	135000	130000		166000		
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Uranium	0.1	2	420	-	1.8	1	1	1.2		0.8	0.7	1	5.3	1.0	1.0	0.7		0.7		
Vanadium	0.5	0.5	250	-	< 0.5	6	4.8	< 0.5		< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5		< 0.5		
Zinc	5	5	1100	-	74	77	12	398		303	68	228	< 5	213.0	213.0	99		55		

Historical Groundwater Quality Data - MW15-12

Sample Location Sample ID Property Location Laboratory ID Sample Date			Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-5 MW15-5 CPU Property 1545012-08 30/10/2015	MW15-5 MW15-5 CPU Property 1623214-05 5/31/2016	MW15-5 MW15-5 CPU Property 1645002-05 10/28/2016	MW15-5 MW15-5 CPU Property 1718037-05 4/28/2017	MW15-5 MW15-5 CPU Property 1743465-02 10/26/2017	MW15-5 MW15-5 CPU Property 1822387-01 5/30/2018	MW15-5 MW15-5 CPU Property 1846110-04 11/12/2018	MW15-5 MW15-5 CPU Property 1922365-05 5/29/2019	MW15-5 MW15-5 CPU Property 1943444-01 10/23/2019	MW15-5 MW15-5 CPU Property 2021190-01 5/20/2020	MW15-5 DUP-1 CPU Property 2021190-05 5/20/2020	MW15-5 MW15-5 CPU Property 2043258-01 10/20/2020	MW15-5 DUP-1 CPU Property 2043258-11 10/20/2020	MW15-5 MW15-5 CPU Property 2123129-04 5/31/2021	MW15-5 MW15-5 CPU Property 2150402-02 12/8/2021	
Parameters	**RDL**	**RL**																		
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.8	7.4	7.4	7.2	7.6	7.4	7.3	7.6	7.5	7.3	7.5	7.3	7.4	7.6	7.9	
Alkalinity (CaCO3)	5	-	-	-	236	442	516	475	400	438	454	355	325	390	392	341	345	403	363	
Ammonia	0.01	-	-	4.524	0.08	0.41	0.46	0.58	0.17	0.39	0.32	0.31	0.15	0.44	0.40	0.13	0.3	0.43	0.16	
Conductivity (µS/cm)	5	-	-	-	1090	2420	2070	1850	2480	1950	2280	2480	2570	1720	1950	2280	2260	1930	1890	
Chloride	1	1	2300	-	88	351	195	142	416	178	286	510	479	280	284	298	306	202	200	
Nitrate (N)	0.1	0.1	-	-	1.2	0.1	0.6	0.6	0.5	0.2	0.6	0	0.7	0.3	0.3	0.9	0.9	0.3	0.5	
Sulphate	1	-	-	-	181	329	343	402	380	395	424	225	269	333	341	446	452	266	330	
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	3	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.0	< 2	
Chemical Oxygen Demand (COD)	10	-	-	-	11	39	N/A	23	23	11	13	< 10	< 10	< 10	< 10	22.0	22.0	< 10	< 10	
Dissolved Organic Carbon	0.5	-	-	-	3.5	5.1	N/A	5.5	6.7	3.4	2	2.4	2.7	24.2	20.7	3	3.1	3.8	3.7	
Hardness	-	-	-	-	-	660	533	583	566	640	734	788	611	481	486	719	728	455	533	
Total Dissolved Solids	10	-	-	-	530	1510	1210	1260	1190	1210	1440	1570	1640	1140	1130	1510	1510	1110	1120	
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Anthracene	0.05	0.1	2.4	-	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	0.08	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	0.05	0.1	1	-	< 0.05	0.08	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	0.01	0.4	130	-	< 0.01	0.19	< 0.01	< 0.01	0.09	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	0.05	0.1	580	-	< 0.05	0.12	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Pyrene	0.01	0.2	68	-	< 0.01	0.15	< 0.01	< 0.01	0.08	0.04	< 0.01	0.02	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Barium	1	2	29000	-	96	90	130	159	120	154	157	181	156	118	116	138	136	122	121	
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Boron	10	10	45000	-	46	64	90	66	63	91	88	69	69	52	50	56	57	53	43	
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Calcium	100	-	-	-	85700	214000	177000	203000	187000	210000	240000	267000	194000	159000	160000	230000	232000	149000	177000	
Chromium	1	10	810	-	< 1	4	8	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Cobalt	0.5	1	66	-	1.5	1.4	1.3	< 0.5	0.9	1.7	1.5	1.3	0.9	0.9	0.9	0.7	0.7	1.0	0.9	
Copper	0.5	5	87	-	1.3	6.7	4.1	2.8	4.7	1.7	3.1	3.1	3.3	2.4	2.4	1.8	2.0	2.6	2.4	
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
Lead	0.1	1	25	-	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Magnesium	200	-	-	-	11300	30800	22200	18500	24000	27800	32500	29600	30900	20600	20800	34900	35900	19800	22200	
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Molybdenum	0.5	0.5	9200	-	5.2	1	< 0.5	1.5	21.3	0.6	0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Nickel	1	1	490	-	2	9	4	2	3	4	4	4	3.0	3	3	2	2	3	2.0	
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	
Sodium	200	5000	2300000	-	118000	54200	272000	215000	303000	205000	210000	267000	311000	217000	246000	187000	185000	192000	285000	
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Uranium	0.1	2	420	-	0.6	1	1	1	0.9	0.8	1	0.7	1.0	0.8	0.8	0.9	0.9	0.9	1.0	
Vanadium	0.5	0.5	250	-	< 0.5	5.8	4.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Zinc	5	5	1100	-	< 5	9	7	< 5	< 5	< 5	< 5	< 5	< 5	< 5	11	< 5	< 5	< 5	< 5	

Historical Groundwater Quality Data - MW15-12

Sample Location Sample ID Property Location Laboratory ID Sample Date			Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-6 MW15-6 CPU Property 1544375-03 29/10/2015	MW15-6 MW15-6 CPU Property 1623214-06 5/31/2016	MW15-6 MW15-6 CPU Property 1645002-06 10/28/2016	MW15-6 MW15-6 CPU Property 1736257-01 9/6/2017	MW15-6 MW15-6 CPU Property 1743465-03 10/26/2017	MW15-6 MW15-6 CPU Property 1822570-05 5/31/2018	MW15-6 MW15-6 CPU Property 1846213-02 11/13/2018	MW15-6 MW15-6 CPU Property 1922365-06 5/29/2019	MW15-6 DUP-2 CPU Property 1922365-09 5/29/2019	MW15-6 MW15-6 CPU Property 1943543-05 10/24/2019	MW15-6 MW15-6 CPU Property 2021397-06 5/22/2020	MW15-6 MW15-6 CPU Property 2043549-05 10/22/2020	MW15-6 CPU Property 5/31/2021	MW15-6 MW15-6 CPU Property 2151099-02 12/13/2021		
Parameters	**RDL**	**RL**																		
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.5	7.4	7.5	7.2	7.6	7.6	7.8	7.8	7.8	7.4	7.6	7.7		7.9		
Alkalinity (CaCO3)	5	-	-	-	241	264	299	314	334	298	357	260	261	338	289	275		268		
Ammonia	0.01	-	-	4.524	0.16	0.16	0.02	0.03	0.04	0.05	0.13	0.06	0.06	0.05	0.09	0.21		0.37		
Conductivity (µS/cm)	5	-	-	-	5120	5210	5810	5480	6370	5150	2640	3550	3680	5530	6170	4020		1510		
Chloride	1	1	2300	-	1410	1400	1740	1630	1870	1400	582	1020	955	1470	2040	941		270		
Nitrate (N)	0.1	0.1	-	-	4.1	6.2	4.1	3.1	3.8	2.9	1.5	3	4	3.0	3.2	2.1	Insufficient	0.6		
Sulphate	1	-	-	-	380	499	450	446	442	252	162	204	190	309	234	191	Water to Sample	51		
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 2	< 2	5	< 2	< 2	4	< 2	< 2	< 2		5		
Chemical Oxygen Demand (COD)	10	-	-	-	29	40	31	45	< 10	22	35	< 10	11	19.0	46.0	31.0		33		
Dissolved Organic Carbon	0.5	-	-	-	0.8	2.3	2.7	2.1	4.2	1.2	1.2	< 0.5	0.8	4.1	97.7	6		10.3		
Hardness	-	-	-	-	-	1160	913	1090	867	849	193	503	501	476	820	372		84.6		
Total Dissolved Solids	10	-	-	-	3400	3400	3250	3750	3770	3230	1370	2180	2120	3110	3540	2210		832		
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	1.3	1.3	< 0.5	0.7	0.6	0.9	< 0.5	1.6	< 0.5	0.5	< 0.5		< 0.5		
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25		< 25		
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Naphthalene	0.05	2	1400	-	0.19	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05		
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5		
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1		
Barium	1	2	29000	-	232	135	180	195	219	131	34	63	64	133	165	73		-		
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		-		
Boron	10	10	45000	-	56	36	62	76	60	54	29	38	42	56	34	35		18		
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Calcium	100	-	-	-	345000	380000	305000	356000	296000	275000	65300	159000	161000	153000	256000	120000		28600		
Chromium	1	10	810	-	< 1	8	9	1	< 1	< 1	1	< 1	3	< 1	< 1	2		< 1		
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		< 10		
Cobalt	0.5	1	66	-	0.8	0.7	1.7	2.4	3.0	< 0.5	0.9	< 0.5	< 0.5	0.6	1.3	0.8		< 0.5		
Copper	0.5	5	87	-	1.7	11.9	5	3.1	3.8	2.1	9.3	11.5	13.2	4.1	2.0	7.2		10.8		
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100		
Lead	0.1	1	25	-	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Magnesium	200	-	-	-	45900	52000	36900	48700	31100	39200	7130	26000	24300	23000	44100	17400		3220		
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Molybdenum	0.5	0.5	9200	-	1.6	< 0.5	< 0.5	0.9	1.1	1.1	2.5	2.1	2.2	2.3	1.5	4.8		8.2		
Nickel	1	1	490	-	3	11	8	19	20	2	4	2	4	4.0	3	3		7.0		
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1	2	< 1	2	1	< 1	< 1	< 1		< 1		
Silver	0.1	0.3	1.5	-	0.4	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Sodium	200	5000	2300000	-	656000	64100	893000	769000	1040000	683000	451000	571000	603000	274000	1020000	697000		325000		
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1		
Uranium	0.1	2	420	-	2.2	2.9	3.1	4.8	4.4	3.4	2.4	1.9	2.0	0.9	3.8	4.7		2.5		
Vanadium	0.5	0.5	250	-	< 0.5	1.8	2	< 0.5	< 0.5	< 0.5	< 0.5	0.5	0.5	0.5	0.5	0.9		< 0.5		
Zinc	5	5	1100	-	6	5	< 5	10	< 5	6	6	6	8	< 5	< 5	< 5		10		

Historical Groundwater Quality Data - MW15-12

Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-7 MW15-7 CPU Property 1544375-04 29/10/2015	MW15-7 MW15-7 CPU Property 1623214-07 5/31/2016	MW15-7 DUP-2 CPU Property 1623214-13 5/31/2016	MW15-7 MW15-7 CPU Property 1645002-07 10/28/2016	MW15-7 MW15-7 CPU Property 1718037-06 4/28/2017	MW15-7 MW15-7 CPU Property 1743465-04 10/26/2017	MW15-7 MW15-7 CPU Property 1822570-06 5/31/2018	MW15-7 MW15-7 CPU Property 1846110-05 11/12/2018	MW15-7 DUP-1 CPU Property 1846110-11 11/12/2018	MW15-7 MW15-7 CPU Property 1922365-07 5/29/2019	MW15-7 MW15-7 CPU Property 1943543-06 10/24/2019	MW15-7 DUP-2 CPU Property 1943543-07 10/24/2019	MW15-7 MW15-7 CPU Property 2021315-01 5/21/2020	MW15-7 MW15-7 CPU Property 2043258-02 10/20/2020	MW15-7 MW15-7 CPU Property 2122544-01 5/31/2021	MW15-7 MW15-7 CPU Property 2150402-03 12/8/2021
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.6	7.4	7.4	7.5	7.2	7.6	7.4	7.4	7.4	7.4	7.2	7.2	7.7	7.4	7.4	7.8
Alkalinity (CaCO3)	5	-	-	-	362	355	357	373	387	389	400	422	423	349	345	345	388	389	414	430.5
Ammonia	0.01	-	-	4.524	0.18	0.34	0.22	0.04	0.08	0.04	0.07	0.04	0.32	0.05	0.07	0.06	0.06	0.83	0.04	0.025
Conductivity (µS/cm)	5	-	-	-	1960	2130	2110	2030	2400	1710	2790	2110	2080	3200	2310	2250	1870	1610	2260	1755
Chloride	1	1	2300	-	182	235	237	291	473	236	581	394	373	795	445	440	405	207	341	220.5
Nitrate (N)	0.1	0.1	-	-	15.4	8.3	8	1.9	2.8	1.4	2.9	1	1	5	1.6	1.6	2.4	2.2	2.8	2.6
Sulphate	1	-	-	-	381	410	406	256	220	177	153	157	156	175	138	138	181	115	163	143.5
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.0	< 2
Chemical Oxygen Demand (COD)	10	-	-	-	27	18	19	< 10	25	37	13	21	< 10	28	13.0	17.0	18.0	29.0	< 10	< 10
Dissolved Organic Carbon	0.5	-	-	-	2.4	4.7	3.9	3	6	4.1	5.2	0.9	1.8	7.5	6.0	5.5	22.3	4.1	4.1	3.9
Hardness	-	-	-	-	-	799	816	736	839	520	649	555	557	823	477	78	475	352	483	477.5
Total Dissolved Solids	10	-	-	-	1200	1410	1380	1170	1600	954	1650	1160	1160	2080	1210	1250	1120	890	1310	948
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	0.05	0.1	2.4	-	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	0.01	0.4	130	-	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	0.05	2	1400	-	0.23	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	0.05	0.1	580	-	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	0.01	0.2	68	-	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.3	< 0.5	< 0.5	< 0.5	< 0.5
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	6.0	< 1	< 1	< 1	< 1
Barium	1	2	29000	-	139	93	92	114	121	102	164	119	108	249	131	25	105	95	126	118.5
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	10	10	45000	-	64	48	48	58	52	54	66	52	52	47	56	28	34	42	37	38.5
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Calcium	100	-	-	-	218000	270000	275000	245000	289000	176000	218000	178000	180000	268000	153000	22700	156000	116000	157000	160000
Chromium	1	10	810	-	< 1	4	3	10	< 1	< 1	< 1	< 1	< 1	< 1	< 1	2.0	< 1	< 1	< 1	< 1
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cobalt	0.5	1	66	-	3.5	0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.6	0.6	< 0.5	< 0.5	< 0.5	< 0.5
Copper	0.5	5	87	-	2.6	4.2	4.2	49.4	1.8	2.5	2.9	2.3	2.3	4	3.6	2.9	3.2	2.5	2.9	2.95
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	715.0	< 100	< 100	< 100	133
Lead	0.1	1	25	-	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	2.4	< 0.1	< 0.1	< 0.1	< 0.1
Magnesium	200	-	-	-	25600	30500	31400	30100	28600	19500	25600	26500	26100	37300	23000	5070	20800	15500	22100	18850
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	0.5	0.5	9200	-	4.7	0.9	1.1	< 0.5	0.9	0.8	3.4	< 0.5	< 0.5	11.6	2.3	4.2	4.5	2	1.6	0.65
Nickel	1	1	490	-	6	8	8	3	1	2	1	2	2	1	4.0	2.0	1	2	1	50.0
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver	0.1	0.3	1.5	-	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.2
Sodium	200	5000	2300000	-	151000	13600	13900	166000	198000	131000	326000	198000	200000	340000	274000	29100	264000	176000	244000	224000
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Uranium	0.1	2	420	-	1.1	1.2	1.1	0.6	0.9	0.6	0.9	0.9	0.9	1.3	0.9	0.4	0.9	0.7	1	0.85
Vanadium	0.5	0.5	250	-	< 0.5	4.1	2.9	3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.9	0.5	3.6	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	5	5	1100	-	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	8.0	< 5	< 5	< 5	24.5

Historical Groundwater Quality Data - MW15-12

Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-8 MW15-8 CPU Property 1545012-09 30/10/2015	MW15-8 MW15-8 CPU Property 1623214-08 5/31/2016	MW15-8 MW15-8 CPU Property 1645002-08 10/28/2016	MW15-8 MW15-8 CPU Property 1718037-07 4/28/2017	MW15-8 MW15-8 CPU Property 1743566-01 10/27/2017	MW15-8 CPU Property 5/31/2018	MW15-8 MW15-8 CPU Property 1846213-03 11/13/2018	MW15-8 DUP-2 CPU Property 1846213-08 11/13/2018	MW15-8 CPU Property 5/29/2019	MW15-8 MW15-8 CPU Property 1943444-02 10/23/2019	MW15-8 MW15-8 CPU Property 2021190-02 5/20/2020	MW15-8 MW15-8 CPU Property 2043258-03 10/20/2020	MW15-8 MW15-8 CPU Property 2122544-02 5/31/2021	MW15-8 MW15-8 CPU Property 2149456-03 12/2/2021		
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.8	7.7	7.8	7.5	7.6	Well Damaged - Could Not be Sampled	7.7	7.7	Well Could Not be Found	7.7	7.5	7.6	7.7	7.7		
Alkalinity (CaCO3)	5	-	-	-	280	360	218	390	307		344	344		307	407	292	394	303		
Ammonia	0.01	-	-	4.524	0.23	0.32	0.01	0.2	0.1		0.02	0.25		0.04	0.07	0.18	0.06	0.01		
Conductivity (µS/cm)	5	-	-	-	1020	1420	1000	1450	1460		1160	1160		1660	1680	1510	1460	1060		
Chloride	1	1	2300	-	84	158	108	136	203		156	156		246	304	234	166	116		
Nitrate (N)	0.1	0.1	-	-	0.6	0.9	0.9	1.4	1.6		0.6	0.6		1.6	1	1.1	0.3	0.8		
Sulphate	1	-	-	-	126	170	140	220	211		80	80		147	162	134	84	61		
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	3	< 2	< 2		< 2	< 2		< 2	< 2	< 2	< 2.0	< 2		
Chemical Oxygen Demand (COD)	10	-	-	-	10	< 10	21	16	23		12	24		< 10	< 10	< 10	< 10	< 10		
Dissolved Organic Carbon	0.5	-	-	-	3	2.2	5.1	2.7	3.1		0.6	< 0.5		2.1	22.8	2.2	2.6	2		
Hardness	-	-	-	-	-	413	309	555	349		317	323		453	548	389	375	257		
Total Dissolved Solids	10	-	-	-	552	830	522	902	876		632	626		948	1140	876	790	592		
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25		< 25	< 25		< 25	< 25	< 25	< 25	< 25		
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100		< 100	< 100		< 100	< 100	< 100	< 100	< 100		
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100		< 100	< 100		< 100	< 100	< 100	< 100	< 100		
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100		< 100	< 100		< 100	< 100	< 100	< 100	< 100		
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Anthracene	0.05	0.1	2.4	-	0.02	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	0.01	0.2	4.7	-	0.12	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	0.01	0.01	0.81	-	0.1	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	0.01	0.1	0.75	-	0.16	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	0.06	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	0.05	0.1	0.4	-	0.1	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Chrysene	0.05	0.1	1	-	0.1	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Fluoranthene	0.01	0.4	130	-	0.22	0.08	0.12	< 0.01	< 0.01		< 0.01	< 0.01		0.03	< 0.01	0.04	0.05	< 0.01		
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	0.07	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Naphthalene	0.05	2	1400	-	0.19	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Pyrene	0.01	0.2	68	-	0.19	0.07	0.11	< 0.01	< 0.01		< 0.01	< 0.01		0.03	< 0.01	0.03	0.05	< 0.01		
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1		< 1	< 1		< 1	< 1	< 1	< 1	< 1		
Barium	1	2	29000	-	58	89	63	105	78		56	57		97	98	73	70	57		
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Boron	10	10	45000	-	30	38	29	42	50		38	37		44	33	28	33	31		
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Calcium	100	-	-	-	73800	128000	98200	183000	110000		98200	99800		136000	172000	117000	117000	81700		
Chromium	1	10	810	-	< 1	2	6	< 1	< 1		< 1	< 1		< 1	< 1	< 1	< 1	< 1		
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10		< 10	< 10		< 10	< 10	< 10	< 10	< 10		
Cobalt	0.5	1	66	-	1.6	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Copper	0.5	5	87	-	1.8	4.2	3.8	1.2	2.1		1.8	2.0		2.9	2.3	1.4	3.2	1.7		
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100		< 100	< 100		< 100	< 100	< 100	< 100	< 100		
Lead	0.1	1	25	-	0.2	0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Magnesium	200	-	-	-	12700	22600	15400	23900	18100		17600	17900		27800	29000	23600	20200	12800		
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Molybdenum	0.5	0.5	9200	-	7.2	0.7	2.3	< 0.5	0.8		0.7	0.7		0.5	< 0.5	< 0.5	0.5	0.7		
Nickel	1	1	490	-	1	5	< 1	1	1		< 1	1		3	1	< 1	1	< 1		
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1		< 1	< 1		< 1	< 1	< 1	< 1	< 1		
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1		< 0.1	0.2	< 0.1	< 0.1	< 0.1		
Sodium	200	5000	2300000	-	121000	12800	102000	104000	134000		117000	118000		161000	194000	146000	117000	95100		
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Uranium	0.1	2	420	-	0.6	0.9	0.3	0.9	0.6		0.4	0.5		0.7	0.8	0.5	0.7	0.5		
Vanadium	0.5	0.5	250	-	< 0.5	2.7	1.6	< 0.5	< 0.5		< 0.5	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Zinc	5	5	1100	-	18	13	< 5	8	8		< 5	< 5		< 5	5	< 5	7	< 5		

Historical Groundwater Quality Data - MW15-12

Sample Location / Sample ID / Property Location / Laboratory ID / Sample Date			Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-9 MW15-9 CPU Property 1544375-05 29/10/2015	MW15-9 MW15-9 CPU Property 1623214-09 5/31/2016	MW15-9 MW15-9 CPU Property 1644414-01 10/27/2016	MW15-9 MW15-9 CPU Property 1718037-08 4/28/2017	MW15-9 DUP-1 CPU Property 1718037-11 4/28/2017	MW15-9 MW15-9 CPU Property 1743566-02 10/26/2017	MW15-9 DUP-2 CPU Property 1743566-06 10/26/2017	MW15-9 MW15-9 CPU Property 1822570-07 5/31/2018	MW15-9 MW15-9 CPU Property 1846213-04 11/13/2018	MW15-9 MW15-9 CPU Property 1922365-08 5/29/2019	MW15-9 MW15-9 CPU Property 1943444-03 10/23/2019	MW15-9 DUP-1 CPU Property 1943444-07 10/23/2019	MW15-9 MW15-9 CPU Property 2021315-02 5/21/2020	MW15-9 MW15-9 CPU Property 2043549-06 10/22/2020	MW15-9 MW15-9 CPU Property 2122544-03 5/28/2021	MW15-9 MW15-9 CPU Property 2151181-01 12/14/2021
Parameters	**RDL**	**RL**																			
General Inorganic Parameters (mg/L)																					
pH (pH units)	0.1	-	-	-	7.8	7.8	7.6	7.4	7.5	7.9	7.9	7.8	7.8	7.9	7.8	7.8	7.8	7.6	7.7	7.8
Alkalinity (CaCO3)	5	-	-	-	223	246	252	285	284	302	302	270	372	247	268	268	257	275	268	229
Ammonia	0.01	-	-	4.524	0.06	0.1	0.03	0.32	0.27	0.03	0.04	0.06	0.03	0.05	0.03	0.04	0.01	0.15	0.1	0.04
Conductivity (µS/cm)	5	-	-	-	2190	2440	2540	7590	7470	2420	2450	2880	2060	2060	3220	3230	5700	3690	6330	6270
Chloride	1	1	2300	-	324	291	416	2150	2130	358	361	592	300	354	587	589	1810	800	1610	1710
Nitrate (N)	0.1	0.1	-	-	3	4.9	2.9	3.9	3.7	2.9	2.9	3.9	2.2	4	3.7	3.7	4.4	2.6	3.8	0.4
Sulphate	1	-	-	-	474	575	503	896	863	502	525	323	313	342	495	503	588	419	376	138
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 20	< 20	< 2	< 2	< 2	< 2	4	< 2	< 2	< 2	< 2	< 2.0	< 2
Chemical Oxygen Demand (COD)	10	-	-	-	< 10	14	< 10	115	108	< 10	< 10	18	21	11	< 10	< 10	40.0	17.0	30.0	57.0
Dissolved Organic Carbon	0.5	-	-	-	1.2	1.5	2.4	3.6	3.9	3.9	2.9	0.8	1.5	0.9	2.6	4.4	12.6	3.2	2.4	4.8
Hardness	-	-	-	-	-	745	660.21	2000	2050	-	-	600	341	519	687	687	1080	797	1160	291
Total Dissolved Solids	10	-	-	-	1370	1620	1670	5370	5500	1520	1540	1760	1190	1300	1990	1980	3550	2250	3840	3510
Volatile Organic Compounds (µg/L)																					
Chloroform	0.5	1	240 [c]	22	< 0.5	1.4	< 0.5	< 0.5	< 0.5	0.8	0.7	0.6	0.6	1.6	< 0.5	< 0.5	1.6	< 0.5	< 0.5	< 0.5
Petroleum Hydrocarbons (µg/L)																					
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Polynuclear Aromatic Hydrocarbons (µg/L)																					
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Metals (µg/L)																					
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	1	2	29000	-	67	50	76	90	93	39	39	79	45	36	89	86	47	164	93	64
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	10	10	45000	-	51	49	83	100	109	61	54	57	53	58	71	73	24	45	39	31
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Calcium	100	-	-	-	180000	227000	218000	647000	663000	-	-	184000	105000	156000	212000	212000	327000	253000	354000	91800
Chromium	1	10	810	-	< 1	4	7	1	1	< 1	< 1	< 1	2	< 1	1.0	1.0	< 1	< 1	< 1	< 1
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cobalt	0.5	1	66	-	2.4	4.1	3	< 0.5	< 0.5	6.1	6.0	1.7	1.7	3.6	3.0	3.0	< 0.5	1.5	< 0.5	0.9
Copper	0.5	5	87	-	1.9	4.7	7.2	1.2	1.1	4.9	4.9	1.7	3.4	9	3.6	3.2	1.9	3.1	1.8	4.1
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	-	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Lead	0.1	1	25	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Magnesium	200	-	-	-	26500	43400	28100	93800	96500	-	-	34100	19200	24300	37900	37900	64700	40200	66800	15100
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	0.5	0.5	9200	-	8.3	6.3	6	7.2	7.1	6.6	6.6	6.4	8.4	7.2	10.4	10.5	6.2	7.3	12.2	17.5
Nickel	1	1	490	-	6	19	10	3	3	26	26	10	7	19	13.0	13.0	1	6	2	3.0
Selenium	1	5	63	-	< 1	1	< 1	1	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver	0.1	0.3	1.5	-	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1	0.2	< 0.1
Sodium	200	5000	2300000	-	256000	25400	307000	968000	977000	322000	298000	372000	347000	279000	477000	478000	772000	467000	726000	1020000
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Uranium	0.1	2	420	-	2.1	2.6	2.7	4.9	5	3.6	3.6	2.1	2.7	2.0	4.0	3.9	2.2	2.5	3.1	1.2
Vanadium	0.5	0.5	250	-	< 0.5	1.3	5.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	5	5	1100	-	7	16	< 5	< 5	< 5	6	< 5	< 5	< 5	< 5	5.0	< 5	< 5	< 5	< 5	81

Historical Groundwater Quality Data - MW15-12

Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-10 MW15-10 CPU Property 1544375-06 29/10/2015	MW15-10 MW15-10 CPU Property 1623214-10 5/31/2016	MW15-10 MW15-10 CPU Property 1644414-02 10/27/2016	MW15-10 MW15-10 CPU Property 1725040-01 6/16/2017	MW15-10 MW15-10 CPU Property 1743566-03 10/27/2017	MW15-10 MW15-10 CPU Property 1822387-02 5/30/2018	MW15-10 MW15-10 CPU Property 1846213-05 11/13/2018	MW15-10 MW15-10 CPU Property 1922264-08 5/28/2019	MW15-10 MW15-10 CPU Property 1943444-04 10/23/2019	MW15-10 MW15-10 CPU Property 2021315-03 5/21/2020	MW15-10 MW15-10 CPU Property 2043258-04 10/20/2020	MW15-10 CPU Property 5/28/2021	MW15-10 MW15-10 CPU Property 2150402-04 12/8/2021			
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.7	7.2	6.8	6.9	7	7.3	7.3	7.3	7.6	7.5	7.2		7.7			
Alkalinity (CaCO3)	5	-	-	-	153	212	277	310	345	406	389	400	256	402	232		392			
Ammonia	0.01	-	-	4.524	0.32	0.55	1.18	< 0.01	0.07	0.06	0.09	0.08	0.09	0.04	0.05		0.23			
Conductivity (µS/cm)	5	-	-	-	3860	7980	7740	6760	3970	3500	2950	2570	1250	2350	976		1720			
Chloride	1	1	2300	-	1060	**2410**	2250	1950	994	661	553	394	112	374	58		93			
Nitrate (N)	0.1	0.1	-	-	0.7	1.6	0.5	1.3	1.7	1.3	1	2	0.9	1.2	0.2	Insufficient	0.6			
Sulphate	1	-	-	-	154	390	513	667	436	443	387	454	190	415	173	Water to Sample	375			
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 20	< 12	< 2	< 2	< 2	ND (4)	2.0	< 2	< 2		< 2			
Chemical Oxygen Demand (COD)	10	-	-	-	61	113	113	119	63	77	50	95	59.0	70.0	88.0		36			
Dissolved Organic Carbon	0.5	-	-	-	6.1	7.3	15	19.1	18.7	27.8	12.8	30.3	19.2	50.8	15.8		15.9			
Hardness	-	-	-	-	-	1390	1255.79	1360	573	643	501	477	271	385	224		498			
Total Dissolved Solids	10	-	-	-	2440	5380	5170	4740	2370	2090	1750	1670	742	1360	570		1090			
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5			
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25		< 25			
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100			
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100			
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100			
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Anthracene	0.05	0.1	2.4	-	0.09	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01			
Benzo(a)anthracene	0.01	0.2	4.7	-	0.3	< 0.01	< 0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01			
Benzo(a)pyrene	0.01	0.01	0.81	-	0.26	< 0.01	< 0.01	0.06	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01			
Benzo(b)fluoranthene	0.01	0.1	0.75	-	0.35	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	0.16	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Benzo(k)fluoranthene	0.05	0.1	0.4	-	0.13	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Chrysene	0.05	0.1	1	-	0.31	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	0.06	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Fluoranthene	0.01	0.4	130	-	0.69	< 0.01	< 0.01	0.06	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01			
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	0.14	< 0.05	< 0.05	0.07	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Naphthalene	0.05	2	1400	-	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Phenanthrene	0.05	0.1	580	-	0.46	< 0.05	< 0.05	0.06	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05			
Pyrene	0.01	0.2	68	-	0.56	< 0.01	< 0.01	0.06	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01			
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5			
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1			
Barium	1	2	29000	-	276	225	329	457	113	80	43	56	32	47	79		70			
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5			
Boron	10	10	45000	-	31	19	51	47	41	57	41	33	32	24	22		36			
Cadmium	0.1	0.5	2.7	-	0.1	0.5	0.4	0.7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1			
Calcium	100	-	-	-	177000	452000	409000	451000	189000	212000	158000	153000	84000	124000	72200		163000			
Chromium	1	10	810	-	< 1	6	14	1	< 1	< 1	< 1	1	< 1	1	< 1		< 1			
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		< 10			
Cobalt	0.5	1	66	-	1.5	1.7	1.2	1.7	0.7	1.0	0.7	1.1	< 0.5	< 0.5	< 0.5		0.8			
Copper	0.5	5	87	-	4.8	16.3	10	6.5	4.9	7.1	7.1	11.4	7.6	9.4	4.8		5.4			
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		< 100			
Lead	0.1	1	25	-	0.1	0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.1			
Magnesium	200	-	-	-	26500	63900	56900	55900	24400	27800	25900	23300	14900	18100	10700		22100			
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1			
Molybdenum	0.5	0.5	9200	-	6.7	< 0.5	1.2	0.7	< 0.5	< 0.5	0.5	< 0.5	0.9	< 0.5	< 0.5		< 0.5			
Nickel	1	1	490	-	3	15	7	3	4	6	4	7	2.0	2	1		166			
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		< 1			
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1			
Sodium	200	5000	2300000	-	472000	105000	1080000	1140000	576000	546000	452000	399000	149000	403000	102000		254000			
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1			
Uranium	0.1	2	420	-	4.2	1.4	2.8	2.6	1.9	1.5	1.6	1.8	1.0	1.5	1		2.6			
Vanadium	0.5	0.5	250	-	0.7	1	7.7	0.5	< 0.5	< 0.5	< 0.5	0.7	0.9	0.6	< 0.5		0.7			
Zinc	5	5	1100	-	8	8	19	6	< 5	< 5	< 5	6	8.0	< 5	6		55			

Historical Groundwater Quality Data - MW15-12

Sample Location / Sample ID / Property Location / Laboratory ID / Sample Date			Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-11 MW15-11 CPU Property 1544375-07 29/10/2015	MW15-11 DUP-1 CPU Property 1544375-09 29/10/2015	MW15-11 MW15-11 CPU Property 1623214-11 5/31/2016	MW15-11 MW15-11 CPU Property 1644414-03 10/27/2016	MW15-11 MW15-11 CPU Property 1718037-09 4/28/2017	MW15-11 MW15-11 CPU Property 1743566-04 10/27/2017	MW15-11 MW15-11 CPU Property 1822387-03 5/30/2018	MW15-11 MW15-11 CPU Property 1846213-06 11/13/2018	MW15-11 MW15-11 CPU Property 1922264-07 5/28/2019	MW15-11 MW15-11 CPU Property 1943444-05 10/23/2019	MW15-11 MW15-11 CPU Property 2021190-03 5/20/2020	MW15-11 MW15-11 CPU Property 2043258-05 10/20/2020	MW15-11 MW15-11 CPU Property 2122544-04 5/28/2021	MW15-11 MW15-11 CPU Property 2150402-05 12/8/2021		
Parameters	**RDL**	**RL**																		
General Inorganic Parameters (mg/L)																				
pH (pH units)	0.1	-	-	-	7.9	7.9	7.9	7.6	7.5	7.7	7.8	7.7	7.7	7.8	7.8	7.7	7.8	8.0		
Alkalinity (CaCO3)	5	-	-	-	296	298	257	300	277	325	307	320	288	291	260	295	258	292		
Ammonia	0.01	-	-	4.524	0.02	0.03	0.1	< 0.01	0.03	0.06	0.03	0.09	0.02	0.10	0.09	0.12	0.05	0		
Conductivity (µS/cm)	5	-	-	-	1330	1290	1270	1430	2660	1590	1280	1300	1840	1530	1180	1490	1500	1400		
Chloride	1	1	2300	-	201	199	158	197	603	271	168	193	375	260	269	261	222	217		
Nitrate (N)	0.1	0.1	-	-	1	1	1.1	1.3	1.3	1.5	0.7	1	1	1.1	0.7	1	0.5	1		
Sulphate	1	-	-	-	77	76	139	132	242	133	113	89	144	89	92	84	67	74		
Biological Oxygen Demand (BOD)	2	-	-	-	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.0	< 2		
Chemical Oxygen Demand (COD)	10	-	-	-	< 10	14	11	< 10	21	12	< 10	< 10	< 10	17.0	< 10	< 10	< 10	< 10		
Dissolved Organic Carbon	0.5	-	-	-	1.8	1.7	1.5	2.2	2.6	3.4	1.5	< 0.5	1.0	18.2	6.2	2.5	1.8	7.7		
Hardness	-	-	-	-	-	-	326	376.51	685	345	319	355	466	386	306	332	310	320		
Total Dissolved Solids	10	-	-	-	740	678	688	758	1610	874	660	682	1070	820	674	804	764	726		
Volatile Organic Compounds (µg/L)																				
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Petroleum Hydrocarbons (µg/L)																				
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25		
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
Polynuclear Aromatic Hydrocarbons (µg/L)																				
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Anthracene	0.05	0.1	2.4	-	< 0.05	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Fluoranthene	0.01	0.4	130	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Naphthalene	0.05	2	1400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05		
Pyrene	0.01	0.2	68	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Metals (µg/L)																				
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Barium	1	2	29000	-	118	116	89	107	205	94	98	87	160	117	82	107	96	75		
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Boron	10	10	45000	-	27	28	19	37	33	33	44	27	30	33	22	23	22	22		
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Calcium	100	-	-	-	115000	109000	97600	116000	218000	106000	96900	106000	141000	116000	92800	101000	94000	102000		
Chromium	1	10	810	-	< 1	< 1	4	7	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		
Cobalt	0.5	1	66	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Copper	0.5	5	87	-	0.7	1.2	2.2	62.2	< 0.5	0.7	< 0.5	1.5	1	2.7	1.5	1.8	0.9	2.2		
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100		
Lead	0.1	1	25	-	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Magnesium	200	-	-	-	18800	18900	20000	21100	34000	19700	18800	21800	28000	23100	17900	19000	18400	16100		
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Molybdenum	0.5	0.5	9200	-	1.2	1.2	0.7	0.9	0.5	0.7	0.7	0.9	0.6	0.8	0.8	0.7	0.6	0.9		
Nickel	1	1	490	-	< 1	< 1	3	2	< 1	< 1	< 1	< 1	< 1	1.0	< 1	< 1	< 1	9		
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1		
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1		
Sodium	200	5000	2300000	-	134000	131000	10900	137000	297000	145000	156000	136000	181000	169000	136000	164000	125000	184000		
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Uranium	0.1	2	420	-	0.8	0.8	0.7	0.8	1	1.1	0.7	0.8	1.0	1.0	0.7	0.9	0.7	0.9		
Vanadium	0.5	0.5	250	-	< 0.5	< 0.5	1.4	5.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Zinc	5	5	1100	-	< 5	17	< 5	< 5	< 5	< 5	< 5	< 5	6	< 5	< 5	< 5	< 5	75		

Historical Groundwater Quality Data - MW15-12

Sample Location / Sample ID / Property Location / Laboratory ID / Sample Date / Parameters	RDL	RL	Full Depth Site Condition Standards - Non-Potable Groundwater (Table 3)	Property Specific Standards (as per Certificate of Property Use 0371-8TYQMY)	MW15-12 MW15-12 CPU Property 1544375-08 29/10/2015	MW15-12 MW15-12 CPU Property 1623214-12 5/31/2016	MW15-12 MW15-12 CPU Property 1644414-04 10/27/2016	MW15-12 Dup-1 CPU Property 1644414-05 10/27/2016	MW15-12 MW15-12 CPU Property 1718037-10 4/28/2017	MW15-12 MW15-12 CPU Property 1743566-05 10/27/2017	MW15-12 MW15-12 CPU Property 1822387-04 5/30/2018	MW15-12 DUP-1 CPU Property 1822387-10 5/30/2018	MW15-12 MW15-12 CPU Property 1846213-07 11/13/2018	MW15-12 MW15-12 CPU Property 1922264-06 5/28/2019	MW15-12 MW15-12 CPU Property 1943444-06 10/23/2019	MW15-12 MW15-12 CPU Property 2021190-04 5/20/2020	MW15-12 MW15-12 CPU Property 2043549-07 10/22/2020	MW15-12 MW15-12 CPU Property 2122544-05 5/28/2021	MW15-12 DUP-1 CPU Property 2122544-06 5/28/2021	MW15-12 MW15-12 CPU Property 2149456-04 12/2/2021
General Inorganic Parameters (mg/L)																					
pH (pH units)	0.1	-	-	-	7.9	7.8	7.7	7.7	7.4	7.8	7.8	7.8	7.8	7.8	8	7.7	7.8	7.8	7.8	7.5
Alkalinity (CaCO3)	5	-	-	-	246	238	278	278	256	315	306	305	302	301	244	294	262	317	319	265
Ammonia	0.01	-	-	4.524	**10.6**	1.32	0.03	0.02	0.05	0.06	0.06	0.03	0.03	0.02	0.04	0.08	0.04	0.04	0.05	0.02
Conductivity (µS/cm)	5	-	-	-	1120	2050	1050	1050	6850	1660	2530	2510	956	3960	757	4320	940	3890	3970	1690
Chloride	1	1	2300	-	105	339	112	111	1960	308	519	556	133	1060	80	1350	115	738	733	293
Nitrate (N)	0.1	0.1	-	-	0.3	1	0.2	0.2	2.0	0.4	0.4	0.3	0.2	0.8	< 0.1	1.2	< 0.1	1.3	1.3	0.9
Sulphate	1	-	-	-	184	322	104	102	938	153	165	166	34	320	11	472	30	469	462	194
Biological Oxygen Demand (BOD)	2	-	-	-	4	< 2	< 2	< 2	< 20	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.0	< 2.0	< 2
Chemical Oxygen Demand (COD)	10	-	-	-	47	< 10	< 10	< 10	81	< 10	10	10	15	18	< 10	20.0	13.0	< 10	< 10	< 10
Dissolved Organic Carbon	0.5	-	-	-	8.4	1.9	2.6	2.8	3.1	3.2	1.5	1.8	< 0.5	1.5	14.3	17.0	5.3	3.1	2.7	3.5
Hardness	-	-	-	-	-	587	248	243	1470	310	470	479	255	569	128	676	183	615	619	473
Total Dissolved Solids	10	-	-	-	672	1250	574	574	4640	944	1410	1410	524	2300	386	2670	494	2340	2300	1050
Volatile Organic Compounds (µg/L)																					
Chloroform	0.5	1	240 [c]	22	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Petroleum Hydrocarbons (µg/L)																					
PHC F1 (C6 - C10) [a]	25	25	750	-	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
PHC F2 (>C10 - C16) [a]	100	100	150	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
PHC F3 (>C16 - C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
PHC F4 (>C34) [a]	100	500	500	-	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Polynuclear Aromatic Hydrocarbons (µg/L)																					
Acenaphthene	0.05	1	600	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	0.05	1	1.8	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	0.05	0.1	2.4	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	0.01	0.2	4.7	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	0.01	0.01	0.81	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	0.01	0.1	0.75	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(g,h,i)perylene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	0.05	0.1	0.4	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	0.05	0.1	1	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	0.05	0.2	0.52	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	0.01	0.4	130	-	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	0.05	0.5	400	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3,c,d)pyrene	0.05	0.2	0.2	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 1- [b]	0.05	2	1800	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene, 2- [b]	0.05	2		-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	0.05	2	1400	-	0.16	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	0.05	0.1	580	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	0.01	0.2	68	-	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Metals (µg/L)																					
Antimony	0.5	0.5	20000	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Arsenic	1	1	1900	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barium	1	2	29000	-	89	58	60	59	145	80	78	92	45	93	30	133	33	115	116	97
Beryllium	0.5	0.5	67	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	10	10	45000	-	36	26	41	43	87	36	48	52	33	46	38	35	33	31	31	29
Cadmium	0.1	0.5	2.7	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Calcium	100	-	-	-	114000	182000	78600	76300	471000	99100	144000	147000	80200	173000	40300	205000	58000	181000	183000	150000
Chromium	1	10	810	-	1	4	5	5	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium (VI)	10	10	140	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cobalt	0.5	1	66	-	1.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Copper	0.5	5	87	-	4.3	4.1	2.2	2.4	0.8	1.3	< 0.5	< 0.5	2.0	2.2	6.5	2.5	4.8	2.7	2.7	1.5
Iron	100	-	-	24240	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Lead	0.1	1	25	-	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Magnesium	200	-	-	-	17000	32100	12500	12700	72100	15100	26700	26900	13300	33100	6660	39600	9210	39600	39400	24100
Mercury	0.1	0.1	0.29	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	0.5	0.5	9200	-	13.4	< 0.5	0.9	0.8	< 0.5	0.9	0.9	0.9	1	0.9	1.9	1.3	2.5	1	1	0.7
Nickel	1	1	490	-	1	5	1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1
Selenium	1	5	63	-	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver	0.1	0.3	1.5	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1
Sodium	200	5000	2300000	-	116000	18700	115000	109000	969000	178000	355000	354000	103000	614000	112000	852000	114000	524000	528000	138000
Thallium	0.1	0.5	510	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Uranium	0.1	2	420	-	1.7	0.6	0.4	0.4	2.6	0.8	1	1	0.5	1.9	0.6	2.3	0.6	2.4	2.3	0.7
Vanadium	0.5	0.5	250	-	1.3	1.2	5.5	5.6	< 0.5	< 0.5	< 0.5	< 0.5	0.6	< 0.5	0.8	0.6	0.7	< 0.5	< 0.5	0.5
Zinc	5	5	1100	-	18	12	7	11	< 5	< 5	< 5	< 5	< 5	< 5	6	< 5	< 5	6	< 5	< 5

Appendix F
Historical Landfill Gas Monitoring Data

Notes on Landfill Gas Monitoring Results

Relative pressure readings for October 28, 2015 monitoring taken on November 17, 2015.

masl = Metres above sea level.

mbgs = Metres below ground surface.

LEL = Lower Exposive Limit

Monitoring performed using a Landtec GEM 2000 or 5000 Landfill Gas Analyzer.

>>> = Methane over Detectable Range of the Instrument.

2.5	Percent Methane by Volume Exceeds MOE Regulation 232/98 for Landfill Property Boundary Subsurface.
1	Percent Methane by Volume Exceeds MOE Regulation 232/98 for Landfill On-Site Building or Foundation.
0.05	Percent Methane by Volume Exceeds MOE Regulation 232/98 for Landfill Off-Site Building or Foundation.

Historical Landfill Gas Monitoring Data

Monitor ID	MTM Coordinates		Ground Surface Elevation (masl)	Screen Interval (mbgs)	Geologic Media Intersected by Screen	Monitoring Date	In-Situ Measurements							Comments (Status of Landfill Gas Probes)
	Easting	Northing					Methane (CH_4)			Carbon Dioxide (%)	Oxygen (%)	Balance Gases (%)	Relative Pressure (Inches of Water)	
							% v/v		% LEL					
							Initial and/or Peak	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable		
GP15-1	368878.435	5029083.949	65.043	1.52 - 3.05	Overburden	28-Oct-15	0.1	0.1	2.0	4.8	12.0	83.1	0.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	6.2	4.3	89.5	0.0	Good Condition
						10-May-16	0.1	0.0	1.0	6.9	0.8	92.2	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	4.1	15.8	79.9	0.0	Good Condition
						4-Nov-16	0.0	0.0	0.0	8.5	4.2	86.9	0.0	Good Condition
						14-Feb-17	0.1	0.1	1.0	3.3	10.1	86.4	0.0	Good Condition
						25-Apr-17	0.0	0.0	0.0	6.4	2.8	90.7	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	7.7	12.6	79.7	0.0	Good Condition
						23-Oct-17	0.1	0.1	0.0	1.6	19.8	78.5	0.0	Good Condition
						21-Feb-18	0.0	0.0	0.0	6.0	6.0	87.9	0.0	Good Condition
						29-May-18	0.0	0.0	0.0	5.7	12.7	81.6	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	4.7	12.2	82.1	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	4.0	16.5	79.6	0.0	Good Condition
						19-Feb-19	0.1	0.0	0.0	7.7	2.1	90.2	0.0	Good Condition
						27-May-19	0.0	0.0	0.0	7.4	7.1	85.5	0.0	Good Condition
						7-Aug-19	0.0	0.0	0.0	7.0	12.6	80.2	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	5.2	11.1	83.6	0.0	Good Condition
						2-Apr-20	0.0	0.0	0.0	4.8	9.5	85.7	0.0	Good Condition
						9-Jun-20	0.0	0.0	0.0	6.2	11.3	82.5	0.0	Good Condition
						9-Sep-20	0.0	0.0	0.0	8.3	12.0	79.7	0.2	Good Condition
						30-Nov-20	0.1	0.1	0.0	10.7	0.7	88.6	0.1	Good Condition
						25-Feb-21	0.0	0.0	0.0	3.6	14.2	82.1	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	5.7	11.1	83.1	0.2	Good Condition
						26-Aug-21	0.0	0.0	0.0	7.0	13.5	79.5	-0.2	Good Condition
						1-Dec-21	0.0	0.0	0.0	8.0	6.8	85.2	0.0	Good Condition
GP15-2	368835.264	5029365.156	65.228	1.52 - 3.05	Overburden	28-Oct-15	0.0	0.0	0.0	3.1	2.9	94.0	-1.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	1.5	16.2	82.1	0.2	Good Condition
						10-May-16	0.0	0.0	0.0	1.4	14.2	84.3	1.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	3.0	6.2	90.8	0.2	Good Condition
						4-Nov-16	0.1	0.1	1.0	3.9	3.7	92.4	0.2	Good Condition
						14-Feb-17	0.0	0.0	0.0	0.5	18.1	81.4	-0.5	Good Condition
						25-Apr-17	0.0	0.0	0.0	1.0	13.6	85.4	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	3.6	7.2	88.8	0.0	Good Condition
						23-Oct-17	0.1	0.1	1.0	1.5	16.1	82.2	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Local Flooding
						29-May-18	0.0	0.0	0.0	2.5	13.4	84.0	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	3.3	8.6	88.0	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	4.7	7.2	88.1	0.0	Good Condition
						19-Feb-19	-	-	-	-	-	-	-	Could Not Locate
						27-May-19	0.0	0.0	0.0	3.0	12.3	84.7	0.6	Good Condition
						7-Aug-19	0.0	0.0	0.0	4.3	10.4	85.3	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	3.7	12.8	83.5	0.2	Good Condition
						2-Apr-20	0.0	0.0	0.0	2.6	11.6	85.8	0.0	Good Condition
						9-Jun-20	0.0	0.0	0.0	3.0	15.0	82.0	0.8	Good Condition
						9-Sep-20	0.0	0.0	0.0	5.3	8.6	86.1	2.3	Good Condition
						30-Nov-20	0.0	0.0	0.0	4.3	13.0	82.6	0.0	Good Condition
						25-Feb-21	0.2	0.2	0.0	0.7	20.1	76.8	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	2.1	17.1	81.1	0.1	Good Condition
						26-Aug-21	0.0	0.0	0.0	5.2	10.3	84.5	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.2	13.1	82.7	-3.383	Good Condition

Historical Landfill Gas Monitoring Data

Monitor ID	MTM Coordinates		Ground Surface Elevation (masl)	Screen Interval (mbgs)	Geologic Media Intersected by Screen	Monitoring Date	In-Situ Measurements							Comments (Status of Landfill Gas Probes)
	Easting	Northing					Methane (CH_4)			Carbon Dioxide (%)	Oxygen (%)	Balance Gases (%)	Relative Pressure (Inches of Water)	
							% v/v		% LEL					
							Initial and/or Peak	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable		
GP15-3	368835.685	5029306.220	65.067	1.52 - 3.05	Overburden	28-Oct-15	0.0	0.0	0.0	0.4	20.9	78.8	0.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	0.1	21.7	78.3	0.0	Good Condition
						10-May-16	0.0	0.0	0.0	0.6	19.1	80.2	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	3.0	13.7	83.1	0.0	Good Condition
						4-Nov-16	0.1	0.1	1.0	0.5	20.4	78.9	0.0	Good Condition
						14-Feb-17	0.1	0.1	1.0	0.0	21.5	78.4	0.0	Good Condition
						25-Apr-17	0.0	0.0	0.0	0.3	20.5	79.2	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	2.4	15.6	82.0	0.0	Good Condition
						23-Oct-17	0.1	0.0	0.0	0.4	20.9	78.6	0.0	Good Condition
						21-Feb-18	0.0	0.0	0.0	20.0	0.3	79.5	0.0	Good Condition
						29-May-18	0.0	0.0	0.0	1.4	17.1	81.5	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	1.6	15.1	73.9	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	0.6	21.2	78.2	0.0	Good Condition
						19-Feb-19	-	-	-	-	-	-	-	Could Not Locate
						27-May-19	0.0	0.0	0.0	0.9	19.1	80.0	0.5	Good Condition
						7-Aug-19	0.0	0.0	0.0	2.6	15.4	81.9	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	0.5	20.9	78.5	0.5	Good Condition
						2-Apr-20	0.0	0.0	0.0	0.4	20.4	79.2	0.0	Good Condition
						9-Jun-20	0.1	0.0	0.0	2.2	15.6	82.2	0.1	Good Condition
						9-Sep-20	0.0	0.0	0.0	3.3	15.6	81.1	1.2	Good Condition
						30-Nov-20	0.0	0.0	0.0	1.5	18.6	79.9	0.0	Good Condition
						25-Feb-21	0.1	0.0	0.0	2.6	17.9	79.3	0.2	Good Condition
						4-May-21	0.0	0.0	0.0	0.7	19.2	80.1	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	3.8	13.2	83.0	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	0.6	20.4	79.0	0.0	Good Condition
GP15-4	368893.417	5029339.143	-	1.52 - 3.05	Overburden	28-Oct-15	0.9	0.9	19.0	8.6	0.0	90.5	0.0	Good Condition
						23-Feb-16	0.7	0.7	13.0	6.9	0.2	92.2	0.0	Good Condition
						10-May-16	0.2	0.1	4.0	5.4	0.0	94.4	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	14.0	1.6	84.6	0.0	Good Condition
						4-Nov-16	0.3	0.2	5.0	10.5	0.0	89.1	0.0	Good Condition
						14-Feb-17	0.4	0.4	7.0	2.9	10.5	86.1	-0.2	Good Condition
						25-Apr-17	0.5	0.5	11.0	6.0	0.0	93.5	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	12.5	1.8	85.7	0.0	Good Condition
						23-Oct-17	0.1	0.1	1.0	5.0	15.2	79.8	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Could Not Locate
						29-May-18	0.0	0.0	0.0	6.0	9.7	84.1	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	7.9	3.3	81.5	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	12.7	<<	86.9	0.0	Good Condition
						19-Feb-19	0.0	0.0	0.0	7.5	1.2	91.3	0.0	Good Condition
						27-May-19	0.0	0.0	0.0	7.0	4.4	88.6	0.1	Good Condition
						7-Aug-19	0.0	0.0	0.0	13.1	6.1	80.6	0.0	Good Condition
						28-Nov-19	0.1	0.0	0.0	10.7	2.2	87.0	0.0	Good Condition
						2-Apr-20	0.4	0.4	0.8	6.9	0.0	92.7	0.0	Good Condition
						9-Jun-20	0.1	0.1	2.0	8.0	9.3	82.6	0.0	Good Condition
						9-Sep-20	0.0	0.0	0.0	17.1	1.1	81.8	0.2	Good Condition
						30-Nov-20	0.0	0.0	0.0	11.5	0.1	88.4	0.1	Good Condition
						25-Feb-21	0.3	0.2	0.0	8.1	0.8	91.0	0.1	Good Condition
						4-May-21	0.0	0.0	0.0	7.9	7.5	84.5	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	16.2	3.0	80.8	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	13.0	2.6	84.4	-0.014	Good Condition

Historical Landfill Gas Monitoring Data

Monitor ID	MTM Coordinates		Ground Surface Elevation (masl)	Screen Interval (mbgs)	Geologic Media Intersected by Screen	Monitoring Date	In-Situ Measurements							Comments (Status of Landfill Gas Probes)
	Easting	Northing					Methane (CH_4)			Carbon Dioxide (%)	Oxygen (%)	Balance Gases (%)	Relative Pressure (Inches of Water)	
							% v/v		% LEL					
							Initial and/or Peak	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable		
GP15-5	368837.499	5029252.218	-	0.91 - 2.44	Overburden	28-Oct-15	0.0	0.0	0.0	3.4	14.3	82.3	0.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	1.9	19.2	78.7	0.0	Good Condition
						10-May-16	0.0	0.0	0.0	2.3	16.3	81.4	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	5.1	8.3	86.5	0.0	Good Condition
						4-Nov-16	0.1	0.1	2.0	4.9	12.1	83.0	0.0	Good Condition
						14-Feb-17	0.1	0.1	1.0	0.0	21.6	78.3	0.0	Good Condition
						25-Apr-17	0.0	0.0	0.0	2.5	16.6	80.9	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	4.4	10.1	85.4	0.0	Good Condition
						23-Oct-17	0.1	0.0	0.0	1.8	18.1	80.0	0.0	Good Condition
						21-Feb-18	0.1	0.0	0.0	18.4	1.8	79.7	-0.4	Good Condition
						29-May-18	0.0	0.0	0.0	2.8	16.0	81.1	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	3.8	9.4	78.8	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	4.1	14.4	81.5	0.0	Good Condition
						19-Feb-19	-	-	-	-	-	-	-	Could Not Locate
						27-May-19	0.0	0.0	0.0	2.3	16.9	80.8	0.0	Good Condition
						7-Aug-19	0.0	0.0	0.0	5.2	10.2	84.6	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	3.1	16.8	80.1	0.1	Good Condition
						2-Apr-20	0.0	0.0	0.0	2.1	19.0	79.9	0.0	Good Condition
						9-Jun-20	0.1	0.0	0.0	2.8	16.6	80.6	0.0	Good Condition
						9-Sep-20	0.0	0.0	0.0	5.2	8.9	85.9	0.5	Good Condition
						30-Nov-20	0.0	0.0	0.0	3.1	15.9	81.0	0.2	Good Condition
						25-Feb-21	0.1	0.0	0.0	2.2	19.7	78.0	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	2.2	17.7	80.1	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	4.6	10.2	85.2	-0.1	Good Condition
						1-Dec-21	0.0	0.0	0.0	2.8	15.7	81.5	-2.666	Good Condition
GP15-6	368875.492	5029271.998	-	0.61 - 2.13	Overburden	28-Oct-15	0.5	0.5	11.0	5.1	0.1	94.4	0.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	0.8	17.5	81.5	0.0	Good Condition
						10-May-16	0.3	0.2	5.0	3.2	0.0	96.5	0.0	Good Condition
						12-Aug-16	0.6	0.4	7.0	6.4	0.1	93.0	0.2	Probe submerged in water, drained
						4-Nov-16	0.8	0.8	16.0	5.4	0.0	93.7	0.0	Good Condition
						14-Feb-17	0.1	0.1	1.0	0.0	21.6	78.3	0.0	Good Condition
						25-Apr-17	0.8	0.8	16.0	3.3	0.0	95.9	0.0	Good Condition
						21-Jul-17	0.3	0.3	6.0	5.7	0.0	94.0	0.0	Good Condition
						23-Oct-17	0.1	0.1	2.0	1.5	15.9	82.4	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Could Not Locate
						29-May-18	0.2	0.2	3.0	4.1	0.8	94.9	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	3.9	1.8	89.8	0.0	Good Condition
						8-Nov-18	0.3	0.3	0.0	5.6	<<	94.3	-0.1	Good Condition
						19-Feb-19	0.0	0.0	0.0	4.1	0.4	95.5	0.0	Good Condition
						27-May-19	0.2	0.2	0.0	4.9	0.0	94.8	0.1	Good Condition
						7-Aug-19	0.0	0.0	0.0	7.4	0.7	91.9	0.0	Good Condition
						28-Nov-19	0.4	0.3	0.0	4.7	0.0	95.0	0.0	Good Condition
						2-Apr-20	0.0	0.5	1.0	4.1	0.0	95.4	0.0	Good Condition
						9-Jun-20	0.1	0.1	2.0	6.1	1.8	92.0	0.0	Good Condition
						9-Sep-20	0.7	0.7	0.0	8.5	0.0	90.8	0.3	Good Condition
						30-Nov-20	0.2	0.2	0.0	5.6	0.1	94.1	0.0	Good Condition
						25-Feb-21	0.2	0.2	0.0	4.4	0.3	95.2	0.1	Good Condition
						4-May-21	0.0	0.0	0.0	5.1	2.2	92.8	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	8.9	2.3	88.8	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.7	5.3	90.0	> -4	Good Condition

Historical Landfill Gas Monitoring Data

Monitor ID	MTM Coordinates		Ground Surface Elevation (masl)	Screen Interval (mbgs)	Geologic Media Intersected by Screen	Monitoring Date	In-Situ Measurements							Comments (Status of Landfill Gas Probes)
	Easting	Northing					Methane (CH_4)			Carbon Dioxide (%)	Oxygen (%)	Balance Gases (%)	Relative Pressure (Inches of Water)	
							% v/v		% LEL					
							Initial and/or Peak	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable		
GP15-7	368931.653	5029294.223	-	0.91 - 2.44	Overburden	28-Oct-15	0.0	0.0	1.0	6.4	3.5	90.1	0.0	Good Condition
						23-Feb-16	-	-	-	-	-	-	-	Could Not Locate
						10-May-16	0.0	0.0	0.0	1.0	16.6	82.6	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	5.5	14.1	80.2	0.0	Good Condition
						4-Nov-16	0.0	0.0	0.0	5.1	0.4	94.2	0.1	Good Condition
						14-Feb-17	0.0	0.0	0.0	4.9	10.4	84.7	0.0	Good Condition
						25-Apr-17	0.0	0.0	0.0	2.2	7.1	90.7	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	6.9	0.0	93.1	0.0	Good Condition
						23-Oct-17	0.1	0.1	2.0	3.5	14.1	82.2	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Local Flooding
						29-May-18	0.0	0.0	0.0	5.4	8.1	86.7	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	4.8	12.4	72.6	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	3.1	19.3	77.6	0.0	Good Condition
						19-Feb-19	-	-	-	-	-	-	-	Could Not Locate
						27-May-19	0.0	0.0	0.0	5.5	15.6	78.9	0.0	Good Condition
						7-Aug-19	0.0	0.0	0.0	6.2	12.9	80.8	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	2.9	18.6	78.4	0.1	Good Condition
						2-Apr-20	0.0	0.0	0.0	4.4	7.1	88.5	-0.6	Good Condition
						9-Jun-20	0.0	0.0	0.0	5.0	17.0	78.0	0.0	Good Condition
						9-Sep-20	0.0	0.0	0.0	10.0	10.0	80.0	0.1	Good Condition
						30-Nov-20	0.0	0.0	0.0	11.4	0.2	88.2	0.0	Good Condition
						25-Feb-21	0.0	0.0	0.0	3.9	0.4	94.1	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	2.7	18.1	79.1	0.2	Good Condition
						26-Aug-21	0.0	0.0	0.0	5.3	16.1	78.6	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	3.7	18.2	78.1	-3.580	Good Condition
GP15-8	368865.766	5029240.857	65.319	1.52 - 3.05	Overburden	28-Oct-15	0.3	0.2	3.0	6.0	5.3	89.2	0.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	3.0	12.3	84.4	0.0	Good Condition
						10-May-16	0.0	0.0	0.0	4.4	8.9	86.2	0.2	Good Condition
						12-Aug-16	0.0	0.0	0.0	10.3	2.3	87.2	0.0	Good Condition
						4-Nov-16	0.0	0.0	0.0	5.4	9.1	85.4	0.0	Good Condition
						14-Feb-17	-	-	-	-	-	-	-	Could Not Locate
						25-Apr-17	0.0	0.0	0.0	2.9	10.1	86.9	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	8.8	5.7	85.5	0.0	Good Condition
						23-Oct-17	0.0	0.0	0.0	2.6	15.8	81.6	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Local Flooding
						29-May-18	0.0	0.0	0.0	5.2	9.7	84.8	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	8.3	7.5	84.6	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	3.2	17.6	79.2	-0.2	Good Condition
						19-Feb-19	-	-	-	-	-	-	-	Could Not Locate
						27-May-19	0.0	0.0	0.0	4.7	5.6	89.7	0.1	Good Condition
						7-Aug-19	0.0	0.0	0.0	8.9	5.7	85.4	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	2.6	15.8	81.6	0.0	Good Condition
						2-Apr-20	0.0	0.0	0.0	2.1	0.4	97.5	0.0	Good Condition
						9-Jun-20	0.0	0.0	0.0	6.7	2.9	90.4	0.0	Good Condition
						9-Sep-20	0.0	0.0	0.0	10.3	1.6	88.1	-0.2	Good Condition
						30-Nov-20	0.0	0.0	0.0	5.1	1.5	93.5	0.2	Good Condition
						25-Feb-21	-	-	-	-	-	-	-	Could not access due to snow cover
						4-May-21	0.0	0.0	0.0	4.6	5.6	88.8	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	6.4	10.9	82.7	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	2.3	16.7	80.0	-2.334	Good Condition

Historical Landfill Gas Monitoring Data

Monitor ID	MTM Coordinates		Ground Surface Elevation (masl)	Screen Interval (mbgs)	Geologic Media Intersected by Screen	Monitoring Date	In-Situ Measurements							Comments (Status of Landfill Gas Probes)
	Easting	Northing					Methane (CH_4)			Carbon Dioxide (%)	Oxygen (%)	Balance Gases (%)	Relative Pressure (Inches of Water)	
							% v/v		% LEL					
							Initial and/or Peak	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable	Long Term and/or Stable		
GP15-9	368950.930	5029210.490	64.924	1.52 - 3.05	Overburden	28-Oct-15	0.0	0.0	0.0	6.3	15.3	78.5	0.0	Good Condition
						23-Feb-16	-	-	-	-	-	-	-	Could Not Locate
						10-May-16	0.0	0.0	0.0	3.2	15.4	81.0	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	5.5	14.9	79.4	0.0	Good Condition
						4-Nov-16	0.0	0.0	0.0	4.5	17.0	78.3	0.0	Good Condition
						14-Feb-17	0.0	0.0	0.0	2.3	17.5	80.2	-0.1	Good Condition
						25-Apr-17	0.0	0.0	0.0	1.5	16.3	82.2	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	8.0	10.4	81.6	0.0	Good Condition
						23-Oct-17	0.0	0.0	0.0	0.4	21.1	78.4	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Local Flooding
						29-May-18	0.0	0.0	0.0	3.8	14.1	82.0	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	0.1	20.5	79.3	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	4.0	18.7	77.3	0.0	Good Condition
						19-Feb-19	0.1	0.1	0.0	3.9	16.3	79.8	0.0	Good Condition
						27-May-19	0.0	0.0	0.0	4.7	13.3	82.0	0.0	Good Condition
						7-Aug-19	0.0	0.0	0.0	6.1	15.8	78.1	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	4.8	16.6	78.7	0.0	Good Condition
						2-Apr-20	0.0	0.0	0.0	5.3	11.4	83.3	0.0	Good Condition
						9-Jun-20	0.0	0.0	2.0	5.7	13.8	80.4	0.0	Good Condition
						9-Sep-20	0.0	0.0	0.0	7.9	12.6	79.5	0.0	Good Condition
						30-Nov-20	0.0	0.0	0.0	5.3	16.5	78.2	0.1	Good Condition
						25-Feb-21	0.1	0.0	0.0	0.2	21.5	78.1	0.0	Good Condition
						4-May-21	0.0	0.0	0.0	4.0	17.3	78.7	0.1	Good Condition
						26-Aug-21	0.0	0.0	0.0	7.0	14.7	78.3	0.0	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.8	16.4	78.8	-1.285	Good Condition
GP15-10	368843.807	5029183.520	64.680	0.91 - 2.13	Overburden	28-Oct-15	0.0	0.0	0.0	5.2	7.6	87.3	0.0	Good Condition
						23-Feb-16	0.0	0.0	0.0	4.0	13.1	83.0	0.0	Good Condition
						10-May-16	0.0	0.0	0.0	2.7	7.5	89.8	0.0	Good Condition
						12-Aug-16	0.0	0.0	0.0	8.2	7.1	84.7	1.0	Probe submerged in water, drained
						4-Nov-16	0.0	0.0	2.0	6.4	9.6	84.0	0.0	Good Condition
						14-Feb-17	-	-	-	-	-	-	-	Could Not Locate
						25-Apr-17	0.0	0.0	0.0	2.4	5.5	92.1	0.0	Good Condition
						21-Jul-17	0.0	0.0	0.0	7.3	3.1	89.7	0.0	Good Condition
						23-Oct-17	0.0	0.0	0.0	0.0	21.6	78.3	0.0	Good Condition
						21-Feb-18	-	-	-	-	-	-	-	Could Not Locate
						29-May-18	0.0	0.0	0.0	3.8	9.7	86.4	0.0	Good Condition
						3-Aug-18	0.0	0.0	0.0	7.9	4.4	87.7	0.0	Good Condition
						8-Nov-18	0.0	0.0	0.0	2.0	17.5	80.5	0.0	Hose barb was damaged and needs to be replaced. The height of the probe needs to be adjusted.
						19-Feb-19	-	-	-	-	-	-	-	Could Not Locate
						27-May-19	0.0	0.0	0.0	4.3	5.0	90.7	0.2	Good Condition
						7-Aug-19	0.0	0.0	0.0	5.5	13.8	80.7	0.0	Good Condition
						28-Nov-19	0.0	0.0	0.0	3.8	19.1	77.1	0.2	Good Condition
						2-Apr-20	0.0	0.0	0.0	3.0	10.2	86.8	0.0	Replaced Gas Probe Valve
						9-Jun-20	0.0	0.0	0.0	4.0	7.2	88.8	0.1	Good Condition
						9-Sep-20	0.0	0.0	0.0	8.6	6.0	85.4	-2.5	Good Condition
						30-Nov-20	0.0	0.0	0.0	3.7	12.5	83.8	0.0	Good Condition
						25-Feb-21	-	-	-	-	-	-	-	Could not access due to snow cover
						4-May-21	0.0	0.0	0.0	1.3	20.0	78.7	0.0	Good Condition
						26-Aug-21	0.0	0.0	0.0	9.3	2.5	88.2	-0.1	Good Condition
						1-Dec-21	0.0	0.0	0.0	4.5	16.3	79.2	-2.362	Good Condition

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 were not reasonably available, in Wood'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 by-laws, 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 of 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, Wood must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Wood's services during the implementation of any remedial measures will allow Wood to observe compliance with the conclusions and recommendations contained in the report. Wood'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 in part, or any reliance thereon, or decisions made based on any information of conclusions in the report, is the sole responsibility of such third party. Wood 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 Wood.
11. Provided that the report is still reliable, and less than 12 months old, Wood will issue a third-party reliance letter to parties client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Wood's report, by such reliance agree to be bound by our proposal and Wood's standard reliance letter. Wood's standard reliance letter indicates that in no event shall Wood be liable for any damages, howsoever arising, relating to third-party reliance on Wood's report. No reliance by any party is permitted without such agreement.