GOLDER
MEMBER OF WSP

FINAL REPORT

Phase Two Environmental Site Assessment

Northwest 0.47-Hectare Parcel at 933 Gladstone Avenue, Ottawa, Ontario

Submitted to:

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Submitted by:

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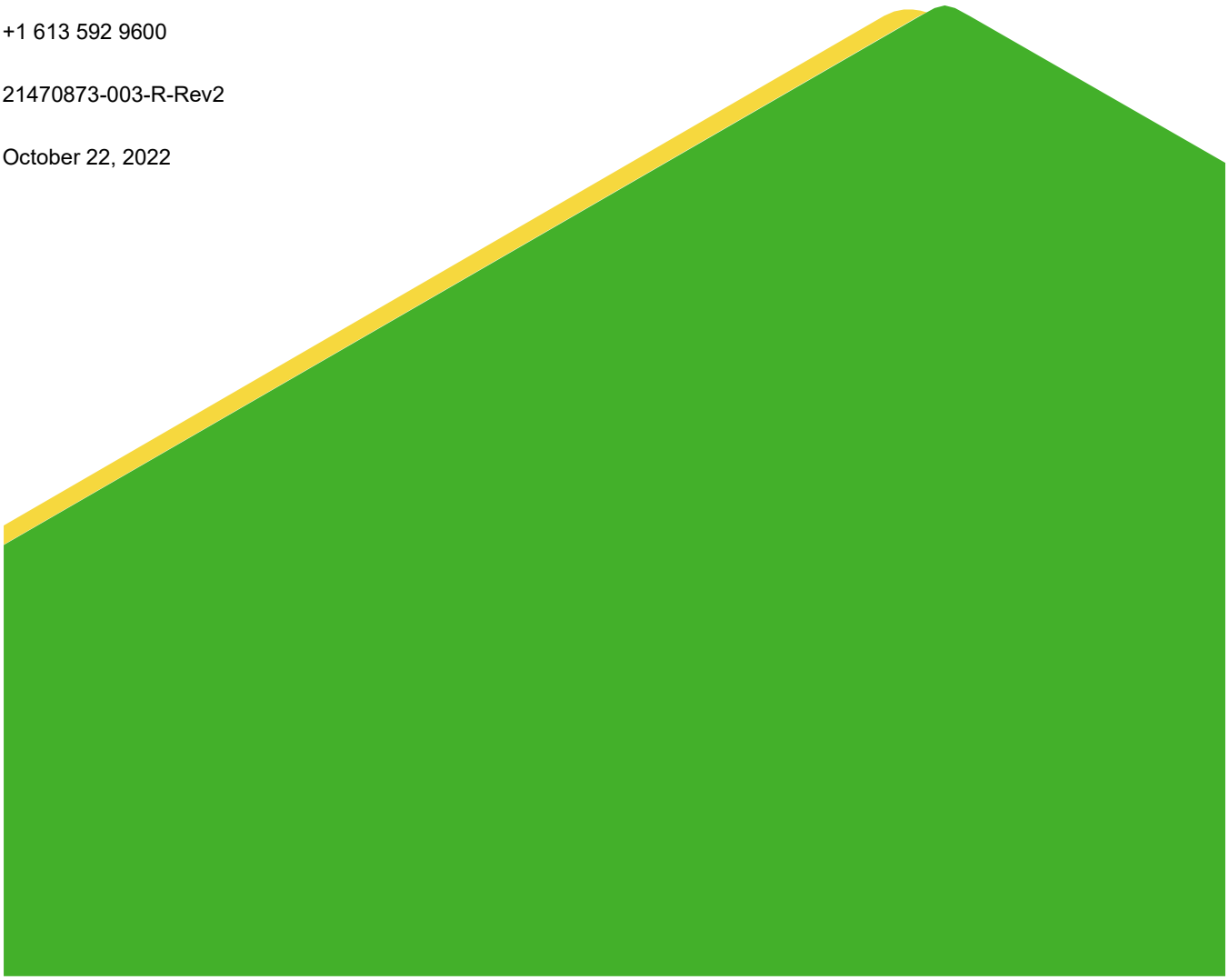

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1.0 EXECUTIVE SUMMARY

Golder Associates Ltd. (Golder) was retained by Ottawa Community Housing Corporation (OCH) to conduct a Phase Two Environmental Site Assessment (Phase Two ESA) for the 0.47-hectare parcel located in the northwestern portion of the larger, 3.3-hectare property known municipally as 933 Gladstone Avenue, Ottawa, Ontario (the "Site", "RSC Property" or "Phase Two Property" is 0.47 hectares within the larger 3.3-hectare property). Golder completed a Phase Two ESA for OCH in March 2017 for due diligence purposes prior to OCH's acquisition of the entire 3.3-hectare property at 933 Gladstone Avenue. The 933 Gladstone Avenue property was subsequently divided to allow for the filing of a Record of Site Condition (RSC) in October 2019 (RSC# 226204) for the 2.83-hectare portion of the property located immediately adjacent to the east of the Phase Two Property. OCH has since acquired the 0.47-hectare parcel and retained Golder to conduct a Phase One and Two ESA Update of the Site.

Golder previously completed a Phase One ESA entitled *Phase One Environmental Site Assessment, 933 Gladstone Avenue, Ottawa, Ontario*, dated December 2016 as well as a Phase One ESA Update report for the Site entitled *Phase One Environmental Site Assessment Update for Northwest 0.47-Hectare Parcel at 933 Gladstone Avenue, Ottawa, Ontario*, dated October 21, 2022. Based on the findings of the Phase One ESA and Phase One ESA Update, that identified nine Areas of Potential Environmental Concern (APEC), Golder completed this Phase Two ESA investigation.

The Phase Two ESA work was completed in two stages. The first stage of the Phase Two ESA work was completed in January and February 2017 during OCH's due diligence process to acquire the 3.3-hectare property that includes the 0.47-hectare parcel of land than is currently part of the RSC property. The second stage of the Phase Two ESA was completed in August 2021 to support the transfer of the closed road allowances from the City of Ottawa to OCH and final definition of the RSC Property boundary in October 2021. The second stage consisted of evaluating the adequacy of the 2017 information in relation to RSC Property boundary and determining if additional assessment was required to evaluate potential changes in site conditions since 2017. Supplemental groundwater sampling was carried out in October 2019 and August 2021 to evaluate temporal changes in groundwater quality since the first stage of the Phase Two ESA in 2017.

Based on the results of the soil and groundwater samples submitted as part of this Phase Two ESA, the reported concentrations of the contaminants of potential concern associated with the nine APECs (including petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylenes, volatile organic compounds, polycyclic aromatic hydrocarbons, metals, and polychlorinated biphenyls) were all below the applicable generic site condition standards. No completion of a risk assessment or remediation is required prior to the submission of an RSC.

2.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Ottawa Community Housing Corporation (OCH) to conduct a Phase Two Environmental Site Assessment (Phase Two ESA) for the 0.47-hectare parcel located in the northwestern portion of the larger, 3.3-hectare property known municipally as 933 Gladstone Avenue, Ottawa, Ontario (the "Site", "RSC Property" or "Phase Two Property" is a 0.47-hectare parcel within the larger 3.3-hectare property). Golder completed a Phase Two ESA for OCH in 2017 for due diligence purposes prior to OCH's acquisition of the entire 3.3-hectare property at 933 Gladstone Avenue. The 933 Gladstone Avenue property was subsequently divided to allow for the filing of a Record of Site Condition (RSC) in October 2019 (RSC# 226204) for the 2.83-hectare portion of the property located immediately adjacent to the east of the Phase Two Property. OCH has since acquired the 0.47-hectare parcel and retained Golder to conduct a Phase One and Two ESA Update of the Site.

A Phase One ESA in accordance with Ontario Regulation 153/04 (O.Reg. 153/04) (as amended) was completed for the entire 933 Gladstone Avenue property by Golder in December 2016 as described in the report entitled *Phase One Environmental Site Assessment, 933 Gladstone Avenue, Ottawa, Ontario*, dated December 2016 (2016 Phase One ESA report). A Phase One ESA Update report for the Site entitled *Phase One Environmental Site Assessment Update for Northwest 0.47-Hectare Parcel at 933 Gladstone Avenue, Ottawa, Ontario* dated October 21, 2022 (2022 Phase One ESA Update report) was prepared by Golder to support the filing of the RSC by evaluating whether new potentially contaminating activities had resulted in additional areas of potential environmental concern since the time of the original Phase One ESA.

This Phase Two ESA report addresses the areas of potential environmental concern that are applicable for the Site identified in the Phase One ESA Update and provides a summary and interpretation of the data relating to the Site. The purpose of this Phase Two ESA is to summarize the existing soil and groundwater conditions at the Phase Two Property and ultimately file an RSC.

2.1 Site Description

Golder was retained by Ottawa Community Housing Corporation (the Client or OCH) to conduct a Phase Two ESA of the following property:

Municipal Address	933 Gladstone Avenue, Ottawa, Ontario (note: there is no separate address for the 0.47-hectare parcel)
Property Identification Number	Parts of PIN 04107-0299
Legal Description	Firstly: Former PIN 04107-0032: Part of Lot 8, Block B, Plan 73; Part of Lot 9, Block B, Plan 73; Part Lot 10, Block B, Plan 73, West side of Champagne Avenue, being Parts 8, 9 & 10 on Plan 5R-4993, Ottawa-Nepean. Secondly: Former PIN 04107-0035: Part Champagne Avenue, Plan 73 (formerly First Avenue) (closed by judge's order per Inst. No. LT1402120), being Part 1 on Plan 4R-33454 and being Part 1 on Plan 4R-33879, City of Ottawa Former PIN 04107-0033: Part Laurel Street, Plan 73 (closed by judge's order per Inst. No. LT1402120), being Part 2 on Plan 4R-33454 and being Part 3 on Plan 4R-33879, City of Ottawa Former PIN 04107-0031: Part Oak Street, Plan 73 (closed by judge's order per Inst. No. LT1402120), being Part 3 on Plan 4R-33454, City of Ottawa.
	0.47 hectares

The Site location is shown on Figure 1. A plan of survey for the Site showing the boundaries of the RSC Property and the Phase Two Property, which are the same, is provided in Appendix A.

2.2 Property Ownership

The RSC Property is owned by Ottawa Community Housing Corporation as of October 2021, noting that the lands referred to in Section 2.1 under *Firstly-Part of 933 Gladstone* were acquired by OCH in May 2017. The contact information for the Phase Two Property owner is as follows:

Current Site Owner(s)	Address	Contact Information
Ottawa Community Housing Corporation	39 Auriga Drive Ottawa, Ontario K2E 7Y8	Mr. Robert MacNeil Tel: 613-731-7223 x 2325 Fax: 613-731-4463 E-Mail: robert_macneil@och.ca

2.3 Current and Proposed Future Uses

The Phase Two Property is currently vacant land and was formerly the site of the Federal Government Central Ordnance Depot prior to 2015. The proposed future use of the Phase Two Property is mixture of residential, institutional (school), parkland and commercial redevelopment. This change in use constitutes a change from a less sensitive to a more sensitive land use, as such the submission of a Record of Site Condition will be required.

2.4 Applicable Site Condition Standard

The analytical results of the samples collected for this Phase Two ESA were compared to the Table 3 Full Depth Generic Site Condition Standards in A Non-Potable Groundwater Condition (residential property use, coarse soil texture) presented in the Ministry of the Environment, Conservation and Parks *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, dated April 15, 2011 (MECP Table 3 Standards). The applicable site condition standards were selected based on the following rationale:

- The Site and all other properties located, in whole or in part, within 250 metres of the Site are supplied by the City of Ottawa municipal drinking water system. No wells were identified that are used or intended for use as a source of water for human consumption or agriculture. Golder contacted the City of Ottawa on October 4, 2021 asking if they were in agreement with using non-potable groundwater standards (see Appendix B). The City of Ottawa has not objected to the notice, and it has been more than 30 days since it was submitted.
- The Site is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water.
- Results of grain-size analysis conducted in 2017 show that at least one third of soil at the property may be considered coarse textured.
- The closest water body is the Ottawa River, located 1 kilometre (km) north of the Phase Two Property.
- There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site, as described in Section 41.
- The average pH of surface soil is 5≤pH≤9 and the pH of sub-surface soil meets the requirement that 5≤pH≤11.

- The intended land use for the Phase Two Property is a mixed-use development that includes residential, parkland, institutional property use development.
- The overburden thickness is greater than 2 metres over more than one-third of the Phase Two Property.

3.0 BACKGROUND INFORMATION

This section presents the background conditions of the Phase Two Property including a description of the physical setting and a summary of past investigations conducted.

3.1 Physical Setting

The nearest surface water body is the Ottawa River, located 1 km north of the Phase Two Property. There are no areas of natural significance within the Phase One Study area. Land uses surrounding the Phase Two Property include parkland, community, residential and commercial, as shown on Figure 2.

The topography of the Phase Two Property is flat, sitting approximately 1.5 m lower than the adjacent lands to the north and 1.0 metres lower than the adjacent lands to the east. The site is at grade with the lands to the south and immediately to the west (recreational use path) however the railway track located approximately 20 metres further to the west is in a manmade 5 m deep trench. The surface water drainage features on the Site include ditches along the eastern perimeter of the Site which contain catch basins at junctions. These catch basins drain to the storm sewer. Otherwise, infiltration is the primary method of water drainage.

3.2 Past Investigations

1) "2001 Phase I ESA" for portion of the Site north of Laurel Street, and adjacent property north of the Site: Aqua Terre Solutions Inc. March 2001. *Phase I Environmental Site Assessment Plouffe Park (1010 Somerset St. W.) Ottawa, Ontario.* Prepared for Public Works and Government Service Canada.

2) "2005 Phase I & II ESA" for the 933 Gladstone Ave. site and adjacent property to the north: Trow Associates Inc. January 2005. *Phase I & II Environmental Site Assessment, Plouffe Park 1010 Somerset St. W., Ottawa, Ontario DRFP#08830.* Prepared for Public Works & Government Services Canada.

3) "2008 Environmental Review" Levac Robichaud Leclerc Associates Ltd. October 2008: *Environmental Review and Limited Investigation Plouffe Park, 1010 Somerset Street West, Ottawa, Ontario.* Prepared for SNC-Lavalin Profac Inc.

4) "2013 Soil and Groundwater Investigation" for the 933 Gladstone Ave. site and adjacent property to the north: DST Consulting Engineers Inc. September 2013. *Subsurface Soil and Groundwater Investigation Sampling Plouffe Park – 1010 Somerset Street West, Ottawa, Ontario.* Prepared for Public Works and Government Services Canada.

5) "2015 Phase One ESA" for the 933 Gladstone Ave. site: Pinchin Ltd. 2015. *Phase One Environmental Site Assessment: 933 Gladstone Avenue Ottawa, Ontario.* Prepared for Canada Lands Company CLC Limited.

6) "2016 Phase One ESA" for the 933 Gladstone Ave. site: Golder Associates. *Phase One Environmental Site Assessment, 933 Gladstone Avenue, Ottawa, Ontario*, dated December 2016, project reference 1661627/1000, prepared for the City of Ottawa.

7) "2018 Phase One ESA Update" for the 2.83-hectare parcel within the larger 3.3-hectare property at 933 Gladstone Ave.: Golder Associates. *Phase One Environmental Site Assessment Update, 933 Gladstone Avenue, Ottawa, Ontario*, dated August 2018, project reference 1897188/1000, prepared for Ottawa Community Housing (OCH).

8) "2019 Phase Two ESA" for the 2.83-hectare parcel within the larger 3.3-hectare property at 933 Gladstone Ave.: Golder Associates. *Phase Two Environmental Site Assessment, 933 Gladstone Avenue, Ottawa, Ontario*, dated October 2, 2019, document reference 1897188-003Rev2, prepared for Ottawa Community Housing (OCH).

Report	On/Off Site	Factual Information Summary
2001 Phase I ESA	On and Off Site – Refers to warehouse that spanned both properties listed as 1010 Somerset St. W.	Six (6) APECs were identified including: 1. Former Coal Storage Area and Diesel AST (boiler room area) 2. Equipment and drum storage in yard (NW maintenance yard) 3. Former underground storage tanks (USTs) (SE of Site) 4. Historical land use on surrounding properties 5. Bulk storage of explosive ordnance 6. Designated substance issues including lead, mercury, and asbestos
2005 Phase I & II ESA	On and Off Site – Refers to warehouse that spanned both properties listed as 1010 Somerset St. W.	Nine (9) PCAs were identified, which included all six (6) APECs reported in "2001 Phase I ESA" as well as 1. The former rail line to the west of the building 2. The general fill quality at the Site 3. The fires at the northern portion of the property in 1950's Only two APECs, the fill and the coal storage yard, showed concentrations above applicable guidelines at the time when analysed during the Phase II investigation. The groundwater flow direction was inferred to be to the north-northeast.
2008 Environmental Review	On and Off Site – Refers to warehouse that spanned both properties listed as 1010 Somerset St. W.	This report noted that the general fill quality on the Site was an environmental concern, and any fill generated from redevelopment would need disposal. Asbestos materials were noted throughout the depot building, as well as lead based paints. Mould was also identified in the building.
2013 Soil and Groundwater Investigation	On and Off Site – Refers to warehouse that spanned both properties listed as 1010 Somerset St. W.	Based on groundwater and soil analysis, four areas of environmental concern (AEC) were identified on the northern portion of the former warehouse north of the Phase One Property (1010 Somerset St. W.). Additionally, based on fill quality assessment, three areas of impacts were identified; two in the northern portion of the Site, and one in the southwestern portion which showed PAHs and metals exceedances.

Report	On/Off Site	Factual Information Summary
2015 Phase One ESA	On and Off Site – same property limits as 2016 Phase One ESA	Seventeen (17) PCAs were identified on Site as well as forty-two (42) PCAs in the Phase One study area outside the Phase One Property. Off Site PCAs which contributed to on-Site APECs included: the adjacent railway tracks, adjacent metal fabrication plant, and a hydro vault located north and adjacent to the Site. Groundwater flow was reportedly inferred to be northwest from topography maps. Typical on-Site PCAs included: ▪ Current diesel ASTs ▪ The former on-Site railway line ▪ Current and former fill ▪ Former on-Site lumber yard ▪ Storage and transportation of ammunition ▪ Several former on-Site ASTs ▪ Former on-Site printers ▪ Former on-Site retail fuel outlet (RFO) ▪ Historical on-Site vehicle maintenance ▪ Historical fires on the Site ▪ Former transformer in the warehouse ▪ Drums of unknown substance ▪ Waste generator codes for the Site. From these PCAs, twenty-one (21) APECs on the Site were identified. A Phase II ESA was recommended prior to filing a Record of Site Condition.
2016 Phase One ESA	On Site and off Site – Includes the entire 933 Gladstone Ave. property	Fifteen (15) PCAs were identified on Site as well as thirty-six (36) PCAs in the Phase One study area outside the Phase One Property. From these PCAs, fifteen (15) APECs on and off the Site were identified. A Phase II ESA was recommended prior to filing a Record of Site Condition.
2018 Phase One ESA Update	Off Site – Refers to the adjacent 2.83-hectare parcel within the larger 3.3-hectare property at 933 Gladstone Ave. that is east of the Site.	The update was prepared to support the RSC for the 2.83-hectare parcel. No significant changes were noted between 2016 and 2018 and the same fifteen (15) APECs on and off the Site were identified. This included several that were site-wide and two APECs that are located on the RSC Property (0.47-hectare parcel). A Phase II ESA was recommended prior to filing a Record of Site Condition.

Report	On/Off Site	Factual Information Summary
2019 Phase Two ESA	Off Site – Refers to the adjacent 2.83-hectare parcel within the larger 3.3-hectare property at 933 Gladstone Ave. that is east of the Site.	The Phase Two ESA was carried out to address the 15 APECs identified in the 2018 Phase One ESA Update. The results of the Phase Two ESA indicated that concentrations of contaminants of concern in soil and/or groundwater associated with the fifteen APECs were all below the applicable generic site condition standards. The only exception to this was elevated levels of vanadium in native clay/silty clay at concentrations above the MECP Table 3 Standards at the Site are naturally occurring background conditions and not the result of a PCA or APEC. The Phase Two ESA was used to support the filing of a RSC in October 2019

2001 Phase I ESA

Of the APECs noted in the 2001 Phase I ESA, only four (4) qualified as PCAs for the 933 Gladstone Property. The former coal storage area and diesel AST fall within the central-west portion of the Site, the former UST falls within southeast corner of the Site, the bulk storage of explosive ordnance and flammable materials, and the historical land use on surrounding properties. The maintenance yard mentioned in the drum storage APEC is located north of the Phase One Property which is hydraulically cross-gradient of the Site, and the designated substance issues no longer exist as the building has been demolished. This PCA data was applied to the Phase One ESA and was used to identify APECs which were targeted in this Phase Two.

2005 Phase I & II ESA

The 2005 Phase I and II ESA include figures showing the locations of the APECs identified. APECs 1, 3, 4, 5, 7, 8, 9 fall within the 933 Gladstone Property. Each of these APECs were already covered in the 2001 Phase I ESA with the exception of APEC #8 which was based on anecdotal information of a potential fuel station near Gladstone Avenue. A Phase II intrusive investigation was completed to assess the APECs on the Site, and only APECs 1 and 9, general fill quality and the coal storage area, had contaminant concentrations exceeding the Ontario background criteria (Table 1) but not federal criteria of the time. The former fuel station (APEC #8) was considered in the report to be false information and was no longer considered to be an APEC. Boreholes were also advanced in the vicinity of the former UST (APEC #3), and no exceedances were detected so this issue is not considered an APEC. The available soil and groundwater quality data described in this report were reviewed and compared to currently applicable residential property use standards as described further below.

2008 Environmental Review

The 2008 Environmental review was meant to assess designated substances in the former depot building. Since the depot has been demolished, findings of this report do not affect the current report. The exception is the note that the general fill quality is of environmental concern to the Site. Three (3) areas of environmental impact were noted in this report, and of these only A3 fell within the current 933 Gladstone Property limits. A3, located beneath the former boiler room in the central-west portion of the current 933 Gladstone property, had exceedances for PAHs and metals found within the fill. This data assisted in the selection of testing parameters and locations for the Phase Two ESA. The other impact sites and areas of concern all occur north of the Site and down gradient and are therefore not considered to cause areas of potential environmental concern (APECs) on the Site.

2013 Soil and Groundwater Investigation

The 2013 Soil and Groundwater Investigation completed by DST identified four areas of environmental concern (AEC) on the property adjacent to the 933 Gladstone Property to the north (1010 Somerset St. W.). Three areas of impacted fill material were identified; two on the property to the north, and one location which is on the 933 Gladstone Property on the central-west side where the boiler room was formerly located. The available soil and groundwater quality data described in this report were reviewed and compared to currently applicable residential property use standards as described further below.

2015 Phase One ESA

The 2015 Phase One ESA completed by Pinchin provides data regarding PCAs and APECs on the Phase One Property and in the Phase One Study Area. Their final list of PCAs and APECs were compared against Golder's to ensure no PCAs were missed in the Phase One ESA and confirming known PCAs. Pinchin's on-Site APEC referencing the 2001 Aqua Terre Phase I ESA report of bulk drum storage with unknown contents is not considered an on-Site APEC as the yard where these were located is north (i.e., cross-gradient) of the current 933 Gladstone Property. Additionally, the APEC included based on the spill of 8 L of hydraulic fluid on-Site is not considered to be an APEC, as the spill was a small quantity, went to sewer, and any contaminated soil is likely to have been removed during the demolition of the depot. Two APECs were stated in reference to temporary fuel ASTs used for vehicles during the depot demolition, these APECs will not be considered due to the short time period the tanks were on-Site. The inferred groundwater flow seen in this Pinchin report (northwest) is approximately ninety degrees off of what the 2005 report by Trow stated (north-northeast). Given that Trow did intrusive testing and used a variety of actual groundwater elevation measurements to interpret their flow, the north-northeast flow direction is considered appropriate as it correlates with topographic information.

2016 Phase One ESA

The 2016 Phase One ESA was completed by Golder to support the sale of the land to Ottawa Community Housing and covered the entire 3.3-hectare property at 933 Gladstone Avenue. At the time of the 2016 Phase One ESA, the site was undeveloped land as the warehouse structure had been demolished since the 2015 Phase One ESA was completed. Historically, the site was part of a larger property that included the immediately adjacent lands to the north that was occupied by a large government owned warehouse structure referred to as the Central Ordnance Depot or Central Supply Depot. The RSC property historically comprised a paved area running along the west side of the warehouse building that was used for parking and storage. Prior to that the site was used as a lumberyard that included a number of rail spurs.

Based on the information obtained and reviewed as part of the 2016 Phase One ESA, a total of 15 areas of potential environmental concern (APEC) were identified at the 2016 Phase One Property (3.3-hectare parcel), of which two were located on the 0.47-hectare RSC Property and several others were site wide. The APEC were grouped into the following general categories:

- Fill – Fill materials of unknown origin and quality are present on the Site. Potential contaminants of concern include metals, PAH (polycyclic aromatic hydrocarbons), PHC (petroleum hydrocarbons) and VOCs (volatile organic compounds).
- Waste/Debris – Areas of debris were noted during the site visit in multiple locations. Potential contaminants of concern include metals, PAH, PHC and VOCs.

- Gasoline and Associated Products Storage – Current and historical ASTs associated with the Site and adjacent lands. Potential contaminants of concern include PHC, PAH, and BTEX (benzene, toluene, ethylbenzene and xylenes).
- Past Site Uses – The Site has been used for commercial printing, ammunition, oil, paint, chemicals and flammable materials storage, vehicle maintenance and repair, a private fuel outlet, and lumberyard. Each of these site uses is associated with a PCA, and the contaminants of potential concern include metals, PAH, PHC, BTEX, and VOCs.
- Waste Generator – The Site has numerous waste generator tags associated with its previous use as a warehouse. Additionally, the Phase One Study Area is populated with industrial and commercial properties with dozens of different waste generator registrations. The contaminants of potential concern include metals, PAHs, PHC, BTEX, and VOCs.
- Fires – The former lumberyard was destroyed by fire in 1900, and there were numerous fires at the warehouse on-site in the early 1950s. It is likely that designated substances and chemicals stored in the former building may have contaminated the Site during the fire via the water used to extinguish the fire. Contaminants of potential concern include metal, PAH, PHC, BTEX, and VOCs.
- Transformer – The former warehouse had transformers within the building. The contaminants of potential concern include PCB and PHC.
- Flammable Storage Room Sump – A 2500 gallon sump was installed in the 1970s as a drainage area for the Flammable Storage room. Chemicals collected in the sump may have entered the subsurface in the event that the integrity of the sump and connected piping was compromised. Contaminants of concern are PHC, BTEX, and VOCs.
- Off-Site PCAs – A metal fabrication facility located adjacent to the Site at 17 Larch Street was identified as likely to contribute to an APEC on site given its close proximity to the east of the site. The contaminant of potential concern is metals, PHC and VOCs.

2018 Phase One ESA Update

The 2018 Phase One ESA Update was prepared by Golder for the parcel located immediately adjacent to the east boundary of the 0.47-hectare RSC Property meaning that the Site covered by the 2018 Update is the eastern and southeastern section of the 2016 Phase One Property. The 2016 Phase One Property has an area of 3.3 hectares and the 2018 Phase One Update Site has an area of 2.83 hectares. At the time of the 2018 Update, the site was still undeveloped land. No significant changes between 2016 and 2018 were reported.

Based on the information obtained and reviewed as part of the 2018 Phase One ESA Update, the same 15 areas of potential environmental concern (APECs) were identified as the 2016 Phase One ESA including several that were site wide and two APECs located on the RSC Property.

The 2018 Phase One ESA Update concluded that a Phase Two ESA was required to be completed for the site to investigate the potential for subsurface impacts to soil and groundwater at the site related to the identified APECs.

2019 Phase Two ESA

- The 2019 Phase Two was prepared by Golder for the 2.83-hectare parcel covered by the 2018 Phase One ESA Update that is located immediately adjacent to the east boundary of the RSC Property. This Phase Two ESA was undertaken to address the 15 APECs identified in the August 2018 Phase One Update.
- The results of this Phase Two ESA indicated that no soil or groundwater impacts associated with the fifteen APECs were identified in any of the analyzed soil and groundwater samples collected from the boreholes and the monitoring wells completed at the Site. The concentrations of the contaminants of potential concern (including PHC, BTEX, PAH, metals, VOC and metals) in soil and/or groundwater associated with the fifteen APECs were all below the applicable generic site condition standards, with the exception of elevated levels of vanadium found in the soil. The elevated levels of vanadium present in the native clay/silty clay exceeded the MECP Table 3 Standards at the Site; this exceedance was deemed to be naturally occurring background conditions and not the result of a PCA or APEC.

The October 2019 Phase Two ESA and associated conceptual site model were used to support the filing of a Record of Site Condition for the 2.83-hectare parcel based on generic site condition standards (RSC number 226204). The RSC demonstrates that historic activities and associated PCAs and APEC did not impact soil or groundwater quality on the 2.83-hectare parcel.

Historical Analytical Data Review and Comparison to Current Standards

The available soil and groundwater quality data described in historic reports prepared for the 933 Gladstone Avenue property were reviewed and the data compared to currently applicable residential property use standards as described in MECP Table 3 generic site condition standards in a non-potable groundwater condition for residential/parkland/institutional property use, coarse textured soil.

Historical data is primarily described in the 2005 Trow Phase II ESA and the 2013 DST Phase II ESA reports. It appears that investigations completed on the 933 Gladstone portion of the former warehouse were primarily located in the vicinity of the former boiler room in the southwest portion of the property. A review of available results shows that concentrations of PAHs and metals were detected in the fill at several locations in the vicinity of the former boiler room at concentrations above the Table 3 residential standards. The samples with elevated concentrations are from the fill material that was present to depths of approximately 1 to 1.8 metres. Similar results and concentrations above standards were noted in sample locations north of the 933 Gladstone property as well, suggesting that fill impacts were present across the site. No information is available documenting building demolition activities that were carried out in 2015 so it is not clear how much, if any, fill material may have been removed as part of the demolition activities.

Since the building demolition in 2015, two Phase Two ESAs have been completed by Golder. In both cases, it was found that the results of these Phase Two ESAs indicate that no soil or groundwater impacts were identified in the analyzed soil and groundwater samples collected from the boreholes and the monitoring wells completed at the Site. The concentrations of the contaminants of potential concern (including PHC, BTEX, PAH, metals, VOC and metals) in soil and/or groundwater were all below the applicable generic site condition standards.

3.2.1 Phase One ESA Update

Golder conducted a Phase One ESA Update entitled *Phase One Environmental Site Assessment Update for Northwest 0.47-Hectare Parcel at 933 Gladstone Avenue Ottawa, Ontario*, dated February 7, 2022, to assess the likelihood of potential soil and/or groundwater contamination resulting from historic or present activities at the RSC

Property and surrounding area. This included a review of available historical information on the Site and surrounding area, interviews with persons familiar with the Site and a Site reconnaissance to evaluate if conditions had changed from the 2016 Phase One ESA. The APECs identified in the Phase One ESA Update are summarized in the following table:

Area of Potential Environmental Concern	Location of APEC on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1: PCA ID# 1-Former on-Site rail tracks as well as rail line adjacent to the west.	Entire Site	PCA 46: Rail Yards, Tracks, and Spurs.	On-Site	Metals*, PAHs, PHC	Soil
APEC 2: PCA ID# 2-Footprint of old buildings was built up with fill following 2015 demolition. Layer of fill was also identified across Site prior to demolition, which included waste products. Fill origin unknown.	Entire Site	PCA 30: Importation of Fill Material of Unknown Quality.	On-Site	Metals*, PAHs, PHC, VOC	Soil
APEC 3: PCA ID# 3-Former lumber yard on-Site.	Entire Site	PCA 59: Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products.	On-Site	Metals*, PAHs, VOCs	Soil
APEC 4a: PCA ID# 4a-Site used as Central Ordnance Depot for 50 years including storage of oils in drums.	Entire Site	PCA: Other – Petroleum Product (oil) Storage in non-fixed tanks (drums).	On-Site	PHC, BTEX	Groundwater and Soil
APEC 4b: PCA ID# 4b-Site used as Central Ordnance Depot for 50 years including storage of munitions and assorted military stores.	Entire Site	PCA 20: Explosives and Ammunition Manufacturing, Processing and Bulk Storage	On-Site	Metals*, PAHs, PHC, VOCs	Groundwater and Soil

Area of Potential Environmental Concern	Location of APEC on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 4c: PCA ID# 4c-Site used as Central Ordnance Depot for 50 years including storage of paints.	Entire Site	PCA 39: Paints Manufacturing, Processing, and Bulk Storage.	On-Site	Metals*, VOCs	Groundwater and Soil
APEC 5: PCA ID# 5-Waste generator codes for petroleum distillates, waste oils and lubricants, light fuels, chemicals, and pharmaceuticals	Entire Site	PCA: Other – Waste Generator.	On-Site	PHC, VOC	Groundwater and Soil
APEC 6: PCA ID# 6-Numerous fires in the 1950's burned down portions of the depot which may have released contaminants including oil and paint across the property	Entire Site	PCA: Other – Fires.	On-Site	PHC, Metals*, PAH, VOCs	Groundwater and Soil
APEC 7: PCA ID# 7-Dyed Diesel AST.	Storage yard, northwest corner of the Site	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site	PHC and BTEX	Groundwater and Soil
APEC 8: PCA ID# 8-Parking area contains empty bulk liquid totes of unknown sources, 5 buckets (25 L each) marked "Hydraulic Fluid – Must be disposed of" on wooden pallet in paved area, soil piles, asphalt pile, empty drums.	Storage yard, northwest portion of the Site	PCA: Other - Storage of Debris and Chemical Waste.	On-Site	Metals*, PHC, PAH, VOCs	Groundwater and Soil

Area of Potential Environmental Concern	Location of APEC on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 9: PCA ID# 10- Several drums of unknown contents noted in 2001 in maintenance yard.	Storage area directly adjacent to north portion of RSC Property	PCA: Other – Drums of Unknown Contents.	Off-Site	PHC, VOC	Groundwater

* Metals includes MECP method groups Metals, As, Sb, Se
PHC – petroleum hydrocarbon fractions 1 to 4
BTEX – benzene, toluene, ethylbenzene and xylenes
PCB – polychlorinated biphenyls
PAH – polycyclic aromatic hydrocarbons
VOC – volatile organic compounds

4.0 SCOPE OF THE INVESTIGATION

4.1 Overview of Site Investigation

The Phase Two ESA work was completed in two stages. The first stage of the Phase Two ESA work was completed in January and February 2017 during OCH's due diligence process to acquire the 3.3 hectare property that includes the 0.47-hectare parcel of land than is currently part of the RSC property. The second stage of the Phase Two ESA was completed in August 2021 to support the transfer of the closed road allowances from the City of Ottawa to OCH and final definition of the RSC Property boundary in October 2021. The second stage consisted of evaluating the adequacy of the 2017 information in relation to RSC Property boundary and determining if additional assessment was required to evaluate potential changes in site conditions since 2017. Supplemental groundwater sampling was carried out in October 2019 and August 2021 to evaluate temporal changes in groundwater quality since the first stage of the Phase Two ESA in 2017.

The Phase Two ESA investigation activities were completed between January 24 and February 13, 2017 with supplemental groundwater sampling was conducted on October 4, 2019 and between August 11 and 20, 2021 and included the following tasks:

- **Health and Safety Plan**: Preparation of a Health and Safety Plan for internal and subcontractor use prior to initiating any field work at the Site.
- **Utility Clearances**: Coordination of utility clearances with local utility companies along with retaining the services of a private locator to assess for possible services in the areas of the proposed test locations.
- **Borehole Advancement and Monitoring Well Installation**: The borehole drilling and monitoring well installation program included drilling of 3 boreholes; each of which were completed as groundwater monitoring wells which were used for groundwater sampling at the Site. The rationale for the selected location of the boreholes is provided in the Sampling and Analysis Plan provided in Appendix C. The

location of the boreholes and monitoring wells are shown on Figure 2. The monitoring well construction details are presented in Table 1.

- **Soil Sampling**: Selected soil samples were collected on January 26, 2017 from the boreholes. Soil samples were submitted for chemical analysis of one or more of the following: petroleum hydrocarbons ("PHCs"), volatile organic compounds ("VOCs"), polycyclic aromatic hydrocarbons ("PAHs"), polychlorinated biphenyls ("PCBs"), metals, hydride-forming metals, and/or other regulated parameters.
- **Groundwater Monitoring and Sampling**: Groundwater samples were collected on three occasions: The first on February 6, 2017, the second on October 4, 2019 and the third between August 11 and 20, 2021. Groundwater samples were submitted for analysis of one or more of the following: PHCs, PAHs, PCBs, VOCs, metals, and/or other regulated parameters. Hydraulic conductivity testing was completed on February 13, 2017.
- **Surveying**: A geodetic survey for the boreholes and monitoring wells advanced as part of the Phase Two ESA investigation was completed on February 1, 2017. An elevation survey for the monitoring wells advanced as part of the Phase Two ESA was completed on February 13, 2017.
- **Reporting**: Golder compiled and assessed the field and laboratory results from the above noted activities into this report.

The Phase Two investigation was carried out in general accordance with Golder's standard operating procedures, which conform to the requirements of O. Reg. 153/04. The data from the Phase Two ESA investigation completed by Golder at the Site were incorporated into a single Phase Two ESA report following the Phase Two ESA report format required by O. Reg. 153/04.

There were no impediments or access limitations that would affect the conclusions of this Phase Two ESA report.

4.2 Media Investigated

To address the potential environmental issues identified in the Phase One ESA, the Phase Two ESA field program included sampling of subsurface soil and of groundwater from wells screened within the overburden at the Site. No sediment was present at the Site and therefore no sediment sampling was completed. A summary of media investigated and the applicable contaminants of potential concern are provided in Tables 2 and 3. The sampling and analysis plan outlines the rationale for the field investigation activities carried out at the Site and the associated methodologies used to meet the objectives of this Phase Two ESA.

4.3 Phase One Conceptual Site Model

The following key Site features (as required by O. Reg. 153/04) are presented on Figures 1 and 2:

- The former warehouse building footprint
- Existing buildings and structures
- Water bodies and areas of natural significance located in the Phase One Study Area
- Roads (including names) and railways within the Phase One Study Area
- Uses of properties adjacent to the Phase One Property
- Location of identified PCAs in the Phase One Study Area (including any storage tanks)

The following describes the Phase One ESA CSM for the Site based on the information obtained and reviewed as part of the Phase One ESA Update:

- The Site is a 0.47-hectare parcel located in the northwestern portion of the larger property known municipally as 933 Gladstone Avenue. At the time of the initial Site reconnaissance for the entire 3.3-hectare parcel, conducted on October 5, 2016, the Site consisted of undeveloped land. No buildings or structures were noted on the Phase One Property. Based on the August 11, 2021 Site reconnaissance, Site conditions for the 0.47 hectare RSC Property have not changed since the December 2016 Phase One ESA.
- An OC Transpo light rail line is in a trench near the west perimeter of the Site. No areas of natural significance were identified on or within the Phase One Study Area.
- No active water source is reportedly available at the Site. Potable water is provided to the Study Area by the City of Ottawa.
- At the time of the Phase One ESA Update, the Site was undeveloped land. Historically, the Site was part of a larger property that included the immediately adjacent lands to the north that was occupied by a large government owned warehouse structure referred to as the Central Ordnance Depot or Central Supply Depot. Prior to that the Site was used as a lumberyard. There are no indications that the Phase One Property was used for any of the following commercial uses: vehicle garage, bulk liquid dispensing facility, or dry cleaning facility.
- At the time of the Phase One ESA Update, the neighbouring properties within the Phase One Study Area included vacant land, residential, commercial, and light industrial land uses. The immediately adjacent parcel to the east, comprising the remaining 2.83-hectare portion of the property known as 933 Gladstone Avenue, was subject to a Record of Site Condition filing in 2019 (RSC number 226204). The RSC demonstrates that historic activities and associated PCAs and APEC did not impact soil or groundwater quality on the 2.83-hectare parcel. Many of the neighbouring properties in the Phase One Study Area were used for industrial purposes as well as the following commercial uses: vehicle garage, fuel dispensing facility, or dry cleaning facility.
- Fifty-eight (58) PCAs were identified in the Phase One Study Area, eight (8) of which were on the RSC Property. Based on site characteristics and the locations of the off-Site PCA, a total of nine (9) Areas of Potential Environmental Concern were identified for the RSC Property as shown on Figure 2.
- Utility connections to the former building were abandoned during demolition, including water, sewer, electrical, natural gas, cable and telephone. Utility mains, including storm sewers observed during the site reconnaissance continue to be present.
- Soil at the Site consists primarily of till plain deposits of silt and clay; and limestone bedrock. The physiography of the soils is till plains. Borehole records for the Site and Study Area from previous environmental studies indicate the presence of wide-spread fill material and silty sand underlain by silty clay, clay, and grey limestone at a depth of approximately 3 to 7 m on Site.
- Local groundwater is anticipated to flow towards the east-northeast based on topography and previously completed subsurface investigations that evaluated groundwater flow direction based on water levels measured in groundwater monitoring wells. Groundwater flow in the western portion of the Site is expected to be influenced by the nearby trench for the OC Transpo rail line. Regional groundwater is anticipated to flow in a northern direction towards the Ottawa River, which is approximately 1 km north of the Site.

4.4 Deviations from Sampling and Analysis Plan

A sampling and analysis plan is provided in Appendix C which incorporates the Phase Two ESA investigation program. The sampling and analysis plan outlines the rationale for the field investigation activities carried out at the Site and the associated methodologies used to meet the objectives of this Phase Two ESA. This plan covers the activities undertaken during the Phase Two ESA that was generally followed with no material deviations except for groundwater samples that had to be re-collected on August 20, 2021 for VOC and PHC analysis, as the samples collected on August 11th were received at the laboratory above the acceptable temperature range and could not be analysed. Also, during the August 2021 groundwater sampling event, MW17-14 had a limited volume of groundwater available for sampling and analysis as described below in Section 5.7.

4.5 Impediments

No physical impediments to the Phase Two ESA investigation were encountered. Access to the Phase Two Property was not denied or restricted.

5.0 INVESTIGATION METHOD

5.1 General

The following sections describe the field investigation methodology employed during the Phase Two ESA. The field work was conducted between January 24, 2017 and February 13, 2017. Supplemental groundwater sampling was conducted on October 4, 2019 and between August 11 and 20, 2021.

Prior to initiating the field work, Golder developed and implemented Site-specific protocols to protect the health and safety of its employees and subcontractors through the preparation of a Site-specific Health and Safety Plan. An assessment of potential health and safety hazards at the Phase Two Property and those associated with the proposed work was completed each day of the field program. A health and safety tail gate meeting was held each day prior to completion of the field work. The document was reviewed and signed on-Site by field personnel prior to commencing work.

5.2 Drilling

Between January 25 and 30, 2017, 23 boreholes were advanced across the 3.3-hectuare property to depths of 2.4 to 5.18 metres below ground surface (“mbgs”), of which three were located on the RSC Property (identified as 17-01, 17-14, and 17-22). Borehole locations are shown on Figure 2 and record of borehole logs can be found in Appendix D. A description of the quality assurance/quality control measures taken to minimize the potential for cross-contamination between sampling locations is provided in Section 5.12.

Boreholes were advanced by Strata Soil Sampling (“Strata”) using a 7822DT Geoprobe rig. During borehole drilling activities, overburden soil samples were collected using dual tube soil sampling equipment.

Soil samples were collected at 0.76 m intervals using the following method:

- Dual-tube sampler: 3 foot long, 1.85 inch diameter disposable PVC liner inside a 3.25 inch OD direct push rod.

5.3 Soil: Sampling

Soil samples were collected from undisturbed locations and split in the field into two components. One component was placed into laboratory-prepared containers with minimal headspace and stored in a cooler for potential laboratory analysis. The second component was placed inside a plastic bag for field screening, consisting of the

soil description, and noting the presence of any staining, odour and/or debris. A photoionization detector calibrated to 100 parts per million ("ppm") isobutylene (MiniRae 3000) was used to measure the total organic vapour in the headspace in the sealed plastic bag.

As per the sampling and analysis plan, provided in Appendix C, at least one soil sample was submitted from each test location. Where the results of field screening suggested the presence of potentially impacted soil, an additional soil sample at greater depth was submitted for laboratory analysis to vertically delineate impacts.

One soil sample representing "worst-case" conditions at each sampling location was selected for laboratory analysis based on the field headspace screening measurements, visual observations (e.g., staining, discoloration and/or free product, if any), and olfactory observations (if any). Soil samples were submitted to the analytical laboratory under chain-of-custody procedures. A summary of the soil samples submitted for analysis is provided in Table 2.

Geologic descriptions, visual and olfactory observations, and results of field headspace measurements are presented on the Record of Borehole sheets in Appendix D.

5.4 Field Screening Measurements

Field measurements of sample headspace concentration were made using the following equipment:

Equipment	Make and Model	Parameters Detected	Detection Limits	Precision	Accuracy	Calibration Standard	Calibration Procedure
Photo-ionization detector (PID) MiniRae 3000 10.6 EV bulb	MiniRae 3000	Organic vapours	0 - 15,000 ppm	N/A	+/- 3%	100 ppm Isobutylene	By Golder Associates field staff prior to and during fieldwork

One soil sample representing "worst-case" conditions at each sampling location was selected for laboratory analysis based on the soil headspace screening measurements, visual observations (e.g., staining, discoloration and/or free product, if any), and olfactory observations (if any). The results of soil headspace screening measurements are provided in the Record of Boreholes in Appendix D.

5.5 Groundwater: Monitoring Well Installation

Groundwater monitoring wells were installed by Strata using threaded 50 mm diameter, schedule 40, polyvinyl chloride ("PVC") well screens and riser pipe, which were brought to the Site in sealed plastic bags. The annular space was filled with silica filter sand to at least 0.3 m above the well screen. The monitoring well was sealed with bentonite from the top of the sand pack and completed with a flush mount protective well casing set in concrete. Monitoring well construction details are provided in Table 1. The riser pipes were sealed with a J-plug or slip cap. A description of the quality assurance/quality control measures taken to minimize the potential for cross-contamination between sampling locations is provided in Section 5.12.

Following drilling, the monitoring wells were developed on January 31, 2017 and February 1, 2017 by removing up to ten well volumes, or by removing one well volume if the well was considered a “low yield” monitoring well, using dedicated Waterra® pumps (tubing with foot valves). During monitoring well development, qualitative observations were made of water colour, clarity, and the presence or absence of any hydrocarbon sheen or odours. Monitoring wells were redeveloped in October 2019 and August 2021 prior to collecting samples.

5.6 Groundwater: Field Measurements for Water Quality Parameters

Groundwater indicator parameters including temperature, pH, conductivity, and dissolved oxygen were measured prior to sampling to ensure adequate well development and purging. A Horiba U-22 water quality meter was used to measure groundwater quality during monitoring well development and groundwater sampling. The instrument was calibrated using factory supplied solutions for electrical conductivity (1413 micro-Siemens per centimetre (µS/cm)) and pH (4.01 pH and 7.01 pH) parameters. Specifications for the water quality metre are summarized in the following table:

Parameter	Measurement Range	Precision	Accuracy
pH	0.00 to 14.00 pH	0.01 pH	±0.1 pH
Conductivity	0.00 to 9.99 S/m	0.1% of full scale	± 3%
Temperature	0 to 55 ºC	0.01 ºC	± 1.0 ºC
Dissolved Oxygen	0 to 19.99 mg/L	0.01 mg/L	± 0.2%

5.7 Groundwater: Sampling

Each monitoring well was purged prior to sample collection. During purging, qualitative observations were made of water colour, clarity, and the presence of hydrocarbon sheen or odour. Purging was completed by pumping at least three well volumes or, where the well was considered a “low-yield” monitoring well, by purging at least one half of the well volume. Groundwater samples were collected on three occasions: The first on February 6, 2017, the second on October 4, 2019 and the third between August 11 and 20, 2021. During the August 2021 sampling event, MW17-14 was purged dry and recovered very slowly such that there was insufficient volume of water to collect samples for the planned suite of analysis.

Groundwater samples were placed in laboratory-prepared containers and stored in a cooler until delivery to the analytical laboratory under chain-of-custody procedures. A summary of the groundwater samples submitted for analysis is presented in Table 3.

5.8 Sediment: Sampling

No sediment samples were collected as part of this investigation.

5.9 Analytical Testing

The contact information for the analytical laboratory is included below.

Bureau Veritas (formerly Maxam Analytics)
36 Antares Dr, Unit 100
Nepean, ON K2E 7W5
Laboratory Contact: Katherine Szozda
613 274 0573

The analytical laboratory is a Standards Council of Canada (SCC) accredited laboratory which meets the International Standard ISO/IEC 17025 (General Requirement for the Competence of Testing and Calibration Laboratories, May 5, 2005, as amended).

The review of the soil and groundwater analytical results indicated that the method detection limits required for the parameters analysed were met.

5.10 Residue Management Procedures

All residues produced during the investigation (e.g., soil cuttings from drilling, groundwater from well development purging, wash water from equipment decontamination) were placed in sealed drums which Golder retained Veolia to dispose of.

5.11 Elevation Surveying

Elevations were determined relative to the following benchmark:

- Orange paint on end of concrete barrier in the parking area to the northeast of the Site with an assumed elevation of 100.00 masl.

5.12 Quality Assurance and Quality Control Measures

Golder's quality assurance program for environmental investigations was implemented to ensure that analytical data obtained by the investigation were valid and representative. The quality assurance program included the following measures:

- The use of standard operating procedures for all field investigation activities.
- All monitoring wells were developed following installation to remove fine particles from the filter pack and any fluids introduced during drilling.
- Monitoring wells were appropriately purged prior to groundwater sample collection to remove stagnant water from the well bore and improve sample representativeness, minimizing sample agitation and aeration to the extent practicable.
- The collection of field duplicate samples at a minimum frequency of one duplicate for every ten samples.
- The collection of at least one trip blank for sampling events that include the analysis of volatile organic compounds in groundwater.
- Initial calibration of field equipment was performed at the start of each field day, with daily checks of calibration, as needed, using a standard of known concentration.

- Groundwater samples were handled and stored in accordance with the sample collection and preservation requirement of the Ministry of the Environment (MOE) *Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.I of the Environmental Protection Act*, July 1, 2011. Samples were collected directly into pre-cleaned, laboratory-supplied sample containers with the appropriate preservative for the analyte group. Upon collection, samples were placed in insulated coolers with ice for storage and transport to the analytical laboratory under chain-of-custody.
- Dedicated sampling equipment (tubing and footvalves) and clean disposable Nitrile™ gloves were used at each sampling location to prevent cross-contamination. All non-dedicated sampling equipment (e.g., water level meters, split spoons) was decontaminated between sampling locations. Sampling equipment in contact with soil, groundwater, or sediment was cleaned by mechanical means; washed with a phosphate-free, laboratory-grade detergent (e.g., LiquiNox) and, if necessary, an appropriate desorbing wash solution; and thoroughly rinsed with analyte-free water.
- Detailed field records documenting the methods and circumstances of collection for each field sample were prepared at the time of sample collection. Each sample was assigned a unique sample identification number recorded in the field notes, along with the date and time of sample collection, the sample matrix, and the requested analyses.
- The submission of samples to the analytical laboratory in accordance with standard chain of custody procedures.

Below is a summary of the primary and duplicate samples collected in January and February 2017, October 2019 and August 2021.

Date	Media	Samples ID	Duplicate ID	Trip Blanks
Jan. 26, 2017	Soil	17-01 SA4, 17-14 SA1, 17-22 SA3 **(3 samples)** *It is noted that these samples were collected as part of the field investigation for the entire 3.3-hectare property that include the collection of duplicate soil samples from locations on the adjacent 2.83-hectare parcel such that duplicate soil samples were collected at a frequency of approximately 1 in 10.	-	-
Feb. 6, 2017	Ground water	17-01, 17-14, 17-22 **(4 samples)**	DUP A (17-22)	-
Feb. 7, 2017	Ground water	Equip. Blank, F Blank **(3 samples)**	-	Trip blank
Oct. 4, 2019	Ground water	17-01, 17-14, 17-22 **(4 samples)**	DUP-1 (17-01)	-
Aug. 11, 2021	Ground water	MW17-01, MW17-14, MW17-22, Field Blank **(4 samples)**	MW17-01 Field Dup	-
Aug. 20, 2021	Ground water	MW17-01, MW17-22, Field Blank **(4 samples)**		Trip Blank

6.0 REVIEW AND EVALUATION

This section of the report presents a review and evaluation of the results of the drilling, monitoring, and sampling activities conducted as part of the Phase Two ESA.

6.1 Geology

The soil conditions encountered during the borehole drilling are presented in the Record of Borehole Sheets (provided in Appendix D), as well as in the cross sections presented on Figures 4B/4C and 5B/5C. The following presents a summary of the subsurface soil conditions encountered during the investigation.

Boreholes 17-01, 17-14, and 17-22 were advanced to a depth of 5.18 mbgs. In general, the subsurface soil conditions consisted of a layer of fill overlying native overburden. The fill generally consists of sandy clay and silty sand. The fill layer extends to 0.76 metres below the existing ground surface. A deposit of sandy clay to clay exists below the fill extending to the maximum depth of drilling. No bedrock was encountered.

Based on the soil conditions encountered in the boreholes, the sandy clay to clay is considered a water bearing formation at the Phase Two Property.

6.2 Groundwater: Elevations and Flow Direction

All monitoring wells were used in the interpretation of shallow groundwater contours and shallow groundwater flow direction. Any temporary fluctuation in water levels on the Phase Two Property is not anticipated to affect the conclusions of the Phase Two ESA.

The elevations of the potentiometric surface at each monitoring well are summarized in Table 1 for the water levels measured prior to the sampling events in 2017, 2018 (in association with a groundwater sampling event on the adjacent 2.83-hectare parcel) and 2021. Groundwater elevations at the Site ranged from 96.01 to 97.68 masl on February 2, 2017. Groundwater elevations at the Site ranged from 96.48 to 98.54 masl on April 30, 2018. Groundwater elevations at the Site ranged from 95.18 to 98.33 masl on August 11, 2021. No evidence of petroleum hydrocarbon free product or sheen was observed during the sampling events.

Based on the interpreted groundwater elevation contours presented on Figure 3, the inferred direction of groundwater flow is to the south, towards the nearby trench for the OC Transpo rail line that is located approximately 20 metres to the southwest. This groundwater flow direction is consistent for all three sets of measurements.

During the initial phase of the 2017 Phase Two field investigation completed that included water level measurements from a total of 16 monitoring wells located across the 3.3-hectare parcel (Golder 2019 Phase Two ESA), the inferred direction of groundwater flow was to the east-northeast, towards the Ottawa River. Localised groundwater flow in the western portion of the Site was noted to be influenced by the nearby trench for the OC Transpo rail line, which is consistent with the findings noted above. The regional groundwater flow direction is expected to be towards the Ottawa River, located approximately 1 km to the north of the Site.

Underground utility drawings available for the Phase Two Property indicated utility connections to the former building were abandoned during demolition, including water, sewer, electrical, natural gas, cable and telephone. Utility mains, including storm sewers observed during the site reconnaissance continue to be present. The presence of subsurface utilities and structures at the Site could act as preferential pathways promoting the migration of COCs as the water table is inferred to intercept buried utilities and subsurface structures at the Phase Two Property.

6.3 Groundwater: Hydraulic Gradients

The horizontal hydraulic gradient was calculated based on August 11, 2021 water levels and the water level contours presented on Figure 3. The horizontal hydraulic gradient in the shallow groundwater is 0.08 m/m.

Vertical hydraulic gradients were not calculated as no COCs were identified in groundwater exceeding the site condition standards and as such, no nested monitoring wells were installed at the Site.

6.4 Fine-Medium Soil Texture

Two representative soil samples were collected from fill and native overburden materials as part of the 2017 Phase Two ESA for the entire 3.3-hectare parcel and submitted to Golder's geotechnical laboratory in Ottawa, Ontario for a 75 µm sieve wash test. While these samples were collected from boreholes located on the adjacent 2.83-hectare parcel, the two samples were considered to be sufficient, given that native soil encountered during the Phase Two ESA was homogeneous across the 3.3-hectare property and representative of conditions on the 0.47-hectare RSC Property. The results of the sieve analysis show that 50% or more of soil particles were greater than 0.075 mm in size in each of the samples, so the soil is considered coarse textured. Refer to the Golder 2019 Phase Two ESA for details and grain-size distribution results.

6.5 Soil: Field Screening

Headspace vapour measurements were conducted on the soil samples collected from BH17-01, BH17-14 and BH17-22. Organic vapour measurements ranged from 1 ppm to 16.5 ppm (highest reading measured at BH17-22 between 2.3 to 3.1 mbgs).

The results of headspace vapour measurements are presented on the Record of Borehole sheets in Appendix D.

6.6 Soil: Quality

Table 2 provides a summary of the soil samples submitted for analysis and the associated test parameters. The analytical results of soil samples are presented in Tables 4A to 4C along with the applicable Table 3 site condition standards. Laboratory Certificates of Analysis for the soil samples are included in Appendix E.

Golder completed soil sampling at the Site during borehole advancement on January 26, 2017. The soil samples were submitted to Bureau Veritas for analysis of one or more of the following parameters: metals (including As, Sb and Se), VOCs, BTEX, PCBs, PAHs and/or PHCs.

A summary of the number of soil samples analysed and the number of soil samples exceeding the MECP Table 3 Standards is provided below:

Parameter	Number of soil samples analysed	Number of soil samples exceeding the Table 3 Standards
VOCs	2	0
PAHs	2	0
Metals (Inc. As, Sb and Se)	2	0
BTEX	3	0
PHC F1-F4	3	0
PCBs	1	0

6.7 Groundwater: Quality

Monitoring well construction details are summarized in Table 1 and a list of groundwater samples submitted for laboratory analysis is provided in Table 3. The analytical results for groundwater samples are summarized in Tables 5A to 5C, along with the applicable Table 3 site condition standards. Laboratory Certificates of Analysis for groundwater are provided in Appendix E.

Golder completed sampling of the monitoring wells at the RSC Property on three occasions: The first on February 6, 2017, the second on October 4, 2019 and the third between August 11 and 20, 2021. On each occasion, groundwater samples were submitted to Bureau Veritas for analysis for one or more of the following parameters: metals (including As, Sb and Se), VOCs, PCBs, PAHs, BTEX and/or PHCs

A summary of the number of groundwater samples analysed and number of samples exceeding the MECP Table 3 Standards is provided below:

Parameter	Number of groundwater samples analysed			Number of groundwater samples exceeding the Table 3 Standards
	Feb. 2017	Oct. 2019	Aug. 2021	
VOCs	2	3	2	0
PAHs	2	3	1	0
Metals	2	3	2	0
BTEX	3	3	2	0
PHC F1-F4	3	3	2	0
PCBs	1	3	3	0

All groundwater samples submitted for analysis met the applicable Site condition standards, for the parameters tested on each of the three sampling dates.

In addition to numerical standards, the MECP Table 3 Standard sets out non-numerical (aesthetic) standards relating to the presence of free phase product and hydrocarbon sheen. Specifically, a property does not meet the site condition standards if there is evidence of free product, including but not limited to, visible petroleum hydrocarbon film or sheen present on groundwater, surface water or in any groundwater or surface water samples. No evidence of free product or sheen in groundwater was observed.

6.8 Sediment: Quality

No sediment samples were collected as part of this investigation as sediment is not present on the property.

6.9 Quality Assurance and Quality Control Results

The quality assurance assessment of the field duplicate sample results was conducted according to the MECP document entitled *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* March 9, 2004 (amended in July 2009 and effective as of July 1, 2011) (“Analytical Protocol”).

To determine the precision of the analytical methods and field sampling procedures, duplicate samples were collected during soil and groundwater sampling. Precision is determined by the relative percent difference ("RPD") between the duplicate and original samples and was calculated as follows:

$$RPD = \frac{|x_1 - x_2|}{x_m}$$

Where
x_1 initial sample results
x_2 duplicate sample results
x_m mean of x_1, x_2

The analytical results of the primary and duplicate soil and groundwater samples indicated a satisfactory correlation between the primary and duplicate samples and were within the 30% recommended control limit in the Analytical Protocol.

It is noted that the trip blank, field blank and equipment blank samples were found to have no detectable concentrations. The quality of the analytical results is further supported by Bureau Veritas' internal quality assurance program that includes laboratory blanks, spikes, surrogates and duplicate samples.

All certificates of analysis or analytical reports received pursuant to clause 47 (2) (b) of the regulation comply with subsection 47(3). A certificate of analysis or analytical report has been received for each sample submitted for analysis and is provided in Appendix E. The analytical laboratory did not qualify any of the analytical results.

Accordingly, the analytical data generated during the investigation are valid and representative and may be used in this Phase Two ESA without further qualification.

6.10 Phase Two Conceptual Site Model

The Phase Two conceptual site model is presented in the following sections.

Potential Sources of Contamination

Potentially Contaminating Activities

Based on the information obtained as part of the Phase One ESA Update, the following potentially contaminating activities ("PCAs") were identified. The location of each PCA is provided on Figure 2.

Summary of PCAs within the RSC Property.

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
1	On-Site (Entire Site)	**PCA 46: Rail Yards, Tracks, and Spurs** (Former on-Site rail spurs running in several locations across the entire property during lumberyard use. Rail spurs running to east side of boiler room and along the west side of the depot building)	Aerial photos, FIP, Site Visit, Pinchin 2015 Phase One ESA	As per Reg. 153/04. All PCAs found on the RSC Property are considered APECs.

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
2	On-Site (Entire Site)	**PCA 30: Importation of Fill Material of Unknown Quality** (Footprint of old building was built up with fill following 2015 demolition. Layer of fill was also identified across Site prior to demolition, which included waste products. Fill origin unknown)	Site observations, Pinchin 2015 Phase One ESA Trow 2005 Phase I & II ESA	As per Reg. 153/04. All PCAs found on the RSC Property are considered APECs.
3	On-Site (Entire Site)	**PCA 59: Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products** (Former lumber yard on-Site)	FIP, Chain of Title, Pinchin 2015 Phase One ESA	
4a 4b 4c	On-Site (Entire Site)	**(a) PCA**: **Other – Petroleum Product (oil) Storage in non-fixed tanks (drums)** **(b) PCA 20: Explosives and Ammunition Manufacturing, Production and Bulk Storage** **(c) PCA 39: Paints Manufacturing, Processing, and Bulk Storage** (Site used as Central Ordnance Depot for 50 years including reported storage of paint, oils, ammunition/ordnance and assorted military stores)	FIP, HLUI, Pinchin 2015 Phase One ESA	
5	On-Site (Unknown, assume entire site)	**PCA: Other – Waste Generator** (Waste generator codes for Petroleum distillates, waste oils and lubricants, light fuels, chemicals, and pharmaceuticals)	EcoLog ERIS, Pinchin 2015 Phase One ESA	
6	On-Site (North and south ends of former warehouse, as well as two fires in unknown locations)	**PCA: Other - Fires** (Numerous fires in the 1950's burned down portions of the depot which may have released contaminants including oil and paint across the property)	1900 Ottawa-Hull Fire Map, 1950's Depot Fire Articles, Trow 2005 Phase I & II ESA	As per Reg. 153/04. All PCAs found on the RSC Property are considered APECs.
7	On-Site (NW corner)	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Dyed Diesel AST)	2018 Golder Phase One ESA	

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
8	On-Site (NW corner)	**PCA: Other – Storage of Debris and Chemical Waste** (Parking/storage area contains empty bulk liquid totes of unknown sources, 5 buckets (25 L each) marked “Hydraulic Fluid – Must be disposed of” on wooden pallet in paved area, soil piles, asphalt pile, empty drums.	2018 Golder Phase One ESA	

Summary of PCAs within the Phase One Study Area but not on the Phase One Property.

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
PCAs North of Site				
9	1040 Somerset Street	**PCA 10: Commercial Autobody Shop** (Paradise Auto Repair)	HLUI	This PCA is not considered likely to contribute to an APEC on Site. This is due the PCA being down-gradient of the Site according to the local inferred groundwater flow.
10	1010 Somerset Street	**PCA: Other – Drums of Unknown Contents** (Several drums of unknown contents noted in 2001 in maintenance yard)	Aqua Terre 2001 Phase I ESA, Pinchin 2015 Phase One ESA	This PCA is considered likely to contribute to an APEC on Site. This is due to the PCA being directly adjacent to the north portion of the Site.
11	969 Somerset Street	**PCA 31: Ink Manufacturing, Processing, and Bulk Storage** (Genesove press Limited – Printers)	HLUI	These PCAs North of the RSC Property are not considered likely to contribute to an APEC on Site. This is due these PCAs being down-gradient of the Site according to the local inferred groundwater flow.
12	903 Somerset Street	**PCA 37: Operation of Dry Cleaning Equipment** (Expert Cleaner and Dyer) **PCA 17: Dye Manufacturing, Processing, and Bulk Storage** (Expert Cleaner and Dyer)	HLUI	

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
13	896 Somerset Street	**PCA 10: Commercial Autobody Shop** (Johnny Closs – Auto repair) **PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Johnny Closs – Auto repair)	HLUI	These PCAs North of the RSC Property are not considered likely to contribute to an APEC on Site. This is due these PCAs being down-gradient of the Site according to the local inferred groundwater flow.
14	893 Somerset Street	**PCA 31: Ink Manufacturing, Processing, and Bulk Storage** (Acadian Printing – Printers)	HLUI	
15	890 Somerset Street	**PCA 10: Commercial Autobody Shop** (Jim Frisby Holdings Limited – Auto repair)	HLUI	
16	55 Breezehill Avenue North	**PCA 10: Commercial Autobody Shop** (Breezehill Auto Body) (Japan Auto SVC Inc. – Auto repair) **PCA 49: Salvage Yard including Automobile Wrecking** (A & T Autoparts)	HLUI, EcoLog ERIS	
17	53 Breezehill Avenue North	**PCA – Other: Bulk Storage of Coal** (Bruce Coal Co.)	HLUI	
PCAs East of Site				
18	933 Gladstone Avenue (Off-Site)	**PCA 46: Rail Yards, Tracks, and Spurs** (Former on-Site rail spurs running in several locations across the entire property during lumberyard use. Rail spurs running to east side of boiler room and along the west side of the depot building)	Aerial photos, FIP, Site Visit, Pinchin 2015 Phase One ESA	These PCAs are not considered likely to contribute to an APEC on Site. They are part of the RSC filed for the 2.83-hectare parcel at 933 Gladstone demonstrating that soil and groundwater impacts are not present.
19	933 Gladstone Avenue (Entire off-Site portion)	**PCA 30: Importation of Fill Material of Unknown Quality** (Footprint of old building was built up with fill following 2015 demolition. Layer of fill was also identified across Site prior to demolition, which included waste products. Fill origin unknown)	Site observations, Pinchin 2015 Phase One ESA Trow 2005 Phase I & II ESA	
20	933 Gladstone Avenue (Entire off-Site portion)	**PCA 59: Bulk Storage of Treated and Preserved Wood Products** (Former lumber yard on-Site)	FIP, Chain of Title, Pinchin 2015 Phase One ESA	These PCAs are not considered likely to contribute to an APEC on Site. They are part

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
21	933 Gladstone Avenue (Entire off-Site portion)	**PCA: Other – Oil Drum Storage** **PCA 20: Explosives and Ammunition Manufacturing, Production and Bulk Storage** **PCA 39: Paints Manufacturing, Processing, and Bulk Storage** (Site used as Central Ordnance Depot for 50 years including reported storage of paint, oils, ammunition/ordnance and assorted military stores)	FIP, HLUI, Pinchin 2015 Phase One ESA	of the RSC filed for the 2.83-hectare parcel at 933 Gladstone demonstrating that soil and groundwater impacts are not present.
22	933 Gladstone Avenue (off-Site)	**PCA 28: Gasoline and Associated Products in Fixed Tanks** (Historical heating oil ASTs west and south of former boiler room)	1958 – 2014 Aerial photos, Pinchin 2015 Phase One ESA	These PCAs are not considered likely to contribute to an APEC on Site. They are part of the RSC filed for the 2.83-hectare parcel at 933 Gladstone demonstrating that soil and groundwater impacts are not present.
23	933 Gladstone Avenue (Entire off-Site portion)	**PCA 31: Ink Manufacturing, Processing and Bulk Storage** (Former printer operation on-Site)	2001/02 Street Directory, Pinchin 2015 Phase One ESA	
24	933 Gladstone Avenue (off-Site)	**PCA: Other – Flammable Chemical Storage Room Sump** (2500 gallon sump was noted in building plans for flammables storage room, SW corner of former building north of former boiler room)	1970/71 Building Plans	
25	933 Gladstone Avenue (Entire off-Site portion)	**PCA: Other – Vehicle Maintenance** (Reported historical vehicle maintenance)	Pinchin 2015 Phase One ESA	

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
26	933 Gladstone Avenue (off-Site)	**PCA : Other – Petroleum Product Drum Storage** (Several 205 L drums of waste oil were stored in the west side of the former boiler room and minor staining was observed)	Pinchin 2015 Phase One ESA	These PCAs are not considered likely to contribute to an APEC on Site. They are part of the RSC filed for the 2.83-hectare parcel at 933 Gladstone demonstrating that soil and groundwater impacts are not present.
27	933 Gladstone Avenue (Entire off-Site portion)	**PCA: Other – Waste Generator** (Waste generator codes for Petroleum distillates, waste oils and lubricants, light fuels, chemicals, and pharmaceuticals)	EcoLog ERIS, Pinchin 2015 Phase One ESA	
28	933 Gladstone Avenue (Off-Site: North and south ends of former warehouse, as well as two fires in unknown locations)	**PCA: Other - Fires** (Numerous fires in the 1950's burned down portions of the depot which may have released contaminants including oil and paint across the property)	1900 Ottawa-Hull Fire Map, 1950's Depot Fire Articles, Trow 2005 Phase I & II ESA	
29	933 Gladstone Avenue (Entire off-Site portion)	**PCA 55: Transformer Use** (Transformers within former warehouse)	Pinchin 2015 Phase One ESA	
30	225 Preston Street	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Malmberg Auto Service – two USTs) **PCA 10: Commercial Autobody Shop** (United Garage, Malmberg Auto Service, Carm's Auto Repair)	EcoLog ERIS, Street Directory, HLUI	These PCAs east of the RSC Property are not considered likely to contribute to an APEC on Site. This is due to their distance from the Site (>100 m) and their position cross-gradient of the Site according to the local inferred groundwater flow.
31	215 Preston Street	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Esso Home Comfort)	HLUI	
32	193 Preston Street	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Aircon Fuels)	HLUI	
33	187 Preston Street	**PCA 53: Tannery** (Farmer and Garrett – Tannery)	HLUI, 1988 Intera Report	These PCAs east of the RSC Property are not considered likely to

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
34	164 Preston Street	**PCA 10: Commercial Autobody Shop** (Ana Transportation Inc. – Auto Repair)	HLUI	contribute to an APEC on Site. This is due to their distance from the Site (>100 m) and their position cross-gradient of the Site according to the local inferred groundwater flow.
35	153 Preston Street	**PCA 59: Bulk Storage of Treated and Preserved Wood Products** (Preston & Lieff Glass – Lumber Wholesale)	HLUI	
36	17 Larch Street	**PCA 34: Metal Fabrication** (Venice Iron Works, V Steel Works Limited)	EcoLog ERIS, Street Directory, HLUI	
PCAs South of Site				
37	933 Gladstone Avenue (off-site)	**PCA: Other – LRT Staging Area** (Staging area for the construction of the LRT Corso Italia Station includes construction equipment and materials storage as well as modular office trailers and vehicle parking.)	August 2021 Site Observations	This PCA southeast of the RSC Property is not considered likely to contribute to an APEC on Site. While this PCA is within 75 m of the Site, its position places it cross-gradient of the Site according to the local inferred groundwater flow.
38	241 Preston Street	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Preston Auto Centre, Mazzocato Service Station, Pannuccio BP Service Station, Petro Canada Service Station – one UST) **PCA 10: Commercial Autobody Shop** (Preston Auto Centre, Jason Auto Centre, Preston Garage)	EcoLog ERIS, Street Directory, HLUI	These PCAs southeast of the RSC Property on Preston Street are not considered likely to contribute to an APEC on Site. This is due to their distance from the Site (>100 m) and their position cross-gradient of the Site according to the local inferred groundwater flow.
39	284 Preston Street	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (C Corp (Ontario) – one UST) (Top Value Gasmart, Mac's Convenience Stores Inc.)	EcoLog ERIS, Street Directory, HLUI	
40	280 Preston Street	**PCA 37: Operation of Dry Cleaning Equipment** (Superior Cleaners – Dry cleaning)	Street Directory, HLUI	These PCAs all are southeast of the RSC Property, and because

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
41	916 Gladstone Avenue	**PCA 10: Commercial Autobody Shop** (R+M Automotive Finishes, Aberousal Body Repair) (Khera Auto Repair, A V I Auto Centre, P B Auto Centre, Dragon Auto Service)	Street Directory, HLUI	of this, are not considered likely to contribute to an APEC on Site. While these PCAs are within 100 m of the Site, their positions place them cross-gradient of the Site rather than up-gradient, according to the local inferred groundwater flow.
42	910 Gladstone Avenue	**PCA 10: Commercial Autobody Shop** (Sal Auto & Truck Service Centre.)	Street Directory, HLUI	
43	203 Louisa Street	**PCA 31: Ink Manufacturing, Processing, and Bulk Storage** (L'Ora Di Ottawa – Newspaper Printer)	EcoLog ERIS, HLUI	
44	188 Louisa Street	**PCA 10: Commercial Autobody Shop** (Motorworks – Auto Repair)	Street Directory	
45	West end of St. Anthony Street	**PCA 41: Petroleum-derived Gas Manufacturing, Processing, and Bulk Storage** (British American Oil Co. Limited)	1988 Intera Report	
46	952 Gladstone Avenue	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Lyle Blackwell Limited – one gasoline UST) **PCA 37: Operation of Dry Cleaning Equipment** (Lyle Blackwell Limited Cleaners & Dyers) **PCA 17: Dye Manufacturing, Processing, and Bulk Storage** (Lyle Blackwell Limited Cleaners & Dyers)	FIPs (1948), HLUI	These PCAs are up gradient of the Site but are considered unlikely to contribute to an APEC due to their distance from the Site >100 m away.
47	940 Gladstone Avenue	**PCA 34: Metal Fabrication** (Hodgins Bros. Limited – Heating equipment manufacturing)	HLUI	

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
48	175 Loretta Avenue North	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (General Supply Co. of Canada Limited – One gasoline UST, City of Ottawa – Two historic USTs) **PCA 39: Paints Manufacturing, Processing, and Bulk Storage** (General Supply Co. Of Canada Limited) **PCA 57: Vehicles and Associated Parts Manufacturing** (General Supply Co. Of Canada Limited, City of Ottawa)	EcoLog ERIS, Street Directory, HLUI, TSSA, 2016 175 Loretta Ave. N. Monitoring Report	This PCA is not considered likely to contribute to an APEC on the Site since available documents indicate that remediation activities had been carried out and that there is reportedly little to no mobilization of contaminants off the 175 Loretta Ave. N. property.
PCAs West of Site				
49	West of Site	**PCA 46: Rail Yards, Tracks, and Spurs** (Multiple rail lines historically running in north-south direction immediately west of Site)	Aerial photos, FIP, Site Visit, Pinchin 2015 Phase One ESA	This PCA is considered likely to contribute to an APEC on Site. This is due to the PCA being directly adjacent to the Site.
50	975 Gladstone Avenue	**PCA 31: Ink Manufacturing, Processing, and Bulk Storage** (British American Bank Note Co. Limited, BA Banknote Inc.)	EcoLog ERIS, Street Directory, HLUI, 1988 Intera Report, FIPs (1948, 1956)	PCAs west of the RSC Property are not considered likely to contribute to an APEC on Site. This is due to their positions cross-gradient of the Site rather than up-gradient, according to the local inferred groundwater flow and their distance from the Site >75 m away.
51	971 Gladstone Avenue	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Mr Gas Limited – one UST)	EcoLog ERIS	
52	951 Gladstone Avenue	**PCA 31: Ink Manufacturing, Processing, and Bulk Storage** (Love Printing Service Limited)	HLUI	

ID on Fig. 2	Location	Potentially Contaminating Activities as per Table 2 of Reg.153/04	Information Sources	Rationale for the PCA to Contribute to an APEC on the Site
53	949 Gladstone Avenue	**PCA 34: Metal Fabrication** (Vesuvio Iron Works) **PCA 10: Commercial Autobody Shop** (Mario Garage, Orville's Auto Electric)	EcoLog ERIS, Street Directory, HLUI	These PCAs southwest of the RSC Property are up gradient of the Site but are considered unlikely to contribute to an APEC due to their distance from the Site >75 m away.
54	157 Loretta Avenue North	**PCA 52: Storage, Maintenance, Fuelling and Repair of Vehicles** (City Queensway Taxi – Auto fleet repair and storage)	Street Directory	
55	155 Loretta Avenue North	**PCA 31: Ink Manufacturing, Processing, and Bulk Storage** (Canada Printing Ink, Canadian Toners, Popular Printing) **PCA 54: Textile Manufacturing and Processing** (Regional Textiles)	Street Directory, HLUI,	
56	145 Loretta Avenue North	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Bell Telephone Co. Of Canada Limited – One gasoline UST)	HLUI, FIP (1956)	
57	131 Loretta Avenue North	**PCA 28: Gasoline and Associated Products Storage in Fixed Tanks** (Hall Fuel Limited – One gasoline UST)	HLUI, FIP (1956)	
58	111 Breezehill Avenue North	**PCA 10: Commercial Autobody Shop** (907462 Ontario Limited, Grandtech Auto – Auto repair)	HLUI	

Areas of Potential Environmental Concern

A summary of the APECs identified at the Phase One Property is provided in the following table. The following APECs were identified, their locations can be seen on Figure 2:

APEC #	Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
1	PCA ID# 1- Former on-Site rail tracks as well as rail line adjacent to the west.	Entire Site	PCA 46: Rail Yards, Tracks, and Spurs.	On-Site	Metals*, PAHs, PHC	Soil
2	PCA ID# 2- Footprint of old buildings was built up with fill following 2015 demolition. Layer of fill was also identified across Site prior to demolition, which included waste products. Fill origin unknown.	Entire Site	PCA 30: Importation of Fill Material of Unknown Quality.	On-Site	Metals*, PAHs, PHC, VOC	Soil
3	PCA ID# 3- Former lumber yard on-Site.	Entire Site	PCA 59: Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products.	On-Site	Metals*, PAHs, VOCs	Soil

APEC #	Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
4a	PCA ID# 4a-Site used as Central Ordnance Depot for 50 years including storage of oils in drums.	Entire Site	PCA: Other – Petroleum Product (oil) Storage in non-fixed tanks (drums).	On-Site	PHC, BTEX	Groundwater and Soil
4b	PCA ID# 4b-Site used as Central Ordnance Depot for 50 years including storage of munitions and assorted military stores.	Entire Site	PCA 20: Explosives and Ammunition Manufacturing, Processing and Bulk Storage	On-Site	Metals*, PAHs, PHC, VOCs	Groundwater and Soil
4c	PCA ID# 4c-Site used as Central Ordnance Depot for 50 years including storage of paints.	Entire Site	PCA 39: Paints Manufacturing, Processing, and Bulk Storage.	On-Site	Metals*, VOCs	Groundwater and Soil

APEC #	Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
5	PCA ID# 5- Waste generator codes for petroleum distillates, waste oils and lubricants, light fuels, chemicals, and pharmaceuticals	Entire Site	PCA: Other – Waste Generator.	On-Site	PHC, VOC	Groundwater and Soil
6	PCA ID# 6- Numerous fires in the 1950's burned down portions of the depot which may have released contaminants including oil and paint across the property	Entire Site	PCA: Other – Fires.	On-Site	PHC, Metals*, PAH, VOCs	Groundwater and Soil
7	PCA ID# 7- Dyed Diesel AST.	Storage yard, northwest corner of the Site	PCA 28: Gasoline and Associated Products Storage in Fixed Tanks.	On-Site	PHC and BTEX	Groundwater and Soil

APEC #	Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on RSC Property	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
8	PCA ID# 8- Parking area contains empty bulk liquid totes of unknown sources, 5 buckets (25 L each) marked “Hydraulic Fluid – Must be disposed of” on wooden pallet in paved area, soil piles, asphalt pile, empty drums.	Storage yard, northwest portion of the Site	PCA: Other - Storage of Debris and Chemical Waste.	On-Site	Metals*, PHC, PAH, VOCs	Groundwater and Soil
9	PCA ID# 10- Several drums of unknown contents noted in 2001 in maintenance yard.	Storage area directly adjacent to north portion of RSC Property	PCA: Other – Drums of Unknown Contents.	Off-Site	PHC, VOC	Groundwater

* Metals includes MECP method groups Metals, As, Sb, Se
PHC – petroleum hydrocarbon fractions 1 to 4
BTEX – benzene, toluene, ethylbenzene and xylenes
PCB – polychlorinated biphenyls
PAH – polycyclic aromatic hydrocarbons

Based on the 2022 Phase One ESA Update, conditions at the RSC Property and surrounding area have not changed since 2016, therefore, it is Golder’s opinion that no additional APECs are present and that no additional sampling and/or analysis is required to satisfy the objectives of the Phase Two ESA. The APECs affecting the entire site were initially evaluated in 2017 as part of the Phase Two ESA that comprised the entire 3.3-hectare parcel and did not identify impacts to soil or groundwater quality. The immediately adjacent parcel to the east, comprising the remaining 2.83-hectare portion of the property known as 933 Gladstone Avenue, was subject to a Record of Site Condition filing based on generic site condition standards in 2019 (RSC number 226204). The RSC demonstrates that historic activities and associated PCAs and APEC did not impact soil or groundwater quality on the 2.83-hectare parcel. Groundwater samples collected by Golder from monitoring wells located on the

RSC property in 2019 and 2021 further confirm that groundwater quality has not been affected by off-site activities and that concentrations of contaminants of potential concern remain below the MECP Table 3 standards.

Subsurface Structures and Utilities and Potential Migration of COCs

Underground utility drawings available for the 933 Gladstone Property indicated utility connections to the former building were abandoned during demolition, including water, sewer, electrical, natural gas, cable and telephone. Utility mains, including storm sewers observed during the site reconnaissance continue to be present. The presence of subsurface utilities and structures at the Site could act as preferential pathways promoting the migration of COCs as the water table is inferred to intercept buried utilities and subsurface structures at the Phase Two Property; however, no COCs are present in groundwater at concentrations exceeding the Site condition standards.

Physical Setting

Stratigraphy

A representative geologic cross-section of the Site is presented on Figures 4B and 5B. In general, the subsurface soil conditions consisted of a layer of fill overlying native overburden. The fill generally consists of sandy clay and silty sand. The fill layer extends to 0.76 metres below the existing ground surface. A deposit of sandy clay to clay exists below the fill extending to the maximum depth of drilling. No bedrock was encountered.

Based on the soil conditions encountered in the boreholes, the sandy clay to clay is considered a water bearing formation at the Phase Two Property.

Given that the average thickness of overburden at the Site is greater than 2 m, the Site is not considered to be a shallow soil property as defined by O. Reg. 153/04 (as amended). Based on borehole records for the adjacent 2.83-hectare parcel, bedrock was encountered at depths of 3 to 7.5 metres.

Hydrogeological Characteristics

The regional groundwater flow direction is expected to be towards the Ottawa River, located approximately 1 km to the north of the Site. In the immediate vicinity of the Site, the inferred direction of groundwater flow is to the south, towards the nearby trench for the OC Transpo rail line. Groundwater level measurements from wells located on the immediately adjacent 2.83-hectare parcel at 933 Gladstone, show that the inferred direction of groundwater flow is to the east-northeast, towards the Ottawa River. This suggest that localised groundwater flow on the 0.47-hecatre RSC Property is influenced by the nearby 5 metre deep trench for the OC Transpo rail line that is located approximately 20 metres south-southwest of the Site.

Static groundwater levels were measured in the monitoring wells located across the Site on February 2, 2017, April 30, 2018 and August 11, 2021. Figure 3 shows groundwater elevations for August 11, 2021 and the interpreted groundwater flow direction. Groundwater elevations at the Site ranged from 96.01 to 97.68 masl on February 2, 2017. Groundwater elevations at the Site ranged from 96.48 to 98.54 masl on April 30, 2018. Groundwater elevations at the Site ranged from 95.18 to 98.33 masl on August 11, 2021. Shallow groundwater flow direction was inferred to be to the south on each occassion.

The horizontal hydraulic gradient was estimated for shallow groundwater conditions based on water levels collected on August 11, 2021, and the inferred groundwater contours are presented on Figure 3. The average horizontal hydraulic gradient for shallow groundwater conditions was 0.08 m/m. Vertical hydraulic gradients were not calculated as no COCs were identified in groundwater exceeding the site condition standards and as such, no nested monitoring wells were installed at the Site.

Site Condition Standards

Shallow Soil Property or Water Body

- Bedrock was not encountered at the boreholes, which were advanced to a depth of 5.18 mbgs. The property does not include all or part of a water body and is not adjacent to a water body or include land that is within 30 metres of a water body. Accordingly, Section 43.1 of the Regulation does not apply to the RSC Property.

Potable Water Wells

The Site and all other properties located, in whole or in part, within 250 metres of the Site are supplied by the City of Ottawa municipal drinking water system. No wells were identified that are used or intended for use as a source of water for human consumption or agriculture. The Site is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water.

Environmentally Sensitive Areas

An area of natural significance is not located within 30 meters of the Site. Additionally, the average pH of surface soil is 5≤pH≤9 and the pH of sub-surface soil meets the requirement that 5≤pH≤11. Accordingly, Section 41 of the Regulation does not apply to the RSC Property.

Proposed Building and Other Structures

There are no buildings or other structures currently present at the Site. Proposed future use of the Site is a mixture of residential, institutional (school), parkland and commercial redevelopment that is expected to include several buildings of varying size, height and density.

Delineation of Contaminant Impacts

APEC Where Contaminants are Present at a Concentration Above the Applicable Site Condition Standard

The reported concentrations of all soil and groundwater samples submitted for analysis indicate that soil and groundwater quality at all APECs meets the applicable site condition standards. Figures 4A/4B/4C and 5A/5B/5C present plan and cross-section views of sample locations and associated summary of results for the contaminants of potential concern.

Contaminant Distribution

No contaminants were present in soil or groundwater samples at a concentration greater than the applicable site condition standards.

Potential Reason for Discharge into the Environment at the Site

No discharge of contaminants has occurred on, in or under the Phase Two property which has resulted in impacts at concentrations greater than the applicable site condition standards.

Contaminant Migration

None of the contaminants of potential concern were detected in groundwater samples at concentrations exceeding the applicable site condition standards and therefore contaminant migration in groundwater is not relevant to the Site.

Meteorological and Climatic Considerations

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events seasonal trends could not be identified; however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter.

Soil Vapour Intrusion Pathways

There are currently no buildings on the Site. No contaminants were present at concentrations greater than the applicable site condition standards and therefore soil vapour intrusion is not anticipated.

Cross-Sections

Lateral and Vertical Distribution of Contaminants

Site plans and representative cross-sections are presented in Figures 4A/4B/4C and 5A/5B/5C.

Potential Exposure Pathways and Receptors

No contaminants were present at concentrations greater than the applicable site condition standards and therefore potential release and transport mechanisms, exposure pathways and human and ecological receptors are not considered further.

7.0 CONCLUSIONS

The Phase Two ESA investigated the nine APECs identified in the October 2022 Phase One ESA Update.

Based on the results of the soil and groundwater samples submitted as part of this Phase Two ESA, the reported concentrations of the contaminants of potential concern were below the applicable site condition standards as of the certification date (August 21, 2021). No risk assessment or remediation is required prior to the submission of a RSC.

The data presented in this report follows the O. Reg. 153/04 Phase Two ESA report format.

8.0 REFERENCES

Source	Date
Phase One Environmental Site Assessment Update for Northwest 0.47-Hectare Parcel at 933 Gladstone Avenue, Ottawa, Ontario. Golder Associates	October 21, 2022
Phase Two Environmental Site Assessment, 933 Gladstone Avenue, Ottawa, Ontario. Golder Associates	October 2, 2019
Phase One Environmental Site Assessment Update for 933 Gladstone Avenue, Ottawa, Ontario. Golder Associates	August 2018
Final Report on Phase One Environmental Site Assessment, 933 Gladstone Avenue Ottawa, Ontario. Golder Associates.	December 2016
Phase One Environmental Site Assessment: 933 Gladstone Avenue Ottawa, Ontario-Draft. Pinchin Ltd.	March 26, 2015
Subsurface Soil and Groundwater Investigation Sampling Plouffe Park – 1010 Somerset Street West, Ottawa, Ontario. DST Consulting Engineers Inc.	September 2013
Environmental Review and Limited Investigation Plouffe Park, 1010 Somerset Street West, Ottawa, Ontario. Levac Robichaud Leclerc Associates Ltd.	October 2008
Phase I & II Environmental Site Assessment, Plouffe Park 1010 Somerset St. W., Ottawa, Ontario DRFP#08830. Trow Associates Inc.	January 2005
Phase I Environmental Site Assessment Plouffe Park (1010 Somerset St. W.) Ottawa, Ontario. Aqua Terre Solutions Inc.	March 2001

9.0 LIMITATIONS

This report was prepared for the exclusive use of Ottawa Community Housing Corporation. The report, which specifically includes all tables, figures and appendices, is based on data and information, collected during conducting the Phase Two ESA, and is based solely on the conditions of the property at the time of conducting investigations, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

The assessment of environmental conditions at this Site has been made using the results of field screening techniques and chemical analysis of soil and groundwater samples at a limited number of locations. The Site conditions between sampling locations have been inferred based on conditions observed at the sampling locations. Conditions may vary from these sample locations. Additional study, including further investigation, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a Site may be contaminated and remain undetected.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party (other than as noted above) as a result of decisions made or actions based on this report.

The content of this report is based on information collected during the drilling, soil and groundwater sampling activities, our present understanding of the Site conditions, and our professional judgement in light of such information at the time of this report. This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

The monitoring wells installed as part of this project have been constructed using licensed drilling/well contractors employing licensed well technicians. It is owner's responsibility to have a licensed well technician properly abandon all monitoring wells, if required.

Signature Page

The undersigned Qualified Person confirms that he/she was responsible for conducting and/or supervising this Phase Two ESA and the associated findings and conclusions.

We trust that you will find the contents of this report satisfactory for your current needs. Should you require clarification of the information provided, please do not hesitate to contact the undersigned.

Golder Associates Ltd.

Eric Wilson, P.Eng., PMP
Senior Environmental Engineer

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Tables

Table 1
Monitoring Well Construction and Groundwater Elevation Details

Monitoring Well ID	Location (UTM 18)		Installation Date	End of Borehole (mbgs)	Screen (mbgs)	Ground Surface Elevation (masl)	Water Level Depth (mbgs)	Water Level Elevation (masl)	Water Level Depth (mbgs)	Water Level Elevation (masl)	Water Level Depth (mbgs)	Water Level Elevation (masl)
	Northing	Easting					02-Feb-17		30-Apr-18		11-Aug-21	
MW17-01	5028292	0443935	2017-01-25	5.18	2.13 - 5.18	100.44	3.18	97.26	2.12	98.32	2.38	98.06
MW17-14	5028273	0443958	2017-01-25	5.18	1.98 - 5.03	100.2	4.19	96.01	3.72	96.48	5.02	95.18
MW17-22	5028312	0443955	2017-01-25	5.18	2.13 - 5.18	99.68	2.0	97.68	1.14	98.54	1.35	98.33

Table 2
Summary of Soil Samples Submitted for Laboratory Analysis

Borehole ID	Soil Samples Submitted for Analysis	Sample Depths (mbgs)	Sample Collection Date	Analytical Paramaters	MECP Table 3 Exceedances (1)
BH17-01	17-01 SA4	3.05 - 3.81	26-01-2017	PHCs and BTEX	None
BH17-14	17-14 SA1	0 - 0.76	26-01-2017	Metals, PAHs, PCB, VOCs, and PHCs.	None
BH17-22	17-22 SA3	2.29 - 3.05	26-01-2017	Metals, PAHs, VOCs, and PHCs.	None

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

None = Not detected above method detection limit and/or does not exceed MECP Table 3 Standards

Table 3
Summary of Groundwater Samples Submitted for Laboratory Analysis

Monitoring Well ID	Groundwater Samples Submitted for Analysis	Date Sampled	Analytical Paramaters	MECP Table 3 Exceedances (1)
MW17-01	17-01	06-02-2017	PHCs and BTEX	None
MW17-01	MW17-01	04-10-2019	PHCs, VOCs, PCBs, PAHs and Metals	None
Duplicate (MW17-01)	DUP-1	04-10-2019	PHCs, VOCs, PCBs, PAHs and Metals	None
MW17-01	MW17-01	11-08-2021	PCBs, PAHs and Metals	None
Duplicate (MW17-01)	MW17-01 Field Dup	11-08-2021	PCBs and Metals	None
MW17-01	17-01	20-08-2021	PHCs, VOCs	None
MW17-14	17-14	06-02-2017	PHCs, VOCs, PCBs, PAHs and Metals	None
MW17-14	MW17-14	04-10-2019	PHCs, VOCs, PCBs, PAHs and Metals	None
MW17-14	MW17-14	11-08-2021	PCBs	None
MW17-22	17-22	06-02-2017	PHCs, VOCs, PAHs and Metals	None
Duplicate (MW17-22)	DUP A	06-02-2017	PHCs, VOCs, PAHs and Metals	None
MW17-22	MW17-22	04-10-2019	PHCs, VOCs, PCBs, PAHs and Metals	None
MW17-22	MW17-22	11-08-2021	PCBs and Metals	None
MW17-22	17-22	20-08-2021	PHCs, VOCs	None
Equipment Blank	Equip. Blank	07-02-2017	VOCs	None
Field Blank	F Blank	07-02-2017	PHCs, VOCs, PCBs, PAHs, and Metals	None
Field Blank	Field Blank	04-10-2019	VOCs	None
Field Blank	Field Blank	11-08-2021	PCBs and Metals	None
Field Blank	Field Blank	20-08-2021	PHCs, VOCs	None
Trip Blank	Trip Blank	07-02-2017	VOCs	None
Trip Blank	Trip Blank	20-08-2021	VOCs	None

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, All Property Use, coarse-textured soil, April 15, 2011 (MECP Table 3 Standards).

None = Not detected above method detection limit and/ or does not exceed MECP Table 3 Standards

Table 4a
Soil Analytical Results for Metals

Sample ID	MDL	MOE Table 3 (µg/g)	17-14 SA1	17-22 SA3
Sample Date (m/d/y)			1-26-2017	1-26-2017
Sample Depths (mbgs)			0 - 0.76	2.29 - 3.05
Metals				
Antimony	0.2	7.5	<0.20	<0.20
Arsenic	1	18	<1.0	1.9
Barium	0.5	390	24	180
Beryllium	0.2	4	<0.20	0.55
Boron (Hot Water Soluble)	0.05	1.5	<0.050	0.24
Cadmium	0.1	1.2	<0.10	<0.10
Chromium	1	160	7.3	37
Chromium VI	0.2	8	<0.2	<0.2
Cobalt	0.1	22	4	12
Copper	0.5	140	8.5	22
Lead	1	120	2.6	5.1
Mercury	0.05	0.27	<0.050	<0.050
Molybdenum	0.5	6.9	<0.50	1.3
Nickel	0.5	100	6.9	23
Selenium	0.5	2.4	<0.50	<0.50
Silver	0.2	20	<0.20	<0.20
Thallium	0.05	1	0.064	0.22
Vanadium	5	86	17	56
Zinc	5	340	14	64
Boron (Total)	5	120	<5.0	6.9
Uranium	0.05	23	0.37	0.87

Table 4b
Soil Analytical Results for VOCs

Sample ID Sample Date (m/d/y) Sample Depths (mbgs)	MDL	MOE Table 3 (µg/g)	17-14 SA1 1-26-2017 0 - 0.76	17-22 SA3 1-26-2017 2.29 - 3.05
Volatile Organic Compounds				
Acetone	0.5	16	<0.50	<0.50
Benzene	0.02	0.21	<0.020	<0.020
Bromodichloromethane	0.05	13	<0.050	<0.050
Bromoform	0.05	0.27	<0.050	<0.050
Bromomethane	0.05	0.05	<0.050	<0.050
Carbon Tetrachloride	0.05	0.05	<0.050	<0.050
Chlorobenzene	0.05	2.4	<0.050	<0.050
Chloroform	0.05	0.05	<0.050	<0.050
Dibromochloromethane	0.05	9.4	<0.050	<0.050
1,2-Dichlorobenzene	0.05	3.4	<0.050	<0.050
1,3-Dichlorobenzene	0.05	4.8	<0.050	<0.050
1,4-Dichlorobenzene	0.05	0.083	<0.050	<0.050
1,1-Dichloroethane	0.05	3.5	<0.050	<0.050
1,2-Dichloroethane	0.05	0.05	<0.050	<0.050
1,1-Dichloroethylene	0.05	0.05	<0.050	<0.050
Cis-1,2-Dichloroethylene	0.05	3.4	<0.050	<0.050
Trans-1,2-Dichloroethylene	0.05	0.084	<0.050	<0.050
1,2-Dichloropropane	0.05	0.05	<0.050	<0.050
Cis-1,3-Dichloropropylene	0.03	NV	<0.030	<0.030
Trans-1,3-Dichloropropylene	0.04	NV	<0.040	<0.040
Ethylbenzene	0.02	2	<0.020	<0.020
Ethylene Dibromide	0.05	0.05	<0.050	<0.050
Methyl Ethyl Ketone	0.5	16	<0.50	<0.50
Methylene Chloride	0.05	0.1	<0.050	<0.050
Methyl Isobutyl Ketone	0.5	1.7	<0.50	<0.50
Methyl-t-Butyl Ether	0.05	0.75	<0.050	<0.050
Styrene	0.05	0.7	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.05	0.058	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	<0.050	<0.050
Toluene	0.02	2.3	<0.020	<0.020
Tetrachloroethylene	0.05	0.28	<0.050	<0.050
1,1,1-Trichloroethane	0.05	0.38	<0.050	<0.050
1,1,2-Trichloroethane	0.05	0.05	<0.050	<0.050
Trichloroethylene	0.05	0.061	<0.050	<0.050
Vinyl Chloride	0.02	0.02	<0.020	<0.020
m-Xylene & p-Xylene	0.02	NV	<0.020	<0.020
o-Xylene	0.02	NV	<0.020	<0.020
Total Xylenes	0.02	3.1	<0.020	<0.020
Dichlorodifluoromethane	0.05	16	<0.050	<0.050
Hexane(n)	0.05	2.8	<0.050	<0.050
Trichlorofluoromethane	0.05	4	<0.050	<0.050
1,3-Dichloropropene (cis + trans)	0.05	0.05	<0.050	<0.050

Table 4c
Soil Analytical Results for PHCs, BTEX, PAHs and PCBs

Sample ID Sample Date (m/d/y) Sample Depths (mbgs)	MDL	MOE Table 3 (µg/g)	17-1 SA4 01/26/2017 3.05 - 3.81	17-14 SA1 2017-01-26 0 - 0.76	17-22 SA3 2017-01-26 2.29 - 3.05
PHC and BTEX					
Benzene	0.02	0.21	<0.02	<0.02	<0.02
Toluene	0.02	2.3	<0.02	<0.02	<0.02
Ethylbenzene	0.02	2	<0.02	<0.02	<0.02
m/p xylenes	0.04	NV	<0.04	<0.04	<0.04
o xylene	0.02	NV	<0.02	<0.02	<0.02
Total Xylenes	0.04	3.1	<0.04	<0.04	<0.04
F1 (C6-C10)	10	55	<10	<10	<10
F1 (C6-C10) - BTEX	10	55	<10	<10	<10
F2 (C10-C16)	10	98	<10	<10	<10
F3 (C16-C34)	50	300	<50	<50	<50
F4 (C34-C50)	50	2800	<50	<50	<50
Reached Baseline at C50		NV	YES	YES	YES
F4 Gravimetric	-	2800	-	-	-
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.005	7.9	-	<0.0050	<0.0050
Acenaphthylene	0.005	0.15	-	<0.0050	<0.0050
Anthracene	0.005	0.67	-	<0.0050	<0.0050
Benzo(a)anthracene	0.005	0.5	-	<0.0050	<0.0050
Benzo(a)pyrene	0.005	0.3	-	<0.0050	<0.0050
Benzo(b/j)fluoranthene	0.005	0.78	-	<0.0050	<0.0050
Benzo(ghi)perylene	0.005	6.6	-	<0.0050	<0.0050
Benzo(k)fluoranthene	0.005	0.78	-	<0.0050	<0.0050
Chrysene	0.005	7	-	<0.0050	<0.0050
Dibenzo(a,h)anthracene	0.005	0.1	-	<0.0050	<0.0050
Fluoranthene	0.005	0.69	-	<0.0050	<0.0050
Fluorene	0.005	62	-	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	0.005	0.38	-	<0.0050	<0.0050
1-Methylnaphthalene (SEE FOOTNOTE 4)	0.005	0.99	-	<0.0050	<0.0050
2-Methylnaphthalene (SEE FOOTNOTE 4)	0.005	0.99	-	<0.0050	<0.0050
Naphthalene	0.005	0.6	-	<0.0050	<0.0050
Phenanthrene	0.005	6.2	-	<0.0050	<0.0050
Pyrene	0.005	78	-	<0.0050	<0.0050
Methylnaphthalene, 2-(1-)	0.014	0.99	-	<0.014	<0.014
PCBs					
Total PCB	0.02	0.35	-	<0.010	-

Footnotes:

All values in ug/g unless otherwise noted.

Tables should be read in conjunction with the accompanying document.

< = Indicates parameter not detected above laboratory method detection limit.

NV = no value

-- Chemical not analyzed or criteria not defined.

mbgs = metres below ground surface

Grey background indicates exceedances.

Italic font indicates a detection limit higher than the applicable criteria.

NOTES:

1. Criteria refers to Ministry of Environment "Soil, Ground Water and and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" March 9, 2004, amended as of July 1, 2011
2. This table represents a summary of the data presented in the Laboratory Certificate of Analysis for convenience purposes only
3. This summary is to be use in conjuction with, not as a replacement of the Laboratory Ceriticate of Analysis which contains all QA/QC information
4. The methylnaphthalene standards are appliable to both 1-Methylnaphthelene and 2-Methylnapthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Table 5a
Groundwater Analytical Results for Metals

Sample Location	MDL	MOE Table 3 (µg/L)[1]	17-1				17-14		17-22				Field Blank	
Sample ID			17-1	DUP 1 Dupl. of 17-1	17-1	MW17-01 Field Dup Dupl. of 17-1	17-14	17-14	17-22	DUP A Dupl. of 17-22	17-22	17-22	F BLANK	F BLANK
Sample Date (m/d/y)			10-04-19	10-04-19	08-11-21	08-11-21	02-06-17	10-04-19	02-06-17	02-06-17	10-04-19	08-11-21	01-30-17	08-11-21
Metals														
Antimony	0.5	20000	<0.50	<0.50	<0.50	<0.50	0.53	<0.50	0.81	0.78	<0.50	<0.50	<0.50	<0.50
Arsenic	1	1900	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.5	1.2	<1.0	<1.0
Barium	2	29000	79	81	51	80	220	84	180	160	57	74	<2.0	<2.0
Beryllium	0.5	67	<0.50	<0.50	<0.40	<0.40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.40	<0.50	<0.40
Boron	10	45000	110	110	100	100	97	81	62	55	49	48	<10	<10
Cadmium	0.1	2.7	<0.10	<0.10	<0.090	<0.090	<0.10	<0.10	<0.10	<0.10	<0.10	<0.090	<0.10	<0.090
Chromium	5	810	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Chromium VI	0.5	140	<0.50	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cobalt	0.5	66	<0.50	<0.50	<0.50	<0.50	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Copper	1	87	1.4	<1.0	1.8	1.5	1.5	1.2	1.5	1.4	<1.0	<0.90	<1.0	<0.90
Lead	0.5	25	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	0.1	0.29	<0.1	<0.1	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1	<0.10
Molybdenum	0.5	9200	20	21	24	21	24	9.9	50	50	12	8.5	<0.50	<0.50
Nickel	1	490	4.2	3.7	2.6	2.5	5	2.3	3.6	3.7	<1.0	<1.0	<1.0	<1.0
Sodium	100	2300000	180000	180000	220000	180000	65000	75000	95000	110000	83000	53000	370	<100
Selenium	2	63	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Silver	0.1	1.5	<0.10	<0.10	<0.090	<0.090	<0.10	<0.10	<0.10	<0.10	<0.10	<0.090	<0.10	<0.090
Thallium	0.05	510	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Vanadium	0.5	250	1.7	1.7	3.5	3.5	0.82	4.6	0.96	1.4	0.53	0.78	<0.50	<0.50
Zinc	5	1100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium	0.1	420	8.2	8.4	10	7.0	9.1	5.3	6.9	7.8	3.5	4.1	<0.10	<0.10

Table 5b
Groundwater Analytical Results for VOCs

Sample Location	MDL	MOE Table 3 (µg/L)[1]	17-1	17-1	17-1	17-14	17-14	17-22	17-22	17-22	17-22
Sample ID			17-1	DUP 1 Dupl. of 17-1	17-1	17-14	17-14	17-22	DUP A Dupl. of 17-22	17-22	17-22
Sample Date (m/d/y)			10-04-19	10-04-19	08-20-21	02-06-17	10-04-19	02-06-17	02-06-17	10-04-19	08-20-21
Volatile Organic Compounds											
Acetone	10	130000	<10	<10	<10	<10	<10	<10	<10	<10	<10
Benzene	0.2	44	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	0.5	85000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	1	380	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	0.5	5.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	0.2	0.79	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	0.2	630	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	0.2	2.4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.5	82000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	0.5	4600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	0.5	9600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	0.5	8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	0.2	320	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	0.5	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	0.2	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,2-Dichloroethylene	0.5	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	0.5	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	0.2	16	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,3-Dichloropropylene	0.3	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Trans-1,3-Dichloropropylene	0.4	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	0.2	2300	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylene Dibromide	0.2	0.25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Ethyl Ketone	10	470000	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylene Chloride	2	610	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	5	140000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl-t-Butyl Ether	0.5	190	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	0.5	1300	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.5	3.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	0.5	3.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	0.2	18000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethylene	0.2	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	0.2	640	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	0.5	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	0.2	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	0.2	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m-Xylene & p-Xylene	0.2	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.2	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylenes	0.2	4200	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorodifluoromethane	1	4400	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexane(n)	1	51	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	0.5	2500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropene (cis + trans)	0.5	5.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 5b
Groundwater Analytical Results for VOCs

Sample Location	MDL	MOE Table 3 (µg/L)[1]	Equipment Blank	Field Blank			Trip Blank	
Sample ID			EQUIP-BLANK	F BLANK	F BLANK	F BLANK	TRIP BLANK	TRIP BLANK
Sample Date (m/d/y)			02-07-17	01-30-17	10-04-19	08-20-21	01-30-17	08-20-21
Volatile Organic Compounds								
Acetone	10	130000	<10	<10	<10	<10	<10	<10
Benzene	0.2	44	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	0.5	85000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	1	380	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	0.5	5.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	0.2	0.79	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	0.2	630	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	0.2	2.4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	0.5	82000	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	0.5	4600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	0.5	9600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	0.5	8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	0.2	320	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	0.5	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	0.2	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,2-Dichloroethylene	0.5	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	0.5	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	0.2	16	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cis-1,3-Dichloropropylene	0.3	NV	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Trans-1,3-Dichloropropylene	0.4	NV	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	0.2	2300	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylene Dibromide	0.2	0.25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Ethyl Ketone	10	470000	<10	<10	<10	<10	<10	<10
Methylene Chloride	2	610	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	5	140000	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl-t-Butyl Ether	0.5	190	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	0.5	1300	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.5	3.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	0.5	3.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	0.2	18000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Tetrachloroethylene	0.2	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	0.2	640	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	0.5	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	0.2	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	0.2	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
m-Xylene & p-Xylene	0.2	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	0.2	NV	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Total Xylenes	0.2	4200	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dichlorodifluoromethane	1	4400	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hexane(n)	1	51	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	0.5	2500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichloropropene (cis + trans)	0.5	5.2	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 5C
Groundwater Analytical Results for PHCs, BTEX, PAHs, and PCBs

Sample Location	MDL	MOE Table 3 (µg/L)[1]	17-1					17-14			17-22				Field Blank
Sample ID			17-1	17-1	DUP 1 Dupl. of 17-1	17-1	MW17-01 Field Dup Dupl. of 17-1	17-14	17-14	17-14	17-22	DUP A Dupl. of 17-22	17-22	17-22	F BLANK
Sample Date (m/d/y)			02-06-17	10-04-19	10-04-19	08-11-21[4]	08-11-21	02-07-16	10-04-19	10-04-19	08-11-21	02-06-17	10-04-19	08-20-21	01-30-17
PHC and BTEX															
Benzene	0.2	44	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	<0.20
Toluene	0.2	18000	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	0.2	2300	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	<0.20
m/p xylenes	0.4	NV	<0.40	<0.40	<0.40	<0.40	-	<0.40	<0.40	<0.40	-	<0.40	<0.40	<0.40	<0.40
o xylene	0.2	NV	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	<0.20
Total Xylenes	0.4	4200	<0.40	<0.40	<0.40	<0.40	-	<0.40	<0.40	<0.40	-	<0.40	<0.40	<0.40	<0.40
F1 (C6-C10)	25	750	<25	<25	<25	<25	-	<25	<25	<25	-	<25	<25	<25	<25
F1 (C6-C10) - BTEX	25	750	<25	<25	<25	<25	-	<25	<25	<25	-	<25	<25	<25	<25
F2 (C10-C16)	100	150	<100	<100	<100	<100	-	<100	<100	<100	-	<100	<100	<100	<100
F3 (C16-C34)	200	500	<200	<200	<200	<200	-	<200	<200	<200	-	<200	<200	<200	<200
F4 (C34-C50)	200	500	<200	<200	<200	<200	-	<200	<200	<200	-	<200	<200	<200	<200
Reached Baseline at C50		-	YES	YES	YES	YES	-	YES	YES	YES	-	YES	YES	YES	YES
F4 Gravimetric	-	500	-	-	-	-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons															
Acenaphthene	0.05	600	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Acenaphthylene	0.05	1.8	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Anthracene	0.05	2.4	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Benzo(a)anthracene	0.05	4.7	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Benzo(a)pyrene	0.01	0.81	-	<0.010	<0.050	<0.010	-	<0.010	<0.010	<0.010	-	<0.050	-	<0.010	<0.010
Benzo(b/j)fluoranthene	0.05	0.75	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Benzo(ghi)perylene	0.05	0.2	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Benzo(k)fluoranthene	0.05	0.4	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Chrysene	0.05	1	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Dibenzo(a,h)anthracene	0.05	0.52	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Fluoranthene	0.05	130	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Fluorene	0.05	400	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.05	0.2	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
1-Methylnaphthalene	0.05	1800	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
2-Methylnaphthalene	0.05	1800	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Naphthalene	0.05	1400	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Phenanthrene	0.03	580	-	<0.030	<0.050	<0.030	-	<0.030	<0.030	<0.030	-	<0.050	-	<0.030	<0.030
Pyrene	0.05	68	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050
Methylnaphthalene, 2-(1-)	0.071	1800	-	<0.071	<0.071	<0.071	-	<0.071	<0.071	<0.071	-	<0.071	-	<0.071	<0.071
PCBs															
Total PCB	0.05	7.8	-	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05

Footnotes:

All values in ug/L unless otherwise noted.

Tables should be read in conjunction with the accompanying document.

MDL = Minimum Dection Limit Indicates. Also known as laboratory method detection limit.

- Chemical not analyzed or criteria not defined.

NOTES:

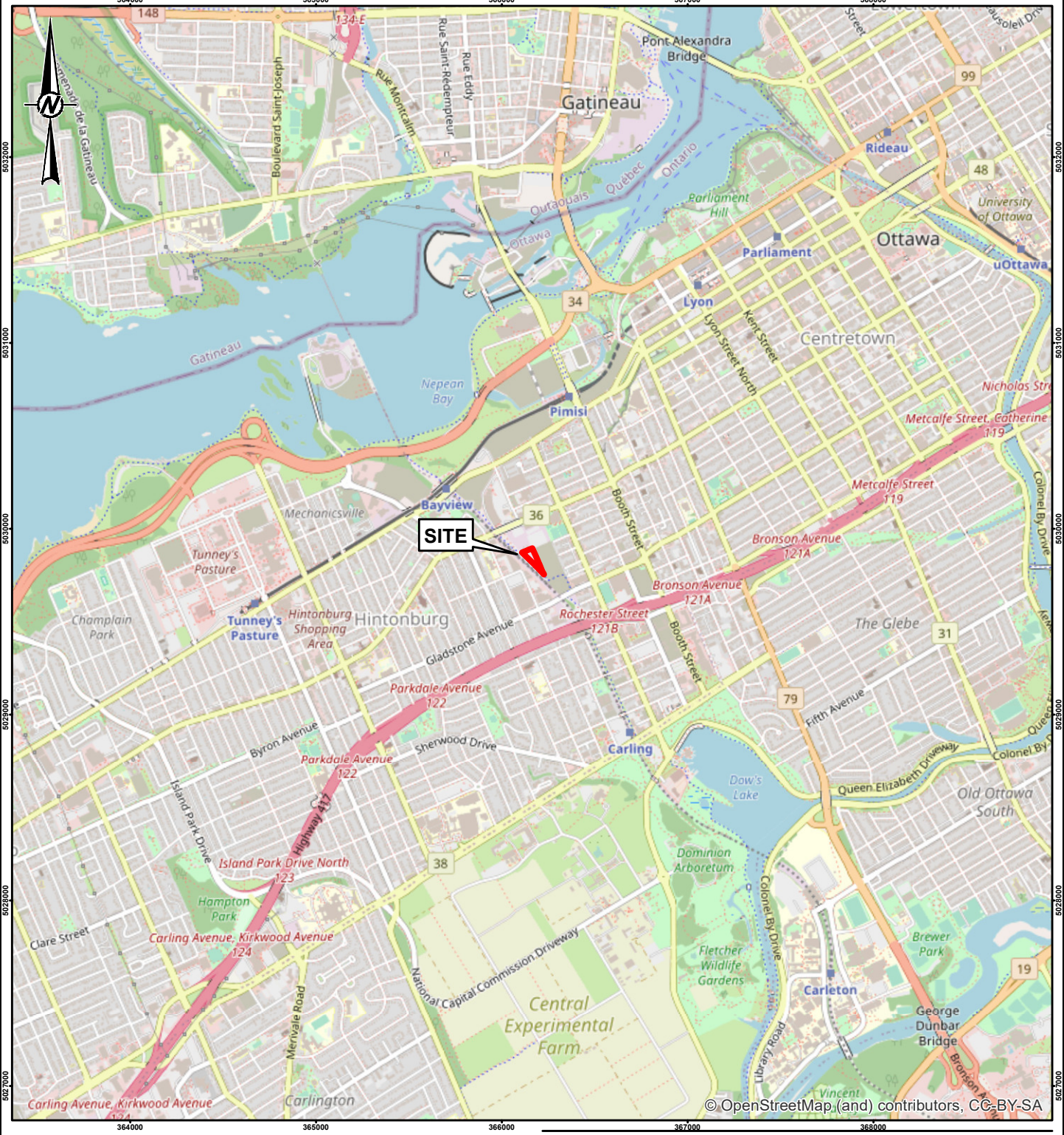
(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, All Types of Property Use, Coarse grained soil

(2) Bold and underlined font indicates an exceedence of MOE Table 3 Standards

(3) The methyl naphthalene standards are applicable to both 1-methyl naphthalene and 2-methyl naphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

(4) PAH and PCB samples were collected in 08/11-2021.

Figures



0 250 500 1,000

1:30,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: MTM ZONE 9 VERTICAL DATUM: CGVD28

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
KEY PLAN

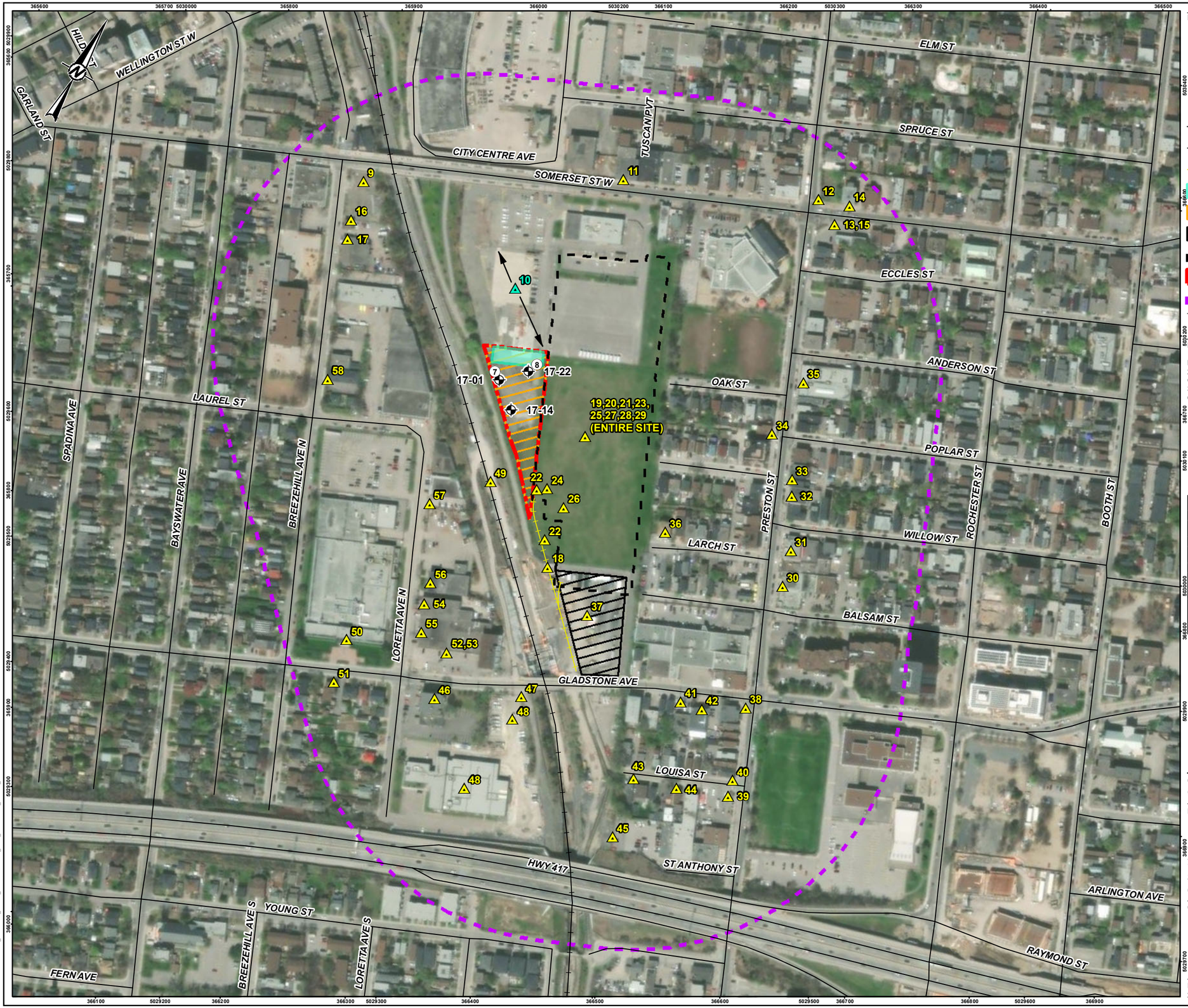
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-10
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: N:\Active\Spatial_IM\OCH\693_Gladstone_Ave\99_PRO\21470873_OCH_Envir\0002_Phase II_ESA\21470873-0002-HS-0001.mxd



LEGEND

- PCA NOT RESULTING IN APEC FOR THE SITE
- OFF-SITE PCA RESULTING IN APEC FOR THE SITE
- APEC LOCATION
- APPROXIMATE MONITORING WELL LOCATION
- ROADWAY
- RAILWAY
- PCA 18 - FORMER RAILWAY
- APEC 9 - RESULTING FROM OFF-SITE PCA
- LOCATION OF APEC 1, 2, 3, 4A, 4B, 4C, 5, 6 (ENTIRE SITE)
- PCA 37 - CONSTRUCTION YARD
- FORMER WAREHOUSE BUILDING FOOTPRINT
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. SERVICE LAYER CREDITS: SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

APEC #	Description
1	Former on-Site rail tracks as well as rail line adjacent to the west.
2	Fill added following 2015 demolition. Layer of fill was also identified across Site prior to demolition, which included waste products. Fill origin unknown.
3	Former lumber yard on-Site.
4a,4b,4c	Site used as Central Ordnance Depot for 50 years including storage of (a) oil (b) munitions and assorted military stores and (c) paints.
5	Waste generator codes for petroleum distillates, waste oils and lubricants, light fuels, chemicals, and pharmaceuticals.
6	Numerous fires in the 1950's burned down portions of the depot which may have released contaminants including oil and paint across the property.
7	Dyed Diesel AST.
8	Parking area contains empty bulk liquid totes of unknown sources, 5 buckets (25 L each) marked "Hydraulic Fluid – Must be disposed of" on wooden pallet in paved area, soil piles, asphalt pile, empty drums. Several drums of unknown contents noted in 2001 in maintenance yard immediately adjacent to north.
9	Several drums of unknown contents noted in 2001 in maintenance yard.

0 50 100 200
1:3,500 METRES

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
SITE PLAN AND AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-10-21
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
0 25mm

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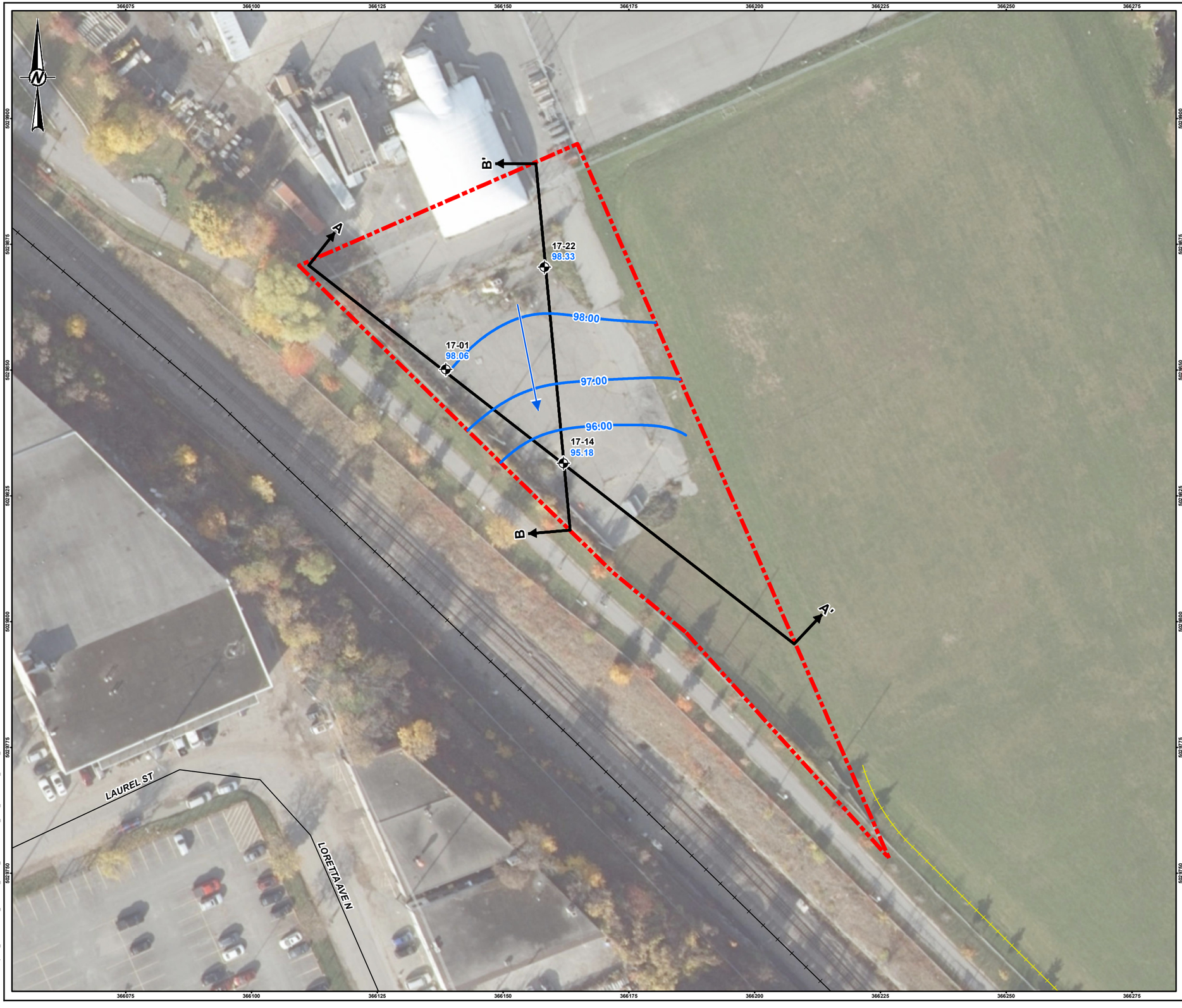
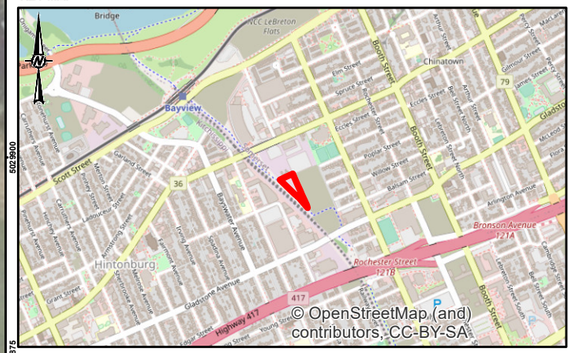


KEY MAP



SCALE 1:25,000

LEGEND

- APPROXIMATE MONITORING WELL LOCATION
- ROADWAY
- RAILWAY
- FORMER RAILWAY
- APPROXIMATE SITE BOUNDARY
- 9999 GROUNDWATER ELEVATION, mASL (August 11, 2021)
- GROUNDWATER ELEVATION CONTOUR, mASL
- INTERPRETED GROUNDWATER FLOW DIRECTION
- A A' CROSS-SECTION LOCATION

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 5 10 20
1:750 METRES

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
GROUNDWATER ELEVATIONS AND INTERPRETED GROUNDWATER FLOW DIRECTION

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	----
PREPARED	JEM/MG
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 25mm

Path: N:\Active\Spatial_IM\OCHC\933_Gladstone_Ave\99_PRO\21470873_OCH_Enviro\0002_Phase\I_ESA\21470873-0002HS-0003.mxd

Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-22 SA3 (2.29-3.05)	26-01-2017	Metals, PAHs, VOCs, and PHCs	None

Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-01 SA4 (3.05-3.81)	26-01-2017	PHCs and BTEX	None

Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-14 SA1 (0-0.76)	26-01-2017	Metals, PAHs, PCB, VOCs, and PHCs	None

17-22

17-01

17-14

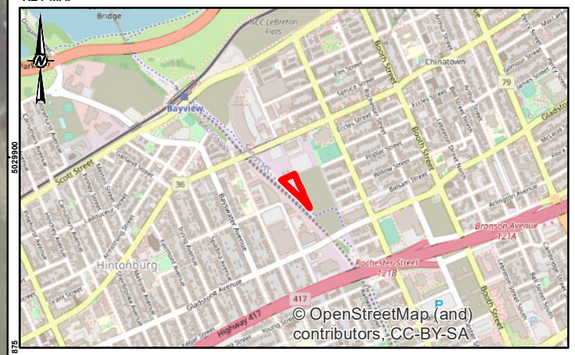
LAUREL ST

LORETTA AVE N

366075 366100 366125 366150 366175 366200 366225 366250 366275

5029900 5029875 5029850 5029825 5029800 5029775 5029750

KEY MAP



SCALE 1:25,000

LEGEND

- APPROXIMATE MONITORING WELL LOCATION
- LOCATION WHERE ALL SAMPLES MEET TABLE 3 STANDARDS
- ROADWAY
- RAILWAY
- FORMER RAILWAY
- APPROXIMATE SITE BOUNDARY

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. THERE ARE NO SOIL EXCEEDANCES TO MECP TABLE 3

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 5 10 20
1:750 METRES

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
SUMMARY OF SOIL ANALYTICAL RESULTS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	---
APPROVED	---

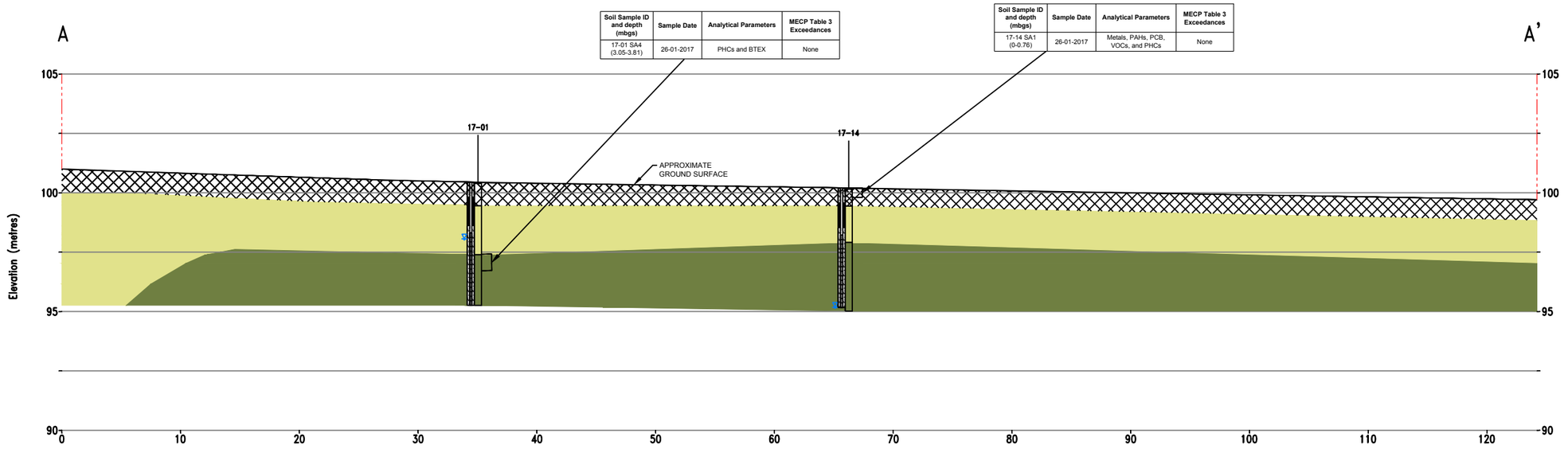
PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	**4A**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
0 25mm

Path: N:\Active\Spatial_IM\OCHC\933_Gladstone_Ave\99_PRO\21470873_OCH_Enviro\0002_Phase II_ESA\21470873-0002-HS-004A.mxd

Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-01 SA4 (3.05-3.81)	26-01-2017	PHCs and BTEX	None

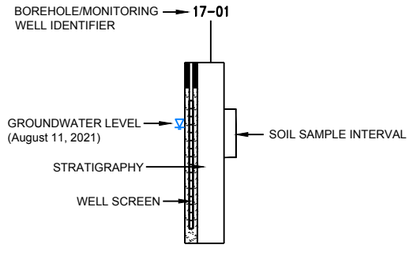
Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-14 SA1 (0-0.76)	26-01-2017	Metals, PAHs, PCB, VOCs, and PHCs	None



STRATIGRAPHY LEGEND

- ASPHALTIC CONCRETE
- FILL
- SANDY CLAY
- CLAY

LEGEND



PHASE TWO SITE BOUNDARY

0 5 10
1:200 VERTICAL METRES

0 10 20
1:400 HORIZONTAL METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 3

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
CROSS-SECTION A-A'
SUMMARY OF SOIL ANALYTICAL RESULTS

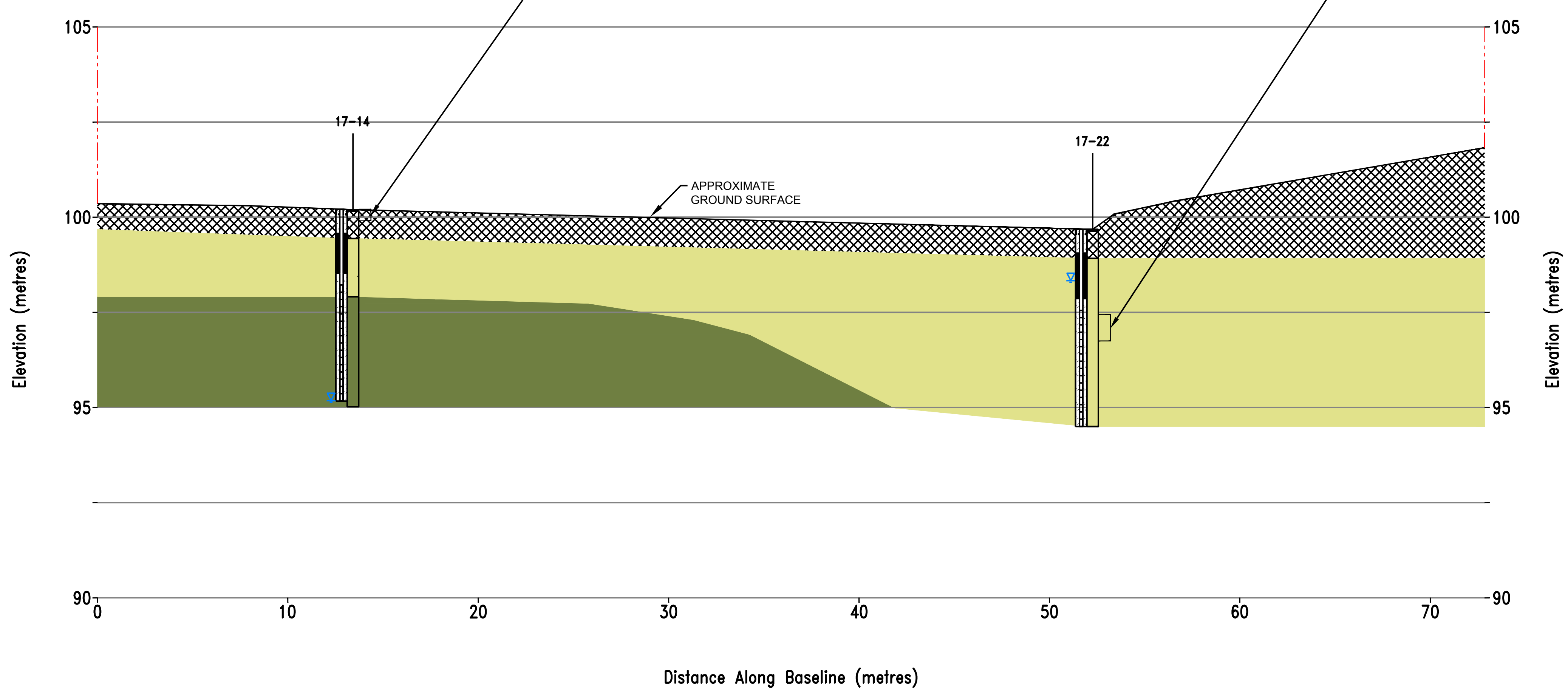
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	####
PREPARED	JEM/MG
REVIEWED	####
APPROVED	####

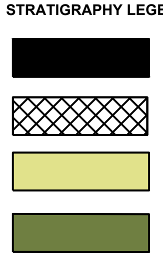
PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	4B

Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-14 SA1 (0-0.76)	26-01-2017	Metals, PAHs, PCB, VOCs, and PHCs	None

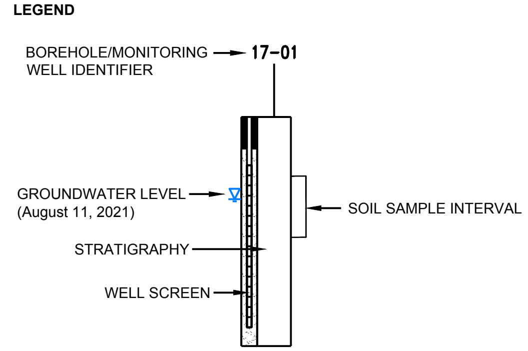
Soil Sample ID and depth (mbgs)	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-22 SA3 (2.29-3.05)	26-01-2017	Metals, PAHs, VOCs, and PHCs	None



STRATIGRAPHY LEGEND



LEGEND



PHASE TWO SITE BOUNDARY

0 2.5 5
1:150 VERTICAL METRES

0 5 10
1:300 HORIZONTAL METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 3

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

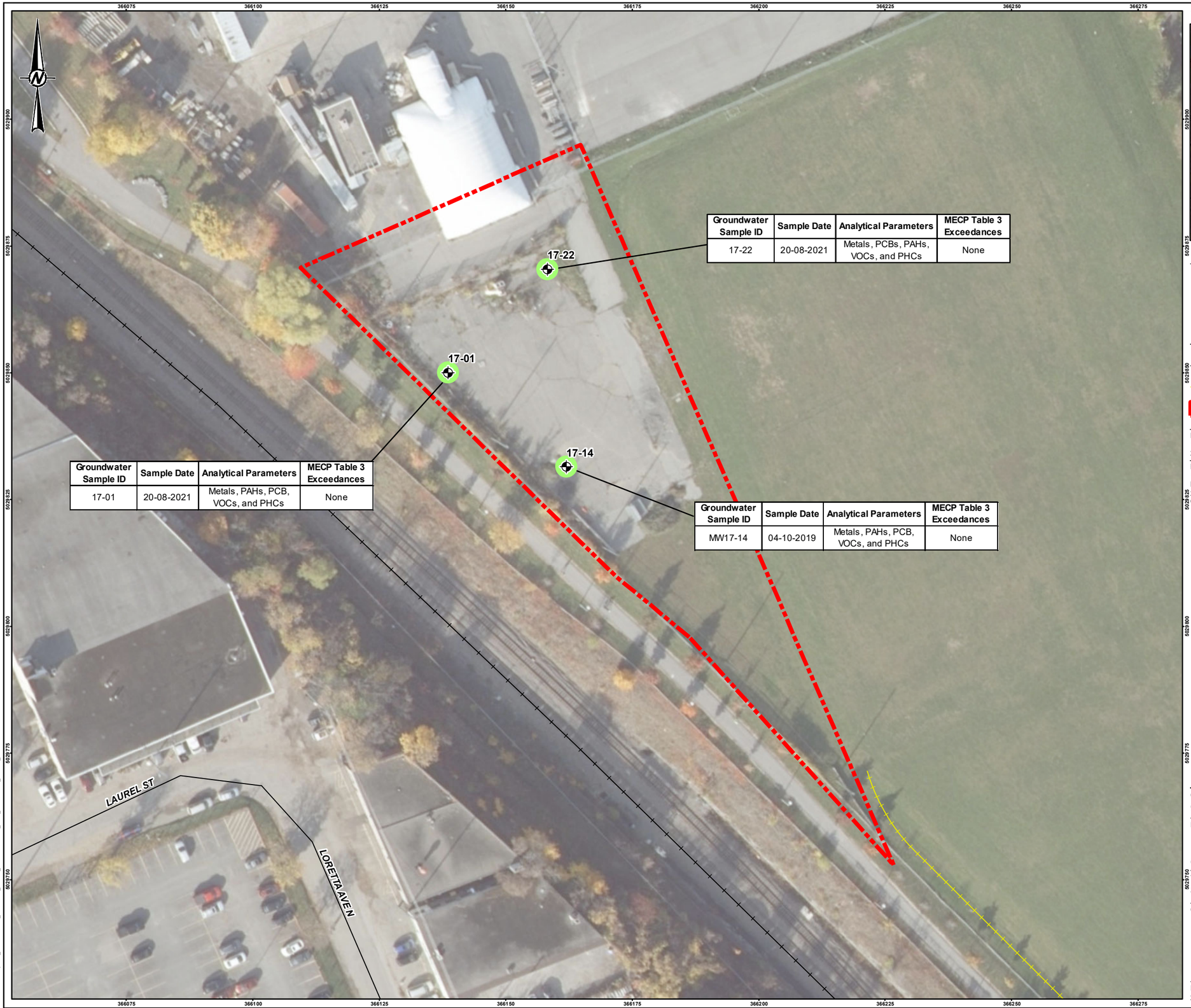
TITLE
CROSS-SECTION B-B'
SUMMARY OF SOIL ANALYTICAL RESULTS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	####
PREPARED	JEM/MG
REVIEWED	####
APPROVED	####

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	4C

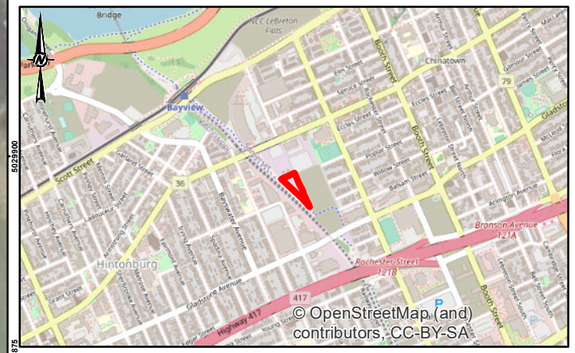


Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-22	20-08-2021	Metals, PCBs, PAHs, VOCs, and PHCs	None

Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-01	20-08-2021	Metals, PAHs, PCB, VOCs, and PHCs	None

Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
MW17-14	04-10-2019	Metals, PAHs, PCB, VOCs, and PHCs	None

KEY MAP



SCALE 1:25,000

LEGEND

- APPROXIMATE MONITORING WELL LOCATION
- LOCATION WHERE ALL SAMPLES MEET TABLE 3 STANDARDS
- ROADWAY
- RAILWAY
- FORMER RAILWAY
- APPROXIMATE SITE BOUNDARY

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. THERE ARE NO GROUNDWATER EXCEEDANCES TO MECP TABLE 3

REFERENCE(S)
1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

0 5 10 20
1:750 METRES

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	---
PREPARED	JEM/MG
REVIEWED	---
APPROVED	---

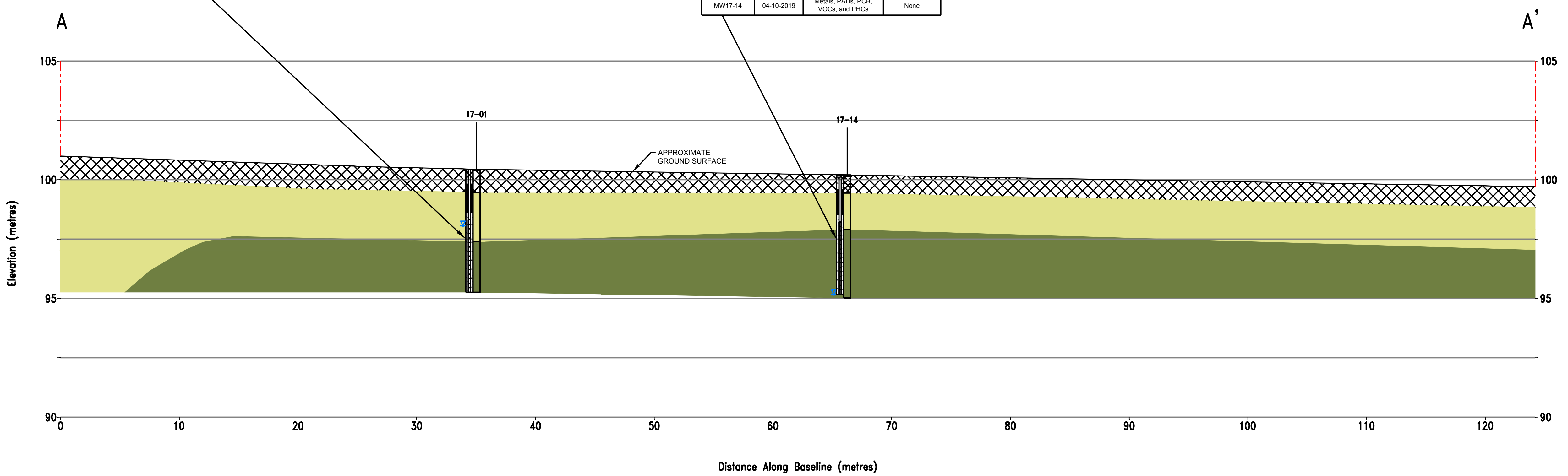
PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	**5A**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm
0

Path: N:\Active\Spatial_IM\OCHC\933_Gladstone_Ave\99_PROJ\21470873_OCH_Enviro\0002_Phase\I_ESA\21470873-0002-HS-005A.mxd

Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-01	20-08-2021	Metals, PAHs, PCB, VOCs, and PHCs	None

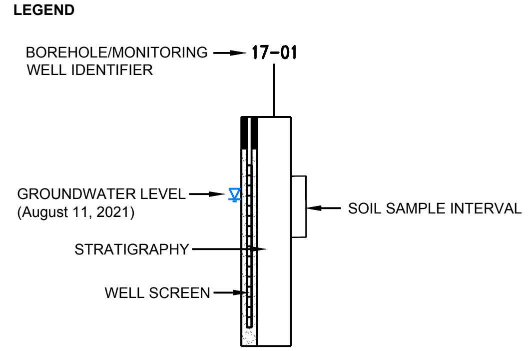
Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
MW17-14	04-10-2019	Metals, PAHs, PCB, VOCs, and PHCs	None



STRATIGRAPHY LEGEND

- ASPHALTIC CONCRETE
- FILL
- SANDY CLAY
- CLAY

LEGEND



PHASE TWO SITE BOUNDARY

0 5 10
1:200 VERTICAL METRES

0 10 20
1:400 HORIZONTAL METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 3

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
CROSS-SECTION A-A'
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

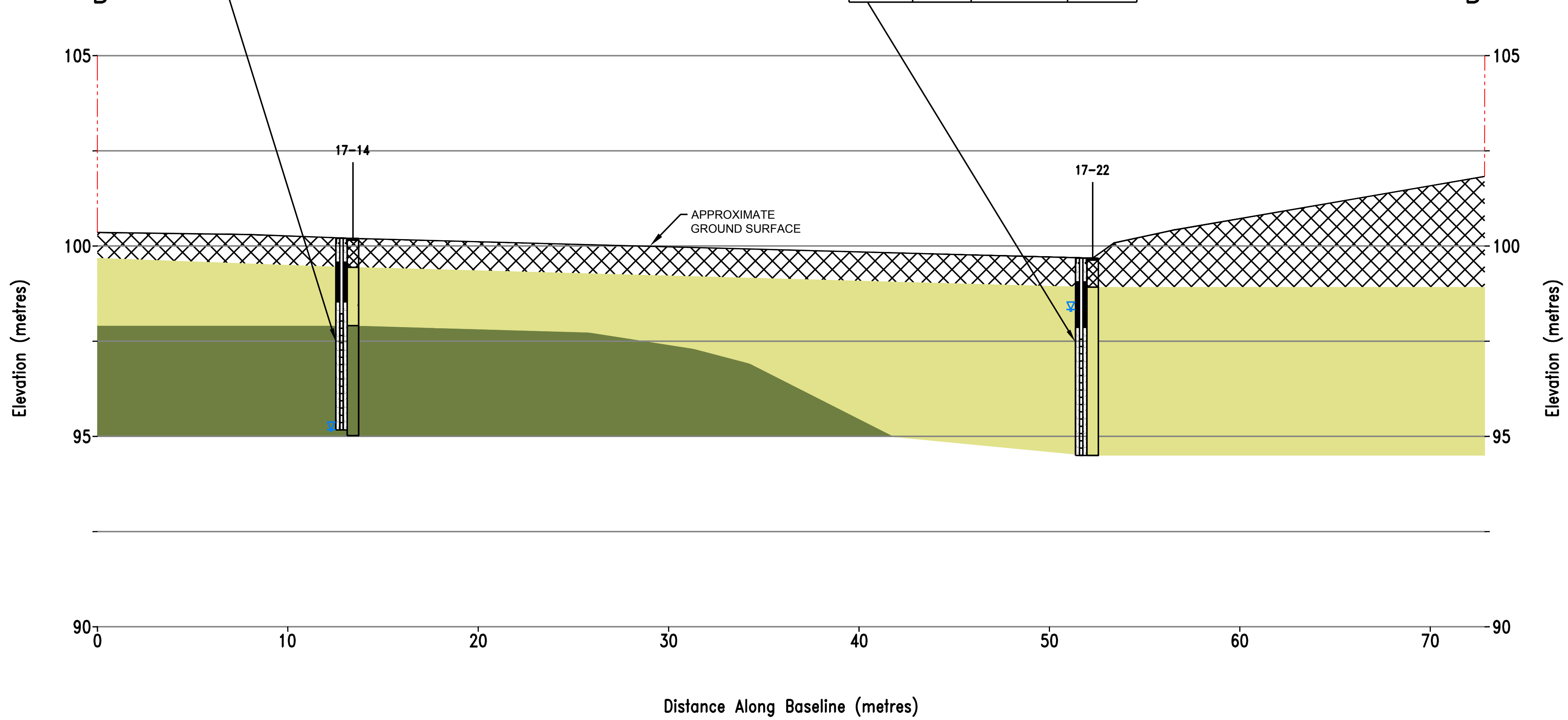
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	####
PREPARED	JEM/MG
REVIEWED	####
APPROVED	####

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	5B

Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
MW17-14	04-10-2019	Metals, PAHs, PCB, VOCs, and PHCs	None

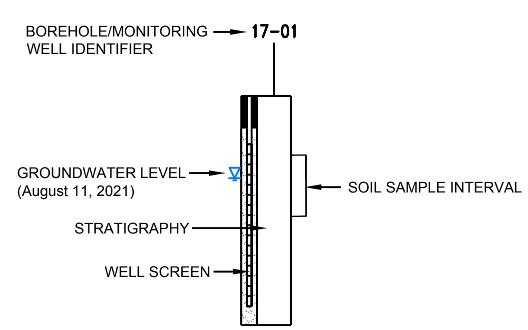
Groundwater Sample ID	Sample Date	Analytical Parameters	MECP Table 3 Exceedances
17-22	20-08-2021	Metals, PCBs, PAHs, VOCs, and PHCs	None



STRATIGRAPHY LEGEND

- ASPHALTIC CONCRETE
- FILL
- SANDY CLAY
- CLAY

LEGEND



PHASE TWO SITE BOUNDARY

0 2.5 5
1:150 VERTICAL METRES

0 5 10
1:300 HORIZONTAL METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. FOR DETAILED STRATIGRAPHY SEE RECORD OF BOREHOLE LOGS
3. FOR CROSS-SECTION LOCATION SEE FIGURE 3

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT FOR NORTHWEST 0.47-HECTARE PARCEL AT 933 GLADSTONE AVE., OTTAWA

TITLE
CROSS-SECTION B-B'
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

CONSULTANT

GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-02-11
DESIGNED	####
PREPARED	JEM/MG
REVIEWED	####
APPROVED	####

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0002	0	5C

APPENDIX A

Plan of Survey

SCHEDULE				
PART	LOT	PLAN	PIN	AREA(SQ. M.)
1	PART OF CHAMPAGNE AVENUE (FORMERLY FIRST AVENUE) (CLOSED BY JUDGE'S ORDER, INST. NO. LT1402120)	73	PART OF 04107-0035	2431.8
2	PART OF LAUREL STREET (CLOSED BY JUDGE'S ORDER, INST. NO. LT1402120)		PART OF 04107-0033	106.0
3	PART OF OAK STREET (CLOSED BY JUDGE'S ORDER, INST. NO. LT1402120)		PART OF 04107-0031	730.3

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE Jan. 20, 2021

GREGORY J. HARTWICK
ONTARIO LAND SURVEYOR

PLAN 4R- 33454
RECEIVED AND DEPOSITED

DATE JAN 20 2021

REPRESENTATIVE FOR
LAND REGISTRAR FOR THE LAND TITLES
DIVISION OF OTTAWA-CARLETON No. 4

PLAN OF SURVEY OF

PART OF CHAMPAGNE AVENUE (FORMERLY FIRST AVENUE) (CLOSED BY JUDGE'S ORDER INST. No. LT1402120) PART OF OAK STREET (CLOSED BY JUDGE'S ORDER INST. No. LT1402120) AND PART OF LAUREL STREET (CLOSED BY JUDGE'S ORDER INST. NO. LT1402120) REGISTERED PLAN 73 CITY OF OTTAWA

SCALE - 1 : 250

5 0 5 10
(METRES)

SOMERSET STREET
(FORMERLY CEDAR STREET)

LORETTA AVENUE
(FORMERLY SECOND AVENUE)
PART 1, PLAN 4R-989

EAST OF LORETTA AVENUE

BLOCK B
REGISTERED PLAN 73

WEST OF CHAMPAGNE AVENUE

SOUTH OF SOMERSET STREET

NORTH OF OAK STREET

SOUTH OF OAK STREET

OAK STREET
(CLOSED BY JUDGE'S ORDER, INST. CR574103)

NORTH OF LAUREL STREET

LAUREL STREET
(CLOSED BY JUDGE'S ORDER, INST. CR574103)

SOUTH OF LAUREL STREET

LAUREL STREET
(CLOSED BY JUDGE'S ORDER, INST. NO.LT1402120)

NORTH OF LARCH STREET

SOUTH OF LARCH STREET

LARCH STREET
(FORMERLY PINE STREET)

LAUREL STREET

LOT 1 · LOT 5 · LOT 6 · LOT 7 · LOT 8 · LOT 9 · LOT 10 · LOT A · LOT B · LOT C · LOT 5A · LOT 5B

BLOCK 115 REGISTERED PLAN 13

BLOCK 122 REGISTERED PLAN 73

BLOCK C REGISTERED PLAN 3

CONCESSION 1 (OTTAWA FRONT)

TRILLIUM RAIL CORRIDOR

PART 1 · PART 2 · PART 3 OAK STREET (CLOSED BY JUDGE'S ORDER, INST. NO.LT1402120) PART 5, PLAN 4R-31143

PART 2, PLAN 4R-28807

SUBJECT TO AN EASEMENT AS IN INST. CR607830
PART 2, PLAN 4R-31143

PART 4, PLAN 4R-28807

PART 10, PLAN 4R-28806

PART 9, PLAN 4R-28806

PART 3, PLAN 4R-28806

PART 4, PLAN 4R-28806

PART 5, PLAN 4R-28806

PART 6, PLAN 4R-28806

PART 7, PLAN 4R-28806

PART 8, PLAN 4R-28806

PART 4, PLAN 4R-989

PART 6, PLAN 4R-31143

PART 7, PLAN 4R-31143

PART 8, PLAN 4R-31143

PART 9, PLAN 4R-31143

PART 10, PLAN 4R-31143

PART 11, PLAN 4R-31143

PART 12, PLAN 4R-31143

PART 13, PLAN 4R-31143

PART 22, PLAN 4R-31143

PART 5, PLAN 4R-28807

PIN 04107-0030 · PIN 04107-0031 · PIN 04107-0032 · PIN 04107-0033 · PIN 04107-0035 · PIN 04107-0024 · PIN 04107-0288 · PIN 04107-0289

SOUTHEASTERLY CORNER OF LOT 1 NORTH OAK STREET BLOCK B REGISTERED PLAN 73

ORP A · ORP B

CHAIN LINK FENCE

METRIC

DISTANCES AND COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

COORDINATES WERE DERIVED FROM GPS OBSERVATIONS USING THE CAN-NET 2016 REAL TIME NETWORK AND ARE REFERENCED TO SPECIFIED CONTROL POINTS 19680105 AND 19680091, MTM ZONE 9 (76°30' WEST LONGITUDE) NAD-83 (ORIGINAL)

COORDINATE VALUES ARE TO URBAN ACCURACY IN ACCORDANCE WITH O.REG. 216/10.

ID#	NORTHING	EASTING
SCP 19680105	5024915.159	373971.649
SCP 19680091	5017606.945	367372.338
ORP A	5029886.85	366146.29
ORP B	5029826.64	366194.47

CAUTION

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

NOTES AND LEGEND

BEARINGS ARE GRID, DERIVED FROM GPS OBSERVATIONS USING THE CAN-NET 2016 REAL TIME NETWORK, ON OBSERVED REFERENCE POINTS A AND B, SHOWN HEREON, AND ARE REFERENCED TO SPECIFIED CONTROL POINTS 19680105 AND 19680091, MTM ZONE 9 (76°30' WEST LONGITUDE) NAD-83 (ORIGINAL).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99993677.

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT PLANTED
SIB	DENOTES STANDARD IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
IB	DENOTES IRON BAR
CP	DENOTES CONCRETE PIN
WIT	DENOTES WITNESS
P1	DENOTES PLAN 4R-31143
P2	DENOTES PLAN 4R-28806
P3	DENOTES PLAN 4R-989
M	DENOTES MEASURED
S	DENOTES SET
(SG)	DENOTES STANTEC GEOMATICS LTD. O.L.S.
(SU)	DENOTES SOURCE UNKNOWN
ORP ID#	DENOTES OBSERVED REFERENCE POINT IDENTIFICATION NUMBER
CLF	DENOTES CHAIN LINK FENCE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

2. THE SURVEY WAS COMPLETED ON THE 23 DAY OF DECEMBER , 2020.

Jan. 20, 2021
DATE

GREGORY J. HARTWICK
ONTARIO LAND SURVEYOR

Ottawa

PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT
SURVEYS & MAPPING BRANCH

PROJECT : 933 GLADSTONE AVE.	FIELD WORK BY : D.COX
CALC'D BY : Q.CHEN	PROJECT NO. 18528P001
C.A.D. BY : Q.CHEN	MS NO. 18528P001-Rplan.dgn
CHECKED BY : G.J.HARTWICK	DATE : DEC 23, 2020

APPENDIX B

Non-Potable Notification

October 4, 2021 Project No. 21470873

Michel Kearney, P.Geo., Senior Hydrogeologist - Asset Management
City of Ottawa
Ottawa City Hall
110 Laurier Avenue West,
Ottawa, ON K1P 1J1

NOTIFICATION OF INTENT TO USE NON-POTABLE GROUNDWATER SITE CONDITON STANDARDS FOR RECORD OF SITE CONDITON FOR THE PROPERTY LOCATED AT 933 GLADSTONE AVENUE, OTTAWA, ONTARIO

Dear Mr. Kearney

Golder Associates Ltd. (Golder) was retained by Ottawa Community Housing Corporation to conduct a Phase Two Environmental Site Assessment (ESA) for a portion of the property located at located at 933 Gladstone Avenue (Site or Phase Two Property). The location of the Phase Two Property is shown on **Figure 1.**

On behalf of Ottawa Community Housing Corporation, Golder is submitting this letter to the City of Ottawa as a formal notification of intent to apply non-potable groundwater Site Condition Standards for the above noted site for the purposes of filing a Record of Site Condition under Ontario Regulation 153/04, Records of Site Condition Under Part XV.1 of the *Environmental Protection Act.* Provision of written notice to the municipality is a requirement of Ontario Regulation 153/04.

If you have any questions or comments, please feel free to contact the undersigned.

Yours truly,

Golder Associates Ltd.

Eric Wilson, P.Eng., QPESA
Senior Environmental Engineer

CW/EW

Attachments: Figure 1

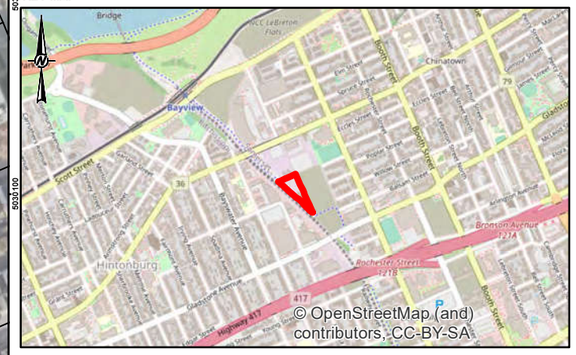
Golder Associates Ltd.
1931 Robertson Road Ottawa, Ontario, K2H 5B7 Canada T: +1 613 592 9600 +1 613 592 9601

365800 365900 366000 366100 366200 366300 366400 366500 366600

5030200 5030100 5030000 5029900 5029800 5029700 5029600 5029500

ELM ST
SPRUCE ST
TUSCAN PVT
ECCLES ST
ANDERSON ST
ROCHESTER ST
BAYVIEW RD
WELLINGTON ST W
CITY CENTRE AVE
SOMERSET ST W
POPLAR ST
OAK ST
WILLOW ST
LARCH ST
PRESTON ST
BALSAM ST
BAYSWATER AVE
BREEZEHILL AVE N
LAUREL ST
SPADINA AVE
LORETTA AVE N
GLADSTONE AVE
LOUISA ST
ST ANTHONY ST
HWY 417
YOUNG ST
IRVING AVE

KEY MAP



SCALE 1:25,000

LEGEND

- ROADWAY
- RAILWAY
- FORMER RAILWAY
- PHASE I SITE
- PHASE I STUDY AREA

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. LAND INFORMATION ONTARIO (LIO) DATA PRODUCED BY GOLDER ASSOCIATES LTD. UNDER LICENCE FROM ONTARIO MINISTRY OF NATURAL RESOURCES, © QUEENS PRINTER 2020
2. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: MTM ZONE 9, VERTICAL DATUM: CGVD28

DRAFT

0 30 60 120
1:3,000 METRES

CLIENT
OTTAWA COMMUNITY HOUSING CORPORATION

PROJECT
PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE
PART OF 933 GLADSTONE AVE., OTTAWA, ONTARIO

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-08-26
DESIGNED	---
PREPARED	JEM
REVIEWED	---
APPROVED	---

PROJECT NO.	CONTROL	REV.	FIGURE
21470873	0001	A	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
25mm
0

Path: N:\Active\Spatial_IM\OCHC\933_Gladstone_Ave\99_PRO\21470873_OCH_Enviro\0001_Phase1_ESA\21470873-0001-H15-0001.mxd

APPENDIX C

Sampling and Analysis Plan

Appendix C
SAMPLING AND ANALYSIS PLAN
Northwest 0.47-Hectare Parcel at 933 Gladstone Avenue, Ottawa, ON

Area of Potential Environmental Concern	Rationale	Location	Borehole Location ID	Well Installed (Y/N)	Depth & Screen Length	Soil Samples[1]	Groundwater Samples[2]
APEC 1 - Former on-Site and adjacent rail tracks APEC 2 - Footprint of demolished warehouse built up with unknown fill after demolition. Layers of fill identified across Site prior to demolition as well which contained waste products. APEC 3 - Former lumber yard on-Site APEC 4 - Former paint, oil, munitions, and assorted military bulk storage. APEC 5 - Waste generator codes for petroleum distillates, waste oils and lubricants, light fuels, chemicals, and pharmacuticals. APEC 6 - Numerous fires in the 1950s bunred portions of warehouse building which may have release contamination.	BH17-01, BH17-14 and BH17-22 are meant to geosptially span and represent the entire Site. The boreholes and monitoring wells are to assess potential soil and groundwater impacts related the APECs whose location is either unknown or non-specific and span the entire Site.	Northwest portion of the Site, within the storage area.	BH17-01	Y	5.18 m – 3.05 m long screen	One soil sample selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHC and BTEX.	Groundwater sample will be analyzed for PHC/BTEX.
		Middle portion of the Site, near southern edge of storage area.	BH17-14	Y	5.18 m – 3.05 m long screen	One soil sample selected from each of the eight boreholes based on field screening measurements and/or estimated depth of contamination. Submitted for: Metals, PAHs, PCB, VOCs, and PHCs.	Groundwater sample will be analyzed for Metals, PAHs, PCB, VOCs, and PHCs.
		Located in the north portion of the Site within the storage yard.	BH17-22	Y	5.18 m – 3.05 m long screen	One soil sample selected from the borehole based on field screening measurements and/or estimated depth of contamination. Submitted for: Metals, PAHs, VOCs, and PHCs.	Groundwater sample will be analyzed for Metals, PAHs, VOCs, and PHCs.
APEC 7 - Dyed diesel AST	Borehole completed with a monitoring well to assess potential soil and groundwater impacts related to the presence of the on-Site dyed diesel AST.	Northwest portion of the Site within a few meters of the tank.	BH17-01	Y	5.18 m – 3.05 m long screen	One soil sample selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHC and BTEX.	Groundwater sample will be analyzed for PHC/BTEX.
APEC 8 - Bulk liquid totes of unknown origin along with five 25 L hydraulic fluid buckets. Soil piles, asphalt piles, empty drums, and several drums of unknown contents.	Borehole comepleted with monitoring well to assess potential groundwater impacts related to the presence of the miscellaneous potential contaminants being stored in the offon-Site yard.	Located in the north portion of the Site within the storage yard.	BH17-22	Y	5.18 m – 3.05 m long screen	One soil sample selected from the borehole based on field screening measurements and/or estimated depth of contamination. Submitted for: Metals, PAHs, VOCs, and PHCs.	Groundwater sample will be analyzed for Metals, PAHs, VOCs, and PHCs.
APEC 9 - Several drums of unknown contents in maintenance yard to north.	Boreholes comepleted with monitoring wells to assess potential groundwater impacts related to the presence of the miscellaneous potential contaminants being stored in the off-Site maintenance yard.	North portion of the Site adjacent to, and down gradient from, off-site storage yard	BH17-01 BH17-22	Y Y	5.18 m – 3.05 m long screen 5.18 m – 3.05 m long screen	N/A	Groundwater sample will be analyzed for Metals, PAHs, VOCs, BTEX and/or PHCs.

1: One (1)duplicate soil sample from one of the boreholes will be submitted for quality assurance purposes of all parameters.
2: One (1) duplicate groundwater sample from one of the wells will be submitted for quality assurance purposes of all parameters.

APPENDIX D

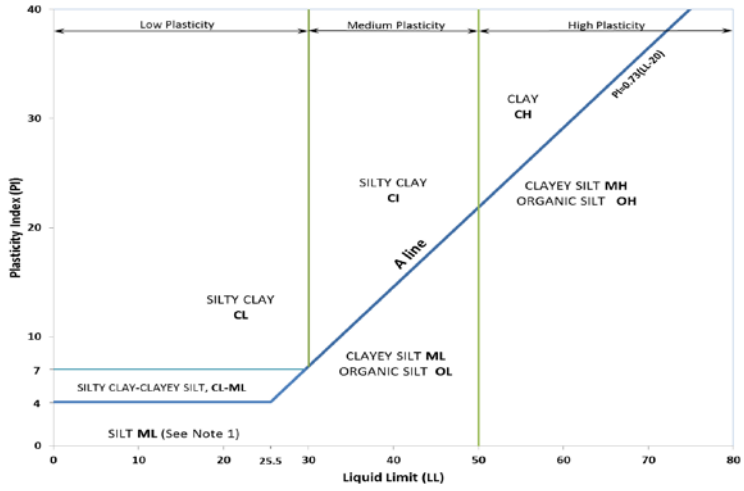
Record of Borehole

METHOD OF SOIL CLASSIFICATION

The Golder Associates Ltd. Soil Classification System is based on the Unified Soil Classification System (USCS)

Organic or Inorganic	Soil Group	Type of Soil		Gradation or Plasticity	$Cu = \frac{D_{60}}{D_{10}}$	$Cc = \frac{(D_{30})^2}{D_{10} x D_{60}}$	Organic Content	USCS Group Symbol	Group Name
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with ≤12% fines (by mass)	Poorly Graded	<4	≤1 or ≥3	≤30%	GP	GRAVEL
				Well Graded	≥4	1 to 3		GW	GRAVEL
			Gravels with >12% fines (by mass)	Below A Line	n/a			GM	SILTY GRAVEL
				Above A Line	n/a			GC	CLAYEY GRAVEL
		SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with ≤12% fines (by mass)	Poorly Graded	<6	≤1 or ≥3		SP	SAND
				Well Graded	≥6	1 to 3		SW	SAND
			Sands with >12% fines (by mass)	Below A Line	n/a			SM	SILTY SAND
				Above A Line	n/a			SC	CLAYEY SAND

Organic or Inorganic	Soil Group	Type of Soil	Laboratory Tests	Field Indicators					Organic Content	USCS Group Symbol	Primary Name
				Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)			
INORGANIC (Organic Content ≤30% by mass)	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	SILTS (Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)	Liquid Limit <50	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
				Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SILT
				Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
			Liquid Limit ≥50	Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	MH	CLAYEY SILT
				None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	OH	ORGANIC SILT
		CLAYS (PI and LL plot above A-Line on Plasticity Chart below)	Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0% to 30% **(see Note 2)**	CL	SILTY CLAY
			Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium		CI	SILTY CLAY
			Liquid Limit ≥50	None	High	Shiny	<1 mm	High		CH	CLAY
HIGHLY ORGANIC SOILS (Organic Content >30% by mass)		Peat and mineral soil mixtures							30% to 75%	PT	SILTY PEAT, SANDY PEAT
		Predominantly peat, may contain some mineral soil, fibrous or amorphous peat							75% to 100%		PEAT



Note 1 – Fine grained materials with PI and LL that plot in this area are named (ML) SILT with slight plasticity. Fine-grained materials which are non-plastic (i.e. a PL cannot be measured) are named SILT.
Note 2 – For soils with <5% organic content, include the descriptor "trace organics" for soils with between 5% and 30% organic content include the prefix "organic" before the Primary name.

Dual Symbol — A dual symbol is two symbols separated by a hyphen, for example, GP-GM, SW-SC and CL-ML.
For non-cohesive soils, the dual symbols must be used when the soil has between 5% and 12% fines (i.e. to identify transitional material between "clean" and "dirty" sand or gravel.
For cohesive soils, the dual symbol must be used when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart (see Plasticity Chart at left).

Borderline Symbol — A borderline symbol is two symbols separated by a slash, for example, CL/CI, GM/SM, CL/ML.
A borderline symbol should be used to indicate that the soil has been identified as having properties that are on the transition between similar materials. In addition, a borderline symbol may be used to indicate a range of similar soil types within a stratum.

ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

Soil Constituent	Particle Size Description	Millimetres	Inches (US Std. Sieve Size)
BOULDERS	Not Applicable	>300	>12
COBBLES	Not Applicable	75 to 300	3 to 12
GRAVEL	Coarse Fine	19 to 75 4.75 to 19	0.75 to 3 (4) to 0.75
SAND	Coarse Medium Fine	2.00 to 4.75 0.425 to 2.00 0.075 to 0.425	(10) to (4) (40) to (10) (200) to (40)
SILT/CLAY	Classified by plasticity	<0.075	< (200)

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (*i.e.,* SAND and GRAVEL)
> 12 to 35	Primary soil name prefixed with "gravelly, sandy, SILTY, CLAYEY" as applicable
> 5 to 12	some
≤ 5	trace

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.). Values reported are as recorded in the field and are uncorrected.

Cone Penetration Test (CPT)

An electronic cone penetrometer with a 60° conical tip and a project end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and sleeve frictions are recorded electronically at 25 mm penetration intervals.

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH: Sampler advanced by hydraulic pressure
PM: Sampler advanced by manual pressure
WH: Sampler advanced by static weight of hammer
WR: Sampler advanced by weight of sampler and rod

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond Drilling
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
GS	Grab Sample
MC	Modified California Samples
MS	Modified Shelby (for frozen soil)
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size (Shelby tube)
TP	Thin-walled, piston – note size (Shelby tube)
WS	Wash sample

SOIL TESTS

w	water content
PL , w_p	plastic limit
LL , w_L	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test[1]
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	relative density (specific gravity, Gs)
DS	direct shear test
GS	specific gravity
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO_4	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V (FV)	field vane (LV-laboratory vane test)
γ	unit weight

1. Tests anisotropically consolidated prior to shear are shown as CAD, CAU.

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

Term	SPT 'N' (blows/0.3m)[1]
Very Loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	>50

1. SPT 'N' in accordance with ASTM D1586, uncorrected for the effects of overburden pressure.
2. Definition of compactness terms are based on SPT 'N' ranges as provided in Terzaghi, Peck and Mesri (1996). Many factors affect the recorded SPT 'N' value, including hammer efficiency (which may be greater than 60% in automatic trip hammers), overburden pressure, groundwater conditions, and grainsize. As such, the recorded SPT 'N' value(s) should be considered only an approximate guide to the soil compactness. These factors need to be considered when evaluating the results, and the stated compactness terms should not be relied upon for design or construction.

Field Moisture Condition

Term	Description
Dry	Soil flows freely through fingers.
Moist	Soils are darker than in the dry condition and may feel cool.
Wet	As moist, but with free water forming on hands when handled.

COHESIVE SOILS

Consistency

Term	Undrained Shear Strength (kPa)	SPT 'N'[1,2] (blows/0.3m)
Very Soft	<12	0 to 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	>200	>30

1. SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.
2. SPT 'N' values should be considered ONLY an approximate guide to consistency; for sensitive clays (e.g., Champlain Sea clays), the N-value approximation for consistency terms does NOT apply. Rely on direct measurement of undrained shear strength or other manual observations.

Water Content

Term	Description
w < PL	Material is estimated to be drier than the Plastic Limit.
w ~ PL	Material is estimated to be close to the Plastic Limit.
w > PL	Material is estimated to be wetter than the Plastic Limit.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$	x or log x, logarithm of x to base 10
g	acceleration due to gravity
t	time

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta\sigma$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
υ	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
$\sigma_1, \sigma_2, \sigma_3$	principal stress (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_l or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity index = $(w_l - w_p)$
NP	non-plastic
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_C	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (over-consolidated range)
C_s	swelling index
C_α	secondary compression index
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
c_h	coefficient of consolidation (horizontal direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	over-consolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3)/2$
p′	mean effective stress $(\sigma'_1 + \sigma'_3)/2$
q	$(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1 $\tau = c' + \sigma' \tan \phi'$

2 shear strength = (compressive strength)/2

PROJECT: 1670949

RECORD OF BOREHOLE: 17-01

SHEET 1 OF 1

LOCATION: N 5028292.0 ;E 443935.0

BORING DATE: January 30, 2017

DATUM: CGVD28

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* (2 4 6 8) / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		100.44						
0		ASPHALTIC CONCRETE		0.05						
		Grey SILTY CLAY			1	DP	-	⊕		Flush Mount Casing; Silica Sand
				99.45						
1		Grey SANDY CLAY		0.99						Bentonite Seal
					2	DP	-	⊕		
2	Geoprobe Direct Push									Silica Sand
					3	DP	-	⊕		
3				97.39						
		Grey CLAY		3.05						
					4	DP	-	⊕		51 mm Diam. PVC #10 Slot Screen
4					5	DP	-	⊕		
					6	DP	-	⊕		
5				95.26						
		End of Borehole		5.18						W.L. in Screen at Elev. 97.26 m on February 6, 2017
6										
7										
8										
9										
10										

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: ALB

CHECKED: EDW

MIS-BHS 001 1670949.GPJ GAL-MIS.GDT 03/21/17 JEM

PROJECT: 1670949

RECORD OF BOREHOLE: 17-14

SHEET 1 OF 1

LOCATION: N 5028273.0 ;E 443958.0

BORING DATE: January 25, 2017

DATUM: CGVD28

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected (2 4 6 8) ⊕ / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected (20 40 60 80) □	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		100.20						
0	Geoprobe Direct Push	ASPHALTIC CONCRETE		0.05						Flush Mount Casing
		Brown SILTY SAND (FILL)			1	DP	-	⊕		Silica Sand
				99.44						
1		Grey SANDY CLAY		0.76						Bentonite Seal
					2	DP	-	⊕		Silica Sand
2				97.91						
		Grey CLAY		2.29	3	DP	-	⊕		
3					4	DP	-	⊕		51 mm Diam. PVC #10 Slot Screen
4					5	DP	-	⊕		▽
					6	DP	-	⊕		
5				95.02						
		End of Borehole		5.18						W.L. in Screen at Elev. 96.01 m on February 6, 2017
6										
7										
8										
9										
10										

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: ALB

CHECKED: EDW

MIS-BHS 001 1670949.GPJ GAL-MIS.GDT 03/21/17 JEM

PROJECT: 1670949

RECORD OF BOREHOLE: 17-22

SHEET 1 OF 1

LOCATION: N 5028312.0 ;E 443955.0

BORING DATE: January 25, 2017

DATUM: CGVD28

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected ⊕	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected □	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT PERCENT	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		99.68								
0	Geoprobe Direct Push	ASPHALTIC CONCRETE		0.05								Flush Mount Casing
		Brown SANDY CLAY (FILL)		99.20	1	DP	-	⊕				Silica Sand
		Brown SILTY SAND (FILL)		0.48 98.92								
1		Grey SANDY CLAY		0.76								Bentonite Seal
					2	DP	-	⊕				Silica Sand
2					3	DP	-		16.5 ⊕			
3					4	DP	-		⊕			
												51 mm Diam. PVC #10 Slot Screen
4												
					5	DP	-	⊕				
5				94.50								
		End of Borehole		5.18								W.L. in Screen at Elev. 97.68 m on February 6, 2017
6												
7												
8												
9												
10												

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected: 2, 4, 6, 8

HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected: 20, 40, 60, 80

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

WATER CONTENT PERCENT: Wp — W — Wl; 20, 40, 60, 80

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: ALB

CHECKED: EDW

MIS-BHS 001 1670949.GPJ GAL-MIS.GDT 03/21/17 JEM

APPENDIX E

Certificates of Analysis

Your Project #: 1670949
Your C.O.C. #: 595611-01-01

Attention:Joanne Woodhouse

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
K2H 5B7

Report Date: 2017/02/06
Report #: R4351094
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B718928
Received: 2017/01/27, 14:50

Sample Matrix: Soil
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	9	N/A	2017/02/06	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron (1)	9	2017/02/01	2017/02/02	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum (1)	9	N/A	2017/02/02		EPA 8260C m
Hexavalent Chromium in Soil by IC (1, 2)	9	2017/02/01	2017/02/02	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (1, 3)	1	N/A	2017/01/31	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (1, 4)	10	2017/02/01	2017/02/01	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS (1)	9	2017/02/01	2017/02/01	CAM SOP-00447	EPA 6020B m
Moisture (1)	10	N/A	2017/02/01	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	9	2017/02/01	2017/02/03	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Soil (1)	1	2017/01/31	2017/01/31	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Soil (1)	7	2017/01/31	2017/02/01	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs (1)	9	N/A	2017/02/01	CAM SOP-00230	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 1670949
Your C.O.C. #: 595611-01-01

Attention:Joanne Woodhouse

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
K2H 5B7

Report Date: 2017/02/06
Report #: R4351094
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B718928
Received: 2017/01/27, 14:50

(1) This test was performed by Maxxam Analytics Mississauga
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(4) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Madison Bingley, Project Manager
Email: MBingley@maxxam.ca
Phone# (613)274-3549

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 METALS PACKAGE (SOIL)

Maxxam ID		DVD670	DVD671	DVD672	DVD673	DVD673		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-17 SA3	17-15 SA2	17-11 SA1	17-13 SA4	17-13 SA4 Lab-Dup	RDL	QC Batch
Inorganics								
Moisture	%	34	26	17	34	34	1.0	4847243
Chromium (VI)	ug/g	0.2	0.2	<0.2	0.2		0.2	4846943
Metals								
Hot Water Ext. Boron (B)	ug/g	0.19	0.17	0.25	0.26		0.050	4846958
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	0.32	<0.20		0.20	4846991
Acid Extractable Arsenic (As)	ug/g	<1.0	1.1	2.4	1.1		1.0	4846991
Acid Extractable Barium (Ba)	ug/g	310	300	180	310		0.50	4846991
Acid Extractable Beryllium (Be)	ug/g	0.77	0.72	0.58	0.72		0.20	4846991
Acid Extractable Boron (B)	ug/g	7.4	<5.0	8.9	6.8		5.0	4846991
Acid Extractable Cadmium (Cd)	ug/g	<0.10	<0.10	0.14	<0.10		0.10	4846991
Acid Extractable Chromium (Cr)	ug/g	72	70	51	72		1.0	4846991
Acid Extractable Cobalt (Co)	ug/g	19	18	13	18		0.10	4846991
Acid Extractable Copper (Cu)	ug/g	34	35	35	35		0.50	4846991
Acid Extractable Lead (Pb)	ug/g	6.0	6.6	23	5.7		1.0	4846991
Acid Extractable Molybdenum (Mo)	ug/g	1.2	<0.50	0.65	1.2		0.50	4846991
Acid Extractable Nickel (Ni)	ug/g	43	41	30	40		0.50	4846991
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50		0.50	4846991
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20		0.20	4846991
Acid Extractable Thallium (Tl)	ug/g	0.40	0.37	0.27	0.41		0.050	4846991
Acid Extractable Uranium (U)	ug/g	1.3	0.60	0.60	1.4		0.050	4846991
Acid Extractable Vanadium (V)	ug/g	92	85	56	94		5.0	4846991
Acid Extractable Zinc (Zn)	ug/g	110	110	79	110		5.0	4846991
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4846991

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 METALS PACKAGE (SOIL)

Maxxam ID		DVD674		DVD675		DVD676		
Sampling Date		2017/01/26		2017/01/26		2017/01/26		
COC Number		595611-01-01		595611-01-01		595611-01-01		
	UNITS	17-12 SA3	QC Batch	17-9 SA3	QC Batch	17-22 SA3	RDL	QC Batch
Inorganics								
Moisture	%	19	4847243	21	4847243	25	1.0	4847243
Chromium (VI)	ug/g	0.6	4846943	0.3	4846943	<0.2	0.2	4846943
Metals								
Hot Water Ext. Boron (B)	ug/g	0.13	4847143	0.059	4846958	0.24	0.050	4847143
Acid Extractable Antimony (Sb)	ug/g	<0.20	4846991	<0.20	4846991	<0.20	0.20	4846991
Acid Extractable Arsenic (As)	ug/g	1.8	4846991	1.3	4846991	1.9	1.0	4846991
Acid Extractable Barium (Ba)	ug/g	140	4846991	120	4846991	180	0.50	4846991
Acid Extractable Beryllium (Be)	ug/g	0.37	4846991	0.34	4846991	0.55	0.20	4846991
Acid Extractable Boron (B)	ug/g	<5.0	4846991	<5.0	4846991	6.9	5.0	4846991
Acid Extractable Cadmium (Cd)	ug/g	<0.10	4846991	<0.10	4846991	<0.10	0.10	4846991
Acid Extractable Chromium (Cr)	ug/g	26	4846991	24	4846991	37	1.0	4846991
Acid Extractable Cobalt (Co)	ug/g	7.3	4846991	7.1	4846991	12	0.10	4846991
Acid Extractable Copper (Cu)	ug/g	16	4846991	13	4846991	22	0.50	4846991
Acid Extractable Lead (Pb)	ug/g	5.3	4846991	3.4	4846991	5.1	1.0	4846991
Acid Extractable Molybdenum (Mo)	ug/g	1.1	4846991	<0.50	4846991	1.3	0.50	4846991
Acid Extractable Nickel (Ni)	ug/g	14	4846991	13	4846991	23	0.50	4846991
Acid Extractable Selenium (Se)	ug/g	<0.50	4846991	<0.50	4846991	<0.50	0.50	4846991
Acid Extractable Silver (Ag)	ug/g	<0.20	4846991	<0.20	4846991	<0.20	0.20	4846991
Acid Extractable Thallium (Tl)	ug/g	0.16	4846991	0.14	4846991	0.22	0.050	4846991
Acid Extractable Uranium (U)	ug/g	0.60	4846991	0.67	4846991	0.87	0.050	4846991
Acid Extractable Vanadium (V)	ug/g	37	4846991	41	4846991	56	5.0	4846991
Acid Extractable Zinc (Zn)	ug/g	37	4846991	38	4846991	64	5.0	4846991
Acid Extractable Mercury (Hg)	ug/g	<0.050	4846991	<0.050	4846991	<0.050	0.050	4846991

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 METALS PACKAGE (SOIL)

Maxxam ID		DVD678		DVD679		
Sampling Date		2017/01/26		2017/01/26		
COC Number		595611-01-01		595611-01-01		
	UNITS	17-14 SA1	QC Batch	17-16 SA1	RDL	QC Batch
Inorganics						
Moisture	%	7.8	4847243	14	1.0	4847243
Chromium (VI)	ug/g	<0.2	4846943	<0.2	0.2	4846943
Metals						
Hot Water Ext. Boron (B)	ug/g	<0.050	4846958	0.52	0.050	4847143
Acid Extractable Antimony (Sb)	ug/g	<0.20	4846991	0.69	0.20	4846991
Acid Extractable Arsenic (As)	ug/g	<1.0	4846991	3.1	1.0	4846991
Acid Extractable Barium (Ba)	ug/g	24	4846991	160	0.50	4846991
Acid Extractable Beryllium (Be)	ug/g	<0.20	4846991	0.42	0.20	4846991
Acid Extractable Boron (B)	ug/g	<5.0	4846991	5.9	5.0	4846991
Acid Extractable Cadmium (Cd)	ug/g	<0.10	4846991	0.14	0.10	4846991
Acid Extractable Chromium (Cr)	ug/g	7.3	4846991	32	1.0	4846991
Acid Extractable Cobalt (Co)	ug/g	4.0	4846991	9.8	0.10	4846991
Acid Extractable Copper (Cu)	ug/g	8.5	4846991	27	0.50	4846991
Acid Extractable Lead (Pb)	ug/g	2.6	4846991	33	1.0	4846991
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	4846991	0.99	0.50	4846991
Acid Extractable Nickel (Ni)	ug/g	6.9	4846991	19	0.50	4846991
Acid Extractable Selenium (Se)	ug/g	<0.50	4846991	<0.50	0.50	4846991
Acid Extractable Silver (Ag)	ug/g	<0.20	4846991	<0.20	0.20	4846991
Acid Extractable Thallium (Tl)	ug/g	0.064	4846991	0.21	0.050	4846991
Acid Extractable Uranium (U)	ug/g	0.37	4846991	0.55	0.050	4846991
Acid Extractable Vanadium (V)	ug/g	17	4846991	45	5.0	4846991
Acid Extractable Zinc (Zn)	ug/g	14	4846991	54	5.0	4846991
Acid Extractable Mercury (Hg)	ug/g	<0.050	4846991	<0.050	0.050	4846991

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 PAHS (SOIL)

Maxxam ID		DVD670		DVD671	DVD672	DVD673	DVD674		
Sampling Date		2017/01/26		2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01		595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-17 SA3	RDL	17-15 SA2	17-11 SA1	17-13 SA4	17-12 SA3	RDL	QC Batch
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	<0.014	0.014	<0.0071	0.57	<0.0071	<0.0071	0.0071	4844192
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.010	0.010	<0.0050	0.0093	<0.0050	<0.0050	0.0050	4846846
Acenaphthylene	ug/g	<0.010	0.010	<0.0050	0.012	<0.0050	<0.0050	0.0050	4846846
Anthracene	ug/g	<0.010	0.010	<0.0050	0.019	<0.0050	<0.0050	0.0050	4846846
Benzo(a)anthracene	ug/g	<0.010	0.010	<0.0050	0.069	<0.0050	<0.0050	0.0050	4846846
Benzo(a)pyrene	ug/g	<0.010	0.010	<0.0050	0.062	<0.0050	<0.0050	0.0050	4846846
Benzo(b/j)fluoranthene	ug/g	<0.010	0.010	<0.0050	0.091	<0.0050	<0.0050	0.0050	4846846
Benzo(g,h,i)perylene	ug/g	<0.010	0.010	<0.0050	0.046	<0.0050	<0.0050	0.0050	4846846
Benzo(k)fluoranthene	ug/g	<0.010	0.010	<0.0050	0.034	<0.0050	<0.0050	0.0050	4846846
Chrysene	ug/g	<0.010	0.010	<0.0050	0.061	<0.0050	<0.0050	0.0050	4846846
Dibenz(a,h)anthracene	ug/g	<0.010	0.010	<0.0050	0.010	<0.0050	<0.0050	0.0050	4846846
Fluoranthene	ug/g	<0.010	0.010	<0.0050	0.14	<0.0050	<0.0050	0.0050	4846846
Fluorene	ug/g	<0.010	0.010	<0.0050	0.0078	<0.0050	<0.0050	0.0050	4846846
Indeno(1,2,3-cd)pyrene	ug/g	<0.010	0.010	<0.0050	0.050	<0.0050	<0.0050	0.0050	4846846
1-Methylnaphthalene	ug/g	<0.010	0.010	<0.0050	0.22	<0.0050	<0.0050	0.0050	4846846
2-Methylnaphthalene	ug/g	<0.010	0.010	<0.0050	0.35	<0.0050	<0.0050	0.0050	4846846
Naphthalene	ug/g	<0.010	0.010	<0.0050	0.069	<0.0050	<0.0050	0.0050	4846846
Phenanthrene	ug/g	<0.010	0.010	<0.0050	0.081	<0.0050	<0.0050	0.0050	4846846
Pyrene	ug/g	<0.010	0.010	<0.0050	0.12	<0.0050	<0.0050	0.0050	4846846
Surrogate Recovery (%)									
D10-Anthracene	%	98		87	85	91	91		4846846
D14-Terphenyl (FS)	%	99		79	82	88	97		4846846
D8-Acenaphthylene	%	101		83	86	89	86		4846846

RDL = Reportable Detection Limit
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Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 PAHS (SOIL)

Maxxam ID		DVD675	DVD676	DVD678	DVD679		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-9 SA3	17-22 SA3	17-14 SA1	17-16 SA1	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	<0.0071	<0.0071	0.28	0.0071	4844192
Polyaromatic Hydrocarbons							
Acenaphthene	ug/g	<0.0050	<0.0050	<0.0050	0.010	0.0050	4846846
Acenaphthylene	ug/g	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	4846846
Anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.026	0.0050	4846846
Benzo(a)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.077	0.0050	4846846
Benzo(a)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.070	0.0050	4846846
Benzo(b/j)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.092	0.0050	4846846
Benzo(g,h,i)perylene	ug/g	<0.0050	<0.0050	<0.0050	0.049	0.0050	4846846
Benzo(k)fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.031	0.0050	4846846
Chrysene	ug/g	<0.0050	<0.0050	<0.0050	0.060	0.0050	4846846
Dibenz(a,h)anthracene	ug/g	<0.0050	<0.0050	<0.0050	0.0097	0.0050	4846846
Fluoranthene	ug/g	<0.0050	<0.0050	<0.0050	0.18	0.0050	4846846
Fluorene	ug/g	<0.0050	<0.0050	<0.0050	0.0088	0.0050	4846846
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.053	0.0050	4846846
1-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.11	0.0050	4846846
2-Methylnaphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.17	0.0050	4846846
Naphthalene	ug/g	<0.0050	<0.0050	<0.0050	0.041	0.0050	4846846
Phenanthrene	ug/g	<0.0050	<0.0050	<0.0050	0.12	0.0050	4846846
Pyrene	ug/g	<0.0050	<0.0050	<0.0050	0.14	0.0050	4846846
Surrogate Recovery (%)							
D10-Anthracene	%	90	92	93	93		4846846
D14-Terphenyl (FS)	%	94	95	93	92		4846846
D8-Acenaphthylene	%	83	91	95	96		4846846

RDL = Reportable Detection Limit
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O.REG 153 PCBS (SOIL)

Maxxam ID		DVD670		DVD671	DVD672		DVD673		DVD674		
Sampling Date		2017/01/26		2017/01/26	2017/01/26		2017/01/26		2017/01/26		
COC Number		595611-01-01		595611-01-01	595611-01-01		595611-01-01		595611-01-01		
	UNITS	17-17 SA3	RDL	17-15 SA2	17-11 SA1	RDL	17-13 SA4	RDL	17-12 SA3	RDL	QC Batch
PCBs											
Aroclor 1242	ug/g	<0.020	0.020	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	4845828
Aroclor 1248	ug/g	<0.020	0.020	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	4845828
Aroclor 1254	ug/g	<0.020	0.020	<0.010	0.10	0.010	<0.020	0.020	<0.010	0.010	4845828
Aroclor 1260	ug/g	<0.020	0.020	<0.010	<0.010	0.010	<0.020	0.020	<0.010	0.010	4845828
Total PCB	ug/g	<0.020	0.020	<0.010	0.10	0.010	<0.020	0.020	<0.010	0.010	4845828
Surrogate Recovery (%)											
Decachlorobiphenyl	%	80		80	84		92		86		4845828

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		DVD675	DVD678	DVD678	DVD679		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-9 SA3	17-14 SA1	17-14 SA1 Lab-Dup	17-16 SA1	RDL	QC Batch
PCBs							
Aroclor 1242	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4845828
Aroclor 1248	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4845828
Aroclor 1254	ug/g	<0.010	<0.010	<0.010	0.11	0.010	4845828
Aroclor 1260	ug/g	<0.010	<0.010	<0.010	<0.010	0.010	4845828
Total PCB	ug/g	<0.010	<0.010	<0.010	0.11	0.010	4845828
Surrogate Recovery (%)							
Decachlorobiphenyl	%	86	95	92	82		4845828

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Report Date: 2017/02/06

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Sampler Initials: JW

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		DVD677		
Sampling Date		2017/01/26		
COC Number		595611-01-01		
	UNITS	17-1 SA4	RDL	QC Batch
Inorganics				
Moisture	%	27	1.0	4847752
BTEX & F1 Hydrocarbons				
Benzene	ug/g	<0.020	0.020	4845339
Toluene	ug/g	<0.020	0.020	4845339
Ethylbenzene	ug/g	<0.020	0.020	4845339
o-Xylene	ug/g	<0.020	0.020	4845339
p+m-Xylene	ug/g	<0.040	0.040	4845339
Total Xylenes	ug/g	<0.040	0.040	4845339
F1 (C6-C10)	ug/g	<10	10	4845339
F1 (C6-C10) - BTEX	ug/g	<10	10	4845339
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	4846906
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	4846906
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	4846906
Reached Baseline at C50	ug/g	Yes		4846906
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	99		4845339
4-Bromofluorobenzene	%	114		4845339
D10-Ethylbenzene	%	90		4845339
D4-1,2-Dichloroethane	%	78		4845339
o-Terphenyl	%	95		4846906

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Sampler Initials: JW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DVD670	DVD671	DVD672	DVD673	DVD674		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-17 SA3	17-15 SA2	17-11 SA1	17-13 SA4	17-12 SA3	RDL	QC Batch
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4844241
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4845281
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281
Bromodichloromethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Bromoform	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Bromomethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Carbon Tetrachloride	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Chlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Chloroform	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Dibromochloromethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,1-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,2-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,1-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,2-Dichloropropane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4845281
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	4845281
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281
Ethylene Dibromide	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Hexane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4845281
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4845281
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Styrene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Tetrachloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DVD670	DVD671	DVD672	DVD673	DVD674		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-17 SA3	17-15 SA2	17-11 SA1	17-13 SA4	17-12 SA3	RDL	QC Batch
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Trichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4845281
Vinyl Chloride	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	4845281
F1 (C6-C10)	ug/g	<10	<10	<10	<10	<10	10	4845281
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10	<10	10	4845281
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	<10	<10	<10	10	4846906
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	4846906
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	<50	<50	<50	50	4846906
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes	Yes		4846906
Surrogate Recovery (%)								
o-Terphenyl	%	91	93	89	90	94		4846906
4-Bromofluorobenzene	%	95	95	95	94	94		4845281
D10-o-Xylene	%	102	96	91	96	96		4845281
D4-1,2-Dichloroethane	%	100	100	101	101	101		4845281
D8-Toluene	%	95	95	96	95	95		4845281

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QC Batch = Quality Control Batch

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Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DVD674	DVD675	DVD676	DVD678	DVD678		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-12 SA3 Lab-Dup	17-9 SA3	17-22 SA3	17-14 SA1	17-14 SA1 Lab-Dup	RDL	QC Batch
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/g		<0.050	<0.050	<0.050		0.050	4844241
Volatile Organics								
Acetone (2-Propanone)	ug/g	<0.50	<0.50	<0.50	<0.50		0.50	4845281
Benzene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
Bromodichloromethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Bromoform	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Bromomethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Carbon Tetrachloride	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Chlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Chloroform	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Dibromochloromethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,1-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,2-Dichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,1-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,2-Dichloropropane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	<0.030	<0.030		0.030	4845281
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	<0.040	<0.040		0.040	4845281
Ethylbenzene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
Ethylene Dibromide	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Hexane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	<0.50	<0.50		0.50	4845281
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	<0.50	<0.50		0.50	4845281
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Styrene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Tetrachloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DVD674	DVD675	DVD676	DVD678	DVD678		
Sampling Date		2017/01/26	2017/01/26	2017/01/26	2017/01/26	2017/01/26		
COC Number		595611-01-01	595611-01-01	595611-01-01	595611-01-01	595611-01-01		
	UNITS	17-12 SA3 Lab-Dup	17-9 SA3	17-22 SA3	17-14 SA1	17-14 SA1 Lab-Dup	RDL	QC Batch
Toluene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Trichloroethylene	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	<0.050	<0.050		0.050	4845281
Vinyl Chloride	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
p+m-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
o-Xylene	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
Total Xylenes	ug/g	<0.020	<0.020	<0.020	<0.020		0.020	4845281
F1 (C6-C10)	ug/g	<10	<10	<10	<10		10	4845281
F1 (C6-C10) - BTEX	ug/g	<10	<10	<10	<10		10	4845281
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/g		<10	<10	<10	<10	10	4846906
F3 (C16-C34 Hydrocarbons)	ug/g		<50	<50	<50	<50	50	4846906
F4 (C34-C50 Hydrocarbons)	ug/g		<50	<50	<50	<50	50	4846906
Reached Baseline at C50	ug/g		Yes	Yes	Yes	Yes		4846906
Surrogate Recovery (%)								
o-Terphenyl	%		96	92	94	92		4846906
4-Bromofluorobenzene	%	95	94	94	94			4845281
D10-o-Xylene	%	94	93	92	97			4845281
D4-1,2-Dichloroethane	%	102	101	101	103			4845281
D8-Toluene	%	95	95	94	96			4845281

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QC Batch = Quality Control Batch
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O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DVD679		
Sampling Date		2017/01/26		
COC Number		595611-01-01		
	UNITS	17-16 SA1	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	4844241
Volatile Organics				
Acetone (2-Propanone)	ug/g	<0.50	0.50	4845281
Benzene	ug/g	<0.020	0.020	4845281
Bromodichloromethane	ug/g	<0.050	0.050	4845281
Bromoform	ug/g	<0.050	0.050	4845281
Bromomethane	ug/g	<0.050	0.050	4845281
Carbon Tetrachloride	ug/g	<0.050	0.050	4845281
Chlorobenzene	ug/g	<0.050	0.050	4845281
Chloroform	ug/g	<0.050	0.050	4845281
Dibromochloromethane	ug/g	<0.050	0.050	4845281
1,2-Dichlorobenzene	ug/g	<0.050	0.050	4845281
1,3-Dichlorobenzene	ug/g	<0.050	0.050	4845281
1,4-Dichlorobenzene	ug/g	<0.050	0.050	4845281
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	4845281
1,1-Dichloroethane	ug/g	<0.050	0.050	4845281
1,2-Dichloroethane	ug/g	<0.050	0.050	4845281
1,1-Dichloroethylene	ug/g	<0.050	0.050	4845281
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	4845281
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	4845281
1,2-Dichloropropane	ug/g	<0.050	0.050	4845281
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	4845281
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	4845281
Ethylbenzene	ug/g	<0.020	0.020	4845281
Ethylene Dibromide	ug/g	<0.050	0.050	4845281
Hexane	ug/g	<0.050	0.050	4845281
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	4845281
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	4845281
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	4845281
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	4845281
Styrene	ug/g	<0.050	0.050	4845281
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	4845281
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	4845281
Tetrachloroethylene	ug/g	<0.050	0.050	4845281
Toluene	ug/g	<0.020	0.020	4845281

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

O.REG 153 VOCS & F1-F4 (SOIL)

Maxxam ID		DVD679		
Sampling Date		2017/01/26		
COC Number		595611-01-01		
	UNITS	17-16 SA1	RDL	QC Batch
1,1,1-Trichloroethane	ug/g	<0.050	0.050	4845281
1,1,2-Trichloroethane	ug/g	<0.050	0.050	4845281
Trichloroethylene	ug/g	<0.050	0.050	4845281
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	4845281
Vinyl Chloride	ug/g	<0.020	0.020	4845281
p+m-Xylene	ug/g	<0.020	0.020	4845281
o-Xylene	ug/g	<0.020	0.020	4845281
Total Xylenes	ug/g	<0.020	0.020	4845281
F1 (C6-C10)	ug/g	<10	10	4845281
F1 (C6-C10) - BTEX	ug/g	<10	10	4845281
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	4846906
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	4846906
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	4846906
Reached Baseline at C50	ug/g	Yes		4846906
Surrogate Recovery (%)				
o-Terphenyl	%	89		4846906
4-Bromofluorobenzene	%	94		4845281
D10-o-Xylene	%	91		4845281
D4-1,2-Dichloroethane	%	102		4845281
D8-Toluene	%	96		4845281

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Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

TEST SUMMARY

Maxxam ID: DVD670
Sample ID: 17-17 SA3
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4846958	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD671
Sample ID: 17-15 SA2
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4846958	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD672
Sample ID: 17-11 SA1
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4846958	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

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Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

TEST SUMMARY

Maxxam ID: DVD673
Sample ID: 17-13 SA4
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4846958	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD673 Dup
Sample ID: 17-13 SA4
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani

Maxxam ID: DVD674
Sample ID: 17-12 SA3
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4847143	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD674 Dup
Sample ID: 17-12 SA3
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

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Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

TEST SUMMARY

Maxxam ID: DVD675
Sample ID: 17-9 SA3
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4846958	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD676
Sample ID: 17-22 SA3
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4847143	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD677
Sample ID: 17-1 SA4
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	4845339	N/A	2017/01/31	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Moisture	BAL	4847752	N/A	2017/02/01	Valentina Kaftani

Maxxam ID: DVD678
Sample ID: 17-14 SA1
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4846958	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu

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Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

TEST SUMMARY

Maxxam ID: DVD678
Sample ID: 17-14 SA1
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/01/31	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

Maxxam ID: DVD678 Dup
Sample ID: 17-14 SA1
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/01/31	Li Peng

Maxxam ID: DVD679
Sample ID: 17-16 SA1
Matrix: Soil

Collected: 2017/01/26
Shipped:
Received: 2017/01/27

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4844192	N/A	2017/02/06	Automated Statchk
Hot Water Extractable Boron	ICP	4847143	2017/02/01	2017/02/02	Suban Kanapathippllai
1,3-Dichloropropene Sum	CALC	4844241	N/A	2017/02/02	Automated Statchk
Hexavalent Chromium in Soil by IC	IC/SPEC	4846943	2017/02/01	2017/02/02	Sally Coughlin
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	4846906	2017/02/01	2017/02/01	Margaret Kulczyk-Stanko
Strong Acid Leachable Metals by ICPMS	ICP/MS	4846991	2017/02/01	2017/02/01	Daniel Teclu
Moisture	BAL	4847243	N/A	2017/02/01	Valentina Kaftani
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	4846846	2017/02/01	2017/02/03	Lingyun Feng
Polychlorinated Biphenyl in Soil	GC/ECD	4845828	2017/01/31	2017/02/01	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4845281	N/A	2017/02/01	Yang (Philip) Yu

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	12.0°C

Cooler custody seal was present and intact.
The samples were received at the laboratory a day after sampling date without ice with average temperature of 12 degrees C.

Sample DVD670 [17-17 SA3] : PCB Analysis: Detection limits were adjusted for high moisture content

PAH analysis: Detection limits were adjusted for high moisture content.

Sample DVD673 [17-13 SA4] : PCB Analysis: Detection limits were adjusted for high moisture content

Results relate only to the items tested.

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Maxxam Job #: B718928
Report Date: 2017/02/06

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4845281	4-Bromofluorobenzene	2017/02/01	102	60 - 140	102	60 - 140	97	%		
4845281	D10-o-Xylene	2017/02/01	104	60 - 130	121	60 - 130	104	%		
4845281	D4-1,2-Dichloroethane	2017/02/01	95	60 - 140	96	60 - 140	98	%		
4845281	D8-Toluene	2017/02/01	104	60 - 140	104	60 - 140	97	%		
4845339	1,4-Difluorobenzene	2017/01/31	95	60 - 140	97	60 - 140	98	%		
4845339	4-Bromofluorobenzene	2017/01/31	114	60 - 140	115	60 - 140	113	%		
4845339	D10-Ethylbenzene	2017/01/31	78	60 - 140	94	60 - 140	88	%		
4845339	D4-1,2-Dichloroethane	2017/01/31	75	60 - 140	78	60 - 140	76	%		
4845828	Decachlorobiphenyl	2017/01/31	97	60 - 130	94	60 - 130	96	%		
4846846	D10-Anthracene	2017/02/03	91	50 - 130	84	50 - 130	83	%		
4846846	D14-Terphenyl (FS)	2017/02/03	101	50 - 130	105	50 - 130	92	%		
4846846	D8-Acenaphthylene	2017/02/03	91	50 - 130	80	50 - 130	81	%		
4846906	o-Terphenyl	2017/02/01	95	60 - 130	96	60 - 130	93	%		
4845281	1,1,1,2-Tetrachloroethane	2017/02/01	101	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
4845281	1,1,1-Trichloroethane	2017/02/01	100	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
4845281	1,1,2,2-Tetrachloroethane	2017/02/01	96	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
4845281	1,1,2-Trichloroethane	2017/02/01	98	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
4845281	1,1-Dichloroethane	2017/02/01	101	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
4845281	1,1-Dichloroethylene	2017/02/01	108	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
4845281	1,2-Dichlorobenzene	2017/02/01	100	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
4845281	1,2-Dichloroethane	2017/02/01	93	60 - 140	90	60 - 130	<0.050	ug/g	NC	50
4845281	1,2-Dichloropropane	2017/02/01	99	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
4845281	1,3-Dichlorobenzene	2017/02/01	102	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
4845281	1,4-Dichlorobenzene	2017/02/01	103	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
4845281	Acetone (2-Propanone)	2017/02/01	95	60 - 140	99	60 - 140	<0.50	ug/g	NC	50
4845281	Benzene	2017/02/01	101	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
4845281	Bromodichloromethane	2017/02/01	99	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
4845281	Bromoform	2017/02/01	94	60 - 140	93	60 - 130	<0.050	ug/g	NC	50
4845281	Bromomethane	2017/02/01	105	60 - 140	96	60 - 140	<0.050	ug/g	NC	50
4845281	Carbon Tetrachloride	2017/02/01	103	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
4845281	Chlorobenzene	2017/02/01	104	60 - 140	100	60 - 130	<0.050	ug/g	NC	50

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4845281	Chloroform	2017/02/01	98	60 - 140	94	60 - 130	<0.050	ug/g	NC	50
4845281	cis-1,2-Dichloroethylene	2017/02/01	104	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
4845281	cis-1,3-Dichloropropene	2017/02/01	99	60 - 140	94	60 - 130	<0.030	ug/g	NC	50
4845281	Dibromochloromethane	2017/02/01	102	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
4845281	Dichlorodifluoromethane (FREON 12)	2017/02/01	96	60 - 140	85	60 - 140	<0.050	ug/g	NC	50
4845281	Ethylbenzene	2017/02/01	107	60 - 140	102	60 - 130	<0.020	ug/g	NC	50
4845281	Ethylene Dibromide	2017/02/01	97	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
4845281	F1 (C6-C10) - BTEX	2017/02/01					<10	ug/g	NC	30
4845281	F1 (C6-C10)	2017/02/01	82	60 - 140	85	80 - 120	<10	ug/g	NC	30
4845281	Hexane	2017/02/01	115	60 - 140	108	60 - 130	<0.050	ug/g	NC	50
4845281	Methyl Ethyl Ketone (2-Butanone)	2017/02/01	100	60 - 140	102	60 - 140	<0.50	ug/g	NC	50
4845281	Methyl Isobutyl Ketone	2017/02/01	101	60 - 140	101	60 - 130	<0.50	ug/g	NC	50
4845281	Methyl t-butyl ether (MTBE)	2017/02/01	102	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
4845281	Methylene Chloride(Dichloromethane)	2017/02/01	105	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
4845281	o-Xylene	2017/02/01	104	60 - 140	100	60 - 130	<0.020	ug/g	NC	50
4845281	p+m-Xylene	2017/02/01	105	60 - 140	99	60 - 130	<0.020	ug/g	NC	50
4845281	Styrene	2017/02/01	106	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
4845281	Tetrachloroethylene	2017/02/01	103	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
4845281	Toluene	2017/02/01	103	60 - 140	97	60 - 130	<0.020	ug/g	NC	50
4845281	Total Xylenes	2017/02/01					<0.020	ug/g	NC	50
4845281	trans-1,2-Dichloroethylene	2017/02/01	101	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
4845281	trans-1,3-Dichloropropene	2017/02/01	100	60 - 140	96	60 - 130	<0.040	ug/g	NC	50
4845281	Trichloroethylene	2017/02/01	102	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
4845281	Trichlorofluoromethane (FREON 11)	2017/02/01	109	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
4845281	Vinyl Chloride	2017/02/01	116	60 - 140	104	60 - 130	<0.020	ug/g	NC	50
4845339	Benzene	2017/01/31	68	60 - 140	92	60 - 140	<0.020	ug/g	NC	50
4845339	Ethylbenzene	2017/01/31	86	60 - 140	109	60 - 140	<0.020	ug/g	NC	50
4845339	F1 (C6-C10) - BTEX	2017/01/31					<10	ug/g	NC	30
4845339	F1 (C6-C10)	2017/01/31	90	60 - 140	104	80 - 120	<10	ug/g	NC	30
4845339	o-Xylene	2017/01/31	89	60 - 140	113	60 - 140	<0.020	ug/g	NC	50
4845339	p+m-Xylene	2017/01/31	81	60 - 140	101	60 - 140	<0.040	ug/g	NC	50

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4845339	Toluene	2017/01/31	78	60 - 140	100	60 - 140	<0.020	ug/g	NC	50
4845339	Total Xylenes	2017/01/31					<0.040	ug/g	NC	50
4845828	Aroclor 1242	2017/01/31					<0.010	ug/g	NC	50
4845828	Aroclor 1248	2017/01/31					<0.010	ug/g	NC	50
4845828	Aroclor 1254	2017/01/31					<0.010	ug/g	NC	50
4845828	Aroclor 1260	2017/01/31	105	60 - 130	103	60 - 130	<0.010	ug/g	NC	50
4845828	Total PCB	2017/01/31	105	60 - 130	103	60 - 130	<0.010	ug/g	NC	50
4846846	1-Methylnaphthalene	2017/02/03	93	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
4846846	2-Methylnaphthalene	2017/02/03	87	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40
4846846	Acenaphthene	2017/02/03	97	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
4846846	Acenaphthylene	2017/02/03	89	50 - 130	84	50 - 130	<0.0050	ug/g	NC	40
4846846	Anthracene	2017/02/03	87	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40
4846846	Benzo(a)anthracene	2017/02/03	93	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
4846846	Benzo(a)pyrene	2017/02/03	97	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
4846846	Benzo(b/j)fluoranthene	2017/02/03	100	50 - 130	105	50 - 130	<0.0050	ug/g	NC	40
4846846	Benzo(g,h,i)perylene	2017/02/03	85	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40
4846846	Benzo(k)fluoranthene	2017/02/03	107	50 - 130	113	50 - 130	<0.0050	ug/g	NC	40
4846846	Chrysene	2017/02/03	105	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
4846846	Dibenz(a,h)anthracene	2017/02/03	90	50 - 130	93	50 - 130	<0.0050	ug/g	NC	40
4846846	Fluoranthene	2017/02/03	106	50 - 130	108	50 - 130	<0.0050	ug/g	NC	40
4846846	Fluorene	2017/02/03	97	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40
4846846	Indeno(1,2,3-cd)pyrene	2017/02/03	89	50 - 130	93	50 - 130	<0.0050	ug/g	NC	40
4846846	Naphthalene	2017/02/03	82	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
4846846	Phenanthrene	2017/02/03	102	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
4846846	Pyrene	2017/02/03	109	50 - 130	112	50 - 130	<0.0050	ug/g	NC	40
4846906	F2 (C10-C16 Hydrocarbons)	2017/02/01	101	50 - 130	103	80 - 120	<10	ug/g	NC	30
4846906	F3 (C16-C34 Hydrocarbons)	2017/02/01	97	50 - 130	99	80 - 120	<50	ug/g	NC	30
4846906	F4 (C34-C50 Hydrocarbons)	2017/02/01	96	50 - 130	99	80 - 120	<50	ug/g	NC	30
4846943	Chromium (VI)	2017/02/02	76	75 - 125	86	80 - 120	<0.2	ug/g	NC	35
4846958	Hot Water Ext. Boron (B)	2017/02/02	96	75 - 125	96	75 - 125	<0.050	ug/g	NC	40
4846991	Acid Extractable Antimony (Sb)	2017/02/01	95	75 - 125	99	80 - 120	<0.20	ug/g	NC	30

Maxxam Job #: B718928
Report Date: 2017/02/06

QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4846991	Acid Extractable Arsenic (As)	2017/02/01	99	75 - 125	102	80 - 120	<1.0	ug/g	NC	30
4846991	Acid Extractable Barium (Ba)	2017/02/01	NC	75 - 125	99	80 - 120	<0.50	ug/g	1.7	30
4846991	Acid Extractable Beryllium (Be)	2017/02/01	99	75 - 125	97	80 - 120	<0.20	ug/g	NC	30
4846991	Acid Extractable Boron (B)	2017/02/01	93	75 - 125	96	80 - 120	<5.0	ug/g	NC	30
4846991	Acid Extractable Cadmium (Cd)	2017/02/01	95	75 - 125	98	80 - 120	<0.10	ug/g	NC	30
4846991	Acid Extractable Chromium (Cr)	2017/02/01	97	75 - 125	100	80 - 120	<1.0	ug/g	7.1	30
4846991	Acid Extractable Cobalt (Co)	2017/02/01	98	75 - 125	98	80 - 120	<0.10	ug/g	3.0	30
4846991	Acid Extractable Copper (Cu)	2017/02/01	94	75 - 125	97	80 - 120	<0.50	ug/g	1.3	30
4846991	Acid Extractable Lead (Pb)	2017/02/01	100	75 - 125	96	80 - 120	<1.0	ug/g	NC	30
4846991	Acid Extractable Mercury (Hg)	2017/02/01	100	75 - 125	96	80 - 120	<0.050	ug/g	NC	30
4846991	Acid Extractable Molybdenum (Mo)	2017/02/01	99	75 - 125	100	80 - 120	<0.50	ug/g	NC	30
4846991	Acid Extractable Nickel (Ni)	2017/02/01	95	75 - 125	99	80 - 120	<0.50	ug/g	4.6	30
4846991	Acid Extractable Selenium (Se)	2017/02/01	100	75 - 125	100	80 - 120	<0.50	ug/g	NC	30
4846991	Acid Extractable Silver (Ag)	2017/02/01	101	75 - 125	100	80 - 120	<0.20	ug/g	NC	30
4846991	Acid Extractable Thallium (Tl)	2017/02/01	98	75 - 125	95	80 - 120	<0.050	ug/g	NC	30
4846991	Acid Extractable Uranium (U)	2017/02/01	97	75 - 125	94	80 - 120	<0.050	ug/g	0.51	30
4846991	Acid Extractable Vanadium (V)	2017/02/01	NC	75 - 125	99	80 - 120	<5.0	ug/g	NC	30
4846991	Acid Extractable Zinc (Zn)	2017/02/01	93	75 - 125	102	80 - 120	<5.0	ug/g	NC	30
4847143	Hot Water Ext. Boron (B)	2017/02/01	95	75 - 125	95	75 - 125	<0.050	ug/g	NC	40
4847243	Moisture	2017/02/01							0.58	20
4847752	Moisture	2017/02/01							0	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B718928
Report Date: 2017/02/06

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: JW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-

27-Jan-17 14:50
Madison Bingley
B718928
PS4 ENV-856

CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:

Company Name: #14090 Golder Associates Ltd
Attention: Central Accounting
Address: 1931 Robertson Rd
Ottawa ON K2H 5B7
Tel: (613) 592-9600 Fax: (613) 592-9601
Email: AP-CustomerService@golder.com

REPOR

Company Name:
Attention: Joanne Woodhouse
Address:
Tel: Fax:
Email: jwoodhouse@golder.com

PROJECT INFORMATION:

B63104
1670949
Site #:
Sampled By:

Laboratory Use Only:

Maxxam Job #:
Bottle Order #: 595611
COC #: C#595611-01-01
Project Manager: Madison Bingley

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [ ] Table 1 [ ] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [x] Table 3 [ ] Agri/Other [ ] For RSC
- [ ] Table ___

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558 [ ] Storm Sewer Bylaw
- [ ] MISA Municipality
- [ ] PWQO
- [ ] Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC):

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	* Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 Metals Package (Cr, Hg, Metals)	O.Reg 153 VOCs & F1-F4 (Water) Soil	O.Reg 153 PAHs (Water) Soil	O.Reg PHC (F1-F4)	PCB	PHC + BTEX					# of Bottles	Comments
1		17-17 SA3	Jan 26		S		X	X	X	X	X							
2		17-15 SA2	"		S		X	X	X	X	X							
3		17-11 SA1	"		"		X	X	X	X	X							
4		17-13 SA4	"		"		X	X	X	X	X							
5		17-12 SA3	"		"		X	X	X	X	X							RECEIVED IN OTTAWA
6		17-9 SA3	"		"		X	X	X	X	X							
7		17-22 SA3	"		"		X	X	X	X								
8		17-1 SA4	"		"							X						
9		17-14 SA1	"		"		X	X	X	X	X							NO ice
10		17-16 SA1	"		"		X	X	X	X	X							

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time
			Mariana Dascan / Dascan	2017/01/27	14:50
			Parmjeet PARAMJEET SINGH	2017/01/28	10:06

jars used and not submitted

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	12, 12, 12	Present	Y	
		Intact	Y	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

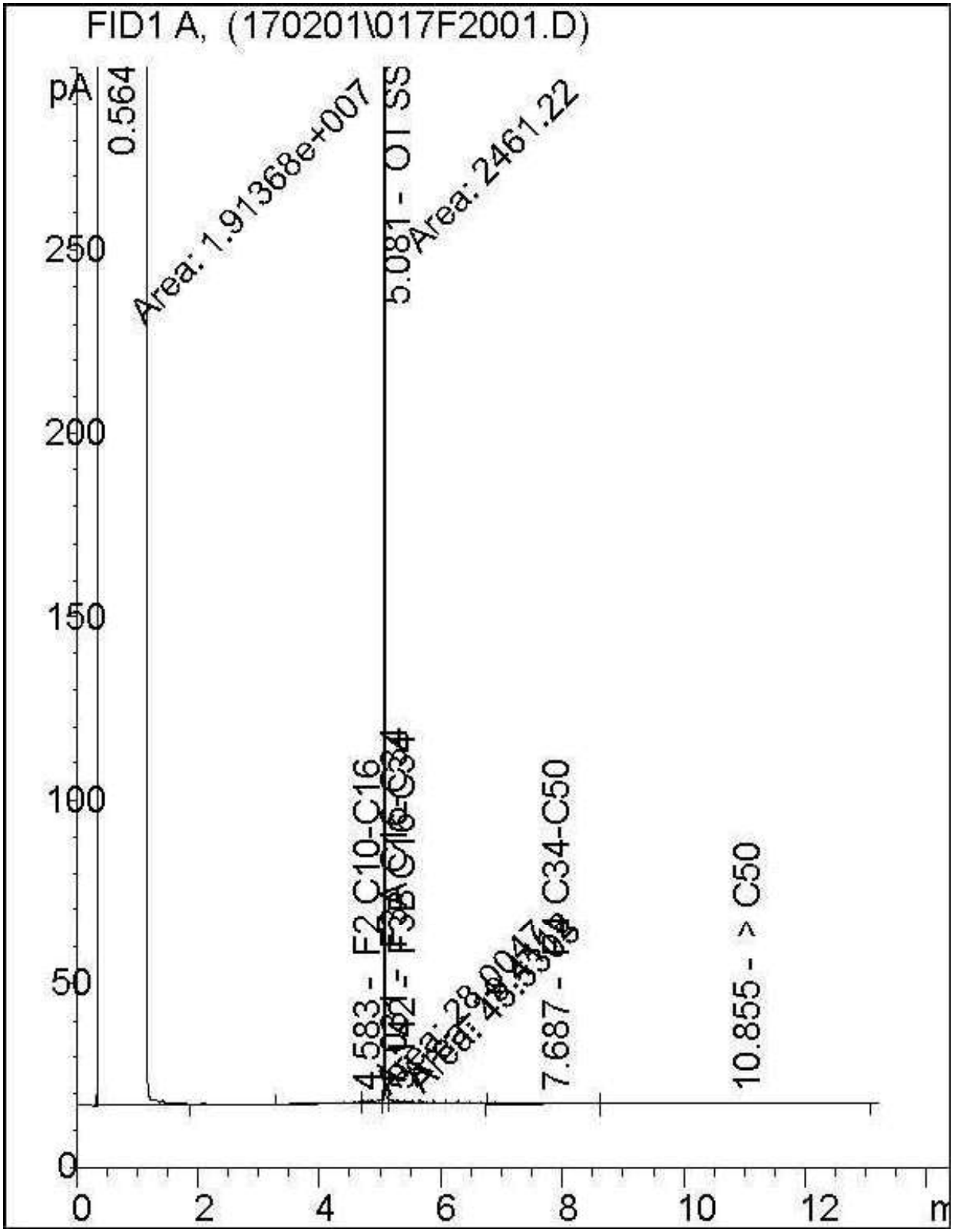
White: Maxxa Yellow: Client

4/6/5

Purc # 3309616350 34

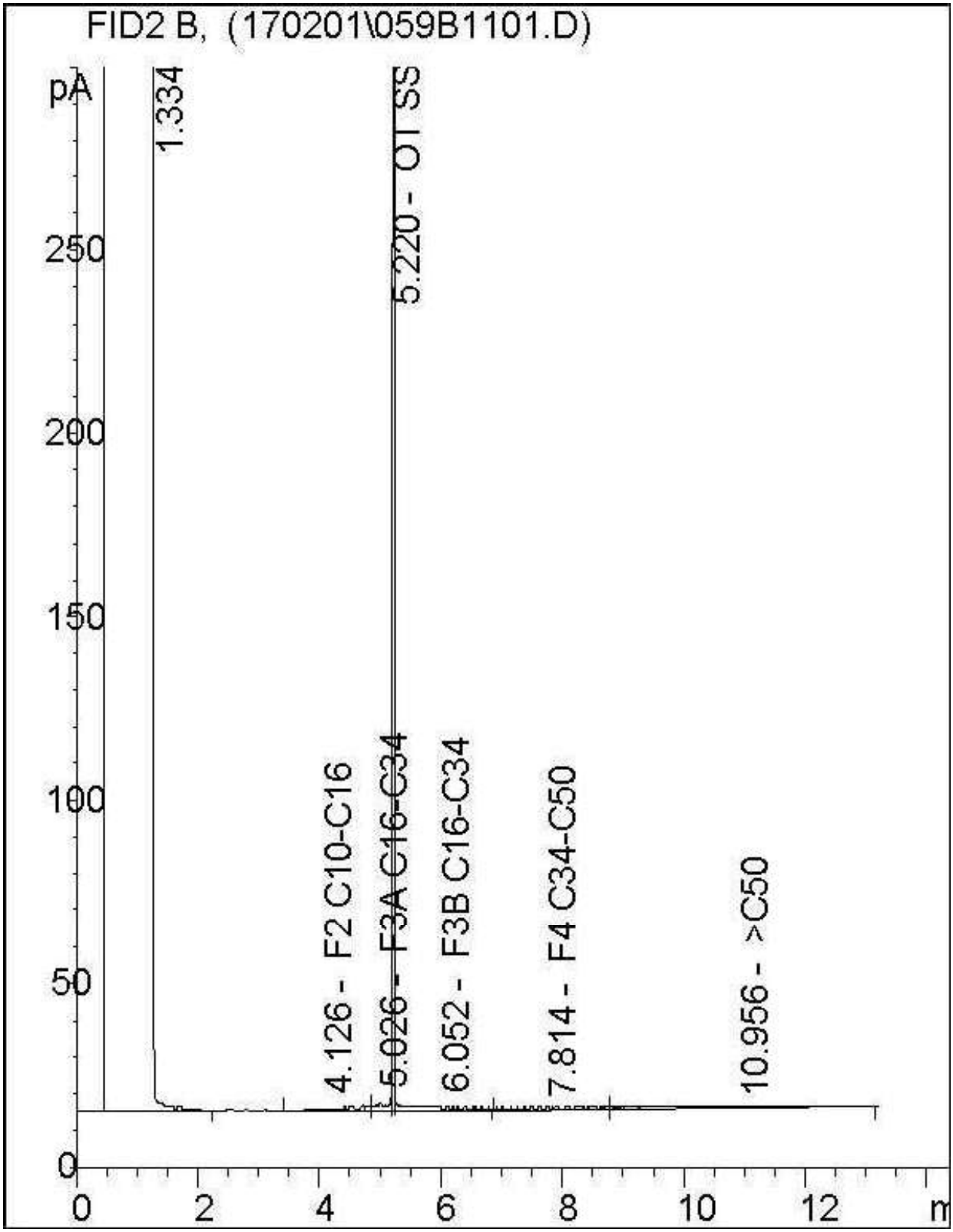
Maxxam Analytics International Corporation o/a Maxxam Analytics

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



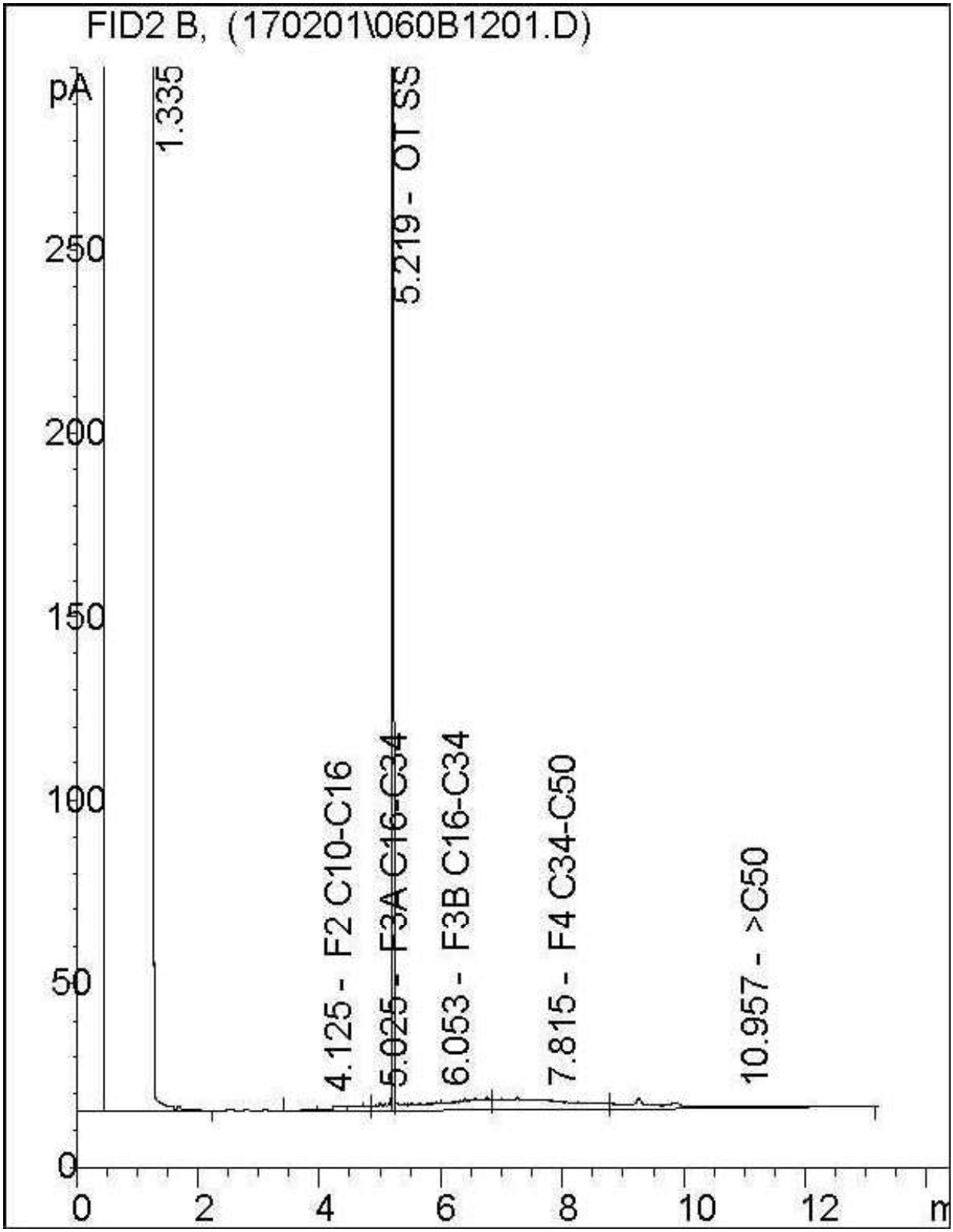
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

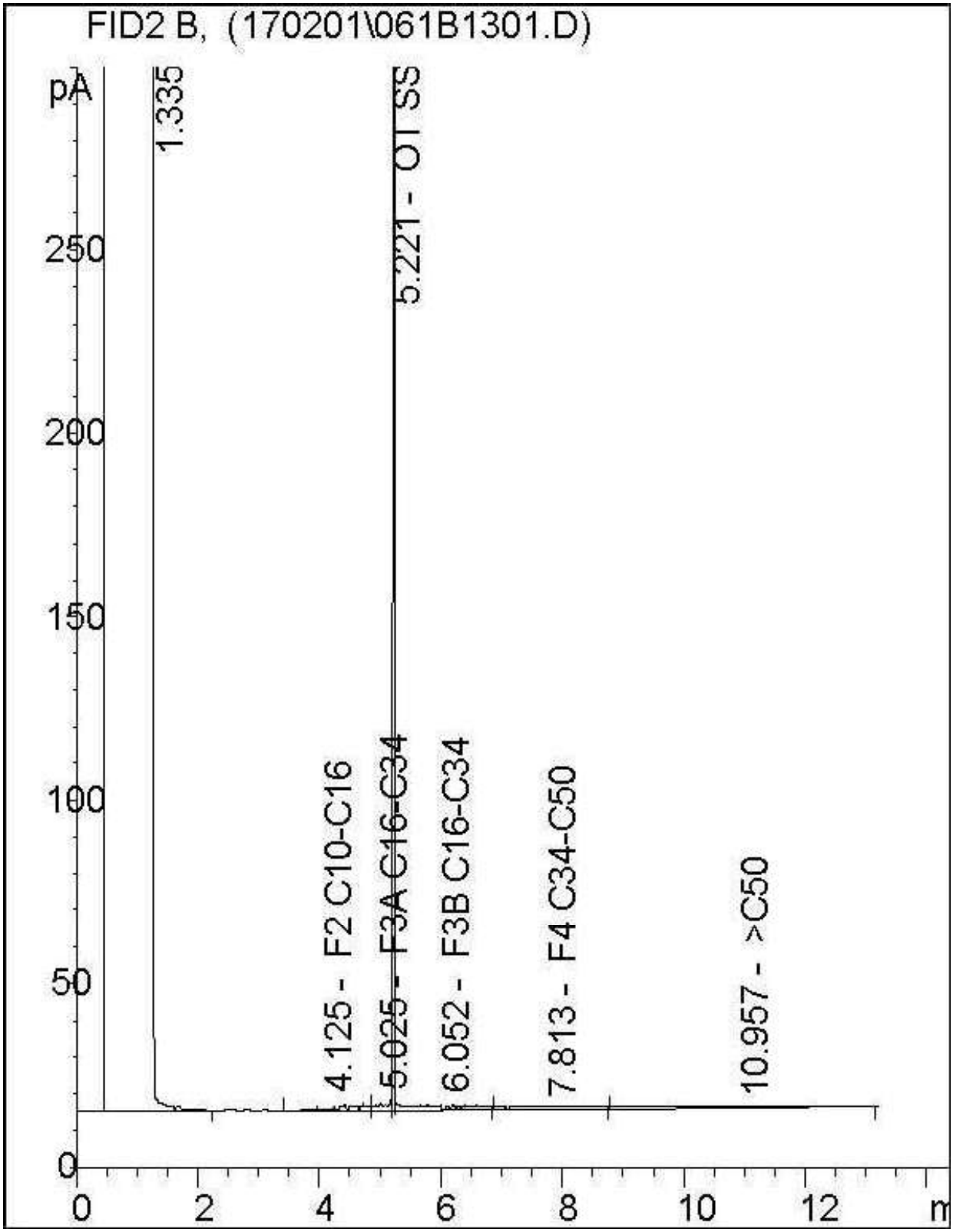


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B718928
Report Date: 2017/02/06
Maxxam Sample: DVD673

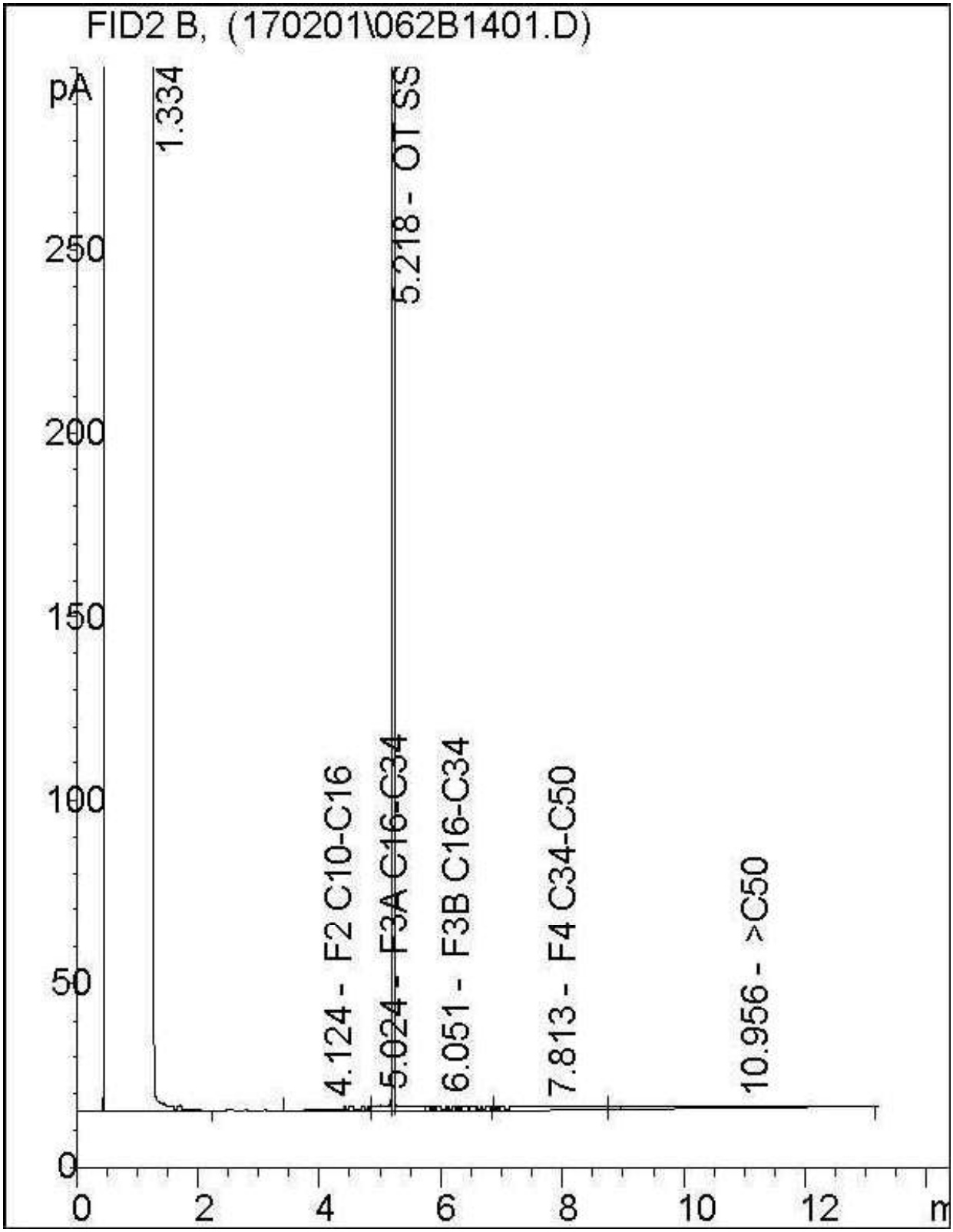
Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-13 SA4

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



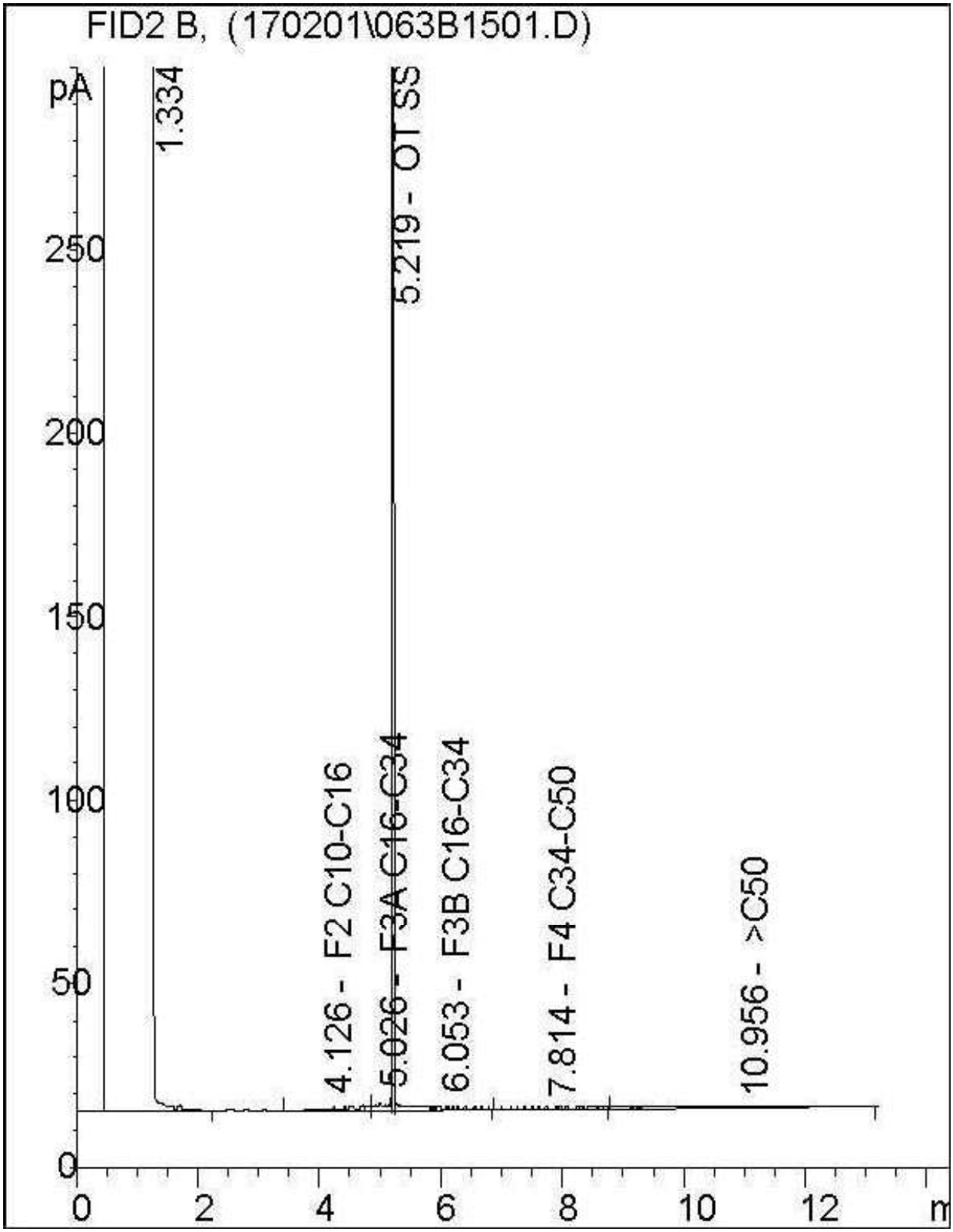
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

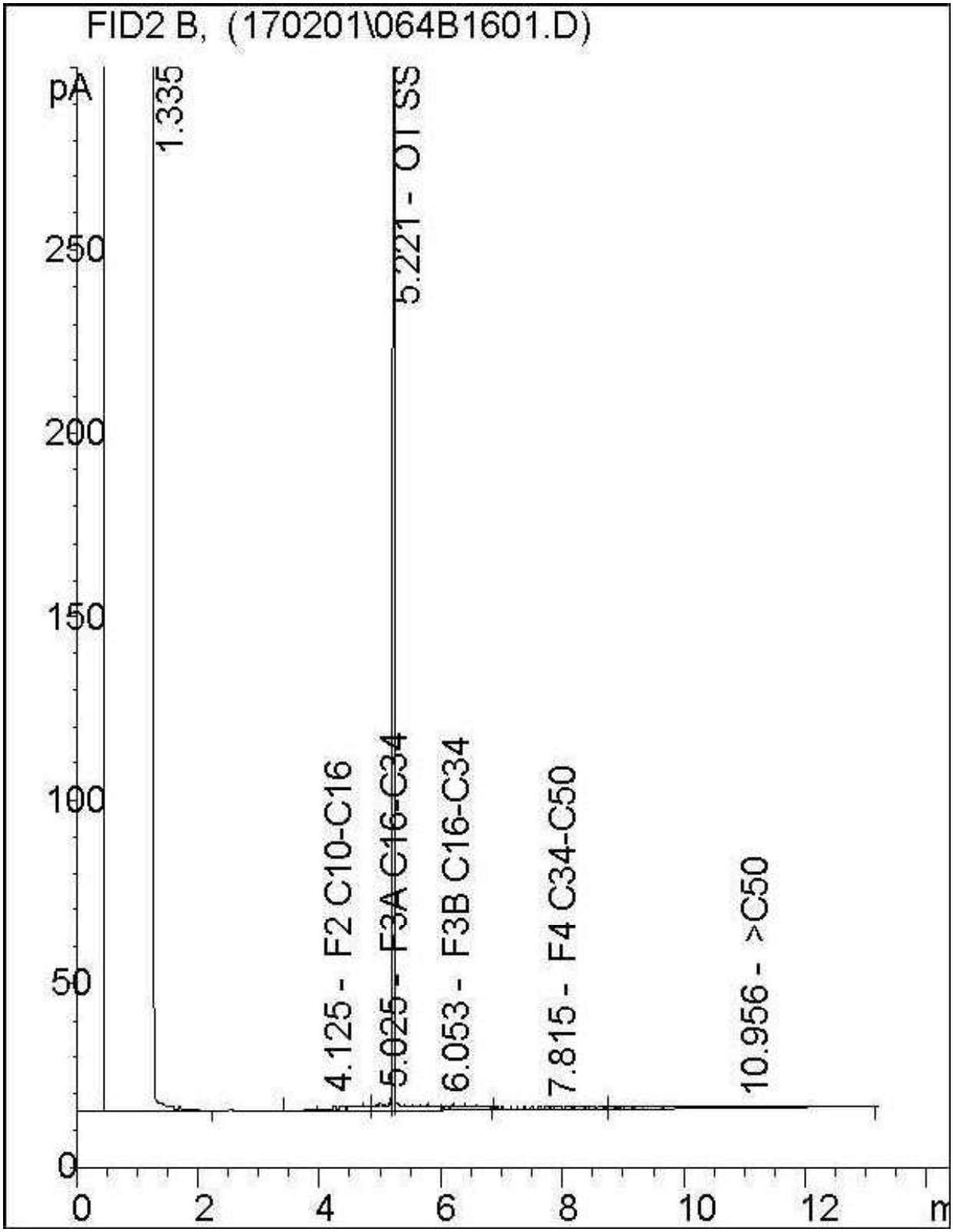


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B718928
Report Date: 2017/02/06
Maxxam Sample: DVD676

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-22 SA3

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

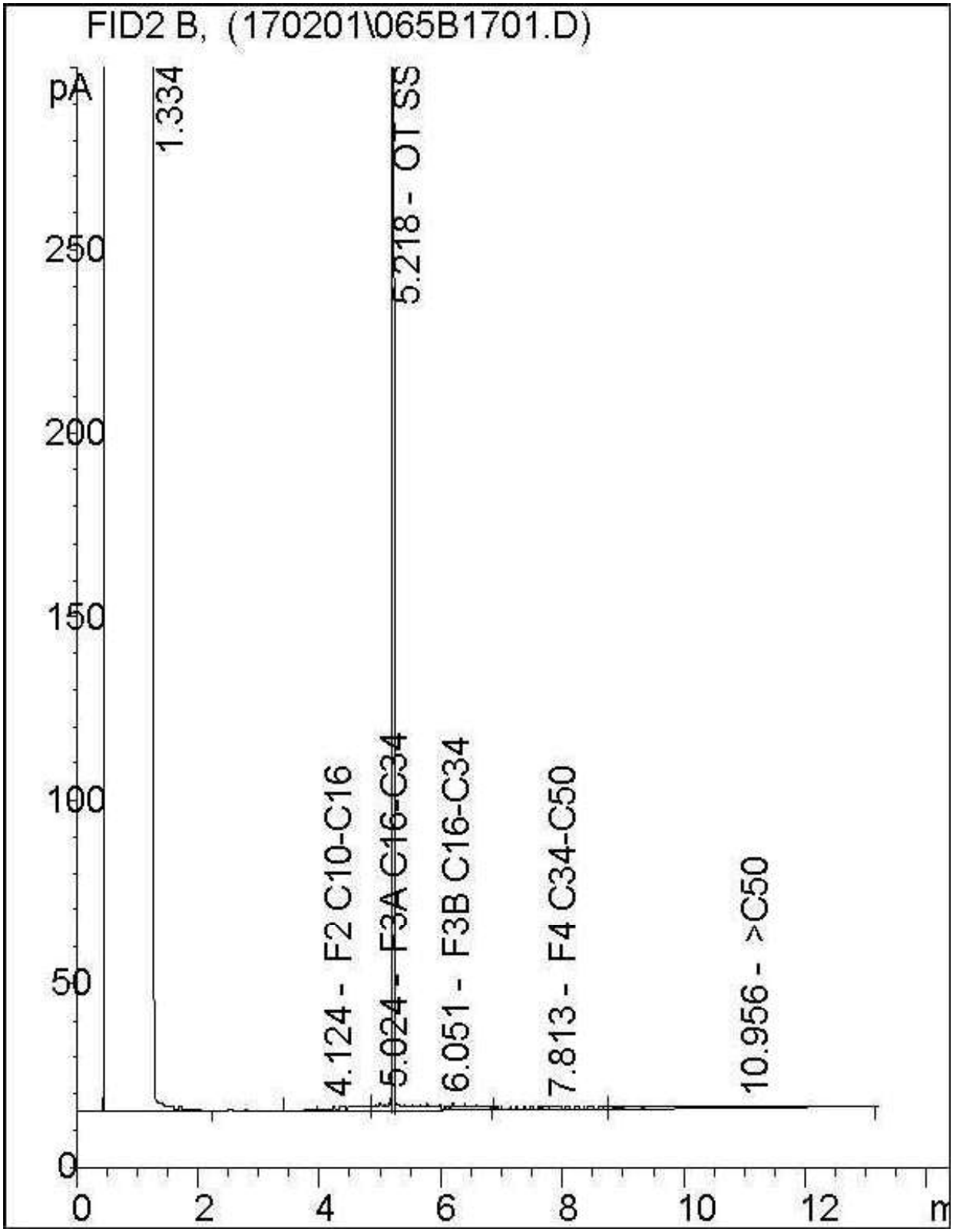


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B718928
Report Date: 2017/02/06
Maxxam Sample: DVD677

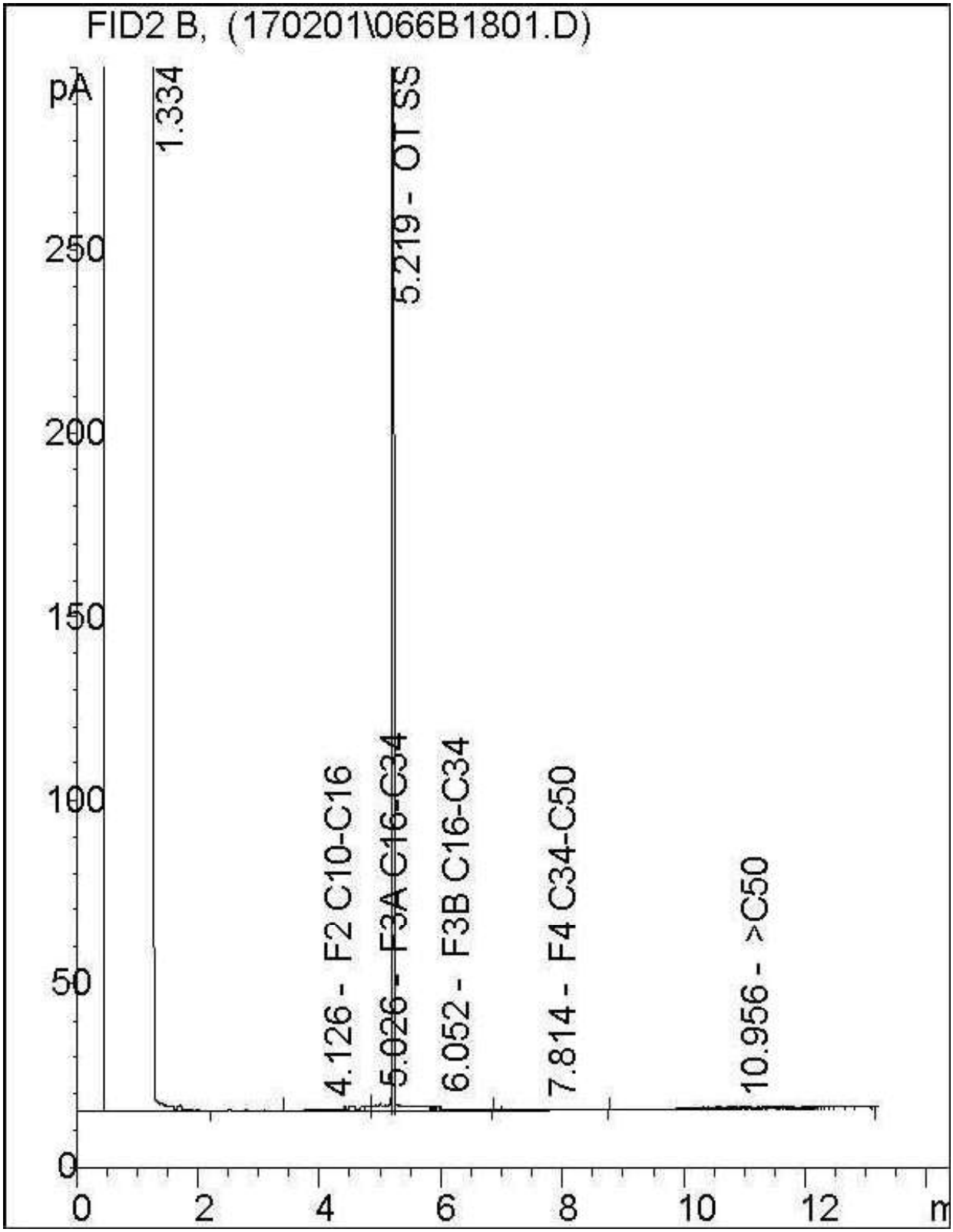
Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-1 SA4

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



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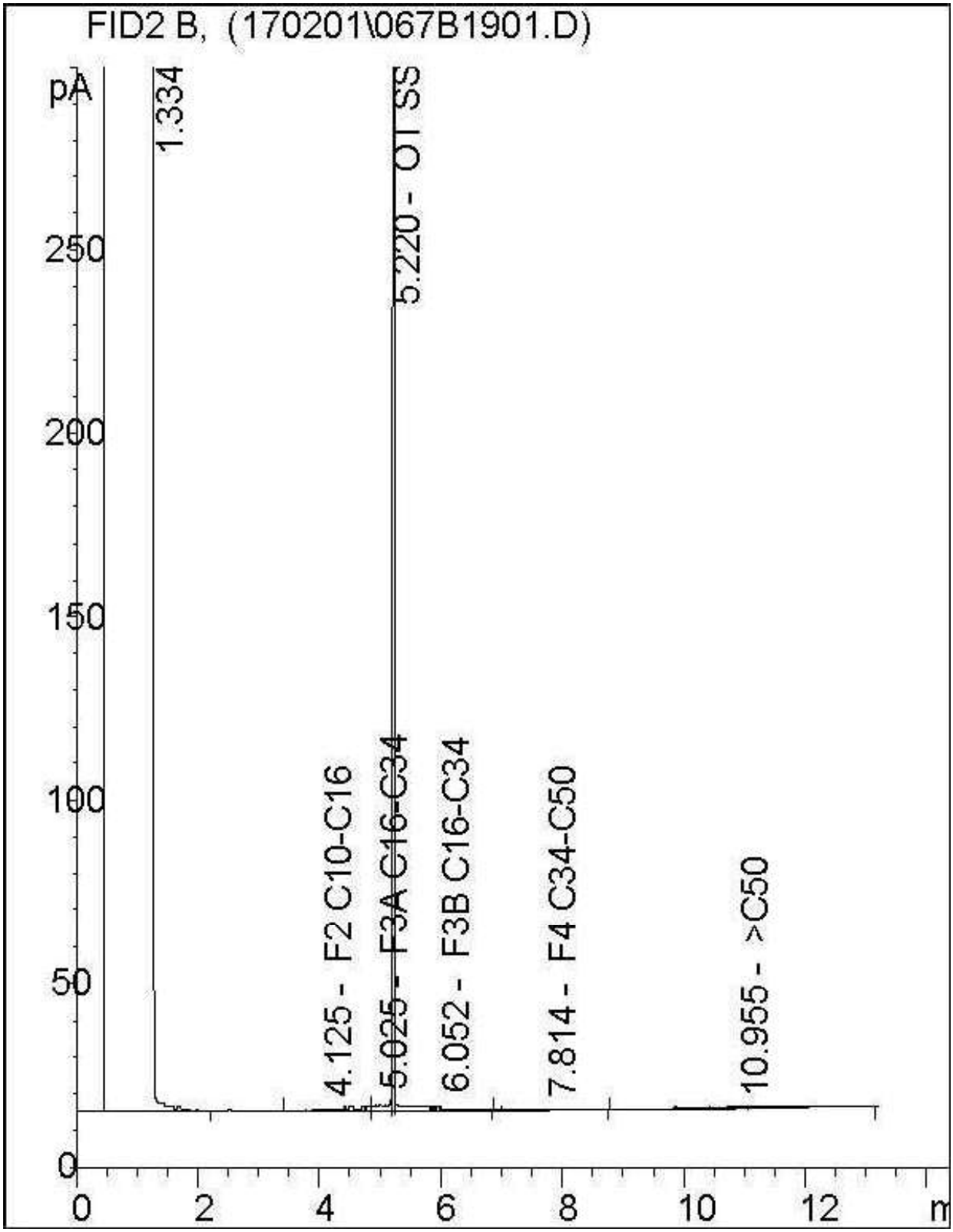
Petroleum Hydrocarbons F2-F4 in Soil Chromatogram

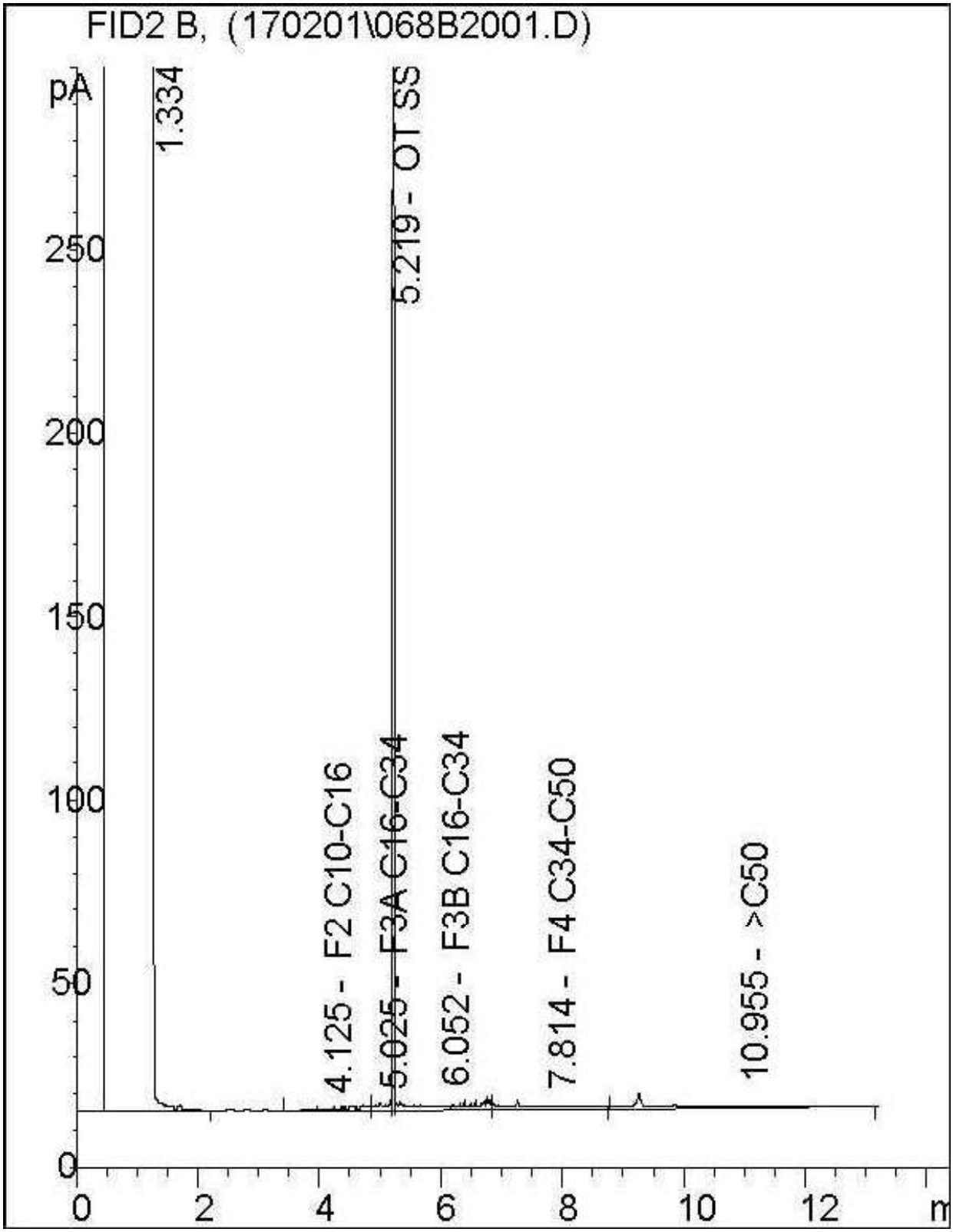


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B718928
Report Date: 2017/02/06
Maxxam Sample: DVD679

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-16 SA1

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam
A Bureau Veritas Group Company

Your Project #: 1670949
Your C.O.C. #: 597255-02-01

Attention:Joanne Woodhouse

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
K2H 5B7

Report Date: 2017/02/13
Report #: R4357883
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B725207
Received: 2017/02/06, 15:25

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	5	N/A	2017/02/09	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	6	N/A	2017/02/09		EPA 8260C m
Chromium (VI) in Water (1)	5	N/A	2017/02/08	CAM SOP-00436	EPA 7199 m
Petroleum Hydro. CCME F1 & BTEX in Water (1)	1	N/A	2017/02/10	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	7	2017/02/09	2017/02/11	CAM SOP-00316	CCME PHC-CWS m
Mercury (1)	5	2017/02/13	2017/02/13	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS (1)	5	N/A	2017/02/09	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM) (1)	5	2017/02/08	2017/02/09	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Water (1)	3	2017/02/08	2017/02/09	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs (1)	2	N/A	2017/02/08	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds and F1 PHCs (1)	4	N/A	2017/02/09	CAM SOP-00230	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods. Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Your Project #: 1670949
Your C.O.C. #: 597255-02-01

Attention:Joanne Woodhouse

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
K2H 5B7

Report Date: 2017/02/13
Report #: R4357883
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B725207
Received: 2017/02/06, 15:25

(1) This test was performed by Maxxam Analytics Mississauga
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Madison Bingley, Project Manager
Email: MBingley@maxxam.ca
Phone# (613)274-3549

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 METALS PACKAGE (WATER)

Maxxam ID		DWI790	DWI792	DWI793	DWI794		DWI796		
Sampling Date		2017/02/06 11:00	2017/02/06 13:00	2017/02/06 13:30	2017/02/06 14:00		2017/02/06 13:00		
COC Number		597255-02-01	597255-02-01	597255-02-01	597255-02-01		597255-02-01		
	UNITS	17-14	17-22	17-13	17-10	QC Batch	DUP A	RDL	QC Batch
Metals									
Chromium (VI)	ug/L	<0.50	<0.50	<0.50	<0.50	4855645	<0.50	0.50	4856231
Mercury (Hg)	ug/L	<0.1	<0.1	<0.1	<0.1	4861256	<0.1	0.1	4861256
Dissolved Antimony (Sb)	ug/L	0.53	0.81	0.78	0.76	4855967	0.78	0.50	4855967
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.1	4855967	<1.0	1.0	4855967
Dissolved Barium (Ba)	ug/L	220	180	120	82	4855967	160	2.0	4855967
Dissolved Beryllium (Be)	ug/L	<0.50	<0.50	<0.50	<0.50	4855967	<0.50	0.50	4855967
Dissolved Boron (B)	ug/L	97	62	84	78	4855967	55	10	4855967
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	<0.10	<0.10	4855967	<0.10	0.10	4855967
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	4855967	<5.0	5.0	4855967
Dissolved Cobalt (Co)	ug/L	1.1	<0.50	<0.50	0.51	4855967	<0.50	0.50	4855967
Dissolved Copper (Cu)	ug/L	1.5	1.5	1.1	1.5	4855967	1.4	1.0	4855967
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	4855967	<0.50	0.50	4855967
Dissolved Molybdenum (Mo)	ug/L	24	50	42	44	4855967	50	0.50	4855967
Dissolved Nickel (Ni)	ug/L	5.0	3.6	2.2	3.0	4855967	3.7	1.0	4855967
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	<2.0	<2.0	4855967	<2.0	2.0	4855967
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	4855967	<0.10	0.10	4855967
Dissolved Sodium (Na)	ug/L	65000	95000	19000	12000	4855967	110000	100	4855967
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	<0.050	4855967	<0.050	0.050	4855967
Dissolved Uranium (U)	ug/L	9.1	6.9	12	9.5	4855967	7.8	0.10	4855967
Dissolved Vanadium (V)	ug/L	0.82	0.96	2.2	2.7	4855967	1.4	0.50	4855967
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	23	4855967	<5.0	5.0	4855967

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 PAHS (WATER)

Maxxam ID		DWI790	DWI792	DWI793	DWI794	DWI796		
Sampling Date		2017/02/06 11:00	2017/02/06 13:00	2017/02/06 13:30	2017/02/06 14:00	2017/02/06 13:00		
COC Number		597255-02-01	597255-02-01	597255-02-01	597255-02-01	597255-02-01		
	UNITS	17-14	17-22	17-13	17-10	DUP A	RDL	QC Batch
Calculated Parameters								
Methylnaphthalene, 2-(1-)	ug/L	<0.071	<0.071	<0.071	<0.071	<0.071	0.071	4854299
Polyaromatic Hydrocarbons								
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Benzo(a)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	4857082
Benzo(b/j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Naphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Phenanthrene	ug/L	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	4857082
Pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4857082
Surrogate Recovery (%)								
D10-Anthracene	%	104	100	99	103	100		4857082
D14-Terphenyl (FS)	%	97	95	94	98	94		4857082
D8-Acenaphthylene	%	106	105	103	106	105		4857082

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QC Batch = Quality Control Batch

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Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 PCBS (WATER)

Maxxam ID		DWI790	DWI793	DWI794		
Sampling Date		2017/02/06 11:00	2017/02/06 13:30	2017/02/06 14:00		
COC Number		597255-02-01	597255-02-01	597255-02-01		
	UNITS	17-14	17-13	17-10	RDL	QC Batch
PCBs						
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	0.05	4856408
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	0.05	4856408
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	0.05	4856408
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	0.05	4856408
Total PCB	ug/L	<0.05	<0.05	<0.05	0.05	4856408
Surrogate Recovery (%)						
Decachlorobiphenyl	%	72	77	75		4856408

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 PETROLEUM HYDROCARBONS (WATER)

Maxxam ID		DWI791		
Sampling Date		2017/02/06 12:00		
COC Number		597255-02-01		
	UNITS	17-1	RDL	QC Batch
BTEX & F1 Hydrocarbons				
Benzene	ug/L	<0.20	0.20	4858939
Toluene	ug/L	<0.20	0.20	4858939
Ethylbenzene	ug/L	<0.20	0.20	4858939
o-Xylene	ug/L	<0.20	0.20	4858939
p+m-Xylene	ug/L	<0.40	0.40	4858939
Total Xylenes	ug/L	<0.40	0.40	4858939
F1 (C6-C10)	ug/L	<25	25	4858939
F1 (C6-C10) - BTEX	ug/L	<25	25	4858939
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	4858247
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	4858247
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	4858247
Reached Baseline at C50	ug/L	Yes		4858247
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	102		4858939
4-Bromofluorobenzene	%	91		4858939
D10-Ethylbenzene	%	107		4858939
D4-1,2-Dichloroethane	%	96		4858939
o-Terphenyl	%	105		4858247

RDL = Reportable Detection Limit
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Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 VOCS & F1-F4 (WATER)

Maxxam ID		DWI790	DWI792	DWI792	DWI793	DWI794		
Sampling Date		2017/02/06 11:00	2017/02/06 13:00	2017/02/06 13:00	2017/02/06 13:30	2017/02/06 14:00		
COC Number		597255-02-01	597255-02-01	597255-02-01	597255-02-01	597255-02-01		
	UNITS	**17-14**	**17-22**	**17-22 Lab-Dup**	**17-13**	**17-10**	**RDL**	**QC Batch**
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50		<0.50	<0.50	0.50	4854300
Volatile Organics								
Acetone (2-Propanone)	ug/L	<10	<10	<10	<10	<10	10	4855687
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4855687
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Chloroform	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4855687
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	4855687
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	4855687
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	4855687
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	4855687
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	<10	<10	10	4855687
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	4855687
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 VOCS & F1-F4 (WATER)

Maxxam ID		DWI790	DWI792	DWI792	DWI793	DWI794		
Sampling Date		2017/02/06 11:00	2017/02/06 13:00	2017/02/06 13:00	2017/02/06 13:30	2017/02/06 14:00		
COC Number		597255-02-01	597255-02-01	597255-02-01	597255-02-01	597255-02-01		
	UNITS	17-14	17-22	17-22 Lab-Dup	17-13	17-10	RDL	QC Batch
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	4855687
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
Total Xylenes	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	4855687
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	25	4855687
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	25	4855687
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100		<100	<100	100	4858247
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200		<200	<200	200	4858247
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200		<200	<200	200	4858247
Reached Baseline at C50	ug/L	Yes	Yes		Yes	Yes		4858247
Surrogate Recovery (%)								
o-Terphenyl	%	106	105		104	106		4858247
4-Bromofluorobenzene	%	95	96	95	94	94		4855687
D4-1,2-Dichloroethane	%	106	105	109	109	108		4855687
D8-Toluene	%	90	91	91	91	91		4855687

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QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 VOCS & F1-F4 (WATER)

Maxxam ID		DWI795	DWI796		
Sampling Date		2017/02/06 14:30	2017/02/06 13:00		
COC Number		597255-02-01	597255-02-01		
	UNITS	17-20	DUP A	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	0.50	4854300
Volatile Organics					
Acetone (2-Propanone)	ug/L	<10	<10	10	4855687
Benzene	ug/L	<0.20	<0.20	0.20	4855687
Bromodichloromethane	ug/L	<0.50	<0.50	0.50	4855687
Bromoform	ug/L	<1.0	<1.0	1.0	4855687
Bromomethane	ug/L	<0.50	<0.50	0.50	4855687
Carbon Tetrachloride	ug/L	<0.20	<0.20	0.20	4855687
Chlorobenzene	ug/L	<0.20	<0.20	0.20	4855687
Chloroform	ug/L	<0.20	<0.20	0.20	4855687
Dibromochloromethane	ug/L	<0.50	<0.50	0.50	4855687
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	4855687
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	4855687
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	4855687
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	1.0	4855687
1,1-Dichloroethane	ug/L	<0.20	<0.20	0.20	4855687
1,2-Dichloroethane	ug/L	<0.50	<0.50	0.50	4855687
1,1-Dichloroethylene	ug/L	<0.20	<0.20	0.20	4855687
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	4855687
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	4855687
1,2-Dichloropropane	ug/L	<0.20	<0.20	0.20	4855687
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	0.30	4855687
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	0.40	4855687
Ethylbenzene	ug/L	<0.20	<0.20	0.20	4855687
Ethylene Dibromide	ug/L	<0.20	<0.20	0.20	4855687
Hexane	ug/L	<1.0	<1.0	1.0	4855687
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	2.0	4855687
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	10	4855687
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	5.0	4855687
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	0.50	4855687
Styrene	ug/L	<0.50	<0.50	0.50	4855687
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	4855687
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	4855687
Tetrachloroethylene	ug/L	<0.20	<0.20	0.20	4855687
Toluene	ug/L	<0.20	<0.20	0.20	4855687

RDL = Reportable Detection Limit
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Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

O.REG 153 VOCS & F1-F4 (WATER)

Maxxam ID		DWI795	DWI796		
Sampling Date		2017/02/06 14:30	2017/02/06 13:00		
COC Number		597255-02-01	597255-02-01		
	UNITS	17-20	DUP A	RDL	QC Batch
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	0.20	4855687
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	0.50	4855687
Trichloroethylene	ug/L	<0.20	<0.20	0.20	4855687
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	0.50	4855687
Vinyl Chloride	ug/L	<0.20	<0.20	0.20	4855687
p+m-Xylene	ug/L	<0.20	<0.20	0.20	4855687
o-Xylene	ug/L	<0.20	<0.20	0.20	4855687
Total Xylenes	ug/L	<0.20	<0.20	0.20	4855687
F1 (C6-C10)	ug/L	<25	<25	25	4855687
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	4855687
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	4858247
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	200	4858247
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	200	4858247
Reached Baseline at C50	ug/L	Yes	Yes		4858247
Surrogate Recovery (%)					
o-Terphenyl	%	106	103		4858247
4-Bromofluorobenzene	%	94	94		4855687
D4-1,2-Dichloroethane	%	108	107		4855687
D8-Toluene	%	90	91		4855687

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2017/02/13

Golder Associates Ltd
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Sampler Initials: AB

TEST SUMMARY

Maxxam ID: DWI790
Sample ID: 17-14
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4854299	N/A	2017/02/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	4854300	N/A	2017/02/09	Automated Statchk
Chromium (VI) in Water	IC	4855645	N/A	2017/02/08	Manoj Kumar Gera
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa
Mercury	CV/AA	4861256	2017/02/13	2017/02/13	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4855967	N/A	2017/02/09	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4857082	2017/02/08	2017/02/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	4856408	2017/02/08	2017/02/09	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/08	Denis Reid

Maxxam ID: DWI791
Sample ID: 17-1
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	4858939	N/A	2017/02/10	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa

Maxxam ID: DWI792
Sample ID: 17-22
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4854299	N/A	2017/02/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	4854300	N/A	2017/02/09	Automated Statchk
Chromium (VI) in Water	IC	4855645	N/A	2017/02/08	Manoj Kumar Gera
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa
Mercury	CV/AA	4861256	2017/02/13	2017/02/13	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4855967	N/A	2017/02/09	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4857082	2017/02/08	2017/02/09	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/08	Denis Reid

Maxxam ID: DWI792 Dup
Sample ID: 17-22
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/09	Denis Reid

Maxxam ID: DWI793
Sample ID: 17-13
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4854299	N/A	2017/02/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	4854300	N/A	2017/02/09	Automated Statchk

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Maxxam Job #: B725207
Report Date: 2017/02/13

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

TEST SUMMARY

Maxxam ID: DWI793
Sample ID: 17-13
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	4855645	N/A	2017/02/08	Manoj Kumar Gera
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa
Mercury	CV/AA	4861256	2017/02/13	2017/02/13	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4855967	N/A	2017/02/09	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4857082	2017/02/08	2017/02/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	4856408	2017/02/08	2017/02/09	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/09	Denis Reid

Maxxam ID: DWI794
Sample ID: 17-10
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4854299	N/A	2017/02/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	4854300	N/A	2017/02/09	Automated Statchk
Chromium (VI) in Water	IC	4855645	N/A	2017/02/08	Manoj Kumar Gera
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa
Mercury	CV/AA	4861256	2017/02/13	2017/02/13	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4855967	N/A	2017/02/09	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4857082	2017/02/08	2017/02/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	4856408	2017/02/08	2017/02/09	Li Peng
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/09	Denis Reid

Maxxam ID: DWI795
Sample ID: 17-20
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	4854300	N/A	2017/02/09	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/09	Denis Reid

Maxxam ID: DWI796
Sample ID: DUP A
Matrix: Water

Collected: 2017/02/06
Shipped:
Received: 2017/02/06

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	4854299	N/A	2017/02/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	4854300	N/A	2017/02/09	Automated Statchk
Chromium (VI) in Water	IC	4856231	N/A	2017/02/08	Lang Le
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	4858247	2017/02/09	2017/02/11	Dorina Popa
Mercury	CV/AA	4861256	2017/02/13	2017/02/13	Magdalena Carlos
Dissolved Metals by ICPMS	ICP/MS	4855967	N/A	2017/02/09	Cristina Petran
PAH Compounds in Water by GC/MS (SIM)	GC/MS	4857082	2017/02/08	2017/02/09	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	4855687	N/A	2017/02/09	Denis Reid

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.0°C

Results relate only to the items tested.

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Maxxam Job #: B725207
Report Date: 2017/02/13

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4855687	4-Bromofluorobenzene	2017/02/08	103	70 - 130	106	70 - 130	94	%		
4855687	D4-1,2-Dichloroethane	2017/02/08	103	70 - 130	100	70 - 130	107	%		
4855687	D8-Toluene	2017/02/08	104	70 - 130	103	70 - 130	90	%		
4856408	Decachlorobiphenyl	2017/02/09	72	60 - 130	69	60 - 130	75	%		
4857082	D10-Anthracene	2017/02/09	99	50 - 130	94	50 - 130	94	%		
4857082	D14-Terphenyl (FS)	2017/02/09	92	50 - 130	98	50 - 130	93	%		
4857082	D8-Acenaphthylene	2017/02/09	98	50 - 130	93	50 - 130	92	%		
4858247	o-Terphenyl	2017/02/10	107	60 - 130	107	60 - 130	101	%		
4858939	1,4-Difluorobenzene	2017/02/09	104	70 - 130	101	70 - 130	102	%		
4858939	4-Bromofluorobenzene	2017/02/09	101	70 - 130	101	70 - 130	98	%		
4858939	D10-Ethylbenzene	2017/02/09	84	70 - 130	82	70 - 130	85	%		
4858939	D4-1,2-Dichloroethane	2017/02/09	95	70 - 130	96	70 - 130	99	%		
4855645	Chromium (VI)	2017/02/08	95	80 - 120	94	80 - 120	<0.50	ug/L	NC	20
4855687	1,1,1,2-Tetrachloroethane	2017/02/09	106	70 - 130	106	70 - 130	<0.50	ug/L	NC	30
4855687	1,1,1-Trichloroethane	2017/02/09	102	70 - 130	105	70 - 130	<0.20	ug/L	NC	30
4855687	1,1,2,2-Tetrachloroethane	2017/02/09	99	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
4855687	1,1,2-Trichloroethane	2017/02/09	97	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
4855687	1,1-Dichloroethane	2017/02/09	100	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
4855687	1,1-Dichloroethylene	2017/02/09	99	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
4855687	1,2-Dichlorobenzene	2017/02/09	98	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
4855687	1,2-Dichloroethane	2017/02/09	95	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
4855687	1,2-Dichloropropane	2017/02/09	96	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
4855687	1,3-Dichlorobenzene	2017/02/09	96	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
4855687	1,4-Dichlorobenzene	2017/02/09	96	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
4855687	Acetone (2-Propanone)	2017/02/09	94	60 - 140	90	60 - 140	<10	ug/L	NC	30
4855687	Benzene	2017/02/09	99	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
4855687	Bromodichloromethane	2017/02/09	102	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
4855687	Bromoform	2017/02/09	105	70 - 130	102	70 - 130	<1.0	ug/L	NC	30
4855687	Bromomethane	2017/02/09	106	60 - 140	106	60 - 140	<0.50	ug/L	NC	30
4855687	Carbon Tetrachloride	2017/02/09	109	70 - 130	111	70 - 130	<0.20	ug/L	NC	30
4855687	Chlorobenzene	2017/02/09	99	70 - 130	97	70 - 130	<0.20	ug/L	NC	30

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Maxxam Job #: B725207
Report Date: 2017/02/13

QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd
Client Project #: 1670949
Sampler Initials: AB

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4855687	Chloroform	2017/02/09	102	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
4855687	cis-1,2-Dichloroethylene	2017/02/09	106	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
4855687	cis-1,3-Dichloropropene	2017/02/09	89	70 - 130	84	70 - 130	<0.30	ug/L	NC	30
4855687	Dibromochloromethane	2017/02/09	108	70 - 130	106	70 - 130	<0.50	ug/L	NC	30
4855687	Dichlorodifluoromethane (FREON 12)	2017/02/09	92	60 - 140	97	60 - 140	<1.0	ug/L	NC	30
4855687	Ethylbenzene	2017/02/09	90	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
4855687	Ethylene Dibromide	2017/02/09	99	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
4855687	F1 (C6-C10) - BTEX	2017/02/09					<25	ug/L	NC	30
4855687	F1 (C6-C10)	2017/02/09	99	60 - 140	97	60 - 140	<25	ug/L	NC	30
4855687	Hexane	2017/02/09	101	70 - 130	103	70 - 130	<1.0	ug/L	NC	30
4855687	Methyl Ethyl Ketone (2-Butanone)	2017/02/09	95	60 - 140	89	60 - 140	<10	ug/L	NC	30
4855687	Methyl Isobutyl Ketone	2017/02/09	90	70 - 130	84	70 - 130	<5.0	ug/L	NC	30
4855687	Methyl t-butyl ether (MTBE)	2017/02/09	91	70 - 130	89	70 - 130	<0.50	ug/L	NC	30
4855687	Methylene Chloride(Dichloromethane)	2017/02/09	110	70 - 130	108	70 - 130	<2.0	ug/L	NC	30
4855687	o-Xylene	2017/02/09	89	70 - 130	87	70 - 130	<0.20	ug/L	NC	30
4855687	p+m-Xylene	2017/02/09	87	70 - 130	85	70 - 130	<0.20	ug/L	NC	30
4855687	Styrene	2017/02/09	93	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
4855687	Tetrachloroethylene	2017/02/09	108	70 - 130	109	70 - 130	<0.20	ug/L	NC	30
4855687	Toluene	2017/02/09	96	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
4855687	Total Xylenes	2017/02/09					<0.20	ug/L	NC	30
4855687	trans-1,2-Dichloroethylene	2017/02/09	102	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
4855687	trans-1,3-Dichloropropene	2017/02/09	92	70 - 130	85	70 - 130	<0.40	ug/L	NC	30
4855687	Trichloroethylene	2017/02/09	105	70 - 130	105	70 - 130	<0.20	ug/L	NC	30
4855687	Trichlorofluoromethane (FREON 11)	2017/02/09	111	70 - 130	114	70 - 130	<0.50	ug/L	NC	30
4855687	Vinyl Chloride	2017/02/09	108	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
4855967	Dissolved Antimony (Sb)	2017/02/09	111	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
4855967	Dissolved Arsenic (As)	2017/02/09	103	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
4855967	Dissolved Barium (Ba)	2017/02/09	104	80 - 120	98	80 - 120	<2.0	ug/L	0.61	20
4855967	Dissolved Beryllium (Be)	2017/02/09	107	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
4855967	Dissolved Boron (B)	2017/02/09	105	80 - 120	101	80 - 120	<10	ug/L	0.45	20
4855967	Dissolved Cadmium (Cd)	2017/02/09	107	80 - 120	99	80 - 120	<0.10	ug/L	NC	20

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4855967	Dissolved Chromium (Cr)	2017/02/09	103	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
4855967	Dissolved Cobalt (Co)	2017/02/09	102	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
4855967	Dissolved Copper (Cu)	2017/02/09	104	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
4855967	Dissolved Lead (Pb)	2017/02/09	100	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
4855967	Dissolved Molybdenum (Mo)	2017/02/09	110	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
4855967	Dissolved Nickel (Ni)	2017/02/09	100	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
4855967	Dissolved Selenium (Se)	2017/02/09	104	80 - 120	98	80 - 120	<2.0	ug/L	NC	20
4855967	Dissolved Silver (Ag)	2017/02/09	98	80 - 120	96	80 - 120	<0.10	ug/L	NC	20
4855967	Dissolved Sodium (Na)	2017/02/09	NC	80 - 120	99	80 - 120	<100	ug/L	2.3	20
4855967	Dissolved Thallium (Tl)	2017/02/09	100	80 - 120	95	80 - 120	<0.050	ug/L	NC	20
4855967	Dissolved Uranium (U)	2017/02/09	106	80 - 120	99	80 - 120	<0.10	ug/L	3.7	20
4855967	Dissolved Vanadium (V)	2017/02/09	105	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
4855967	Dissolved Zinc (Zn)	2017/02/09	102	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
4856231	Chromium (VI)	2017/02/08	94	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
4856408	Aroclor 1242	2017/02/09					<0.05	ug/L		
4856408	Aroclor 1248	2017/02/09					<0.05	ug/L		
4856408	Aroclor 1254	2017/02/09					<0.05	ug/L		
4856408	Aroclor 1260	2017/02/09	67	60 - 130	80	60 - 130	<0.05	ug/L		
4856408	Total PCB	2017/02/09	67	60 - 130	80	60 - 130	<0.05	ug/L	NC	40
4857082	1-Methylnaphthalene	2017/02/09	115	50 - 130	112	50 - 130	<0.050	ug/L	NC	30
4857082	2-Methylnaphthalene	2017/02/09	103	50 - 130	99	50 - 130	<0.050	ug/L	NC	30
4857082	Acenaphthene	2017/02/09	109	50 - 130	107	50 - 130	<0.050	ug/L	NC	30
4857082	Acenaphthylene	2017/02/09	106	50 - 130	100	50 - 130	<0.050	ug/L	NC	30
4857082	Anthracene	2017/02/09	102	50 - 130	98	50 - 130	<0.050	ug/L	NC	30
4857082	Benzo(a)anthracene	2017/02/09	96	50 - 130	106	50 - 130	<0.050	ug/L	NC	30
4857082	Benzo(a)pyrene	2017/02/09	87	50 - 130	106	50 - 130	<0.010	ug/L	NC	30
4857082	Benzo(b/j)fluoranthene	2017/02/09	90	50 - 130	108	50 - 130	<0.050	ug/L	NC	30
4857082	Benzo(g,h,i)perylene	2017/02/09	80	50 - 130	106	50 - 130	<0.050	ug/L	NC	30
4857082	Benzo(k)fluoranthene	2017/02/09	90	50 - 130	113	50 - 130	<0.050	ug/L	NC	30
4857082	Chrysene	2017/02/09	91	50 - 130	106	50 - 130	<0.050	ug/L	NC	30
4857082	Dibenz(a,h)anthracene	2017/02/09	78	50 - 130	98	50 - 130	<0.050	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
4857082	Fluoranthene	2017/02/09	112	50 - 130	113	50 - 130	<0.050	ug/L	NC	30
4857082	Fluorene	2017/02/09	107	50 - 130	105	50 - 130	<0.050	ug/L	NC	30
4857082	Indeno(1,2,3-cd)pyrene	2017/02/09	83	50 - 130	102	50 - 130	<0.050	ug/L	NC	30
4857082	Naphthalene	2017/02/09	95	50 - 130	92	50 - 130	<0.050	ug/L	NC	30
4857082	Phenanthrene	2017/02/09	110	50 - 130	109	50 - 130	<0.030	ug/L	NC	30
4857082	Pyrene	2017/02/09	115	50 - 130	119	50 - 130	<0.050	ug/L	NC	30
4858247	F2 (C10-C16 Hydrocarbons)	2017/02/11	101	50 - 130	93	60 - 130	<100	ug/L	NC	30
4858247	F3 (C16-C34 Hydrocarbons)	2017/02/11	98	50 - 130	95	60 - 130	<200	ug/L	NC	30
4858247	F4 (C34-C50 Hydrocarbons)	2017/02/11	100	50 - 130	100	60 - 130	<200	ug/L	NC	30
4858939	Benzene	2017/02/09	84	70 - 130	86	70 - 130	<0.20	ug/L	NC	30
4858939	Ethylbenzene	2017/02/09	90	70 - 130	90	70 - 130	<0.20	ug/L	NC	30
4858939	F1 (C6-C10) - BTEX	2017/02/09					<25	ug/L	NC	30
4858939	F1 (C6-C10)	2017/02/09	97	70 - 130	107	70 - 130	<25	ug/L	NC	30
4858939	o-Xylene	2017/02/09	93	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
4858939	p+m-Xylene	2017/02/09	82	70 - 130	82	70 - 130	<0.40	ug/L	NC	30
4858939	Toluene	2017/02/09	88	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
4858939	Total Xylenes	2017/02/09					<0.40	ug/L	NC	30
4861256	Mercury (Hg)	2017/02/13	107	75 - 125	105	80 - 120	<0.1	ug/L	NC	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name	#14090 Golder Associates Ltd	Company Name		Quotation #	B63104	Maxxam Job #:	Bottle Order #:
Attention	Central Accounting	Attention	Joanne Woodhouse	P.O. #			597255
Address	1931 Robertson Rd Ottawa ON K2H 5B7	Address		Project	1670949	COC #:	Project Manager:
Tel	(613) 592-9600 x Fax (613) 592-9601 x	Tel	Fax	Project Name		C#597256-02-01	Madison Bingley
Email	AP-CustomerService@golder.com	Email	jwoodhouse@golder.com	Site #			
				Sampled By	Aaron Bradshaw		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☒ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☒ Table 3 ☐ Agri/Other ☒ For RSC	☐ MISA Municipality	
☐ Table ___	☐ PWQO	
	☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? ____

Turnaround Time (TAT) Required
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number: ____
(call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): O.Reg 153 PCBs (Water)	Metals/Hg/CrVI	PAH	PHC F1-F4	BTEX	VOC	# of Bottles
1		17-14	17/02/06	1100	GW	yes	X	X	X	X		X	12
2		17-1		1200						X	X		5
3		17-22		1300		yes		X	X	X		X	10
4		17-13		1330		yes	X	X	X	X		X	12
5		17-10		1400		yes	X	X	X	X		X	12
6		17-20		1430						X	X	X	5
7		DUP A	↓	1300	↓	yes		X	X	X		X	10
8													
9													
10													

06-Feb-17 15:25
Madison Bingley
B725207
HGR ENV-946

RECEIVED IN OTTAWA

Noia

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Aaron Bradshaw	17/02/06	15:25	Mariana Bascan / Bascan	2017/02/06	15:25	0
			[illegible] BRADSHAW	2017/02/07	08:39	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	6, 6, 6	Present	Y	
		Intact	Y	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

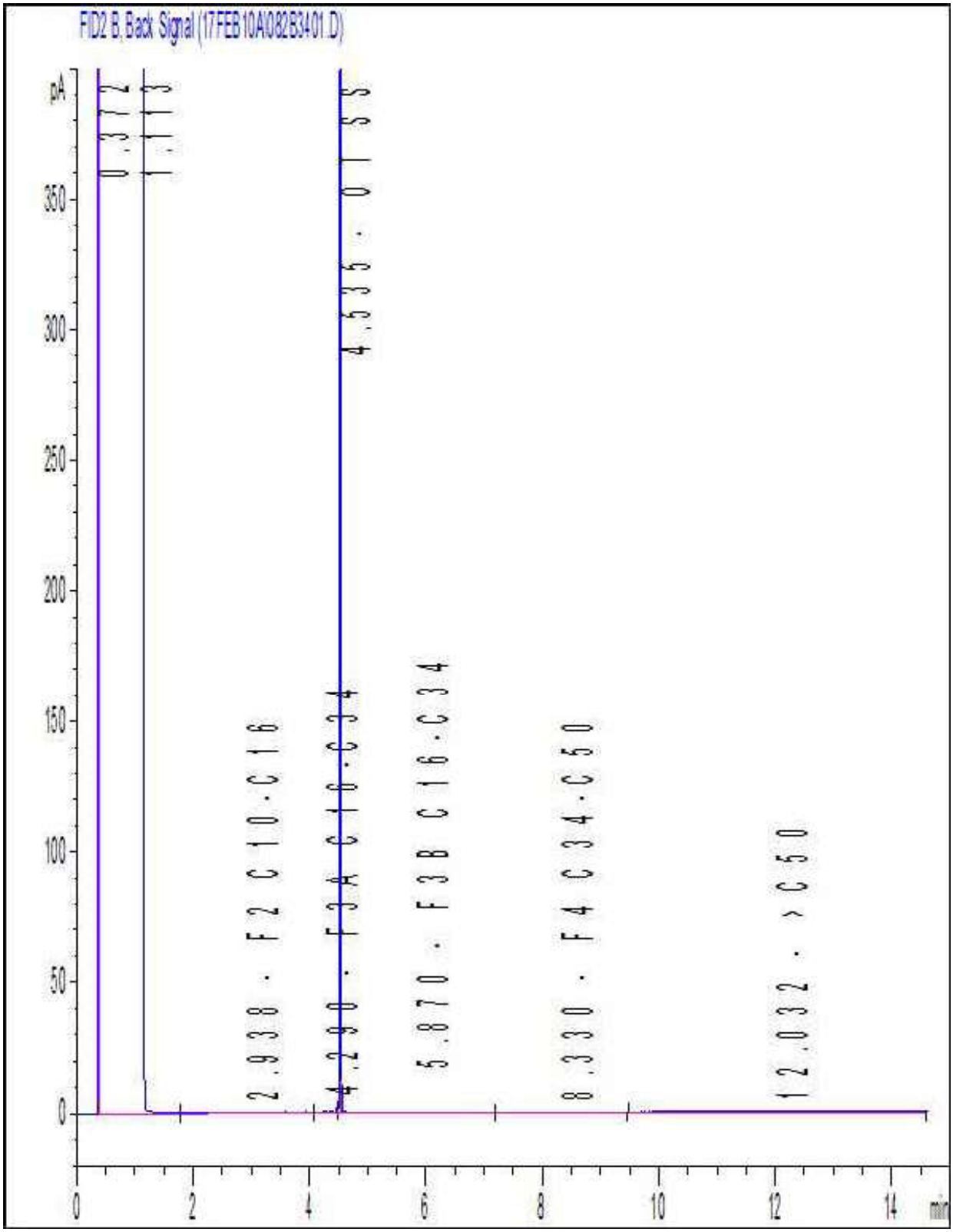
4/4/15 4/3/14

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI790

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-14

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

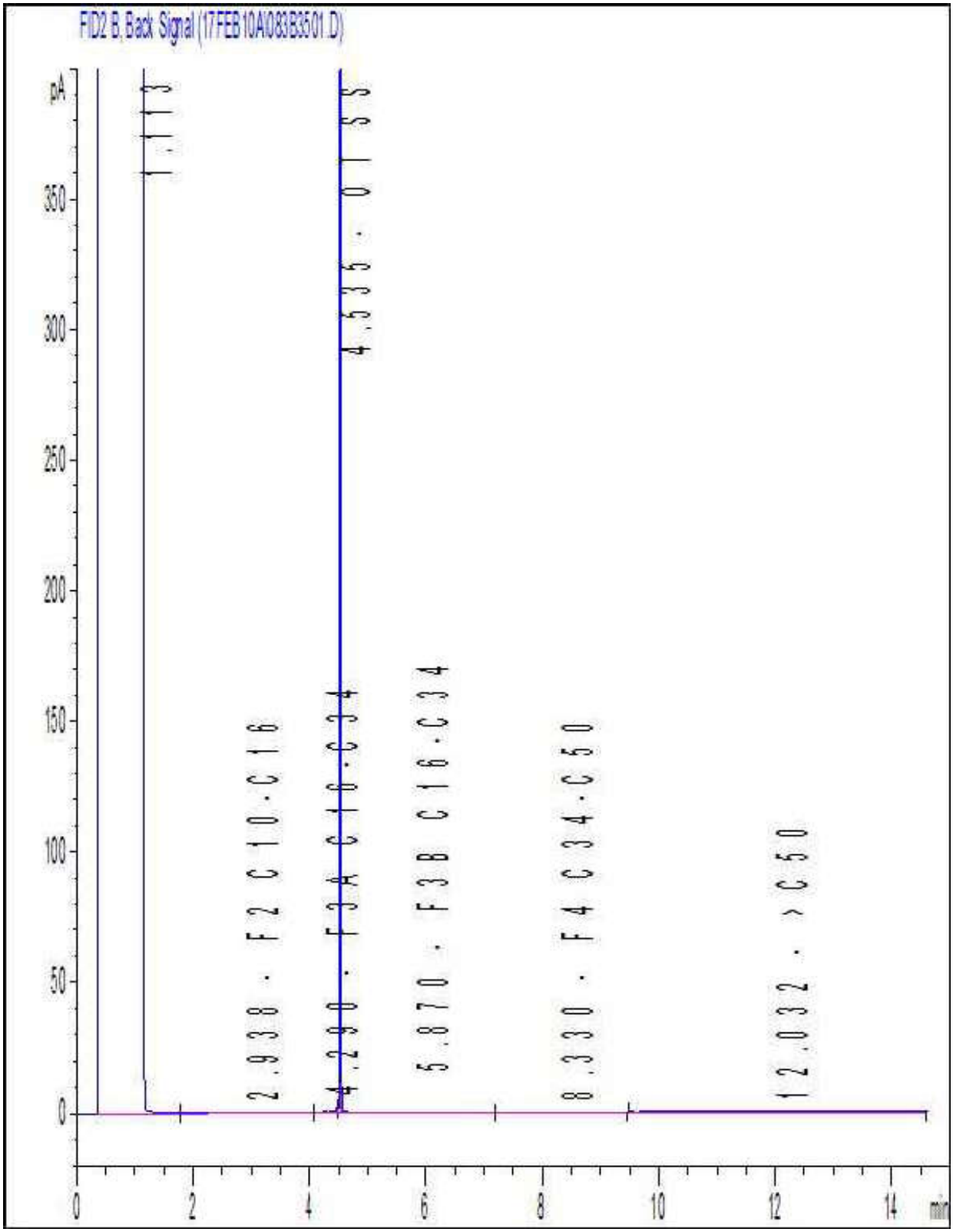


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI791

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

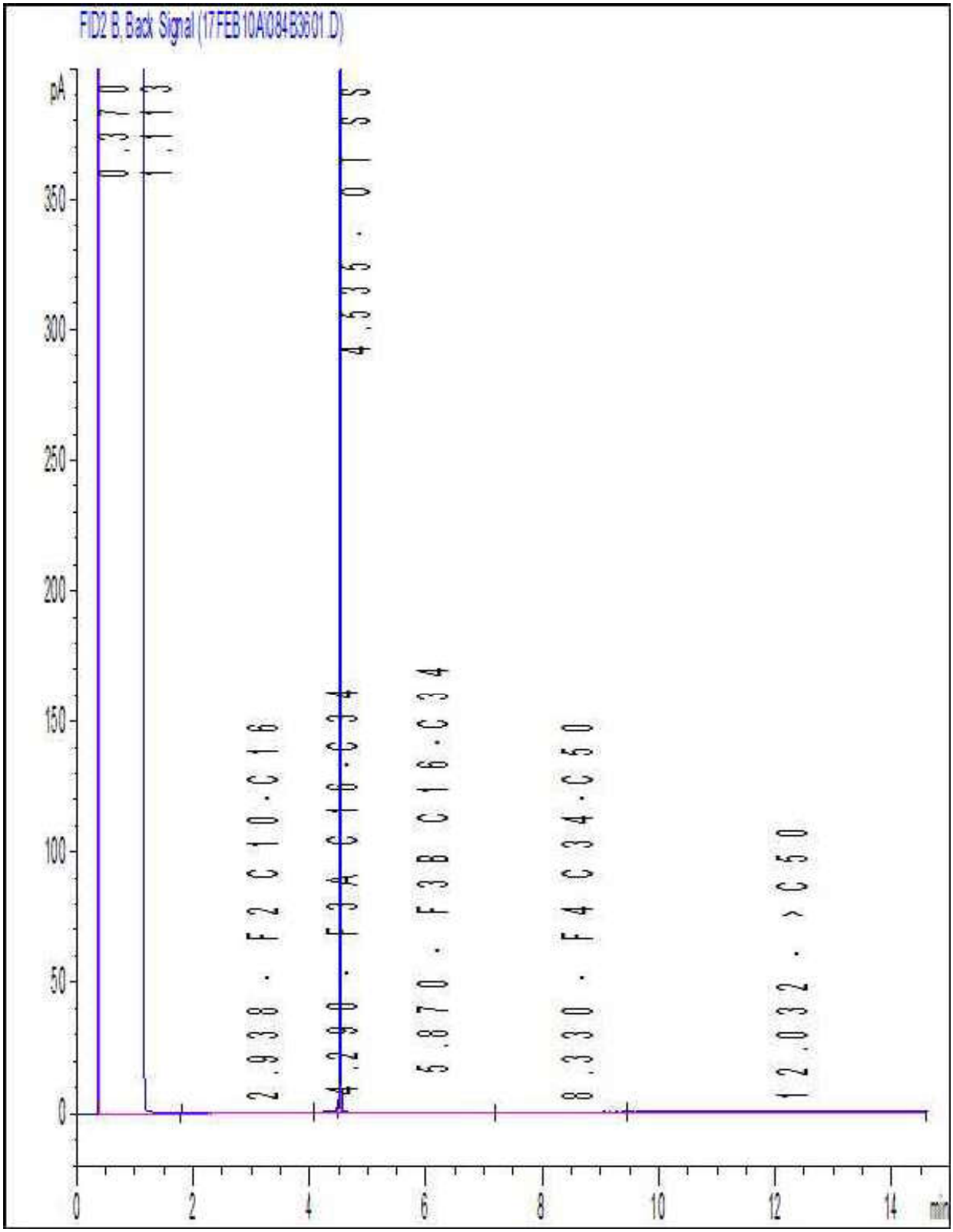


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI792

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-22

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

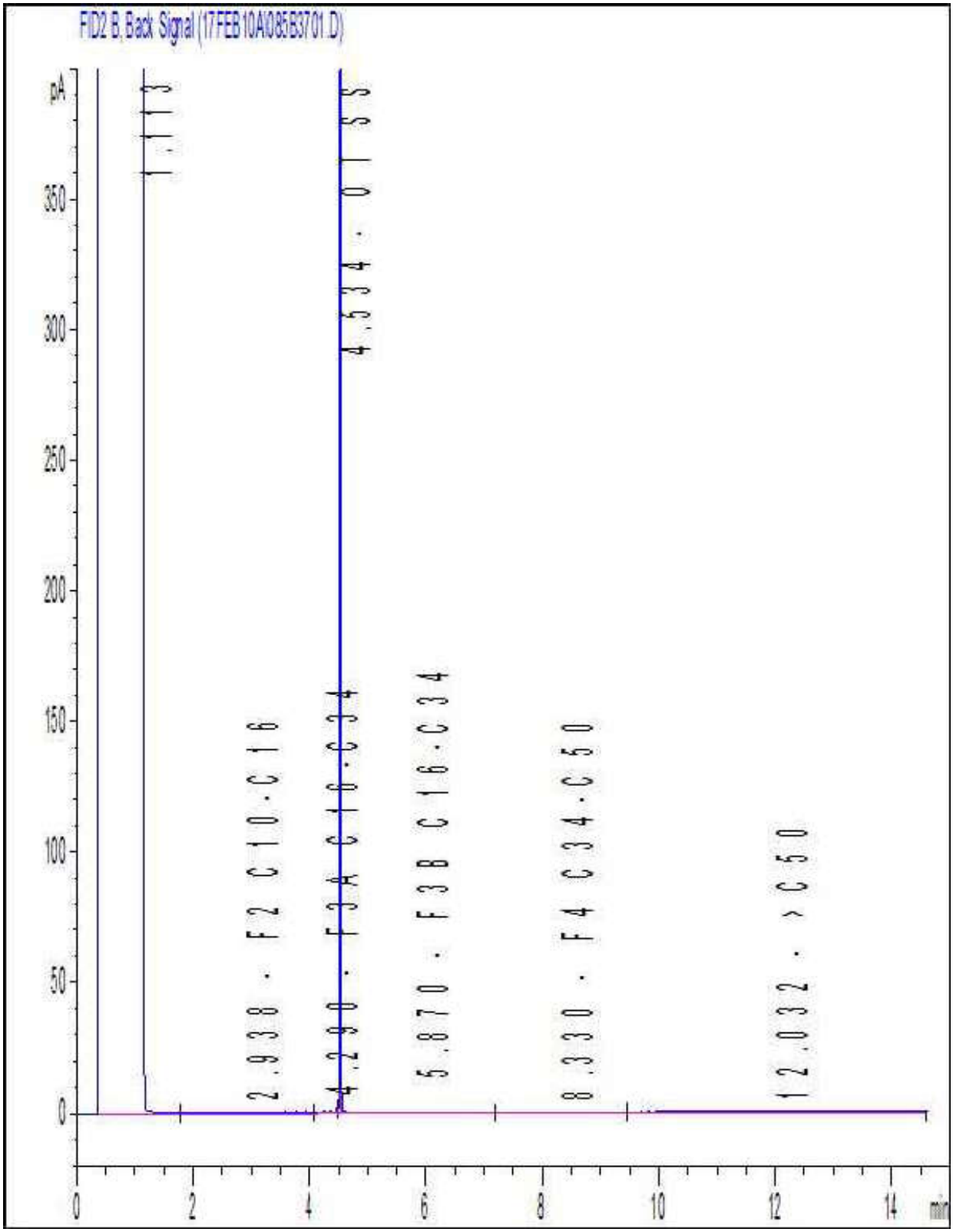


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI793

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-13

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

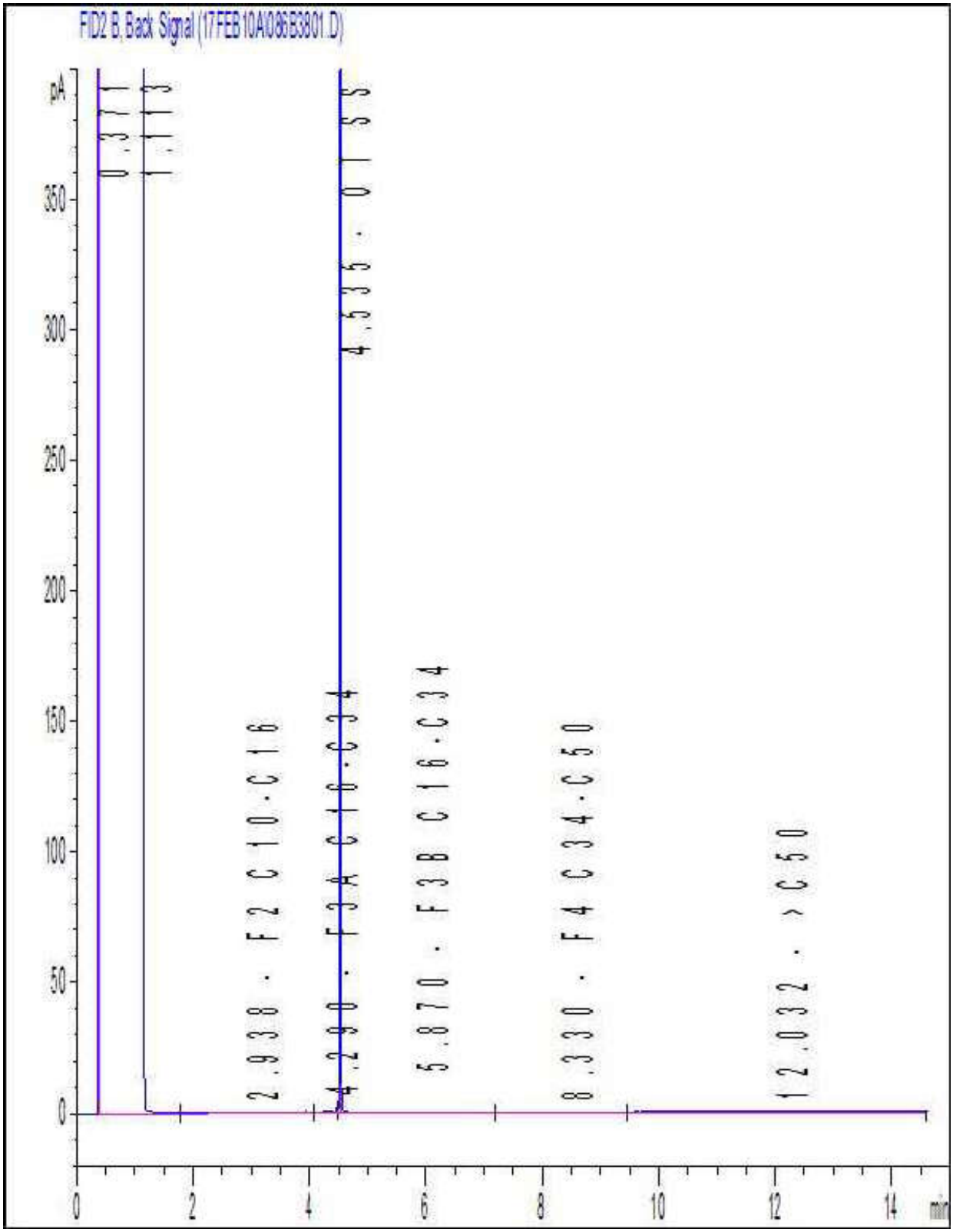


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI794

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-10

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

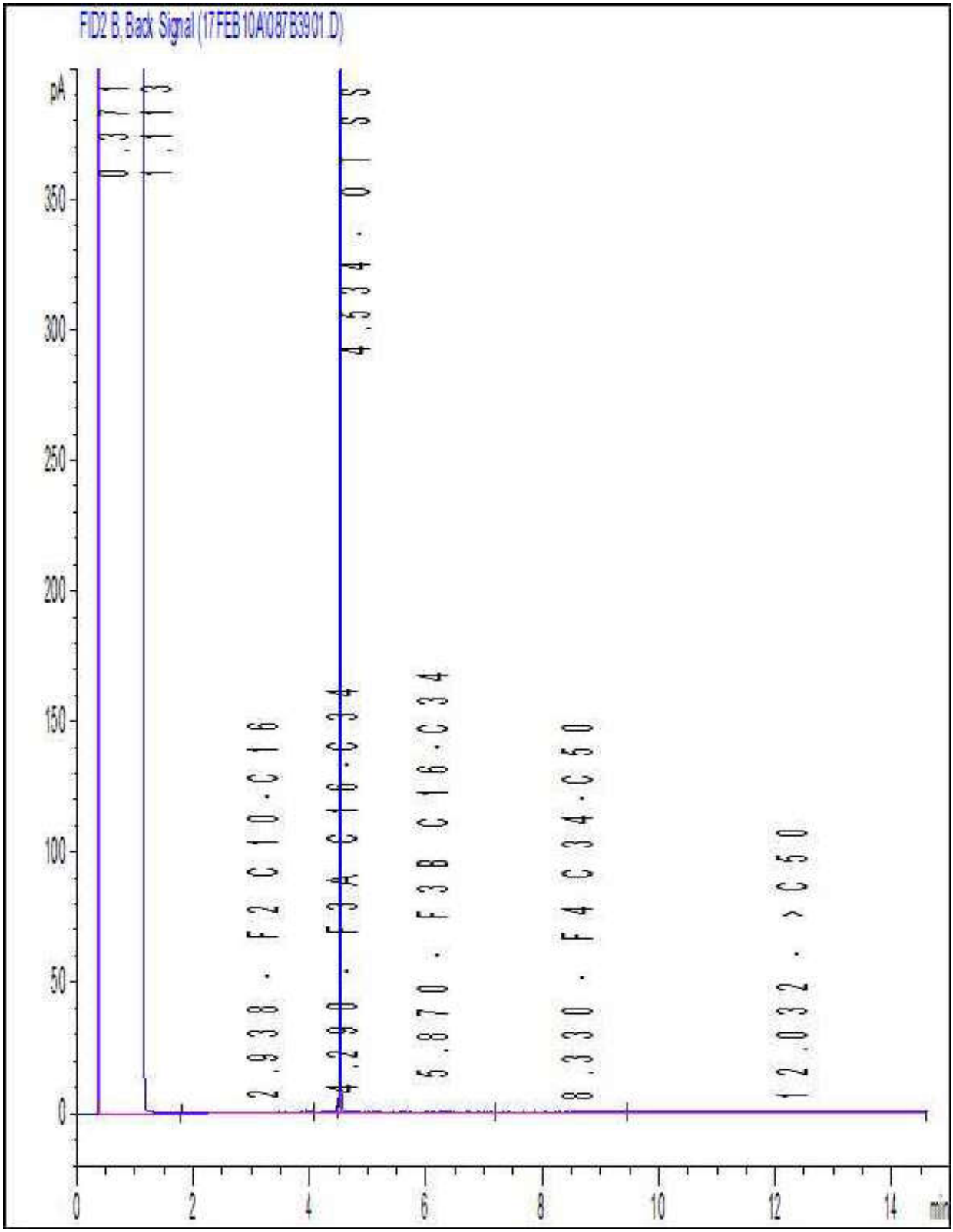


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI795

Golder Associates Ltd
Client Project #: 1670949
Client ID: 17-20

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

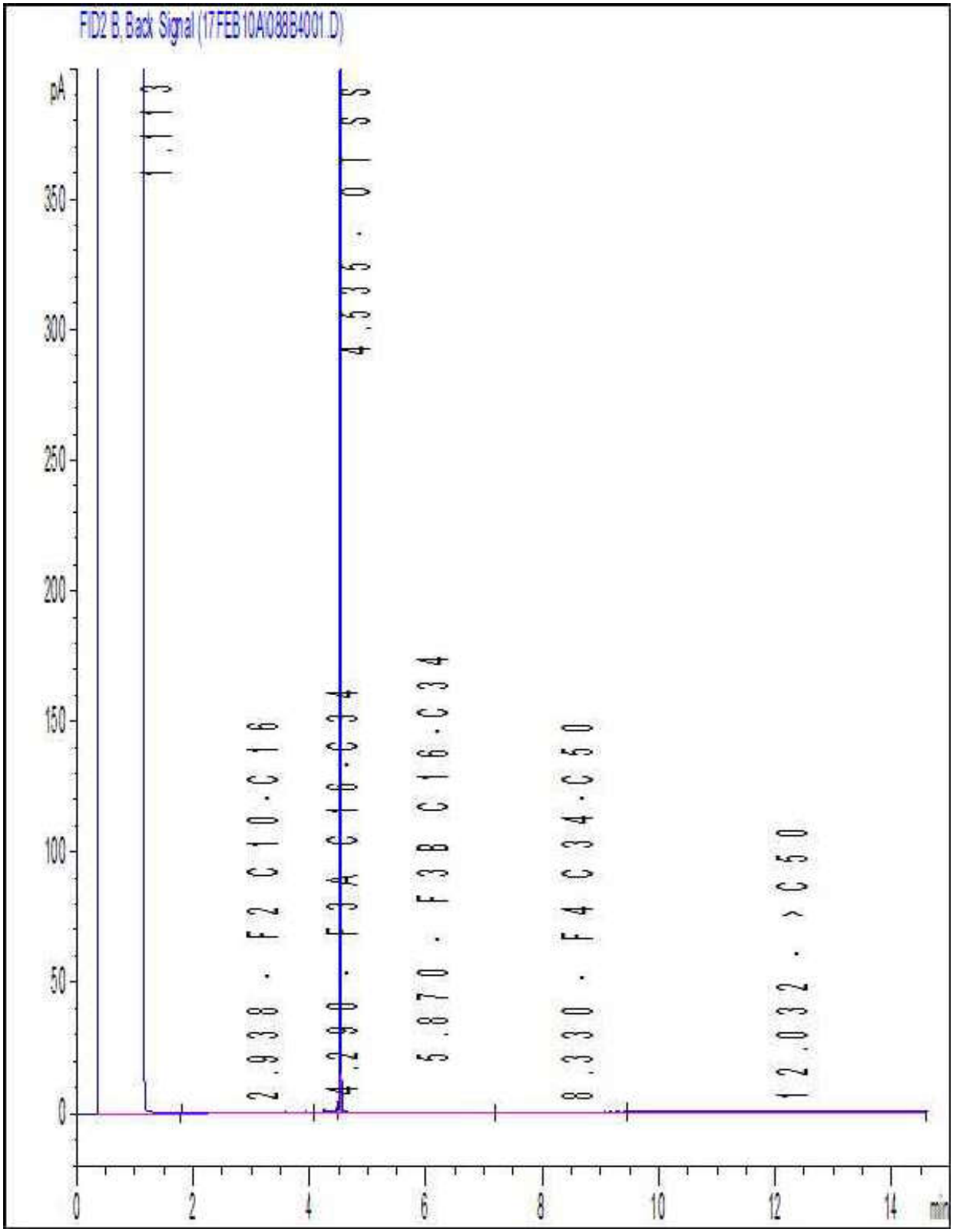


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B725207
Report Date: 2017/02/13
Maxxam Sample: DWI796

Golder Associates Ltd
Client Project #: 1670949
Client ID: DUP A

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 1897188/1100
Your C.O.C. #: 740787-01-01

Attention: Eric Wilson

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2019/10/11
Report #: R5918038
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S0253
Received: 2019/10/04, 16:45

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	4	N/A	2019/10/09	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	1	N/A	2019/10/09		EPA 8260C m
1,3-Dichloropropene Sum (1)	4	N/A	2019/10/10		EPA 8260C m
Chromium (VI) in Water (1)	4	N/A	2019/10/08	CAM SOP-00436	EPA 7199 m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	4	2019/10/08	2019/10/09	CAM SOP-00316	CCME PHC-CWS m
Mercury in Water by CVAA (1)	1	2019/10/09	2019/10/09	CAM SOP-00453	EPA 7470A m
Mercury (1)	3	2019/10/09	2019/10/09	CAM SOP-00453	EPA 7470A m
Lab Filtered Metals by ICPMS (1)	1	2019/10/08	2019/10/11	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS (1)	3	N/A	2019/10/09	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM) (1)	4	2019/10/08	2019/10/09	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Water (1)	3	2019/10/07	2019/10/09	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Water (1)	1	2019/10/09	2019/10/10	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs (1)	4	N/A	2019/10/09	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water (1)	1	N/A	2019/10/08	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

Your Project #: 1897188/1100
Your C.O.C. #: 740787-01-01

Attention: Eric Wilson

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2019/10/11
Report #: R5918038
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S0253
Received: 2019/10/04, 16:45

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Bureau Veritas Laboratories Mississauga

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Keshani Vijh
Supervisor - Environmental
Customer Service
11 Oct 2019 16:26:38

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alisha Williamson, Project Manager
Email: Alisha.Williamson@bvlabs.com
Phone# (613)274-0573

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		KYU637	KYU637		
Sampling Date		2019/10/04 14:30	2019/10/04 14:30		
COC Number		740787-01-01	740787-01-01		
	UNITS	MW17-14	MW17-14 Lab-Dup	RDL	QC Batch
Metals					
Dissolved Aluminum (Al)	ug/L	5.8	5.3	5.0	6375929
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	0.50	6375929
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	1.0	6375929
Dissolved Barium (Ba)	ug/L	84	83	2.0	6375929
Dissolved Beryllium (Be)	ug/L	<0.50	<0.50	0.50	6375929
Dissolved Bismuth (Bi)	ug/L	<1.0	<1.0	1.0	6375929
Dissolved Boron (B)	ug/L	81	83	10	6375929
Dissolved Cadmium (Cd)	ug/L	<0.10	<0.10	0.10	6375929
Dissolved Calcium (Ca)	ug/L	170000	170000	200	6375929
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	5.0	6375929
Dissolved Cobalt (Co)	ug/L	<0.50	<0.50	0.50	6375929
Dissolved Copper (Cu)	ug/L	1.2	1.2	1.0	6375929
Dissolved Iron (Fe)	ug/L	<100	<100	100	6375929
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	0.50	6375929
Dissolved Lithium (Li)	ug/L	23	23	5.0	6375929
Dissolved Magnesium (Mg)	ug/L	92000	90000	50	6375929
Dissolved Manganese (Mn)	ug/L	2.9	2.7	2.0	6375929
Dissolved Molybdenum (Mo)	ug/L	9.9	9.9	0.50	6375929
Dissolved Nickel (Ni)	ug/L	2.3	2.3	1.0	6375929
Dissolved Phosphorus (P)	ug/L	130	140	100	6375929
Dissolved Potassium (K)	ug/L	17000	17000	200	6375929
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	2.0	6375929
Dissolved Silicon (Si)	ug/L	9300	9100	50	6375929
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	0.10	6375929
Dissolved Sodium (Na)	ug/L	75000	73000	100	6375929
Dissolved Strontium (Sr)	ug/L	1800	1800	1.0	6375929
Dissolved Tellurium (Te)	ug/L	<1.0	<1.0	1.0	6375929
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	0.050	6375929
Dissolved Tin (Sn)	ug/L	<1.0	<1.0	1.0	6375929
Dissolved Titanium (Ti)	ug/L	<5.0	<5.0	5.0	6375929
Dissolved Tungsten (W)	ug/L	<1.0	<1.0	1.0	6375929
Dissolved Uranium (U)	ug/L	5.3	5.3	0.10	6375929
Dissolved Vanadium (V)	ug/L	4.6	4.5	0.50	6375929
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	5.0	6375929

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

Golder Associates Ltd
Client Project #: 1897188/1100
Sampler Initials: AW

ELEMENTS BY ICP/MS (WATER)

BV Labs ID		KYU637	KYU637		
Sampling Date		2019/10/04 14:30	2019/10/04 14:30		
COC Number		740787-01-01	740787-01-01		
	UNITS	MW17-14	MW17-14 Lab-Dup	RDL	QC Batch
Dissolved Zirconium (Zr)	ug/L	<1.0	<1.0	1.0	6375929

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		KYU637		
Sampling Date		2019/10/04 14:30		
COC Number		740787-01-01		
	UNITS	MW17-14	RDL	QC Batch
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/L	<0.071	0.071	6373220

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 METALS PACKAGE (WATER)

BV Labs ID		KYU636			KYU637			KYU638		
Sampling Date		2019/10/04 13:00			2019/10/04 14:30			2019/10/04 15:30		
COC Number		740787-01-01			740787-01-01			740787-01-01		
	UNITS	MW17-1	RDL	QC Batch	MW17-14	RDL	QC Batch	MW17-22	RDL	QC Batch
Metals										
Chromium (VI)	ug/L	<0.50	0.50	6373726	0.72	0.50	6373726	<0.50	0.50	6373726
Mercury (Hg)	mg/L				<0.0001	0.0001	6377896			
Mercury (Hg)	ug/L	<0.1	0.1	6377924				<0.1	0.1	6377924
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6375118				<0.50	0.50	6375118
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6375118				2.5	1.0	6375118
Dissolved Barium (Ba)	ug/L	79	2.0	6375118				57	2.0	6375118
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6375118				<0.50	0.50	6375118
Dissolved Boron (B)	ug/L	110	10	6375118				49	10	6375118
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6375118				<0.10	0.10	6375118
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6375118				<5.0	5.0	6375118
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6375118				<0.50	0.50	6375118
Dissolved Copper (Cu)	ug/L	1.4	1.0	6375118				<1.0	1.0	6375118
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6375118				<0.50	0.50	6375118
Dissolved Molybdenum (Mo)	ug/L	20	0.50	6375118				12	0.50	6375118
Dissolved Nickel (Ni)	ug/L	4.2	1.0	6375118				<1.0	1.0	6375118
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6375118				<2.0	2.0	6375118
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6375118				<0.10	0.10	6375118
Dissolved Sodium (Na)	ug/L	180000	100	6375118				83000	100	6375118
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6375118				<0.050	0.050	6375118
Dissolved Uranium (U)	ug/L	8.2	0.10	6375118				3.5	0.10	6375118
Dissolved Vanadium (V)	ug/L	1.7	0.50	6375118				0.53	0.50	6375118
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6375118				<5.0	5.0	6375118

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 METALS PACKAGE (WATER)

BV Labs ID		KYU639		
Sampling Date		2019/10/04 13:30		
COC Number		740787-01-01		
	UNITS	DUP-1	RDL	QC Batch
Metals				
Chromium (VI)	ug/L	<0.50	0.50	6373726
Mercury (Hg)	ug/L	<0.1	0.1	6377924
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6375118
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6375118
Dissolved Barium (Ba)	ug/L	81	2.0	6375118
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6375118
Dissolved Boron (B)	ug/L	110	10	6375118
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6375118
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6375118
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	6375118
Dissolved Copper (Cu)	ug/L	<1.0	1.0	6375118
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6375118
Dissolved Molybdenum (Mo)	ug/L	21	0.50	6375118
Dissolved Nickel (Ni)	ug/L	3.7	1.0	6375118
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6375118
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6375118
Dissolved Sodium (Na)	ug/L	180000	100	6375118
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6375118
Dissolved Uranium (U)	ug/L	8.4	0.10	6375118
Dissolved Vanadium (V)	ug/L	1.7	0.50	6375118
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6375118

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

O.REG 153 PAHS (WATER)

BV Labs ID		KYU636			KYU637			KYU638		
Sampling Date		2019/10/04 13:00			2019/10/04 14:30			2019/10/04 15:30		
COC Number		740787-01-01			740787-01-01			740787-01-01		
	UNITS	MW17-1	RDL	QC Batch	MW17-14	RDL	QC Batch	MW17-22	RDL	QC Batch
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/L	<0.071	0.071	6373220				<0.071	0.071	6373220
Polyaromatic Hydrocarbons										
Acenaphthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Acenaphthylene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Anthracene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(a)anthracene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(a)pyrene	ug/L	<0.010	0.010	6376739	<0.010	0.010	6376739	<0.010	0.010	6376739
Benzo(b/j)fluoranthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(g,h,i)perylene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(k)fluoranthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Chrysene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Dibenz(a,h)anthracene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Fluoranthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Fluorene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
1-Methylnaphthalene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
2-Methylnaphthalene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Naphthalene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Phenanthrene	ug/L	<0.030	0.030	6376739	<0.030	0.030	6376739	<0.030	0.030	6376739
Pyrene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739	<0.050	0.050	6376739
Surrogate Recovery (%)										
D10-Anthracene	%	111		6376739	105		6376739	102		6376739
D14-Terphenyl (FS)	%	97		6376739	102		6376739	88		6376739
D8-Acenaphthylene	%	96		6376739	99		6376739	97		6376739

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 PAHS (WATER)

BV Labs ID		KYU638			KYU639		
Sampling Date		2019/10/04 15:30			2019/10/04 13:30		
COC Number		740787-01-01			740787-01-01		
	UNITS	MW17-22 Lab-Dup	RDL	QC Batch	DUP-1	RDL	QC Batch
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/L				<0.071	0.071	6373220
Polyaromatic Hydrocarbons							
Acenaphthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Acenaphthylene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Anthracene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(a)anthracene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(a)pyrene	ug/L	<0.010	0.010	6376739	<0.010	0.010	6376739
Benzo(b/j)fluoranthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(g,h,i)perylene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Benzo(k)fluoranthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Chrysene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Dibenz(a,h)anthracene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Fluoranthene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Fluorene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
1-Methylnaphthalene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
2-Methylnaphthalene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Naphthalene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Phenanthrene	ug/L	<0.030	0.030	6376739	<0.030	0.030	6376739
Pyrene	ug/L	<0.050	0.050	6376739	<0.050	0.050	6376739
Surrogate Recovery (%)							
D10-Anthracene	%	105		6376739	102		6376739
D14-Terphenyl (FS)	%	91		6376739	97		6376739
D8-Acenaphthylene	%	98		6376739	94		6376739

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 PCBS (WATER)

BV Labs ID		KYU636		KYU637	KYU637		KYU638	KYU638		
Sampling Date		2019/10/04 13:00		2019/10/04 14:30	2019/10/04 14:30		2019/10/04 15:30	2019/10/04 15:30		
COC Number		740787-01-01		740787-01-01	740787-01-01		740787-01-01	740787-01-01		
	UNITS	MW17-1	QC Batch	MW17-14	MW17-14 Lab-Dup	QC Batch	MW17-22	MW17-22 Lab-Dup	RDL	QC Batch
PCBs										
Aroclor 1242	ug/L	<0.05	6374933	<0.05	<0.05	6378597	<0.05	<0.05	0.05	6374933
Aroclor 1248	ug/L	<0.05	6374933	<0.05	<0.05	6378597	<0.05	<0.05	0.05	6374933
Aroclor 1254	ug/L	<0.05	6374933	<0.05	<0.05	6378597	<0.05	<0.05	0.05	6374933
Aroclor 1260	ug/L	<0.05	6374933	<0.05	<0.05	6378597	<0.05	<0.05	0.05	6374933
Total PCB	ug/L	<0.05	6374933	<0.05	<0.05	6378597	<0.05	<0.05	0.05	6374933
Surrogate Recovery (%)										
Decachlorobiphenyl	%	73	6374933	63	62	6378597	76	83		6374933

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

BV Labs ID		KYU639		
Sampling Date		2019/10/04 13:30		
COC Number		740787-01-01		
	UNITS	DUP-1	RDL	QC Batch
PCBs				
Aroclor 1242	ug/L	<0.05	0.05	6374933
Aroclor 1248	ug/L	<0.05	0.05	6374933
Aroclor 1254	ug/L	<0.05	0.05	6374933
Aroclor 1260	ug/L	<0.05	0.05	6374933
Total PCB	ug/L	<0.05	0.05	6374933
Surrogate Recovery (%)				
Decachlorobiphenyl	%	70		6374933

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		KYU636	KYU637	KYU638			KYU638		
Sampling Date		2019/10/04 13:00	2019/10/04 14:30	2019/10/04 15:30			2019/10/04 15:30		
COC Number		740787-01-01	740787-01-01	740787-01-01			740787-01-01		
	UNITS	MW17-1	MW17-14	MW17-22	RDL	QC Batch	MW17-22 Lab-Dup	RDL	QC Batch
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	0.50	6373059			
Volatile Organics									
Acetone (2-Propanone)	ug/L	<10	<10	<10	10	6375031			
Benzene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Bromoform	ug/L	<1.0	<1.0	<1.0	1.0	6375031			
Bromomethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Chloroform	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	1.0	6375031			
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	0.30	6375031			
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	0.40	6375031			
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Hexane	ug/L	<1.0	<1.0	<1.0	1.0	6375031			
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	2.0	6375031			
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	10	6375031			
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	5.0	6375031			
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Styrene	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		KYU636	KYU637	KYU638			KYU638		
Sampling Date		2019/10/04 13:00	2019/10/04 14:30	2019/10/04 15:30			2019/10/04 15:30		
COC Number		740787-01-01	740787-01-01	740787-01-01			740787-01-01		
	UNITS	MW17-1	MW17-14	MW17-22	RDL	QC Batch	MW17-22 Lab-Dup	RDL	QC Batch
Toluene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	0.50	6375031			
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
o-Xylene	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
Total Xylenes	ug/L	<0.20	<0.20	<0.20	0.20	6375031			
F1 (C6-C10)	ug/L	<25	<25	<25	25	6375031			
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	25	6375031			
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	100	6376735	<100	100	6376735
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	200	6376735	<200	200	6376735
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	200	6376735	<200	200	6376735
Reached Baseline at C50	ug/L	Yes	Yes	Yes		6376735	Yes		6376735
Surrogate Recovery (%)									
o-Terphenyl	%	84	84	84		6376735	82		6376735
4-Bromofluorobenzene	%	96	95	95		6375031			
D4-1,2-Dichloroethane	%	96	94	96		6375031			
D8-Toluene	%	97	97	97		6375031			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		KYU639		
Sampling Date		2019/10/04 13:30		
COC Number		740787-01-01		
	UNITS	DUP-1	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	6373059
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	6375031
Benzene	ug/L	<0.20	0.20	6375031
Bromodichloromethane	ug/L	<0.50	0.50	6375031
Bromoform	ug/L	<1.0	1.0	6375031
Bromomethane	ug/L	<0.50	0.50	6375031
Carbon Tetrachloride	ug/L	<0.20	0.20	6375031
Chlorobenzene	ug/L	<0.20	0.20	6375031
Chloroform	ug/L	<0.20	0.20	6375031
Dibromochloromethane	ug/L	<0.50	0.50	6375031
1,2-Dichlorobenzene	ug/L	<0.50	0.50	6375031
1,3-Dichlorobenzene	ug/L	<0.50	0.50	6375031
1,4-Dichlorobenzene	ug/L	<0.50	0.50	6375031
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	6375031
1,1-Dichloroethane	ug/L	<0.20	0.20	6375031
1,2-Dichloroethane	ug/L	<0.50	0.50	6375031
1,1-Dichloroethylene	ug/L	<0.20	0.20	6375031
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	6375031
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	6375031
1,2-Dichloropropane	ug/L	<0.20	0.20	6375031
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	6375031
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	6375031
Ethylbenzene	ug/L	<0.20	0.20	6375031
Ethylene Dibromide	ug/L	<0.20	0.20	6375031
Hexane	ug/L	<1.0	1.0	6375031
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	6375031
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	6375031
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	6375031
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	6375031
Styrene	ug/L	<0.50	0.50	6375031
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	6375031
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	6375031
Tetrachloroethylene	ug/L	<0.20	0.20	6375031
Toluene	ug/L	<0.20	0.20	6375031

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		KYU639		
Sampling Date		2019/10/04 13:30		
COC Number		740787-01-01		
	UNITS	DUP-1	RDL	QC Batch
1,1,1-Trichloroethane	ug/L	<0.20	0.20	6375031
1,1,2-Trichloroethane	ug/L	<0.50	0.50	6375031
Trichloroethylene	ug/L	<0.20	0.20	6375031
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	6375031
Vinyl Chloride	ug/L	<0.20	0.20	6375031
p+m-Xylene	ug/L	<0.20	0.20	6375031
o-Xylene	ug/L	<0.20	0.20	6375031
Total Xylenes	ug/L	<0.20	0.20	6375031
F1 (C6-C10)	ug/L	<25	25	6375031
F1 (C6-C10) - BTEX	ug/L	<25	25	6375031
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	6376735
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	6376735
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	6376735
Reached Baseline at C50	ug/L	Yes		6376735
Surrogate Recovery (%)				
o-Terphenyl	%	83		6376735
4-Bromofluorobenzene	%	95		6375031
D4-1,2-Dichloroethane	%	97		6375031
D8-Toluene	%	96		6375031

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS (WATER)

BV Labs ID		KYU640		
Sampling Date		2019/10/04		
COC Number		740787-01-01		
	UNITS	FIELD BLANK	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	6373059
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	6374975
Benzene	ug/L	<0.20	0.20	6374975
Bromodichloromethane	ug/L	<0.50	0.50	6374975
Bromoform	ug/L	<1.0	1.0	6374975
Bromomethane	ug/L	<0.50	0.50	6374975
Carbon Tetrachloride	ug/L	<0.20	0.20	6374975
Chlorobenzene	ug/L	<0.20	0.20	6374975
Chloroform	ug/L	<0.20	0.20	6374975
Dibromochloromethane	ug/L	<0.50	0.50	6374975
1,2-Dichlorobenzene	ug/L	<0.50	0.50	6374975
1,3-Dichlorobenzene	ug/L	<0.50	0.50	6374975
1,4-Dichlorobenzene	ug/L	<0.50	0.50	6374975
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	6374975
1,1-Dichloroethane	ug/L	<0.20	0.20	6374975
1,2-Dichloroethane	ug/L	<0.50	0.50	6374975
1,1-Dichloroethylene	ug/L	<0.20	0.20	6374975
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	6374975
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	6374975
1,2-Dichloropropane	ug/L	<0.20	0.20	6374975
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	6374975
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	6374975
Ethylbenzene	ug/L	<0.20	0.20	6374975
Ethylene Dibromide	ug/L	<0.20	0.20	6374975
Hexane	ug/L	<1.0	1.0	6374975
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	6374975
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	6374975
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	6374975
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	6374975
Styrene	ug/L	<0.50	0.50	6374975
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	6374975
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	6374975
Tetrachloroethylene	ug/L	<0.20	0.20	6374975
Toluene	ug/L	<0.20	0.20	6374975
1,1,1-Trichloroethane	ug/L	<0.20	0.20	6374975

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS (WATER)

BV Labs ID		KYU640		
Sampling Date		2019/10/04		
COC Number		740787-01-01		
	UNITS	FIELD BLANK	RDL	QC Batch
1,1,2-Trichloroethane	ug/L	<0.50	0.50	6374975
Trichloroethylene	ug/L	<0.20	0.20	6374975
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	6374975
Vinyl Chloride	ug/L	<0.20	0.20	6374975
p+m-Xylene	ug/L	<0.20	0.20	6374975
o-Xylene	ug/L	<0.20	0.20	6374975
Total Xylenes	ug/L	<0.20	0.20	6374975
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	98		6374975
D4-1,2-Dichloroethane	%	103		6374975
D8-Toluene	%	95		6374975

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

BV Labs ID: KYU636
Sample ID: MW17-1
Matrix: Water

Collected: 2019/10/04
Shipped:
Received: 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6373220	N/A	2019/10/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	6373059	N/A	2019/10/10	Automated Statchk
Chromium (VI) in Water	IC	6373726	N/A	2019/10/08	Lang Le
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6376735	2019/10/08	2019/10/09	Prabhjot Gulati
Mercury	CV/AA	6377924	2019/10/09	2019/10/09	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6375118	N/A	2019/10/09	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6376739	2019/10/08	2019/10/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	6374933	2019/10/07	2019/10/09	Dawn Alarie
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6375031	N/A	2019/10/09	Xueming Jiang

BV Labs ID: KYU637
Sample ID: MW17-14
Matrix: Water

Collected: 2019/10/04
Shipped:
Received: 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6373220	N/A	2019/10/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	6373059	N/A	2019/10/10	Automated Statchk
Chromium (VI) in Water	IC	6373726	N/A	2019/10/08	Lang Le
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6376735	2019/10/08	2019/10/09	Prabhjot Gulati
Mercury in Water by CVAA	CV/AA	6377896	2019/10/09	2019/10/09	Medhat Nasr
Lab Filtered Metals by ICPMS	ICP/MS	6375929	2019/10/08	2019/10/11	Prempal Bhatti
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6376739	2019/10/08	2019/10/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	6378597	2019/10/09	2019/10/10	Dawn Alarie
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6375031	N/A	2019/10/09	Xueming Jiang

BV Labs ID: KYU637 Dup
Sample ID: MW17-14
Matrix: Water

Collected: 2019/10/04
Shipped:
Received: 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Lab Filtered Metals by ICPMS	ICP/MS	6375929	2019/10/08	2019/10/11	Prempal Bhatti
Polychlorinated Biphenyl in Water	GC/ECD	6378597	2019/10/09	2019/10/10	Dawn Alarie

BV Labs ID: KYU638
Sample ID: MW17-22
Matrix: Water

Collected: 2019/10/04
Shipped:
Received: 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6373220	N/A	2019/10/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	6373059	N/A	2019/10/10	Automated Statchk
Chromium (VI) in Water	IC	6373726	N/A	2019/10/08	Lang Le
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6376735	2019/10/08	2019/10/09	Prabhjot Gulati
Mercury	CV/AA	6377924	2019/10/09	2019/10/09	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6375118	N/A	2019/10/09	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6376739	2019/10/08	2019/10/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	6374933	2019/10/07	2019/10/09	Dawn Alarie

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TEST SUMMARY

BV Labs ID: KYU638 **Collected:** 2019/10/04
Sample ID: MW17-22 **Shipped:**
Matrix: Water **Received:** 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6375031	N/A	2019/10/09	Xueming Jiang

BV Labs ID: KYU638 Dup **Collected:** 2019/10/04
Sample ID: MW17-22 **Shipped:**
Matrix: Water **Received:** 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6376735	2019/10/08	2019/10/09	Prabhjot Gulati
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6376739	2019/10/08	2019/10/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	6374933	2019/10/08	2019/10/09	Dawn Alarie

BV Labs ID: KYU639 **Collected:** 2019/10/04
Sample ID: DUP-1 **Shipped:**
Matrix: Water **Received:** 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6373220	N/A	2019/10/09	Automated Statchk
1,3-Dichloropropene Sum	CALC	6373059	N/A	2019/10/10	Automated Statchk
Chromium (VI) in Water	IC	6373726	N/A	2019/10/08	Lang Le
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6376735	2019/10/08	2019/10/09	Prabhjot Gulati
Mercury	CV/AA	6377924	2019/10/09	2019/10/09	Medhat Nasr
Dissolved Metals by ICPMS	ICP/MS	6375118	N/A	2019/10/09	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6376739	2019/10/08	2019/10/09	Mitesh Raj
Polychlorinated Biphenyl in Water	GC/ECD	6374933	2019/10/07	2019/10/09	Dawn Alarie
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6375031	N/A	2019/10/09	Xueming Jiang

BV Labs ID: KYU640 **Collected:** 2019/10/04
Sample ID: FIELD BLANK **Shipped:**
Matrix: Water **Received:** 2019/10/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6373059	N/A	2019/10/09	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	6374975	N/A	2019/10/08	Chandni Khawas

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	11.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6374933	Decachlorobiphenyl	2019/10/09	74	60 - 130	93	60 - 130	82	%		
6374975	4-Bromofluorobenzene	2019/10/08	101	70 - 130	101	70 - 130	99	%		
6374975	D4-1,2-Dichloroethane	2019/10/08	102	70 - 130	99	70 - 130	102	%		
6374975	D8-Toluene	2019/10/08	94	70 - 130	100	70 - 130	94	%		
6375031	4-Bromofluorobenzene	2019/10/09	95	70 - 130	103	70 - 130	96	%		
6375031	D4-1,2-Dichloroethane	2019/10/09	82	70 - 130	92	70 - 130	91	%		
6375031	D8-Toluene	2019/10/09	106	70 - 130	101	70 - 130	97	%		
6376735	o-Terphenyl	2019/10/08	87	60 - 130	86	60 - 130	83	%		
6376739	D10-Anthracene	2019/10/09	111	50 - 130	106	50 - 130	107	%		
6376739	D14-Terphenyl (FS)	2019/10/09	102	50 - 130	100	50 - 130	107	%		
6376739	D8-Acenaphthylene	2019/10/09	106	50 - 130	101	50 - 130	100	%		
6378597	Decachlorobiphenyl	2019/10/10	66	60 - 130	61	60 - 130	65	%		
6373726	Chromium (VI)	2019/10/08	108	80 - 120	105	80 - 120	<0.50	ug/L	NC	20
6374933	Aroclor 1242	2019/10/09					<0.05	ug/L	NC	30
6374933	Aroclor 1248	2019/10/09					<0.05	ug/L	NC	30
6374933	Aroclor 1254	2019/10/09					<0.05	ug/L	NC	30
6374933	Aroclor 1260	2019/10/09	79	60 - 130	96	60 - 130	<0.05	ug/L	NC	30
6374933	Total PCB	2019/10/09	79	60 - 130	96	60 - 130	<0.05	ug/L	NC	40
6374975	1,1,1,2-Tetrachloroethane	2019/10/08	91	70 - 130	87	70 - 130	<0.50	ug/L	NC	30
6374975	1,1,1-Trichloroethane	2019/10/08	87	70 - 130	84	70 - 130	<0.20	ug/L	NC	30
6374975	1,1,2,2-Tetrachloroethane	2019/10/08	95	70 - 130	88	70 - 130	<0.50	ug/L	NC	30
6374975	1,1,2-Trichloroethane	2019/10/08	92	70 - 130	86	70 - 130	<0.50	ug/L	NC	30
6374975	1,1-Dichloroethane	2019/10/08	89	70 - 130	84	70 - 130	<0.20	ug/L	NC	30
6374975	1,1-Dichloroethylene	2019/10/08	93	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
6374975	1,2-Dichlorobenzene	2019/10/08	83	70 - 130	79	70 - 130	<0.50	ug/L	NC	30
6374975	1,2-Dichloroethane	2019/10/08	94	70 - 130	87	70 - 130	<0.50	ug/L	NC	30
6374975	1,2-Dichloropropane	2019/10/08	86	70 - 130	81	70 - 130	<0.20	ug/L	NC	30
6374975	1,3-Dichlorobenzene	2019/10/08	83	70 - 130	79	70 - 130	<0.50	ug/L	NC	30
6374975	1,4-Dichlorobenzene	2019/10/08	87	70 - 130	83	70 - 130	<0.50	ug/L	NC	30
6374975	Acetone (2-Propanone)	2019/10/08	95	60 - 140	83	60 - 140	<10	ug/L	NC	30
6374975	Benzene	2019/10/08	90	70 - 130	84	70 - 130	<0.20	ug/L	NC	30
6374975	Bromodichloromethane	2019/10/08	89	70 - 130	83	70 - 130	<0.50	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6374975	Bromoform	2019/10/08	93	70 - 130	87	70 - 130	<1.0	ug/L	NC	30
6374975	Bromomethane	2019/10/08	92	60 - 140	83	60 - 140	<0.50	ug/L	NC	30
6374975	Carbon Tetrachloride	2019/10/08	86	70 - 130	83	70 - 130	<0.20	ug/L	NC	30
6374975	Chlorobenzene	2019/10/08	85	70 - 130	81	70 - 130	<0.20	ug/L	NC	30
6374975	Chloroform	2019/10/08	86	70 - 130	80	70 - 130	<0.20	ug/L	NC	30
6374975	cis-1,2-Dichloroethylene	2019/10/08	84	70 - 130	78	70 - 130	<0.50	ug/L	NC	30
6374975	cis-1,3-Dichloropropene	2019/10/08	94	70 - 130	86	70 - 130	<0.30	ug/L	NC	30
6374975	Dibromochloromethane	2019/10/08	93	70 - 130	87	70 - 130	<0.50	ug/L	NC	30
6374975	Dichlorodifluoromethane (FREON 12)	2019/10/08	79	60 - 140	75	60 - 140	<1.0	ug/L	NC	30
6374975	Ethylbenzene	2019/10/08	81	70 - 130	79	70 - 130	<0.20	ug/L	NC	30
6374975	Ethylene Dibromide	2019/10/08	92	70 - 130	85	70 - 130	<0.20	ug/L	NC	30
6374975	Hexane	2019/10/08	106	70 - 130	86	70 - 130	<1.0	ug/L	NC	30
6374975	Methyl Ethyl Ketone (2-Butanone)	2019/10/08	97	60 - 140	87	60 - 140	<10	ug/L	NC	30
6374975	Methyl Isobutyl Ketone	2019/10/08	94	70 - 130	88	70 - 130	<5.0	ug/L	NC	30
6374975	Methyl t-butyl ether (MTBE)	2019/10/08	82	70 - 130	78	70 - 130	<0.50	ug/L	NC	30
6374975	Methylene Chloride(Dichloromethane)	2019/10/08	95	70 - 130	88	70 - 130	<2.0	ug/L	NC	30
6374975	o-Xylene	2019/10/08	84	70 - 130	82	70 - 130	<0.20	ug/L	NC	30
6374975	p+m-Xylene	2019/10/08	88	70 - 130	85	70 - 130	<0.20	ug/L	NC	30
6374975	Styrene	2019/10/08	84	70 - 130	82	70 - 130	<0.50	ug/L	NC	30
6374975	Tetrachloroethylene	2019/10/08	81	70 - 130	79	70 - 130	<0.20	ug/L	6.8	30
6374975	Toluene	2019/10/08	82	70 - 130	78	70 - 130	<0.20	ug/L	NC	30
6374975	Total Xylenes	2019/10/08					<0.20	ug/L	NC	30
6374975	trans-1,2-Dichloroethylene	2019/10/08	91	70 - 130	86	70 - 130	<0.50	ug/L	NC	30
6374975	trans-1,3-Dichloropropene	2019/10/08	99	70 - 130	88	70 - 130	<0.40	ug/L	NC	30
6374975	Trichloroethylene	2019/10/08	90	70 - 130	87	70 - 130	<0.20	ug/L	NC	30
6374975	Trichlorofluoromethane (FREON 11)	2019/10/08	92	70 - 130	88	70 - 130	<0.50	ug/L	NC	30
6374975	Vinyl Chloride	2019/10/08	89	70 - 130	83	70 - 130	<0.20	ug/L	NC	30
6375031	1,1,1,2-Tetrachloroethane	2019/10/09	90	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
6375031	1,1,1-Trichloroethane	2019/10/09	97	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	1,1,2,2-Tetrachloroethane	2019/10/09	74	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6375031	1,1,2-Trichloroethane	2019/10/09	79	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
6375031	1,1-Dichloroethane	2019/10/09	95	70 - 130	98	70 - 130	<0.20	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6375031	1,1-Dichloroethylene	2019/10/09	99	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	1,2-Dichlorobenzene	2019/10/09	95	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6375031	1,2-Dichloroethane	2019/10/09	80	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
6375031	1,2-Dichloropropane	2019/10/09	85	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	1,3-Dichlorobenzene	2019/10/09	105	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
6375031	1,4-Dichlorobenzene	2019/10/09	105	70 - 130	106	70 - 130	<0.50	ug/L	NC	30
6375031	Acetone (2-Propanone)	2019/10/09	80	60 - 140	99	60 - 140	<10	ug/L	1.6	30
6375031	Benzene	2019/10/09	95	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
6375031	Bromodichloromethane	2019/10/09	82	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
6375031	Bromoform	2019/10/09	77	70 - 130	93	70 - 130	<1.0	ug/L	NC	30
6375031	Bromomethane	2019/10/09	98	60 - 140	96	60 - 140	<0.50	ug/L	NC	30
6375031	Carbon Tetrachloride	2019/10/09	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	Chlorobenzene	2019/10/09	90	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	Chloroform	2019/10/09	89	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	cis-1,2-Dichloroethylene	2019/10/09	95	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
6375031	cis-1,3-Dichloropropene	2019/10/09	80	70 - 130	85	70 - 130	<0.30	ug/L	NC	30
6375031	Dibromochloromethane	2019/10/09	85	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6375031	Dichlorodifluoromethane (FREON 12)	2019/10/09	101	60 - 140	94	60 - 140	<1.0	ug/L	NC	30
6375031	Ethylbenzene	2019/10/09	95	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6375031	Ethylene Dibromide	2019/10/09	85	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
6375031	F1 (C6-C10) - BTEX	2019/10/09					<25	ug/L	2.7	30
6375031	F1 (C6-C10)	2019/10/09	97	60 - 140	96	60 - 140	<25	ug/L	2.7	30
6375031	Hexane	2019/10/09	102	70 - 130	98	70 - 130	<1.0	ug/L	NC	30
6375031	Methyl Ethyl Ketone (2-Butanone)	2019/10/09	73	60 - 140	96	60 - 140	<10	ug/L	6.4	30
6375031	Methyl Isobutyl Ketone	2019/10/09	65 (1)	70 - 130	86	70 - 130	<5.0	ug/L	NC	30
6375031	Methyl t-butyl ether (MTBE)	2019/10/09	80	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
6375031	Methylene Chloride(Dichloromethane)	2019/10/09	86	70 - 130	95	70 - 130	<2.0	ug/L	NC	30
6375031	o-Xylene	2019/10/09	89	70 - 130	92	70 - 130	<0.20	ug/L	NC	30
6375031	p+m-Xylene	2019/10/09	90	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
6375031	Styrene	2019/10/09	86	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6375031	Tetrachloroethylene	2019/10/09	115	70 - 130	108	70 - 130	<0.20	ug/L	NC	30
6375031	Toluene	2019/10/09	96	70 - 130	95	70 - 130	<0.20	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6375031	Total Xylenes	2019/10/09					<0.20	ug/L	NC	30
6375031	trans-1,2-Dichloroethylene	2019/10/09	101	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
6375031	trans-1,3-Dichloropropene	2019/10/09	86	70 - 130	85	70 - 130	<0.40	ug/L	NC	30
6375031	Trichloroethylene	2019/10/09	102	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6375031	Trichlorofluoromethane (FREON 11)	2019/10/09	109	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
6375031	Vinyl Chloride	2019/10/09	105	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
6375118	Dissolved Antimony (Sb)	2019/10/09	102	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
6375118	Dissolved Arsenic (As)	2019/10/09	100	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
6375118	Dissolved Barium (Ba)	2019/10/09	98	80 - 120	94	80 - 120	<2.0	ug/L	0.90	20
6375118	Dissolved Beryllium (Be)	2019/10/09	103	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
6375118	Dissolved Boron (B)	2019/10/09	97	80 - 120	97	80 - 120	<10	ug/L	0.66	20
6375118	Dissolved Cadmium (Cd)	2019/10/09	101	80 - 120	98	80 - 120	<0.10	ug/L	NC	20
6375118	Dissolved Chromium (Cr)	2019/10/09	99	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
6375118	Dissolved Cobalt (Co)	2019/10/09	98	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
6375118	Dissolved Copper (Cu)	2019/10/09	100	80 - 120	95	80 - 120	<1.0	ug/L	NC	20
6375118	Dissolved Lead (Pb)	2019/10/09	99	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
6375118	Dissolved Molybdenum (Mo)	2019/10/09	103	80 - 120	96	80 - 120	<0.50	ug/L	2.1	20
6375118	Dissolved Nickel (Ni)	2019/10/09	98	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
6375118	Dissolved Selenium (Se)	2019/10/09	105	80 - 120	98	80 - 120	<2.0	ug/L	NC	20
6375118	Dissolved Silver (Ag)	2019/10/09	98	80 - 120	94	80 - 120	<0.10	ug/L	NC	20
6375118	Dissolved Sodium (Na)	2019/10/09	102	80 - 120	100	80 - 120	<100	ug/L	0.39	20
6375118	Dissolved Thallium (Tl)	2019/10/09	101	80 - 120	100	80 - 120	<0.050	ug/L	NC	20
6375118	Dissolved Uranium (U)	2019/10/09	105	80 - 120	101	80 - 120	<0.10	ug/L	3.3	20
6375118	Dissolved Vanadium (V)	2019/10/09	99	80 - 120	97	80 - 120	<0.50	ug/L	NC	20
6375118	Dissolved Zinc (Zn)	2019/10/09	100	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
6375929	Dissolved Aluminum (Al)	2019/10/11	101	80 - 120	99	80 - 120	<5.0	ug/L	9.0	20
6375929	Dissolved Antimony (Sb)	2019/10/11	104	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
6375929	Dissolved Arsenic (As)	2019/10/11	102	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
6375929	Dissolved Barium (Ba)	2019/10/11	101	80 - 120	96	80 - 120	<2.0	ug/L	1.6	20
6375929	Dissolved Beryllium (Be)	2019/10/11	91	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
6375929	Dissolved Bismuth (Bi)	2019/10/11	101	80 - 120	96	80 - 120	<1.0	ug/L	NC	20
6375929	Dissolved Boron (B)	2019/10/11	93	80 - 120	102	80 - 120	<10	ug/L	2.1	20

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6375929	Dissolved Cadmium (Cd)	2019/10/11	101	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
6375929	Dissolved Calcium (Ca)	2019/10/11	NC	80 - 120	101	80 - 120	<200	ug/L	3.9	20
6375929	Dissolved Chromium (Cr)	2019/10/11	95	80 - 120	92	80 - 120	<5.0	ug/L	NC	20
6375929	Dissolved Cobalt (Co)	2019/10/11	101	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
6375929	Dissolved Copper (Cu)	2019/10/11	99	80 - 120	97	80 - 120	<1.0	ug/L	1.6	20
6375929	Dissolved Iron (Fe)	2019/10/11	103	80 - 120	100	80 - 120	<100	ug/L	NC	20
6375929	Dissolved Lead (Pb)	2019/10/11	98	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
6375929	Dissolved Lithium (Li)	2019/10/11	103	80 - 120	109	80 - 120	<5.0	ug/L	0.11	20
6375929	Dissolved Magnesium (Mg)	2019/10/11	NC	80 - 120	101	80 - 120	<50	ug/L	2.1	20
6375929	Dissolved Manganese (Mn)	2019/10/11	100	80 - 120	97	80 - 120	<2.0	ug/L	6.0	20
6375929	Dissolved Molybdenum (Mo)	2019/10/11	105	80 - 120	95	80 - 120	<0.50	ug/L	0.68	20
6375929	Dissolved Nickel (Ni)	2019/10/11	97	80 - 120	97	80 - 120	<1.0	ug/L	2.0	20
6375929	Dissolved Phosphorus (P)	2019/10/11	94	80 - 120	120	80 - 120	100, RDL=100	ug/L	5.2	20
6375929	Dissolved Potassium (K)	2019/10/11	99	80 - 120	98	80 - 120	<200	ug/L	1.9	20
6375929	Dissolved Selenium (Se)	2019/10/11	101	80 - 120	100	80 - 120	<2.0	ug/L	NC	20
6375929	Dissolved Silicon (Si)	2019/10/11	96	80 - 120	97	80 - 120	<50	ug/L	2.1	20
6375929	Dissolved Silver (Ag)	2019/10/11	99	80 - 120	96	80 - 120	<0.10	ug/L	NC	20
6375929	Dissolved Sodium (Na)	2019/10/11	NC	80 - 120	99	80 - 120	<100	ug/L	3.5	20
6375929	Dissolved Strontium (Sr)	2019/10/11	NC	80 - 120	94	80 - 120	<1.0	ug/L	2.4	20
6375929	Dissolved Tellurium (Te)	2019/10/11	100	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
6375929	Dissolved Thallium (Tl)	2019/10/11	101	80 - 120	98	80 - 120	<0.050	ug/L	NC	20
6375929	Dissolved Tin (Sn)	2019/10/11	105	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
6375929	Dissolved Titanium (Ti)	2019/10/11	99	80 - 120	96	80 - 120	<5.0	ug/L	NC	20
6375929	Dissolved Tungsten (W)	2019/10/11	103	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
6375929	Dissolved Uranium (U)	2019/10/11	105	80 - 120	98	80 - 120	<0.10	ug/L	0.98	20
6375929	Dissolved Vanadium (V)	2019/10/11	98	80 - 120	94	80 - 120	<0.50	ug/L	2.4	20
6375929	Dissolved Zinc (Zn)	2019/10/11	95	80 - 120	94	80 - 120	<5.0	ug/L	NC	20
6375929	Dissolved Zirconium (Zr)	2019/10/11	106	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
6376735	F2 (C10-C16 Hydrocarbons)	2019/10/09	95	50 - 130	94	60 - 130	<100	ug/L	NC	30
6376735	F3 (C16-C34 Hydrocarbons)	2019/10/09	86	50 - 130	86	60 - 130	<200	ug/L	NC	30
6376735	F4 (C34-C50 Hydrocarbons)	2019/10/09	71	50 - 130	71	60 - 130	<200	ug/L	NC	30
6376739	1-Methylnaphthalene	2019/10/09	108	50 - 130	94	50 - 130	<0.050	ug/L	NC	30

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6376739	2-Methylnaphthalene	2019/10/09	98	50 - 130	85	50 - 130	<0.050	ug/L	NC	30
6376739	Acenaphthene	2019/10/09	110	50 - 130	102	50 - 130	<0.050	ug/L	NC	30
6376739	Acenaphthylene	2019/10/09	112	50 - 130	103	50 - 130	<0.050	ug/L	NC	30
6376739	Anthracene	2019/10/09	102	50 - 130	93	50 - 130	<0.050	ug/L	NC	30
6376739	Benzo(a)anthracene	2019/10/09	122	50 - 130	114	50 - 130	<0.050	ug/L	NC	30
6376739	Benzo(a)pyrene	2019/10/09	109	50 - 130	103	50 - 130	<0.010	ug/L	NC	30
6376739	Benzo(b/j)fluoranthene	2019/10/09	104	50 - 130	98	50 - 130	<0.050	ug/L	NC	30
6376739	Benzo(g,h,i)perylene	2019/10/09	111	50 - 130	103	50 - 130	<0.050	ug/L	NC	30
6376739	Benzo(k)fluoranthene	2019/10/09	96	50 - 130	94	50 - 130	<0.050	ug/L	NC	30
6376739	Chrysene	2019/10/09	97	50 - 130	90	50 - 130	<0.050	ug/L	NC	30
6376739	Dibenz(a,h)anthracene	2019/10/09	111	50 - 130	105	50 - 130	<0.050	ug/L	NC	30
6376739	Fluoranthene	2019/10/09	119	50 - 130	111	50 - 130	<0.050	ug/L	NC	30
6376739	Fluorene	2019/10/09	107	50 - 130	100	50 - 130	<0.050	ug/L	NC	30
6376739	Indeno(1,2,3-cd)pyrene	2019/10/09	118	50 - 130	111	50 - 130	<0.050	ug/L	NC	30
6376739	Naphthalene	2019/10/09	91	50 - 130	77	50 - 130	<0.050	ug/L	NC	30
6376739	Phenanthrene	2019/10/09	111	50 - 130	104	50 - 130	<0.030	ug/L	NC	30
6376739	Pyrene	2019/10/09	115	50 - 130	110	50 - 130	<0.050	ug/L	NC	30
6377896	Mercury (Hg)	2019/10/09	96	75 - 125	97	80 - 120	<0.0001	mg/L	NC	20
6377924	Mercury (Hg)	2019/10/09	97	75 - 125	98	80 - 120	<0.1	ug/L	NC	20
6378597	Aroclor 1242	2019/10/10					<0.05	ug/L	NC	30
6378597	Aroclor 1248	2019/10/10					<0.05	ug/L	NC	30
6378597	Aroclor 1254	2019/10/10					<0.05	ug/L	NC	30
6378597	Aroclor 1260	2019/10/10	82	60 - 130	72	60 - 130	<0.05	ug/L	NC	30

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6378597	Total PCB	2019/10/10	82	60 - 130	72	60 - 130	<0.05	ug/L	NC	40

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) The recovery was below the lower control limit. This may represent a low bias in some results for this specific analyte.

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.bvlabs.com

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.bvlabs.com

CHAIN OF CUSTODY RECORD

Page of

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #14090 Golder Associates Ltd	Company Name:	Quotation #: B80683	BV Labs Job #: / Bottle Order #: 740787
Attention: Central Accounting	Attention:	P.O. #:	
Address: 1931 Robertson Rd, Ottawa ON K2H 5B7	Address:	Project: 1897188/1100	COC #: C#740787-01-01
Tel: (613) 592-9600 Fax: (613) 592-9601	Tel: Fax:	Project Name:	Project Manager: Alisha Williamson
Email: AP_CustomerService@golder.com	Email:	Site #:	
		Sampled By:	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): Table 1, Table 2, Table 3, Table ___; Res/Park, Ind/Comm, Agri/Other; Medium/Fine, Coarse, For RSC

Other Regulations: CCME, Reg 558, MISA, PWQO, Other; Sanitary Sewer Bylaw, Storm Sewer Bylaw, Municipality

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ______

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ______ Time Required: ______
Rush Confirmation Number: ______ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 VOCs by HS & F1-F4	O.Reg 153 PAHs	O.Reg 153 PCBs (Water)	O.Reg 153 Metals Package (Water)	CrVI + Hg	CrVI					# of Bottles	Comments
1		MW17-1	2019/10/04	13:00	GW	X	X	X	X	X								
2		MW17-14	↓	14:30	↓		X	X		X	X							Limited PAH sample CrVI + Metals need filter
3		MW17-22	↓	15:30	↓	X	X	X	X	X								
4		DUP-1	↓	13:30	↓	X	X	X	X	X								
5																		
6																		
7																		
8																		
9																		on ice
10																		

04-Oct-19 16:45
Alisha Williamson
B9S0253
KFL ENV-612

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alex Wood	19/10/04	16:45		2019/10/04	16:45	
			Porsey Porsey Pickard	2019/10/05	08:32	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	13, 12, 10	Present		
		Intact	☒	

White: BV Labs Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

7/6/4

Bureau Veritas Canada (2019) Inc.

URE 2019/10/05 7/5/4

Maxxam — A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#14090 Golder Associates Ltd	Company Name:	Golder	Quotation #:	~~B80683~~ B80683	Maxxam Job #:	Bottle Order #:
Attention:	Central Accounting	Attention:	Eric Wilson	P.O. #:			695003
Address:	1931 Robertson Rd Ottawa ON K2H 5B7	Address:	As per Invoice	Project:	~~18105014~~ 18971881100	COC #:	Project Manager:
Tel:	(613) 592-9600 Fax: (613) 592-9601	Tel:	Fax:	Project Name:		C#695003-13-01	Alisha Williamson
Email:	AP_CustomerService@golder.com	Email:	eric_wilson@golder.com	Site #:			
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☐ Table 3 ☐ Agri/Other ☒ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs by HS & F1-F4 (Soil)	Conductivity	Sodium Adsorption Ratio (SAR)	O.Reg 153 Metals Package (Soil)	pH CaCl2 EXTRACT	Hg Dissolved	RSBS			# of Bottles	Comments
1		MW17-14	2019/10/07	8:30	GW							X	X			3	Hg not field filtered. Needs filtering. Preservative removed
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	ON Ice

04-Oct-19 16:45
Alisha Williamson
B9S0253
KFL ENV-612

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alex Wood	19/10/07	10:00		19/10/07	~~Hg~~ 13:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	6, 6, 6	Present	☒	
		Intact	☒	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam Analytics International Corporation o/a Maxxam Analytics

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#14090 Golder Associates Ltd	Company Name:	Golder	Quotation #:	~~B80683~~ B80683	Maxxam Job #:	Bottle Order #:
Attention:	Central Accounting	Attention:	Eric Wilson	P.O. #:			695003
Address:	1931 Robertson Rd	Address:	AS per Invoice	Project:	~~18105014~~ 18971881/1100	COC #:	Project Manager:
	Ottawa ON K2H 5B7			Project Name:		C#695003-13-01	Alisha Williamson
Tel:	(613) 592-9600 Fax: (613) 592-9601	Tel:	Fax:	Site #:			
Email:	AP_CustomerService@golder.com	Email:	eric_wilson@golder.com	Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
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- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558. ☐ Storm Sewer Bylaw
- ☐ MISA Municipality ___
- ☐ PWQO
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	O.Reg 153 PAHs (Soil)	O.Reg 153 VOCs by HS & F1-F4 (Soil)	Conductivity	Sodium Adsorption Ratio (SAR)	O.Reg 153 Metals Package (Soil)	pH CaCl2 EXTRACT	Hg Dissolved	PCBs			# of Bottles	Comments
1		MW17-14	2019/10/07	8:30	GW							X	X			3	Hg not field filtered. Needs filtering. Preservative removed
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	ON Fee

04-Oct-19 16:45
Alisha Williamson
B9S0253
KFL ENV-612

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
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Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alex Wood Alex Wood	19/10/07	10:00	[illegible]	2019/10/07	[illegible]	
			Rick Gillespie	2019/10/08	13:50	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	6, 6, 6	Present	☒	
		Intact	☒	

08:00
8, 8, 8

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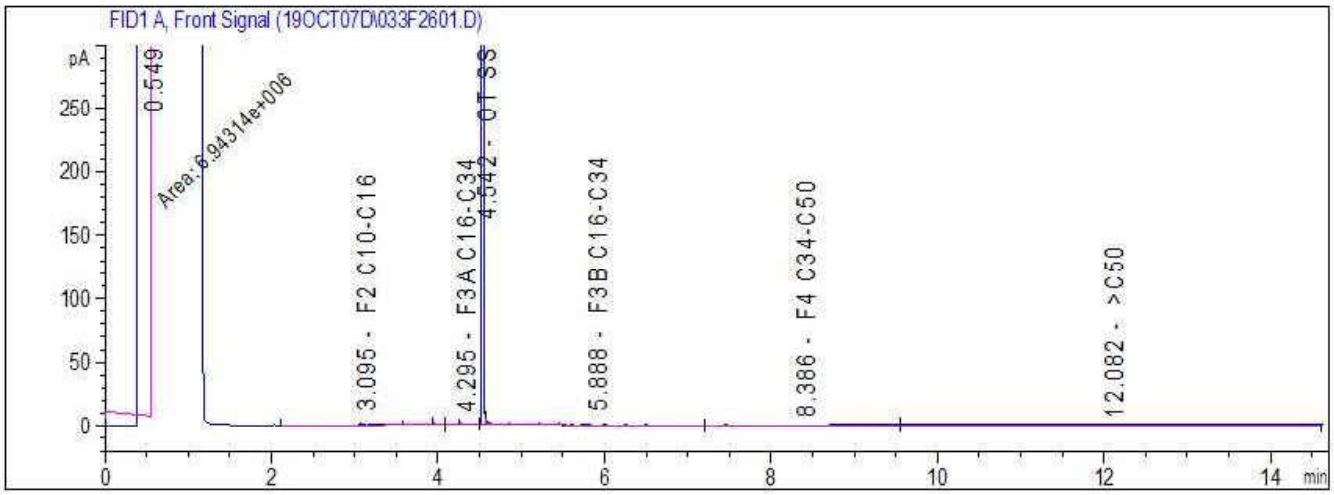
SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

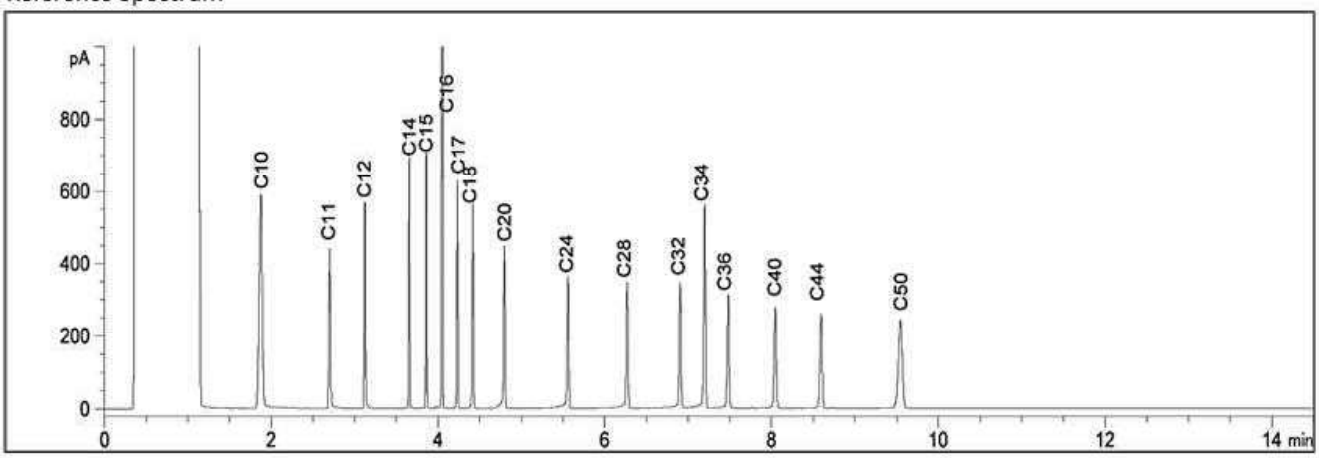
BV Labs Job #: B9S0253
Report Date: 2019/10/11
BV Labs Sample: KYU636

Golder Associates Ltd
Client Project #: 1897188/1100
Client ID: MW17-1

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum

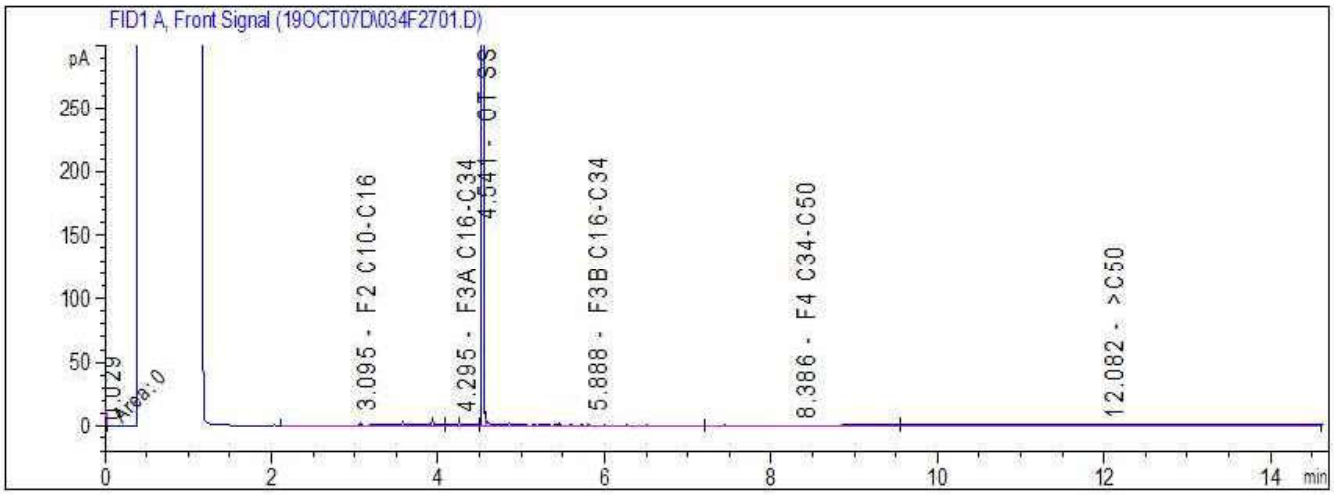


TYPICAL PRODUCT CARBON NUMBER RANGES

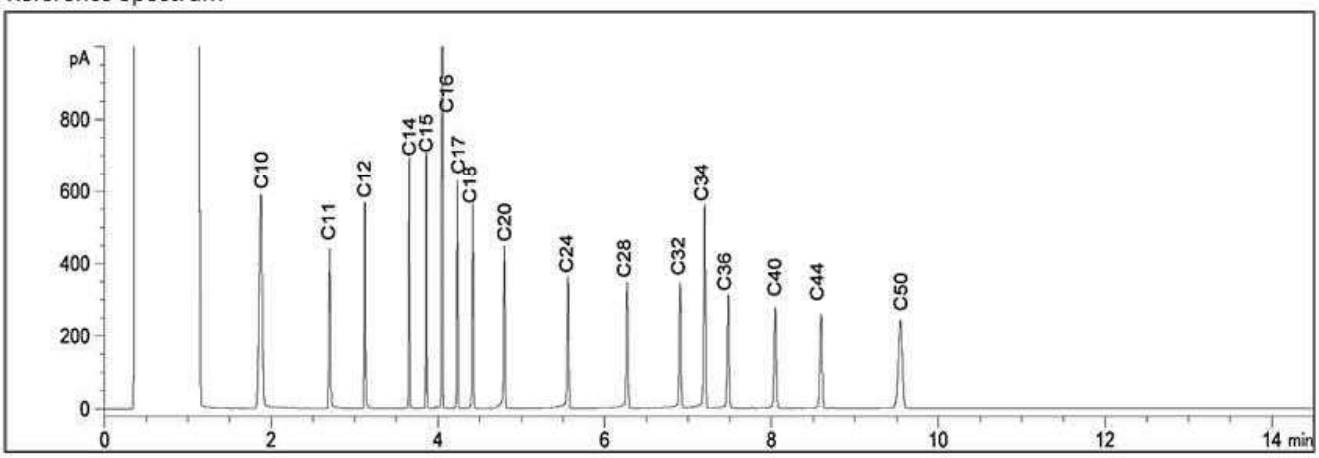
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum

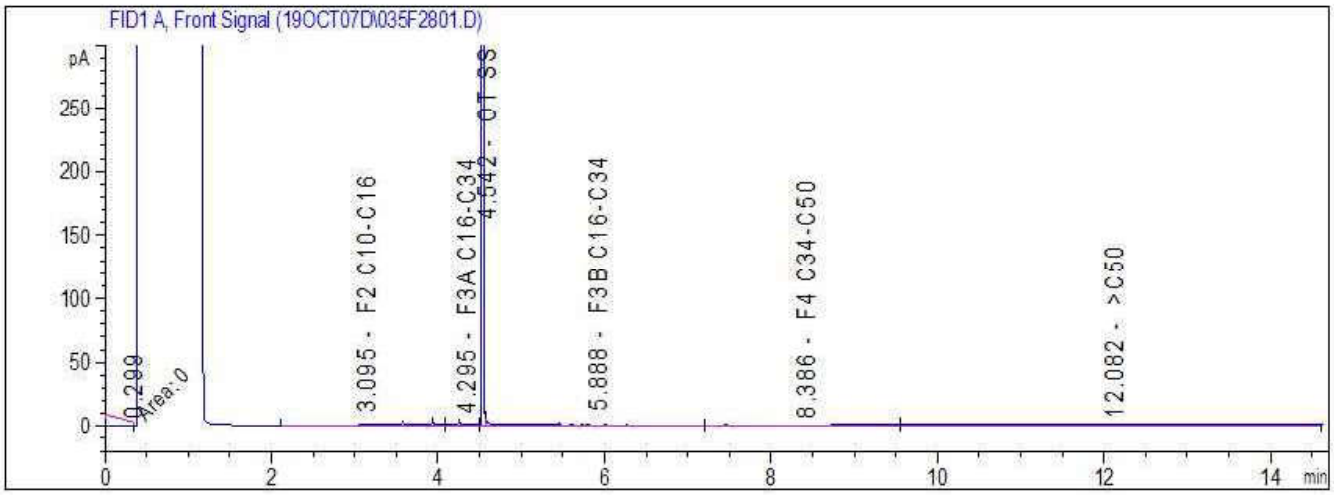


TYPICAL PRODUCT CARBON NUMBER RANGES

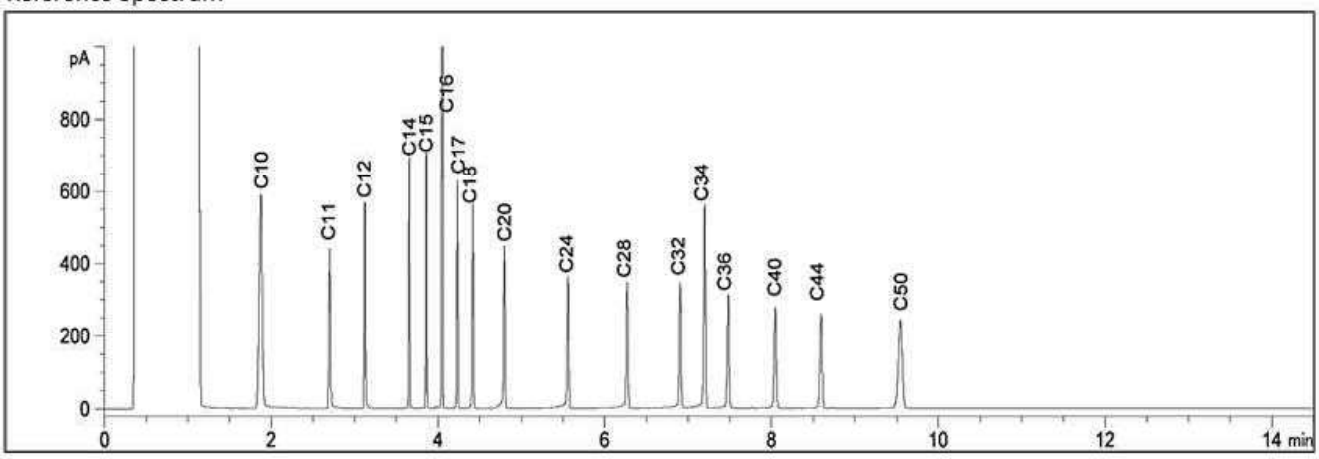
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

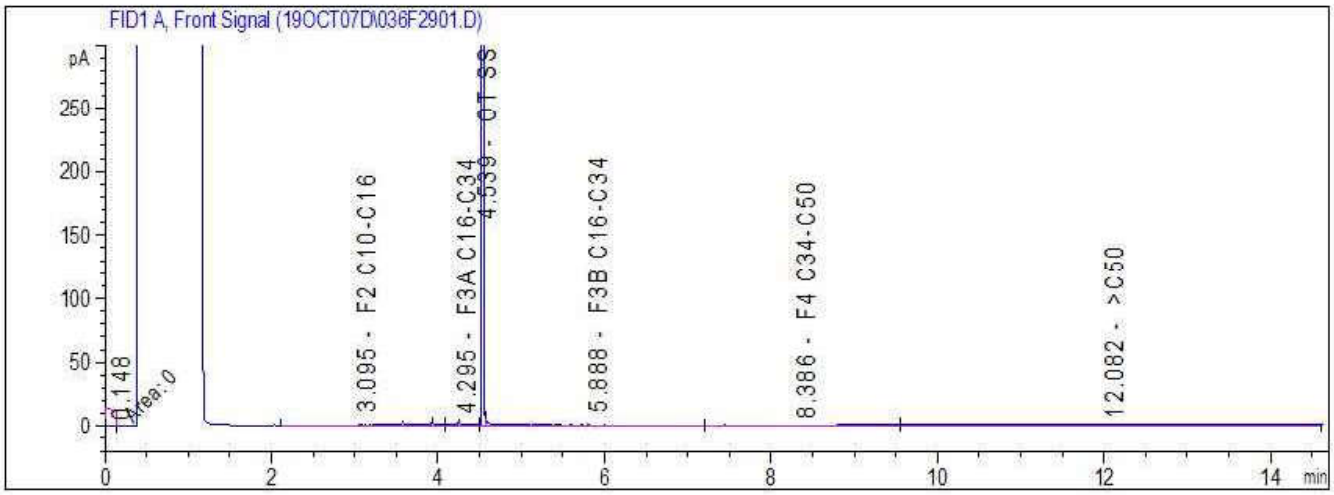
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

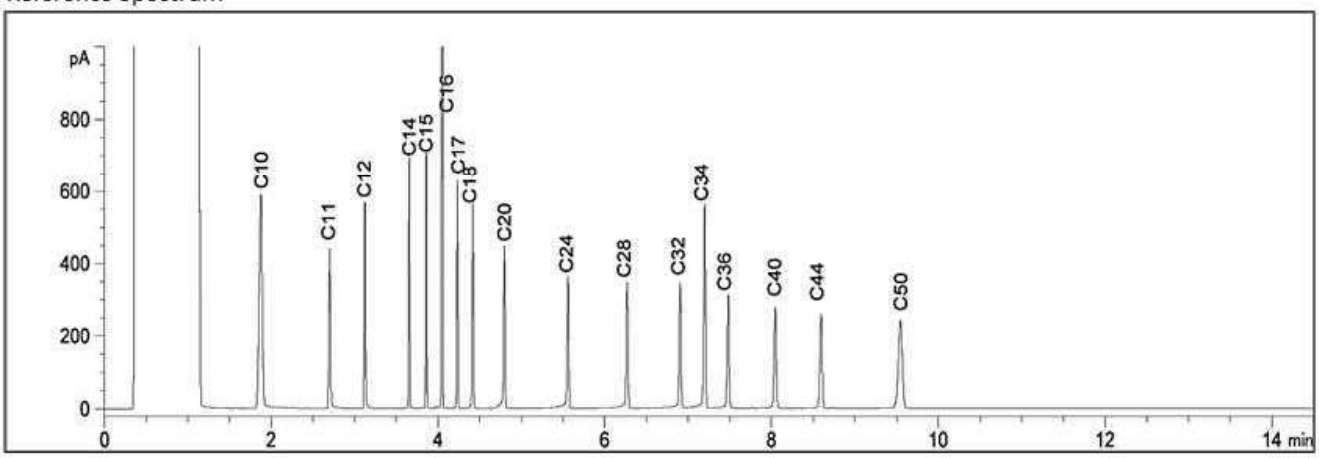
BV Labs Job #: B9S0253
Report Date: 2019/10/11
BV Labs Sample: KYU638 Lab-Dup

Golder Associates Ltd
Client Project #: 1897188/1100
Client ID: MW17-22

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum

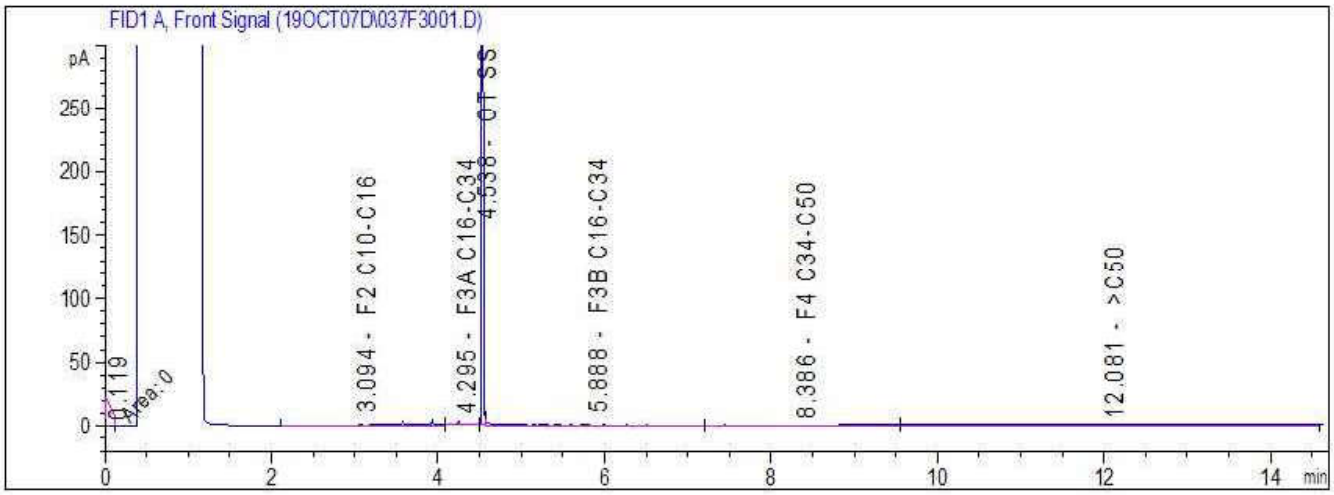


TYPICAL PRODUCT CARBON NUMBER RANGES

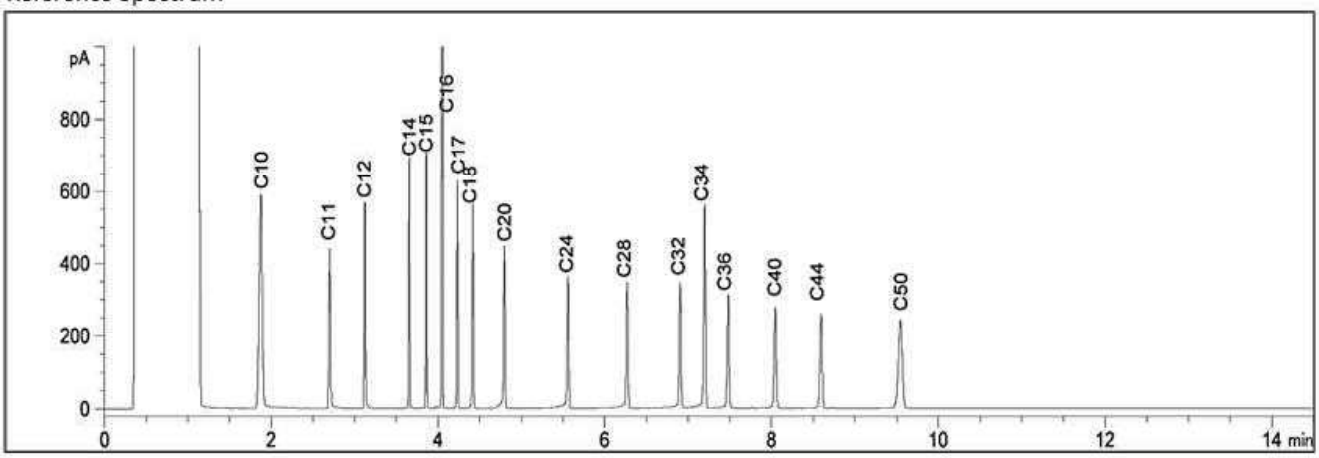
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 21470873
Site Location: OCH GLADSTONE
Your C.O.C. #: 840665-01-01

Attention: Soheil Fatehi

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2021/08/23
Report #: R6777284
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1N0907
Received: 2021/08/13, 15:50

Sample Matrix: Ground Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum (1)	1	N/A	2021/08/19	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum (1)	1	N/A	2021/08/19		EPA 8260C m
1,3-Dichloropropene Sum (1)	1	N/A	2021/08/20		EPA 8260C m
Chromium (VI) in Water (1)	4	N/A	2021/08/20	CAM SOP-00436	EPA 7199 m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	1	2021/08/18	2021/08/19	CAM SOP-00316	CCME PHC-CWS m
Mercury (1)	4	2021/08/18	2021/08/18	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS (1)	4	N/A	2021/08/19	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM) (1)	1	2021/08/18	2021/08/19	CAM SOP-00318	EPA 8270D m
Polychlorinated Biphenyl in Water (1)	5	2021/08/17	2021/08/18	CAM SOP-00309	EPA 8082A m
Volatile Organic Compounds and F1 PHCs (1)	1	N/A	2021/08/19	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water (1)	1	N/A	2021/08/19	CAM SOP-00228	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga

Your Project #: 21470873
Site Location: OCH GLADSTONE
Your C.O.C. #: 840665-01-01

Attention: Soheil Fatehi

Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2021/08/23
Report #: R6777284
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1N0907
Received: 2021/08/13, 15:50

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Katherine Szozda
Project Manager
23 Aug 2021 10:58:45

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: C1N0907
Report Date: 2021/08/23

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

O.REG 153 METALS PACKAGE (WATER)

BV Labs ID		QJO864	QJO865	QJO867	QJO869		
Sampling Date		2021/08/11 10:15	2021/08/13 14:30	2021/08/11 12:15	2021/08/11 10:15		
COC Number		840665-01-01	840665-01-01	840665-01-01	840665-01-01		
	UNITS	MW 17-01	MW 17-01 FIELD DUP	MW 17-22	FIELD BLANK	RDL	QC Batch
Metals							
Chromium (VI)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7523360
Mercury (Hg)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	7526478
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7525507
Dissolved Arsenic (As)	ug/L	<1.0	<1.0	1.2	<1.0	1.0	7525507
Dissolved Barium (Ba)	ug/L	51	80	74	<2.0	2.0	7525507
Dissolved Beryllium (Be)	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	7525507
Dissolved Boron (B)	ug/L	100	100	48	<10	10	7525507
Dissolved Cadmium (Cd)	ug/L	<0.090	<0.090	<0.090	<0.090	0.090	7525507
Dissolved Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7525507
Dissolved Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7525507
Dissolved Copper (Cu)	ug/L	1.8	1.5	<0.90	<0.90	0.90	7525507
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7525507
Dissolved Molybdenum (Mo)	ug/L	24	21	8.5	<0.50	0.50	7525507
Dissolved Nickel (Ni)	ug/L	2.6	2.5	<1.0	<1.0	1.0	7525507
Dissolved Selenium (Se)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7525507
Dissolved Silver (Ag)	ug/L	<0.090	<0.090	<0.090	<0.090	0.090	7525507
Dissolved Sodium (Na)	ug/L	220000	180000	53000	<100	100	7525507
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7525507
Dissolved Uranium (U)	ug/L	10	7.0	4.1	<0.10	0.10	7525507
Dissolved Vanadium (V)	ug/L	3.5	3.5	0.78	<0.50	0.50	7525507
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7525507

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C1N0907
Report Date: 2021/08/23

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

O.REG 153 PAHS (GROUND WATER)

BV Labs ID		QJO865		
Sampling Date		2021/08/13 14:30		
COC Number		840665-01-01		
	UNITS	MW 17-01 FIELD DUP	RDL	QC Batch
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/L	<0.071	0.071	7523840
Polyaromatic Hydrocarbons				
Acenaphthene	ug/L	<0.050	0.050	7527364
Acenaphthylene	ug/L	<0.050	0.050	7527364
Anthracene	ug/L	<0.050	0.050	7527364
Benzo(a)anthracene	ug/L	<0.050	0.050	7527364
Benzo(a)pyrene	ug/L	<0.0090	0.0090	7527364
Benzo(b/j)fluoranthene	ug/L	<0.050	0.050	7527364
Benzo(g,h,i)perylene	ug/L	<0.050	0.050	7527364
Benzo(k)fluoranthene	ug/L	<0.050	0.050	7527364
Chrysene	ug/L	<0.050	0.050	7527364
Dibenzo(a,h)anthracene	ug/L	<0.050	0.050	7527364
Fluoranthene	ug/L	<0.050	0.050	7527364
Fluorene	ug/L	<0.050	0.050	7527364
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	7527364
1-Methylnaphthalene	ug/L	<0.050	0.050	7527364
2-Methylnaphthalene	ug/L	<0.050	0.050	7527364
Naphthalene	ug/L	<0.050	0.050	7527364
Phenanthrene	ug/L	<0.030	0.030	7527364
Pyrene	ug/L	<0.050	0.050	7527364
Surrogate Recovery (%)				
D10-Anthracene	%	116		7527364
D14-Terphenyl (FS)	%	76		7527364
D8-Acenaphthylene	%	101		7527364

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C1N0907
Report Date: 2021/08/23

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

O.REG 153 PCBS (WATER)

BV Labs ID		QJO864	QJO865	QJO866	QJO867	QJO869		
Sampling Date		2021/08/11 10:15	2021/08/13 14:30	2021/08/11 13:30	2021/08/11 12:15	2021/08/11 10:15		
COC Number		840665-01-01	840665-01-01	840665-01-01	840665-01-01	840665-01-01		
	UNITS	MW 17-01	MW 17-01 FIELD DUP	MW 17-14	MW 17-22	FIELD BLANK	RDL	QC Batch
PCBs								
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	7524784
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	7524784
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	7524784
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	7524784
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	7524784
Surrogate Recovery (%)								
Decachlorobiphenyl	%	82	80	94	89	93		7524784

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs ID		QJO869		
Sampling Date		2021/08/11 10:15		
COC Number		840665-01-01		
	UNITS	FIELD BLANK Lab-Dup	RDL	QC Batch
PCBs				
Aroclor 1242	ug/L	<0.05	0.05	7524784
Aroclor 1248	ug/L	<0.05	0.05	7524784
Aroclor 1254	ug/L	<0.05	0.05	7524784
Aroclor 1260	ug/L	<0.05	0.05	7524784
Total PCB	ug/L	<0.05	0.05	7524784
Surrogate Recovery (%)				
Decachlorobiphenyl	%	100		7524784

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvlabs.com

O.REG 153 VOCS BY HS & F1-F4 (GROUND WATER)

BV Labs ID		QJO865		
Sampling Date		2021/08/13 14:30		
COC Number		840665-01-01		
	UNITS	MW 17-01 FIELD DUP	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	7523779
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7526359
Benzene	ug/L	<0.17	0.17	7526359
Bromodichloromethane	ug/L	<0.50	0.50	7526359
Bromoform	ug/L	<1.0	1.0	7526359
Bromomethane	ug/L	<0.50	0.50	7526359
Carbon Tetrachloride	ug/L	<0.20	0.20	7526359
Chlorobenzene	ug/L	<0.20	0.20	7526359
Chloroform	ug/L	<0.20	0.20	7526359
Dibromochloromethane	ug/L	<0.50	0.50	7526359
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7526359
1,3-Dichlorobenzene	ug/L	<0.50	0.50	7526359
1,4-Dichlorobenzene	ug/L	<0.50	0.50	7526359
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7526359
1,1-Dichloroethane	ug/L	<0.20	0.20	7526359
1,2-Dichloroethane	ug/L	<0.50	0.50	7526359
1,1-Dichloroethylene	ug/L	<0.20	0.20	7526359
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7526359
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7526359
1,2-Dichloropropane	ug/L	<0.20	0.20	7526359
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7526359
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7526359
Ethylbenzene	ug/L	<0.20	0.20	7526359
Ethylene Dibromide	ug/L	<0.20	0.20	7526359
Hexane	ug/L	<1.0	1.0	7526359
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7526359
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7526359
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7526359
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7526359
Styrene	ug/L	<0.50	0.50	7526359
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7526359
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7526359

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (GROUND WATER)

BV Labs ID		QJO865		
Sampling Date		2021/08/13 14:30		
COC Number		840665-01-01		
	UNITS	MW 17-01 FIELD DUP	RDL	QC Batch
Tetrachloroethylene	ug/L	<0.20	0.20	7526359
Toluene	ug/L	<0.20	0.20	7526359
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7526359
1,1,2-Trichloroethane	ug/L	<0.50	0.50	7526359
Trichloroethylene	ug/L	<0.20	0.20	7526359
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7526359
Vinyl Chloride	ug/L	<0.20	0.20	7526359
p+m-Xylene	ug/L	<0.20	0.20	7526359
o-Xylene	ug/L	<0.20	0.20	7526359
Total Xylenes	ug/L	<0.20	0.20	7526359
F1 (C6-C10)	ug/L	<25	25	7526359
F1 (C6-C10) - BTEX	ug/L	<25	25	7526359
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	7527367
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	7527367
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	7527367
Reached Baseline at C50	ug/L	Yes		7527367
Surrogate Recovery (%)				
o-Terphenyl	%	102		7527367
4-Bromofluorobenzene	%	86		7526359
D4-1,2-Dichloroethane	%	112		7526359
D8-Toluene	%	93		7526359

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvlabs.com

O.REG 153 VOCS BY HS (WATER)

BV Labs ID		QJO868		
Sampling Date		2021/08/11		
COC Number		840665-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	7523779
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7526479
Benzene	ug/L	<0.20	0.20	7526479
Bromodichloromethane	ug/L	<0.50	0.50	7526479
Bromoform	ug/L	<1.0	1.0	7526479
Bromomethane	ug/L	<0.50	0.50	7526479
Carbon Tetrachloride	ug/L	<0.19	0.19	7526479
Chlorobenzene	ug/L	<0.20	0.20	7526479
Chloroform	ug/L	<0.20	0.20	7526479
Dibromochloromethane	ug/L	<0.50	0.50	7526479
1,2-Dichlorobenzene	ug/L	<0.40	0.40	7526479
1,3-Dichlorobenzene	ug/L	<0.40	0.40	7526479
1,4-Dichlorobenzene	ug/L	<0.40	0.40	7526479
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7526479
1,1-Dichloroethane	ug/L	<0.20	0.20	7526479
1,2-Dichloroethane	ug/L	<0.49	0.49	7526479
1,1-Dichloroethylene	ug/L	<0.20	0.20	7526479
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7526479
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7526479
1,2-Dichloropropane	ug/L	<0.20	0.20	7526479
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7526479
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7526479
Ethylbenzene	ug/L	<0.20	0.20	7526479
Ethylene Dibromide	ug/L	<0.19	0.19	7526479
Hexane	ug/L	<1.0	1.0	7526479
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7526479
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7526479
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7526479
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7526479
Styrene	ug/L	<0.40	0.40	7526479
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7526479
1,1,2,2-Tetrachloroethane	ug/L	<0.40	0.40	7526479
Tetrachloroethylene	ug/L	<0.20	0.20	7526479

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS (WATER)

BV Labs ID		QJO868		
Sampling Date		2021/08/11		
COC Number		840665-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Toluene	ug/L	<0.20	0.20	7526479
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7526479
1,1,2-Trichloroethane	ug/L	<0.40	0.40	7526479
Trichloroethylene	ug/L	<0.20	0.20	7526479
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7526479
Vinyl Chloride	ug/L	<0.20	0.20	7526479
p+m-Xylene	ug/L	<0.20	0.20	7526479
o-Xylene	ug/L	<0.20	0.20	7526479
Total Xylenes	ug/L	<0.20	0.20	7526479
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	95		7526479
D4-1,2-Dichloroethane	%	109		7526479
D8-Toluene	%	95		7526479

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C1N0907
Report Date: 2021/08/23

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

TEST SUMMARY

BV Labs ID: QJO864
Sample ID: MW 17-01
Matrix: Ground Water

Collected: 2021/08/11
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	7523360	N/A	2021/08/20	Violeta Porcila
Mercury	CV/AA	7526478	2021/08/18	2021/08/18	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7525507	N/A	2021/08/19	Daniel Teclu
Polychlorinated Biphenyl in Water	GC/ECD	7524784	2021/08/17	2021/08/18	Dawn Howard

BV Labs ID: QJO865
Sample ID: MW 17-01 FIELD DUP
Matrix: Ground Water

Collected: 2021/08/13
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7523840	N/A	2021/08/19	Automated Statchk
1,3-Dichloropropene Sum	CALC	7523779	N/A	2021/08/20	Automated Statchk
Chromium (VI) in Water	IC	7523360	N/A	2021/08/20	Violeta Porcila
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7527367	2021/08/18	2021/08/19	Dennis Ngondu
Mercury	CV/AA	7526478	2021/08/18	2021/08/18	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7525507	N/A	2021/08/19	Daniel Teclu
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7527364	2021/08/18	2021/08/19	Jonghan Yoon
Polychlorinated Biphenyl in Water	GC/ECD	7524784	2021/08/17	2021/08/18	Dawn Howard
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7526359	N/A	2021/08/19	Yang (Philip) Yu

BV Labs ID: QJO866
Sample ID: MW 17-14
Matrix: Ground Water

Collected: 2021/08/11
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	7524784	2021/08/17	2021/08/18	Dawn Howard

BV Labs ID: QJO867
Sample ID: MW 17-22
Matrix: Ground Water

Collected: 2021/08/11
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	7523360	N/A	2021/08/20	Violeta Porcila
Mercury	CV/AA	7526478	2021/08/18	2021/08/18	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7525507	N/A	2021/08/19	Daniel Teclu
Polychlorinated Biphenyl in Water	GC/ECD	7524784	2021/08/17	2021/08/18	Dawn Howard

BV Labs ID: QJO868
Sample ID: TRIP BLANK
Matrix: Ground Water

Collected: 2021/08/11
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7523779	N/A	2021/08/19	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	7526479	N/A	2021/08/19	Chandni Khawas

BV Labs Job #: C1N0907
Report Date: 2021/08/23

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

TEST SUMMARY

BV Labs ID: QJO869
Sample ID: FIELD BLANK
Matrix: Ground Water

Collected: 2021/08/11
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	7523360	N/A	2021/08/20	Violeta Porcila
Mercury	CV/AA	7526478	2021/08/18	2021/08/18	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	7525507	N/A	2021/08/19	Daniel Teclu
Polychlorinated Biphenyl in Water	GC/ECD	7524784	2021/08/17	2021/08/18	Dawn Howard

BV Labs ID: QJO869 Dup
Sample ID: FIELD BLANK
Matrix: Ground Water

Collected: 2021/08/11
Shipped:
Received: 2021/08/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	7524784	2021/08/17	2021/08/18	Dawn Howard

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	17.0°C
Package 2	13.7°C

Results relate only to the items tested.

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvlabs.com

BV Labs Job #: C1N0907
Report Date: 2021/08/23

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7524784	Decachlorobiphenyl	2021/08/18	86	60 - 130	91	60 - 130	97	%		
7526359	4-Bromofluorobenzene	2021/08/19	100	70 - 130	101	70 - 130	88	%		
7526359	D4-1,2-Dichloroethane	2021/08/19	105	70 - 130	102	70 - 130	107	%		
7526359	D8-Toluene	2021/08/19	103	70 - 130	107	70 - 130	94	%		
7526479	4-Bromofluorobenzene	2021/08/19	103	70 - 130	102	70 - 130	99	%		
7526479	D4-1,2-Dichloroethane	2021/08/19	105	70 - 130	103	70 - 130	107	%		
7526479	D8-Toluene	2021/08/19	105	70 - 130	103	70 - 130	96	%		
7527364	D10-Anthracene	2021/08/19	107	50 - 130	114	50 - 130	110	%		
7527364	D14-Terphenyl (FS)	2021/08/19	101	50 - 130	101	50 - 130	97	%		
7527364	D8-Acenaphthylene	2021/08/19	98	50 - 130	104	50 - 130	97	%		
7527367	o-Terphenyl	2021/08/19	102	60 - 130	102	60 - 130	101	%		
7523360	Chromium (VI)	2021/08/20	105	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
7524784	Aroclor 1242	2021/08/18					<0.05	ug/L	NC	30
7524784	Aroclor 1248	2021/08/18					<0.05	ug/L	NC	30
7524784	Aroclor 1254	2021/08/18					<0.05	ug/L	NC	30
7524784	Aroclor 1260	2021/08/18	85	60 - 130	87	60 - 130	<0.05	ug/L	NC	30
7524784	Total PCB	2021/08/18	85	60 - 130	87	60 - 130	<0.05	ug/L	NC	40
7525507	Dissolved Antimony (Sb)	2021/08/19	104	80 - 120	104	80 - 120	<0.50	ug/L		
7525507	Dissolved Arsenic (As)	2021/08/19	101	80 - 120	100	80 - 120	<1.0	ug/L		
7525507	Dissolved Barium (Ba)	2021/08/19	99	80 - 120	103	80 - 120	<2.0	ug/L	1.7	20
7525507	Dissolved Beryllium (Be)	2021/08/19	99	80 - 120	99	80 - 120	<0.40	ug/L		
7525507	Dissolved Boron (B)	2021/08/19	NC	80 - 120	95	80 - 120	<10	ug/L	0.95	20
7525507	Dissolved Cadmium (Cd)	2021/08/19	99	80 - 120	100	80 - 120	<0.090	ug/L	NC	20
7525507	Dissolved Chromium (Cr)	2021/08/19	99	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
7525507	Dissolved Cobalt (Co)	2021/08/19	102	80 - 120	104	80 - 120	<0.50	ug/L		
7525507	Dissolved Copper (Cu)	2021/08/19	103	80 - 120	103	80 - 120	<0.90	ug/L	NC	20
7525507	Dissolved Lead (Pb)	2021/08/19	97	80 - 120	104	80 - 120	<0.50	ug/L	NC	20
7525507	Dissolved Molybdenum (Mo)	2021/08/19	110	80 - 120	101	80 - 120	<0.50	ug/L		
7525507	Dissolved Nickel (Ni)	2021/08/19	95	80 - 120	97	80 - 120	<1.0	ug/L		
7525507	Dissolved Selenium (Se)	2021/08/19	87	80 - 120	101	80 - 120	<2.0	ug/L		
7525507	Dissolved Silver (Ag)	2021/08/19	77 (1)	80 - 120	99	80 - 120	<0.090	ug/L	NC	20
7525507	Dissolved Sodium (Na)	2021/08/19	NC	80 - 120	101	80 - 120	<100	ug/L	0.54	20

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7525507	Dissolved Thallium (Tl)	2021/08/19	99	80 - 120	104	80 - 120	<0.050	ug/L		
7525507	Dissolved Uranium (U)	2021/08/19	98	80 - 120	102	80 - 120	<0.10	ug/L		
7525507	Dissolved Vanadium (V)	2021/08/19	101	80 - 120	98	80 - 120	<0.50	ug/L		
7525507	Dissolved Zinc (Zn)	2021/08/19	92	80 - 120	97	80 - 120	<5.0	ug/L	NC	20
7526359	1,1,1,2-Tetrachloroethane	2021/08/19	97	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
7526359	1,1,1-Trichloroethane	2021/08/19	97	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
7526359	1,1,2,2-Tetrachloroethane	2021/08/19	96	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
7526359	1,1,2-Trichloroethane	2021/08/19	101	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
7526359	1,1-Dichloroethane	2021/08/19	93	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
7526359	1,1-Dichloroethylene	2021/08/19	91	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
7526359	1,2-Dichlorobenzene	2021/08/19	94	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
7526359	1,2-Dichloroethane	2021/08/19	94	70 - 130	89	70 - 130	<0.50	ug/L	NC	30
7526359	1,2-Dichloropropane	2021/08/19	96	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
7526359	1,3-Dichlorobenzene	2021/08/19	94	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
7526359	1,4-Dichlorobenzene	2021/08/19	117	70 - 130	114	70 - 130	<0.50	ug/L	NC	30
7526359	Acetone (2-Propanone)	2021/08/19	100	60 - 140	94	60 - 140	<10	ug/L	NC	30
7526359	Benzene	2021/08/19	87	70 - 130	82	70 - 130	<0.20	ug/L	NC	30
7526359	Bromodichloromethane	2021/08/19	100	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
7526359	Bromoform	2021/08/19	93	70 - 130	91	70 - 130	<1.0	ug/L	NC	30
7526359	Bromomethane	2021/08/19	88	60 - 140	87	60 - 140	<0.50	ug/L	NC	30
7526359	Carbon Tetrachloride	2021/08/19	95	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
7526359	Chlorobenzene	2021/08/19	94	70 - 130	90	70 - 130	<0.20	ug/L	NC	30
7526359	Chloroform	2021/08/19	96	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
7526359	cis-1,2-Dichloroethylene	2021/08/19	96	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
7526359	cis-1,3-Dichloropropene	2021/08/19	94	70 - 130	88	70 - 130	<0.30	ug/L	NC	30
7526359	Dibromochloromethane	2021/08/19	88	70 - 130	85	70 - 130	<0.50	ug/L	NC	30
7526359	Dichlorodifluoromethane (FREON 12)	2021/08/19	77	60 - 140	79	60 - 140	<1.0	ug/L	NC	30
7526359	Ethylbenzene	2021/08/19	89	70 - 130	86	70 - 130	<0.20	ug/L	NC	30
7526359	Ethylene Dibromide	2021/08/19	92	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
7526359	F1 (C6-C10) - BTEX	2021/08/19					<25	ug/L	NC	30
7526359	F1 (C6-C10)	2021/08/19	74	60 - 140	100	60 - 140	<25	ug/L	NC	30
7526359	Hexane	2021/08/19	89	70 - 130	88	70 - 130	<1.0	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7526359	Methyl Ethyl Ketone (2-Butanone)	2021/08/19	107	60 - 140	101	60 - 140	<10	ug/L	NC	30
7526359	Methyl Isobutyl Ketone	2021/08/19	100	70 - 130	96	70 - 130	<5.0	ug/L	NC	30
7526359	Methyl t-butyl ether (MTBE)	2021/08/19	90	70 - 130	85	70 - 130	<0.50	ug/L	NC	30
7526359	Methylene Chloride(Dichloromethane)	2021/08/19	93	70 - 130	88	70 - 130	<2.0	ug/L	NC	30
7526359	o-Xylene	2021/08/19	89	70 - 130	87	70 - 130	<0.20	ug/L	NC	30
7526359	p+m-Xylene	2021/08/19	91	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
7526359	Styrene	2021/08/19	99	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
7526359	Tetrachloroethylene	2021/08/19	88	70 - 130	86	70 - 130	<0.20	ug/L	NC	30
7526359	Toluene	2021/08/19	90	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
7526359	Total Xylenes	2021/08/19					<0.20	ug/L	NC	30
7526359	trans-1,2-Dichloroethylene	2021/08/19	91	70 - 130	88	70 - 130	<0.50	ug/L	NC	30
7526359	trans-1,3-Dichloropropene	2021/08/19	96	70 - 130	92	70 - 130	<0.40	ug/L	NC	30
7526359	Trichloroethylene	2021/08/19	97	70 - 130	92	70 - 130	<0.20	ug/L	NC	30
7526359	Trichlorofluoromethane (FREON 11)	2021/08/19	92	70 - 130	89	70 - 130	<0.50	ug/L	NC	30
7526359	Vinyl Chloride	2021/08/19	89	70 - 130	88	70 - 130	<0.20	ug/L	NC	30
7526478	Mercury (Hg)	2021/08/18	93	75 - 125	97	80 - 120	<0.10	ug/L	NC	20
7526479	1,1,1,2-Tetrachloroethane	2021/08/19	105	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
7526479	1,1,1-Trichloroethane	2021/08/19	107	70 - 130	105	70 - 130	<0.20	ug/L	NC	30
7526479	1,1,2,2-Tetrachloroethane	2021/08/19	102	70 - 130	99	70 - 130	<0.40	ug/L	NC	30
7526479	1,1,2-Trichloroethane	2021/08/19	107	70 - 130	103	70 - 130	<0.40	ug/L	NC	30
7526479	1,1-Dichloroethane	2021/08/19	98	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7526479	1,1-Dichloroethylene	2021/08/19	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7526479	1,2-Dichlorobenzene	2021/08/19	99	70 - 130	100	70 - 130	<0.40	ug/L	NC	30
7526479	1,2-Dichloroethane	2021/08/19	102	70 - 130	99	70 - 130	<0.49	ug/L	NC	30
7526479	1,2-Dichloropropane	2021/08/19	97	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7526479	1,3-Dichlorobenzene	2021/08/19	97	70 - 130	98	70 - 130	<0.40	ug/L	NC	30
7526479	1,4-Dichlorobenzene	2021/08/19	115	70 - 130	116	70 - 130	<0.40	ug/L	NC	30
7526479	Acetone (2-Propanone)	2021/08/19	107	60 - 140	100	60 - 140	<10	ug/L	NC	30
7526479	Benzene	2021/08/19	93	70 - 130	92	70 - 130	<0.20	ug/L	NC	30
7526479	Bromodichloromethane	2021/08/19	105	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
7526479	Bromoform	2021/08/19	103	70 - 130	100	70 - 130	<1.0	ug/L	NC	30
7526479	Bromomethane	2021/08/19	98	60 - 140	96	60 - 140	<0.50	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7526479	Carbon Tetrachloride	2021/08/19	104	70 - 130	103	70 - 130	<0.19	ug/L	NC	30
7526479	Chlorobenzene	2021/08/19	101	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7526479	Chloroform	2021/08/19	102	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7526479	cis-1,2-Dichloroethylene	2021/08/19	103	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
7526479	cis-1,3-Dichloropropene	2021/08/19	95	70 - 130	92	70 - 130	<0.30	ug/L	NC	30
7526479	Dibromochloromethane	2021/08/19	101	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
7526479	Dichlorodifluoromethane (FREON 12)	2021/08/19	90	60 - 140	94	60 - 140	<1.0	ug/L	NC	30
7526479	Ethylbenzene	2021/08/19	94	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
7526479	Ethylene Dibromide	2021/08/19	98	70 - 130	96	70 - 130	<0.19	ug/L	NC	30
7526479	Hexane	2021/08/19	101	70 - 130	101	70 - 130	<1.0	ug/L	NC	30
7526479	Methyl Ethyl Ketone (2-Butanone)	2021/08/19	115	60 - 140	108	60 - 140	<10	ug/L	NC	30
7526479	Methyl Isobutyl Ketone	2021/08/19	108	70 - 130	106	70 - 130	<5.0	ug/L	NC	30
7526479	Methyl t-butyl ether (MTBE)	2021/08/19	93	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7526479	Methylene Chloride(Dichloromethane)	2021/08/19	105	70 - 130	104	70 - 130	<2.0	ug/L	NC	30
7526479	o-Xylene	2021/08/19	94	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7526479	p+m-Xylene	2021/08/19	99	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
7526479	Styrene	2021/08/19	105	70 - 130	106	70 - 130	<0.40	ug/L	NC	30
7526479	Tetrachloroethylene	2021/08/19	96	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
7526479	Toluene	2021/08/19	96	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
7526479	Total Xylenes	2021/08/19					<0.20	ug/L	NC	30
7526479	trans-1,2-Dichloroethylene	2021/08/19	101	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7526479	trans-1,3-Dichloropropene	2021/08/19	104	70 - 130	98	70 - 130	<0.40	ug/L	NC	30
7526479	Trichloroethylene	2021/08/19	103	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
7526479	Trichlorofluoromethane (FREON 11)	2021/08/19	103	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
7526479	Vinyl Chloride	2021/08/19	97	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7527364	1-Methylnaphthalene	2021/08/19	105	50 - 130	100	50 - 130	<0.050	ug/L	NC	30
7527364	2-Methylnaphthalene	2021/08/19	105	50 - 130	100	50 - 130	<0.050	ug/L	NC	30
7527364	Acenaphthene	2021/08/19	102	50 - 130	98	50 - 130	<0.050	ug/L	NC	30
7527364	Acenaphthylene	2021/08/19	102	50 - 130	99	50 - 130	<0.050	ug/L	NC	30
7527364	Anthracene	2021/08/19	101	50 - 130	95	50 - 130	<0.050	ug/L	NC	30
7527364	Benzo(a)anthracene	2021/08/19	96	50 - 130	83	50 - 130	<0.050	ug/L	NC	30
7527364	Benzo(a)pyrene	2021/08/19	90	50 - 130	78	50 - 130	<0.0090	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7527364	Benzo(b/j)fluoranthene	2021/08/19	89	50 - 130	79	50 - 130	<0.050	ug/L	NC	30
7527364	Benzo(g,h,i)perylene	2021/08/19	87	50 - 130	75	50 - 130	<0.050	ug/L	NC	30
7527364	Benzo(k)fluoranthene	2021/08/19	91	50 - 130	74	50 - 130	<0.050	ug/L	NC	30
7527364	Chrysene	2021/08/19	93	50 - 130	80	50 - 130	<0.050	ug/L	NC	30
7527364	Dibenzo(a,h)anthracene	2021/08/19	94	50 - 130	78	50 - 130	<0.050	ug/L	NC	30
7527364	Fluoranthene	2021/08/19	103	50 - 130	94	50 - 130	<0.050	ug/L	NC	30
7527364	Fluorene	2021/08/19	101	50 - 130	98	50 - 130	<0.050	ug/L	NC	30
7527364	Indeno(1,2,3-cd)pyrene	2021/08/19	87	50 - 130	76	50 - 130	<0.050	ug/L	NC	30
7527364	Naphthalene	2021/08/19	110	50 - 130	105	50 - 130	<0.050	ug/L	NC (2)	30
7527364	Phenanthrene	2021/08/19	101	50 - 130	96	50 - 130	<0.030	ug/L	NC	30
7527364	Pyrene	2021/08/19	101	50 - 130	93	50 - 130	<0.050	ug/L	NC	30
7527367	F2 (C10-C16 Hydrocarbons)	2021/08/19	NC	60 - 130	105	60 - 130	<100	ug/L	12	30
7527367	F3 (C16-C34 Hydrocarbons)	2021/08/19	NC	60 - 130	106	60 - 130	<200	ug/L	NC	30
7527367	F4 (C34-C50 Hydrocarbons)	2021/08/19	108	60 - 130	110	60 - 130	<200	ug/L	NC	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Matrix Spike exceeds acceptance limits, sample inhomogeneity suspected.

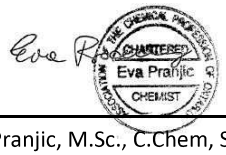
(2) DL was raised due to matrix interference.

BV Labs Job #: C1N0907
Report Date: 2021/08/23

Golder Associates Ltd
Client Project #: 21470873
Site Location: OCH GLADSTONE
Sampler Initials: C.W

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.bvlabs.com

Page of

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#14090 Golder Associates Ltd	Company Name:	GOLDER	Quotation #:	B80683	BV Labs Job #:	Bottle Order #: 840665
Attention:	Accounts Payable	Attention:	Soheil Fatehi	P.O. #:			
Address:	1931 Robertson Rd Ottawa ON K2H 5B7	Address:		Project:	21470873	COC #: C#840665-01-01	Project Manager: Katherine Szozda
Tel:	(613) 592-9600 Fax: (613) 592-9601	Tel:	Fax:	Project Name:	OCH Gladstone		
Email:	CanadaAccountsPayableInvoices@golder.com	Email:	soheil_fatehi@golder.com	Site #:			
				Sampled By:	C. Woodfield		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☐ Res/Park ☐ Medium/Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☑ Table 3 ☐ Agri/Other ☐ For RSC ☐ Table ___	☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Reg 406 Table ___ ☐ Other ___	

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle) Metals / Hg / Cr VI	VOCs by HS & F1-F4	PCBs	PAHs	Metals Package	# of Bottles	Comments
1	MW 17-01	MW 17-01	11/08	1015	GW		✓	✓	✓	✓	10	
2	MW 17-01 (2) FIELD DUP	MW 17-01	13/08	1430	GW		✓	✓	✓	✓	10	PCB + VOC sample on 11/08
3	MW 17-14	MW 17-14	11/08	1330	GW		✓	✓	✓	✓	10	[illegible]
4	MW 17-22	MW 17-22	11/08	1215	GW		✓	✓	✓	✓		dry well, no metals Cr
5												
6	QA/QC											
7	Trip Blank						✓	✓	✓	✓		
8	Field Blank	MW 17-01	11/08	1015	GW		✓	✓	✓	✓		
9												ON Ice
10												

RECEIVED IN OTTAWA

13-Aug-21 15:50
Katherine Szozda
C1N0907
VTH ENV-584

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Laboratory Use Only: Temperature (°C) on Recei	Custody Seal Present	Yes	No
Claire Woodfield			[illegible]	21/08/13	15:50			18 17 16	Intact	✓	
			[illegible]	21/08/14	08:20						

c/s present and intact

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

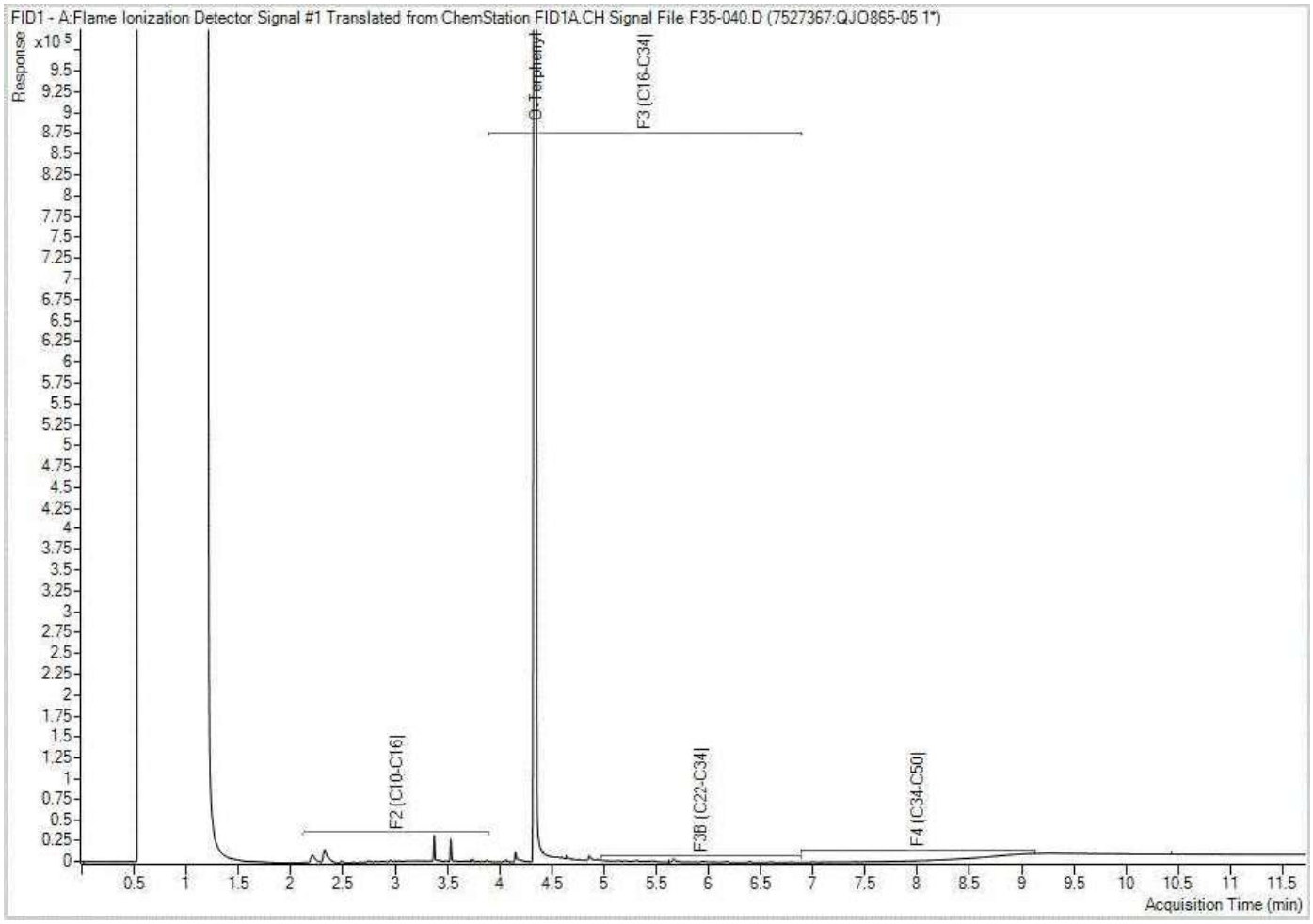
Bureau Veritas Canada (2019) Inc.

01/1 01/0 14 13 14

BV Labs Job #: C1N0907
Report Date: 2021/08/23
BV Labs Sample: QJO865

Golder Associates Ltd
Client Project #: 21470873
Project name: OCH GLADSTONE
Client ID: MW 17-01 FIELD DUP

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Your Project #: 21470873
Site Location: GLADSTONE OCH
Your C.O.C. #: 841860-01-01

Attention: Soheil Fatehi
Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2021/08/30
Report #: R6788095
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1N8670
Received: 2021/08/20, 10:10

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
1,3-Dichloropropene Sum (1)	3	N/A	2021/08/27		EPA 8260C m
1,3-Dichloropropene Sum (1)	1	N/A	2021/08/30		EPA 8260C m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	3	2021/08/25	2021/08/25	CAM SOP-00316	CCME PHC-CWS m
Volatile Organic Compounds and F1 PHCs (1)	3	N/A	2021/08/26	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds and F1 PHCs (1)	1	N/A	2021/08/29	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Mississauga
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Your Project #: 21470873
Site Location: GLADSTONE OCH
Your C.O.C. #: 841860-01-01

Attention: Soheil Fatehi

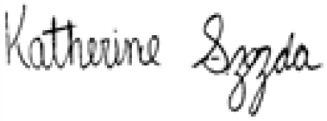
Golder Associates Ltd
1931 Robertson Rd
Ottawa, ON
CANADA K2H 5B7

Report Date: 2021/08/30
Report #: R6788095
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1N8670
Received: 2021/08/20, 10:10

Encryption Key



Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Katherine Szozda, Project Manager
Email: Katherine.Szozda@bureauveritas.com
Phone# (613)274-0573 Ext:7063633
==========
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BV Labs Job #: C1N8670
Report Date: 2021/08/30

Golder Associates Ltd
Client Project #: 21470873
Site Location: GLADSTONE OCH
Sampler Initials: CW

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		QLD931		
Sampling Date		2021/08/20		
COC Number		841860-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	7534151
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7540106
Benzene	ug/L	<0.17	0.17	7540106
Bromodichloromethane	ug/L	<0.50	0.50	7540106
Bromoform	ug/L	<1.0	1.0	7540106
Bromomethane	ug/L	<0.50	0.50	7540106
Carbon Tetrachloride	ug/L	<0.20	0.20	7540106
Chlorobenzene	ug/L	<0.20	0.20	7540106
Chloroform	ug/L	<0.20	0.20	7540106
Dibromochloromethane	ug/L	<0.50	0.50	7540106
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7540106
1,3-Dichlorobenzene	ug/L	<0.50	0.50	7540106
1,4-Dichlorobenzene	ug/L	<0.50	0.50	7540106
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7540106
1,1-Dichloroethane	ug/L	<0.20	0.20	7540106
1,2-Dichloroethane	ug/L	<0.50	0.50	7540106
1,1-Dichloroethylene	ug/L	<0.20	0.20	7540106
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7540106
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7540106
1,2-Dichloropropane	ug/L	<0.20	0.20	7540106
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7540106
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7540106
Ethylbenzene	ug/L	<0.20	0.20	7540106
Ethylene Dibromide	ug/L	<0.20	0.20	7540106
Hexane	ug/L	<1.0	1.0	7540106
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7540106
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7540106
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7540106
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7540106
Styrene	ug/L	<0.50	0.50	7540106
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7540106
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7540106
Tetrachloroethylene	ug/L	<0.20	0.20	7540106

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C1N8670
Report Date: 2021/08/30

Golder Associates Ltd
Client Project #: 21470873
Site Location: GLADSTONE OCH
Sampler Initials: CW

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		QLD931		
Sampling Date		2021/08/20		
COC Number		841860-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Toluene	ug/L	<0.20	0.20	7540106
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7540106
1,1,2-Trichloroethane	ug/L	<0.50	0.50	7540106
Trichloroethylene	ug/L	<0.20	0.20	7540106
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7540106
Vinyl Chloride	ug/L	<0.20	0.20	7540106
p+m-Xylene	ug/L	<0.20	0.20	7540106
o-Xylene	ug/L	<0.20	0.20	7540106
Total Xylenes	ug/L	<0.20	0.20	7540106
F1 (C6-C10)	ug/L	<25	25	7540106
F1 (C6-C10) - BTEX	ug/L	<25	25	7540106
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	96		7540106
D4-1,2-Dichloroethane	%	110		7540106
D8-Toluene	%	93		7540106

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		QLD928	QLD929	QLD930		
Sampling Date		2021/08/20 08:25	2021/08/20 08:30	2021/08/20 09:15		
COC Number		841860-01-01	841860-01-01	841860-01-01		
	UNITS	FIELD BLANK	17-01	17-22	RDL	QC Batch
Calculated Parameters						
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	0.50	7534151
Volatile Organics						
Acetone (2-Propanone)	ug/L	<10	<10	<10	10	7535820
Benzene	ug/L	<0.17	<0.17	<0.17	0.17	7535820
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820
Bromoform	ug/L	<1.0	<1.0	<1.0	1.0	7535820
Bromomethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Chloroform	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7535820
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	1.0	7535820
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	0.20	7535820
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	0.50	7535820
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	0.20	7535820
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	0.30	7535820
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	0.40	7535820
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Hexane	ug/L	<1.0	<1.0	<1.0	1.0	7535820
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	2.0	7535820
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	10	7535820
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	5.0	7535820
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	0.50	7535820
Styrene	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		QLD928	QLD929	QLD930		
Sampling Date		2021/08/20 08:25	2021/08/20 08:30	2021/08/20 09:15		
COC Number		841860-01-01	841860-01-01	841860-01-01		
	UNITS	FIELD BLANK	17-01	17-22	RDL	QC Batch
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Toluene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	0.20	7535820
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7535820
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	0.50	7535820
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	0.20	7535820
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
o-Xylene	ug/L	<0.20	<0.20	<0.20	0.20	7535820
Total Xylenes	ug/L	<0.20	<0.20	<0.20	0.20	7535820
F1 (C6-C10)	ug/L	<25	<25	<25	25	7535820
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	25	7535820
F2-F4 Hydrocarbons						
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	100	7539907
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	200	7539907
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	200	7539907
Reached Baseline at C50	ug/L	Yes	Yes	Yes		7539907
Surrogate Recovery (%)						
o-Terphenyl	%	100	99	99		7539907
4-Bromofluorobenzene	%	87	85	87		7535820
D4-1,2-Dichloroethane	%	105	105	105		7535820
D8-Toluene	%	103	105	105		7535820

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

BV Labs Job #: C1N8670
Report Date: 2021/08/30

Golder Associates Ltd
Client Project #: 21470873
Site Location: GLADSTONE OCH
Sampler Initials: CW

TEST SUMMARY

BV Labs ID: QLD928
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2021/08/20
Shipped:
Received: 2021/08/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7534151	N/A	2021/08/27	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7539907	2021/08/25	2021/08/25	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7535820	N/A	2021/08/26	Anna Gabrielyan

BV Labs ID: QLD929
Sample ID: 17-01
Matrix: Water

Collected: 2021/08/20
Shipped:
Received: 2021/08/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7534151	N/A	2021/08/27	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7539907	2021/08/25	2021/08/25	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7535820	N/A	2021/08/26	Anna Gabrielyan

BV Labs ID: QLD930
Sample ID: 17-22
Matrix: Water

Collected: 2021/08/20
Shipped:
Received: 2021/08/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7534151	N/A	2021/08/27	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7539907	2021/08/25	2021/08/25	Dennis Ngondu
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7535820	N/A	2021/08/26	Anna Gabrielyan

BV Labs ID: QLD931
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2021/08/20
Shipped:
Received: 2021/08/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7534151	N/A	2021/08/30	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7540106	N/A	2021/08/29	Anna Gabrielyan

BV Labs Job #: C1N8670
Report Date: 2021/08/30

Golder Associates Ltd
Client Project #: 21470873
Site Location: GLADSTONE OCH
Sampler Initials: CW

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	14.3°C

Results relate only to the items tested.

BV Labs Job #: C1N8670
Report Date: 2021/08/30

QUALITY ASSURANCE REPORT

Golder Associates Ltd
Client Project #: 21470873
Site Location: GLADSTONE OCH
Sampler Initials: CW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7535820	4-Bromofluorobenzene	2021/08/26	104	70 - 130	104	70 - 130	88	%		
7535820	D4-1,2-Dichloroethane	2021/08/26	105	70 - 130	103	70 - 130	103	%		
7535820	D8-Toluene	2021/08/26	99	70 - 130	100	70 - 130	105	%		
7539907	o-Terphenyl	2021/08/25	102	60 - 130	101	60 - 130	101	%		
7540106	4-Bromofluorobenzene	2021/08/29	102	70 - 130	101	70 - 130	96	%		
7540106	D4-1,2-Dichloroethane	2021/08/29	107	70 - 130	103	70 - 130	104	%		
7540106	D8-Toluene	2021/08/29	96	70 - 130	102	70 - 130	96	%		
7535820	1,1,1,2-Tetrachloroethane	2021/08/26	105	70 - 130	105	70 - 130	<0.50	ug/L	NC	30
7535820	1,1,1-Trichloroethane	2021/08/26	105	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
7535820	1,1,2,2-Tetrachloroethane	2021/08/26	101	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7535820	1,1,2-Trichloroethane	2021/08/26	108	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
7535820	1,1-Dichloroethane	2021/08/26	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7535820	1,1-Dichloroethylene	2021/08/26	100	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7535820	1,2-Dichlorobenzene	2021/08/26	108	70 - 130	111	70 - 130	<0.50	ug/L	NC	30
7535820	1,2-Dichloroethane	2021/08/26	102	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7535820	1,2-Dichloropropane	2021/08/26	97	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7535820	1,3-Dichlorobenzene	2021/08/26	115	70 - 130	118	70 - 130	<0.50	ug/L	NC	30
7535820	1,4-Dichlorobenzene	2021/08/26	102	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
7535820	Acetone (2-Propanone)	2021/08/26	95	60 - 140	93	60 - 140	<10	ug/L	NC	30
7535820	Benzene	2021/08/26	90	70 - 130	90	70 - 130	<0.17	ug/L	NC	30
7535820	Bromodichloromethane	2021/08/26	105	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
7535820	Bromoform	2021/08/26	103	70 - 130	102	70 - 130	<1.0	ug/L	NC	30
7535820	Bromomethane	2021/08/26	101	60 - 140	97	60 - 140	<0.50	ug/L	NC	30
7535820	Carbon Tetrachloride	2021/08/26	105	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
7535820	Chlorobenzene	2021/08/26	106	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
7535820	Chloroform	2021/08/26	101	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
7535820	cis-1,2-Dichloroethylene	2021/08/26	98	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
7535820	cis-1,3-Dichloropropene	2021/08/26	103	70 - 130	95	70 - 130	<0.30	ug/L	NC	30
7535820	Dibromochloromethane	2021/08/26	103	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
7535820	Dichlorodifluoromethane (FREON 12)	2021/08/26	97	60 - 140	99	60 - 140	<1.0	ug/L	NC	30
7535820	Ethylbenzene	2021/08/26	94	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7535820	Ethylene Dibromide	2021/08/26	101	70 - 130	100	70 - 130	<0.20	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7535820	F1 (C6-C10) - BTEX	2021/08/26					<25	ug/L	NC	30
7535820	F1 (C6-C10)	2021/08/26	100	60 - 140	103	60 - 140	<25	ug/L	NC	30
7535820	Hexane	2021/08/26	95	70 - 130	96	70 - 130	<1.0	ug/L	NC	30
7535820	Methyl Ethyl Ketone (2-Butanone)	2021/08/26	98	60 - 140	97	60 - 140	<10	ug/L	NC	30
7535820	Methyl Isobutyl Ketone	2021/08/26	100	70 - 130	98	70 - 130	<5.0	ug/L	NC	30
7535820	Methyl t-butyl ether (MTBE)	2021/08/26	94	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7535820	Methylene Chloride(Dichloromethane)	2021/08/26	101	70 - 130	100	70 - 130	<2.0	ug/L	NC	30
7535820	o-Xylene	2021/08/26	94	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7535820	p+m-Xylene	2021/08/26	100	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
7535820	Styrene	2021/08/26	110	70 - 130	111	70 - 130	<0.50	ug/L	NC	30
7535820	Tetrachloroethylene	2021/08/26	98	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
7535820	Toluene	2021/08/26	100	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
7535820	Total Xylenes	2021/08/26					<0.20	ug/L	NC	30
7535820	trans-1,2-Dichloroethylene	2021/08/26	96	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
7535820	trans-1,3-Dichloropropene	2021/08/26	105	70 - 130	95	70 - 130	<0.40	ug/L	NC	30
7535820	Trichloroethylene	2021/08/26	109	70 - 130	109	70 - 130	<0.20	ug/L	NC	30
7535820	Trichlorofluoromethane (FREON 11)	2021/08/26	104	70 - 130	105	70 - 130	<0.50	ug/L	NC	30
7535820	Vinyl Chloride	2021/08/26	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7539907	F2 (C10-C16 Hydrocarbons)	2021/08/25	106	60 - 130	105	60 - 130	<100	ug/L	NC	30
7539907	F3 (C16-C34 Hydrocarbons)	2021/08/25	112	60 - 130	110	60 - 130	<200	ug/L	NC	30
7539907	F4 (C34-C50 Hydrocarbons)	2021/08/25	116	60 - 130	114	60 - 130	<200	ug/L	NC	30
7540106	1,1,1,2-Tetrachloroethane	2021/08/29	82	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
7540106	1,1,1-Trichloroethane	2021/08/29	88	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
7540106	1,1,2,2-Tetrachloroethane	2021/08/29	86	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7540106	1,1,2-Trichloroethane	2021/08/29	86	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7540106	1,1-Dichloroethane	2021/08/29	84	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
7540106	1,1-Dichloroethylene	2021/08/29	85	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7540106	1,2-Dichlorobenzene	2021/08/29	76	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7540106	1,2-Dichloroethane	2021/08/29	87	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
7540106	1,2-Dichloropropane	2021/08/29	86	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7540106	1,3-Dichlorobenzene	2021/08/29	75	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7540106	1,4-Dichlorobenzene	2021/08/29	86	70 - 130	108	70 - 130	<0.50	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7540106	Acetone (2-Propanone)	2021/08/29	93	60 - 140	101	60 - 140	<10	ug/L	NC	30
7540106	Benzene	2021/08/29	79	70 - 130	88	70 - 130	<0.17	ug/L	NC	30
7540106	Bromodichloromethane	2021/08/29	93	70 - 130	102	70 - 130	<0.50	ug/L	NC	30
7540106	Bromoform	2021/08/29	82	70 - 130	96	70 - 130	<1.0	ug/L	NC	30
7540106	Bromomethane	2021/08/29	82	60 - 140	96	60 - 140	<0.50	ug/L	NC	30
7540106	Carbon Tetrachloride	2021/08/29	87	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
7540106	Chlorobenzene	2021/08/29	80	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7540106	Chloroform	2021/08/29	88	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
7540106	cis-1,2-Dichloroethylene	2021/08/29	90	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7540106	cis-1,3-Dichloropropene	2021/08/29	85	70 - 130	94	70 - 130	<0.30	ug/L	NC	30
7540106	Dibromochloromethane	2021/08/29	82	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
7540106	Dichlorodifluoromethane (FREON 12)	2021/08/29	67	60 - 140	81	60 - 140	<1.0	ug/L	NC	30
7540106	Ethylbenzene	2021/08/29	72	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
7540106	Ethylene Dibromide	2021/08/29	81	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
7540106	F1 (C6-C10) - BTEX	2021/08/29					<25	ug/L	NC	30
7540106	F1 (C6-C10)	2021/08/29	86	60 - 140	93	60 - 140	<25	ug/L	NC	30
7540106	Hexane	2021/08/29	82	70 - 130	95	70 - 130	<1.0	ug/L	NC	30
7540106	Methyl Ethyl Ketone (2-Butanone)	2021/08/29	94	60 - 140	101	60 - 140	<10	ug/L	NC	30
7540106	Methyl Isobutyl Ketone	2021/08/29	87	70 - 130	95	70 - 130	<5.0	ug/L	NC	30
7540106	Methyl t-butyl ether (MTBE)	2021/08/29	79	70 - 130	88	70 - 130	<0.50	ug/L	NC	30
7540106	Methylene Chloride(Dichloromethane)	2021/08/29	95	70 - 130	105	70 - 130	<2.0	ug/L	NC	30
7540106	o-Xylene	2021/08/29	74	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
7540106	p+m-Xylene	2021/08/29	75	70 - 130	93	70 - 130	<0.20	ug/L	NC	30
7540106	Styrene	2021/08/29	78	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
7540106	Tetrachloroethylene	2021/08/29	75	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
7540106	Toluene	2021/08/29	80	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
7540106	Total Xylenes	2021/08/29					<0.20	ug/L	NC	30
7540106	trans-1,2-Dichloroethylene	2021/08/29	88	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
7540106	trans-1,3-Dichloropropene	2021/08/29	84	70 - 130	102	70 - 130	<0.40	ug/L	NC	30
7540106	Trichloroethylene	2021/08/29	90	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
7540106	Trichlorofluoromethane (FREON 11)	2021/08/29	84	70 - 130	97	70 - 130	<0.50	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7540106	Vinyl Chloride	2021/08/29	77	70 - 130	92	70 - 130	<0.20	ug/L	NC	30

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

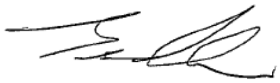
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories 100 – 36 Antares Dr. Nepean, ON, K2E 7W5 Phone: 613-274-0573 Website: www.bvlabs.com

Bureau Veritas Laboratories
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.bvlabs.com

20-Aug-21 10:10
Katherine Szozda
C1N8670

Page of

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Only:
Company Name:	#14090 Golder Associates Ltd	Company Name:	GOLDER	Quotation #:	B80683	Bottle Order #: 841860
Attention:	Accounts Payable	Attention:	Soheil Fatehi	P.O. #:		
Address:	1931 Robertson Rd Ottawa ON K2H 5B7	Address:		Project:	21470873	COC #: C#841860-01-01
Tel:	(613) 592-9600 Fax: (613) 592-9601	Tel:	Fax:	Project Name:	GLADSTONE OCH	Project Manager: Katherine Szozda
Email:	CanadaAccountsPayableInvoices@golder.com	Email:	Soheil_Fatehi@golder.com	Site #:		
				Sampled By:	C WOODFIELD	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- ☐ Table 1 ☐ Res/Park ☐ Medium/Fine
- ☐ Table 2 ☐ Ind/Comm ☐ Coarse
- ☑ Table 3 ☐ Agri/Other ☐ For RSC
- ☐ Table ___

Other Regulations
- ☐ CCME ☐ Sanitary Sewer Bylaw
- ☐ Reg 558 ☐ Storm Sewer Bylaw
- ☐ MISA Municipality: ___
- ☐ PWQO ☐ Reg 406 Table ___
- ☐ Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT:
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 VOCs by HS & F1-F4	O.Reg 153 Metals Package (Water)	# of Bottles	Comments
1	FIELD BLANK	MW 17-01	20108	8:25	GW		/	~~X~~	5	
2	17-01	MW17-01	20108	8:30	GW		/	~~X~~	5	
3	17-22	MW17-22	20108	9:15	GW		/	~~X~~	5	
4	TRIP BLANK	LOT # 3708	20108				/		2	HEAD SPACE IN VIAL NOTICED
5	17-14	MW17-14							0	DRY WELL, NO WATER FOR ANALYSIS
6										
7										
8										
9										
10										Five pools

RECEIVED IN OTTAWA

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
C WOODFIELD	21108/20	1000	DIPIKA SINGH	2021/08/20 2021/08/21	10:10 08:26	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	14, 14, 15	Present		
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

White: BV Labs Yellow: Client

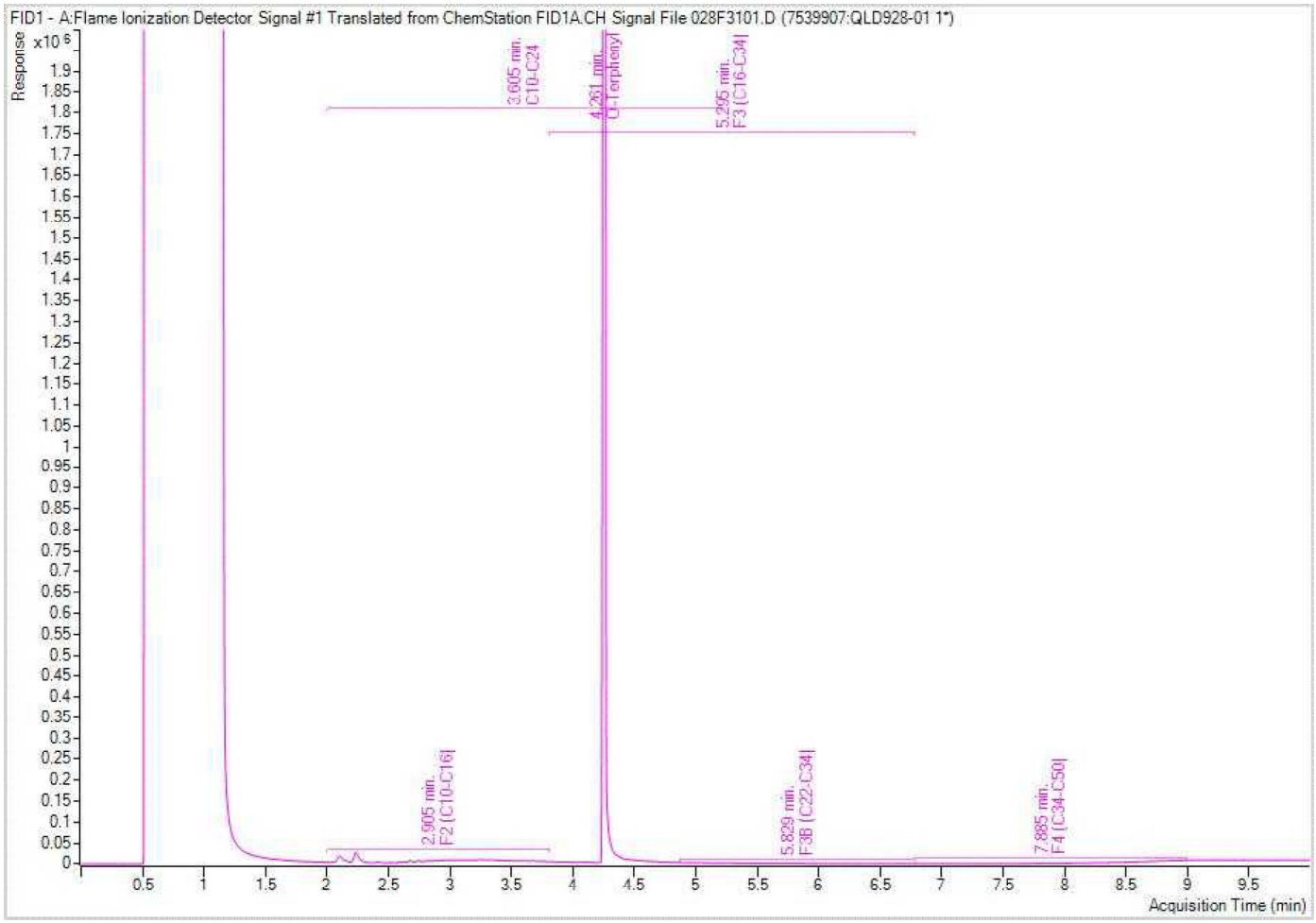
Bureau Veritas Canada (2019) Inc.

4/4/7 Custody Seal Intact

BV Labs Job #: C1N8670
Report Date: 2021/08/30
BV Labs Sample: QLD928

Golder Associates Ltd
Client Project #: 21470873
Project name: GLADSTONE OCH
Client ID: FIELD BLANK

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

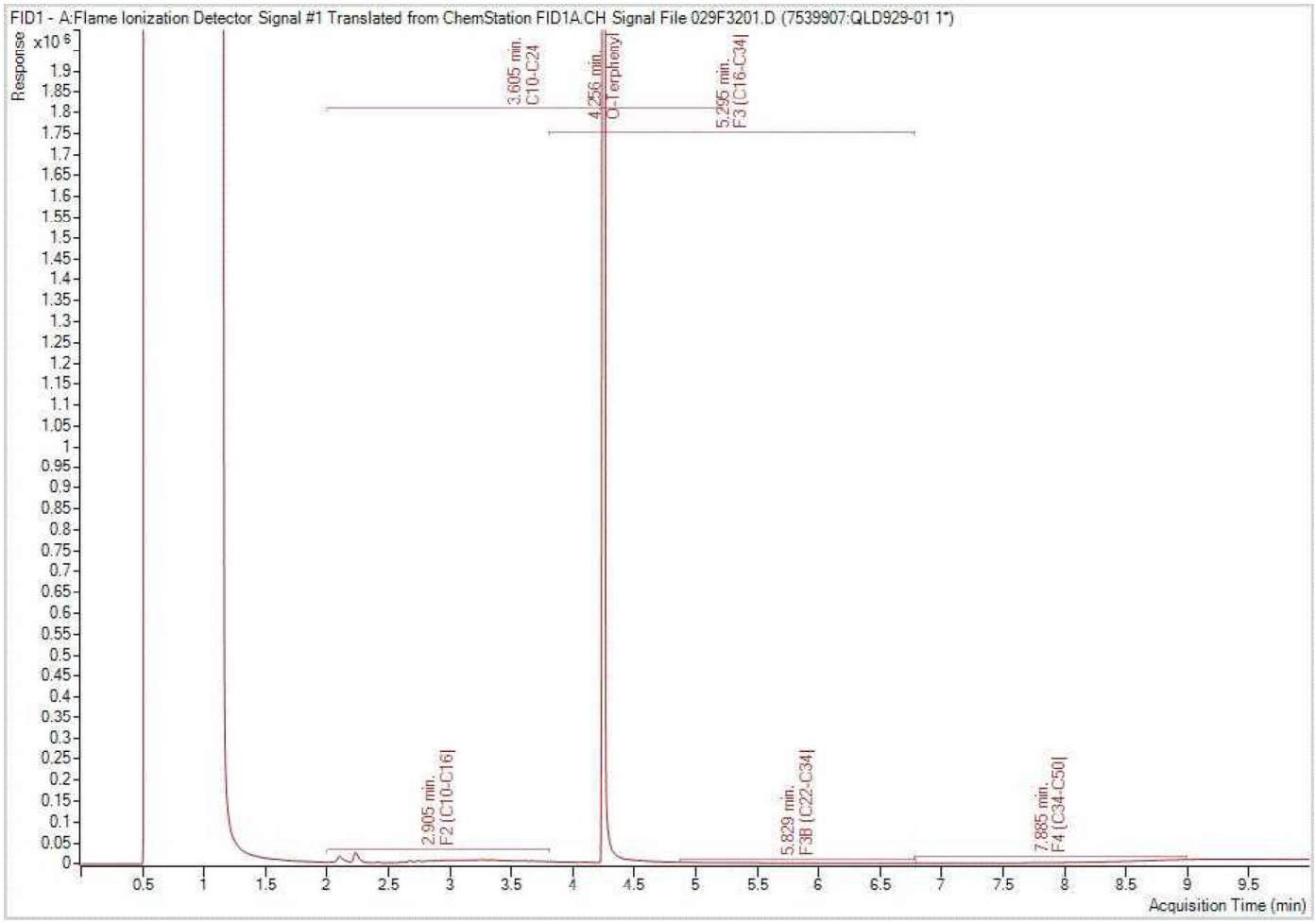


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: C1N8670
Report Date: 2021/08/30
BV Labs Sample: QLD929

Golder Associates Ltd
Client Project #: 21470873
Project name: GLADSTONE OCH
Client ID: 17-01

Petroleum Hydrocarbons F2-F4 in Water Chromatogram

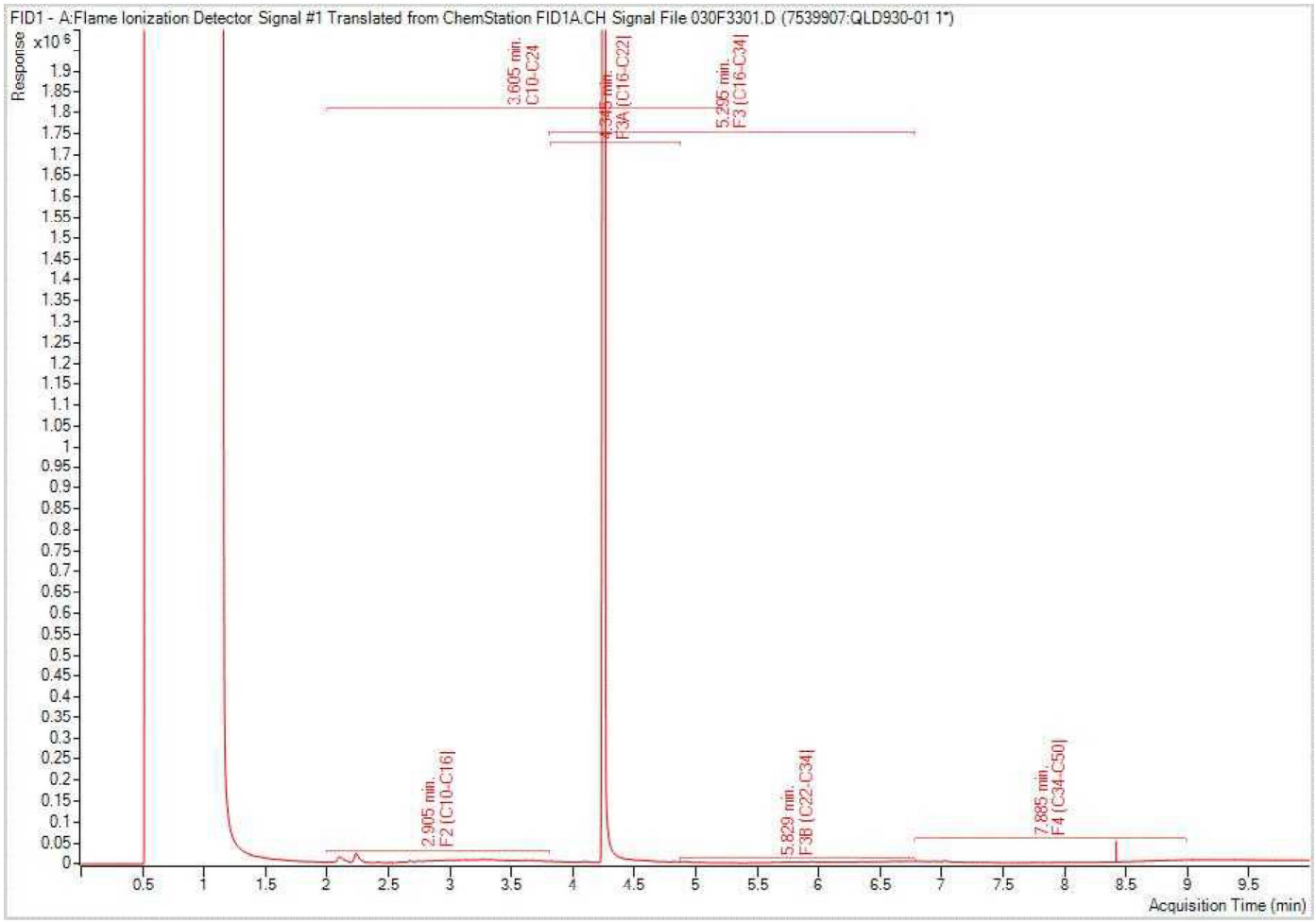


Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

BV Labs Job #: C1N8670
Report Date: 2021/08/30
BV Labs Sample: QLD930

Golder Associates Ltd
Client Project #: 21470873
Project name: GLADSTONE OCH
Client ID: 17-22

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

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