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Phase Two Environmental Site Assessment
393 McArthur Avenue
Proposed Residential Development
Ottawa, Ontario

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Phase Two Environmental Site Assessment
393 McArthur Avenue
Ottawa, Ontario

June 2, 2022
Project: 64819.22 - V02

GEMTEC Consulting Engineers and Scientists Limited
32 Steacie Drive
Ottawa, ON, Canada
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June 2, 2022

File: 64819.22 – V02

Novatech Engineering Consultants Limited
240 Michael Cowpland Drive, Suite 200
Ottawa, ON
K2M 1P6

Attention: Murray Chown, MCIP, RPP.

Re: Phase Two Environmental Site Assessment
393 McArthur Avenue
Ottawa, ON

Enclosed is our Phase Two ESA report for the above-noted for your review. The Phase Two ESA was completed in accordance with O.Reg 153/04, and describes the environmental conditions encountered at the property.

We trust this information is sufficient for your current needs. If you have any questions or require further information, please contact the undersigned.

Nicole Soucy, M.A.Sc., P.Eng
Environmental Engineer

Shaun Pelkey, M.Sc.E., P.Eng.
Principal Engineer, Vice President

KM/NS/DP/SP/EW

Enclosures
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1.0 EXECUTIVE SUMMARY

GEMTEC Consulting Engineers and Scientist Limited (GEMTEC) was retained by Novatech Engineering Consultants Limited (Novatech) to carry out a Phase Two Environmental Site Assessment (ESA) for the property located at 393 McArthur Avenue, in Ottawa, Ontario (the 'subject property').

The property is legally described as Part of Lot 7, Concession Junction Gore, Being part 1 on Plan 5R-12736, City of Ottawa. The regional location plan is shown on Figure A.1, Appendix A.

GEMTEC understands that the Phase Two ESA is required in support of a proposed development, with potential re-zoning of the property from vacant (or commercial) to residential land-use. Change in land use from vacant 'commercial' to residential' would represent a shift to a more stringent land use, a condition that would make the filing of a Record of Site Condition (RSC) mandatory under the Ontario Regulation (O.Reg.) 153/04 under the Environmental Protection Act.

This Phase Two ESA was conducted in accordance of O.Reg 153/04, and may be used to support a future RSC application for the property, provided a legal survey of the property, and lawyers letter are included in the RSC application.

Based on the findings of the Phase One ESA, GEMTEC identified four areas of potential environmental concern (APECs) at the subject property. These APECs are associated with the use of salt for de-icing purposes, importation of fill of unknown origin and a hydrocarbon spill from a truck on the subject property. One off-site potentially contaminating activity (dry cleaner) was identified within the study area with a potential to impact the subject property through contaminant migration.

The Phase Two ESA included the installation of four boreholes BH19-1 to BH19-4, three of which were completed as monitoring wells (MW19-1, MW19-3 and MW19-4) to a maximum depth of 9.22 metres below ground surface (m bgs) and collection of soil and groundwater samples for chemical analysis. Soil and groundwater samples were analyzed for concentrations of metals and inorganics (M&I), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and petroleum hydrocarbons (PHCs). Analytical results were compared to the Ministry of the Environment, Conservation and Parks (MECP) Table 3 Site Condition Standards (SCS) for residential / parkland / institutional (RPI) property use in a non-potable groundwater setting and coarse textured soil.

The following is a summary of the contaminants of concern identified in soil at the subject property:

- The electrical conductivity (EC) and sodium adsorption ratio (SAR) in a soil sample collected at the depth of 0.61 to 1.22 m bgs (silty sand fill) at BH19-2 was 0.707 mS/cm and 8.97, marginally exceeding the Table 3 SCS of 0.7 mS/cm and 5, respectively. An underlying

sample collected from 4.27 to 4.88 m bgs (native glacial till) was below the Table 3 SCS for both parameters.

- The EC in a soil sample collected at a depth of 0.61 to 1.22 m bgs (silty sand fill) at BH19-3 was 1.25 mS/cm, exceeding the Table 3 SCS of 0.7 mS/cm. An underlying sample collected from 2.44 to 3.05 m bgs (native glacial till) was below the Table 3 SCS for all M&I parameters.

However, it is interpreted that elevated EC and SAR in soil samples originating from the subject property are due to substances that have been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. As such, according to section 20 (2) of O.Reg 407/19, MECP SCS exceedances of EC, and SAR are not considered to be contamination within the project limits.

The soil analytical results are representative only of the sampling locations and conditions may vary between sampling locations. The sampling was conducted to give a general overview of soil quality and final acceptance by a receiving site may require supplemental sampling.

The soil and groundwater analytical results are representative only of the sampling locations and conditions may vary between sampling locations. The sampling was conducted to give a general overview of soil and groundwater quality.

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2.0 INTRODUCTION

GEMTEC Consulting Engineers and Scientist Limited (GEMTEC) was retained by Novatech Engineering Consultants Limited (Novatech) to carry out a Phase Two Environmental Site Assessment (ESA) for the property located at 393 McArthur Avenue, in Ottawa, Ontario (the 'subject property'). Hydrogeological and geotechnical investigations are being completed under separate covers for the project.

The property is legally described as Part of Lot 7, Concession Junction Gore, Being part 1 on Plan 5R-12736, City of Ottawa. The regional location plan is shown on Figure 9.1.

GEMTEC understands that the Phase Two ESA is required in support of a proposed development, with potential re-zoning of the property from vacant (or commercial) to residential land-use. Change in land use from vacant 'commercial' to residential' would represent a shift to a more stringent land use, a condition that would make the filing of a Record of Site Condition (RSC) mandatory under the Ontario Regulation (O.Reg.) 153/04, and O.Reg 407/19 under the Environmental Protection Act.

This Phase Two ESA was conducted in general accordance of O.Reg 153/04, and may be used to support a future RSC application for the property, provided a legal survey of the property , and lawyers letter are included in the RSC application.

2.1 Site Description

The subject property is rectangular in shape with approximately 21 m of frontage along McArthur Avenue and 57 m along the west side of Belisle Street, with an area of approximately 0.16 hectares (0.4 acres). The subject property is currently vacant with concrete block barricades around the property perimeter and a gated entrance off McArthur Avenue.

Authorization to proceed with the work was granted to GEMTEC by Mr. Murray Chown of Novatech on July 16, 2019. Mr. Chown can be reached at 613-254-9643.

2.2 Property Ownership

The subject property is owned by Elite Home Management and is located on the northwest quadrant of McArthur Avenue and Belisle Street.

2.3 Current and Proposed Future Uses

As described above, the subject property is currently vacant. GEMTEC understands that the Phase Two ESA is required for a potential re-zoning to residential, or mixed residentla-commercial land use.

2.4 Applicable Site Condition Standard

The MECP SCS are established under Part XV.1 of the Ontario Environmental Protection Act (EPA). Tabulated generic criteria are provided in the MECP document "*Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act"* (SGWS), dated March 9, 2004 and amended in April, 2011. For the purposes of this assessment, GEMTEC selected the MECP Table 3 SCS for residential / parkland / institutional (RPI) property use in a non-potable groundwater setting and coarse textured soil based on the following assumptions:

- The Rideau River is situated approximately 1.5 km west of the subject property, which flows north towards the Ottawa River approximately 3.2 km north of the subject property;
- Records indicated that six wells were identified within the study area;
- Surrounding properties are a mix of residential, commercial, and community use;
- The subject property is currently vacant, and is proposed to be developed into residential;
- The subject property is 60 m above sea level (asl), and topography at the subject site and surrounding topography slopes down towards the west;
- Geology mapping suggests that the subject property consists of dark brown to black shale, with laminations of calcareous siltstone underlying clay and silt underlying erosional terraces;
- The surrounding properties are serviced by municipal water obtained from a surface water source (Ottawa River);
- The subject property is not situated within a sensitive area (e.g. ANSI) or within 30 m of a waterbody;
- Soil is consistent with the definition of coarse textured soils as per O. Reg. 153/04;
- Stratified soil conditions were not used for evaluating laboratory result; and,
- The site is not environmentally sensitive.

Although the site currently has commercial use, proposed future development and use includes residential structures or units in addition to commercial uses, therefore, residential standards are applied during the Phase Two ESA.

3.0 BACKGROUND INFORMATION

3.1 Physical Setting

Surficial and bedrock geology maps of the Ottawa area indicate that the overburden in the vicinity of the subject property generally consists of clay and silt underlying erosional terraces with a thickness between 2 and 5 metres (ESRI, 2016). Bedrock beneath the site is mapped as dark brown to black shale, with laminations of calcareous siltstone of the Billings Formation (ESRI, 2016).

The review indicated that the subject property is approximately 60 m above sea level, and topography at the subject site and surrounding topography slopes downward towards the west. The Rideau River is situated approximately 1.5 km west of the subject property, and the Ottawa River is situated approximately 3.2 km north of the subject property. It is anticipated that the local shallow groundwater flow is westward towards the Rideau River, located approximately 1.5 kilometers (km) west of the subject site.

3.2 Past Investigations

3.2.1 Phase One ESA, GEMTEC – 2019

A Phase One ESA was completed for the subject property by GEMTEC dated May 31, 2022 in general accordance of O.Reg 153/04. Through an evaluation of the information from the records review, interview, and the site reconnaissance, GEMTEC identified Areas of Potential Environmental Concern (APECs) with the potential to impact soil and groundwater conditions at the subject property. The APECs identified at the subject property included:

APEC 1: Operation of Dry-Cleaning Equipment at 387 McArthur Avenue

The Ecolog ERIS report, city directory, and site reconnaissance identified 387 McArthur Avenue as a dry cleaner. As detailed in the ERIS manufacturing directory: Men's and boys' cut and sew suit, coat and overcoat manufacturing, and dry cleaning and laundry services.

APEC 2: Use of Salt for De-Icing purposes on the Subject Property

It was identified through the site interview and aerial photographs that the subject property has been historically used as a commercial parking lot. As such, salt has likely been used at 393 McArthur Avenue as a de-icing agent.

APEC 3: Importation of Fill Material of Unknown Quality on the Subject Property

Fill material of unknown origin may have been brought to site during the development of the site as a parking lot or during the development of the structures historically present on the subject site. Furthermore, since no records are available regarding the demolishment of the historical buildings, deleterious building material may still be present on the subject property.

APEC 4: Hydrocarbon Spill from Truck on the Subject Property

A white pick-up truck was identified during the site reconnaissance. The truck was located on the east side of the property, staining and a hydrocarbon odour were identified on the asphalt below the truck.

A Phase Two ESA was recommended to be completed for the subject property to investigate soil and groundwater quality in the vicinity of the identified APECs and assist in the preparation of a remedial or risk management strategy for the development of the subject property, if necessary.

3.3 Contaminants of Concern

Contaminants of potential concern (COPCs) in soil and groundwater, associated with past activities at the subject property and adjacent lands include: metals and inorganics (M&I), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and petroleum hydrocarbon compounds (PHCs).

4.0 SCOPE OF THE INVESTIGATION

4.1 Overview of the Site Investigation

The intent of the Phase Two ESA is to address both on-site and off-site Potentially Contaminating Activities (PCAs), and on-site Areas of Potential Environmental Concern (APECs) identified through the preparation of the Phase One ESA against MECP Table 3 SCS to support the development of a residential development. The Phase Two ESA sampling and analysis plan is included in Appendix A of this report.

APECs identified during the Phase One ESA (GEMTEC, 2022) to exist on the subject site include:

- Operation of Dry Cleaning Equipment;
- Hydrocarbon Spill;
- Fill of Unknown Origin on the Subject Site; and,
- Salt Manufacturing, Processing and Bulk Storage.

To meet the objective, the following tasks were completed during the Phase Two ESA:

- Preparation of a sample and analysis plan to document the rationale for the investigation, including the number of sampling points, sample frequency, analytical parameters and media to be sampled – A copy of the sampling and analysis plan can be found in Appendix A;
- Co-ordination with the drilling contractor George Downing Estate Drilling Ltd. (Downing) and public locators to obtain utility locates near the proposed borehole locations;
- Providing supervision during drilling to obtain samples of soil that are representative of the worst-case conditions observed during the investigation;
- Advancement of four boreholes to a maximum depth of 9.22 metres (m). Soil samples were recovered from each borehole. Three of the boreholes (BH19-1, BH19-3 and BH19-4) were completed as groundwater monitoring wells, constructed with 51 mm diameter polyvinyl chloride (PVC) pipe with 1.5 and 3.0 m long screens and flush-mounted / monument casings;
- Collection, screening and classifying soil samples at each borehole location for possible laboratory analysis. Soil sample headspace vapours were monitored using a combustible gas indicator (CGI) and a photoionization detector (PID), to assess the presence of VOCs and combustible petroleum contaminants;

- Soil samples were selected for submission to AGAT Laboratories (AGAT), a CALA-accredited laboratory for chemical analysis of metals and inorganics (M&I), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), petroleum hydrocarbons (PHCs) including benzene, toluene, ethylbenzene and xylenes (BTEX);
- Field screening soil vapour concentrations and water levels in the monitoring wells;
- Collection of groundwater samples from the monitoring well and submission for the analysis of M&I, PHCs and VOCs;
- Collection of quality assurance / quality control (QA/QC) duplicate samples at a frequency of 10% throughout the field program; and,
- Comparison of laboratory analytical results of soil and groundwater samples to the MECP Table 3 for residential / parkland / institutional land use for coarse textured soils.

4.2 Media Investigated

Boreholes were advanced on site to access if the soil and groundwater conditions at selected test locations satisfy the applicable MECP SCS for the site. Boreholes were advanced using a truck-mounted drill rig supplied and operated by George Downing Estate Drilling Ltd. of Grenville-sur-la-Rouge, Quebec. Standard penetration testing was carried out in the boreholes using drive open sampling equipment.

COPCs identified in the Phase One ESA (GEMTEC, 2022) for soil and groundwater at the site include metals and inorganics, PAHs, PHCs and BTEX, and possibly VOCs. The soil sampling program included the submission of a minimum of one representative overburden/fill soil sample from each borehole for laboratory analysis of the parameters summarized above. Duplicate soil samples were collected and analysed for QA/QC purposes at a frequency of one in 10 samples.

The groundwater investigation program consisted of the collection of groundwater elevations from all three monitoring wells and the development, purging and sampling of groundwater for laboratory analysis of COCs. Duplicate groundwater samples were collected and analysed for QA/QC purposes at a frequency of one in 10 samples.

The table below indicates the rational for each borehole and monitoring well location and the associated contaminants of concern.

Table 4.1: **Summary of Borehole and Monitoring Well Location Rationale**

Borehole ID	Rational for Location	Contaminants of Potential Concern
BH/MW 19-1	This borehole is situated down gradient of the dry cleaning facility. Soil and overburden groundwater quality impacts from APEC 1 will be investigated at this location. Potential salt from winter maintenance	Metals & Inorganics

Borehole ID	Rational for Location	Contaminants of Potential Concern
	impacts from APEC 2, and importation of fill material from APEC 3 will be investigated at this location.	VOCs PAHs
BH19-2	This borehole is situated near the location where historical buildings are believed to have been on site, and demolition would have occurred. Potential salt from winter maintenance impacts from APEC 2, and importation of fill material from APEC 3 will be investigated at this location.	Metals & Inorganics VOCs PAHs PHCs
BH/MW 19-3	This borehole is situated near the hydrocarbon spill that was identified on the subject property. Soil and overburden groundwater quality impacts from APEC 4 will be investigated at this location. Potential salt from winter maintenance impacts from APEC 2, and importation of fill material from APEC 3 will also be investigated at this location.	Metals & Inorganics PAHs
BH/MW 19-4	This borehole is situated down gradient of the hydrocarbon spill that was identified on the subject property. Soil and overburden groundwater quality impacts from APEC 4 will be investigated at this location. Potential salt from winter maintenance impacts from APEC 2, and importation of fill material from APEC 3 will also be investigated at this location.	Metals & Inorganics PAHs PHCs

4.3 Phase One Conceptual Site Model

Interpreting the probable environmental conditions of the 393 McArthur Avenue site is undertaken by reference to a Phase One Conceptual Site Model (CSM). A Conceptual Site Model is an idealization of potential site contaminants and their interaction with the hydrogeological system and surrounding properties, based on the known conditions of a site. The CSM includes a description of the potential contaminating activities at the Phase One ESA property and surrounding properties, identifying COCs and their source locations, and defining on-site APECs for further investigation.

Information considered in the development of this CSM was gathered from numerous sources (i.e. aerial photographs, city directories, environmental database searches, physical setting sources, interviews and a site reconnaissance), which reduces the potential for not identifying a former property use or PCA.

4.3.1 Current and Proposed Future Site Use

The subject property is rectangular in shape with approximately 21 m of frontage along McArthur Avenue and 57 m along the west side of Belisle Street, with an area of approximately 0.16

hectares (0.4 acres). The subject property is currently vacant with concrete block barricades around the property perimeter and a gated entrance off of McArthur Avenue.

GEMTEC understands that the Phase Two ESA is required for a potential re-zoning to residential, or mixed residential-commercial land use.

4.3.2 Waterbodies and Areas of Natural and Scientific Interest

No surface water, lagoon or standing water is located on-site or within 250 m of the site. A review of the interactive natural heritage map published by the Ministry of Natural Resources and Forestry (MNRF, 2015), identified no areas of natural and scientific interested on-site or within 250 m of the site. Records indicated that six wells were identified within the study area.

A topographic map based on Ontario Basic Mapping identified the subject property is 60 m asl, and topography at the subject site and surrounding topography slopes down towards the west.

The Rideau River is situated approximately 1.5 km west of the subject property, which flows north towards the Ottawa River approximately 3.2 km north of the subject site. Groundwater flow often reflects topographic features and typically flows toward nearby lakes, drains and wetland areas. Based on the topography of the area, it is expected that the local shallow groundwater flow is north.

4.3.3 Existing Buildings and Structures

The subject property is currently vacant, however, it was formerly developed with multiple structures.

4.3.4 PCAs, CoPCs and APECs

The Phase One ESA (GEMTEC, 2022) identified several PCAs, and APECs within the Phase One study area; defined in the Phase One as the area located within a 250 metre radius of the site. A summary of PCAs, and APECs as outlined on Table 2 in Schedule D of the Regulation and identified in the Phase One ESA is provided in Table 4.2 below.

Table 4.2: Summary of PCAs and APECs identified in the Phase One ESA

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
48. Salt Manufacturing, Processing and Bulk Storage	393 McArthur Avenue	On the subject site	Use of salts for a paring lot is typically de-icing activity for the winter.	Yes	Based on the use of salt as a de-icing agent on the subject site.	Soil	EC SAR
Other - Spill	393 McArthur Avenue	On the subject site	A white pick-up truck was located on the east side of the property, staining was identified below the truck and a hydrocarbon odour was identified.	Yes	Based on the presence of hydrocarbon staining and odour on the subject site.	Soil and Groundwater	PHCs BTEX Metals
30. Importation of Fill Material of Unknown Quality	393 McArthur Avenue	On the subject site	Fill of unknown quantity is expected on site due to the potential of fill material during construction of the parking lot, and due to the demolishment of building historically on-site.	Yes	Based on the likelihood of fill of unknown origin being present on the subject site.	Soil	PAHs Metals & Inorganics
37 - Operation of Dry Cleaning Equipment (where chemicals are used)	387 McArthur Avenue	Adjacent west	Listed as McArthur Tailor and Dry Cleaning, a men's and boys' cut and sew suit, coat and overcoat manufacturing, dry cleaning and laundry service.	Yes	Based on the presence of a dry cleaning business at an adjacent property to subject site.	Soil and Groundwater	VOCs
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and	373 McArthur Avenue	Adjacent northwest	Ottawa Carelton District School Board listed as producing paint/ pigment/ coating residues from 2009 to 2016, and as of	No	Based on anticipated groundwater flow direction, and anticipated minimal quantity of	-	-

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
transfer of waste, other than use of biosoils as soil conditioners			Dec 2018 and March 2019.		wastes produced		
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	390 McArthur Avenue	20 metres south	Richmond Technical Services - McArthur Medical Centre listed as producing photoprocessing wastes from 1986 to 1990, and 1992 to 2004, and pathological wastes from 2014 to as of Mar 2019.	No	Based on anticipated groundwater flow direction, and anticipated minimal quantity of wastes produced	-	-
31 - Ink Manufacturing, Processing and Bulk Storage	377 McArthur Avenue	25 metres west	Ray-Tek Printing Inc. listed as digital printing, other printing and business service centers in 1993.	No	Based on anticipated groundwater flow direction	-	-
Other - Spill	400 McArthur Avenue	45 metres southeast	City of Ottawa reported a 40 litre douse water spill occurred in 2014 due to vehicle fire.	No	Based on anticipated groundwater flow direction.	-	-
31 - Ink Manufacturing, Processing and Bulk Storage	411 McArthur Avenue	70 metres east	CR Printing listed as quick printing, digital printing, and other printing in 1994.	No	PCB wastes registered for only one year and situated down gradient based on anticipated groundwater flow direction.	-	-

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	780 Church Street	70 metres northeast	Conseil des Ecoles Catholiques de Langue listed as producing PCBs from 1993 to 2001.	No	Based on anticipated groundwater flow direction, and anticipated minimal quantity of wastes produced	-	-
Other - Spill	362 McArthur Avenue	125 metres southwest	A natural gas release occurred in 2006.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
Other - Spill	415 McArthur Avenue	140 metres east	Enbridge Gas Distribution Inc. reported an incident occurred in 2009 when a 1/2" pipeline was hit. A casual incident analysis was complete.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	414 McArthur Avenue	145 metres southeast	1067323 Ontario Ltd. owned a gasoline service station with at least five fuel storage tanks. Tanks included a 22,700 litre and a 25,500 litre liquid fuel single walled UST for gasoline, one 13,600 litre liquid fuel single walled UST for diesel, and one 13,600 litre liquid fuel	No	Based on distance to subject site and anticipated groundwater flow direction	-	-

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
			single walled UST with undefined contents.				
Other - Spill	358 McArthur Avenue	155 metres southwest	A natural gas release occurred in 2007 due to a pipeline strike at a construction site.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
Other - Spill	350 McArthur Avenue	180 metres southwest	A natural gas release occurred in 2007 due to a pipeline leak. The file was referred back to the MOE as the leak had migrated off-site.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	420 McArthur Avenue	180 metres southeast	Fred Trottier Construction Ltd. was listed as producing paint/ pigment/ coating residues from 2004 to 2016 and as od Dec 2018 to Mar 2019.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of	420 McArthur Avenue	180 metres southeast	U A P Inc. listed as producing alkaline wastes, and emulsified oils from 1988 to 1990, and 1992 to 1998.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
biosoils as soil conditioners							
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	485 Donald Street	180 metres southeast	Ottawa Board of Education listed as producing inorganic laboratory chemicals, aliphatic solvents, petroleum distillates, light fuels, halogenated solvents, oils skimmings & sludges, waste oils & lubricants, and organic laboratory chemicals from 1986 to 1990, 1992 to 2016, and as od Dec 2018 to Mar 2019.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
Other - Spill	485 Donald Street	180 metres southeast	Ottawa-Carleton District School Board reported an unknown volume of oily water spill occurred in 2005. Environmental impact was not anticipated soil contamination.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of	422 McArthur Avenue	200 metres southeast	Bytown Cat Hospital was listed as producing pharmaceutical wastes, pathological wastes, and photoprocessing wastes from 1992 to 2016, and ad of Dec 2018 to Mar 2019.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
biosoils as soil conditioners							
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	McArthur Avenue at Irwin Miller Street	210 metres west	Greely Construction was listed as producing light fuel wastes in 2014.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
Other - Spill	15 Eastwood Place	240 metres west	N R Construction Co. Ltd. reported a 50 litre hydraulic oil spill occurred in 2015 due to equipment failure. Nature of impact was land.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	416 McArthur Avenue	165 metres southeast	Transmission Depot & Eliseo Signorini Garage were kisted as Motor Vehicle Repair Shops & Motor Vehicles, Wholesale.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-
37 - Operation of Dry Cleaning Equipment (where chemicals are used)	425 McArthur Avenue	210 metres east	Dutch Girl Cleaners were listed as Laundries and Cleaners	No	Based on distance to subject site	-	-

Type of PCA	Address / Location	Distance from Subject Property	Description	PCA Resulted in APEC / No APEC	Rationale	Material of Concern	Contaminants of Concern
31 - Ink Manufacturing, Processing and Bulk Storage	435 Donald Street	220 metres south	Centre Franco Ontarien was listed as commercial printing industry.	No	Based on distance to subject site and anticipated groundwater flow direction	-	-

4.3.5 Subsurface Structures and Utilities

Buildings in the study area are fully serviced with hydro, water, natural gas, sanitary and storm sewers. Sewers were observed in the streets adjacent to the subject property. Structures in the study area are connected to overhead hydro and had natural gas hookups on the exterior of their homes. There is potential for underground utilities to affect contaminant transport on or to the subject property.

4.3.6 Uncertainty

There is uncertainty with the Phase One Conceptual Site Model associated with using well record data, topographic and geology maps from external sources. Information based on these sources may have changed since publishing due to construction, seasonal variations, or other factors.

There is also uncertainly associated with the origin of the truck identified on the subject property resulting in the hydrocarbon spill.

4.4 Impediments and Deviations from Sampling and Analysis Plan

The SAP prepared in advance of the Phase Two ESA sampling events are included in Appendix A. The intent of the plans was followed during the investigation, to ensure that the subsurface was adequately assessed at the APECs on the subject property. Deviations to the plans included:

- MW19-3 was completed with a 1.52 m long screen;
- BH19-2 SA5B and a duplicate sample were analyzed for PHC F1 to F4 including BTEX;
- BH19-2 SA5B and BH19-2 SA105B were analyzed for VOCs; and,
- MW19-101 (duplicate of MW19-1) was analyzed for PHCs including BTEX.

The above noted deviations do not impact the investigation objectives and conclusions of this report.

There were no impediments or denial of access that prevented the completion of the original defined scope of the investigation.

5.0 INVESTIGATION METHOD

5.1 General

Prior to any intrusive investigation at the site, underground utility locates were completed, to identify the location of all underground buried utilities at the site. Utilities including telephone, gas, hydro, municipal services and private utilities were cleared through these services.

Borehole drilling and soil sampling was completed between 0.0 and 9.2 mbgs using a truck-mounted drill rig. Boreholes were advanced though the overburden using a 203.2mm hollow stem auger, while advancing a 50mm diameter split-spoon at 0.6m intervals.

Soil samples were collected by split-spoon soil sampler. Soil samples were logged for stratigraphy, moisture and visual/olfactory evidence of contamination. In addition, soil samples were collected in air tight bags and screened in the field using a photoionization detector (PID). Three of the four boreholes were completed as monitoring wells instrumented with 2" PVC risers, and well screens with 3.05m screen intervals.

All new monitoring wells were sampled for groundwater quality in October 2019. Prior to groundwater sampling each monitoring well developed by removing three well volumes several days in advance of to low-flow sampling to ensure that samples were representative of formation conditions. Well development activities were performed using dedicated Waterra inertial hand pumps with purge water being containerized for proper offsite disposal.

Groundwater samples were collected using peristaltic pump and dedicated sampling tubing following low-flow parameter stabilization techniques. Samples were collected directly into laboratory supplies sample containers and released to laboratory under chain-of-custody procedures. Samples were collected for analysis of metals, inorganics, PHC/BTEX, and VOCs. Metal samples were field filtered using in-line disposable filters.

Field quality control measured used during the Phase Two ESA consisted of the collection of one field duplicated sample for metals & inorganics, PAHs, PHCs, VOCs in soil and one field duplicate for metals & inorganics, PHCs and BTEX analysis in groundwater. Additionally, relative percent difference (RPD) values for comparison of samples to corresponding field duplicates were calculated and compared to MECP quality requirements.

Residual wastes generated during drilling activities, such as contaminated soil cuttings and wash water, was contained and sealed on site in approved waste containers.

5.2 Drilling

Four boreholes, including three monitoring wells were advanced at the site to assess the soil and groundwater conditions in accordance with the sampling plan described in the Drilling Program from the Phase Two ESA Sampling and Analysis Plan. All boreholes were completed by George Downing Estate Drilling Ltd. All drilling was completed using hollow-stem auger, split-spoon techniques and coring methods. Monitoring wells were installed at three of the boreholes. The installed boreholes/monitoring wells are illustrated on Figure 9.2.

The boreholes were advanced using a truck-mounted drill rig supplied and operated by George Downing Estate Drilling Ltd. of Grenville-sur-la-Rouge, Quebec. Standard penetration testing was carried out in the boreholes using drive open sampling equipment. Prior to drilling, GEMTEC

retained the services of an underground services locating company to coordinate clearance of the public and private buried utilities at the borehole locations.

The field work for the borehole investigation was carried out on September 30, 2019, and October 1, 2019. During that time, four boreholes, numbered 19-1 through 19-4, were advanced at the site using both hollow stem auger and rotary diamond drilling techniques, supplied and operated by George Downing Estate Drilling Ltd. of Grenville-sur-la-Rouge, Quebec.

Split spoon samples were obtained to assess soil quality. The boreholes were advanced to depths of between 4.9 and 9.2 mbgs, terminated within the glacial till (BH19-1, BH19-2, and BH19-3), and bedrock (BH19-4). Three environmental wells were instrumented with a monitoring well to intercept the groundwater. Monitoring well installation was completed using a 50-mm diameter, 3.05 metre, flush-threaded PVC screen and risers with a silica sand pack and bentonite seal.

Solid stem augers were used to drill through the packed gravel/ asphalt surface (approximately 0.1m) prior to the beginning of continuous split spoon soil sampling. Following the collection of each soil sample, the remaining soil was containerized and each split spoon was cleaned.

If visual or olfactory evidence contamination was noted during the advancement of a particular borehole than all drilling equipment, including auger flights, split spoons, and drill rods used for coring were decontaminated prior to re-use at the next borehole location.

5.3 Soil Sampling

All soil samples were collected via a 50mm diameter split-spoon. Samples were split, with a portion transferred immediately into laboratory supplied containers, and placed in a cooler. The remainder of the soils were placed in a re-sealable bag to allow for field screening. For samples considered for laboratory analysis of benzene, toluene, ethylbenzene, xylenes and F1 fraction of hydrocarbon (BTEX-F1), a core was recovered from the undisturbed portion of the bag and placed in laboratory prepared vials containing a measured amount of methanol. Efforts were made to avoid splashing the methanol during the sample placement.

Soil samples are identified as BH/MWX-Y where X indicates the year the borehole was constructed and Y is the borehole identifier. For example, BH/MW19-2 indicates the borehole was constructed in 2019 and is identified as borehole number two.

Boreholes 19-1, 19-2 and 19-4 encountered a layer of asphaltic concrete and an underlying layer of base/subbase material. The base/subbase material can generally be described as grey, sand and gravel, with some silt.

Boreholes 19-1, 19-2 and 19-4 contained fill material below the existing pavement, and borehole 19-3 has fill material from surface. The fill material can generally be described as brown to reddish brown silty sand, some clay and trace gravel.

Glacial till was identified in all four boreholes below the fill material. The glacial till can be generally described as compact to dense light grey silty sand, with some gravel and clay, boreholes 19-1, 19-2, and 19-3 were terminated within the glacial till layer. Bedrock was encountered in borehole 19-4, and was classified as shale bedrock.

Borehole stratigraphic logs are included in Appendix B, and borehole locations are shown on Figure 9.2.

Site geological conditions were observed in the soil samples and recorded in the field log by a GEMTEC field technologist indicating the colour, odour, texture, soil type and moisture. Clean gloves were worn and changed between each sample and the split barrel sampler was washed and rinsed between each sampling event. Soil samples were inspected in the field for visual, tactile and olfactory evidence of impact.

5.4 Field Screening Measurements

Soil samples were screened using an RKI Eagle 2, which operates as a PID and CGI, to measure total organic vapours and combustible vapours. Results of field screening and the soil samples submitted to the laboratory for chemical analysis are included on the borehole logs in Appendix B.

The PID was equipped with a 10.6 electron-volt (eV) lamp, which was calibrated with a known concertation of isobutylene. This instrument detects VOCs that emit below an ionization potential of 10.6 eV, which includes a wide range of chemicals such as solvents and fuels. The detection limit of the instrument ranges from 0 to 15,000 ppm, and accuracy is +/- 10% for VOCs in the range of 0 and 2,000 ppm and +/- 20% of the reading above 2,000 ppm. The resolution of this instrument is 0.1 ppm for VOCs in the range of 0 and 1,000 ppm and 1 ppm for readings above 1,000 ppm. The PID provides an indication of organic contamination in soil but does not measure concentrations of individual contaminants.

The CGI detects combustible vapours such as those associated with fuels. This instrument measures a concentration of total combustible gas, calibrated to a known concentration of hexane. The instrument operates in the methane elimination mode. The detection limit of the instrument ranges from 0 to 11,000 ppm (i.e., 100 % LEL of hexane). The CGI has an accuracy of 25 ppm below 1,000 ppm and 5% of the lower explosive limit (LEL) between 1,000 ppm and 100% LEL. As with the PID, it provides an indication of contamination but not chemical specific concentrations.

The instrument was obtained by GEMTEC from Maxim Environmental & Safety Inc. (Maxim) for this project. Maxim calibrates their instruments on a regular basis, including prior to the use on this project, to ensure consistent results. Site calibration of the field instrument was completed by GEMTEC each day according to the manufacturer's instructions.

5.5 Groundwater Monitoring Well Installation

Installation of all the monitoring wells were completed using a 50-mm diameter, 3.05 metre length, flush-threaded PVC screen and risers with a silica sand pack and bentonite seal. Each monitoring well was finished at surface with flush-mount protective casings. Silica sand was placed around the screened intervals and bentonite hole plug was used to seal the borehole to ground surface. Monitoring well instrumentation details are included on the borehole stratigraphic logs in Appendix B. Monitoring well instrumentation was completed by George Downing Estate Drilling Ltd., under the direct supervision of GEMTEC personnel.

Monitoring wells were installed in three of the four boreholes and were completed in conjunction with the borehole drilling to determine static groundwater elevation, subsurface hydraulic properties, and to permit the collection of groundwater samples for geochemical analysis. Monitoring wells were installed by George Downing Estate Drilling Ltd, a MECP-licenced well driller. Monitoring wells were installed by hand, lowering PVC components through the surface drill casing. Wells were labelled sequentially as MW19-1, MW19-3, and MW19-4, following the same numbering as the boreholes, detailed of the well installations can be found in Table 5.1

Table 5.1: Details of Monitoring Well Installations

MW ID	Depth of MW (m bgs)	Length of Screen (m)	Screened Interval (m bgs)
MW19-1	6.10	3.05	3.05-6.10
MW19-3	4.57	1.52	3.05-4.57
MW19-4	7.62	3.05	4.57-7.62

m bgs - metres below ground surface

Development of monitoring wells took place concurrently with monitoring well purging activities prior to groundwater sampling.

5.6 Groundwater Elevation Monitoring

On October 15, October 18, and October 30, 2019, groundwater elevations were recorded in all newly installed monitoring wells to determine static groundwater elevations on site. Static groundwater levels were measured relative to Top of PVC Riser (TOPVC) using an electronic water level tape (Heron Instruments water meter). The water level meter probe was decontaminated between wells with soapy water (water and alconox solution) and rinsed with deionised water. Static groundwater levels were recorded to the nearest 0.01m. Top of PVC riser elevations were surveyed into a geodetic elevation in October 2019.

5.7 Groundwater Sampling

On September 18, 2019 groundwater samples were collected using peristaltic pump and dedicated sample tubing following low-flow parameter stabilization techniques ensuring that the sampled groundwater is representative of formation conditions and not monitoring well conditions.

Groundwater samples were collected from monitoring wells using dedicated polyethylene tubing with a peristaltic pump. Groundwater samples were collected from MW19-1, MW19-2, and MW19-4 using a peristaltic pump with tubing lowered to a depth of approximately the mid-point of the well screen. Groundwater samples were collected from the monitoring wells in laboratory supplied bottles. The groundwater samples were collected, stored in dedicated coolers and then submitted to AGAT Laboratories Ltd., a CALA accredited laboratory for analyses.

Well development was conducted on October 15, 2019, at the newly installed monitoring wells. The depth to groundwater was measured using an interface probe with water level measurements recorded from the top of the monitoring well PVC pipe. No non-aqueous phase liquid, NAPL (I.e., free product) was noted at the monitoring well locations. The wells were then developed using Waterra tubing and an inertial lift system to remove three well volumes of groundwater and any fine-grained material from around the well screens to ensure proper groundwater movement through the aquifer surrounding the monitoring wells.

5.8 Analytical Testing

Soil and groundwater samples collected for metals/inorganics, PAH, PHC/BTEX, and VOC analysis were collected directly into laboratory-supplied sampling containers. All samples were stored and shipped in coolers with ice packs. Samples were submitted to AGAT Laboratories Ltd., of Mississauga, Ontario, a CALA-certified analytical laboratory, under standard chain-of-custody procedures and in accordance with GEMTEC QA/QC procedures. Complete laboratory analytical reports for 2019 analyses are included in Appendix C.

5.9 Residue Management Procedures

The management of residues such as soil cuttings, purge and development groundwater and fluids from equipment cleaning was conducted as indicated in the following table.

Table 5.2 Summary of Residue Management Procedures

	Residue	Management Procedure
i.	Soil cuttings from drilling	Soil cuttings from the drilling were placed into steel 205 litre drums and left on-site
ii.	Water from well development and purging	Groundwater from the development and purging of the monitoring wells was emptied into steel 205 litre drums and left on-site.

Residue		Management Procedure
iii.	Fluids from equipment cleaning	Equipment cleaning water was emptied into steel 205 litre drums and left on-site.

5.10 Elevation Surveying

The borehole and monitoring well locations were selected by GEMTEC Consulting Engineers and Scientists Limited personnel, and were constrained by accessibility and underground service locations. The ground surface elevations at the location of the boreholes (ground surface) and monitoring wells (with elevations from the PVC risers) were determined using a Trimble R10 global positioning system. The coordinates of the boreholes are referenced to NAD83 (CSRS) Epoch 2010, vertical network CGVD28 and are considered to be accurate within the tolerance of the instrument.

5.11 Quality Assurance and Quality Control Measures

Soil and groundwater samples collected for metals/inorganics, PAH, PHC/BTEX, VOC analysis were collected directly into laboratory-supplied sampling containers. All samples were stored and shipped in coolers. Samples were submitted to AGAT Laboratories Ltd., under standard chain-of-custody procedures and in accordance with GEMTEC QA/QC procedures.

Equipment cleaning procedures for soil sampling consisted of manual cleaning of both split spoons and auger flights. Following each split spoon sample all loose soils were removed from the spoons by heavy brush. Following the removal of loose soils, split spoons were washed prior to a final deionised water rinse. If visual or olfactory evidence of contamination was noted during the advancement of a particular borehole, all drilling equipment including auger flights and split spoons were decontaminated prior to use at the next borehole.

Prior to groundwater sampling, static groundwater levels were determined using an electronic water level tape. To ensure no cross contamination between wells, the water level meter probe was decontaminated between wells with soapy water (water and alconox solution) and then rinsed with deionised water. During the process of groundwater sampling, a multiparameter unit, Horiba U-52, was used to determine field parameters of the groundwater. To ensure no cross contamination, the unit probes as well as flow cell was rinsed with deionised water between each monitoring well.

Due to the dedicated nature of all monitoring well instrumentation (Waterra inertial hand pump, ¼-inch and ¾-inch tubing) no decontamination procedures were required during groundwater sampling. All required lengths of tubing for the groundwater sampling (both ¼-inch and ¾-inch tubing) were disposed of after usage at each designated well. New tubing (both ¼-inch and ¾-inch) was used for groundwater sampling at each well. Standard field protocols were strictly

adhered to in effort to prevent the contamination of sampling equipment (peristaltic pump) during the groundwater sampling program.

Field quality control measures used during the Phase Two ESA consisted of the collection of one field duplicated sample for metals & inorganics, PAHs, PHCs, VOCs in soil and one field duplicate for metals & inorganics, PHCs and BTEX analysis in groundwater. Duplicate soil and groundwater samples were submitted to AGAT Laboratories Ltd. for analysis of selected parameters at a minimum rate of one field duplicate per 10 samples collected. The field duplicate samples will be assessed by calculating the relative percent difference and comparing the average of the analytical testing group to the scientific acceptance criteria

6.0 REVIEW AND EVALUATION

6.1 Geology and Hydrogeology

The surficial geology of the subject site was obtained from the geotechnical investigation conducted by GEMTEC entitled “Geotechnical Investigation, 393 McArthur Avenue, Ottawa, Ontario” and dated November 1, 2019. Borehole logs with detailed soil descriptions and depths are included in Appendix C. The geology encountered during the investigation is detailed within the geotechnical report and summarized below.

A layer of asphaltic concrete was encountered at surface at boreholes 19-1, 19-2, and 19-4. The thickness of the asphaltic concrete is about 30 to 80 millimetres. Base/Subbase material was encountered below the asphaltic concrete at boreholes 19-1, 19-2, and 19-4. The base/subbase material consists generally of sand and gravel with some silt and clay content, and extends to depths of about 0.2 to 0.4 metres below surface grade.

Fill material was encountered below the base/subbase materials at boreholes 19-1, 19-2, and 19-4, and from surface at borehole 19-3. The fill material can generally be described as dark brown/brown/reddish brown/light brown/grey brown sand to silty sand with some gravel and clay, as well as brick fragments. The thickness of the fill ranges between 0.4 to 2.3 metres, and extends to depths of between 0.8 to 2.5 metres below existing grade (approximate elevation of 60.2 to 61.9 metres).

A native deposit of light brown/reddish brown/ grey brown sand and silt with some clay and a trace of gravel was encountered below the fill at boreholes 19-1 and 19-2. The thickness of the silty sand deposit ranges between 0.7 to 2.3 metres, and extends to depths between about 3.1 and 3.2 metres below existing grade (approximate elevation between 59.5 and 59.6 metres).

A native deposit of glacial till was encountered below the sand and silt deposit at boreholes 19-1 and 19-2, and below the fill at boreholes 19-3 and 19-4, at depths between about 1.8 and 3.2 metres below existing grade (elevation 59.6 to 61.1 metres). Glacial till is a heterogeneous mixture

of all grain sizes, however, the glacial till encountered at this site can be described as dark brown to dark grey to light grey silty sand with some clay and gravel, including shale fragments.

Borehole 19-1 was terminated within the glacial till at a depth of 6.1 metres (elevation 56.5 metres). Boreholes 19-2 and 19-3 were terminated due to refusal to further advancement on boulders or inferred bedrock at depths of 4.9 and 7.8 metres below existing grade (elevation 55.2 and 57.8 metres). At borehole 19-3, coring equipment was required in order to penetrate the cobble and boulder obstructions within the glacial till. At borehole 19-4, the glacial till has a thickness of 6.1 metres and extends to a depth of 8.4 metres (elevation 54.4 metres).

At borehole 19-4, shale bedrock was encountered at a depth of approximately 8.4 metres below existing grade (elevation 54.4 metres) and was penetrated with the auguring equipment to a depth of about 9.2 metres below existing grade (elevation 53.6 metres), at which depth the borehole was terminated due to anticipated bedrock refusal to further advancement of the borehole.

The water table at the site is generally found within the glacial till overburden unit, at depths between 2.8 and 3.2 mBGS. Groundwater monitoring wells were installed specifically to target the groundwater quality in the shallowest aquifer present beneath the site. No aquitard, perched aquifer, or confined aquifer were identified during the 2019 investigations. Groundwater flow is discussed in further detail below.

6.2 Groundwater Elevations and Flow Direction

The rationale for choosing locations of monitoring wells was to investigate APECs, identified in the Phase One ESA by GEMTEC. The monitoring wells were designed and installed to intersect the inferred groundwater table.

A groundwater monitoring program was completed by GEMTEC at the subject property on October 15, 18, and 31, 2019. Free product or sheen was not observed or measured in the monitoring wells as part of this investigation. The measured water levels ranged from 2.86 to 3.11 m bgs in the wells which corresponds to groundwater elevations ranging from 59.65 to 59.92 m asl. A table showing the water levels and elevations is presented in Table 6.1.

Table 6.1 Summary of Groundwater Levels – October 18, 2019

Monitoring Well ID	Coordinates (UTM NAD 1983 Zone 18N)		Elevation (m asl)		
	Easting	Northing	Ground surface	Groundwater Elevation	Free product thickness (mm)
MW19-1	449141.7	5031181.3	62.626	59.764	0.00
MW19-3	449160.6	5031177.7	62.928	59.921	0.00
MW19-4	449154.0	5031189.5	62.766	59.651	0.00

m asl' - metres above sea level

Based on the measured groundwater elevations, the groundwater flow is interpreted to be towards the northwest. The groundwater contours were prepared using groundwater elevations at the subject property measured during the sampling event on October 18, 2019. A plan of groundwater contours is shown in Figure A-3.

6.3 Groundwater Hydraulic Gradients

The horizontal hydraulic gradients, calculated based on the following monitoring well pairs, are summarized below:

- BH19-1 to BH19-3 = 0.008 m/m
- BH19-1 to BH19-4 = 0.009 m/m
- BH19-3 to BH19-4 = 0.020 m/m

The average horizontal hydraulic gradient is approximately 0.012 m/m. It should be noted that vertical hydraulic gradients were not evaluated for the site as only one water bearing unit was encountered at the depths investigated at the site.

6.4 Soil Field Screening

Soil vapours were screened for soil samples following a period of equilibration to ambient temperature, using a combustible gas detector (RKI Eagle combustible gas detector calibrated to hexane standards, with methane elimination enabled). Combustible headspace soil vapour readings ranged from 0 ppm and 40 ppm.

Field screening results are provided with the borehole logs in Appendix B.

6.5 Soil Quality

Soil samples were selected for analytical analysis based on the combustible headspace gas readings, visual, olfactory and tactile evidence of impact, fill material as well as the proximity to the groundwater table. A total of 13 soil samples (including two duplicates) were submitted to AGAT Laboratories, a CALA accredited laboratory, for analysis of selected parameters.

The soil samples submitted for analyses and the selected parameters are summarized in Table 6.3:

Table 6.2: Summary of Soil Samples

Sample ID	UMT Coordinates		Sample Depth (mBGS)	Sample Collection Date	Analysis
BH19-1 SA2	5031181	449141	0.15-0.61	01-Oct-19	Metals & inorganics
BH19-1 SA3	5031181	449141	1.52-2.13	01-Oct-19	PAHs, VOCs
BH19-1 SA5	5031181	449141	3.05-3.66	01-Oct-19	VOCs

Sample ID	UMT Coordinates		Sample Depth (mBGS)	Sample Collection Date	Analysis
BH19-1 SA7	5031181	449141	4.57-4.82	01-Oct-19	Metals & inorganics, PAHs
BH19-2 SA2	5031193	449155	0.61-1.22	30-Sep-2019	Metals & inorganics
BH19-2 SA102	5031193	449155	0.61-1.22	30-Sep-2019	Metals & inorganics
BH19-2 SA5B	5031193	449155	2.51-3.05	30-Sep-2019	PAHs, PHCs, VOCs
BH19-2 SA105B	5031193	449155	2.51-3.05	30-Sep-2019	PAHs, PHCs, VOCs
BH19-2 SA8	5031193	449155	4.27-4.88	30-Sep-2019	Metals & inorganics, PAHs
BH19-3 SA2	5031177	449160	0.61-1.22	30-Sep-2019	Metals & inorganics, PAHs
BH19-3 SA5	5031177	449160	2.44-3.05	30-Sep-2019	Metals & inorganics, PAHs
BH19-4 SA4	5031189	449154	2.29-2.90	01-Oct-19	Metals & inorganics, PAHs, PHCs, BTEX
BH19-4 SA6	5031189	449154	3.81-4.42	01-Oct-19	Metals & inorganics, PAHs, PHCs, BTEX

Analytical results for the soil samples submitted for analyses and the selected MECP Table 3 SCS are presented in Tables 9.3 through 9.8 in Section 9. Laboratory Certificates of Analysis for the soil samples are provided in Appendix C.

The sample collected from BH19-2 from 0.61 to 1.22 m bgs (SA2 within the silty sand fill) had concentrations of EC, and SAR above the Table 3 SCS, and BH19-3 SA2 (silty sand fill) had a concentration of EC above the Table 3 SCS. The underlying samples were all below the applicable Table 3 SCS for M&I. All other parameters analysed were either not detected or were less than the Table 3 SCS.

6.6 Groundwater Quality

Well screens were installed in the overburden the three boreholes (MW19-1, MW19-2, and MW19-4), to measure the depth to groundwater and to facilitate groundwater sampling.

Groundwater samples were collected from the monitoring wells in laboratory supplied bottles using a peristaltic pump with disposable tubing. A total of six groundwater samples (including one duplicate, one groundwater field blank, and one groundwater trip blank) were submitted to AGAT Laboratories for analysis of selected parameters. The groundwater samples submitted for analyses of selected parameters is summarized in Table 6.3 a more detailed description can be found in Table 9.9, in Section 9.

Table 6.3: Groundwater Sample Analyses

Sample ID	UMT Coordinates		Stratigraphic Unit	Screened Interval (mASL)	Analysis
	Easting	Northing			
MW 19-1	5031181	449141	Overburden	56.53-59.58	Metals & inorganics, PHCs, VOCs
MW 19-3	5031177	449160	Overburden	58.15-59.67	Metals & inorganics, PHCs, BTEX
MW 19-4	5031189	449154	Overburden	55.31-59.36	Metals & inorganics, PHCs, BTEX

Analytical results for the groundwater samples submitted for analyses and the selected MECP Table 3 SCS are presented in Tables 9.9 through 9.13 in Section 9. Laboratory Certificates of Analysis for the soil samples are provided in Appendix C. All parameters analysed were either not detected or were less than the MECP Table 3 SCS.

6.7 Quality Assurance/Quality Control

A quality assurance/quality control (QA/QC) program was implemented during the Phase Two ESA field investigations as described in Section 5.11. The QA/QC program consisted of the use of standard field protocols. The QA/QC program also included internal laboratory QC performed by AGAT Laboratories of Ottawa, Ontario.

AGAT completed a variety of QA/QC measures on the soil and groundwater samples submitted as part of this sampling program. These QA/QC measures include: sample replicas, matrix spiked laboratory blanks and process blanks. Based on review of the groundwater analytical report, tap water was reportedly analysed as QC sample testing for duplicate and matrix spike due to insufficient sample volume. No other QA/QC comments were present within the report.

A laboratory supplied trip blank for VOCs was transported to the project limits during groundwater sampling activities and submitted to AGAT for VOC analysis to determine if contamination occurred during shipping and field handling procedures.

Soil and groundwater samples were randomly selected by GEMTEC field staff for field duplicate testing. Duplicate samples were selected for every 10 samples submitted for analysis. GEMTEC submitted two soil, and one groundwater field duplicate. BH19-2 SA102 was a blind field duplicate of BH19-2 SA2 (0.61 to 1.22 m) and analyzed for M&I, and BH19-2 SA105B was a blind field duplicate of BH19-2 SA5B (2.51 to 3.05 m) and analyzed for PAHs, PHCs and VOCs.MW19-101 was a blind field duplicate of MW19-1 and analyzed for M&I and VOCs, and MW19-104 was a blind field duplicate of MW19-4 and analyzed for PHCs and BTEX.

The results from the duplicate samples were used to assess the accuracy and reliability of the laboratory procedures and instruments.

Precision is determined by the relative percent difference (RPD) between the set of duplicate samples and was calculated as follows:

$$\text{RPD} = \frac{ABS(\text{x1} - \text{x2})}{\left(\frac{\text{x1} + \text{x2}}{2}\right)} \text{ X } 100$$

Where: X1 is the concentration of the original sample; and

X2 is the concentration of the duplicate sample;

RPD values for homogeneous samples are generally considered acceptable in laboratory QC if they are less than 30%. As well, because the uncertainty associated with a value increases dramatically as the result approaches the MDL, the MECP recommends using a duplicate result in RPD calculations only if the average of the two duplicates is greater than five times the MDL (5x MDL) (MOE, 2004).

A calculation of the relative percent difference (RPD) between the sample and its duplicate was performed and compared to the acceptance limits outlined in the '*Protocol for Analytical Methods Used in the Assessment of Properties'* under Part XV.1 of the Environmental Protection Act, April 2011. The RPD calculation is only applicable when the average of the sample and the field duplicate concentrations are greater than five times the reported detection limit.

The RPDs for soil and groundwater met the MECP Alert criteria which is considered acceptable.

6.8 Phase Two Conceptual Site Model

6.8.1 Overview

The subject property consists of one municipal address, 393 McArthur Avenue. The subject property is rectangular in shape with approximately 21 m of frontage along McArthur Avenue and 57 m along the west side of Belisle Street, with an area of approximately 0.16 hectares (0.4 acres). The subject property is currently vacant with concrete block barricades around the property perimeter and a gated entrance off of McArthur Avenue.

The subject property was first developed sometime prior to 1928. A structure is visible on the subject property in the 1928 aerial photograph. Land use in the study area prior to 1928 was primarily agricultural followed by residential, and commercial.

6.8.2 Proposed Development

GEMTEC understands that the Phase Two ESA is required in support of a proposed development, with potential re-zoning of the property from vacant (commercial) to residential land-use.

6.8.3 Site Stratigraphy

Geological conditions encountered on the subject property during the drilling program consist of fill materials (sand to silty sand) to depths between 0.8 to 2.5 m bgs underlain by native sand and silt and/or glacial till. The glacial till consists of a heterogeneous mixture of silty sand, clay, gravel and shale fragments. The glacial till extends to approximately 8.4 m bgs, where shale bedrock was encountered.

6.8.4 Approximate Depth to Water Table

Based on groundwater levels measured on October 31, 2019, the depth to the water table at the site ranges from 2.8 mBGS to 3.2 mBGS (elevations of 59.4m to 60.1m).

6.8.5 Hydrogeological Characteristics

To date, three groundwater monitoring wells have been advanced at the site and are identified as, MW19-1, MW19-3, and MW19-4, as illustrated on Figure 9.2. Based on groundwater elevations obtained during the Phase Two ESA flow is interpreted to be directed to the north, as illustrated on Figure 9.5.

The horizontal hydraulic gradient, calculated based on the two monitoring well pairs, are summarized below:

- BH19-1 to BH19-3 = 0.008 m/m
- BH19-1 to BH19-4 = 0.009 m/m
- BH19-3 to BH19-4 = 0.020 m/m

The average horizontal hydraulic gradient is approximately 0.012 m/m. It should be noted that vertical hydraulic gradients were not evaluated for the site as only one water bearing unit was encountered at the depths investigated at the site.

6.8.6 Applicability of Section 41 and 43.1 of the Regulation

There were no conditions on the subject property which would apply under Section 41 Environmentally Sensitive Areas and Section 43.1 Shallow Soil Property or Lands Present within 30 m of a Water Body of O.Reg 153/04.

6.8.7 Potential Receptors

On-site human an ecological receptors considered during future site residential use include tenants (potentially including pregnant females and/or children), sub-surface workers and outdoor workers. Off-site human receptors considered during future site residential use include sub-surface workers and indoor workers.

Ecological receptors are represented by on-site and off-sited valued urban ecological components such as mammals and birds, plants, and soil organisms.

6.8.8 PCAs and APECs

The PCAs that created four APECs on the subject property are summarized in the Table 6.4 below.

Table 6.4: Areas of Potential Environmental Concern

APEC #	PCA and Location	Location of APEC on Phase OnePhase One Property	Contaminants of Potential Concern	Media Potentially Impacted
1	PCA # 37: Operation of Dry Cleaning Equipment at 387 McArthur Avenue	West boundary of subject property adjacent to structure at 387 McArthur Avenue	VOCs	Soil and Groundwater
2	PCA # 48: Use of Salt for de-icing purposes on the subject property	Across the subject site	EC SAR	Soil
3	PCA # 30: Importation of Fill Material of Unknown Quality on the subject property	Across the subject site, and two former buildings along east boundary	PAHs Metals & Inorganics	Soil
4	PCA # Other: Hydrocarbon spill from truck on the subject property	Along the eastern boundary midway through the subject property.	PHCs BTEX Metals	Soil and Groundwater

6.8.9 Environmental Conditions

Based on the findings of the Phase One and Phase Two ESA reports, the applicable Site Condition Standards for the future use of the site is Table 3 Generic Site Condition Standards for use in a Non-Potable Ground Water Condition, Course Textured Soils (MOE, 2011a). Environmental conditions at the subject site, as part of the Phase Two CSM are illustrated in plan view on Figure 9.4 and in cross sections A-A' and B-B', Figures 9.6 and 9.7, respectively.

6.8.10 Soil Quality

A comparison of analytical results to the MECP Table 3 SCS for coarse-grained soils identified elevated EC and SAR for soil samples collected at BH19-2 and BH19-3 (See Table B-1):

Table 6.5 Soil Parameters that Exceed Table 3 SCS

Analytical Suite	BH ID / Sample ID	Parameter	Concentration	Table 3 SCS
Metals and Inorganics	BH19-2 SA2	Electrical Conductivity	0.707 mS/cm	0.7 mS/cm
Metals and Inorganics	BH19-2 SA2	Sodium Adsorption Ratio	8.97	5
Metals and Inorganics	BH19-3 SA2	Electrical Conductivity	1.25 mS/cm	0.7 mS/cm

It is anticipated that elevated EC, and SAR in soil samples originating from the subject property are due to substances that have been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. As such, according to section 20 (2) of O.Reg 407/19, "If an applicable site condition standard is exceeded at a property solely because a substance has been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both", as provided for under section 2 of Regulation 339 of the Revised Regulations of Ontario, 1990, Classes of Contaminants – Exemptions, the applicable site condition standard is deemed to not be exceeded for the purpose of Part XV.1 of the Act". Therefore, MECP SCS exceedances of EC, and SAR in soil samples on are not considered to be contamination within the project limits.

6.8.11 Soil and Groundwater Quality

The analytical results indicate groundwater samples collected at each of the sampled monitoring wells met the applicable Table 3 SCS.

6.8.12 Areas Where Contaminants Are Present

The results of the Phase Two ESA indicate the presence of soil contamination at the property at concentrations exceeding MECP Table 3 SCS. The area of soil contamination was along the east boundary of the main rental facility along Belisle Street. However, as indicated above, based on the conditions in which the contamination was incurred, and which conditions are likely to continue, EC and SAR in soil samples on are not considered to be contaminants within the project limits.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The site consists of 393 McArthur Avenue in Ottawa, Ontario and has been subject to development of the property, and demolishment, indicating several APECs on the site.

- APEC 1: Operation of Dry-Cleaning Equipment at 387 McArthur Avenue;
- APEC 2: Use of Salt for de-icing purposes on the subject property.
- APEC 3: Importation of Fill Material of Unknown Quality on the subject property; and,
- APEC 4: Hydrocarbon spill from truck on the subject property.

Geological conditions encountered on the subject property during the drilling program consist of fill materials (sand to silty sand) to depths between 0.8 to 2.5 m bgs underlain by native sand and silt and/or glacial till. The glacial till consists of a heterogeneous mixture of silty sand, clay, gravel and shale fragments. The glacial till extends to approximately 8.4 m bgs, where shale bedrock was encountered.

A total of thirteen soil samples and five groundwater samples (including two supplicates for soil, one duplicate for groundwater, one groundwater trip blank, and one groundwater field blank) were selected based on the combustible headspace gas readings, visual, olfactory and tactile evidence of impacts and submitted to AGAT Laboratories for analysis of selected parameters. Parameters identified in the Phase One ESA (GEMTEC, 2022) for soil and groundwater at the site include metals and inorganics, PAHs, PHCs and BTEX, and VOCs.

The following is a summary of the contaminants of concern identified in soil at the subject property:

- The EC and SAR in a soil sample collected at the depth of 0.61 to 1.22 m bgs (silty sand fill) at BH19-2 was 0.707 mS/cm and 8.97, marginally exceeding the Table 3 SCS of 0.7 mS/cm and 5, respectively; and,
- The EC in a soil sample collected at a depth of 0.61 to 1.22 m bgs (silty sand fill) at BH19-3 was 1.25 mS/cm, exceeding the Table 3 SCS of 0.7 mS/cm.

It is interpreted that elevated SAR and EC within the fill materials in BH19-2 and BH19-3 originate from the subject property are due to substances that have been applied to surfaces for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. Accordingly, as indicated above according to Section 20 (2) of O.Reg 407/19, MECP SCS exceedances of SAR, and EC in are not considered to be contamination within the project limits. As such, no further work is recommended.

The soil and groundwater analytical results are representative only of the sampling locations and conditions may vary between sampling locations. The sampling was conducted to give a general overview of soil and groundwater quality.

Based on the results of the Phase Two ESA, the soil quality at the subject property does not meet the applicable site condition standards established in the MECP document Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (SGWS), dated March 9, 2004, and amended in April 2011. However, based on Section 20 (2) of O.Reg. 407/19, EC and SAR exceedances do not represent soil contamination at the Subject Property.

8.0 CLOSURE

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact the undersigned.

Nicole Soucy, M.A.Sc., P.Eng
Environmental Engineer

Shaun Pelkey, M.Sc.E., P.Eng.
Principal Engineer, Vice President

9.0 LIMITATION OF LIABILITY

This report was prepared for and the work referred to within it has been undertaken by GEMTEC Consulting Engineers and Scientists Ltd for Novatech . It is intended for the exclusive use of Novatech . This report may not be relied upon by any other person or entity without the express written consent of GEMTEC, Novatech . Nothing in this report is intended to provide a legal opinion.

The investigation undertaken by GEMTEC with respect to this report and any conclusions or recommendations made in this report reflect the best judgements of GEMTEC based on the site conditions observed during the investigations undertaken at the date(s) identified in the report and on the information available at the time the report was prepared. This report has been prepared for the application noted and it is based, in part, on visual observations made at the site, subsurface investigations at discrete locations and depths and laboratory analyses of specific chemical parameters and material during a specific time interval, all as described in the report. Unless otherwise stated, the findings contained in this report cannot be extrapolated or extended to previous or future site conditions, portions of the site that were unavailable for direct investigation, subsurface locations on the site that were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Chemical parameters other than those addressed by the investigation described in this report may exist in soil and groundwater elsewhere on the site, the chemical parameters addressed in the report may exist in soil and groundwater at other locations at the site that were not investigated, and concentrations of the chemical parameters addressed which are different than those reported may exist at other locations on the site than those from where the samples were taken.

Should new information become available during future work, including excavations, borings, or other studies, GEMTEC should be requested to review the information and, if necessary, re-assess the conclusions presented herein.

10.0 REFERENCES

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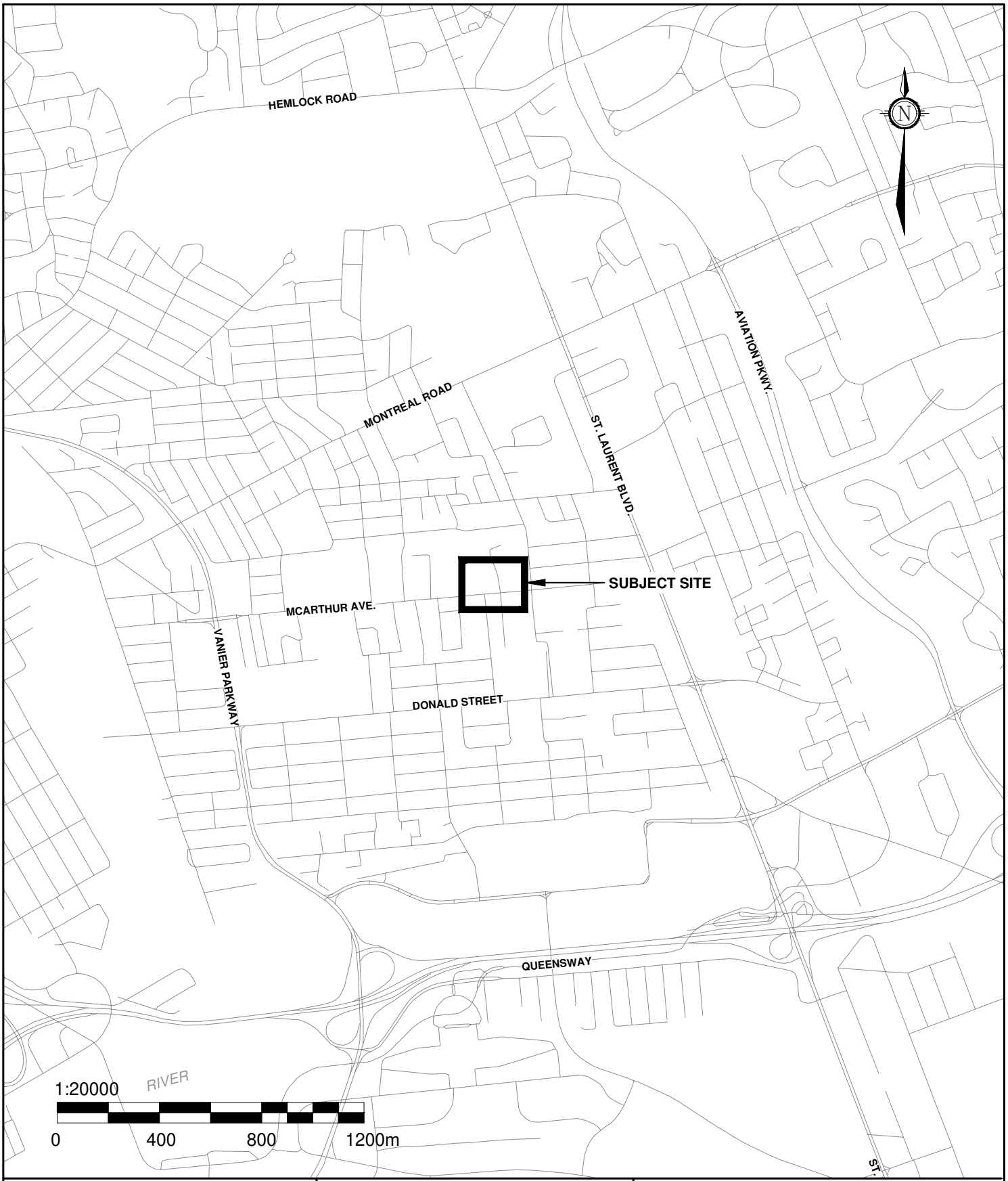
APPENDIX A

Figures



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Project	Drawing
PHASE TWO ESA/RECORD OF SITE CONDITION 393 MCARTHUR AVENUE OTTAWA, ONTARIO	SITE LOCATION

Drwn By	Chkd By	Date	Project No.	Revision No.	
P.C.	N.S.	JUNE 2020	64819.22	2	**FIGURE 9.1**

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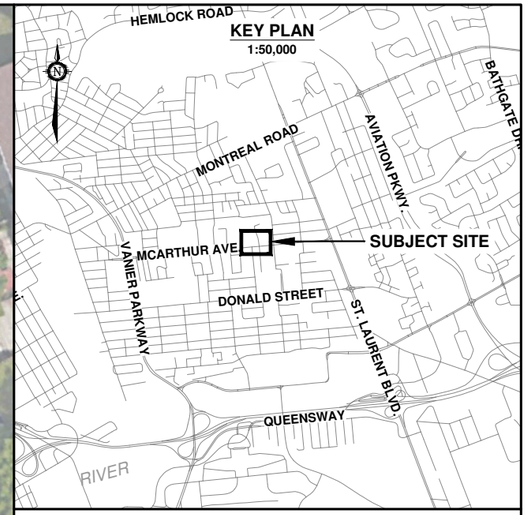

LEGEND

SUBJECT SITE

BOREHOLE LOCATION IN PLAN
(current investigation by GEMTEC)

BOREHOLE LOCATION WITH MONITORING WELL
(current investigation by GEMTEC)

BH/MW # ← BOREHOLE/MONITORING WELL ID
XX.XX ← GROUND SURFACE ELEVATION, IN METRES GEODETIC DATUM

A A'

CROSS SECTION LOCATION IN PLAN
(current investigation by GEMTEC)

Scale 1:500

0 10 20 30m

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Drawing: SITE LAYOUT

Client: NOVATECH

Project: 64819.22

PHASE TWO ESA/RECORD OF SITE CONDITION
393 MCARTHUR AVENUE
OTTAWA, ONTARIO

Drwn by: P.C.
Chkd by: N.S.

Date: JUNE 2020
Rev.: 2

FIGURE 9.2

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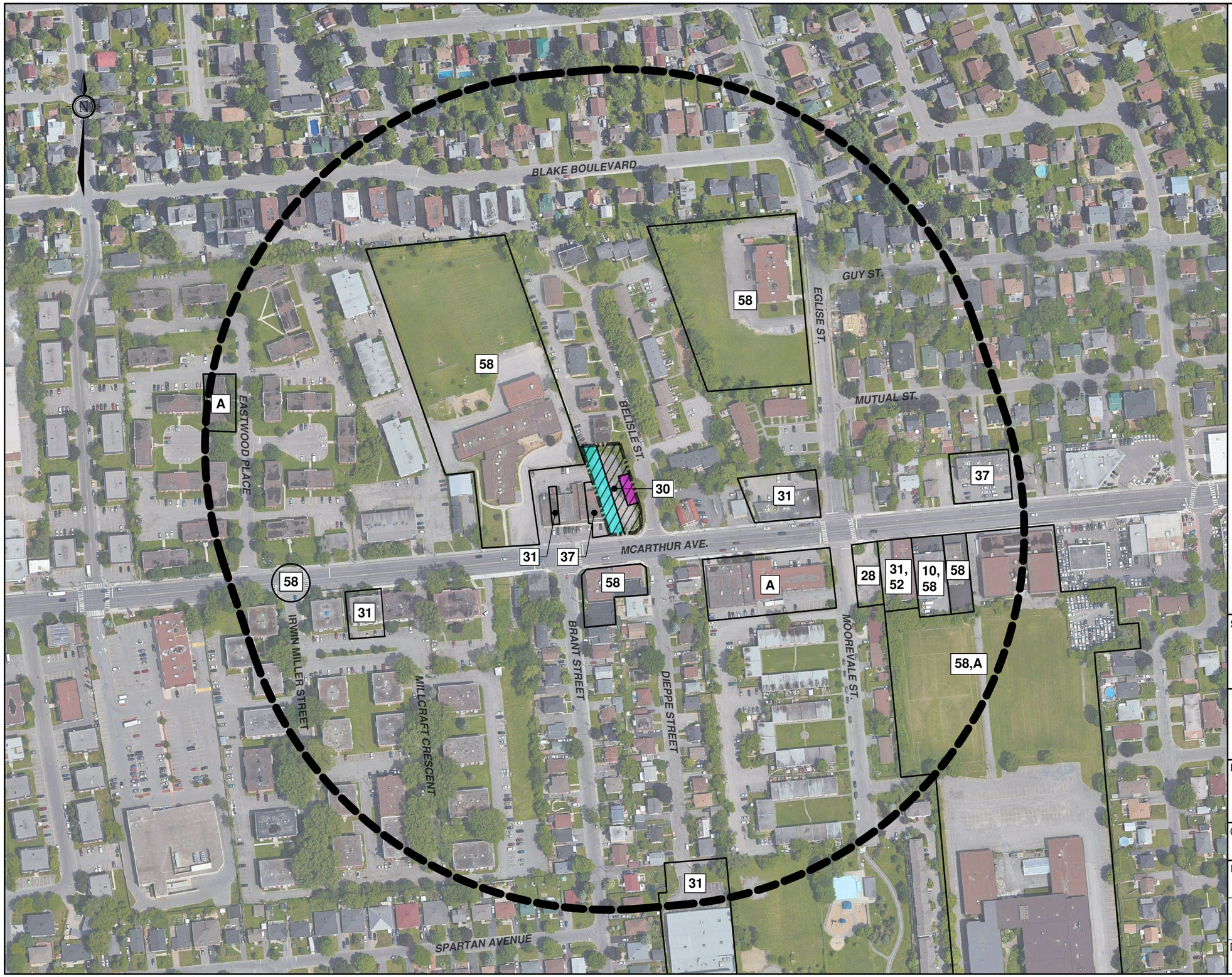

LEGEND

SUBJECT SITE

250 METRE BUFFER SHOWING EXTENT OF STUDY AREA

POTENTIALLY CONTAMINATING ACTIVITIES (PCA)

28	GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS
30	IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY
31	INK MANUFACTURING, PROCESSING AND BULK STORAGE
37	OPERATION OF DRY CLEANING EQUIPMENT
48	SALT MANUFACTURING, PROCESSING AND BULK STORAGE
52	STORAGE, MAINTENANCE, FUELLING AND REPAIR OF EQUIPMENT, VEHICLES, AND MATERIAL USED TO MAINTAIN TRANSPORTATION SYSTEMS
58	WASTE DISPOSAL AND WASTE MANAGEMENT, INCLUDING THERMAL TREATMENT, LANDFILLING AND TRANSFER OF WASTE, OTHER THAN USE OF BIOSOILS AS SOIL CONDITIONERS

OTHER PCAs:

A	SPILL

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

- APEC 1
- APEC 2 (ENTIRE SITE)
- APEC 3

Scale 1:2500

0 50 100 150m

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Drawing: PHASE ONE CONCEPTUAL SITE MODEL

Client: NOVATECH

Project: 64819.22

Drwn by: P.C. | Chkd by: N.S.

PHASE TWO ESA/RECORD OF SITE CONDITION
393 MCARTHUR AVENUE
OTTAWA, ONTARIO

Date: JUNE 2020 | Rev.: 2

FIGURE 9.3

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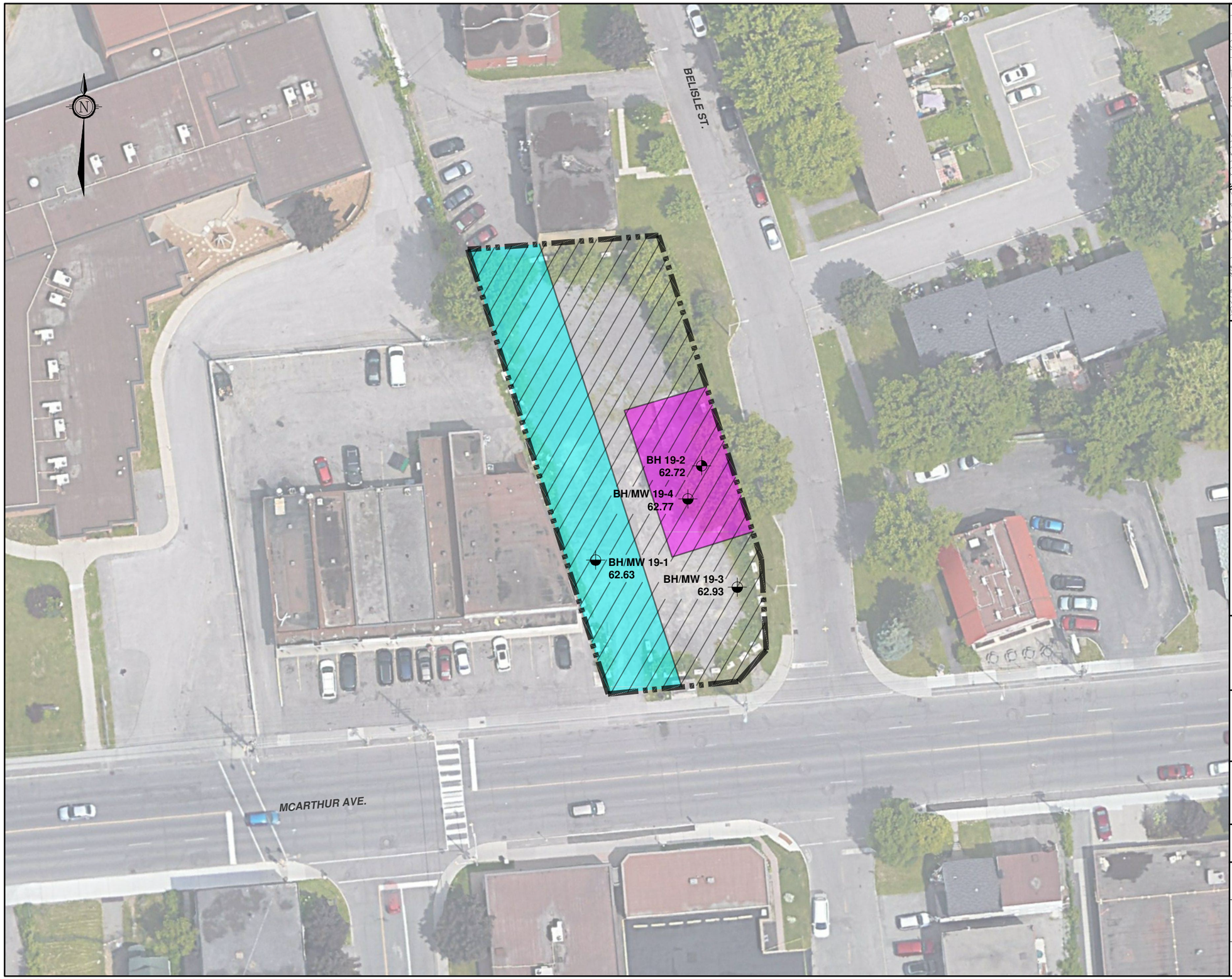

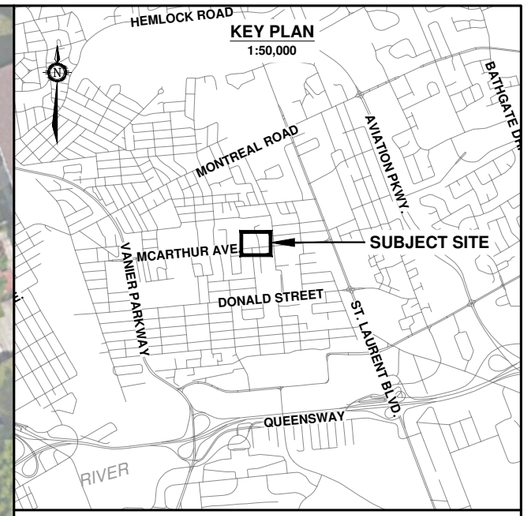

LEGEND

SUBJECT SITE

BOREHOLE LOCATION
(current investigation by GEMTEC)

BOREHOLE LOCATION WITH MONITORING WELL
(current investigation by GEMTEC)

BH/MW # — BOREHOLE/MONITORING WELL ID

XX.XX — GROUND SURFACE ELEVATION, IN METRES GEODETIC DATUM

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

- APEC 1
- APEC 2 (ENTIRE SITE)
- APEC 3

Scale 1:500

0 10 20 30m

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Drawing: APECs & PHASE TWO ESA SAMPLING LOCATIONS

Client: NOVATECH

Project: 64819.22

PHASE TWO ESA/RECORD OF SITE CONDITION
393 MCARTHUR AVENUE
OTTAWA, ONTARIO

Drwn by: P.C.

Chkd by: N.S.

Date: JUNE 2020

Rev.: 2

FIGURE 9.4

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BH 19-2

Sample Type	ID	Depth/ Screened Interval (mbgs)	Date	Stratigraphic Unit	Exceedances
Soil	BH19-2 SA2	0.61 - 1.22	Sept-30-2019	Fill	SAR, EC
Soil	BH19-2 SA102	0.61 - 1.22	Sept-30-2019	Fill	SAR
Soil	BH19-2 SA5B	2.51 - 3.05	Sept-30-2019	Sand and Silt	None
Soil	BH19-2 SA105B	2.51 - 3.05	Sept-30-2019	Sand and Silt	None
Soil	BH19-2 SA8	4.27 - 4.88	Sept-30-2019	Glacial Till	None

BH/MW 19-4

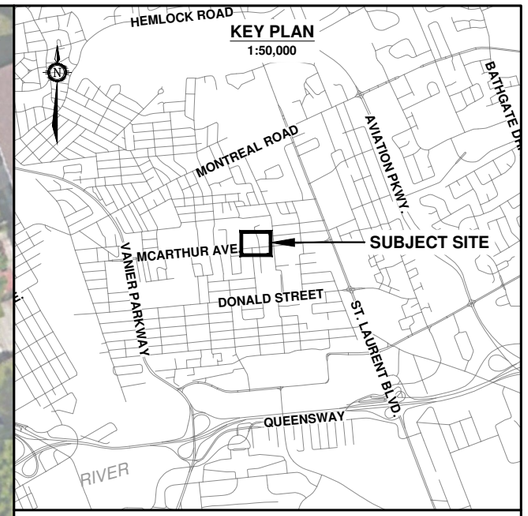
Sample Type	ID	Depth/ Screened Interval (mbgs)	Date	Stratigraphic Unit	Exceedances
Groundwater	MW19-4	3.41 - 7.46	Jan-18-2019	Overburden	None
Soil	BH19-4 SA4	2.29 - 2.90	Oct-01-2019	Glacial Till	None
Soil	BH19-4 SA6	3.81-4.42	Oct-01-2019	Glacial Till	None

BH/MW 19-1

Sample Type	ID	Depth/ Screened Interval (mbgs)	Date	Stratigraphic Unit	Exceedances
Groundwater	MW19-1	3.05 - 6.10	Jan-18-2019	Overburden	None
Soil	BH19-1 SA2	0.15 - 0.61	Oct-01-2019	Base/ Subsase Fill	SAR
Soil	BH19-1 SA3	1.52 - 2.13	Oct-01-2019	Sand and Silt	None
Soil	BH19-1 SA5	3.05 - 3.66	Oct-01-2019	Glacial Till	None
Soil	BH19-1 SA7	4.57 - 4.82	Oct-01-2019	Glacial Till	None

BH/MW 19-3

Sample Type	ID	Depth/ Screened Interval (mbgs)	Date	Stratigraphic Unit	Exceedances
Groundwater	MW19-3	3.26 - 4.78	Jan-18-2019	Overburden	None
Soil	BH19-3 SA2	0.61 - 1.22	Sept-30-2019	Fill	EC
Soil	BH19-3 SA5	2.44 - 3.05	Sept-30-2019	Glacial Till	None



LEGEND

- SUBJECT SITE
- **BOREHOLE LOCATION IN PLAN** (current investigation by GEMTEC)
- **BOREHOLE LOCATION WITH MONITORING WELL** (current investigation by GEMTEC)
- BH/MW # (XX.XX) — BOREHOLE/MONITORING WELL ID; GROUNDWATER ELEVATION, IN METRES GEODETIC DATUM
- GROUNDWATER FLOW DIRECTION

Scale 1:500

0 10 20 30m

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Drawing: PLAN DISTRIBUTION OF SOIL AND GROUNDWATER QUALITY EXCEEDANCES

Client: NOVATECH

Project: 64819.22

PHASE TWO ESA/RECORD OF SITE CONDITION
393 MCARTHUR AVENUE
OTTAWA, ONTARIO

Drwn by: P.C. | Chkd by: N.S.

Date: JUNE 2020 | Rev.: 2

FIGURE 9.5

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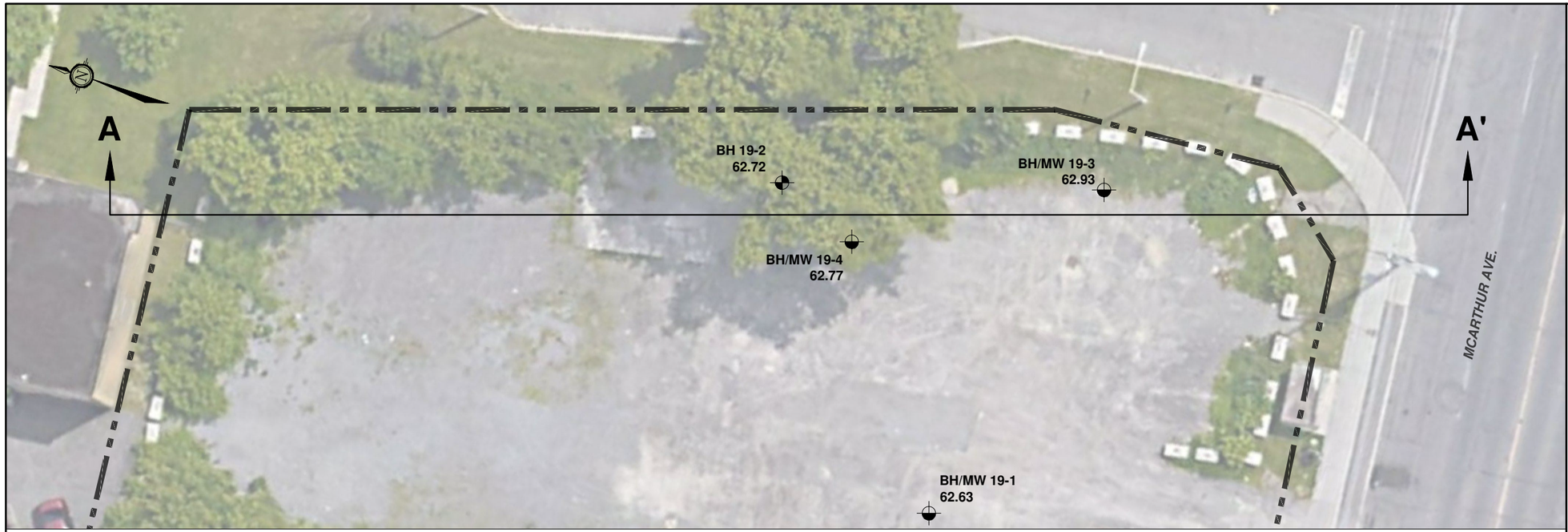
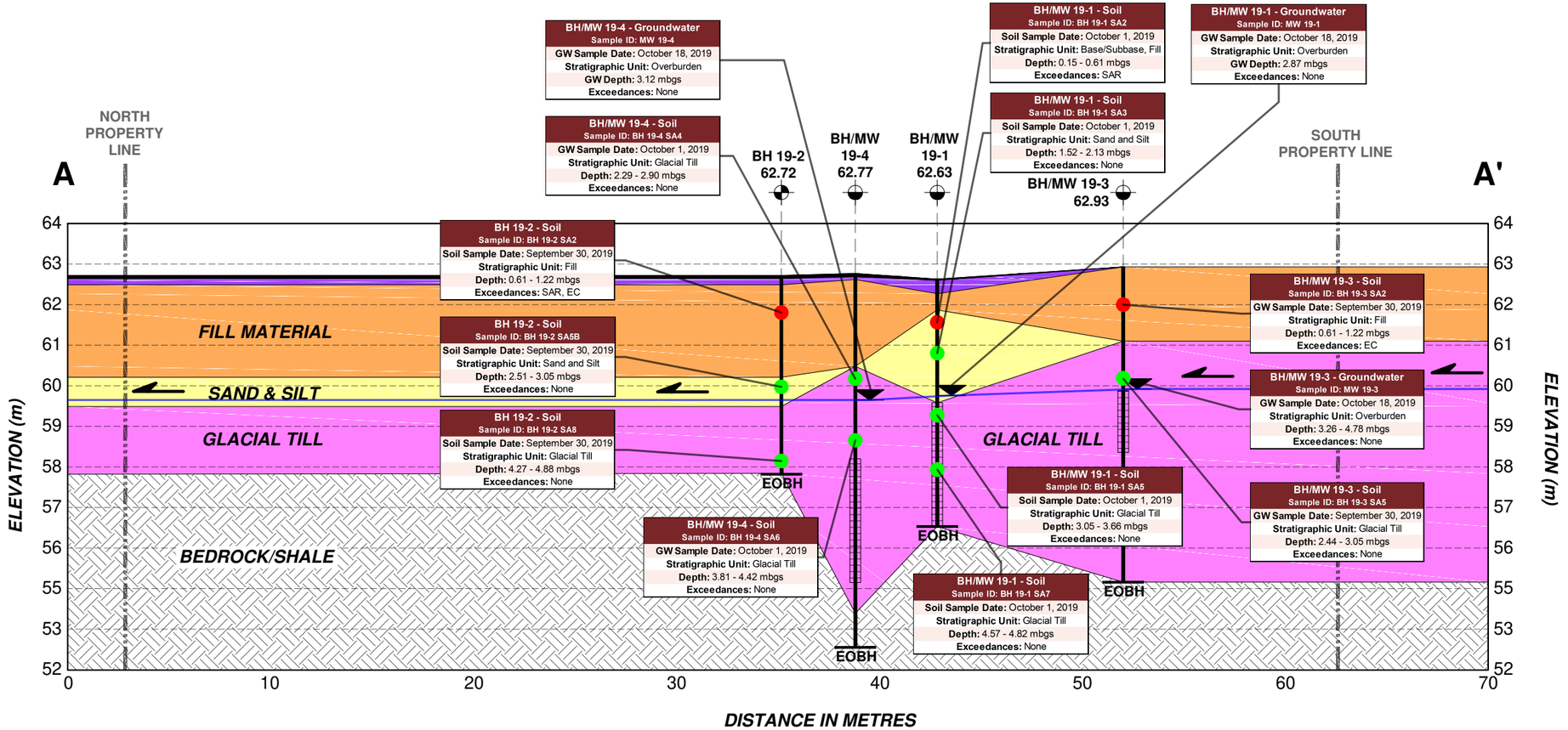


LEGEND

- **BOREHOLE LOCATION** (current investigation by GEMTEC)
- **BOREHOLE WITH MONITORING WELL** (current investigation by GEMTEC)
- **BH/MW #** — BOREHOLE/MONITORING WELL ID
- **XX.XX** — GROUND SURFACE ELEVATION, IN METRES GEODETIC DATUM
- GROUNDWATER LEVEL (Measured October 18, 2019)
- ASPHALTIC CONCRETE
- SAND AND SILT
- BASE/SUBBASE MATERIAL
- GLACIAL TILL
- FILL MATERIAL
- BEDROCK/SHALE
- INTERPRETED GROUNDWATER FLOW DIRECTION
- SAMPLE LOCATION (NO EXCEEDANCES)
- SAMPLE LOCATION (WITH EXCEEDANCES)
- WELL SCREEN



Horizontal Scale
1:250
0 5 10 15m

Vertical Scale
1:125
0 2.5 5 7.5m

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Drawing
CROSS SECTION A-A'
SOIL QUALITY EXCEEDANCES

Client
NOVATECH

Project
64819.22

PHASE TWO ESA/RECORD OF SITE CONDITION
393 MCARTHUR AVENUE
OTTAWA, ONTARIO

Drwn by	Chkd by
P.C.	N.S.

Date
JUNE 2020

Rev.
2

FIGURE 9.6

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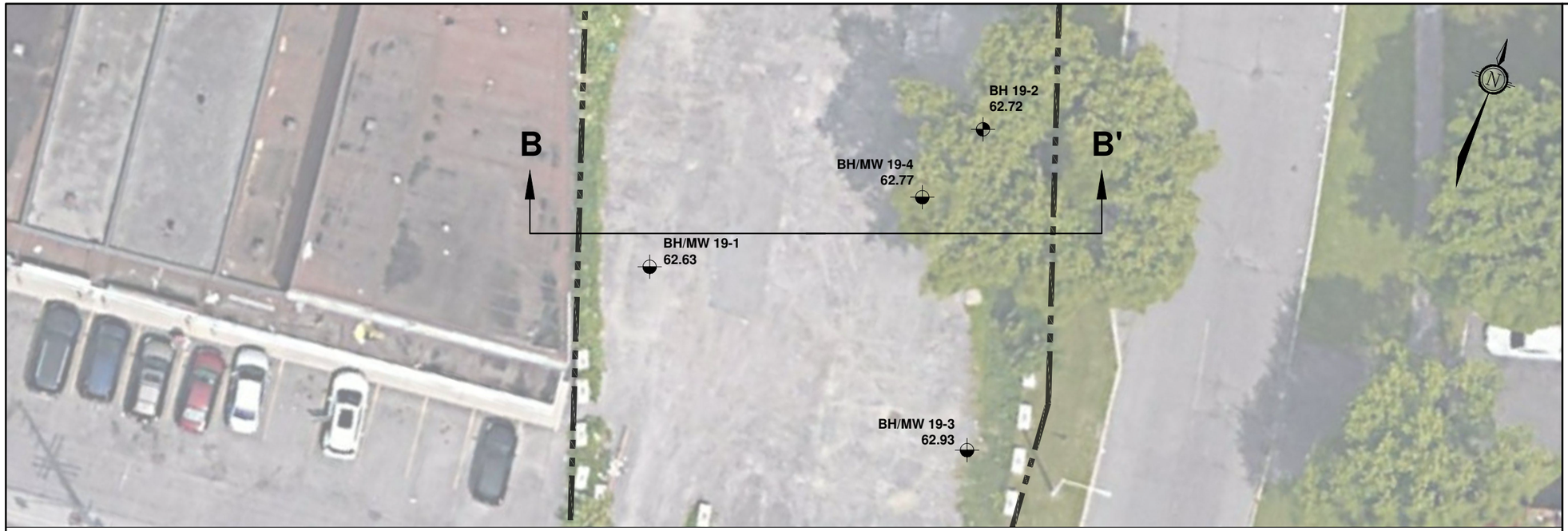
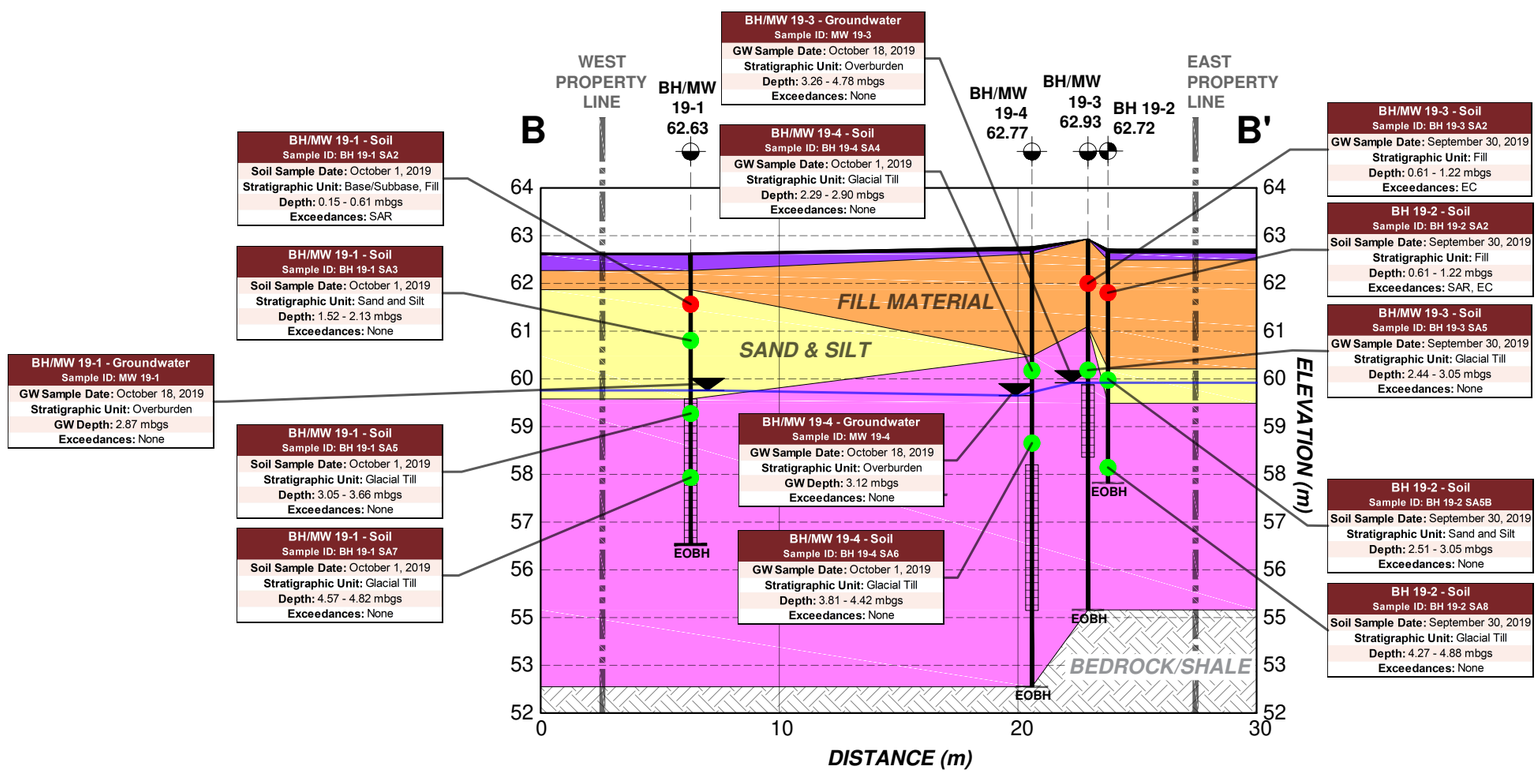


LEGEND

- **BOREHOLE LOCATION** (current investigation by GEMTEC)
- **BOREHOLE WITH MONITORING WELL** (current investigation by GEMTEC)
- **BH/MW #** — BOREHOLE/MONITORING WELL ID
- **XX.XX** — GROUND SURFACE ELEVATION, IN METRES GEODETIC DATUM
- GROUNDWATER LEVEL (Measured October 18, 2019)
- ASPHALTIC CONCRETE
- SAND AND SILT
- BASE/SUBBASE MATERIAL
- GLACIAL TILL
- FILL MATERIAL
- BEDROCK/SHALE
- INTERPRETED GROUNDWATER FLOW DIRECTION
- SAMPLE LOCATION (NO EXCEEDANCES)
- SAMPLE LOCATION (WITH EXCEEDANCES)
- WELL SCREEN



Horizontal Scale

1:250

0 5 10 15m

Vertical Scale

1:125

0 2.5 5 7.5m

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Drawing

CROSS SECTION B-B'
SOIL QUALITY EXCEEDANCES

Client

NOVATECH

Project	PHASE TWO ESA/RECORD OF SITE CONDITION 393 MCARTHUR AVENUE OTTAWA, ONTARIO
64819.22	
Drwn by: P.C. / Chkd by: N.S.	
Date: JUNE 2020	Rev. 2

FIGURE 9.7

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APPENDIX B

Soil and Groundwater Summary Tables

GEMTEC
Consulting Engineers and Scientists

Table B-1: Summary of Analytical Results in Soil
Metals, Inorganics and PAHs
393 McArthur Avenue, Ottawa, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MECP TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH19-1 SA2 0.15-0.61 19Z526729 01-Oct-19	BH19-1 SA3 1.52-2.13 19Z526729 01-Oct-19	BH19-1 SA5 3.05-3.66 19Z526729 01-Oct-19	BH19-1 SA7 4.57-4.82 19Z526729 01-Oct-19	BH19-2 SA2 0.61-1.22 19Z526729 30-Sep-2019	BH19-2 SA102 Duplicate of BH19-2 SA2 0.61-1.22 19Z526729 30-Sep-2019	BH19-2 SA5B 2.51-3.05 19Z526729 30-Sep-2019	BH19-2 SA105B Duplicate of BH19-2 SA5B 2.51-3.05 19Z526729 30-Sep-2019	BH19-2 SA8 4.27-4.88 19Z526729 30-Sep-2019
Metals and Inorganics												
Antimony	7.5	0.8	µg/g	<0.8	NA	NA	<0.8	<0.8	<0.8	NA	NA	<0.8
Arsenic	18	1	µg/g	2	NA	NA	4	2	2	NA	NA	4
Barium	390	2	µg/g	114	NA	NA	98	147	154	NA	NA	52
Beryllium	4	0.5	µg/g	<0.5	NA	NA	<0.5	0.5	0.5	NA	NA	<0.5
Boron (Hot Water Soluble)	1.5	0.1	µg/g	0.14	NA	NA	0.35	0.2	0.18	NA	NA	0.15
Cadmium	1.2	0.5	µg/g	<0.5	NA	NA	<0.5	<0.5	<0.5	NA	NA	<0.5
Chromium	160	2	µg/g	41	NA	NA	17	49	47	NA	NA	12
Chromium VI	8	0.2	µg/g	<0.2	NA	NA	<0.2	<0.2	<0.2	NA	NA	<0.2
Cobalt	22	0.5	µg/g	10.1	NA	NA	7.5	10.5	10.5	NA	NA	6.5
Copper	140	1	µg/g	22	NA	NA	21	23	22	NA	NA	23
Lead	120	1	µg/g	5	NA	NA	10	6	6	NA	NA	7
Mercury	0.27	0.1	µg/g	<0.10	NA	NA	<0.10	<0.10	<0.10	NA	NA	<0.10
Molybdenum	6.9	0.5	µg/g	0.8	NA	NA	1.8	<0.5	<0.5	NA	NA	1.4
Nickel	100	1	µg/g	23	NA	NA	19	27	26	NA	NA	16
Selenium	2.4	0.4	µg/g	<0.4	NA	NA	<0.4	<0.4	<0.4	NA	NA	<0.4
Silver	20	0.2	µg/g	<0.2	NA	NA	<0.2	<0.2	<0.2	NA	NA	<0.2
Thallium	1	0.4	µg/g	<0.4	NA	NA	<0.4	<0.4	<0.4	NA	NA	<0.4
Vanadium	86	1	µg/g	47	NA	NA	23	50	48	NA	NA	20
Zinc	340	5	µg/g	42	NA	NA	27	46	45	NA	NA	26
pH	5 to 9	NV	pH Units	7.31	7.63	7.95	8.15	7.73	7.74	NA	NA	8.08
Electrical Conductivity	0.7	0.005	mS/cm	0.461	NA	NA	0.285	**0.707**	0.681	NA	NA	0.207
Sodium Adsorption Ratio	5	NV	N/A	**6.81**	NA	NA	0.604	**8.97**	**8.56**	NA	NA	0.399
Cyanide, Free	0.051	0.04	µg/g	<0.040	NA	NA	<0.040	<0.040	<0.040	NA	NA	<0.040
Boron (Total)	120	5	µg/g	<5	NA	NA	7	<5	<5	NA	NA	<5
Uranium	23	0.5	µg/g	0.8	NA	NA	1	0.9	0.9	NA	NA	0.8
Polycyclic Aromatic Hydrocarbons (PAHs)												
Acenaphthene	7.9	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Acenaphthylene	0.15	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Anthracene	0.67	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Benzo(a)anthracene	0.5	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Benzo(a)pyrene	0.3	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Benzo(b/j)fluoranthene	0.78	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Benzo(ghi)perylene	6.6	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	0.78	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Chrysene	7	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	0.1	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Fluoranthene	0.69	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Fluorene	62	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	0.38	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
1,2-Methylnaphthalene	0.99	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Naphthalene	0.6	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Phenanthrene	6.2	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05
Pyrene	78	0.05	µg/g	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.05

Notes:
'NV ' : No Standard established NA: Parameter not analyzed
MECP Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Soil in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional Property Use with Coarse Textured Soils.

100	Exceeds MECP Table 3: Standards
100	Detection Limit Exceeds MECP Standard

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Table B-1: Summary of Analytical Results in Soil
Metals, Inorganics and PAHs
393 McArthur Avenue, Ottawa, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MECP TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH19-3 SA2 0.61-1.22 19Z526729 30-Sep-2019	BH19-3 SA5 2.44-3.05 19Z526729 30-Sep-2019	BH19-4 SA4 2.29-2.90 19Z526729 01-Oct-19	BH19-4 SA6 3.81-4.42 19Z526729 01-Oct-19
Metals and Inorganics							
Antimony	7.5	0.8	µg/g	<0.8	<0.8	<0.8	<0.8
Arsenic	18	1	µg/g	5	7	7	7
Barium	390	2	µg/g	133	269	112	202
Beryllium	4	0.5	µg/g	<0.5	0.5	0.5	0.7
Boron (Hot Water Soluble)	1.5	0.1	µg/g	0.36	0.22	0.23	0.42
Cadmium	1.2	0.5	µg/g	0.6	<0.5	<0.5	<0.5
Chromium	160	2	µg/g	34	18	18	24
Chromium VI	8	0.2	µg/g	<0.2	<0.2	<0.2	<0.2
Cobalt	22	0.5	µg/g	8.7	11.1	10.7	14.2
Copper	140	1	µg/g	22	30	29	37
Lead	120	1	µg/g	104	13	13	19
Mercury	0.27	0.1	µg/g	0.12	<0.10	<0.10	<0.10
Molybdenum	6.9	0.5	µg/g	1.2	4.9	4.9	5.3
Nickel	100	1	µg/g	22	35	36	43
Selenium	2.4	0.4	µg/g	0.5	0.6	0.4	0.7
Silver	20	0.2	µg/g	<0.2	<0.2	<0.2	<0.2
Thallium	1	0.4	µg/g	<0.4	<0.4	<0.4	<0.4
Vanadium	86	1	µg/g	38	26	27	28
Zinc	340	5	µg/g	275	39	39	38
pH	5 to 9	NV	pH Units	8.11	7.9	7.87	8.03
Electrical Conductivity	0.7	0.005	mS/cm	**1.25**	0.458	0.676	0.366
Sodium Adsorption Ratio	5	NV	N/A	3.71	0.59	1.25	0.928
Cyanide, Free	0.051	0.04	µg/g	<0.040	<0.040	<0.040	<0.040
Boron (Total)	120	5	µg/g	7	9	9	11
Uranium	23	0.5	µg/g	0.9	1.8	1.9	2.3
Polycyclic Aromatic Hydrocarbons (PAHs)							
Acenaphthene	7.9	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	0.15	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Anthracene	0.67	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Benzo(a)anthracene	0.5	0.05	µg/g	0.09	<0.05	<0.05	<0.05
Benzo(a)pyrene	0.3	0.05	µg/g	0.07	<0.05	<0.05	<0.05
Benzo(b/j)fluoranthene	0.78	0.05	µg/g	0.07	<0.05	<0.05	<0.05
Benzo(ghi)perylene	6.6	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	0.78	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Chrysene	7	0.05	µg/g	0.07	<0.05	<0.05	<0.05
Dibenzo(a,h)anthracene	0.1	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.69	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Fluorene	62	0.05	µg/g	0.12	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	0.38	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
1,2-Methylnaphthalene	0.99	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Naphthalene	0.6	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Phenanthrene	6.2	0.05	µg/g	<0.05	<0.05	<0.05	<0.05
Pyrene	78	0.05	µg/g	0.13	<0.05	<0.05	<0.05

Notes:
'NV ' : No Standard established NA: Parameter not analyzed
MECP Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Soil in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional Property Use with Coarse Textured Soils.

100	Exceeds MECP Table 3: Standards
100	Detection Limit Exceeds MECP Standard

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Table B-2: Summary of Analytical Results in Soil
PHCs and VOCs
393 McArthur Avenue, Ottawa, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MECP TABLE 3 STANDARD	REPORTING LIMIT	UNITS	BH19-1 SA3 1.52-2.13 19Z526729 01-Oct-19	BH19-1 SA5 3.05-3.66 19Z526729 01-Oct-19	BH19-2 SA5B 2.51-3.05 19Z526729 30-Sep-19	BH19-2 SA105B Duplicate of BH19-2 SA5B 2.51-3.05 19Z526729 30-Sep-19	BH19-4 SA4 2.29-2.90 19Z526729 01-Oct-19	BH19-4 SA6 3.81-4.42 19Z526729 01-Oct-19
Petroleum Hydrocarbon Compounds (PHCs)									
F1 (C6-C10)	55	5	µg/g	NA	NA	<5	<5	10	24
F1 (C6-C10) - BTEX	55	5	µg/g	NA	NA	<5	<5	10	24
F2 (C10-C16)	98	10	µg/g	NA	NA	<10	22	11	<10
F3 (C16-C34)	300	50	µg/g	NA	NA	<50	<50	<50	<50
F4 (C34-C50)	2800	50	µg/g	NA	NA	<50	<50	<50	<50
F4 Gravimetric	2800	50	µg/g	NA	NA	NA	NA	NA	NA
Reached Baseline at C50	NV	YES/NO	NV	NA	NA	YES	YES	YES	YES
Volatile Organic Compounds (VOCs)									
Acetone	16	0.5	µg/g	<0.50	<0.50	<0.50	<0.50	NA	NA
Benzene	0.21	0.02	µg/g	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	13	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Bromoform	0.27	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Bromomethane	0.05	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Carbon Tetrachloride	0.05	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Chlorobenzene	2.4	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Chloroform	0.05	0.04	µg/g	<0.04	<0.04	<0.04	<0.04	NA	NA
Dibromochloromethane	9.4	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,2-Dichlorobenzene	3.4	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,3-Dichlorobenzene	4.8	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,4-Dichlorobenzene	0.083	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,1-Dichloroethane	3.5	0.02	µg/g	<0.02	<0.02	<0.02	<0.02	NA	NA
1,2-Dichloroethane	0.05	0.03	µg/g	<0.03	<0.03	<0.03	<0.03	NA	NA
1,1-Dichloroethylene	0.05	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Cis-1,2-Dichloroethylene	3.4	0.02	µg/g	<0.02	<0.02	<0.02	<0.02	NA	NA
Trans-1,2-Dichloroethylene	0.084	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,2-Dichloropropane	0.05	0.03	µg/g	<0.03	<0.03	<0.03	<0.03	NA	NA
1,3-Dichloropropylene	0.05	0.04	µg/g	<0.04	<0.04	<0.04	<0.04	NA	NA
Ethylbenzene	2	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide (1,2-Dibromoethane	0.05	0.04	µg/g	<0.04	<0.04	<0.04	<0.04	NA	NA
Methyl Ethyl Ketone	16	0.5	µg/g	<0.50	<0.50	<0.50	<0.50	NA	NA
Methylene Chloride	0.1	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Methyl Isobutyl Ketone	1.7	0.5	µg/g	<0.50	<0.50	<0.50	<0.50	NA	NA
Methyl-t-Butyl Ether	0.75	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Styrene	0.7	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,1,1,2-Tetrachloroethane	0.058	0.04	µg/g	<0.04	<0.04	<0.04	<0.04	NA	NA
1,1,2,2-Tetrachloroethane	0.05	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Toluene	2.3	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.28	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,1,1-Trichloroethane	0.38	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
1,1,2-Trichloroethane	0.05	0.04	µg/g	<0.04	<0.04	<0.04	<0.04	NA	NA
Trichloroethylene	0.061	0.03	µg/g	<0.03	<0.03	<0.03	<0.03	NA	NA
Vinyl Chloride	0.02	0.02	µg/g	<0.02	<0.02	<0.02	<0.02	NA	NA
m-Xylene & p-Xylene	NV	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
o-Xylene	NV	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Total Xylenes	3.1	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	16	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Dioxane, 1,4-	1.8	NA	µg/g	NA	NA	NA	NA	NA	NA
Hexane(n)	2.8	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA
Trichlorofluoromethane	4	0.05	µg/g	<0.05	<0.05	<0.05	<0.05	NA	NA

Notes:
'NV ' : No Standard established NA: Parameter not analyzed
MECP Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards for Soil in a Non-Potable Ground Water Condition for Residential/Parkland/Institutional Property Use with Coarse Textured Soils.

100	Exceeds MECP Table 3: Standards
100	Detection Limit Exceeds MECP Standard

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Table B-3: Summary of Analytical Results in Groundwater
Metals, Inorganics and PAHs
393 McArthur Avenue, Ottawa, Ontario

Sample ID Screen Interval (mbgs) Lab Job # Sampling Date	MECP TABLE 3 STANDARD	REPORTING LIMIT	UNITS	MW19-1 3.05-6.10 19Z532666 18-Oct-2019	MW19-101 Duplicate of MW19-1 3.05-6.10 19Z532666 18-Oct-2019	MW19-3 3.05-4.57 19Z532666 18-Oct-2019	MW19-4 4.57-7.62 19Z532666 18-Oct-2019
Metals and Inorganics							
Antimony	20000	1.0	ug/L	<1.0	<1.0	<1.0	<1.0
Arsenic	1900	1.0	ug/L	<1.0	1.2	<1.0	<1.0
Barium	29000	2.0	ug/L	187	185	231	160
Beryllium	67	0.5	ug/L	<0.5	<0.5	<0.5	<0.5
Boron (Total)	45000	10.0	ug/L	152	158	134	121
Cadmium	2.7	0.2	ug/L	<0.2	<0.2	<0.2	<0.2
Chromium	810	2.0	ug/L	2.6	2.2	<2.0	<2.0
Chromium VI	140	5	ug/L	<5	<5	<5	<5
Cobalt	66	0.5	ug/L	1.6	1.5	1.1	<0.5
Copper	87	1.0	ug/L	<1.0	<1.0	1.3	<1.0
Lead	25	0.5	ug/L	<0.5	<0.5	<0.5	<0.5
Mercury	0.29	0.02	ug/L	<0.02	<0.02	<0.02	<0.02
Molybdenum	9200	0.5	ug/L	2.5	2.4	13.6	<0.5
Nickel	490	1.0	ug/L	1.5	1.4	3.8	<1.0
Selenium	63	1.0	ug/L	<1.0	1.7	<1.0	1.1
Silver	1.5	0.2	ug/L	<0.2	<0.2	<0.2	<0.2
Thallium	510	0.3	ug/L	<0.3	<0.3	<0.3	<0.3
Vanadium	250	0.4	ug/L	0.6	1.1	1.1	0.9
Zinc	1100	5.0	ug/L	<5.0	<5.0	5.3	<5.0
pH	5 to 9	NA	pH Units	7.64	7.83	7.69	7.76
Electrical Conductivity	NV	2	mS/cm	2270	2280	3050	1550
Cyanide, Free	66	2	ug/L	<2	<2	<2	<2
Sodium	2300000	2500	ug/L	110000	112000	234000	94200
Chloride	2300000	1000	ug/L	576000	595000	885000	347000
Uranium	420	0.5	ug/L	1.4	1.4	2.2	<0.5

Notes:
'NV ' : No Standard established NA: Parameter not analyzed
MECP Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards in a Non-Potable Ground Water for All Types of Property Use with coarse textured soils.

100	Exceeds MECP Table 3: Standards
100	Detection Limit Exceeds Applicable Standard

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Table B-4: Summary of Analytical Results in Groundwater
PHCs and VOCs
393 McArthur Avenue, Ottawa, Ontario

Sample ID Screen Interval (mbgs) Lab Job # Sampling Date	MECP TABLE 3 STANDARD	REPORTING LIMIT	UNITS	MW19-1 3.05-6.10 19Z532666 18-Oct-2019	MW19-101 Duplicate of MW19-1 3.05-6.10 19Z532666 18-Oct-2019	MW19-4 4.57-7.62 19Z532666 18-Oct-2019	MW19-104 4.57-7.62 19Z532666 18-Oct-2019
Petroleum Hydrocarbon Compounds (PHCs)							
F1 (C6-C10)	750	25	ug/L	NA	<25	<25	<25
F1 (C6-C10) - BTEX	750	25	ug/L	NA	<25	<25	<25
F2 (C10-C16)	150	100	ug/L	NA	<100	<100	<100
F3 (C16-C34)	500	100	ug/L	NA	<100	<100	<100
F4 (C34-C50)	500	100	ug/L	NA	<100	<100	<100
F4 Gravimetric	500	500	ug/L	NA	NA	NA	NA
Reached Baseline at C50	NV	YES/No	NV	NA	YES	YES	YES
Volatile Organic Compounds (VOCs)							
Acetone	130000	1	ug/L	<1.0	<1.0	NA	NA
Benzene	44	0.2	ug/L	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	85000	0.2	ug/L	<0.20	<0.20	NA	NA
Bromoform	380	0.1	ug/L	<0.10	<0.10	NA	NA
Bromomethane	5.6	0.2	ug/L	<0.20	<0.20	NA	NA
Carbon Tetrachloride	0.79	0.2	ug/L	<0.20	<0.20	NA	NA
Chlorobenzene	630	0.1	ug/L	<0.10	<0.10	NA	NA
Chloroform	2.4	0.2	ug/L	<0.20	<0.20	NA	NA
Dibromochloromethane	82000	0.1	ug/L	<0.10	<0.10	NA	NA
1,2-Dichlorobenzene	4600	0.1	ug/L	<0.10	<0.10	NA	NA
1,3-Dichlorobenzene	9600	0.1	ug/L	<0.10	<0.10	NA	NA
1,4-Dichlorobenzene	8	0.1	ug/L	<0.10	<0.10	NA	NA
1,1-Dichloroethane	320	0.3	ug/L	<0.30	<0.30	NA	NA
1,2-Dichloroethane	1.6	0.2	ug/L	<0.20	<0.20	NA	NA
1,1-Dichloroethylene	1.6	0.3	ug/L	<0.30	<0.30	NA	NA
Cis-1,2-Dichloroethylene	1.6	0.2	ug/L	<0.20	<0.20	NA	NA
Trans-1,2-Dichloroethylene	1.6	0.2	ug/L	<0.20	<0.20	NA	NA
1,2-Dichloropropane	16	0.2	ug/L	<0.20	<0.20	NA	NA
Cis-1,3-Dichloropropylene	NV	NA	ug/L	NA	NA	NA	NA
Trans-1,3-Dichloropropylene	NV	NA	ug/L	NA	NA	NA	NA
1,3-Dichloropropylene	5.2	0.3	ug/L	<0.30	<0.30	NA	NA
Ethylbenzene	2300	0.1	ug/L	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide (1,2-Dibromoethane)	0.25	0.1	ug/L	<0.10	<0.10	NA	NA
Methyl Ethyl Ketone	470000	1	ug/L	<1.0	<1.0	NA	NA
Methylene Chloride	610	0.3	ug/L	<0.30	<0.30	NA	NA
Methyl Isobutyl Ketone	140000	1	ug/L	<1.0	<1.0	NA	NA
Methyl-t-Butyl Ether	190	0.2	ug/L	<0.20	<0.20	NA	NA
Styrene	1300	0.1	ug/L	<0.10	<0.10	NA	NA
1,1,1,2-Tetrachloroethane	3.3	0.1	ug/L	<0.10	<0.10	NA	NA
1,1,2,2-Tetrachloroethane	3.2	0.1	ug/L	<0.10	<0.10	NA	NA
Toluene	18000	0.2	ug/L	<0.20	<0.20	NA	NA
Tetrachloroethylene	1.6	0.2	ug/L	<0.20	<0.20	NA	NA
1,1,1-Trichloroethane	640	0.3	ug/L	<0.30	<0.30	NA	NA
1,1,2-Trichloroethane	4.7	0.2	ug/L	<0.20	<0.20	NA	NA
Trichloroethylene	1.6	0.2	ug/L	<0.20	<0.20	NA	NA
Vinyl Chloride	0.5	0.17	ug/L	<0.17	<0.17	NA	NA
m-Xylene & p-Xylene	NV	0.2	ug/L	<0.20	<0.20	NA	NA
o-Xylene	NV	0.1	ug/L	<0.10	<0.10	NA	NA
Total Xylenes	4200	0.2	ug/L	<0.20	<0.20	0.27	0.24
Dichlorodifluoromethane	4400	0.2	ug/L	<0.20	<0.20	NA	NA
Dioxane, 1,4-	1900000	NA	ug/L	NA	NA	NA	NA
Hexane(n)	51	0.2	ug/L	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	2500	0.4	ug/L	<0.40	<0.40	NA	NA

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MECP Table 3: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards in a Non-Potable Ground Water for All Types of Property Use with coarse textured soils.

100	Exceeds MECP Table 3: Standards
100	Detection Limit Exceeds Applicable Standard

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Table B-5: Summary of Relative Percent Differences (RPDs) in Soil
393 McArthur Avenue, Ottawa, Ontario

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH19-2 SA2	BH19-2 SA102	
Metals and Inorganics					
Antimony	30%	0.8	<0.8	<0.8	-
Arsenic	30%	1	2	2	-
Barium	30%	2	147	154	4.7%
Beryllium	30%	0.5	0.5	0.5	-
Boron (Hot Water Soluble)	40%	0.1	0.2	0.18	-
Cadmium	30%	0.5	<0.5	<0.5	-
Chromium	30%	2	49	47	4.2%
Chromium VI	35%	0.2	<0.2	<0.2	-
Cobalt	30%	0.5	10.5	10.5	0.0%
Copper	30%	1	23	22	4.4%
Lead	30%	1	6	6	0.0%
Mercury	30%	0.1	<0.10	<0.10	-
Molybdenum	30%	0.5	<0.5	<0.5	-
Nickel	30%	1	27	26	3.8%
Selenium	30%	0.4	<0.4	<0.4	-
Silver	30%	0.2	<0.2	<0.2	-
Thallium	30%	0.4	<0.4	<0.4	-
Vanadium	30%	1	50	48	4.1%
Zinc	30%	5	46	45	2.2%
pH (pH Units)	0.3	NV	7.73	7.74	0.13%
Electrical Conductivity (mS/cm)	10%	0.005	0.707	0.681	3.7%
Sodium Adsorption Ratio	30%	NV	8.97	8.56	4.7%
Cyanide, Free	35%	0.04	<0.040	<0.040	-
Boron (Total)	30%	5	<5	<5	-
Uranium	30%	0.5	0.9	0.9	-

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH19-2 SA5B	BH19-2 SA105B	
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	40%	0.05	<0.05	<0.05	-
Acenaphthylene	40%	0.05	<0.05	<0.05	-
Anthracene	40%	0.05	<0.05	<0.05	-
Benzo(a)anthracene	40%	0.05	<0.05	<0.05	-
Benzo(a)pyrene	40%	0.05	<0.05	<0.05	-
Benzo(b/j)fluoranthene	40%	0.05	<0.05	<0.05	-
Benzo(ghi)perylene	40%	0.05	<0.05	<0.05	-
Benzo(k)fluoranthene	40%	0.05	<0.05	<0.05	-
Chrysene	40%	0.05	<0.05	<0.05	-
Dibenzo(a,h)anthracene	40%	0.05	<0.05	<0.05	-
Fluoranthene	40%	0.05	<0.05	<0.05	-
Fluorene	40%	0.05	<0.05	<0.05	-
Indeno(1,2,3-cd)pyrene	40%	0.05	<0.05	<0.05	-
1-, 2-Methylnaphthalene	40%	0.05	<0.05	<0.05	-
Naphthalene	40%	0.05	<0.05	<0.05	-
Phenanthrene	40%	0.05	<0.05	<0.05	-
Pyrene	40%	0.05	<0.05	<0.05	-

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH19-2 SA5B	BH19-2 SA105B	
Petroleum Hydrocarbon Compounds (PHCs)					
F1 (C6-C10)	30%	5	<5	<5	-
F1 (C6-C10) - BTEX	30%	5	<5	<5	-
F2 (C10-C16)	30%	10	<10	22	-
F3 (C16-C34)	30%	50	<50	<50	-
F4 (C34-C50)	30%	50	<50	<50	-

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			BH19-2 SA5B	BH19-2 SA105B	
Volatile Organic Compounds (VOCs)					
Acetone	50%	0.5	<0.50	<0.50	-
Benzene	50%	0.02	<0.02	<0.02	-
Bromodichloromethane	50%	0.05	<0.05	<0.05	-
Bromoform	50%	0.05	<0.05	<0.05	-
Bromomethane	50%	0.05	<0.05	<0.05	-
Carbon Tetrachloride	50%	0.05	<0.05	<0.05	-
Chlorobenzene	50%	0.05	<0.05	<0.05	-
Chloroform	50%	0.04	<0.04	<0.04	-
Dibromochloromethane	50%	0.05	<0.05	<0.05	-
1,2-Dichlorobenzene	50%	0.05	<0.05	<0.05	-
1,3-Dichlorobenzene	50%	0.05	<0.05	<0.05	-
1,4-Dichlorobenzene	50%	0.05	<0.05	<0.05	-
1,1-Dichloroethane	50%	0.02	<0.02	<0.02	-
1,2-Dichloroethane	50%	0.03	<0.03	<0.03	-
1,1-Dichloroethylene	50%	0.05	<0.05	<0.05	-
Cis-1,2-Dichloroethylene	50%	0.02	<0.02	<0.02	-
Trans-1,2-Dichloroethylene	50%	0.05	<0.05	<0.05	-
1,2-Dichloropropane	50%	0.03	<0.03	<0.03	-
1,3-Dichloropropylene	50%	0.04	<0.04	<0.04	-
Ethylbenzene	50%	0.05	<0.05	<0.05	-
Ethylene Dibromide	50%	0.04	<0.04	<0.04	-
Methyl Ethyl Ketone	50%	0.5	<0.50	<0.50	-
Methylene Chloride	50%	0.05	<0.05	<0.05	-
Methyl Isobutyl Ketone	50%	0.5	<0.50	<0.50	-
Methyl-t-Butyl Ether	50%	0.05	<0.05	<0.05	-
Styrene	50%	0.05	<0.05	<0.05	-
1,1,1,2-Tetrachloroethane	50%	0.04	<0.04	<0.04	-
1,1,2,2-Tetrachloroethane	50%	0.05	<0.05	<0.05	-
Toluene	50%	0.05	<0.05	<0.05	-
Tetrachloroethylene	50%	0.05	<0.05	<0.05	-
1,1,1-Trichloroethane	50%	0.05	<0.05	<0.05	-
1,1,2-Trichloroethane	50%	0.04	<0.04	<0.04	-
Trichloroethylene	50%	0.03	<0.03	<0.03	-
Vinyl Chloride	50%	0.02	<0.02	<0.02	-
m-Xylene & p-Xylene	50%	0.05	<0.05	<0.05	-
o-Xylene	50%	0.05	<0.05	<0.05	-
Total Xylenes	50%	0.05	<0.05	<0.05	-
Dichlorodifluoromethane	50%	0.05	<0.05	<0.05	-
Dioxane, 1,4-	50%	NA	NA	NA	NA
Hexane(n)	50%	0.05	<0.05	<0.05	-
Trichlorofluoromethane	50%	0.05	<0.05	<0.05	-

Notes:

(1)	All results reported in micrograms per gram (µg/g) unless otherwise noted.
<	Parameter not detected above value specified
% Difference	Relative Percent Difference = |(X-Y)/Average(X,Y)| x 100% where X is the sample and Y is the duplicate
-	RPD could not be calculated as either one or both of the results are less than the detection limit or the results are less than 5 times the detection limit.
50.2%	RPD exceeds MECP Alert Criteria

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Table B-6: Summary of Relative Percent Differences (RPDs) in Groundwater
393 McArthur Avenue, Ottawa, Ontario

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			MW19-1	MW19-101	
Metals and Inorganics					
Antimony	20%	1.0	<1.0	<1.0	-
Arsenic	20%	1.0	<1.0	1.2	-
Barium	20%	2.0	187	185	1.1%
Beryllium	20%	0.5	<0.5	<0.5	-
Boron (Total)	20%	10.0	152	158	3.9%
Cadmium	20%	0.2	<0.2	<0.2	-
Chromium	20%	2.0	2.6	2.2	-
Chromium VI	20%	5	<5	<5	-
Cobalt	20%	0.5	1.6	1.5	-
Copper	20%	1.0	<1.0	<1.0	-
Lead	20%	0.5	<0.5	<0.5	-
Mercury	20%	0.02	<0.02	<0.02	-
Molybdenum	20%	0.5	2.5	2.4	-
Nickel	20%	1.0	1.5	1.4	-
Selenium	20%	1.0	<1.0	1.7	-
Silver	20%	0.2	<0.2	<0.2	-
Thallium	20%	0.3	<0.3	<0.3	-
Vanadium	20%	0.4	0.6	1.1	-
Zinc	20%	5.0	<5.0	<5.0	-
pH (pH Units)	0.3	NA	7.64	7.83	0.02
Electrical Conductivity (mS/cm)	10%	2	2270	2280	0.4%
Cyanide, Free	20%	2	<2	<2	-
Sodium	20%	2500	110000	112000	1.8%
Chloride	20%	1000	576000	595000	3.2%
Uranium	20%	0.5	1.4	1.4	-

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			MW19-4	MW19-104	
Petroleum Hydrocarbon Compounds (PHCs)					
F1 (C6-C10)	30%	25	<25	<25	-
F1 (C6-C10) - BTEX	30%	25	<25	<25	-
F2 (C10-C16)	30%	100	<100	<100	-
F3 (C16-C34)	30%	100	<100	<100	-
F4 (C34-C50)	30%	100	<100	<100	-
F4 Gravimetric	30%	500	NA	NA	NA

Parameter	MECP Alert Criteria	RDL	Sample[(1)]	Duplicate	% Difference
			MW19-1	MW19-101	
Volatile Organic Compounds (VOCs)					
Acetone	30%	1	<1.0	<1.0	-
Benzene	30%	0.2	<0.20	<0.20	-
Bromodichloromethane	30%	0.2	<0.20	<0.20	-
Bromoform	30%	0.1	<0.10	<0.10	-
Bromomethane	30%	0.2	<0.20	<0.20	-
Carbon Tetrachloride	30%	0.2	<0.20	<0.20	-
Chlorobenzene	30%	0.1	<0.10	<0.10	-
Chloroform	30%	0.2	<0.20	<0.20	-
Dibromochloromethane	30%	0.1	<0.10	<0.10	-
1,2-Dichlorobenzene	30%	0.1	<0.10	<0.10	-
1,3-Dichlorobenzene	30%	0.1	<0.10	<0.10	-
1,4-Dichlorobenzene	30%	0.1	<0.10	<0.10	-
1,1-Dichloroethane	30%	0.3	<0.30	<0.30	-
1,2-Dichloroethane	30%	0.2	<0.20	<0.20	-
1,1-Dichloroethylene	30%	0.3	<0.30	<0.30	-
Cis-1,2-Dichloroethylene	30%	0.2	<0.20	<0.20	-
Trans-1,2-Dichloroethylene	30%	0.2	<0.20	<0.20	-
1,2-Dichloropropane	30%	0.2	<0.20	<0.20	-
Cis-1,3-Dichloropropylene	30%	NA	NA	NA	NA
Trans-1,3-Dichloropropylene	30%	NA	NA	NA	NA
1,3-Dichloropropylene	30%	0.3	<0.30	<0.30	-
Ethylbenzene	30%	0.1	<0.10	<0.10	-
Ethylene Dibromide	30%	0.1	<0.10	<0.10	-
Methyl Ethyl Ketone	30%	1	<1.0	<1.0	-
Methylene Chloride	30%	0.3	<0.30	<0.30	-
Methyl Isobutyl Ketone	30%	1	<1.0	<1.0	-
Methyl-t-Butyl Ether	30%	0.2	<0.20	<0.20	-
Styrene	30%	0.1	<0.10	<0.10	-
1,1,1,2-Tetrachloroethane	30%	0.1	<0.10	<0.10	-
1,1,2,2-Tetrachloroethane	30%	0.1	<0.10	<0.10	-
Toluene	30%	0.2	<0.20	<0.20	-
Tetrachloroethylene	30%	0.2	<0.20	<0.20	-
1,1,1-Trichloroethane	30%	0.3	<0.30	<0.30	-
1,1,2-Trichloroethane	30%	0.2	<0.20	<0.20	-
Trichloroethylene	30%	0.2	<0.20	<0.20	-
Vinyl Chloride	30%	0.17	<0.17	<0.17	-
m-Xylene & p-Xylene	30%	0.2	<0.20	<0.20	-
o-Xylene	30%	0.1	<0.10	<0.10	-
Total Xylenes	30%	0.2	<0.20	<0.20	-
Dichlorodifluoromethane	30%	0.2	<0.20	<0.20	-
Dioxane, 1,4-	30%	NA	NA	NA	NA
Hexane(n)	30%	0.2	<0.20	<0.20	-
Trichlorofluoromethane	30%	0.4	<0.40	<0.40	-

Notes:

(1)	All results reported in micrograms per gram (µg/L) unless otherwise noted.
<	Parameter not detected above value specified
% Difference	Relative Percent Difference = |(X-Y)/Average(X,Y)| x 100% where X is the sample and Y is the duplicate
-	RPD could not be calculated as either one or both of the results are less than the detection limit or the results are less than 5 times the detection limit.
40.5%	RPD exceeds MECP Alert Criteria

APPENDIX C

Sampling and Analysis Plan

Soil						
Monitoring Location	**Proposed Borehole Depth (m bgs)**	**Reg 153 Metals and Inorganics**	**pH**	**Reg 153 PHCs F1-F4 including BTEX**	**Reg 153 VOCs**	**Reg 153 PAHs**
BH19-1	6.1 or until refusal	2	4	0	2	2
BH19-2	6.1 or until refusal	2	2	0	0	2
BH19-3	6.1 or until refusal	2	2	0	0	2
BH19-4	6.1 or until refusal	2	2	2	0	2
Sub total		8	10	2	2	8
Field Duplicates		1	1	1	1	1
Total Samples		**9**	**11**	**3**	**3**	**9**

Notes:

*Each sample parameter requires a field duplicate

*VOC and PHC F1 -BTEX samples (5 g of soil) to be collected with syringe and placed directly into vials with preservative (if methanol splashes, it is no longer valid and you must use a new vial.) No headspace in jars.

*Collect VOC/PHC within the fill at location of highest HEX and ISBL concentration (if no visual evidence)

*Collect samples within the fill material in each borehole

*Each stratigraphy encountered should be placed into separate polyethylene bags and screened with the CGI/PID meter

Groundwater						
Monitoring Location	**Proposed Monitoring Well Depth (m bgs)**	**Well Screen Length (m)**	**Reg 153 Metals and Inorganics**	**Reg 153 PHCs F1-F4 and BTEX**	**Reg 153 VOCs**	**Environmental Investigation Notes**
MW19-1	6.1	3.05	1	0	1	Take headspace vapour readings before purging and collecting samples
MW19-3	6.1	3.05	1	0	0	
MW19-4	6.1	3.05	1	1	0	
Sub total			**1**	**1**	**1**	
Field Duplicates			1	1	1	
Trip Blank			0	0	1	
Total Samples			**2**	**2**	**3**	

Notes:
*Parameters in select wells may change based on results of soil quality analysis results

APPENDIX D

Borehole Logs

Report to: Novatech
Project: 64819.22 (June 2, 2022)

RECORD OF BOREHOLE 19-1

CLIENT: Novatech
PROJECT: 393 McArthur Ave., Ottawa, ON
JOB#: 64819.22
LOCATION: See Figure 1 - Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Oct 1 2019

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		Ground Surface		62.63									
0	Power Auger Hollow Stem Auger (210mm OD)	Asphaltic concrete pavement		0.03									
		Brown/dark grey sand and gravel, some silt, trace clay (BASE/SUBBASE)		62.27 / 0.36	1	SS	432	6		1A - HEX - 0, ISBL - 0 1B - HEX - 0, ISBL - 0			
		Dark brown/brown/light brown silty sand some gravel and clay (FILL)		61.87 / 0.76									
1		Loose to compact, light brown/reddish brown SAND and SILT, some clay, trace gravel			2	SS	457	4	M&I	HEX - 0, ISBL - 0			Bentonite Seal
2					3	SS	254	8	pH, PAH, VOC	HEX - 0, ISBL - 0			
					4	SS	51	9		HEX - 0, ISBL - 0			No. 2 Filter Sand
3		Compact to very dense, dark brown/dark grey silty sand, some gravel, some clay, possible cobbles/boulders (GLACIAL TILL).		59.58 / 3.05	5	SS	533	17	pH, VOC	HEX - 0, ISBL - 5			TOP OF SCREEN ELEV.: 59.58 m
4					6	SS	457	>50		HEX - 5, ISBL - 0			50 mm diameter, 3.05 m long well screen.
					7	SS	216	50 for 100 mm	M&I, PAH	HEX - 5, ISBL - 0			
5					8	SS	203	50 for 100 mm		HEX - 5, ISBL - 0			
6		End of Borehole		56.53 / 6.10									BOTTOM OF SCREEN ELEV.: 56.53 m

GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEVATION (m)
Oct. 15/19	3.21	59.42
Oct. 18/19	2.87	59.76
Oct. 31/19	2.76	59.87

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LOGGED: KM
CHECKED: MR

ENV - BOREHOLE LOG 64819.22_GNT01_V01_2019-11-01.GPJ GEMTEC 2018.GDT 11/1/19

RECORD OF BOREHOLE 19-2

CLIENT: Novatech
PROJECT: 393 McArthur Ave., Ottawa, ON
JOB#: 64819.22
LOCATION: See Figure 1 - Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Sep 30 2019

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)	MONITORING WELL INSTALLATION AND NOTES
		Ground Surface		62.72									
0	Power Auger Hollow Stem Auger (210mm OD)	Asphaltic concrete pavement		0.08									
		Brown/dark brown sand with gravel some silt (BASE/SUBBASE)		62.49									
		Light brown/brown/dark brown silty sand, trace/some gravel, trace/some clay (FILL)		0.23	1	SS	241	13		1A - HEX - 0, ISBL - 0 1B - HEX - 0, ISBL - 0			
1					2	SS	394	9	M&I	HEX - 0, ISBL - 0			
					3	SS	254	11	5B (2.51-3.05 m) - PAH, PHC, VOC Dup - 105B	3A - HEX - 0, ISBL - 0 3B - HEX - 0, ISBL - 0			
2					4	SS	508	34		HEX - 0, ISBL - 0			Backfilled with Bentonite and silica sand
				60.21									
		Loose to compact, grey brown SAND and SILT, some clay, trace gravel		2.51	5	SS	356	13		5A - HEX - 0, ISBL - 0 5B - HEX - 0, ISBL - 0			
3				59.49									
		Compact to very dense, dark brown/dark grey silty sand, some gravel, some clay, possible cobbles/boulders, granitic and shale rock fragments (GLACIAL TILL).		3.23	6	SS	318	6		6A - HEX - 0, ISBL - 0 6B - HEX - 0, ISBL - 0			
					7	SS	0	32		HEX - 20, ISBL - 0			
4		Turning light grey		4.27	8	SS	0	16	M&I	HEX - 25, ISBL - 0			
				57.82									
		Refusal to augering on inferred boulder or bedrock. End of Borehole		4.90 58.45	9	SS	0	50 for 25 mm					

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LOGGED: KM
CHECKED: MR

ENV - BOREHOLE LOG 64819.22_GNT01_V01_2019-11-01.GPJ GEMTEC 2018.GDT 11/1/19

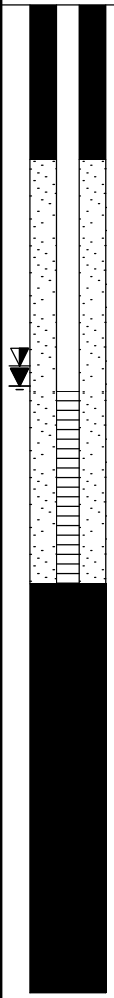
RECORD OF BOREHOLE 19-3

CLIENT: Novatech
PROJECT: 393 McArthur Ave., Ottawa, ON
JOB#: 64819.22
LOCATION: See Figure 1 - Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Sep 30 2019

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)
0		Ground Surface		62.93								
0	Power Auger Hollow Stem Auger (210mm OD)	Brown sand and gravel some silt trace clay (FILL)		0.06	1	SS	381	7		HEX - 0, ISBL - 0		
1		Dark brown/brown silty sand some gravel and clay, ash, shale fragments (FILL)			2	SS	229	4	M&I, PAH	HEX - 0, ISBL - 0		
1					3	SS	330	8		HEX - 0, ISBL - 0		
2		Compact to very dense, dark brown/dark grey silty sand, some gravel, some clay, possible cobbles/boulders, granitic rock fragments (GLACIAL TILL).		61.10 1.83	4	SS	356	16		HEX - 0, ISBL - 0		
2					5	SS	267	20	M&I, PAH	HEX - 0, ISBL - 0		
3					6	SS	508	12		HEX - 0, ISBL - 0		
4					7	SS	432	37		7A - HEX - 40, ISBL - 0 7B - HEX - 35, ISBL - 0		
4		Turning light grey		4.27	8	SS	432	37		HEX - 35, ISBL - 0		
5	Power Auger Hollow Stem Auger (210mm OD) NQ (70mm OD)				9	SS	50	50 for 50 mm		HEX - 10, ISBL - 0		
6					10	RC				HEX - 0, ISBL - 0		
7					11	RC				HEX - 0, ISBL - 0		
7					12	SS	102	95 for 229 mm		HEX - 0, ISBL - 0		
7		Refusal to augering on inferred boulder or bedrock. End of Borehole		55.16 7.77 58.66								

MONITORING WELL INSTALLATION AND NOTES



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEVATION (m)
Oct. 15/19	3.01 ▽	59.92
Oct. 18/19	3.01 ▼	59.92
Oct. 31/19	2.85 ▼	60.08

GEMTEC
Consulting Engineers and Scientists

LOGGED: KM
CHECKED: MR

ENV - BOREHOLE LOG 64819.22_GNT01_V01_2019-11-01.GPJ GEMTEC 2018.GDT 11/1/19

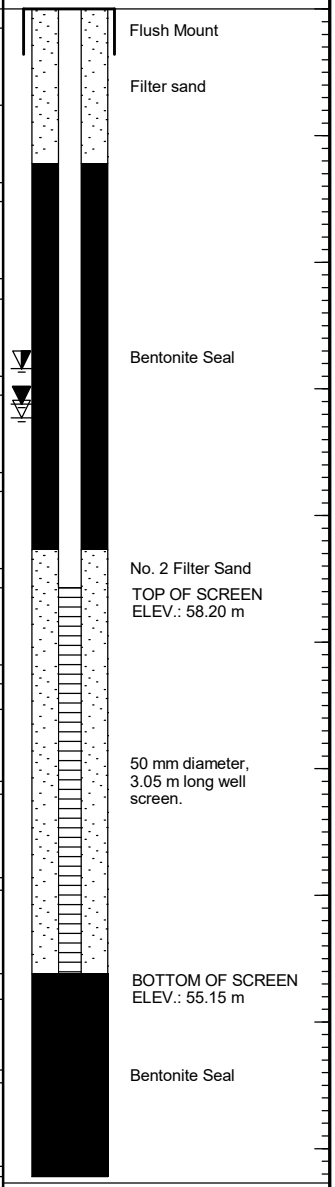
RECORD OF BOREHOLE 19-4

CLIENT: Novatech
PROJECT: 393 McArthur Ave., Ottawa, ON
JOB#: 64819.22
LOCATION: See Figure 1 - Borehole Location Plan

SHEET: 1 OF 1
DATUM: CGVD28
BORING DATE: Sep 30 2019

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	RECOVERY (mm)	BLOWS/0.3m	LABORATORY ANALYSES	COMBUSTIBLE VAPOUR CONCENTRATION (ppm)	ODOUR	TPH (mg/kg)
		Ground Surface		62.77								
0	Power Auger Hollow Stem Auger (210mm OD)	Asphaltic concrete pavement		0.08								
		Grey sand and gravel (BASE/SUBBASE)		0.15	1	SS	267	5		1A - HEX - 0, ISBL - 0 1B - HEX - 0, ISBL - 0		
1		Light brown/reddish brown/dark brown/brown silty sand, trace to some gravel and clay, brick (FILL)			2	SS	533	12		2A - HEX - 0, ISBL - 0 2B - HEX - 0, ISBL - 0		
2					3	SS	279	30		3A - HEX - 0, ISBL - 0 3B - HEX - 0, ISBL - 0		
				60.48								
		Compact to very dense, dark brown/dark grey silty sand, some gravel, some clay, possible cobbles/boulders (GLACIAL TILL).		2.29	4	SS	508	12	M&I, PAH, PHC, BTEX	HEX - 0, ISBL - 0		
3					5	SS	229	23		HEX - 0, ISBL - 0		
4					6	SS	610	50	M&I, PAH, PHC, BTEX	HEX - 0, ISBL - 0		
		Turning light grey		4.57								
5					7	SS	381	50		HEX - 0, ISBL - 0		
					8	SS	152	50 for 50 mm		HEX - 0, ISBL - 0		
6					9	SS	100	50 for 100 mm		HEX - 0, ISBL - 0		
7					10	SS	100	50 for 100 mm		HEX - 0, ISBL - 0		
					11	SS	152	50 for 152 mm		HEX - 0, ISBL - 0		
8				54.39								
		Bedrock - Shale		8.38 58.20	12	SS	100	50 for 100 mm		HEX - 0, ISBL - 0		
9				53.55	13	SS	51	50 for 76 mm		HEX - 0, ISBL - 0		
		End of Borehole		9.22								

MONITORING WELL INSTALLATION AND NOTES



GROUNDWATER OBSERVATIONS

DATE	DEPTH (m)	ELEVATION (m)
Oct. 15/19	3.23	59.54
Oct. 18/19	3.12	59.65
Oct. 31/19	2.84	59.93

GEMTEC
Consulting Engineers and Scientists

LOGGED: KM
CHECKED: MR

ENV - BOREHOLE LOG 64819.22_GNT01_V01_2019-11-01.GPJ GEMTEC 2018.GDT 11/1/19

APPENDIX E

Certificates of Analysis

AGAT Laboratories

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CLIENT NAME: **GEMTEC CONSULTING ENGINEERS AND SCIENTISTS**
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OTTAWA, ON K2K 2A9
(613) 836-1422

ATTENTION TO: **Kathryn Maton**

PROJECT: **Phase Two ESA - 64819.22**

AGAT WORK ORDER: **19Z526729**

SOIL ANALYSIS REVIEWED BY: **Amanjot Bhela, Inorganic Supervisor**

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

DATE REPORTED: **Oct 15, 2019**

PAGES (INCLUDING COVER): **23**

VERSION*: **1**

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

NOTES

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

				SAMPLE DESCRIPTION:		BH19-1 SA2	BH19-1 SA7	BH19-2 SA2	BH19-2 SA102	BH19-2 SA8	BH19-3 SA2
				SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED:		2019-10-01	2019-10-01	2019-09-30	2019-09-30	2019-09-30	2019-09-30
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592948	592952	592959	592960	592964	592965
Antimony	µg/g	7.5	0.8	2019-10-10	2019-10-10	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	2019-10-10	2019-10-10	2	4	2	2	4	5
Barium	µg/g	390	2	2019-10-10	2019-10-10	114	98	147	154	52	133
Beryllium	µg/g	4	0.5	2019-10-10	2019-10-10	<0.5	<0.5	0.5	0.5	<0.5	<0.5
Boron	µg/g	120	5	2019-10-10	2019-10-10	<5	7	<5	<5	<5	7
Boron (Hot Water Soluble)	µg/g	1.5	0.10	2019-10-10	2019-10-10	0.14	0.35	0.20	0.18	0.15	0.36
Cadmium	µg/g	1.2	0.5	2019-10-10	2019-10-10	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Chromium	µg/g	160	2	2019-10-10	2019-10-10	41	17	49	47	12	34
Cobalt	µg/g	22	0.5	2019-10-10	2019-10-10	10.1	7.5	10.5	10.5	6.5	8.7
Copper	µg/g	140	1	2019-10-10	2019-10-10	22	21	23	22	23	22
Lead	µg/g	120	1	2019-10-10	2019-10-10	5	10	6	6	7	104
Molybdenum	µg/g	6.9	0.5	2019-10-10	2019-10-10	0.8	1.8	<0.5	<0.5	1.4	1.2
Nickel	µg/g	100	1	2019-10-10	2019-10-10	23	19	27	26	16	22
Selenium	µg/g	2.4	0.4	2019-10-10	2019-10-10	<0.4	<0.4	<0.4	<0.4	<0.4	0.5
Silver	µg/g	20	0.2	2019-10-10	2019-10-10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	2019-10-10	2019-10-10	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	23	0.5	2019-10-10	2019-10-10	0.8	1.0	0.9	0.9	0.8	0.9
Vanadium	µg/g	86	1	2019-10-10	2019-10-10	47	23	50	48	20	38
Zinc	µg/g	340	5	2019-10-10	2019-10-10	42	27	46	45	26	275
Chromium VI	µg/g	8	0.2	2019-10-10	2019-10-10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	2019-10-10	2019-10-10	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Mercury	µg/g	0.27	0.10	2019-10-10	2019-10-10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12
Electrical Conductivity	mS/cm	0.7	0.005	2019-10-11	2019-10-11	0.461	0.285	**0.707**	0.681	0.207	**1.25**
Sodium Adsorption Ratio	NA	5	NA	2019-10-11	2019-10-11	**6.81**	0.604	**8.97**	**8.56**	0.399	3.71
pH, 2:1 CaCl2 Extraction	pH Units		NA	2019-10-10	2019-10-10	7.31	8.15	7.73	7.74	8.08	8.11

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

					SAMPLE DESCRIPTION:	BH19-3 SA5	BH19-4 SA4	BH19-4 SA6
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2019-09-30	2019-10-01	2019-10-01
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592967	592968	592983
Antimony	µg/g	7.5	0.8	2019-10-10	2019-10-10	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	2019-10-10	2019-10-10	7	7	7
Barium	µg/g	390	2	2019-10-10	2019-10-10	269	112	202
Beryllium	µg/g	4	0.5	2019-10-10	2019-10-10	0.5	0.5	0.7
Boron	µg/g	120	5	2019-10-10	2019-10-10	9	9	11
Boron (Hot Water Soluble)	µg/g	1.5	0.10	2019-10-10	2019-10-10	0.22	0.23	0.42
Cadmium	µg/g	1.2	0.5	2019-10-10	2019-10-10	<0.5	<0.5	<0.5
Chromium	µg/g	160	2	2019-10-10	2019-10-10	18	18	24
Cobalt	µg/g	22	0.5	2019-10-10	2019-10-10	11.1	10.7	14.2
Copper	µg/g	140	1	2019-10-10	2019-10-10	30	29	37
Lead	µg/g	120	1	2019-10-10	2019-10-10	13	13	19
Molybdenum	µg/g	6.9	0.5	2019-10-10	2019-10-10	4.9	4.9	5.3
Nickel	µg/g	100	1	2019-10-10	2019-10-10	35	36	43
Selenium	µg/g	2.4	0.4	2019-10-10	2019-10-10	0.6	0.4	0.7
Silver	µg/g	20	0.2	2019-10-10	2019-10-10	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	2019-10-10	2019-10-10	<0.4	<0.4	<0.4
Uranium	µg/g	23	0.5	2019-10-10	2019-10-10	1.8	1.9	2.3
Vanadium	µg/g	86	1	2019-10-10	2019-10-10	26	27	28
Zinc	µg/g	340	5	2019-10-10	2019-10-10	39	39	38
Chromium VI	µg/g	8	0.2	2019-10-10	2019-10-10	<0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	2019-10-11	2019-10-11	<0.040	<0.040	<0.040
Mercury	µg/g	0.27	0.10	2019-10-10	2019-10-10	<0.10	<0.10	<0.10
Electrical Conductivity	mS/cm	0.7	0.005	2019-10-11	2019-10-11	0.458	0.676	0.366
Sodium Adsorption Ratio	NA	5	NA	2019-10-11	2019-10-11	0.590	1.25	0.928
pH, 2:1 CaCl2 Extraction	pH Units		NA	2019-10-10	2019-10-10	7.90	7.87	8.03

Certified By:

Amanjot Bhela

ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO CHARTERED AMANJOT BHELA CHEMIST

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Certificate of Analysis

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

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

592948-592983 EC was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio. SAR is a calculated parameter.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Amanjot Bhela

ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO
CHARTERED
AMANJOT BHELA
CHEMIST

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AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04

DATE REPORTED: 2019-10-15

						SAMPLE DESCRIPTION:	BH19-1 SA3	BH19-1 SA5
						SAMPLE TYPE:	Soil	Soil
						DATE SAMPLED:	2019-10-01	2019-10-01
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed		592950	592951
pH, 2:1 CaCl2 Extraction	pH Units		NA	2019-10-10	2019-10-10		7.63	7.95

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

592950-592951 pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Analysis performed at AGAT Toronto (unless marked by *)

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AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04

DATE REPORTED: 2019-10-15

				SAMPLE DESCRIPTION:		BH19-1 SA5
				SAMPLE TYPE:		Soil
				DATE SAMPLED:		2019-10-01
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592951
Dichlorodifluoromethane	µg/g	16	0.05	2019-10-10	2019-10-10	<0.05
Vinyl Chloride	ug/g	0.02	0.02	2019-10-10	2019-10-10	<0.02
Bromomethane	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05
Trichlorofluoromethane	ug/g	4	0.05	2019-10-10	2019-10-10	<0.05
Acetone	ug/g	16	0.50	2019-10-10	2019-10-10	<0.50
1,1-Dichloroethylene	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05
Methylene Chloride	ug/g	0.1	0.05	2019-10-10	2019-10-10	<0.05
Trans- 1,2-Dichloroethylene	ug/g	0.084	0.05	2019-10-10	2019-10-10	<0.05
Methyl tert-butyl Ether	ug/g	0.75	0.05	2019-10-10	2019-10-10	<0.05
1,1-Dichloroethane	ug/g	3.5	0.02	2019-10-10	2019-10-10	<0.02
Methyl Ethyl Ketone	ug/g	16	0.50	2019-10-10	2019-10-10	<0.50
Cis- 1,2-Dichloroethylene	ug/g	3.4	0.02	2019-10-10	2019-10-10	<0.02
Chloroform	ug/g	0.05	0.04	2019-10-10	2019-10-10	<0.04
1,2-Dichloroethane	ug/g	0.05	0.03	2019-10-10	2019-10-10	<0.03
1,1,1-Trichloroethane	ug/g	0.38	0.05	2019-10-10	2019-10-10	<0.05
Carbon Tetrachloride	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05
Benzene	ug/g	0.21	0.02	2019-10-10	2019-10-10	<0.02
1,2-Dichloropropane	ug/g	0.05	0.03	2019-10-10	2019-10-10	<0.03
Trichloroethylene	ug/g	0.061	0.03	2019-10-10	2019-10-10	<0.03
Bromodichloromethane	ug/g	13	0.05	2019-10-10	2019-10-10	<0.05
Methyl Isobutyl Ketone	ug/g	1.7	0.50	2019-10-10	2019-10-10	<0.50
1,1,2-Trichloroethane	ug/g	0.05	0.04	2019-10-10	2019-10-10	<0.04
Toluene	ug/g	2.3	0.05	2019-10-10	2019-10-10	<0.05
Dibromochloromethane	ug/g	9.4	0.05	2019-10-10	2019-10-10	<0.05
Ethylene Dibromide	ug/g	0.05	0.04	2019-10-10	2019-10-10	<0.04
Tetrachloroethylene	ug/g	0.28	0.05	2019-10-10	2019-10-10	<0.05
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.04	2019-10-10	2019-10-10	<0.04
Chlorobenzene	ug/g	2.4	0.05	2019-10-10	2019-10-10	<0.05
Ethylbenzene	ug/g	2	0.05	2019-10-10	2019-10-10	<0.05
m & p-Xylene	ug/g		0.05	2019-10-10	2019-10-10	<0.05

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04

DATE REPORTED: 2019-10-15

					SAMPLE DESCRIPTION:	BH19-1 SA5
					SAMPLE TYPE:	Soil
					DATE SAMPLED:	2019-10-01
Parameter	**Unit**	**G / S**	**RDL**	**Date Prepared**	**Date Analyzed**	**592951**
Bromoform	ug/g	0.27	0.05	2019-10-10	2019-10-10	<0.05
Styrene	ug/g	0.7	0.05	2019-10-10	2019-10-10	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05
o-Xylene	ug/g		0.05	2019-10-10	2019-10-10	<0.05
1,3-Dichlorobenzene	ug/g	4.8	0.05	2019-10-10	2019-10-10	<0.05
1,4-Dichlorobenzene	ug/g	0.083	0.05	2019-10-10	2019-10-10	<0.05
1,2-Dichlorobenzene	ug/g	3.4	0.05	2019-10-10	2019-10-10	<0.05
Xylene Mixture	ug/g	3.1	0.05	2019-10-10	2019-10-10	<0.05
1,3-Dichloropropene	µg/g	0.05	0.04	2019-10-10	2019-10-10	<0.04
n-Hexane	µg/g	2.8	0.05	2019-10-10	2019-10-10	<0.05
Moisture Content	%		0.1	2019-10-10	2019-10-10	10.3
Surrogate	**Unit**	**Acceptable Limits**				
Toluene-d8	% Recovery	50-140		2019-10-10	2019-10-10	90
4-Bromofluorobenzene	% Recovery	50-140		2019-10-10	2019-10-10	92

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

592951 The sample was analyzed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

					SAMPLE DESCRIPTION:	BH19-1 SA3	BH19-1 SA7	BH19-2 SA5B	BH19-2 SA105B	BH19-2 SA8	BH19-3 SA2
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2019-10-01	2019-10-01	2019-09-30	2019-09-30	2019-09-30	2019-09-30
Parameter	**Unit**	**G / S**	**RDL**	**Date Prepared**	**Date Analyzed**	**592950**	**592952**	**592961**	**592963**	**592964**	**592965**
Naphthalene	µg/g	0.6	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	7.9	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	6.2	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g	0.67	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g	0.69	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
Pyrene	µg/g	78	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	0.13
Benz(a)anthracene	µg/g	0.5	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	0.09
Chrysene	µg/g	7	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Benzo(b)fluoranthene	µg/g	0.78	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Benzo(k)fluoranthene	µg/g	0.78	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Indeno(1,2,3-cd)pyrene	µg/g	0.38	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	6.6	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g	0.99	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	2019-10-09	2019-10-09	20.5	9.1	14.1	14.3	10.1	20.7
Surrogate	**Unit**	**Acceptable Limits**									
Chrysene-d12	%	50-140		2019-10-09	2019-10-09	80	82	76	73	73	87

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AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

					SAMPLE DESCRIPTION:	BH19-3 SA5	BH19-4 SA4	BH19-4 SA6
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2019-09-30	2019-10-01	2019-10-01
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592967	592968	592983
Naphthalene	µg/g	0.6	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.15	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Acenaphthene	µg/g	7.9	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Fluorene	µg/g	62	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Phenanthrene	µg/g	6.2	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Anthracene	µg/g	0.67	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Fluoranthene	µg/g	0.69	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Pyrene	µg/g	78	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/g	0.5	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Chrysene	µg/g	7	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.78	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.78	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.38	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	6.6	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g	0.99	0.05	2019-10-09	2019-10-09	<0.05	<0.05	<0.05
Moisture Content	%		0.1	2019-10-09	2019-10-09	8.5	9.3	6.4
Surrogate	**Unit**	**Acceptable Limits**						
Chrysene-d12	%	50-140		2019-10-09	2019-10-09	82	80	95

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

592950-592983 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.
2- and 1-Methyl Naphthalene is a calculated parameter. The calculated value is the sum of 2-Methyl Naphthalene and 1-Methyl Naphthalene.

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AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

					SAMPLE DESCRIPTION:	BH19-2 SA5B	BH19-2 SA105B
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2019-09-30	2019-09-30
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592961	592963
F1 (C6 to C10)	µg/g	55	5	2019-10-07	2019-10-07	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	2019-10-07	2019-10-07	<5	<5
F2 (C10 to C16)	µg/g	98	10	2019-10-10	2019-10-11	<10	22
F2 (C10 to C16) minus Naphthalene	µg/g		10	2019-10-10	2019-10-11	<10	22
F3 (C16 to C34)	µg/g	300	50	2019-10-10	2019-10-11	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	2019-10-10	2019-10-11	<50	<50
F4 (C34 to C50)	µg/g	2800	50	2019-10-10	2019-10-11	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	2019-10-10	2019-10-11	NA	NA
Moisture Content	%		0.1	2019-10-08	2019-10-08	14.1	14.3
Surrogate	**Unit**	**Acceptable Limits**					
Terphenyl	%	60-140		2019-10-10	2019-10-11	79	65

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

592961-592963 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

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PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2019-10-04

DATE REPORTED: 2019-10-15

					SAMPLE DESCRIPTION:	BH19-4 SA4	BH19-4 SA6
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2019-10-01	2019-10-01
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592968	592983
Benzene	µg/g	0.21	0.02	2019-10-07	2019-10-07	<0.02	<0.02
Toluene	µg/g	2.3	0.05	2019-10-07	2019-10-07	<0.05	<0.05
Ethylbenzene	µg/g	2	0.05	2019-10-07	2019-10-07	<0.05	<0.05
Xylene Mixture	µg/g	3.1	0.05	2019-10-07	2019-10-07	<0.05	<0.05
F1 (C6 to C10)	µg/g	55	5	2019-10-07	2019-10-07	10	24
F1 (C6 to C10) minus BTEX	µg/g	55	5	2019-10-07	2019-10-07	10	24
F2 (C10 to C16)	µg/g	98	10	2019-10-10	2019-10-11	11	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	2019-10-10	2019-10-11	11	<10
F3 (C16 to C34)	µg/g	300	50	2019-10-10	2019-10-11	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	2019-10-10	2019-10-11	<50	<50
F4 (C34 to C50)	µg/g	2800	50	2019-10-10	2019-10-11	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	2019-10-10	2019-10-11	NA	NA
Moisture Content	%		0.1	2019-10-08	2019-10-08	9.3	6.4
Surrogate	**Unit**	**Acceptable Limits**					
Terphenyl	%	60-140		2019-10-10	2019-10-11	87	78

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SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2019-10-04

DATE REPORTED: 2019-10-15

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

592968-592983 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
C>10 – C16 (F2- Naphthalene) is a calculated parameter. The calculated value is F2 - Naphthalene.
C>16 - C34 (F3-PAH) is a calculated parameter. The calculated value is F3-PAH (PAH: sum of Phenanthrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-c,d)pyrene and Pyrene).
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04

DATE REPORTED: 2019-10-15

					SAMPLE DESCRIPTION:	BH19-1 SA3	BH19-2 SA5B	BH19-2 SA105B
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2019-10-01	2019-09-30	2019-09-30
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592950	592961	592963
Dichlorodifluoromethane	µg/g	16	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.02	2019-10-10	2019-10-10	<0.02	<0.02	<0.02
Bromomethane	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Trichlorofluoromethane	ug/g	4	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Acetone	ug/g	16	0.50	2019-10-10	2019-10-10	<0.50	<0.50	<0.50
1,1-Dichloroethylene	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Methylene Chloride	ug/g	0.1	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g	0.084	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Methyl tert-butyl Ether	ug/g	0.75	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,1-Dichloroethane	ug/g	3.5	0.02	2019-10-10	2019-10-10	<0.02	<0.02	<0.02
Methyl Ethyl Ketone	ug/g	16	0.50	2019-10-10	2019-10-10	<0.50	<0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g	3.4	0.02	2019-10-10	2019-10-10	<0.02	<0.02	<0.02
Chloroform	ug/g	0.05	0.04	2019-10-10	2019-10-10	<0.04	<0.04	<0.04
1,2-Dichloroethane	ug/g	0.05	0.03	2019-10-10	2019-10-10	<0.03	<0.03	<0.03
1,1,1-Trichloroethane	ug/g	0.38	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Benzene	ug/g	0.21	0.02	2019-10-10	2019-10-10	<0.02	<0.02	<0.02
1,2-Dichloropropane	ug/g	0.05	0.03	2019-10-10	2019-10-10	<0.03	<0.03	<0.03
Trichloroethylene	ug/g	0.061	0.03	2019-10-10	2019-10-10	<0.03	<0.03	<0.03
Bromodichloromethane	ug/g	13	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Methyl Isobutyl Ketone	ug/g	1.7	0.50	2019-10-10	2019-10-10	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	ug/g	0.05	0.04	2019-10-10	2019-10-10	<0.04	<0.04	<0.04
Toluene	ug/g	2.3	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Dibromochloromethane	ug/g	9.4	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Ethylene Dibromide	ug/g	0.05	0.04	2019-10-10	2019-10-10	<0.04	<0.04	<0.04
Tetrachloroethylene	ug/g	0.28	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.04	2019-10-10	2019-10-10	<0.04	<0.04	<0.04
Chlorobenzene	ug/g	2.4	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Ethylbenzene	ug/g	2	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
m & p-Xylene	ug/g		0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05

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PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

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

DATE RECEIVED: 2019-10-04 **DATE REPORTED: 2019-10-15**

					SAMPLE DESCRIPTION:	BH19-1 SA3	BH19-2 SA5B	BH19-2 SA105B
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2019-10-01	2019-09-30	2019-09-30
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	592950	592961	592963
Bromoform	ug/g	0.27	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Styrene	ug/g	0.7	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
o-Xylene	ug/g		0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g	4.8	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/g	0.083	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/g	3.4	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Xylene Mixture	ug/g	3.1	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
1,3-Dichloropropene	µg/g	0.05	0.04	2019-10-10	2019-10-10	<0.04	<0.04	<0.04
n-Hexane	µg/g	2.8	0.05	2019-10-10	2019-10-10	<0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**						
Toluene-d8	% Recovery	50-140		2019-10-10	2019-10-10	101	103	107
4-Bromofluorobenzene	% Recovery	50-140		2019-10-10	2019-10-10	73	76	73

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

592950-592963 The sample was analyzed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene + o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

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Guideline Violation

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
592948	BH19-1 SA2	ON T3 S RPI CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	5	6.81
592959	BH19-2 SA2	ON T3 S RPI CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	0.7	0.707
592959	BH19-2 SA2	ON T3 S RPI CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	5	8.97
592960	BH19-2 SA102	ON T3 S RPI CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	5	8.56
592965	BH19-3 SA2	ON T3 S RPI CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Electrical Conductivity	mS/cm	0.7	1.25

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Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

Soil Analysis

RPT Date: Oct 15, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	592948	592948	<0.8	<0.8	NA	< 0.8	110%	70%	130%	93%	80%	120%	92%	70%	130%
Arsenic	592948	592948	2	3	NA	< 1	107%	70%	130%	101%	80%	120%	103%	70%	130%
Barium	592948	592948	114	117	2.6%	< 2	107%	70%	130%	101%	80%	120%	101%	70%	130%
Beryllium	592948	592948	<0.5	<0.5	NA	< 0.5	99%	70%	130%	115%	80%	120%	99%	70%	130%
Boron	592948	592948	<5	<5	NA	< 5	81%	70%	130%	109%	80%	120%	89%	70%	130%
Boron (Hot Water Soluble)	592948	592948	0.14	0.15	NA	< 0.10	101%	60%	140%	100%	70%	130%	101%	60%	140%
Cadmium	592948	592948	<0.5	<0.5	NA	< 0.5	113%	70%	130%	102%	80%	120%	105%	70%	130%
Chromium	592948	592948	41	41	0.0%	< 2	99%	70%	130%	109%	80%	120%	101%	70%	130%
Cobalt	592948	592948	10.1	10.0	1.0%	< 0.5	99%	70%	130%	106%	80%	120%	101%	70%	130%
Copper	592948	592948	22	22	0.0%	< 1	94%	70%	130%	108%	80%	120%	98%	70%	130%
Lead	592948	592948	5	5	0.0%	< 1	107%	70%	130%	104%	80%	120%	102%	70%	130%
Molybdenum	592948	592948	0.8	0.7	NA	< 0.5	111%	70%	130%	107%	80%	120%	110%	70%	130%
Nickel	592948	592948	23	24	4.3%	< 1	101%	70%	130%	108%	80%	120%	101%	70%	130%
Selenium	592948	592948	<0.4	<0.4	NA	< 0.4	110%	70%	130%	98%	80%	120%	100%	70%	130%
Silver	592948	592948	<0.2	<0.2	NA	< 0.2	116%	70%	130%	104%	80%	120%	101%	70%	130%
Thallium	592948	592948	<0.4	<0.4	NA	< 0.4	98%	70%	130%	104%	80%	120%	103%	70%	130%
Uranium	592948	592948	0.8	0.9	NA	< 0.5	112%	70%	130%	105%	80%	120%	106%	70%	130%
Vanadium	592948	592948	47	48	2.1%	< 1	100%	70%	130%	107%	80%	120%	100%	70%	130%
Zinc	592948	592948	42	43	2.4%	< 5	100%	70%	130%	103%	80%	120%	101%	70%	130%
Chromium VI	592967	592967	<0.2	<0.2	NA	< 0.2	82%	80%	120%	85%	70%	130%	86%	70%	130%
Cyanide	581486		<0.040	<0.040	NA	< 0.040	100%	70%	130%	91%	80%	120%	91%	70%	130%
Mercury	592948	592948	<0.10	<0.10	NA	< 0.10	100%	70%	130%	100%	80%	120%	100%	70%	130%
Electrical Conductivity	592948	592948	0.461	0.468	1.5%	< 0.005	101%	90%	110%	NA			NA		
Sodium Adsorption Ratio	592948	592948	6.81	6.30	7.8%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	592959	592959	7.73	7.72	0.1%	NA	101%	80%	120%	NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

O. Reg. 153(511) - ORPs (Soil)															
pH, 2:1 CaCl2 Extraction	592959	592959	7.73	7.72	0.1%	NA	101%	90%	110%	NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Certified By: Amanjot Bhela

ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO — CHARTERED — AMANJOT BHELA — CHEMIST

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Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

Trace Organics Analysis

RPT Date: Oct 15, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	589748		< 0.05	< 0.05	NA	< 0.05	71%	50%	140%	79%	50%	140%	79%	50%	140%
Vinyl Chloride	589748		< 0.02	< 0.02	NA	< 0.02	102%	50%	140%	106%	50%	140%	87%	50%	140%
Bromomethane	589748		< 0.05	< 0.05	NA	< 0.05	76%	50%	140%	105%	50%	140%	74%	50%	140%
Trichlorofluoromethane	589748		< 0.05	< 0.05	NA	< 0.05	78%	50%	140%	72%	50%	140%	87%	50%	140%
Acetone	589748		< 0.50	< 0.50	NA	< 0.50	95%	50%	140%	82%	50%	140%	81%	50%	140%
1,1-Dichloroethylene	589748		< 0.05	< 0.05	NA	< 0.05	70%	50%	140%	94%	60%	130%	91%	50%	140%
Methylene Chloride	589748		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	103%	60%	130%	74%	50%	140%
Trans- 1,2-Dichloroethylene	589748		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	97%	60%	130%	93%	50%	140%
Methyl tert-butyl Ether	589748		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	80%	60%	130%	96%	50%	140%
1,1-Dichloroethane	589748		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	77%	60%	130%	79%	50%	140%
Methyl Ethyl Ketone	589748		< 0.50	< 0.50	NA	< 0.50	70%	50%	140%	83%	50%	140%	83%	50%	140%
Cis- 1,2-Dichloroethylene	589748		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	98%	60%	130%	91%	50%	140%
Chloroform	589748		< 0.04	< 0.04	NA	< 0.04	94%	50%	140%	100%	60%	130%	79%	50%	140%
1,2-Dichloroethane	589748		< 0.03	< 0.03	NA	< 0.03	75%	50%	140%	103%	60%	130%	91%	50%	140%
1,1,1-Trichloroethane	589748		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	79%	60%	130%	93%	50%	140%
Carbon Tetrachloride	589748		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	80%	60%	130%	100%	50%	140%
Benzene	589748		< 0.02	< 0.02	NA	< 0.02	92%	50%	140%	83%	60%	130%	101%	50%	140%
1,2-Dichloropropane	589748		< 0.03	< 0.03	NA	< 0.03	90%	50%	140%	86%	60%	130%	91%	50%	140%
Trichloroethylene	589748		< 0.03	< 0.03	NA	< 0.03	100%	50%	140%	87%	60%	130%	77%	50%	140%
Bromodichloromethane	589748		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	89%	60%	130%	94%	50%	140%
Methyl Isobutyl Ketone	589748		< 0.50	< 0.50	NA	< 0.50	74%	50%	140%	85%	50%	140%	80%	50%	140%
1,1,2-Trichloroethane	589748		< 0.04	< 0.04	NA	< 0.04	88%	50%	140%	77%	60%	130%	97%	50%	140%
Toluene	589748		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	101%	60%	130%	102%	50%	140%
Dibromochloromethane	589748		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	101%	60%	130%	102%	50%	140%
Ethylene Dibromide	589748		< 0.04	< 0.04	NA	< 0.04	91%	50%	140%	98%	60%	130%	99%	50%	140%
Tetrachloroethylene	589748		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	95%	60%	130%	77%	50%	140%
1,1,1,2-Tetrachloroethane	589748		< 0.04	< 0.04	NA	< 0.04	89%	50%	140%	77%	60%	130%	91%	50%	140%
Chlorobenzene	589748		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	105%	60%	130%	117%	50%	140%
Ethylbenzene	589748		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	90%	60%	130%	80%	50%	140%
m & p-Xylene	589748		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	89%	60%	130%	101%	50%	140%
Bromoform	589748		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	97%	60%	130%	100%	50%	140%
Styrene	589748		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	95%	60%	130%	91%	50%	140%
1,1,2,2-Tetrachloroethane	589748		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	90%	60%	130%	96%	50%	140%
o-Xylene	589748		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	89%	60%	130%	101%	50%	140%
1,3-Dichlorobenzene	589748		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	77%	60%	130%	91%	50%	140%
1,4-Dichlorobenzene	589748		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	93%	60%	130%	103%	50%	140%
1,2-Dichlorobenzene	589748		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	95%	60%	130%	79%	50%	140%
1,3-Dichloropropene	589748		< 0.04	< 0.04	NA	< 0.04	104%	50%	140%	89%	60%	130%	104%	50%	140%
n-Hexane	589748		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	114%	60%	130%	98%	50%	140%

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Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

Trace Organics Analysis (Continued)

RPT Date: Oct 15, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	589718		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	115%	50%	140%	113%	50%	140%
Acenaphthylene	589718		< 0.05	< 0.05	NA	< 0.05	117%	50%	140%	113%	50%	140%	110%	50%	140%
Acenaphthene	589718		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	108%	50%	140%	104%	50%	140%
Fluorene	589718		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	113%	50%	140%	105%	50%	140%
Phenanthrene	589718		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	105%	50%	140%	98%	50%	140%
Anthracene	589718		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	105%	50%	140%	111%	50%	140%
Fluoranthene	589718		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	99%	50%	140%	88%	50%	140%
Pyrene	589718		< 0.05	< 0.05	NA	< 0.05	118%	50%	140%	109%	50%	140%	107%	50%	140%
Benz(a)anthracene	589718		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	91%	50%	140%	80%	50%	140%
Chrysene	589718		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	102%	50%	140%	96%	50%	140%
Benzo(b)fluoranthene	589718		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	96%	50%	140%	107%	50%	140%
Benzo(k)fluoranthene	589718		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	100%	50%	140%	98%	50%	140%
Benzo(a)pyrene	589718		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	106%	50%	140%	99%	50%	140%
Indeno(1,2,3-cd)pyrene	589718		< 0.05	< 0.05	NA	< 0.05	76%	50%	140%	86%	50%	140%	72%	50%	140%
Dibenz(a,h)anthracene	589718		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	91%	50%	140%	93%	50%	140%
Benzo(g,h,i)perylene	589718		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	96%	50%	140%	99%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs and VOC) (Soil)															
F2 (C10 to C16)	584661		< 10	< 10	NA	< 10	114%	60%	130%	86%	80%	120%	77%	70%	130%
F3 (C16 to C34)	584661		< 50	< 50	NA	< 50	112%	60%	130%	110%	80%	120%	80%	70%	130%
F4 (C34 to C50)	584661		< 50	< 50	NA	< 50	93%	60%	130%	98%	80%	120%	107%	70%	130%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	588168		< 0.02	< 0.02	NA	< 0.02	101%	60%	130%	75%	60%	130%	75%	60%	130%
Toluene	588168		< 0.05	< 0.05	NA	< 0.05	96%	60%	130%	81%	60%	130%	76%	60%	130%
Ethylbenzene	588168		< 0.05	< 0.05	NA	< 0.05	99%	60%	130%	90%	60%	130%	74%	60%	130%
Xylene Mixture	588168		< 0.05	< 0.05	NA	< 0.05	107%	60%	130%	97%	60%	130%	88%	60%	130%
F1 (C6 to C10)	588168		< 5	< 5	NA	< 5	75%	60%	130%	96%	85%	115%	95%	70%	130%

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

Certified By:

AGAT Laboratories

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Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	pH METER

AGAT Laboratories

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Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260D	(P&T)GC/MS
Moisture Content		MOE E3139	BALANCE
Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Acenaphthylene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Acenaphthene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Fluorene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Phenanthrene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Anthracene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS

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FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z526729

PROJECT: Phase Two ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur

SAMPLED BY:K. Maton

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Pyrene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Benz(a)anthracene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Chrysene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Benzo(a)pyrene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
Moisture Content	ORG-91-5106	EPA SW-846 3541 & 8270E	BALANCE
Chrysene-d12	ORG-91-5106	EPA SW846 3541 & 8270E	GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P&T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P&T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC/FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	CCME Tier 1 Method	GC/FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC/FID
F3 (C16 to C34) minus PAHs	VOL-91-5009	CCME Tier 1 Method	GC/FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P&T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P&T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P&T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P&T GC/MS

large

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
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webearth.agatlabs.com

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 19752672 9

Cooler Quantity: one - ice packs

Arrival Temperatures: 5.0 | 4.7 | 5.0
1.3 | 6.1 | 3.4

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: on ice

Report Information:

Company: GEMTEC
Contact: Kathryn Maton
Address: 32 Steacie Drive
Kanata, ON
Phone: 613-223-5565 Fax:
Reports to be sent to:
1. Email: Kathryn.maton@gemtec.ca
2. Email:

Project Information:

Project: Phase Two ESA.
Site Location: 393 McArthur.
Sampled By: K. Maton.
AGAT Quote #: PO: 64819.22
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 *Indicate One*
☐ Ind/Com
☒ Res/Park
☐ Agriculture

Soil Texture *(Check One)*
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm

Region _____ *Indicate One*
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
_____ *Indicate One*

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

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☐ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

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

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

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	All Metals ☐ 153 Metals (excl. Hydrides)	Hydride Metals ☐ 153 Metals (Incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
BH19-1 SA2	01/10/2019	8am	1	S			X			X				X			X				
BH19-1 SA3			2							X				X							
BH19-1 SA5			2							X				X							
BH19-1 SA7			2				X			X							X				
BH19-2 SA2	30/09/19	8am	1				X			X											
BH19-2 SA10Z			1				X			X											
BH19-2 SA5B			2											X	X		X				
BH19-2 SA10SB			2											X	X		X				
BH19-2 SA8			1				X			X							X				
BH19-3 SA																					
BH19-3 SA2	30/09/19	12pm	3				X			X							X				

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Kathryn Maton	04/10/2019	7:48am		20/9/10/04	13h00
	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
				004/19	11h50 AM
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
	20/9/10/04	16h00			

Page 1 of 2

N°: T078197

Document ID: Div 75-1511.015

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Date Issued: March 16, 2018

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Chain of Custody Record

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

Report Information:

Company: GEMTEC
Contact: Kathryn Maton
Address: 32 Steacie Drive, Ottawa, ON
Phone: 613-223-5885 Fax:
Reports to be sent to:
1. Email: Kathryn.maton@gemtec.ca
2. Email:

Project Information:

Project: Phase Two ESA
Site Location: 393 McArthur Ave.
Sampled By: K. Maton
AGAT Quote #: PO: 64819.22
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐
Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☐ Ind/Com
☒ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

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

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Laboratory Use Only

Work Order #: 19752672 9
Cooler Quantity: one - ice packs
Arrival Temperatures: 5.0 M.7 5.0
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes:

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*
For 'Same Day' analysis, please contact your AGAT CPM

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN⁻ ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
BH19-3 SA5	3/09/19	12pm	2	S			X	X						X				
BH19-4 SA4	04/10/19	11:2pm	2	↓			X	X					X	X				
BH19-4 SA6	↓	11:2pm	2	↓			X	X					X	X				

Samples Relinquished By (Print Name and Sign): Kathryn Maton	Date 04/10/19	Time 7:48am	Samples Received By (Print Name and Sign):	Date 19/10/04	Time 13h00
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign): to FWD	Date 2019/10/04	Time 16h00	Samples Received By (Print Name and Sign):	Date Oct 5-19	Time 11:50 AM

Page 2 of 2

No: T 078198

Document ID: DIV 78 1511 015

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Revised: March 16, 2018

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http://www.agatlabs.com

CLIENT NAME: **GEMTEC CONSULTING ENGINEERS AND SCIENTISTS**
32 STEACIE DRIVE
OTTAWA, ON K2K 2A9
(613) 836-1422

ATTENTION TO: **Kathryn Maton**

PROJECT: **Phase 2 ESA - 64819.22**

AGAT WORK ORDER: **19Z532666**

TRACE ORGANICS REVIEWED BY: **Navdeep Kaur Kansera, Senior Lab Technician**

WATER ANALYSIS REVIEWED BY: **Jacky Zhu, Spectroscopy Technician**

DATE REPORTED: **Oct 28, 2019**

PAGES (INCLUDING COVER): **14**

VERSION*: **1**

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

NOTES

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

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Certificate of Analysis

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

DATE RECEIVED: 2019-10-18 **DATE REPORTED: 2019-10-28**

					SAMPLE DESCRIPTION:	MW19-101
					SAMPLE TYPE:	Water
					DATE SAMPLED:	2019-10-18
Parameter	**Unit**	**G / S**	**RDL**	**Date Prepared**	**Date Analyzed**	**630825**
F1 (C6 - C10)	µg/L		25	2019-10-30	2019-10-30	<25
F1 (C6 to C10) minus BTEX	µg/L		25	2019-10-30	2019-10-30	<25
F2 (C10 to C16)	µg/L		100	2019-10-22	2019-10-23	<100
F3 (C16 to C34)	µg/L		100	2019-10-22	2019-10-23	<100
F4 (C34 to C50)	µg/L		100	2019-10-22	2019-10-23	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	2019-10-22	2019-10-23	NA
Surrogate	**Unit**	**Acceptable Limits**				
Terphenyl	%	60-140		2019-10-22	2019-10-23	76

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

630825
The C6-C10 fraction is calculated using Toluene response factor.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contribution.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Navdeep Kansera

AGAT Laboratories

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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

DATE RECEIVED: 2019-10-18 **DATE REPORTED: 2019-10-28**

					SAMPLE DESCRIPTION:	MW19-4	MW19-104
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2019-10-18	2019-10-18
Parameter	**Unit**	**G / S**	**RDL**	**Date Prepared**	**Date Analyzed**	**630823**	**630837**
Benzene	µg/L	44	0.20	2019-10-30	2019-10-30	<0.20	<0.20
Toluene	µg/L	18000	0.20	2019-10-30	2019-10-30	0.24	0.23
Ethylbenzene	µg/L	2300	0.10	2019-10-30	2019-10-30	<0.10	0.23
Xylene Mixture	µg/L	4200	0.20	2019-10-30	2019-10-30	0.27	0.27
F1 (C6 - C10)	µg/L	750	25	2019-10-30	2019-10-30	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	2019-10-30	2019-10-30	<25	<25
F2 (C10 to C16)	µg/L	150	100	2019-10-22	2019-10-23	<100	<100
F3 (C16 to C34)	µg/L	500	100	2019-10-22	2019-10-23	<100	<100
F4 (C34 to C50)	µg/L	500	100	2019-10-22	2019-10-23	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	500	2019-10-22	2019-10-23	NA	NA
Surrogate	**Unit**	**Acceptable Limits**					
Terphenyl	%	60-140		2019-10-22	2019-10-23	83	94

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

630823-630837 The C6-C10 fraction is calculated using Toluene response factor.
Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
C6–C10 (F1 minus BTEX) is a calculated parameter. The calculated value is F1 minus BTEX.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contribution.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.
NA = Not Applicable

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Navdeep Kansera

AGAT Laboratories

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MISSISSAUGA, ONTARIO
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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

DATE RECEIVED: 2019-10-18

DATE REPORTED: 2019-10-28

					SAMPLE DESCRIPTION:	MW19-1	MW19-101	Trip Blank
					SAMPLE TYPE:	Water	Water	Water
					DATE SAMPLED:	2019-10-18	2019-10-18	2019-10-18
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	630821	630825	630826
Dichlorodifluoromethane	µg/L	4400	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L	0.5	0.17	2019-10-25	2019-10-26	<0.17	<0.17	<0.17
Bromomethane	µg/L	5.6	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	2500	0.40	2019-10-25	2019-10-26	<0.40	<0.40	<0.40
Acetone	µg/L	130000	1.0	2019-10-25	2019-10-26	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L	1.6	0.30	2019-10-25	2019-10-26	<0.30	<0.30	<0.30
Methylene Chloride	µg/L	610	0.30	2019-10-25	2019-10-26	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L	1.6	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L	190	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L	320	0.30	2019-10-25	2019-10-26	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L	470000	1.0	2019-10-25	2019-10-26	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L	1.6	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
1,2-Dichloroethane	µg/L	1.6	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L	640	0.30	2019-10-25	2019-10-26	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	0.79	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Benzene	µg/L	44	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L	16	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	1.6	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	85000	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L	140000	1.0	2019-10-25	2019-10-26	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L	4.7	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Toluene	µg/L	18000	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L	82000	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L	0.25	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L	1.6	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
Chlorobenzene	µg/L	630	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2300	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20

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Certificate of Analysis

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

DATE RECEIVED: 2019-10-18 **DATE REPORTED: 2019-10-28**

					SAMPLE DESCRIPTION:	MW19-1	MW19-101	Trip Blank
					SAMPLE TYPE:	Water	Water	Water
					DATE SAMPLED:	2019-10-18	2019-10-18	2019-10-18
Parameter	**Unit**	**G / S**	**RDL**	**Date Prepared**	**Date Analyzed**	**630821**	**630825**	**630826**
Bromoform	µg/L	380	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
Styrene	µg/L	1300	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L	3.2	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L	9600	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	8	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	4600	0.10	2019-10-25	2019-10-26	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L	5.2	0.30	2019-10-25	2019-10-26	<0.30	<0.30	<0.30
Xylene Mixture	µg/L	4200	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
n-Hexane	µg/L	51	0.20	2019-10-25	2019-10-26	<0.20	<0.20	<0.20
Surrogate	**Unit**	**Acceptable Limits**						
Toluene-d8	% Recovery	50-140		2019-10-25	2019-10-26	103	107	106
4-Bromofluorobenzene	% Recovery	50-140		2019-10-25	2019-10-26	97	81	98

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

630821-630826 Xylenes total is a calculated parameter. The calculated value is the sum of m&p-Xylene and o-Xylene.
1,3-Dichloropropene total is a calculated parameter. The calculated value is the sum of Cis-1,3-Dichloropropene and Trans-1,3-Dichloropropene.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: Navdeep Kansera

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AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

DATE RECEIVED: 2019-10-18

DATE REPORTED: 2019-10-28

					SAMPLE DESCRIPTION:	MW19-1		MW19-3		
					SAMPLE TYPE:	Water		Water		
					DATE SAMPLED:	2019-10-18		2019-10-18		
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	630821	RDL	630822	RDL	Date Prepared
Antimony	µg/L	20000	1.0	2019-10-22	2019-10-22	<1.0	1.0	<1.0	1.0	2019-10-22
Arsenic	µg/L	1900	1.0	2019-10-22	2019-10-22	<1.0	1.0	<1.0	1.0	2019-10-22
Barium	µg/L	29000	2.0	2019-10-22	2019-10-22	187	2.0	231	2.0	2019-10-22
Beryllium	µg/L	67	0.5	2019-10-22	2019-10-22	<0.5	0.5	<0.5	0.5	2019-10-22
Boron	µg/L	45000	10.0	2019-10-22	2019-10-22	152	10.0	134	10.0	2019-10-22
Cadmium	µg/L	2.7	0.2	2019-10-22	2019-10-22	<0.2	0.2	<0.2	0.2	2019-10-22
Chromium	µg/L	810	2.0	2019-10-22	2019-10-22	2.6	2.0	<2.0	2.0	2019-10-22
Cobalt	µg/L	66	0.5	2019-10-22	2019-10-22	1.6	0.5	1.1	0.5	2019-10-22
Copper	µg/L	87	1.0	2019-10-22	2019-10-22	<1.0	1.0	1.3	1.0	2019-10-22
Lead	µg/L	25	0.5	2019-10-22	2019-10-22	<0.5	0.5	<0.5	0.5	2019-10-22
Molybdenum	µg/L	9200	0.5	2019-10-22	2019-10-22	2.5	0.5	13.6	0.5	2019-10-22
Nickel	µg/L	490	1.0	2019-10-22	2019-10-22	1.5	1.0	3.8	1.0	2019-10-22
Selenium	µg/L	63	1.0	2019-10-22	2019-10-22	<1.0	1.0	<1.0	1.0	2019-10-22
Silver	µg/L	1.5	0.2	2019-10-22	2019-10-22	<0.2	0.2	<0.2	0.2	2019-10-22
Thallium	µg/L	510	0.3	2019-10-22	2019-10-22	<0.3	0.3	<0.3	0.3	2019-10-22
Uranium	µg/L	420	0.5	2019-10-22	2019-10-22	1.4	0.5	2.2	0.5	2019-10-22
Vanadium	µg/L	250	0.4	2019-10-22	2019-10-22	0.6	0.4	1.1	0.4	2019-10-22
Zinc	µg/L	1100	5.0	2019-10-22	2019-10-22	<5.0	5.0	5.3	5.0	2019-10-22
Mercury	µg/L	0.29	0.02	2019-10-21	2019-10-21	<0.02	0.02	<0.02	0.02	2019-10-21
Chromium VI	µg/L	140	5	2019-10-26	2019-10-26	<5	5	<5	5	2019-10-26
Cyanide	µg/L	66	2	2019-10-22	2019-10-22	<2	2	<2	2	2019-10-22
Sodium	µg/L	2300000	2500	2019-10-22	2019-10-22	110000	2500	234000	2500	2019-10-22
Chloride	µg/L	2300000	1000	2019-10-21	2019-10-21	576000	2000	885000	1000	2019-10-25
Electrical Conductivity	uS/cm		2	2019-10-21	2019-10-21	2270	2	3050	2	2019-10-21
pH	pH Units		NA	2019-10-21	2019-10-21	7.64	NA	7.69	NA	2019-10-21

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AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

DATE RECEIVED: 2019-10-18

DATE REPORTED: 2019-10-28

					SAMPLE DESCRIPTION:	MW19-4	MW19-101
					SAMPLE TYPE:	Water	Water
					DATE SAMPLED:	2019-10-18	2019-10-18
Parameter	Unit	G / S	RDL	Date Prepared	Date Analyzed	630823	630825
Antimony	µg/L	20000	1.0	2019-10-22	2019-10-22	<1.0	<1.0
Arsenic	µg/L	1900	1.0	2019-10-22	2019-10-22	<1.0	1.2
Barium	µg/L	29000	2.0	2019-10-22	2019-10-22	160	185
Beryllium	µg/L	67	0.5	2019-10-22	2019-10-22	<0.5	<0.5
Boron	µg/L	45000	10.0	2019-10-22	2019-10-22	121	158
Cadmium	µg/L	2.7	0.2	2019-10-22	2019-10-22	<0.2	<0.2
Chromium	µg/L	810	2.0	2019-10-22	2019-10-22	<2.0	2.2
Cobalt	µg/L	66	0.5	2019-10-22	2019-10-22	<0.5	1.5
Copper	µg/L	87	1.0	2019-10-22	2019-10-22	<1.0	<1.0
Lead	µg/L	25	0.5	2019-10-22	2019-10-22	<0.5	<0.5
Molybdenum	µg/L	9200	0.5	2019-10-22	2019-10-22	<0.5	2.4
Nickel	µg/L	490	1.0	2019-10-22	2019-10-22	<1.0	1.4
Selenium	µg/L	63	1.0	2019-10-22	2019-10-22	1.1	1.7
Silver	µg/L	1.5	0.2	2019-10-22	2019-10-22	<0.2	<0.2
Thallium	µg/L	510	0.3	2019-10-22	2019-10-22	<0.3	<0.3
Uranium	µg/L	420	0.5	2019-10-22	2019-10-22	<0.5	1.4
Vanadium	µg/L	250	0.4	2019-10-22	2019-10-22	0.9	1.1
Zinc	µg/L	1100	5.0	2019-10-22	2019-10-22	<5.0	<5.0
Mercury	µg/L	0.29	0.02	2019-10-21	2019-10-21	<0.02	<0.02
Chromium VI	µg/L	140	5	2019-10-26	2019-10-26	<5	<5
Cyanide	µg/L	66	2	2019-10-22	2019-10-22	<2	<2
Sodium	µg/L	2300000	2500	2019-10-22	2019-10-22	94200	112000
Chloride	µg/L	2300000	1000	2019-10-25	2019-10-25	347000	595000
Electrical Conductivity	uS/cm		2	2019-10-21	2019-10-21	1550	2280
pH	pH Units		NA	2019-10-21	2019-10-21	7.76	7.83

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

630821-630825 Elevated RDL indicates the degree of sample dilution prior to the analysis in order to keep analytes within the calibration range of the instrument and to reduce matrix interference.

Analysis performed at AGAT Toronto (unless marked by *)

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CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

Trace Organics Analysis

RPT Date: Oct 28, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	630817		< 0.20	< 0.20	NA	< 0.20	88%	50%	140%	84%	50%	140%	89%	50%	140%
Vinyl Chloride	630817		< 0.17	< 0.17	NA	< 0.17	85%	50%	140%	110%	50%	140%	107%	50%	140%
Bromomethane	630817		< 0.20	< 0.20	NA	< 0.20	86%	50%	140%	96%	50%	140%	87%	50%	140%
Trichlorofluoromethane	630817		< 0.40	< 0.40	NA	< 0.40	91%	50%	140%	105%	50%	140%	106%	50%	140%
Acetone	630817		< 1.0	< 1.0	NA	< 1.0	107%	50%	140%	104%	50%	140%	118%	50%	140%
1,1-Dichloroethylene	630817		< 0.30	< 0.30	NA	< 0.30	79%	50%	140%	83%	60%	130%	92%	50%	140%
Methylene Chloride	630817		< 0.30	< 0.30	NA	< 0.30	90%	50%	140%	107%	60%	130%	90%	50%	140%
trans- 1,2-Dichloroethylene	630817		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	85%	60%	130%	79%	50%	140%
Methyl tert-butyl ether	630817		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	76%	60%	130%	94%	50%	140%
1,1-Dichloroethane	630817		< 0.30	< 0.30	NA	< 0.30	84%	50%	140%	89%	60%	130%	96%	50%	140%
Methyl Ethyl Ketone	630817		< 1.0	< 1.0	NA	< 1.0	82%	50%	140%	95%	50%	140%	99%	50%	140%
cis- 1,2-Dichloroethylene	630817		< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	92%	60%	130%	97%	50%	140%
Chloroform	630817		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	97%	60%	130%	104%	50%	140%
1,2-Dichloroethane	630817		< 0.20	< 0.20	NA	< 0.20	110%	50%	140%	113%	60%	130%	117%	50%	140%
1,1,1-Trichloroethane	630817		< 0.30	< 0.30	NA	< 0.30	94%	50%	140%	81%	60%	130%	95%	50%	140%
Carbon Tetrachloride	630817		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	86%	60%	130%	81%	50%	140%
Benzene	630817		< 0.20	< 0.20	NA	< 0.20	101%	50%	140%	97%	60%	130%	101%	50%	140%
1,2-Dichloropropane	630817		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	93%	60%	130%	82%	50%	140%
Trichloroethylene	630817		< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	111%	60%	130%	103%	50%	140%
Bromodichloromethane	630817		< 0.20	< 0.20	NA	< 0.20	90%	50%	140%	108%	60%	130%	90%	50%	140%
Methyl Isobutyl Ketone	630817		< 1.0	< 1.0	NA	< 1.0	100%	50%	140%	113%	50%	140%	115%	50%	140%
1,1,2-Trichloroethane	630817		< 0.20	< 0.20	NA	< 0.20	119%	50%	140%	98%	60%	130%	111%	50%	140%
Toluene	630817		< 0.20	< 0.20	NA	< 0.20	82%	50%	140%	117%	60%	130%	114%	50%	140%
Dibromochloromethane	630817		< 0.10	< 0.10	NA	< 0.10	97%	50%	140%	118%	60%	130%	110%	50%	140%
Ethylene Dibromide	630817		< 0.10	< 0.10	NA	< 0.10	115%	50%	140%	105%	60%	130%	105%	50%	140%
Tetrachloroethylene	630817		< 0.20	< 0.20	NA	< 0.20	73%	50%	140%	112%	60%	130%	109%	50%	140%
1,1,1,2-Tetrachloroethane	630817		< 0.10	< 0.10	NA	< 0.10	87%	50%	140%	117%	60%	130%	114%	50%	140%
Chlorobenzene	630817		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	97%	60%	130%	115%	50%	140%
Ethylbenzene	630817		< 0.10	< 0.10	NA	< 0.10	75%	50%	140%	109%	60%	130%	107%	50%	140%
m & p-Xylene	630817		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	113%	60%	130%	112%	50%	140%
Bromoform	630817		< 0.10	< 0.10	NA	< 0.10	108%	50%	140%	93%	60%	130%	115%	50%	140%
Styrene	630817		< 0.10	< 0.10	NA	< 0.10	79%	50%	140%	106%	60%	130%	104%	50%	140%
1,1,2,2-Tetrachloroethane	630817		< 0.10	< 0.10	NA	< 0.10	101%	50%	140%	106%	60%	130%	99%	50%	140%
o-Xylene	630817		< 0.10	< 0.10	NA	< 0.10	87%	50%	140%	119%	60%	130%	117%	50%	140%
1,3-Dichlorobenzene	630817		< 0.10	< 0.10	NA	< 0.10	99%	50%	140%	116%	60%	130%	88%	50%	140%
1,4-Dichlorobenzene	630817		< 0.10	< 0.10	NA	< 0.10	100%	50%	140%	108%	60%	130%	90%	50%	140%
1,2-Dichlorobenzene	630817		< 0.10	< 0.10	NA	< 0.10	105%	50%	140%	90%	60%	130%	95%	50%	140%
1,3-Dichloropropene	630817		< 0.30	< 0.30	NA	< 0.30	90%	50%	140%	90%	60%	130%	84%	50%	140%
n-Hexane	630817		< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	103%	60%	130%	95%	50%	140%

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Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS
AGAT WORK ORDER: 19Z532666
PROJECT: Phase 2 ESA - 64819.22
ATTENTION TO: Kathryn Maton
SAMPLING SITE:393 McArthur Ave
SAMPLED BY:Kathryn Maton

Trace Organics Analysis (Continued)

RPT Date: Oct 28, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Water)															
Benzene	653359		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	80%	60%	130%	85%	50%	140%
Toluene	653359		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	85%	60%	130%	90%	50%	140%
Ethylbenzene	653359		< 0.10	< 0.10	NA	< 0.10	99%	50%	140%	80%	60%	130%	91%	50%	140%
Xylene Mixture	653359		< 0.20	< 0.20	NA	< 0.20	90%	50%	140%	83%	60%	130%	90%	50%	140%
F1 (C6 - C10)	653359		< 25	< 25	NA	< 25	92%	60%	140%	109%	60%	140%	110%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	81%	60%	140%	90%	60%	140%	92%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	90%	60%	140%	107%	60%	140%	87%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	89%	60%	140%	84%	60%	140%	119%	60%	140%
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	646411		< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	115%	50%	140%	100%	50%	140%
Vinyl Chloride	646411		< 0.17	< 0.17	NA	< 0.17	85%	50%	140%	122%	50%	140%	95%	50%	140%
Bromomethane	646411		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	117%	50%	140%	108%	50%	140%
Trichlorofluoromethane	646411		< 0.40	< 0.40	NA	< 0.40	77%	50%	140%	113%	50%	140%	118%	50%	140%
Acetone	646411		< 1.0	< 1.0	NA	< 1.0	117%	50%	140%	102%	50%	140%	89%	50%	140%
1,1-Dichloroethylene	646411		< 0.30	< 0.30	NA	< 0.30	91%	50%	140%	109%	60%	130%	109%	50%	140%
Methylene Chloride	646411		< 0.30	< 0.30	NA	< 0.30	103%	50%	140%	84%	60%	130%	97%	50%	140%
trans- 1,2-Dichloroethylene	646411		< 0.20	< 0.20	NA	< 0.20	100%	50%	140%	116%	60%	130%	116%	50%	140%
Methyl tert-butyl ether	646411		< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	83%	60%	130%	90%	50%	140%
1,1-Dichloroethane	646411		< 0.30	< 0.30	NA	< 0.30	101%	50%	140%	120%	60%	130%	115%	50%	140%
Methyl Ethyl Ketone	646411		< 1.0	< 1.0	NA	< 1.0	88%	50%	140%	108%	50%	140%	105%	50%	140%
cis- 1,2-Dichloroethylene	646411		< 0.20	< 0.20	NA	< 0.20	110%	50%	140%	92%	60%	130%	95%	50%	140%
Chloroform	646411		< 0.20	< 0.20	NA	< 0.20	114%	50%	140%	91%	60%	130%	99%	50%	140%
1,2-Dichloroethane	646411		< 0.20	< 0.20	NA	< 0.20	119%	50%	140%	100%	60%	130%	105%	50%	140%
1,1,1-Trichloroethane	646411		< 0.30	< 0.30	NA	< 0.30	100%	50%	140%	118%	60%	130%	103%	50%	140%
Carbon Tetrachloride	646411		< 0.20	< 0.20	NA	< 0.20	100%	50%	140%	110%	60%	130%	97%	50%	140%
Benzene	646411		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	100%	60%	130%	104%	50%	140%
1,2-Dichloropropane	646411		< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	108%	60%	130%	101%	50%	140%
Trichloroethylene	646411		< 0.20	< 0.20	NA	< 0.20	82%	50%	140%	87%	60%	130%	111%	50%	140%
Bromodichloromethane	646411		< 0.20	< 0.20	NA	< 0.20	104%	50%	140%	113%	60%	130%	104%	50%	140%
Methyl Isobutyl Ketone	646411		< 1.0	< 1.0	NA	< 1.0	87%	50%	140%	91%	50%	140%	99%	50%	140%
1,1,2-Trichloroethane	646411		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	102%	60%	130%	95%	50%	140%
Toluene	646411		< 0.20	< 0.20	NA	< 0.20	106%	50%	140%	95%	60%	130%	98%	50%	140%
Dibromochloromethane	646411		< 0.10	< 0.10	NA	< 0.10	100%	50%	140%	97%	60%	130%	94%	50%	140%
Ethylene Dibromide	646411		< 0.10	< 0.10	NA	< 0.10	104%	50%	140%	84%	60%	130%	101%	50%	140%
Tetrachloroethylene	646411		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	94%	60%	130%	90%	50%	140%
1,1,1,2-Tetrachloroethane	646411		< 0.10	< 0.10	NA	< 0.10	90%	50%	140%	78%	60%	130%	86%	50%	140%
Chlorobenzene	646411		< 0.10	< 0.10	NA	< 0.10	106%	50%	140%	101%	60%	130%	114%	50%	140%
Ethylbenzene	646411		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	107%	60%	130%	104%	50%	140%

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Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

Trace Organics Analysis (Continued)

RPT Date: Oct 28, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
m & p-Xylene	646411		< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	105%	60%	130%	104%	50%	140%
Bromoform	646411		< 0.10	< 0.10	NA	< 0.10	86%	50%	140%	79%	60%	130%	94%	50%	140%
Styrene	646411		< 0.10	< 0.10	NA	< 0.10	85%	50%	140%	89%	60%	130%	98%	50%	140%
1,1,2,2-Tetrachloroethane	646411		< 0.10	< 0.10	NA	< 0.10	108%	50%	140%	93%	60%	130%	117%	50%	140%
o-Xylene	646411		< 0.10	< 0.10	NA	< 0.10	96%	50%	140%	84%	60%	130%	109%	50%	140%
1,3-Dichlorobenzene	646411		< 0.10	< 0.10	NA	< 0.10	111%	50%	140%	97%	60%	130%	107%	50%	140%
1,4-Dichlorobenzene	646411		< 0.10	< 0.10	NA	< 0.10	111%	50%	140%	93%	60%	130%	94%	50%	140%
1,2-Dichlorobenzene	646411		< 0.10	< 0.10	NA	< 0.10	104%	50%	140%	96%	60%	130%	106%	50%	140%
1,3-Dichloropropene	646411		< 0.30	< 0.30	NA	< 0.30	92%	50%	140%	91%	60%	130%	96%	50%	140%
n-Hexane	646411		< 0.20	< 0.20	NA	< 0.20	84%	50%	140%	110%	60%	130%	108%	50%	140%

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

Certified By: Navdeep Kansera

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Quality Assurance

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

Water Analysis

RPT Date: Oct 28, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Water)															
Antimony	634952		<1.0	<1.0	NA	< 1.0	106%	70%	130%	97%	80%	120%	101%	70%	130%
Arsenic	634952		<1.0	<1.0	NA	< 1.0	103%	70%	130%	103%	80%	120%	120%	70%	130%
Barium	634952		117	119	1.7%	< 2.0	102%	70%	130%	104%	80%	120%	98%	70%	130%
Beryllium	634952		<0.5	<0.5	NA	< 0.5	103%	70%	130%	103%	80%	120%	115%	70%	130%
Boron	634952		76.9	83.9	8.7%	< 10.0	96%	70%	130%	101%	80%	120%	108%	70%	130%
Cadmium	634952		<0.2	<0.2	NA	< 0.2	100%	70%	130%	104%	80%	120%	110%	70%	130%
Chromium	634952		<2.0	<2.0	NA	< 2.0	100%	70%	130%	103%	80%	120%	102%	70%	130%
Cobalt	634952		<0.5	0.5	NA	< 0.5	101%	70%	130%	100%	80%	120%	101%	70%	130%
Copper	634952		<1.0	<1.0	NA	< 1.0	106%	70%	130%	108%	80%	120%	103%	70%	130%
Lead	634952		<0.5	<0.5	NA	< 0.5	99%	70%	130%	104%	80%	120%	99%	70%	130%
Molybdenum	634952		6.8	7.2	5.7%	< 0.5	102%	70%	130%	101%	80%	120%	110%	70%	130%
Nickel	634952		2.2	2.2	NA	< 1.0	106%	70%	130%	104%	80%	120%	103%	70%	130%
Selenium	634952		<1.0	<1.0	NA	< 1.0	99%	70%	130%	102%	80%	120%	123%	70%	130%
Silver	634952		<0.2	<0.2	NA	< 0.2	104%	70%	130%	106%	80%	120%	98%	70%	130%
Thallium	634952		<0.3	<0.3	NA	< 0.3	100%	70%	130%	107%	80%	120%	100%	70%	130%
Uranium	634952		<0.5	<0.5	NA	< 0.5	97%	70%	130%	99%	80%	120%	100%	70%	130%
Vanadium	634952		<0.4	<0.4	NA	< 0.4	98%	70%	130%	99%	80%	120%	103%	70%	130%
Zinc	634952		<5.0	<5.0	NA	< 5.0	103%	70%	130%	105%	80%	120%	117%	70%	130%
Mercury	630821	630821	<0.02	<0.02	NA	< 0.02	103%	70%	130%	99%	80%	120%	97%	70%	130%
Chromium VI	630821	630821	<5	<5	NA	< 5	100%	70%	130%	101%	80%	120%	98%	70%	130%
Cyanide	630821	630821	<2	<2	NA	< 2	107%	70%	130%	106%	80%	120%	81%	70%	130%
Sodium	630821	630821	110000	109000	0.9%	< 500	97%	70%	130%	97%	80%	120%	97%	70%	130%
Chloride	630861		7820	8500	8.3%	< 100	110%	70%	130%	100%	70%	130%	106%	70%	130%
Electrical Conductivity	630782		994	1000	0.6%	< 2	106%	90%	110%						
pH	630782		7.84	7.84	0.0%	NA	100%	90%	110%						

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:

AGAT Laboratories

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Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

ATTENTION TO: Kathryn Maton

SAMPLING SITE:393 McArthur Ave

SAMPLED BY:Kathryn Maton

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

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Method Summary

CLIENT NAME: GEMTEC CONSULTING ENGINEERS AND SCIENTISTS

AGAT WORK ORDER: 19Z532666

PROJECT: Phase 2 ESA - 64819.22

ATTENTION TO: Kathryn Maton

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Styrene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Xylene Mixture	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030C & 8260D	(P&T)GC/MS
Water Analysis			
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Chromium VI	INOR-93-6034	SM 3500-Cr B	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE METHOD CN- 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE

1 Cg BLK

AGAT Laboratories

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Chain of Custody Record

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

Report Information:

Company: GEMTEC
Contact: Kathryn Maton
Address: 32 Steacie Drive, Ottawa, ON
Phone: 613-223-5885 Fax:
Reports to be sent to:
1. Email: kathryn.maton@gemtec.ca
2. Email:

Project Information:

Project: Phase Two ESA
Site Location: 393 McArthur Ave
Sampled By: Kathryn Maton
AGAT Quote #: PO: 64819.22
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

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

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☐ Ind/Com
☒ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

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

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Laboratory Use Only

Work Order #: 1925326666
Cooler Quantity: 1
Arrival Temperatures: 9.5 | 9.5 | 7.5 / 2.9 | 3.1 | 2.7
Custody Seal Intact: ☐ Yes ☐ No ☒ N/A
Notes:

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*
For 'Same Day' analysis, please contact your AGAT CPM

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Field Filtered - Metals, Hg, CrVI	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides); ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR)	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	PHCs F1 - F4 + BTEX	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use						Potentially Hazardous or High Concentration (Y/N)
MW19-1	18/10/19	11:50am	8	GW				X					X														
MW19-3	↓	2:40pm	5	↓				X																			
MW19-4		1:15pm	9					X						X													
MW19-101		11:50am	9					X						X													
Trip Blank			3										X														
MW19-104	↓	1:15pm	4	↓										X													

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Adam Alain	Oct 18/19	4:00pm	Jeff Jones	18/10/19	16h
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
			MANOJ JOHN	OCT 19/19	9:10
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

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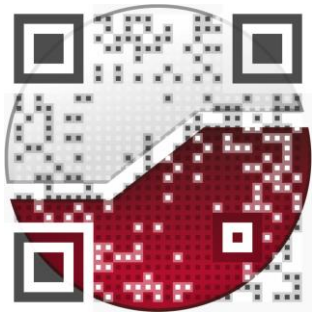
Nº: T095112

experience • knowledge • integrity



civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité