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## Clifton Associates



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**04 September 2018**

Attention: Mr. Greg Paliouras (gpaliou@sears.ca)  
Company: Sears Canada Inc.  
Address: Department 702 C E Real Estate, 290 Yonge Street  
Toronto, Ontario M5B 2C3

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### Soil Sampling at Private Residence Hounsfeld Heights – Briar Hill Community Calgary, Alberta

**File CG2430.1 E001**

Clifton Associates Ltd. (Clifton), at the request of Sears Canada Inc. (Sears), performed surficial soil sampling within the excavated foundation of a new home being constructed within Hounsfeld Heights, Calgary, Alberta (Site).

On 16 August 2018, Clifton was contacted by the owner of the Site and was informed of the construction occurring and that an excavation for a foundation had been completed. The excavation had been completed to a depth varying between 2.5 m on the west side to 4.0 m below ground surface (bgs) on the east side.

Prior to pouring the concrete foundation, the owner, requested Clifton perform soil sampling at the base of the excavation to determine whether or not the soil had been impacted from the historical subsurface contamination associated with the former Sears Service Station located at 1616-14<sup>th</sup> Avenue NW.

On 20 August 2018, Mr. Gavin Clarke of Clifton, arranged Site access with the owner and obtained 5 soil samples at a depth of approximately 0.30 m below the base of the excavation. Samples were obtained at each of the four corners of the excavation, as well as a fifth sample, taken from the middle of the excavation.

The depth of 0.30 m was selected based on the Alberta Environment and Parks (AEP) Tier 1 Soil and Groundwater Remediation Guidelines (February 2016). The AEP Tier 1 Guidelines provide pathway specific protection targets based on computer based models which take into consideration a series of assumptions. The soil vapour intrusion pathway is calculated based on the assumption that no volatile contaminants are present within 0.30 m of a building foundation. If contamination is present, a Tier 2 approach, taking into account Site specific information, would be required.

The soil samples were submitted for analysis of benzene, toluene, ethylbenzene, xylene(s) and petroleum hydrocarbon fractions F1 to F4, volatile organic compounds and poly aromatic hydrocarbons. These contaminants were selected for analysis based on their association with the historical gas plume within the Hounsfeld Heights and Briar Hill Community.

The analytical results from all five soil samples submitted for laboratory analysis were below the analytical detection limit and therefore met the AEP Tier 1 Guidelines for fine and coarse-grained soils under residential land use. The results from the soil sampling are presented in Tables 1 to 3 of the attachments. The laboratory certificate of analysis is attached in Appendix A.

Based on the results, Clifton can confirm that there is no evidence to suggest contamination within 0.30 m of the proposed foundation at the Site and that the assumptions made in the AEP Tier 1 Guidelines for the protection of human health through the vapour intrusion pathway are applicable.

### **Closure**

This report was prepared by Clifton Associates Ltd. for the account of Sears Canada Inc. The material in it reflects Clifton Associates Ltd. best judgment available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Clifton Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Our conclusions and recommendations are preliminary and based upon the information obtained from the referenced subsurface exploration. The Site monitoring and associated laboratory testing indicate subsurface, groundwater and chemical conditions only at the specific locations and times investigated, only to the depth penetrated and only for the soil and chemical properties tested. The subsurface conditions may vary between the investigation points and with time. The subsurface interpretation provided is a professional opinion of conditions and not a certification of the site conditions. The nature and extent of subsurface variation may not become evident until construction or further investigation. If variations or other latent conditions do become evident, Clifton Associates Ltd. should be notified immediately so that we may re-evaluate our conclusions and recommendations.

This report has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty, expressed or implied is made.

No environmental site investigation or remediation can wholly eliminate uncertainty regarding environmental conditions in connection with a property. This investigation is intended to reduce, but not eliminate the uncertainty regarding environmental conditions. Conclusions regarding the condition of the site do not represent a warranty that all areas within the site and beneath structures are of the same quality as those sampled. Further, contamination could also exist in forms not indicated by the investigation. The work was based in part upon the environmental quality guidelines and regulations in effect when the work was begun. Future regulatory changes may require reassessment of the findings of this investigation.

Clifton Associates Ltd.



Stephen d'Abadie, P Biol  
Environmental Scientist

William R. Morgan, P Geol  
Senior Geologist

Association of Professional  
Engineers and Geoscientists of Alberta  
Permit to Practice P4823

**Attachments**

- Table 1 – Summary of Soil Laboratory Analyses, BTEX and PHC Fractions F1 to F4
- Table 2 – Summary of Soil Laboratory Analyses, VOCs
- Table 3 – Summary of Soil Laboratory Analyses, PAHs

**Appendices**

- Appendix A – Certificate of Laboratory Analyses

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# Tables

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## Clifton Associates



### Calgary Office

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**Table 1 - Summary of Soil Laboratory Analyses  
BTEX and PHC fractions F1-F4**

Sample ID	NE	SE	SW	NW	Centre	Guideline <sup>1</sup>	Guideline <sup>2</sup>
Depth (m bgs)	0-0.30	0-0.30	0-0.30	0-0.30	0-0.30		
Sample Date	21-Aug-2018	21-Aug-2018	21-Aug-2018	21-Aug-2018	21-Aug-2018		
Benzene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.073	0.046
Toluene	<0.020	<0.020	<0.020	<0.020	<0.020	0.12	0.52
Ethylbenzene	<0.010	<0.010	<0.010	<0.010	<0.010	0.14	0.073
Xylenes (Total)	<0.045	<0.045	<0.045	<0.045	<0.045	1.9	0.99
F1 minus BTEX (C6 - C10)	<10	<10	<10	<10	<10	24	210
F2 (C10 - C16)	<10	<10	<10	<10	<10	130	150
F3 (C16 - C34)	<50	<50	<50	<50	<50	300	1,300
F4 (C34 - C50)	<50	<50	<50	<50	<50	2,800	5,600

**Notes:**

1 AEP 2016 Tier 1 Guidelines for residential land use of coarse-grained surface soil (< 3.0 m bgs).

2 AEP 2016 Tier 1 Guidelines for residential land use of fine-grained surface soil (< 3.0 m bgs).

m bgs meters below grade surface.

NG No Specified Guideline Value.

All results are expressed as mg/kg unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 2 - Summary of Soil Laboratory Analyses  
PAHs**

Sample ID	NE	SE	SW	NW	Centre	Guideline <sup>1</sup>	Guideline <sup>2</sup>
Depth (m bgs)	0-0.30	0-0.30	0-0.30	0-0.30	0-0.30		
Sample Date	21-Aug-2018	21-Aug-2018	21-Aug-2018	21-Aug-2018	21-Aug-2018		
1-Methylnaphthalene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
2-Methylnaphthalene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Acenaphthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.38	0.32
Acenaphthylene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Acridine	<0.010	<0.010	<0.010	<0.010	<0.010	NG	NG
Anthracene	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0056	0.0046
Benzo(a)anthracene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo(a)pyrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.083	0.070
Benzo(b&j)fluoranthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.77	0.70
Benzo(c)phenanthrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo(g,h,i)perylene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo(k)fluoranthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Benzo[a]pyrene equivalency	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	NG	NG
Benzo[e]pyrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Chrysene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Dibenz(a,h)anthracene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Fluoranthene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.039	0.032
Fluorene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.34	0.29
Indeno(1,2,3-cd)pyrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Naphthalene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.017	0.014
Perylene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	NG	NG
Phenanthrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.061	0.051
Pyrene	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.040	0.034
Quinoline	<0.010	<0.010	<0.010	<0.010	<0.010	NG	NG

**Notes:**

1 AEP 2016 Tier 1 Guidelines for residential land use of coarse-grained surface soil (< 3.0 m bgs).

2 AEP 2016 Tier 1 Guidelines for residential land use of fine-grained surface soil (< 3.0 m bgs).

m bgs meters below grade surface.

NG No Specified Guideline Value.

All results are expressed as mg/kg unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

**Table 3 - Summary of Soil Laboratory Analyses  
VOCs**

Sample ID	NE	SE	SW	NW	Centre	Guideline <sup>1</sup>	Guideline <sup>2</sup>
Depth (m bgs)	0-0.30	0-0.30	0-0.30	0-0.30	0-0.30		
Sample Date	21-Aug-2018	21-Aug-2018	21-Aug-2018	21-Aug-2018	21-Aug-2018		
1,1,1,2-Tetrachloroethane	<0.10	<0.10	<0.10	<0.10	<0.10	NG	NG
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,1,2,2-Tetrachloroethane	<0.050	<0.050	<0.050	<0.050	<0.050	NG	NG
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	<0.020	0.021	0.15
1,2,3-Trichlorobenzene	<0.040	<0.040	<0.040	<0.040	<0.040	0.26	0.26
1,2,4-Trichlorobenzene	<0.040	<0.040	<0.040	<0.040	<0.040	0.78	0.23
1,2,4-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG
1,2-Dibromoethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	NG	NG
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	<0.020	0.097	0.18
1,2-Dichloroethane	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0027	0.025
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,3,5-Trichlorobenzene	<0.040	<0.040	<0.040	<0.040	<0.040	1.9	0.13
1,3,5-Trimethylbenzene	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	<0.020	0.051	0.098
Bromodichloromethane	<0.030	<0.030	<0.030	<0.030	<0.030	NG	NG
Bromoform	<0.050	<0.050	<0.050	<0.050	<0.050	NG	NG
Bromomethane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Carbon Tetrachloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00057	0.013
Chlorobenzene	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.39	0.018
Chlorodibromomethane	<0.020	<0.020	<0.020	<0.020	<0.020	0.27	0.91
Chloroethane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Chloroform	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.0030	0.0029
Chloromethane	<0.030	<0.030	<0.030	<0.030	<0.030	NG	NG
cis- 1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
cis-1,3-Dichloropropene	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Dichloromethane	<0.030	<0.030	<0.030	<0.030	<0.030	0.095	0.10
Methyl Methacrylate	<0.040	<0.040	<0.040	<0.040	<0.040	1.3	0.10
Methyl tert-butyl ether	<0.030	<0.030	<0.030	<0.030	<0.030	0.044	0.046
Styrene	<0.020	<0.020	<0.020	<0.020	<0.020	0.68	0.80
Tetrachloroethene	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	0.26
trans- 1,2-dichloroethylene	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
trans-1,3-Dichloropropene	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Trichloroethylene	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.054
Trichlorofluoromethane	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG
Vinyl Chloride	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00034	0.0083

**Notes:**

1 AEP 2016 Tier 1 Guidelines for residential land use of coarse-grained surface soil (< 3.0 m bgs).

2 AEP 2016 Tier 1 Guidelines for residential land use of fine-grained surface soil (< 3.0 m bgs).  
m bgs meters below grade surface.

NG No Specified Guideline Value.

All results are expressed as mg/kg unless otherwise noted.

Testing was conducted by Maxxam Analytics, Calgary, Alberta.

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# Appendix A

## Certificate of Laboratory Analyses

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**Clifton Associates**



**Calgary Office**

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Your Project #: CG243.1 E003

Site Location:

Your C.O.C. #: M064440

**Attention: STEPHEN DABADIE**

CLIFTON ASSOCIATES LTD.  
2222 30TH AVENUE NE  
CALGARY, AB  
CANADA T2E 7K9

**Report Date: 2018/08/28**

Report #: R2610657

Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B870819**

**Received: 2018/08/21, 14:45**

Sample Matrix: Soil  
# Samples Received: 5

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1)	5	N/A	2018/08/25	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	5	N/A	2018/08/27	AB SOP-00039	Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (2)	5	2018/08/22	2018/08/25	AB SOP-00036	CCME PHC-CWS m
Moisture	5	N/A	2018/08/24	AB SOP-00002	CCME PHC-CWS m
Benzo[a]pyrene Equivalency	5	N/A	2018/08/27	AB SOP-00003	Auto Calc
PAH in Soil by GC/MS	5	2018/08/22	2018/08/25	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
VOCs in Soil by HS GC/MS (Std List) (1)	5	N/A	2018/08/24	AB SOP-00056	EPA 5021a/8260d 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. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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. Maxxam 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 Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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 #: CG243.1 E003  
Site Location:  
Your C.O.C. #: M064440

**Attention: STEPHEN DABADIE**

CLIFTON ASSOCIATES LTD.  
2222 30TH AVENUE NE  
CALGARY, AB  
CANADA T2E 7K9

**Report Date: 2018/08/28**  
Report #: R2610657  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B870819**

**Received: 2018/08/21, 14:45**

- (1) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
- (2) All CCME 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.

Leanne Cameron, C.E.T., Senior Project Manager

Email: LCameron@maxxam.ca

Phone# (780)577-7103

=====  
This report has been generated and distributed using a secure automated process.

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 #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**AT1 BTEX AND F1-F4 IN SOIL (VIALS)**

Maxxam ID		UD1378	UD1379	UD1380	UD1381	UD1382		
Sampling Date		2018/08/21 11:00	2018/08/21 10:15	2018/08/21 09:30	2018/08/21 10:00	2018/08/21 10:45		
COC Number		M064440	M064440	M064440	M064440	M064440		
	UNITS	SW	CENTRE	S.E	N.E	N.W	RDL	QC Batch
<b>Ext. Pet. Hydrocarbon</b>								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	<10	10	9113641
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	9113641
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	50	9113641
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	N/A	9113641
<b>Physical Properties</b>								
Moisture	%	6.0	4.6	9.6	4.9	4.9	0.30	9114871
<b>Volatiles</b>								
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	<0.045	0.045	9112824
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	<10	<10	10	9112824
<b>Field Preserved Volatiles</b>								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9114933
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114933
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9114933
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9114933
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114933
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	10	9114933
<b>Surrogate Recovery (%)</b>								
1,4-Difluorobenzene (sur.)	%	101	101	96	100	100	N/A	9114933
4-Bromofluorobenzene (sur.)	%	93	91	86	91	91	N/A	9114933
D10-o-Xylene (sur.)	%	82	85	85	84	84	N/A	9114933
D4-1,2-Dichloroethane (sur.)	%	88	95	93	88	83	N/A	9114933
O-TERPHENYL (sur.)	%	92	104	98	105	91	N/A	9113641
RDL = Reportable Detection Limit								
N/A = Not Applicable								

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**SEMIVOLATILE ORGANICS BY GC-MS (SOIL)**

Maxxam ID		UD1378	UD1379	UD1380	UD1381	UD1382		
Sampling Date		2018/08/21 11:00	2018/08/21 10:15	2018/08/21 09:30	2018/08/21 10:00	2018/08/21 10:45		
COC Number		M064440	M064440	M064440	M064440	M064440		
	UNITS	SW	CENTRE	S.E	N.E	N.W	RDL	QC Batch
<b>Polycyclic Aromatics</b>								
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo[a]pyrene equivalency	mg/kg	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	0.0071	9112266
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9113530
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	9113530
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo(b&j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Benzo[e]pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	9113530
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9113530
<b>Surrogate Recovery (%)</b>								
D10-ANTHRACENE (sur.)	%	90	103	94	89	91	N/A	9113530
D8-ACENAPHTHYLENE (sur.)	%	88	102	92	87	90	N/A	9113530
D8-NAPHTHALENE (sur.)	%	78	90	82	78	80	N/A	9113530
TERPHENYL-D14 (sur.)	%	94	107	98	94	96	N/A	9113530
RDL = Reportable Detection Limit N/A = Not Applicable								

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**VOLATILE ORGANICS BY GC-MS (SOIL)**

Maxxam ID		UD1378	UD1378	UD1379	UD1380	UD1381		
Sampling Date		2018/08/21 11:00	2018/08/21 11:00	2018/08/21 10:15	2018/08/21 09:30	2018/08/21 10:00		
COC Number		M064440	M064440	M064440	M064440	M064440		
	UNITS	SW	SW Lab-Dup	CENTRE	S.E	N.E	RDL	QC Batch
<b>Field Preserved Volatiles</b>								
Bromodichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	9114973
Bromoform	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	9114973
Bromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
Carbon tetrachloride	mg/kg	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9114973
Chlorobenzene	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9114973
Chlorodibromomethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
Chloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
Chloroform	mg/kg	<0.00080	0.00087	<0.00080	<0.00080	<0.00080	0.00080	9114973
Chloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	9114973
1,2-dibromoethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9114973
1,2-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,3-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,4-dichlorobenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,1-dichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,2-dichloroethane	mg/kg	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9114973
1,1-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
cis-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
trans-1,2-dichloroethene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
Dichloromethane	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	9114973
1,2-dichloropropane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
cis-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
trans-1,3-dichloropropene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
Methyl methacrylate	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9114973
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	<0.030	<0.030	<0.030	<0.030	0.030	9114973
Styrene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,1,1,2-tetrachloroethane	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	9114973
1,1,2,2-tetrachloroethane	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	9114973
Tetrachloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9114973
1,2,3-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9114973
1,2,4-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9114973
RDL = Reportable Detection Limit								
Lab-Dup = Laboratory Initiated Duplicate								

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**VOLATILE ORGANICS BY GC-MS (SOIL)**

Maxxam ID		UD1378	UD1378	UD1379	UD1380	UD1381		
Sampling Date		2018/08/21 11:00	2018/08/21 11:00	2018/08/21 10:15	2018/08/21 09:30	2018/08/21 10:00		
COC Number		M064440	M064440	M064440	M064440	M064440		
	UNITS	SW	SW Lab-Dup	CENTRE	S.E	N.E	RDL	QC Batch
1,3,5-trichlorobenzene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	9114973
1,1,1-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,1,2-trichloroethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
Trichloroethene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	9114973
Trichlorofluoromethane	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	9114973
1,2,4-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	9114973
1,3,5-trimethylbenzene	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	9114973
Vinyl chloride	mg/kg	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	9114973
<b>Surrogate Recovery (%)</b>								
1,4-Difluorobenzene (sur.)	%	97	97	96	97	97	N/A	9114973
4-Bromofluorobenzene (sur.)	%	98	104	107	105	105	N/A	9114973
D10-o-Xylene (sur.)	%	93	106	94	103	96	N/A	9114973
D4-1,2-Dichloroethane (sur.)	%	112	109	112	108	108	N/A	9114973
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable								

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**VOLATILE ORGANICS BY GC-MS (SOIL)**

Maxxam ID		UD1382		
Sampling Date		2018/08/21 10:45		
COC Number		M064440		
	UNITS	N.W	RDL	QC Batch
<b>Field Preserved Volatiles</b>				
Bromodichloromethane	mg/kg	<0.030	0.030	9114973
Bromoform	mg/kg	<0.050	0.050	9114973
Bromomethane	mg/kg	<0.020	0.020	9114973
Carbon tetrachloride	mg/kg	<0.00050	0.00050	9114973
Chlorobenzene	mg/kg	<0.0010	0.0010	9114973
Chlorodibromomethane	mg/kg	<0.020	0.020	9114973
Chloroethane	mg/kg	<0.020	0.020	9114973
Chloroform	mg/kg	<0.00080	0.00080	9114973
Chloromethane	mg/kg	<0.030	0.030	9114973
1,2-dibromoethane	mg/kg	<0.0020	0.0020	9114973
1,2-dichlorobenzene	mg/kg	<0.020	0.020	9114973
1,3-dichlorobenzene	mg/kg	<0.020	0.020	9114973
1,4-dichlorobenzene	mg/kg	<0.020	0.020	9114973
1,1-dichloroethane	mg/kg	<0.020	0.020	9114973
1,2-dichloroethane	mg/kg	<0.0020	0.0020	9114973
1,1-dichloroethene	mg/kg	<0.020	0.020	9114973
cis-1,2-dichloroethene	mg/kg	<0.020	0.020	9114973
trans-1,2-dichloroethene	mg/kg	<0.020	0.020	9114973
Dichloromethane	mg/kg	<0.030	0.030	9114973
1,2-dichloropropane	mg/kg	<0.020	0.020	9114973
cis-1,3-dichloropropene	mg/kg	<0.020	0.020	9114973
trans-1,3-dichloropropene	mg/kg	<0.020	0.020	9114973
Methyl methacrylate	mg/kg	<0.040	0.040	9114973
Methyl-tert-butylether (MTBE)	mg/kg	<0.030	0.030	9114973
Styrene	mg/kg	<0.020	0.020	9114973
1,1,1,2-tetrachloroethane	mg/kg	<0.10	0.10	9114973
1,1,2,2-tetrachloroethane	mg/kg	<0.050	0.050	9114973
Tetrachloroethene	mg/kg	<0.010	0.010	9114973
1,2,3-trichlorobenzene	mg/kg	<0.040	0.040	9114973
1,2,4-trichlorobenzene	mg/kg	<0.040	0.040	9114973
1,3,5-trichlorobenzene	mg/kg	<0.040	0.040	9114973
RDL = Reportable Detection Limit				

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**VOLATILE ORGANICS BY GC-MS (SOIL)**

<b>Maxxam ID</b>		UD1382		
<b>Sampling Date</b>		2018/08/21 10:45		
<b>COC Number</b>		M064440		
	<b>UNITS</b>	<b>N.W</b>	<b>RDL</b>	<b>QC Batch</b>
1,1,1-trichloroethane	mg/kg	<0.020	0.020	9114973
1,1,2-trichloroethane	mg/kg	<0.020	0.020	9114973
Trichloroethene	mg/kg	<0.010	0.010	9114973
Trichlorofluoromethane	mg/kg	<0.020	0.020	9114973
1,2,4-trimethylbenzene	mg/kg	<0.50	0.50	9114973
1,3,5-trimethylbenzene	mg/kg	<0.50	0.50	9114973
Vinyl chloride	mg/kg	<0.00030	0.00030	9114973
<b>Surrogate Recovery (%)</b>				
1,4-Difluorobenzene (sur.)	%	96	N/A	9114973
4-Bromofluorobenzene (sur.)	%	106	N/A	9114973
D10-o-Xylene (sur.)	%	100	N/A	9114973
D4-1,2-Dichloroethane (sur.)	%	112	N/A	9114973
RDL = Reportable Detection Limit N/A = Not Applicable				



Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

### GENERAL COMMENTS

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

Package 1	1.0°C
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**Results relate only to the items tested.**

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**QUALITY ASSURANCE REPORT**

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
9113530	NK3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/08/25	81	%	50 - 130			
			D8-ACENAPHTHYLENE (sur.)	2018/08/25	81	%	50 - 130			
			D8-NAPHTHALENE (sur.)	2018/08/25	71	%	50 - 130			
			TERPHENYL-D14 (sur.)	2018/08/25	92	%	50 - 130			
			Acenaphthene	2018/08/25	83	%	50 - 130			
			Acenaphthylene	2018/08/25	79	%	50 - 130			
			Acridine	2018/08/25	51	%	50 - 130			
			Anthracene	2018/08/25	79	%	50 - 130			
			Benzo(a)anthracene	2018/08/25	97	%	50 - 130			
			Benzo(b&j)fluoranthene	2018/08/25	85	%	50 - 130			
			Benzo(k)fluoranthene	2018/08/25	79	%	50 - 130			
			Benzo(g,h,i)perylene	2018/08/25	67	%	50 - 130			
			Benzo(c)phenanthrene	2018/08/25	93	%	50 - 130			
			Benzo(a)pyrene	2018/08/25	76	%	50 - 130			
			Benzo[e]pyrene	2018/08/25	75	%	50 - 130			
			Chrysene	2018/08/25	88	%	50 - 130			
			Dibenz(a,h)anthracene	2018/08/25	80	%	50 - 130			
			Fluoranthene	2018/08/25	85	%	50 - 130			
			Fluorene	2018/08/25	85	%	50 - 130			
			Indeno(1,2,3-cd)pyrene	2018/08/25	73	%	50 - 130			
			1-Methylnaphthalene	2018/08/25	81	%	50 - 130			
			2-Methylnaphthalene	2018/08/25	76	%	50 - 130			
			Naphthalene	2018/08/25	71	%	50 - 130			
			Phenanthrene	2018/08/25	81	%	50 - 130			
			Perylene	2018/08/25	66	%	50 - 130			
			Pyrene	2018/08/25	83	%	50 - 130			
			Quinoline	2018/08/25	100	%	50 - 130			
			9113530	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/08/25	83	%	50 - 130
						D8-ACENAPHTHYLENE (sur.)	2018/08/25	86	%	50 - 130
						D8-NAPHTHALENE (sur.)	2018/08/25	81	%	50 - 130
						TERPHENYL-D14 (sur.)	2018/08/25	88	%	50 - 130
Acenaphthene	2018/08/25	90				%	50 - 130			
Acenaphthylene	2018/08/25	87				%	50 - 130			
Acridine	2018/08/25	62				%	50 - 130			
Anthracene	2018/08/25	85				%	50 - 130			
Benzo(a)anthracene	2018/08/25	97				%	50 - 130			
Benzo(b&j)fluoranthene	2018/08/25	93				%	50 - 130			
Benzo(k)fluoranthene	2018/08/25	88				%	50 - 130			
Benzo(g,h,i)perylene	2018/08/25	86				%	50 - 130			
Benzo(c)phenanthrene	2018/08/25	90				%	50 - 130			
Benzo(a)pyrene	2018/08/25	92				%	50 - 130			
Benzo[e]pyrene	2018/08/25	85				%	50 - 130			
Chrysene	2018/08/25	92				%	50 - 130			
Dibenz(a,h)anthracene	2018/08/25	94				%	50 - 130			
Fluoranthene	2018/08/25	97				%	50 - 130			
Fluorene	2018/08/25	89				%	50 - 130			
Indeno(1,2,3-cd)pyrene	2018/08/25	90				%	50 - 130			
1-Methylnaphthalene	2018/08/25	89	%	50 - 130						
2-Methylnaphthalene	2018/08/25	84	%	50 - 130						
Naphthalene	2018/08/25	83	%	50 - 130						
Phenanthrene	2018/08/25	87	%	50 - 130						
Perylene	2018/08/25	80	%	50 - 130						

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9113530	NK3	Method Blank	Pyrene	2018/08/25		95	%	50 - 130
			Quinoline	2018/08/25		103	%	50 - 130
			D10-ANTHRACENE (sur.)	2018/08/25		84	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/08/25		82	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/08/25		75	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/08/25		88	%	50 - 130
			Acenaphthene	2018/08/25	<0.0050		mg/kg	
			Acenaphthylene	2018/08/25	<0.0050		mg/kg	
			Acridine	2018/08/25	<0.010		mg/kg	
			Anthracene	2018/08/25	<0.0040		mg/kg	
			Benzo(a)anthracene	2018/08/25	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2018/08/25	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2018/08/25	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2018/08/25	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2018/08/25	<0.0050		mg/kg	
			Benzo(a)pyrene	2018/08/25	<0.0050		mg/kg	
			Benzo[e]pyrene	2018/08/25	<0.0050		mg/kg	
			Chrysene	2018/08/25	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2018/08/25	<0.0050		mg/kg	
			Fluoranthene	2018/08/25	<0.0050		mg/kg	
			Fluorene	2018/08/25	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2018/08/25	<0.0050		mg/kg	
			1-Methylnaphthalene	2018/08/25	<0.0050		mg/kg	
2-Methylnaphthalene	2018/08/25	<0.0050		mg/kg				
Naphthalene	2018/08/25	<0.0050		mg/kg				
Phenanthrene	2018/08/25	<0.0050		mg/kg				
Perylene	2018/08/25	<0.0050		mg/kg				
Pyrene	2018/08/25	<0.0050		mg/kg				
Quinoline	2018/08/25	<0.010		mg/kg				
9113530	NK3	RPD	Acenaphthene	2018/08/25	NC		%	50
			Acenaphthylene	2018/08/25	24		%	50
			Acridine	2018/08/25	NC		%	50
			Anthracene	2018/08/25	30		%	50
			Benzo(a)anthracene	2018/08/25	35		%	50
			Benzo(b&j)fluoranthene	2018/08/25	14		%	50
			Benzo(k)fluoranthene	2018/08/25	9.1		%	50
			Benzo(g,h,i)perylene	2018/08/25	36		%	50
			Benzo(c)phenanthrene	2018/08/25	19		%	50
			Benzo(a)pyrene	2018/08/25	26		%	50
			Benzo[e]pyrene	2018/08/25	35		%	50
			Chrysene	2018/08/25	29		%	50
			Dibenz(a,h)anthracene	2018/08/25	44		%	50
			Fluoranthene	2018/08/25	41		%	50
			Fluorene	2018/08/25	NC		%	50
			Indeno(1,2,3-cd)pyrene	2018/08/25	38		%	50
			1-Methylnaphthalene	2018/08/25	20		%	50
			2-Methylnaphthalene	2018/08/25	20		%	50
			Naphthalene	2018/08/25	34		%	50
			Phenanthrene	2018/08/25	58 (1)		%	50
			Perylene	2018/08/25	39		%	50
			Pyrene	2018/08/25	41		%	50
			Quinoline	2018/08/25	3.7		%	50

Maxxam Job #: B870819  
Report Date: 2018/08/28

CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
Site Location:  
Sampler Initials: GAC

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9113641	LSH	Matrix Spike	O-TERPHENYL (sur.)	2018/08/24		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/24		126	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/24		129	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/24		125	%	60 - 140
9113641	LSH	Spiked Blank	O-TERPHENYL (sur.)	2018/08/24		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/24		105	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2018/08/24		106	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2018/08/24		102	%	60 - 140
9113641	LSH	Method Blank	O-TERPHENYL (sur.)	2018/08/24		102	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/08/24	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2018/08/24	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2018/08/24	<50		mg/kg	
9113641	LSH	RPD	F2 (C10-C16 Hydrocarbons)	2018/08/24	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2018/08/24	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2018/08/24	NC		%	40
9114871	TLO	Method Blank	Moisture	2018/08/24	<0.30		%	
9114871	TLO	RPD	Moisture	2018/08/24	14		%	20
9114933	SAW	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/08/25		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/25		95	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/25		84	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/25		90	%	50 - 140
			Benzene	2018/08/25		90	%	50 - 140
			Toluene	2018/08/25		87	%	50 - 140
			Ethylbenzene	2018/08/25		90	%	50 - 140
			m & p-Xylene	2018/08/25		89	%	50 - 140
			o-Xylene	2018/08/25		93	%	50 - 140
			F1 (C6-C10)	2018/08/25		100	%	60 - 140
			9114933	SAW	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/25	
4-Bromofluorobenzene (sur.)	2018/08/25					91	%	50 - 140
D10-o-Xylene (sur.)	2018/08/25					85	%	50 - 140
D4-1,2-Dichloroethane (sur.)	2018/08/25					95	%	50 - 140
Benzene	2018/08/25					84	%	60 - 130
Toluene	2018/08/25					84	%	60 - 130
Ethylbenzene	2018/08/25					86	%	60 - 130
m & p-Xylene	2018/08/25					86	%	60 - 130
o-Xylene	2018/08/25					87	%	60 - 130
F1 (C6-C10)	2018/08/25					94	%	60 - 140
9114933	SAW	Method Blank				1,4-Difluorobenzene (sur.)	2018/08/25	
			4-Bromofluorobenzene (sur.)	2018/08/25		87	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/25		63	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/25		92	%	50 - 140
			Benzene	2018/08/25	<0.0050		mg/kg	
			Toluene	2018/08/25	<0.020		mg/kg	
			Ethylbenzene	2018/08/25	<0.010		mg/kg	
			m & p-Xylene	2018/08/25	<0.040		mg/kg	
			o-Xylene	2018/08/25	<0.020		mg/kg	
			F1 (C6-C10)	2018/08/25	<10		mg/kg	
			9114933	SAW	RPD	Benzene	2018/08/25	NC
Toluene	2018/08/25	NC					%	50
Ethylbenzene	2018/08/25	NC					%	50
m & p-Xylene	2018/08/25	NC					%	50
o-Xylene	2018/08/25	NC					%	50

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CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
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**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F1 (C6-C10)	2018/08/25	NC		%	30
9114973	GP4	Matrix Spike [UD1378-02]	1,4-Difluorobenzene (sur.)	2018/08/24		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/24		99	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/24		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/24		134	%	50 - 140
			Bromodichloromethane	2018/08/24		110	%	50 - 140
			Bromoform	2018/08/24		133	%	50 - 140
			Bromomethane	2018/08/24		52	%	50 - 140
			Carbon tetrachloride	2018/08/24		73	%	50 - 140
			Chlorobenzene	2018/08/24		87	%	50 - 140
			Chlorodibromomethane	2018/08/24		107	%	50 - 140
			Chloroethane	2018/08/24		84	%	50 - 140
			Chloroform	2018/08/24		93	%	50 - 140
			Chloromethane	2018/08/24		86	%	50 - 140
			1,2-dibromoethane	2018/08/24		117	%	50 - 140
			1,2-dichlorobenzene	2018/08/24		107	%	50 - 140
			1,3-dichlorobenzene	2018/08/24		88	%	50 - 140
			1,4-dichlorobenzene	2018/08/24		91	%	50 - 140
			1,1-dichloroethane	2018/08/24		90	%	50 - 140
			1,2-dichloroethane	2018/08/24		122	%	50 - 140
			1,1-dichloroethene	2018/08/24		81	%	50 - 140
			cis-1,2-dichloroethene	2018/08/24		99	%	50 - 140
			trans-1,2-dichloroethene	2018/08/24		83	%	50 - 140
			Dichloromethane	2018/08/24		91	%	50 - 140
			1,2-dichloropropane	2018/08/24		114	%	50 - 140
			cis-1,3-dichloropropene	2018/08/24		93	%	50 - 140
			trans-1,3-dichloropropene	2018/08/24		81	%	50 - 140
			Methyl methacrylate	2018/08/24		138	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/08/24		101	%	50 - 140
			Styrene	2018/08/24		93	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/08/24		90	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/08/24		82	%	50 - 140
			Tetrachloroethene	2018/08/24		64	%	50 - 140
			1,2,3-trichlorobenzene	2018/08/24		113	%	50 - 140
			1,2,4-trichlorobenzene	2018/08/24		108	%	50 - 140
			1,3,5-trichlorobenzene	2018/08/24		88	%	50 - 140
			1,1,1-trichloroethane	2018/08/24		81	%	50 - 140
			1,1,2-trichloroethane	2018/08/24		129	%	50 - 140
			Trichloroethene	2018/08/24		84	%	50 - 140
			Trichlorofluoromethane	2018/08/24		69	%	50 - 140
			1,2,4-trimethylbenzene	2018/08/24		76	%	50 - 140
			1,3,5-trimethylbenzene	2018/08/24		71	%	50 - 140
			Vinyl chloride	2018/08/24		80	%	50 - 140
9114973	GP4	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/08/24		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/24		107	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/24		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/24		95	%	50 - 140
			Bromodichloromethane	2018/08/24		96	%	60 - 130
			Bromoform	2018/08/24		96	%	60 - 130
			Bromomethane	2018/08/24		70	%	60 - 130
			Carbon tetrachloride	2018/08/24		86	%	60 - 130
			Chlorobenzene	2018/08/24		95	%	60 - 130

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CLIFTON ASSOCIATES LTD.  
Client Project #: CG243.1 E003  
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**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorodibromomethane	2018/08/24		97	%	60 - 130
			Chloroethane	2018/08/24		81	%	60 - 130
			Chloroform	2018/08/24		90	%	60 - 130
			Chloromethane	2018/08/24		91	%	60 - 130
			1,2-dibromoethane	2018/08/24		104	%	60 - 130
			1,2-dichlorobenzene	2018/08/24		99	%	60 - 130
			1,3-dichlorobenzene	2018/08/24		96	%	60 - 130
			1,4-dichlorobenzene	2018/08/24		95	%	60 - 130
			1,1-dichloroethane	2018/08/24		91	%	60 - 130
			1,2-dichloroethane	2018/08/24		101	%	60 - 130
			1,1-dichloroethene	2018/08/24		92	%	60 - 130
			cis-1,2-dichloroethene	2018/08/24		94	%	60 - 130
			trans-1,2-dichloroethene	2018/08/24		90	%	60 - 130
			Dichloromethane	2018/08/24		81	%	60 - 130
			1,2-dichloropropane	2018/08/24		105	%	60 - 130
			cis-1,3-dichloropropene	2018/08/24		108	%	60 - 130
			trans-1,3-dichloropropene	2018/08/24		102	%	60 - 130
			Methyl methacrylate	2018/08/24		111	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/08/24		90	%	60 - 130
			Styrene	2018/08/24		96	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/08/24		93	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/08/24		101	%	60 - 130
			Tetrachloroethene	2018/08/24		86	%	60 - 130
			1,2,3-trichlorobenzene	2018/08/24		102	%	60 - 130
			1,2,4-trichlorobenzene	2018/08/24		99	%	60 - 130
			1,3,5-trichlorobenzene	2018/08/24		93	%	60 - 130
			1,1,1-trichloroethane	2018/08/24		91	%	60 - 130
			1,1,2-trichloroethane	2018/08/24		97	%	60 - 130
			Trichloroethene	2018/08/24		92	%	60 - 130
			Trichlorofluoromethane	2018/08/24		82	%	60 - 130
			1,2,4-trimethylbenzene	2018/08/24		100	%	60 - 130
			1,3,5-trimethylbenzene	2018/08/24		98	%	60 - 130
			Vinyl chloride	2018/08/24		92	%	60 - 130
9114973	GP4	Method Blank	1,4-Difluorobenzene (sur.)	2018/08/24		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/08/24		92	%	50 - 140
			D10-o-Xylene (sur.)	2018/08/24		81	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/08/24		111	%	50 - 140
			Bromodichloromethane	2018/08/24	<0.030		mg/kg	
			Bromoform	2018/08/24	<0.050		mg/kg	
			Bromomethane	2018/08/24	<0.020		mg/kg	
			Carbon tetrachloride	2018/08/24	<0.00050		mg/kg	
			Chlorobenzene	2018/08/24	<0.0010		mg/kg	
			Chlorodibromomethane	2018/08/24	<0.020		mg/kg	
			Chloroethane	2018/08/24	<0.020		mg/kg	
			Chloroform	2018/08/24	<0.00080		mg/kg	
			Chloromethane	2018/08/24	<0.030		mg/kg	
			1,2-dibromoethane	2018/08/24	<0.0020		mg/kg	
			1,2-dichlorobenzene	2018/08/24	<0.020		mg/kg	
			1,3-dichlorobenzene	2018/08/24	<0.020		mg/kg	
			1,4-dichlorobenzene	2018/08/24	<0.020		mg/kg	
			1,1-dichloroethane	2018/08/24	<0.020		mg/kg	
			1,2-dichloroethane	2018/08/24	<0.0020		mg/kg	

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**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1-dichloroethene	2018/08/24	<0.020		mg/kg	
			cis-1,2-dichloroethene	2018/08/24	<0.020		mg/kg	
			trans-1,2-dichloroethene	2018/08/24	<0.020		mg/kg	
			Dichloromethane	2018/08/24	<0.030		mg/kg	
			1,2-dichloropropane	2018/08/24	<0.020		mg/kg	
			cis-1,3-dichloropropene	2018/08/24	<0.020		mg/kg	
			trans-1,3-dichloropropene	2018/08/24	<0.020		mg/kg	
			Methyl methacrylate	2018/08/24	<0.040		mg/kg	
			Methyl-tert-butylether (MTBE)	2018/08/24	<0.030		mg/kg	
			Styrene	2018/08/24	<0.020		mg/kg	
			1,1,1,2-tetrachloroethane	2018/08/24	<0.10		mg/kg	
			1,1,2,2-tetrachloroethane	2018/08/24	<0.050		mg/kg	
			Tetrachloroethene	2018/08/24	<0.010		mg/kg	
			1,2,3-trichlorobenzene	2018/08/24	<0.040		mg/kg	
			1,2,4-trichlorobenzene	2018/08/24	<0.040		mg/kg	
			1,3,5-trichlorobenzene	2018/08/24	<0.040		mg/kg	
			1,1,1-trichloroethane	2018/08/24	<0.020		mg/kg	
			1,1,2-trichloroethane	2018/08/24	<0.020		mg/kg	
			Trichloroethene	2018/08/24	<0.010		mg/kg	
			Trichlorofluoromethane	2018/08/24	<0.020		mg/kg	
			1,2,4-trimethylbenzene	2018/08/24	<0.50		mg/kg	
			1,3,5-trimethylbenzene	2018/08/24	<0.50		mg/kg	
			Vinyl chloride	2018/08/24	<0.00030		mg/kg	
9114973	GP4	RPD [UD1378-02]	Bromodichloromethane	2018/08/24	NC		%	50
			Bromoform	2018/08/24	NC		%	50
			Bromomethane	2018/08/24	NC		%	50
			Carbon tetrachloride	2018/08/24	NC		%	50
			Chlorobenzene	2018/08/24	NC		%	50
			Chlorodibromomethane	2018/08/24	NC		%	50
			Chloroethane	2018/08/24	NC		%	50
			Chloroform	2018/08/24	8.4		%	50
			Chloromethane	2018/08/24	NC		%	50
			1,2-dibromoethane	2018/08/24	NC		%	50
			1,2-dichlorobenzene	2018/08/24	NC		%	50
			1,3-dichlorobenzene	2018/08/24	NC		%	50
			1,4-dichlorobenzene	2018/08/24	NC		%	50
			1,1-dichloroethane	2018/08/24	NC		%	50
			1,2-dichloroethane	2018/08/24	NC		%	50
			1,1-dichloroethene	2018/08/24	NC		%	50
			cis-1,2-dichloroethene	2018/08/24	NC		%	50
			trans-1,2-dichloroethene	2018/08/24	NC		%	50
			Dichloromethane	2018/08/24	NC		%	50
			1,2-dichloropropane	2018/08/24	NC		%	50
			cis-1,3-dichloropropene	2018/08/24	NC		%	50
			trans-1,3-dichloropropene	2018/08/24	NC		%	50
			Methyl methacrylate	2018/08/24	NC		%	50
			Methyl-tert-butylether (MTBE)	2018/08/24	NC		%	50
			Styrene	2018/08/24	NC		%	50
			1,1,1,2-tetrachloroethane	2018/08/24	NC		%	50
			1,1,2,2-tetrachloroethane	2018/08/24	NC		%	50
			Tetrachloroethene	2018/08/24	NC		%	50
			1,2,3-trichlorobenzene	2018/08/24	NC		%	50

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**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2,4-trichlorobenzene	2018/08/24	NC		%	50
			1,3,5-trichlorobenzene	2018/08/24	NC		%	50
			1,1,1-trichloroethane	2018/08/24	NC		%	50
			1,1,2-trichloroethane	2018/08/24	NC		%	50
			Trichloroethene	2018/08/24	NC		%	50
			Trichlorofluoromethane	2018/08/24	NC		%	50
			1,2,4-trimethylbenzene	2018/08/24	NC		%	50
			1,3,5-trimethylbenzene	2018/08/24	NC		%	50
			Vinyl chloride	2018/08/24	NC		%	50

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).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



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**NOTIFICATION LOG**

No Reportable Regulation Exceedences Noted.

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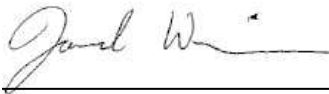
### VALIDATION SIGNATURE PAGE

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



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Janet Gao, B.Sc., QP, Supervisor, Organics



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Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics



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Rahul Suryawanshi, Organics – Senior Analyst



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Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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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.

Invoice Information	Report Information (if differs from invoice)	Project Information	Turnaround Time (TAT) Required
Company: <u>Clifton Associates</u>	Company: _____	Quotation #: _____	<input checked="" type="checkbox"/> 5-7 Days Regular (Most analyses)
Contact Name: <u>Stephen D'Abadie</u>	Contact Name: _____	P.O. #/ AFE#: _____	<b>PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS</b>
Address: <u>2222 30th Ave N.E. Calgary, AB</u>	Address: _____	Project #: <u>CG-2430.1E003</u>	<b>Rush TAT (Surcharges will be applied)</b>
Phone: <u>403-701-8226</u>	Phone: _____	Site Location: _____	<input type="checkbox"/> Same Day <input type="checkbox"/> 2 Days
Email: <u>stephen.dabadie@clifton.ca</u>	Email: _____	Site #: _____	<input type="checkbox"/> 1 Day <input type="checkbox"/> 3-4 Days
Copies: _____	Copies: _____	Sampled By: <u>GAC</u>	Date Required: _____
			Rush Confirmation #: _____

Laboratory Use Only				Analysis Requested												Regulatory Criteria					
Seal Present	Seal Intact	Cooling Media	Cooler ID	Depot Reception												<input checked="" type="checkbox"/> AT1 <input type="checkbox"/> CCME <input type="checkbox"/> Drinking Water <input type="checkbox"/> D50 (Drilling Waste) <input type="checkbox"/> Saskatchewan <input type="checkbox"/> Other:					
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	120																		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																			
Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1	VOC	BTEX F1-F4	Routine Water	Regulated Metals	Tot	Diss	Mercury Total	Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	PAHS	HOLD - DO NOT ANALYZE	Special Instructions
1 SW		2018/08/21	11:00	Soil	4	X	X	X											X		
2 Centre		↓	6:15	↓	4	X	X	X											X		
3 S.E		↓	9:30	↓	4	X	X	X											X		
4 N.E		↓	10:40	↓	4	X	X	X											X		
5 N.W		↓	10:45	↓	4	X	X	X											X		
6																					
7																					
8																					
9																					
10																					

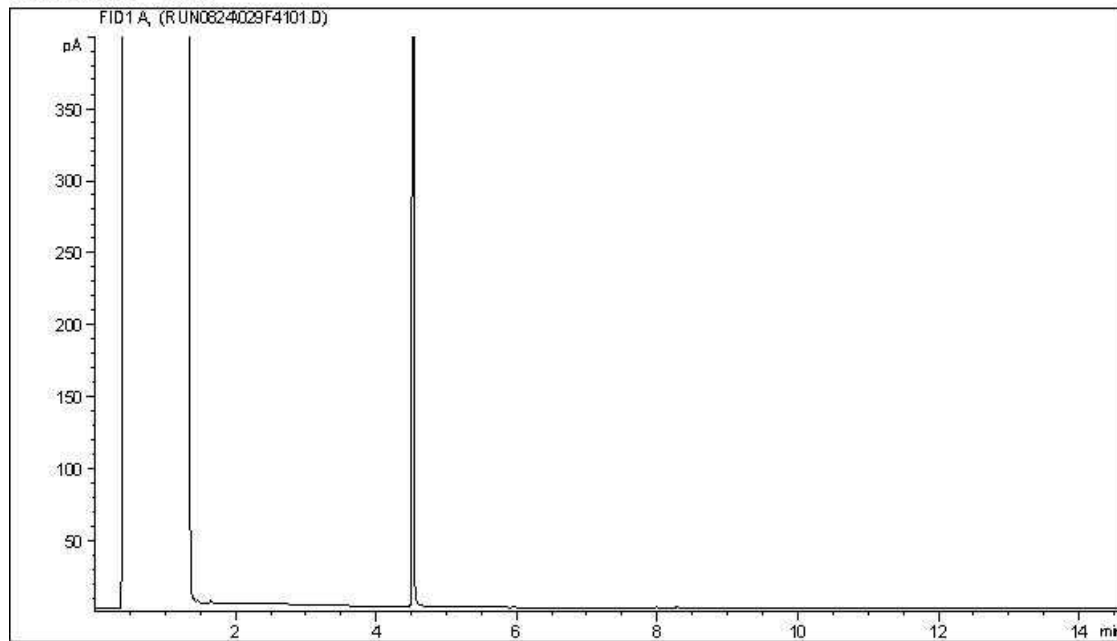
Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
<u>Kevin Paul Gavin</u>	<u>2018/08/21</u>	<u>14:45</u>	<u>Juliana Villamayor</u>	<u>2018/08/21</u>	<u>14:45</u>	<u>B870819</u>

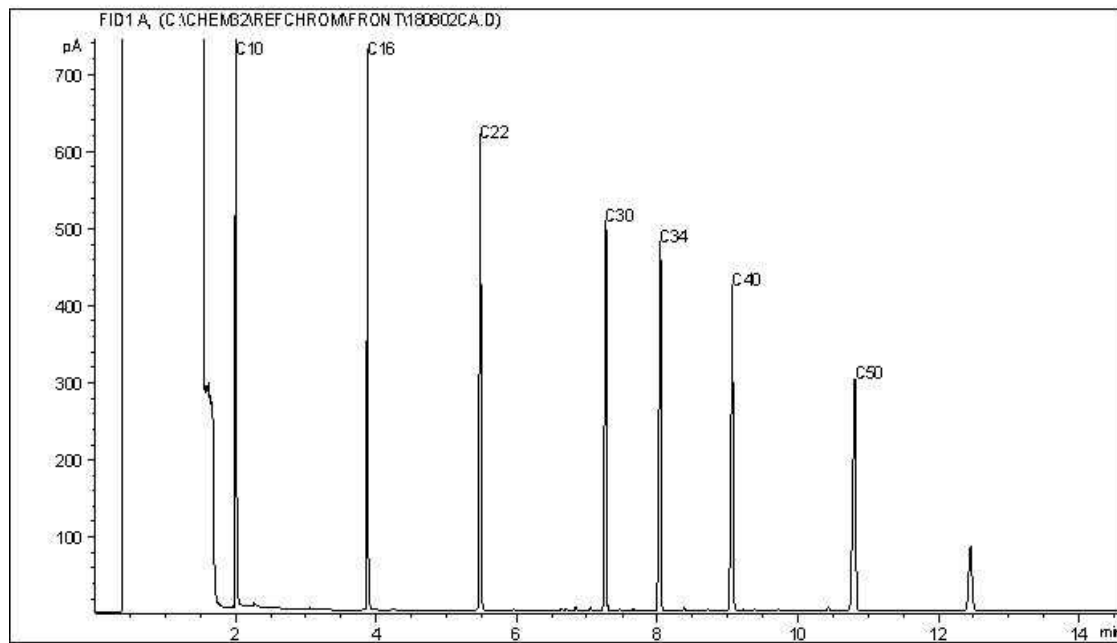
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



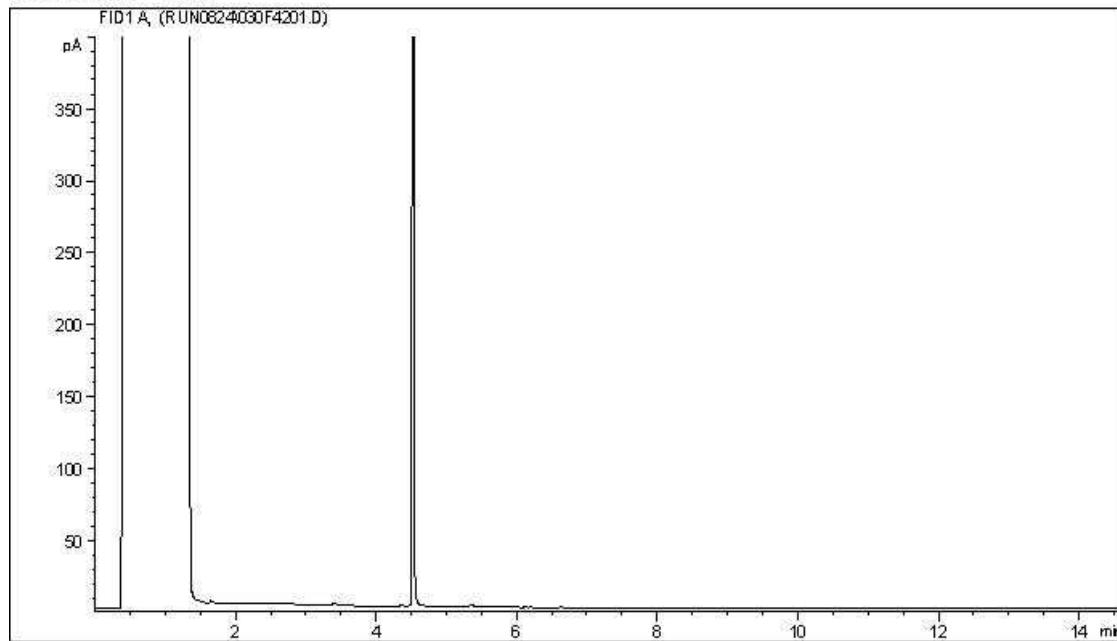
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

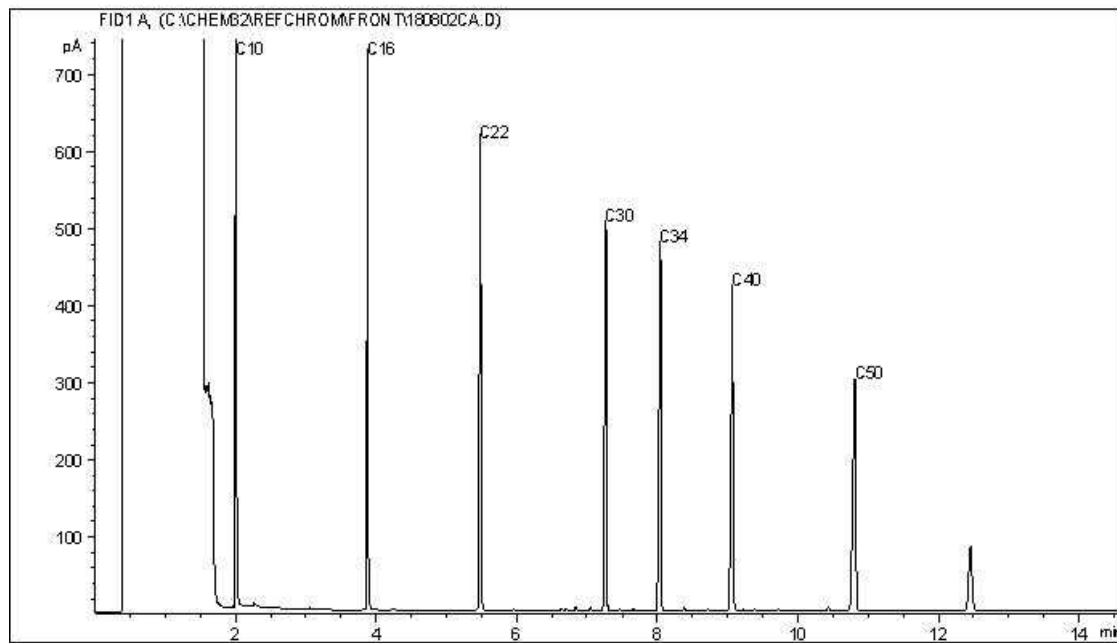
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



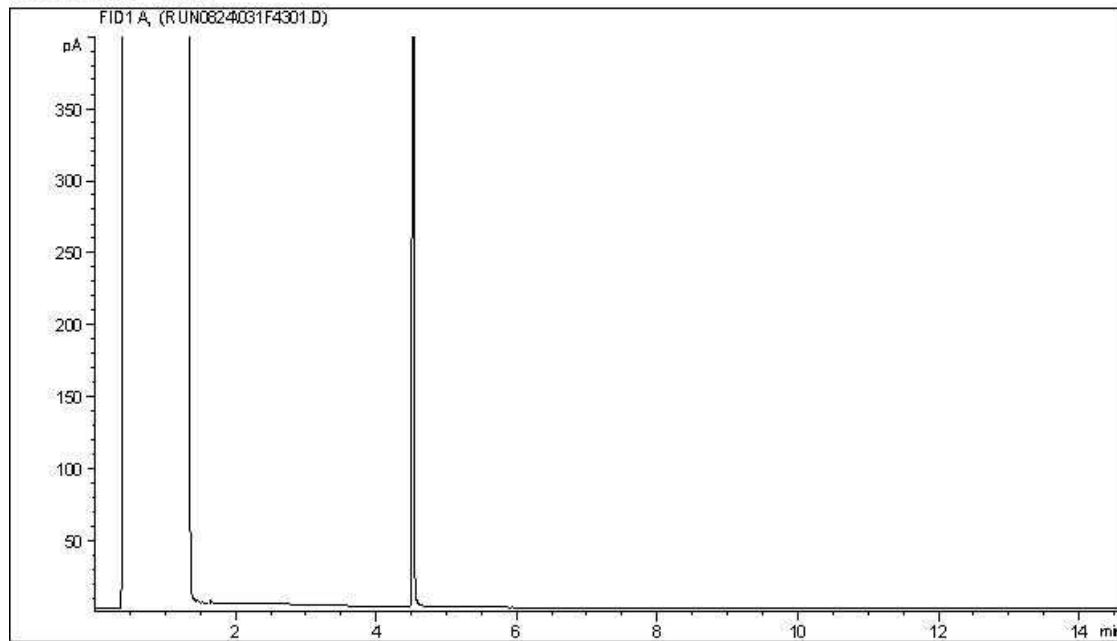
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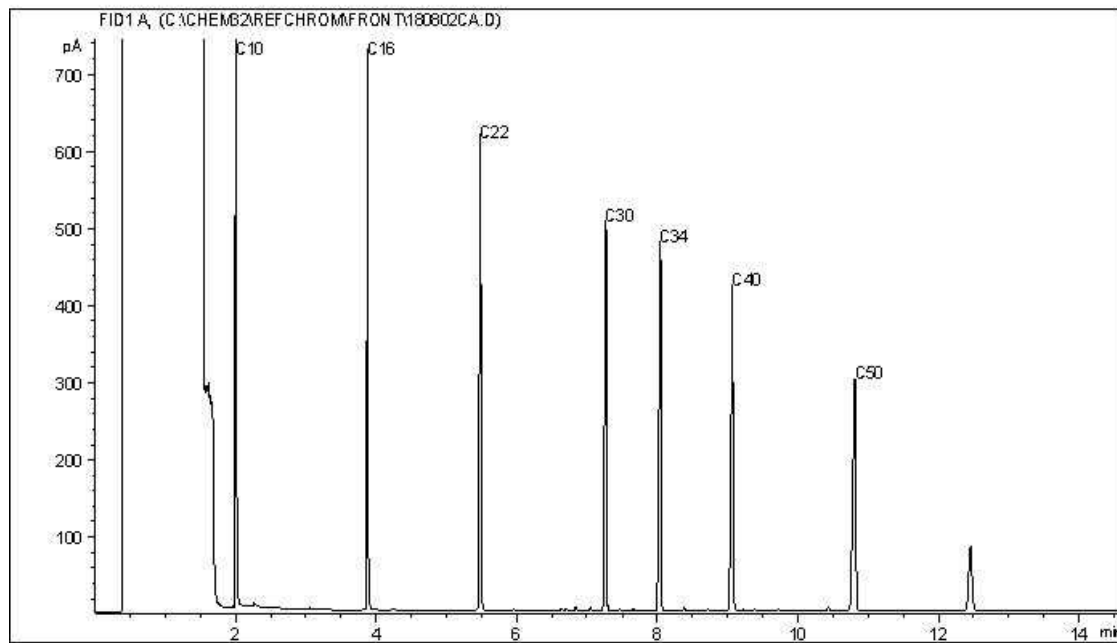
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Carbon Range Distribution - Reference Chromatogram



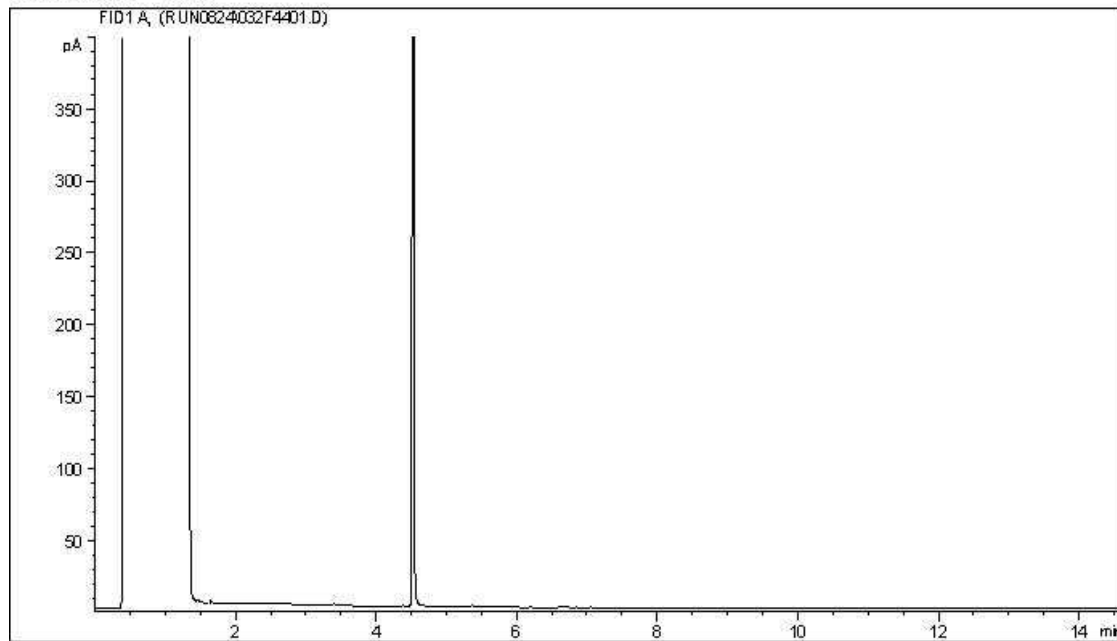
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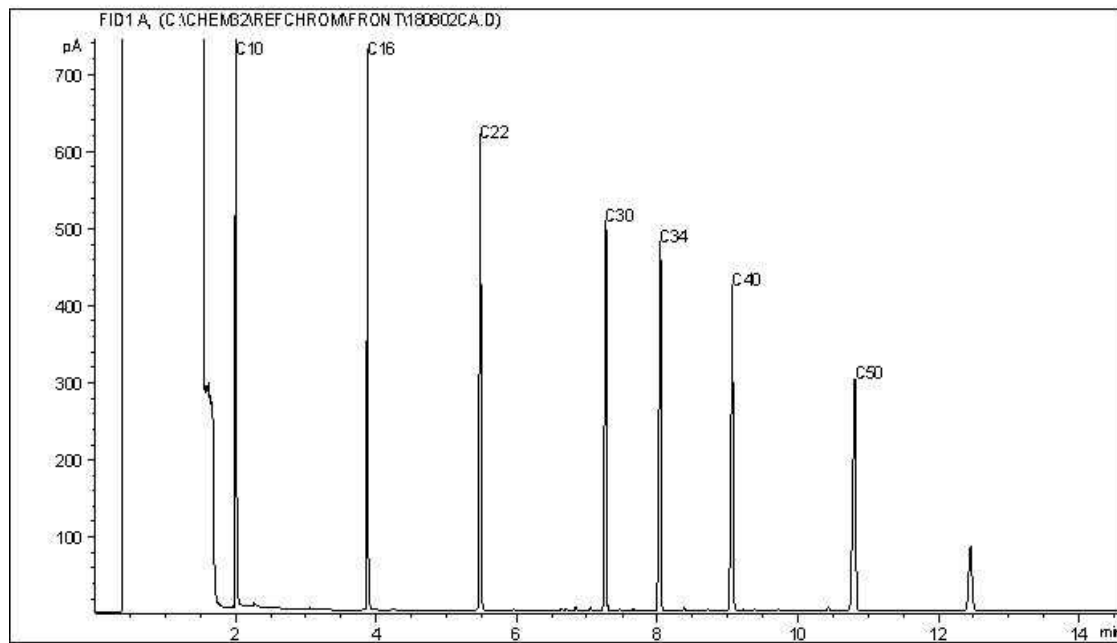
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CCME Hydrocarbons (F2-F4 in soil) Chromatogram

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Carbon Range Distribution - Reference Chromatogram



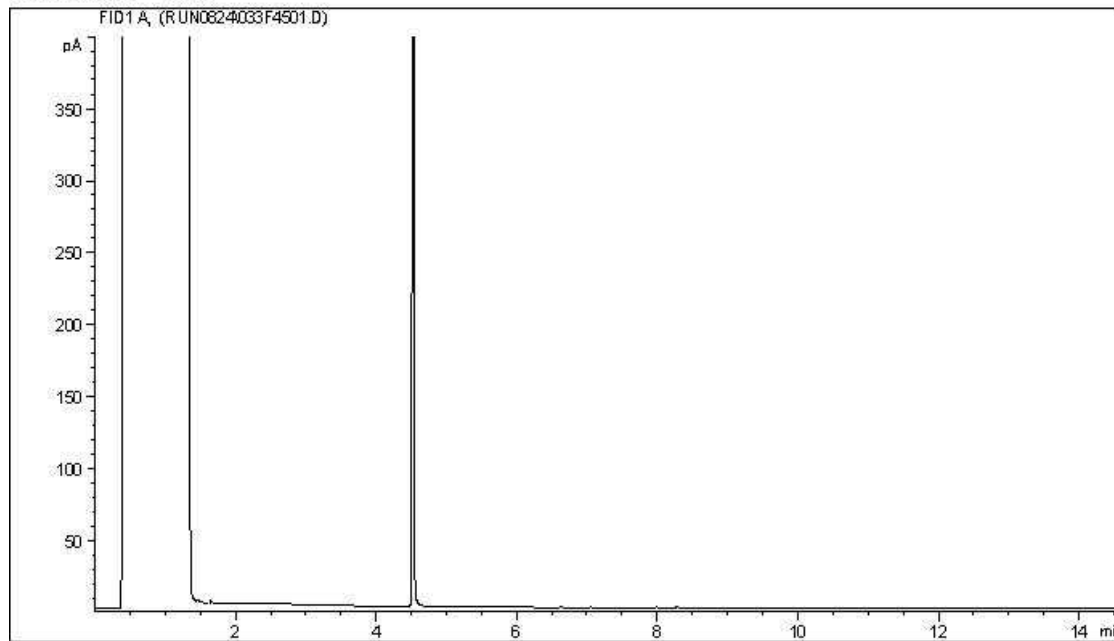
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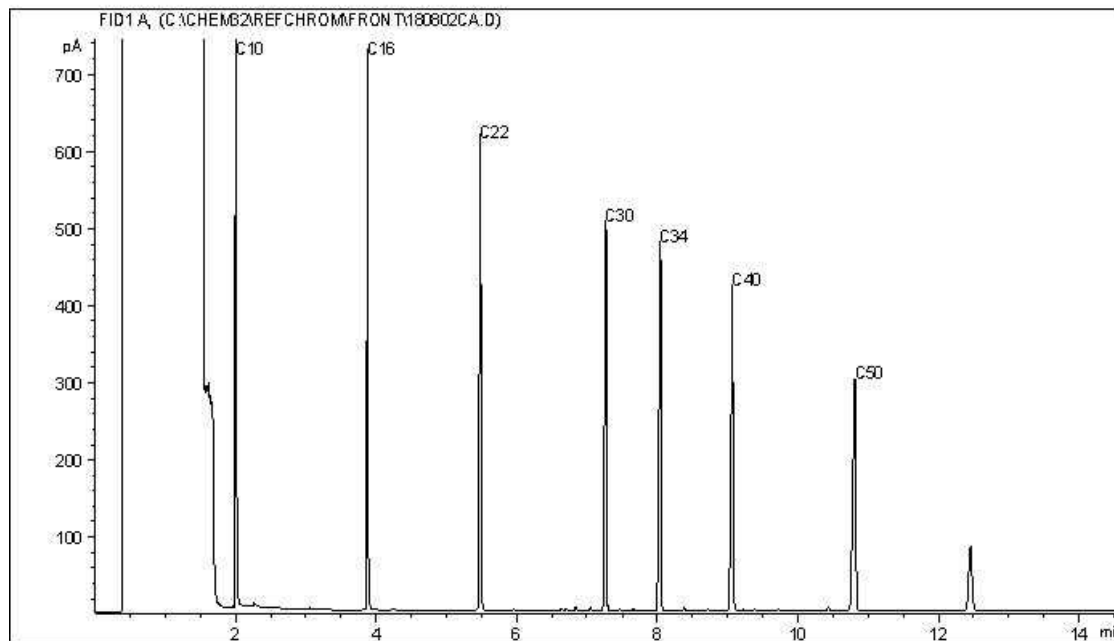
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