Appendix A

Clifton Associates
Maxxam Certificates of Analysis

Clifton Associates

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Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1E32
Your C.O.C. #: m045926

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/17
Report #: R2635926
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B888411
Received: 2018/10/10, 14:45

Sample Matrix: GROUND WATER
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	9	N/A	2018/10/11	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/10/12	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	5	2018/10/13	2018/10/13	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/13	2018/10/14	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	9	N/A	2018/10/17	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	9	2018/10/13	2018/10/14	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	9	N/A	2018/10/12	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	3	N/A	2018/10/11	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List)	6	N/A	2018/10/12	AB SOP-00056	EPA 5021a/8260d m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Trihalomethanes Calculation	1	N/A	2018/10/12	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	1	N/A	2018/10/12	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

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Your Project #: CG2430.1E32
Your C.O.C. #: m045926

Attention: STEPHEN DABADIE

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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B888411
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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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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
==========
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 #: B888411
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UN1097		UN1098		UN1099		UN1100		
Sampling Date		2018/10/10 13:30		2018/10/10 13:10		2018/10/10 14:10		2018/10/10 13:45		
COC Number		m045926		m045926		m045926		m045926		
	UNITS	**1906**	**RDL**	**1911**	**RDL**	**1924**	**RDL**	**1971**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	<0.10	0.10	<0.10	0.10	0.14	0.10	9180616
Volatiles										
Benzene	mg/L	2.4 (1)	0.0020	0.51	0.00040	2.1 (1)	0.0020	0.027	0.00040	9179287
Toluene	mg/L	<0.00040	0.00040	<0.00040	0.00040	0.0049	0.00040	0.0014	0.00040	9179287
Ethylbenzene	mg/L	<0.00040	0.00040	<0.00040	0.00040	<0.00040	0.00040	0.13	0.00040	9179287
m & p-Xylene	mg/L	<0.00080	0.00080	<0.00080	0.00080	0.0036	0.00080	<0.00080	0.00080	9179287
o-Xylene	mg/L	0.00048	0.00040	0.0016	0.00040	0.21	0.00040	<0.00040	0.00040	9179287
Xylenes (Total)	mg/L	<0.00089	0.00089	0.0016	0.00089	0.22	0.00089	<0.00089	0.00089	9178248
F1 (C6-C10) - BTEX	mg/L	<0.50	0.50	<0.10	0.10	0.55	0.10	1.8	0.10	9178248
F1 (C6-C10)	mg/L	2.5 (1)	0.50	0.48	0.10	2.9	0.10	2.0	0.10	9179287
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	103	N/A	104	N/A	105	N/A	95	N/A	9179287
4-Bromofluorobenzene (sur.)	%	96	N/A	94	N/A	96	N/A	99	N/A	9179287
D4-1,2-Dichloroethane (sur.)	%	109	N/A	105	N/A	126	N/A	111	N/A	9179287
O-TERPHENYL (sur.)	%	83	N/A	86	N/A	90	N/A	86	N/A	9180616

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B888411
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UN1101	UN1102	UN1103	UN1104	UN1105		
Sampling Date		2018/10/10 13:20	2018/10/10 13:00	2018/10/10 12:50	2018/10/10 12:35	2018/10/10 13:45		
COC Number		m045926	m045926	m045926	m045926	m045926		
	UNITS	**1976**	**2007**	**2010**	**2012**	**9971**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.16	0.10	9180616
Volatiles								
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.026	0.00040	9179287
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.0013	0.00040	9179287
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.12	0.00040	9179287
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	9179287
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9179287
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	0.00089	9178248
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	1.7	0.10	9178248
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	1.9	0.10	9179287
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	100	101	100	98	N/A	9179287
4-Bromofluorobenzene (sur.)	%	95	95	95	95	97	N/A	9179287
D4-1,2-Dichloroethane (sur.)	%	102	105	100	101	113	N/A	9179287
O-TERPHENYL (sur.)	%	91	89	92	90	93	N/A	9180616

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B888411
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UN1097	UN1098	UN1099		UN1100		
Sampling Date		2018/10/10 13:30	2018/10/10 13:10	2018/10/10 14:10		2018/10/10 13:45		
COC Number		m045926	m045926	m045926		m045926		
	UNITS	**1906**	**1911**	**1924**	**QC Batch**	**1971**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	9178269	<0.000010	0.000010	9179034
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	9180609	<0.00010	0.00010	9180609
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	9180609	<0.00010	0.00010	9180609
Acridine	mg/L	<0.000050	<0.000050	<0.000050	9180609	<0.000050	0.000050	9180609
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	9180609	<0.000010	0.000010	9180609
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	9180609	<0.0000085	0.0000085	9180609
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	9180609	<0.0000085	0.0000085	9180609
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	9180609	<0.0000085	0.0000085	9180609
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	9180609	<0.0000085	0.0000085	9180609
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	9180609	<0.000050	0.000050	9180609
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	9180609	<0.0000075	0.0000075	9180609
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	9180609	<0.000050	0.000050	9180609
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	9180609	<0.0000085	0.0000085	9180609
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	9180609	<0.0000075	0.0000075	9180609
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	9180609	<0.000010	0.000010	9180609
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	9180609	<0.000050	0.000050	9180609
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	9180609	<0.0000085	0.0000085	9180609
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	9180609	0.00040	0.00010	9180609
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	9180609	<0.00010	0.00010	9180609
Naphthalene	mg/L	<0.00010	<0.00010	0.0038	9180609	0.00022	0.00010	9180609
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	9180609	<0.000050	0.000050	9180609
Perylene	mg/L	<0.000050	<0.000050	<0.000050	9180609	<0.000050	0.000050	9180609
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	9180609	<0.000020	0.000020	9180609
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	9180609	<0.00020	0.00020	9180609
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	116	114	118	9180609	116	N/A	9180609
D8-ACENAPHTHYLENE (sur.)	%	96	96	99	9180609	91	N/A	9180609
D8-NAPHTHALENE (sur.)	%	51	55	60	9180609	45 (1)	N/A	9180609
TERPHENYL-D14 (sur.)	%	115	118	121	9180609	120	N/A	9180609

RDL = Reportable Detection Limit
N/A = Not Applicable
(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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Client Project #: CG2430.1E32
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UN1101	UN1102	UN1103	UN1104	UN1105		
Sampling Date		2018/10/10 13:20	2018/10/10 13:00	2018/10/10 12:50	2018/10/10 12:35	2018/10/10 13:45		
COC Number		m045926	m045926	m045926	m045926	m045926		
	UNITS	**1976**	**2007**	**2010**	**2012**	**9971**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9179034
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9180609
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9180609
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9180609
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9180609
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00037	0.00010	9180609
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00021	0.00010	9180609
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9180609
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9180609
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	114	114	121	119	116	N/A	9180609
D8-ACENAPHTHYLENE (sur.)	%	95	101	103	105	102	N/A	9180609
D8-NAPHTHALENE (sur.)	%	55	66	54	67	56	N/A	9180609
TERPHENYL-D14 (sur.)	%	118	118	127	123	121	N/A	9180609

RDL = Reportable Detection Limit
N/A = Not Applicable

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Client Project #: CG2430.1E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UN1097	UN1098		UN1099		UN1100		
Sampling Date		2018/10/10 13:30	2018/10/10 13:10		2018/10/10 14:10		2018/10/10 13:45		
COC Number		m045926	m045926		m045926		m045926		
	UNITS	**1906**	**1911**	**RDL**	**1924**	**RDL**	**1971**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	<0.0013	0.0013	<0.0013	0.0013	<0.0013	0.0013	9178515
Bromodichloromethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Bromoform	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Bromomethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
Carbon tetrachloride	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Chlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Chlorodibromomethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
Chloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
Chloroform	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Chloromethane	mg/L	<0.0020	<0.0020	0.0020	0.0029	0.0020	<0.0020	0.0020	9178871
1,2-dibromoethane	mg/L	<0.00020	<0.00020	0.00020	<0.00020	0.00020	<0.00020	0.00020	9178871
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1-dichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,2-dichloroethane	mg/L	0.032	0.040	0.00050	0.11	0.00050	0.13	0.00050	9178871
1,1-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Dichloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
1,2-dichloropropane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Methyl methacrylate	mg/L	<0.00050	<0.00050	0.00050	<0.0024 (1)	0.0024	<0.0022 (1)	0.0022	9178871
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Styrene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
Tetrachloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.

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Maxxam Job #: B888411
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UN1097	UN1098		UN1099		UN1100		
Sampling Date		2018/10/10 13:30	2018/10/10 13:10		2018/10/10 14:10		2018/10/10 13:45		
COC Number		m045926	m045926		m045926		m045926		
	UNITS	**1906**	**1911**	**RDL**	**1924**	**RDL**	**1971**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1,2-trichloroethane	mg/L	0.00062	<0.00050	0.00050	0.0027 (1)	0.00050	<0.00050	0.00050	9178871
Trichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	0.00050	0.0010	0.00050	<0.00050	0.00050	9178871
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Vinyl chloride	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	105	104	N/A	104	N/A	102	N/A	9178871
4-Bromofluorobenzene (sur.)	%	89	91	N/A	87	N/A	91	N/A	9178871
D4-1,2-Dichloroethane (sur.)	%	124	117	N/A	112	N/A	93	N/A	9178871

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UN1101	UN1102	UN1103	UN1104		UN1105		
Sampling Date		2018/10/10 13:20	2018/10/10 13:00	2018/10/10 12:50	2018/10/10 12:35		2018/10/10 13:45		
COC Number		m045926	m045926	m045926	m045926		m045926		
	UNITS	**1976**	**2007**	**2010**	**2012**	**RDL**	**9971**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	<0.0013	0.0013	9178515
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	0.00020	9178871
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	0.12	0.00050	9178871
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.0030 (1)	0.0030	9178871
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	0.0017	<0.00050	0.00050	<0.00050	0.00050	9178871
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9178871
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9178871

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UN1101	UN1102	UN1103	UN1104		UN1105		
Sampling Date		2018/10/10 13:20	2018/10/10 13:00	2018/10/10 12:50	2018/10/10 12:35		2018/10/10 13:45		
COC Number		m045926	m045926	m045926	m045926		m045926		
	UNITS	**1976**	**2007**	**2010**	**2012**	**RDL**	**9971**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9178871
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	102	101	101	N/A	102	N/A	9178871
4-Bromofluorobenzene (sur.)	%	92	91	92	92	N/A	91	N/A	9178871
D4-1,2-Dichloroethane (sur.)	%	93	90	91	91	N/A	86	N/A	9178871

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN1106		
Sampling Date		2018/10/10		
COC Number		m045926		
	UNITS	**TRIP BLANK 1**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9178515
Bromodichloromethane	mg/L	<0.00050	0.00050	9178871
Bromoform	mg/L	<0.00050	0.00050	9178871
Bromomethane	mg/L	<0.0020	0.0020	9178871
Carbon tetrachloride	mg/L	<0.00050	0.00050	9178871
Chlorobenzene	mg/L	<0.00050	0.00050	9178871
Chlorodibromomethane	mg/L	<0.0010	0.0010	9178871
Chloroethane	mg/L	<0.0010	0.0010	9178871
Chloroform	mg/L	<0.00050	0.00050	9178871
Chloromethane	mg/L	<0.0020	0.0020	9178871
1,2-dibromoethane	mg/L	<0.00020	0.00020	9178871
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9178871
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9178871
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9178871
1,1-dichloroethane	mg/L	<0.00050	0.00050	9178871
1,2-dichloroethane	mg/L	<0.00050	0.00050	9178871
1,1-dichloroethene	mg/L	<0.00050	0.00050	9178871
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9178871
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9178871
Dichloromethane	mg/L	<0.0020	0.0020	9178871
1,2-dichloropropane	mg/L	<0.00050	0.00050	9178871
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9178871
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9178871
Methyl methacrylate	mg/L	<0.00050	0.00050	9178871
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9178871
Styrene	mg/L	<0.00050	0.00050	9178871
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9178871
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9178871
Tetrachloroethene	mg/L	<0.00050	0.00050	9178871
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9178871
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9178871
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9178871
RDL = Reportable Detection Limit				

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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN1106		
Sampling Date		2018/10/10		
COC Number		m045926		
	UNITS	**TRIP BLANK 1**	**RDL**	**QC Batch**
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9178871
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9178871
Trichloroethene	mg/L	<0.00050	0.00050	9178871
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9178871
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9178871
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9178871
Vinyl chloride	mg/L	<0.00050	0.00050	9178871
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	102	N/A	9178871
4-Bromofluorobenzene (sur.)	%	91	N/A	9178871
D4-1,2-Dichloroethane (sur.)	%	90	N/A	9178871

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
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GENERAL COMMENTS

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

Package 1	2.0°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9178871	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/11		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/11		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/11		87	%	50 - 140
			Bromodichloromethane	2018/10/11		97	%	50 - 140
			Bromoform	2018/10/11		106	%	50 - 140
			Bromomethane	2018/10/11		83	%	50 - 140
			Carbon tetrachloride	2018/10/11		96	%	50 - 140
			Chlorobenzene	2018/10/11		99	%	50 - 140
			Chlorodibromomethane	2018/10/11		108	%	50 - 140
			Chloroethane	2018/10/11		76	%	50 - 140
			Chloroform	2018/10/11		88	%	50 - 140
			Chloromethane	2018/10/11		79	%	50 - 140
			1,2-dibromoethane	2018/10/11		100	%	50 - 140
			1,2-dichlorobenzene	2018/10/11		103	%	50 - 140
			1,3-dichlorobenzene	2018/10/11		100	%	50 - 140
			1,4-dichlorobenzene	2018/10/11		96	%	50 - 140
			1,1-dichloroethane	2018/10/11		88	%	50 - 140
			1,2-dichloroethane	2018/10/11		88	%	50 - 140
			1,1-dichloroethene	2018/10/11		88	%	50 - 140
			cis-1,2-dichloroethene	2018/10/11		87	%	50 - 140
			trans-1,2-dichloroethene	2018/10/11		84	%	50 - 140
			Dichloromethane	2018/10/11		87	%	50 - 140
			1,2-dichloropropane	2018/10/11		89	%	50 - 140
			cis-1,3-dichloropropene	2018/10/11		92	%	50 - 140
			trans-1,3-dichloropropene	2018/10/11		100	%	50 - 140
			Methyl methacrylate	2018/10/11		93	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/11		90	%	50 - 140
			Styrene	2018/10/11		101	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/11		98	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/11		98	%	50 - 140
			Tetrachloroethene	2018/10/11		96	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/11		98	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/11		98	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/11		96	%	50 - 140
			1,1,1-trichloroethane	2018/10/11		97	%	50 - 140
			1,1,2-trichloroethane	2018/10/11		96	%	50 - 140
			Trichloroethene	2018/10/11		102	%	50 - 140
			Trichlorofluoromethane	2018/10/11		88	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/11		94	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/11		97	%	50 - 140
			Vinyl chloride	2018/10/11		80	%	50 - 140
9178871	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/11		105	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/11		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/11		87	%	50 - 140
			Bromodichloromethane	2018/10/11		95	%	60 - 130
			Bromoform	2018/10/11		104	%	60 - 130
			Bromomethane	2018/10/11		84	%	60 - 130
			Carbon tetrachloride	2018/10/11		96	%	60 - 130
			Chlorobenzene	2018/10/11		97	%	60 - 130
			Chlorodibromomethane	2018/10/11		105	%	60 - 130
			Chloroethane	2018/10/11		77	%	60 - 130
			Chloroform	2018/10/11		88	%	60 - 130
			Chloromethane	2018/10/11		81	%	60 - 130
			1,2-dibromoethane	2018/10/11		97	%	60 - 130

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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-dichlorobenzene	2018/10/11		101	%	60 - 130
			1,3-dichlorobenzene	2018/10/11		98	%	60 - 130
			1,4-dichlorobenzene	2018/10/11		94	%	60 - 130
			1,1-dichloroethane	2018/10/11		88	%	60 - 130
			1,2-dichloroethane	2018/10/11		87	%	60 - 130
			1,1-dichloroethene	2018/10/11		89	%	60 - 130
			cis-1,2-dichloroethene	2018/10/11		87	%	60 - 130
			trans-1,2-dichloroethene	2018/10/11		84	%	60 - 130
			Dichloromethane	2018/10/11		87	%	60 - 130
			1,2-dichloropropane	2018/10/11		88	%	60 - 130
			cis-1,3-dichloropropene	2018/10/11		91	%	60 - 130
			trans-1,3-dichloropropene	2018/10/11		97	%	60 - 130
			Methyl methacrylate	2018/10/11		92	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/11		90	%	60 - 130
			Styrene	2018/10/11		99	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/11		95	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/11		95	%	60 - 130
			Tetrachloroethene	2018/10/11		95	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/11		94	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/11		94	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/11		93	%	60 - 130
			1,1,1-trichloroethane	2018/10/11		97	%	60 - 130
			1,1,2-trichloroethane	2018/10/11		96	%	60 - 130
			Trichloroethene	2018/10/11		102	%	60 - 130
			Trichlorofluoromethane	2018/10/11		88	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/11		93	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/11		96	%	60 - 130
			Vinyl chloride	2018/10/11		82	%	60 - 130
9178871	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/11		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/11		89	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/11		89	%	50 - 140
			Bromodichloromethane	2018/10/11	<0.00050		mg/L	
			Bromoform	2018/10/11	<0.00050		mg/L	
			Bromomethane	2018/10/11	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/11	<0.00050		mg/L	
			Chlorobenzene	2018/10/11	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/11	<0.0010		mg/L	
			Chloroethane	2018/10/11	<0.0010		mg/L	
			Chloroform	2018/10/11	<0.00050		mg/L	
			Chloromethane	2018/10/11	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/11	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/11	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/11	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/11	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/11	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/11	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/11	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/11	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/11	<0.00050		mg/L	
			Dichloromethane	2018/10/11	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/11	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/11	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/11	<0.00050		mg/L	
			Methyl methacrylate	2018/10/11	<0.00050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl-tert-butylether (MTBE)	2018/10/11	<0.00050		mg/L	
			Styrene	2018/10/11	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/11	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/11	<0.0020		mg/L	
			Tetrachloroethene	2018/10/11	<0.00050		mg/L	
			1,2,3-trichlorobenzene	2018/10/11	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/11	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/11	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/11	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/11	<0.00050		mg/L	
			Trichloroethene	2018/10/11	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/11	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/11	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/11	<0.00050		mg/L	
			Vinyl chloride	2018/10/11	<0.00050		mg/L	
9178871	MZ	RPD	Bromodichloromethane	2018/10/11	NC		%	30
			Bromoform	2018/10/11	NC		%	30
			Bromomethane	2018/10/11	NC		%	30
			Carbon tetrachloride	2018/10/11	NC		%	30
			Chlorobenzene	2018/10/11	NC		%	30
			Chlorodibromomethane	2018/10/11	NC		%	30
			Chloroethane	2018/10/11	NC		%	30
			Chloroform	2018/10/11	NC		%	30
			Chloromethane	2018/10/11	NC		%	30
			1,2-dibromoethane	2018/10/11	NC		%	30
			1,2-dichlorobenzene	2018/10/11	NC		%	30
			1,3-dichlorobenzene	2018/10/11	NC		%	30
			1,4-dichlorobenzene	2018/10/11	NC		%	30
			1,1-dichloroethane	2018/10/11	NC		%	30
			1,2-dichloroethane	2018/10/11	NC		%	30
			1,1-dichloroethene	2018/10/11	NC		%	30
			cis-1,2-dichloroethene	2018/10/11	NC		%	30
			trans-1,2-dichloroethene	2018/10/11	NC		%	30
			Dichloromethane	2018/10/11	NC		%	30
			1,2-dichloropropane	2018/10/11	NC		%	30
			cis-1,3-dichloropropene	2018/10/11	NC		%	30
			trans-1,3-dichloropropene	2018/10/11	NC		%	30
			Methyl methacrylate	2018/10/11	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/11	NC		%	30
			Styrene	2018/10/11	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/11	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/11	NC		%	30
			Tetrachloroethene	2018/10/11	NC		%	30
			1,2,3-trichlorobenzene	2018/10/11	NC		%	30
			1,2,4-trichlorobenzene	2018/10/11	NC		%	30
			1,3,5-trichlorobenzene	2018/10/11	NC		%	30
			1,1,1-trichloroethane	2018/10/11	NC		%	30
			1,1,2-trichloroethane	2018/10/11	NC		%	30
			Trichloroethene	2018/10/11	NC		%	30
			Trichlorofluoromethane	2018/10/11	NC		%	30
			1,2,4-trimethylbenzene	2018/10/11	NC		%	30
			1,3,5-trimethylbenzene	2018/10/11	NC		%	30
			Vinyl chloride	2018/10/11	NC		%	30
9179287	WZ0	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/11		98	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			4-Bromofluorobenzene (sur.)	2018/10/11		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/11		104	%	50 - 140
			Benzene	2018/10/11		98	%	50 - 140
			Toluene	2018/10/11		93	%	50 - 140
			Ethylbenzene	2018/10/11		94	%	50 - 140
			m & p-Xylene	2018/10/11		93	%	50 - 140
			o-Xylene	2018/10/11		97	%	50 - 140
			F1 (C6-C10)	2018/10/11		71	%	60 - 140
9179287	WZ0	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/11		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/11		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/11		110	%	50 - 140
			Benzene	2018/10/11		95	%	60 - 130
			Toluene	2018/10/11		92	%	60 - 130
			Ethylbenzene	2018/10/11		96	%	60 - 130
			m & p-Xylene	2018/10/11		96	%	60 - 130
			o-Xylene	2018/10/11		97	%	60 - 130
			F1 (C6-C10)	2018/10/11		92	%	60 - 140
9179287	WZ0	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/11		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/11		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/11		113	%	50 - 140
			Benzene	2018/10/11	<0.00040		mg/L	
			Toluene	2018/10/11	<0.00040		mg/L	
			Ethylbenzene	2018/10/11	<0.00040		mg/L	
			m & p-Xylene	2018/10/11	<0.00080		mg/L	
			o-Xylene	2018/10/11	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/11	<0.10		mg/L	
9179287	WZ0	RPD	Benzene	2018/10/11	NC		%	30
			Toluene	2018/10/11	NC		%	30
			Ethylbenzene	2018/10/11	NC		%	30
			m & p-Xylene	2018/10/11	NC		%	30
			o-Xylene	2018/10/11	NC		%	30
			F1 (C6-C10)	2018/10/11	NC		%	30
9180609	NK3	Matrix Spike [UN1097-01]	D10-ANTHRACENE (sur.)	2018/10/14		103	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/14		88	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/14		45 (1)	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/14		104	%	50 - 130
			Acenaphthene	2018/10/14		83	%	50 - 130
			Acenaphthylene	2018/10/14		89	%	50 - 130
			Acridine	2018/10/14		80	%	50 - 130
			Anthracene	2018/10/14		87	%	50 - 130
			Benzo(a)anthracene	2018/10/14		95	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/14		96	%	50 - 130
			Benzo(k)fluoranthene	2018/10/14		88	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/14		88	%	50 - 130
			Benzo(c)phenanthrene	2018/10/14		93	%	50 - 130
			Benzo(a)pyrene	2018/10/14		93	%	50 - 130
			Benzo[e]pyrene	2018/10/14		86	%	50 - 130
			Chrysene	2018/10/14		89	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/14		93	%	50 - 130
			Fluoranthene	2018/10/14		99	%	50 - 130
			Fluorene	2018/10/14		93	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/14		86	%	50 - 130
			1-Methylnaphthalene	2018/10/14		68	%	50 - 130
			2-Methylnaphthalene	2018/10/14		63	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Naphthalene	2018/10/14		59	%	50 - 130
			Phenanthrene	2018/10/14		91	%	50 - 130
			Perylene	2018/10/14		76	%	50 - 130
			Pyrene	2018/10/14		96	%	50 - 130
			Quinoline	2018/10/14		90	%	50 - 130
9180609	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/14		113	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/14		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/14		59	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/14		112	%	50 - 130
			Acenaphthene	2018/10/14		76	%	50 - 130
			Acenaphthylene	2018/10/14		88	%	50 - 130
			Acridine	2018/10/14		86	%	50 - 130
			Anthracene	2018/10/14		91	%	50 - 130
			Benzo(a)anthracene	2018/10/14		111	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/14		114	%	50 - 130
			Benzo(k)fluoranthene	2018/10/14		106	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/14		103	%	50 - 130
			Benzo(c)phenanthrene	2018/10/14		101	%	50 - 130
			Benzo(a)pyrene	2018/10/14		110	%	50 - 130
			Benzo[e]pyrene	2018/10/14		104	%	50 - 130
			Chrysene	2018/10/14		103	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/14		111	%	50 - 130
			Fluoranthene	2018/10/14		108	%	50 - 130
			Fluorene	2018/10/14		86	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/14		104	%	50 - 130
			1-Methylnaphthalene	2018/10/14		72	%	50 - 130
			2-Methylnaphthalene	2018/10/14		66	%	50 - 130
			Naphthalene	2018/10/14		72	%	50 - 130
			Phenanthrene	2018/10/14		89	%	50 - 130
			Perylene	2018/10/14		92	%	50 - 130
			Pyrene	2018/10/14		105	%	50 - 130
			Quinoline	2018/10/14		86	%	50 - 130
9180609	NK3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/14		111	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/14		97	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/14		66	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/14		110	%	50 - 130
			Acenaphthene	2018/10/14	<0.00010		mg/L	
			Acenaphthylene	2018/10/14	<0.00010		mg/L	
			Acridine	2018/10/14	<0.000050		mg/L	
			Anthracene	2018/10/14	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/14	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/14	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/14	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/14	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/14	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/14	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/14	<0.000050		mg/L	
			Chrysene	2018/10/14	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/14	<0.0000075		mg/L	
			Fluoranthene	2018/10/14	<0.000010		mg/L	
			Fluorene	2018/10/14	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/14	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/14	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/14	<0.00010		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Naphthalene	2018/10/14	<0.00010		mg/L	
			Phenanthrene	2018/10/14	<0.000050		mg/L	
			Perylene	2018/10/14	<0.000050		mg/L	
			Pyrene	2018/10/14	<0.000020		mg/L	
			Quinoline	2018/10/14	<0.00020		mg/L	
9180609	NK3	RPD	Acenaphthene	2018/10/14	NC		%	30
			Acenaphthylene	2018/10/14	NC		%	30
			Acridine	2018/10/14	NC		%	30
			Anthracene	2018/10/14	NC		%	30
			Benzo(a)anthracene	2018/10/14	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/14	NC		%	30
			Benzo(k)fluoranthene	2018/10/14	NC		%	30
			Benzo(g,h,i)perylene	2018/10/14	NC		%	30
			Benzo(c)phenanthrene	2018/10/14	NC		%	30
			Benzo(a)pyrene	2018/10/14	NC		%	30
			Benzo[e]pyrene	2018/10/14	NC		%	30
			Chrysene	2018/10/14	NC		%	30
			Dibenz(a,h)anthracene	2018/10/14	NC		%	30
			Fluoranthene	2018/10/14	NC		%	30
			Fluorene	2018/10/14	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/14	NC		%	30
			2-Methylnaphthalene	2018/10/14	NC		%	30
			Naphthalene	2018/10/14	NC		%	30
			Phenanthrene	2018/10/14	NC		%	30
			Perylene	2018/10/14	NC		%	30
			Pyrene	2018/10/14	NC		%	30
			Quinoline	2018/10/14	NC		%	30
9180616	MHF	Matrix Spike [UN1098-01]	O-TERPHENYL (sur.)	2018/10/13		83	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/13		87	%	60 - 140
9180616	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/13		89	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/13		95	%	60 - 140
9180616	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/13		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/13	<0.10		mg/L	
9180616	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/13	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).

(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).

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
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CHAIN OF CUSTODY RECORD

M 045926

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Sears Canada Inc.	Company:	Clifton Associates	Quotation #:	567554	☑ 5-7 Days Regular (Most analyses)
Contact Name:	Wayne E. Prada	Contact Name:	Stephen d'Abadie	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	290 Yonge Street, Suite 700 Toronto, ON, M5B 2C3	Address:	2222 – 30th Ave. Calgary, AB T2E 7K9	Project #:	CG2930.1 E32	Rush TAT (Surcharges will be applied) ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	416-941-2126	Phone:	403-263-2556	Site Location:		
Email:	wprada@searsca	Email:	stephen_dabadie@clifton.ca	Site #:		Date Required:
Copies:		Copies:	terry_kuzyk@clifton.ca	Sampled By:		Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	2	2	2
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

Regulatory Criteria: ☑ ATS ☐ CCME ☐ Drinking Water ☐ DSD (Drilling Waste) ☐ Saskatchewan ☐ Other:

Special Instructions

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☑ VOC	BTEX F3-F2	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	BTEX/F1	HOLD - DO NOT ANALYZE
1	1906		2018.10.10	13:30	GW	8	✓	✓									✓		
2	1911		↓	13:10	↓	8	✓	✓									✓		
3	1924			14:10		8	✓	✓									✓		
4	1971			13:45		7	✓	✓									✓		
5	1976			13:20		8	✓	✓									✓		
6	2007			13:00		8	✓	✓									✓		
7	2010			12:50		8	✓	✓									✓		
8	2012			12:35	↓	8	✓	✓									✓		
9	9971		↓	13:45	GW	7	✓	✓									✓		
10	Trip Blank 1		2018.10.10		W		✓											✓	
	Please Indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P		

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018/10/10	14:45	ISABELLA LUM	2018/10/10	14:45

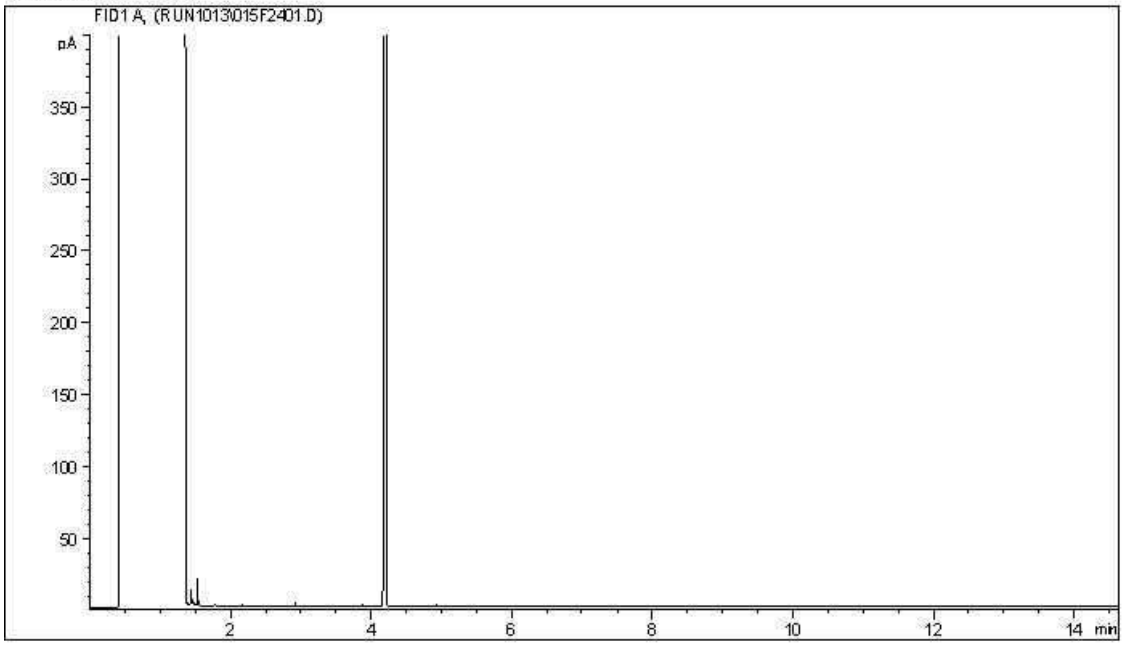
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is an acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca

10-Oct-18 14:45
Leanne Cameron
B888411
JMQ INS-0172

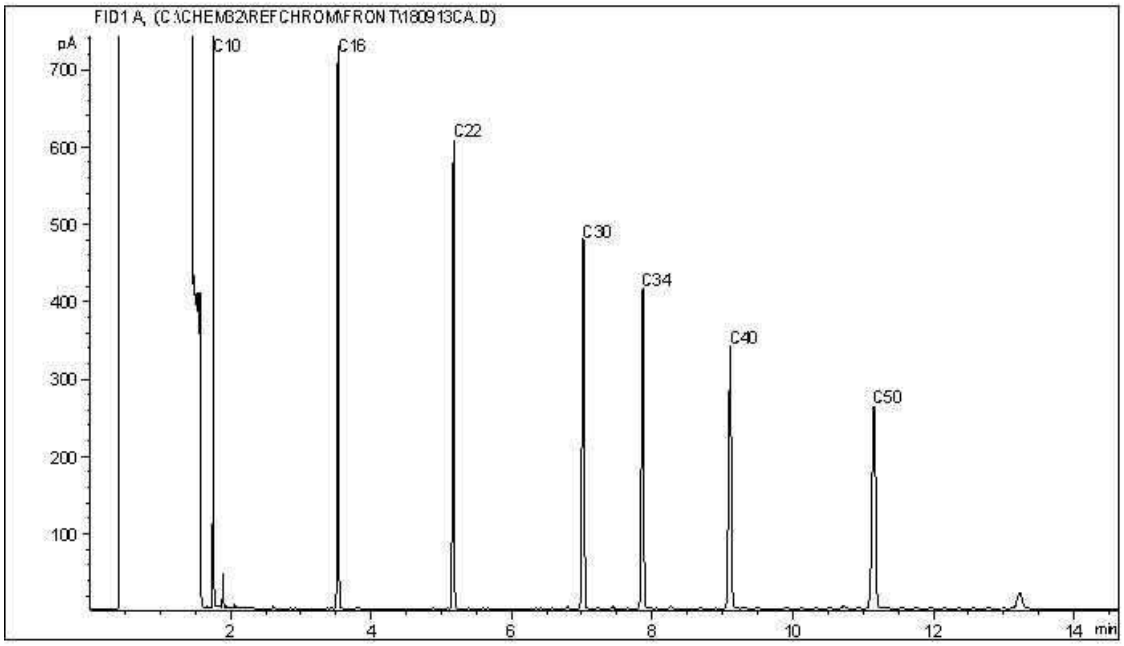
AB-PCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



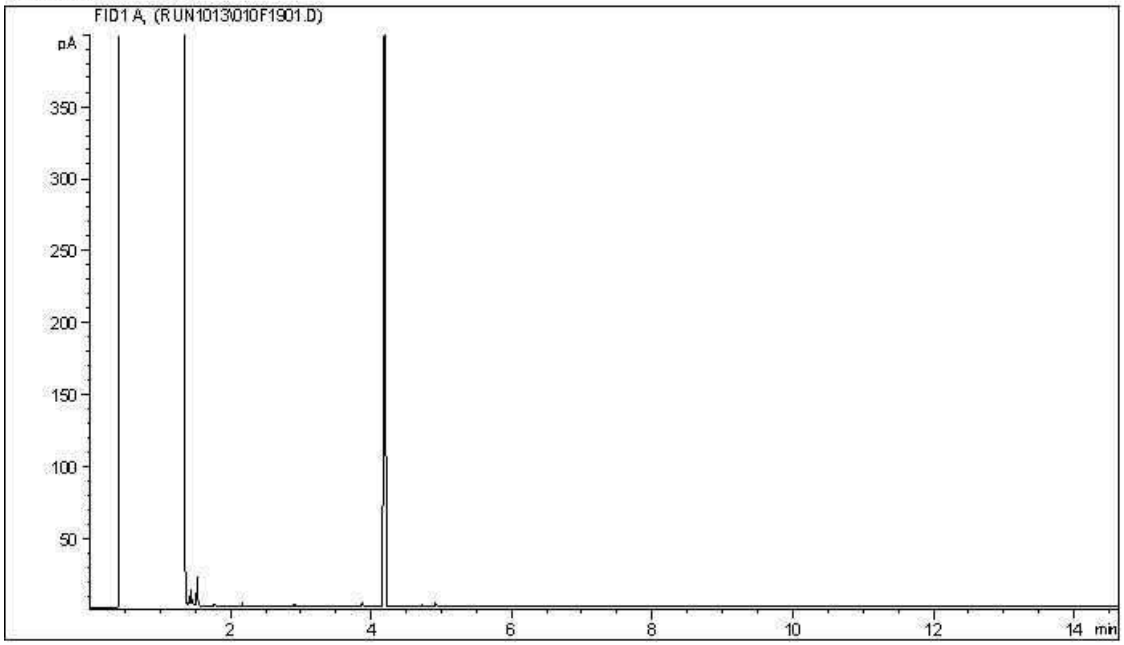
TYPICAL PRODUCT CARBON NUMBER RANGES

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 in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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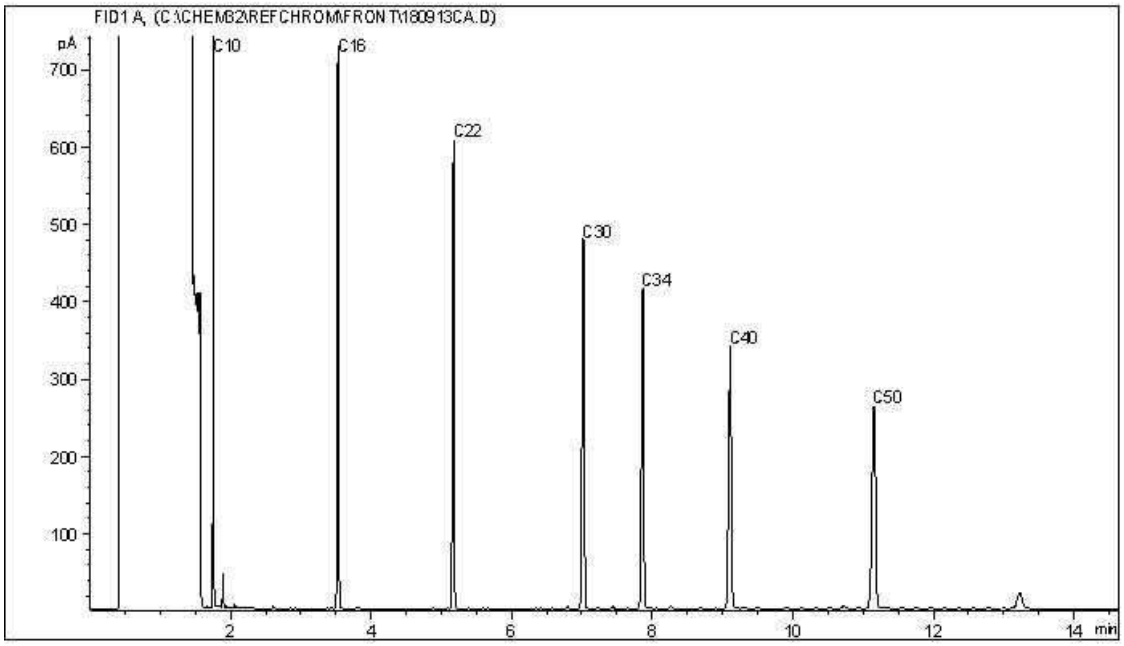

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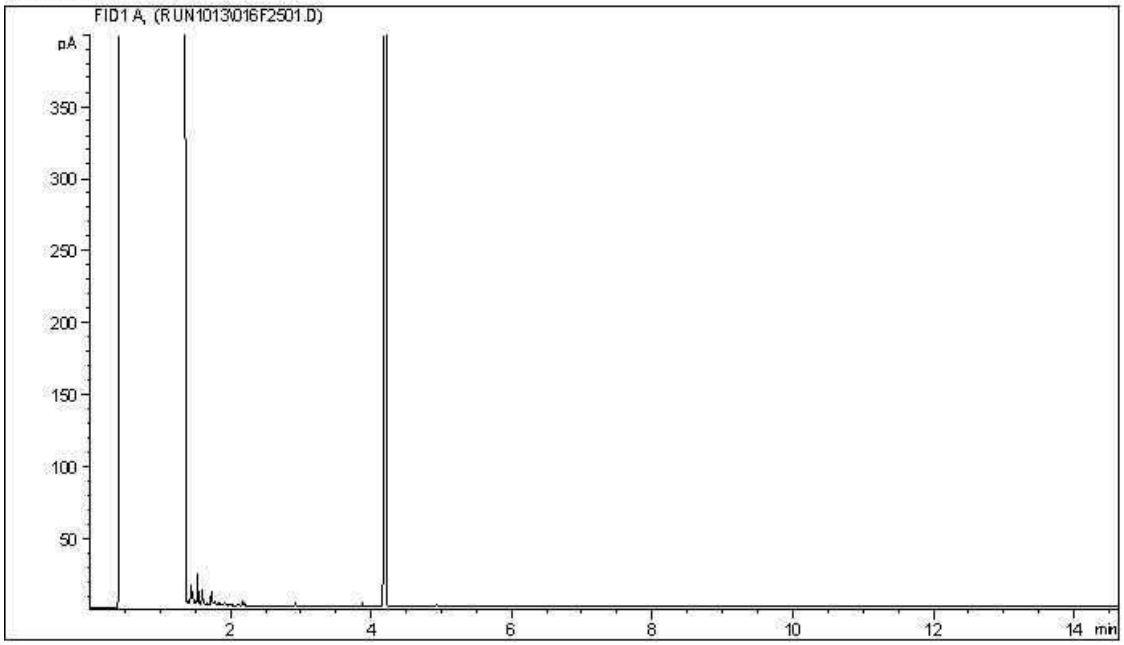

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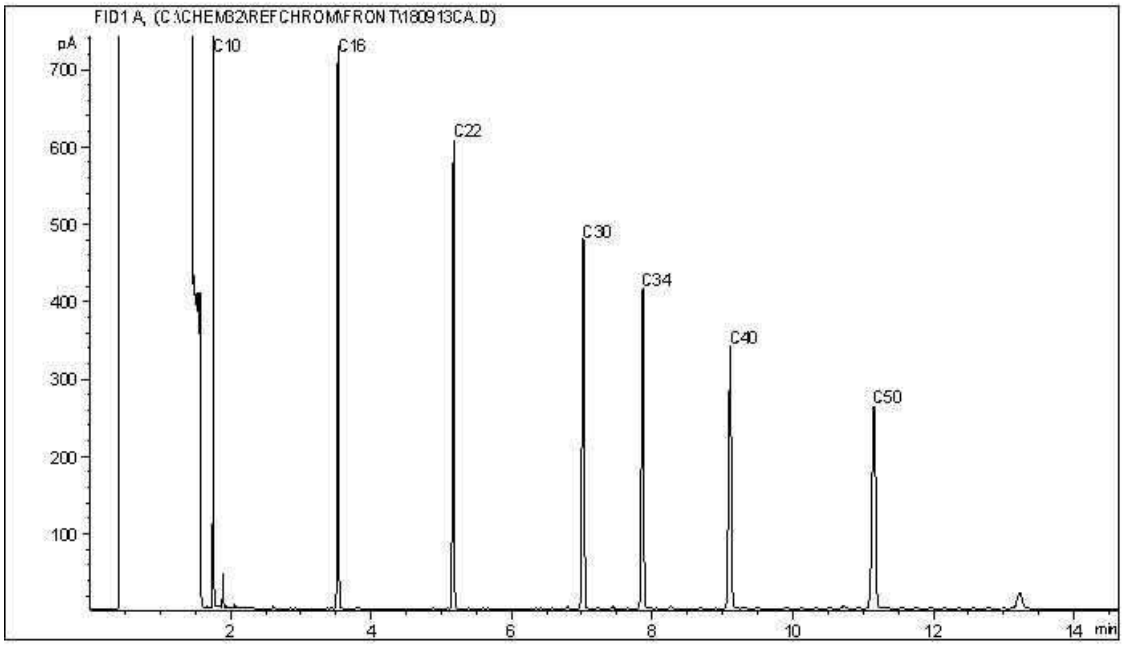

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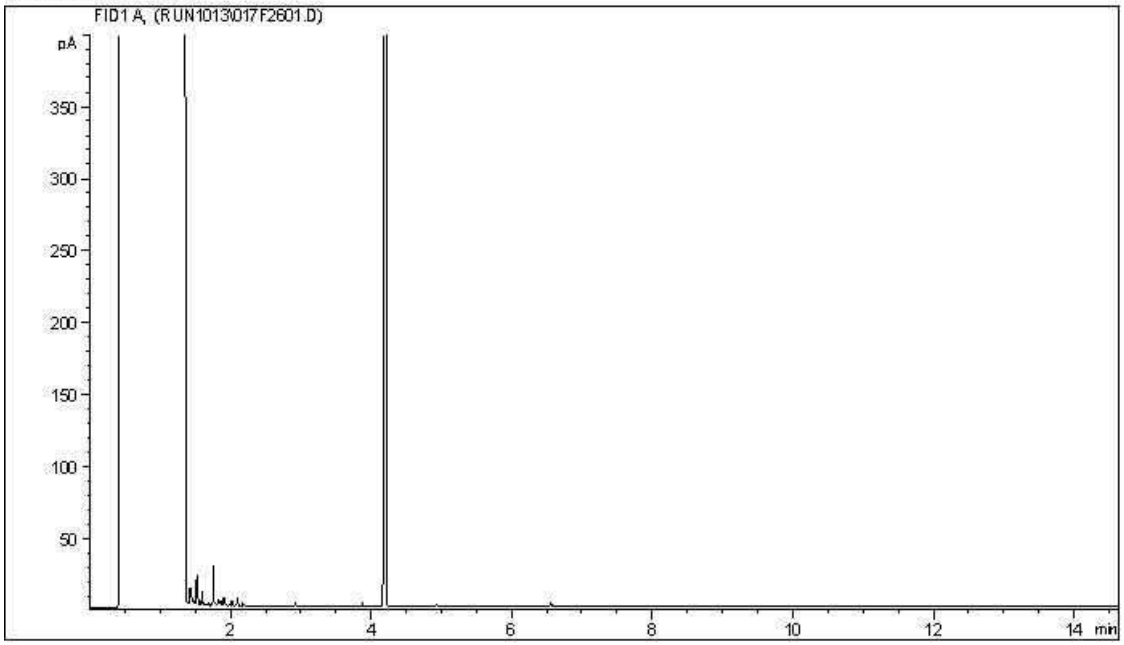

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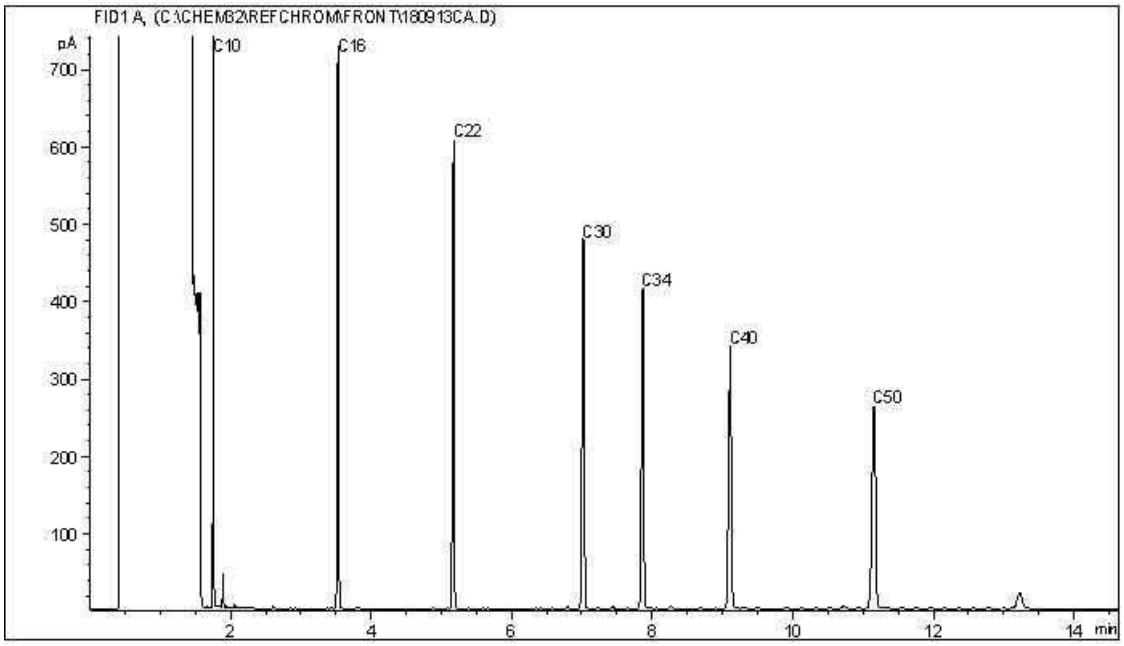

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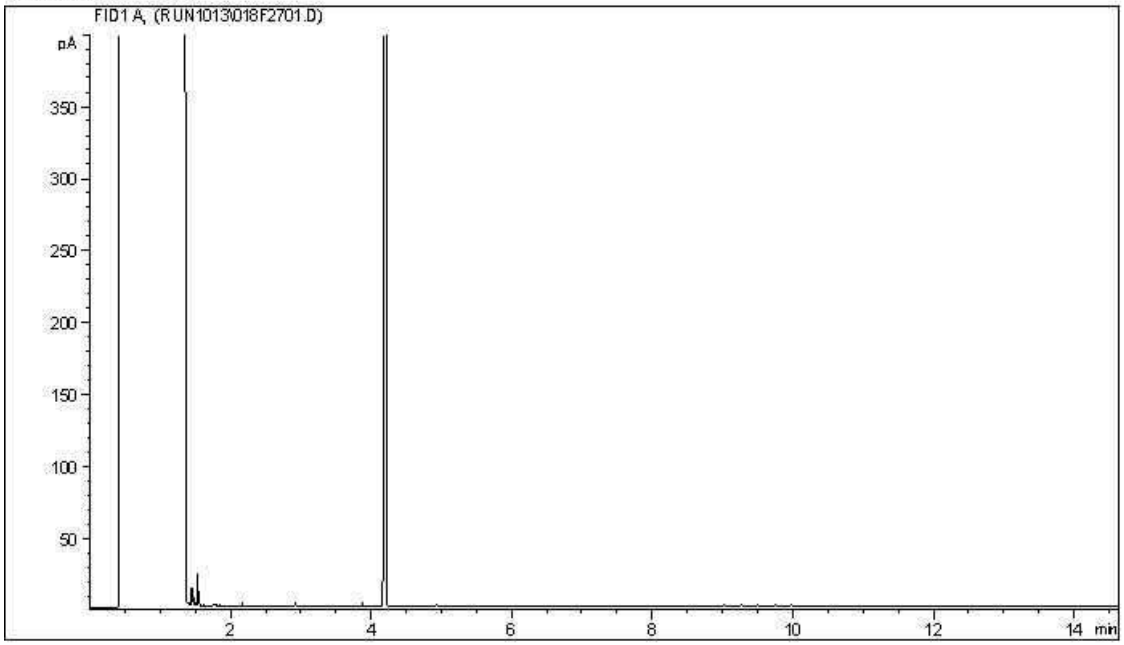

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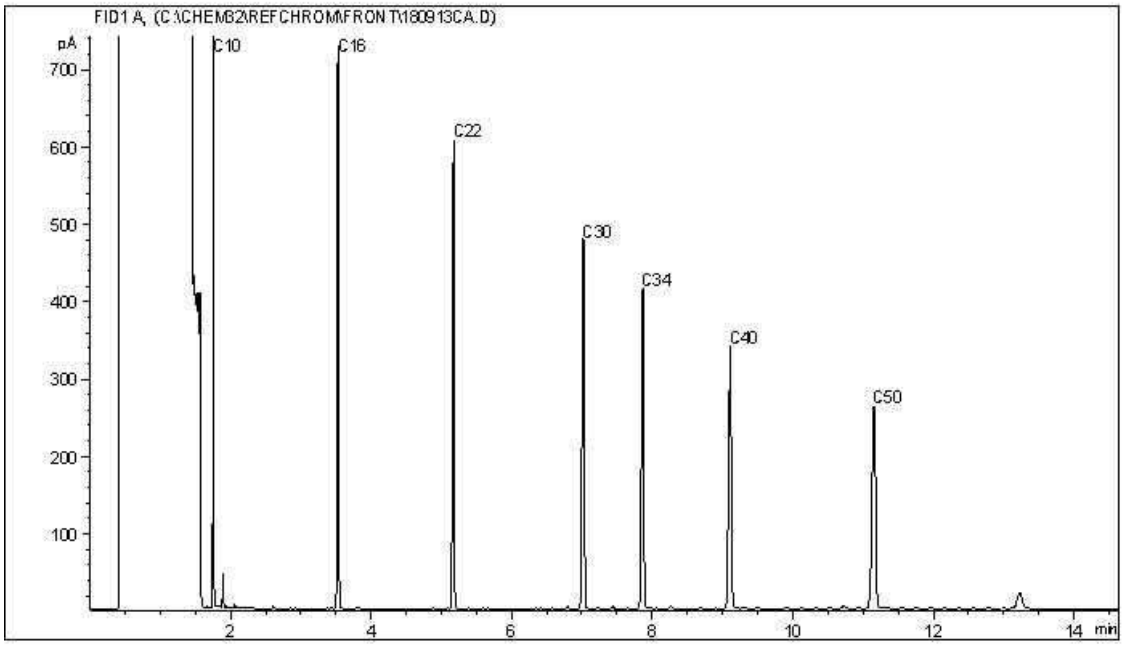

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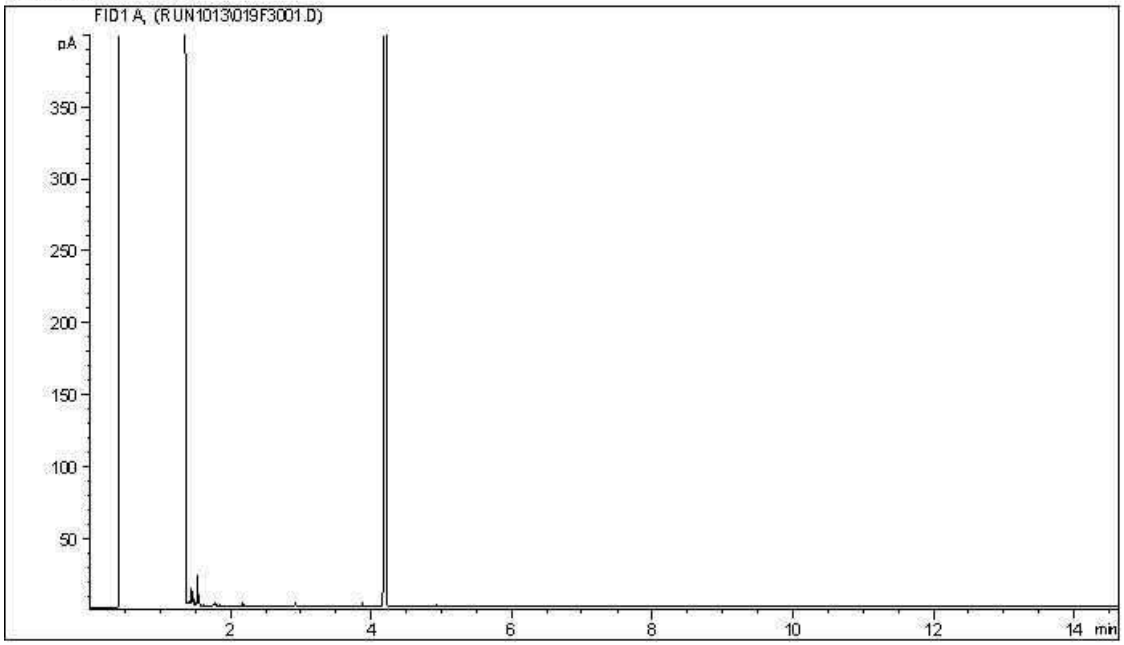

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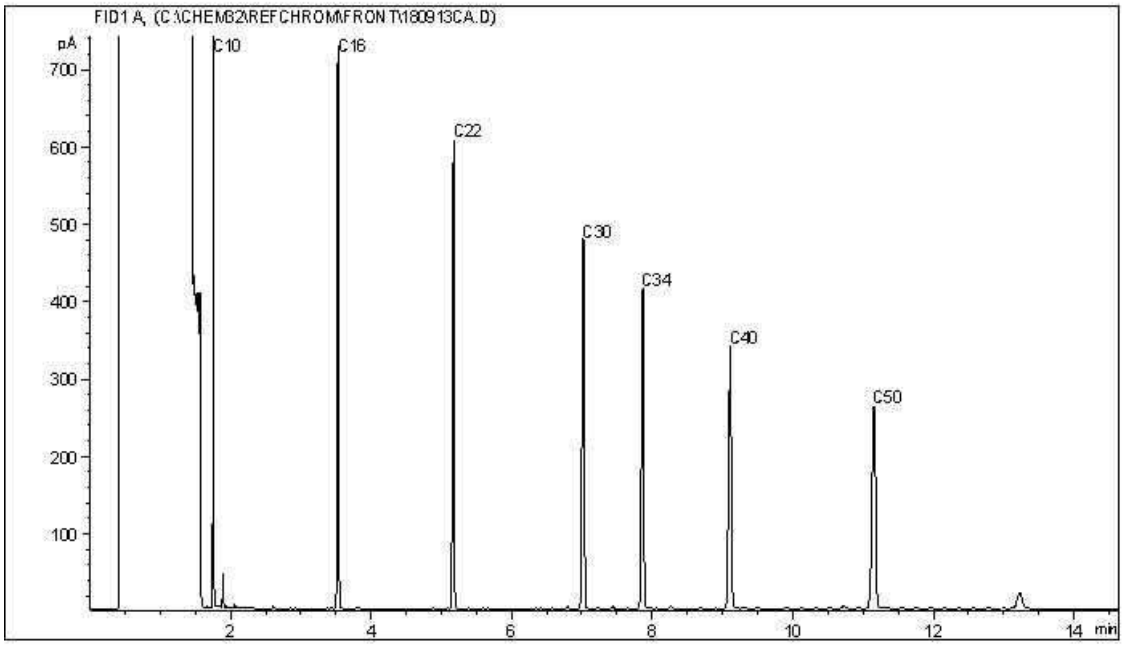

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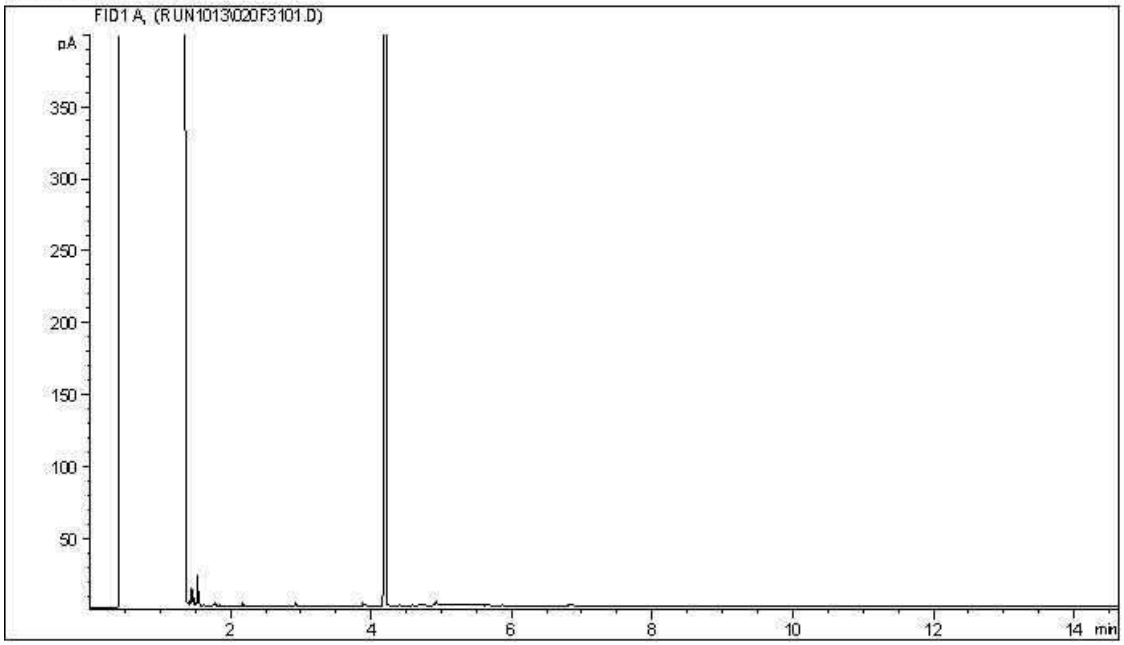

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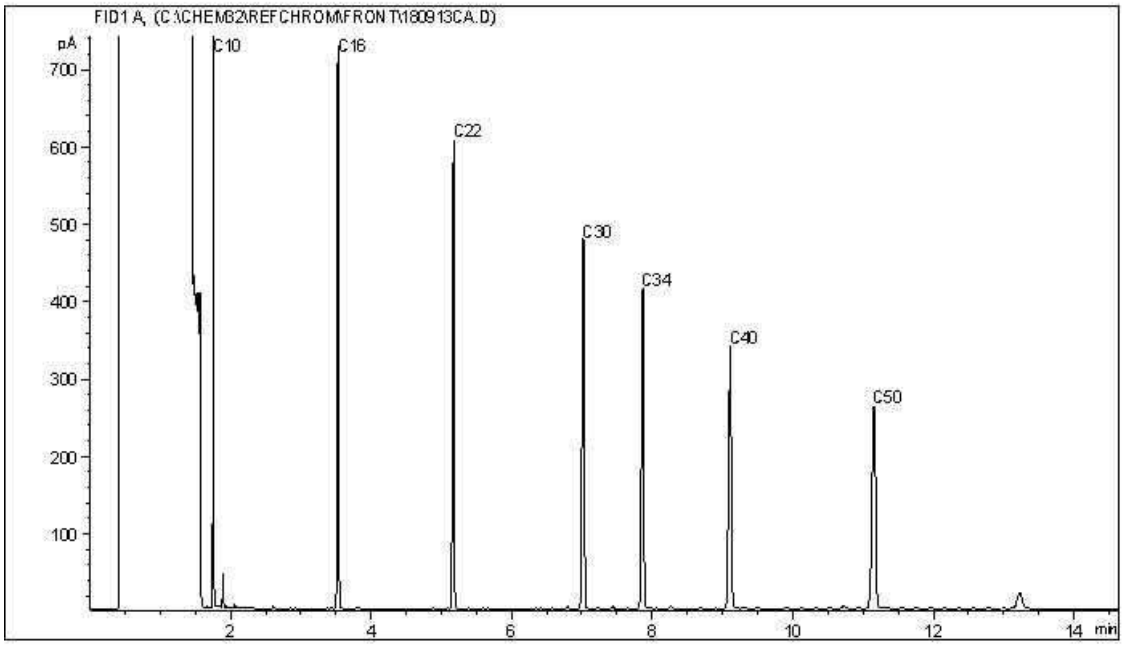

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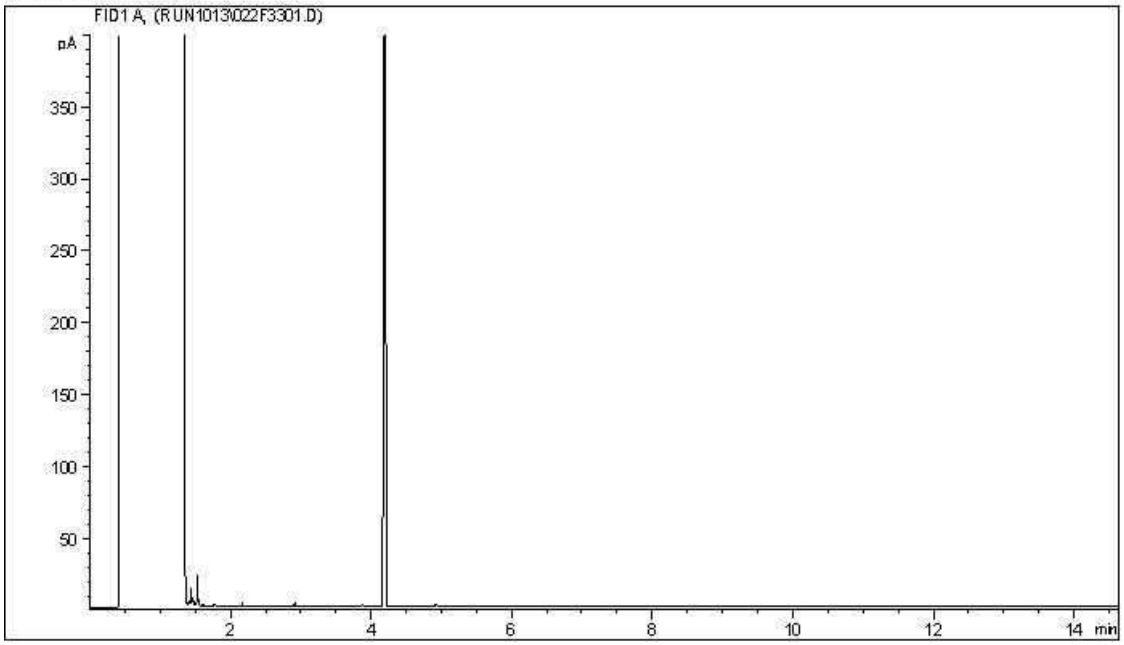

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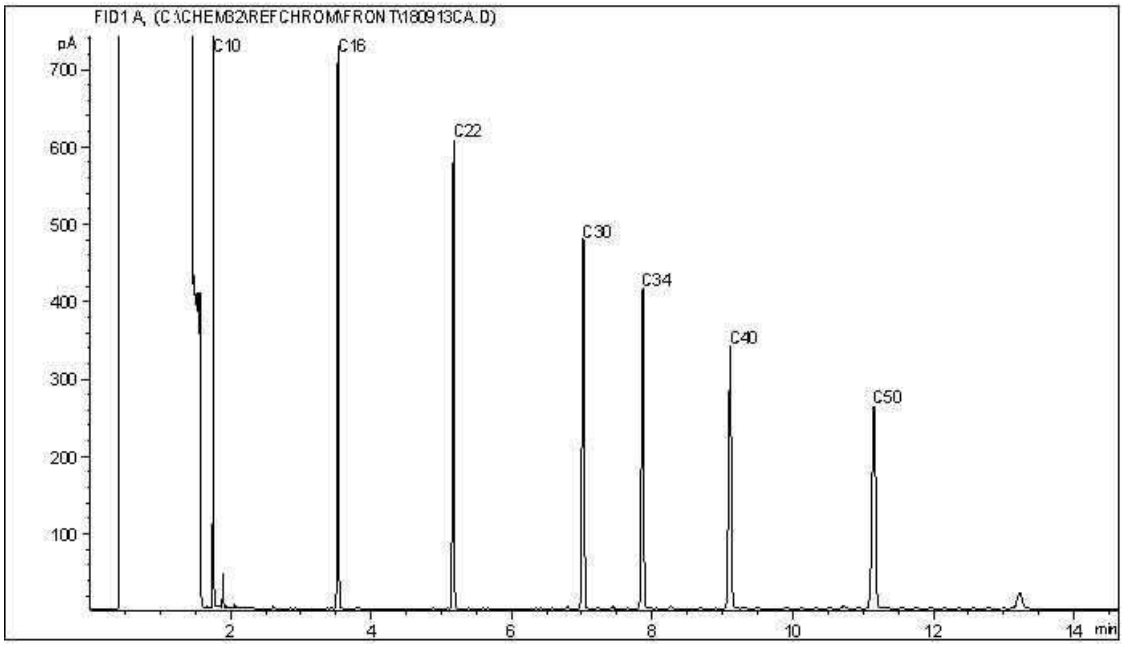

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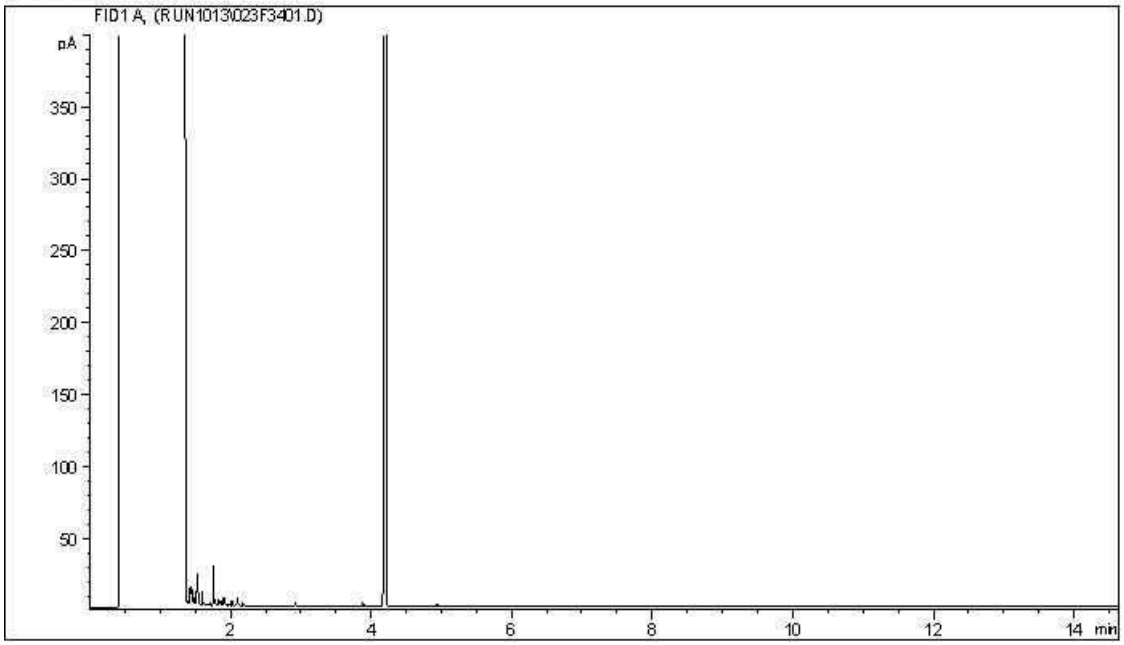
Maxxam Job #: B888411
Report Date: 2018/10/17
Maxxam Sample: UN1105

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Client ID: 9971

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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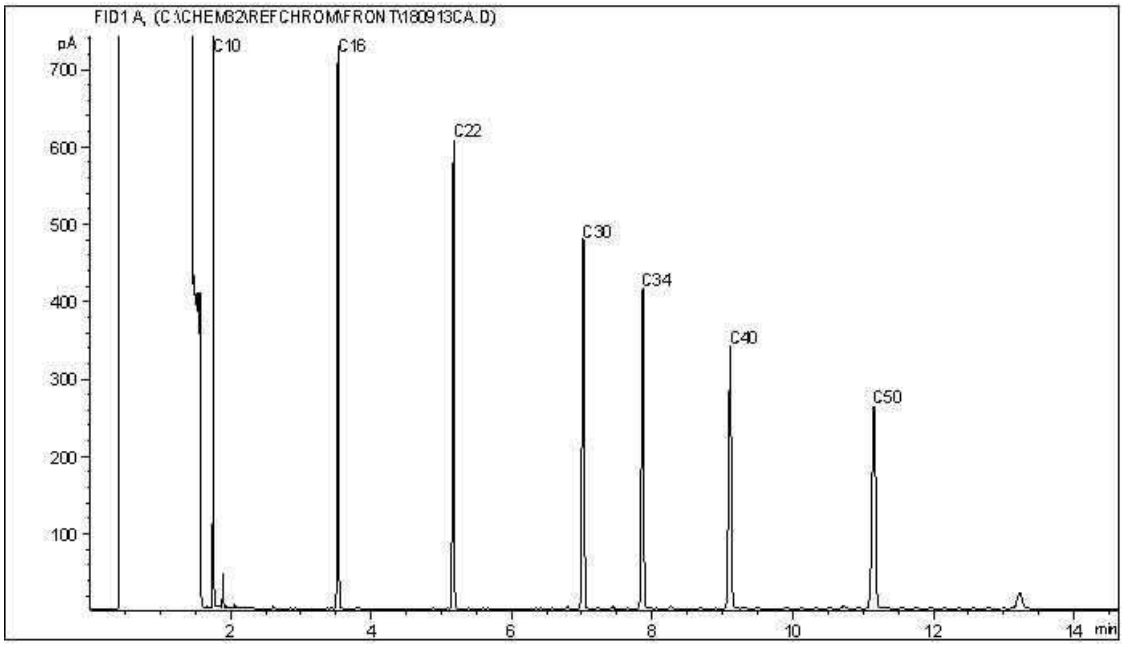

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Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1E32
Your C.O.C. #: M045925

Attention: Stephen D'Abadie

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

Report Date: 2018/10/17
Report #: R2635939
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B888858
Received: 2018/10/11, 14:28

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2018/10/12	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/10/15	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/10/12	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	7	2018/10/13	2018/10/14	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	2	2018/10/15	2018/10/15	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	7	N/A	2018/10/17	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	5	2018/10/13	2018/10/14	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
PAH in Water by GC/MS	2	2018/10/13	2018/10/15	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	10	N/A	2018/10/15	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	10	N/A	2018/10/13	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1E32
Your C.O.C. #: M045925

Attention: Stephen D'Abadie

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

Report Date: 2018/10/17
Report #: R2635939
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B888858
Received: 2018/10/11, 14:28

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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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
==========
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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B888858
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UN3718	UN3718	UN3719	UN3720		UN3721		
Sampling Date		2018/10/11 13:30	2018/10/11 13:30	2018/10/11 13:15	2018/10/11 13:00		2018/10/11 11:15		
COC Number		M045925	M045925	M045925	M045925		M045925		
	UNITS	**1907**	**1907 Lab-Dup**	**1908**	**1910**	**QC Batch**	**1918**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	<0.10	9180616	<0.10	0.10	9182368
Volatiles									
Benzene	mg/L	0.0037	0.0036	0.00083	0.66	9181293	<0.00040	0.00040	9181293
Toluene	mg/L	0.018	0.018	<0.00040	<0.00040	9181293	<0.00040	0.00040	9181293
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	9181293	<0.00040	0.00040	9181293
m & p-Xylene	mg/L	0.011	0.011	<0.00080	<0.00080	9181293	<0.00080	0.00080	9181293
o-Xylene	mg/L	0.0045	0.0045	<0.00040	<0.00040	9181293	<0.00040	0.00040	9181293
Xylenes (Total)	mg/L	0.015	N/A	<0.00089	<0.00089	9179454	<0.00089	0.00089	9179454
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	<0.10	9179454	<0.10	0.10	9179454
F1 (C6-C10)	mg/L	<0.10	0.10	<0.10	0.75	9181293	<0.10	0.10	9181293
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	104	103	115	115	9181293	115	N/A	9181293
4-Bromofluorobenzene (sur.)	%	92	92	93	93	9181293	93	N/A	9181293
D4-1,2-Dichloroethane (sur.)	%	99	98	78	80	9181293	78	N/A	9181293
O-TERPHENYL (sur.)	%	89	N/A	88	94	9180616	94	N/A	9182368

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B888858
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UN3722		UN3723		UN3724	UN3725		
Sampling Date		2018/10/11 10:10		2018/10/11 11:30		2018/10/11 14:10	2018/10/11 13:50		
COC Number		M045925		M045925		M045925	M045925		
	UNITS	**1933**	**QC Batch**	**1953**	**QC Batch**	**1966**	**1102**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	9180616	<0.10	9182368	<0.10	<0.10	0.10	9180616
Volatiles									
Benzene	mg/L	<0.00040	9181293	<0.00040	9181293	<0.00040	<0.00040	0.00040	9181293
Toluene	mg/L	<0.00040	9181293	<0.00040	9181293	<0.00040	<0.00040	0.00040	9181293
Ethylbenzene	mg/L	<0.00040	9181293	<0.00040	9181293	<0.00040	<0.00040	0.00040	9181293
m & p-Xylene	mg/L	<0.00080	9181293	<0.00080	9181293	<0.00080	<0.00080	0.00080	9181293
o-Xylene	mg/L	<0.00040	9181293	<0.00040	9181293	<0.00040	<0.00040	0.00040	9181293
Xylenes (Total)	mg/L	<0.00089	9179454	<0.00089	9179454	<0.00089	<0.00089	0.00089	9180864
F1 (C6-C10) - BTEX	mg/L	<0.10	9179454	<0.10	9179454	<0.10	<0.10	0.10	9180864
F1 (C6-C10)	mg/L	<0.10	9181293	<0.10	9181293	<0.10	<0.10	0.10	9181293
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	117	9181293	118	9181293	116	117	N/A	9181293
4-Bromofluorobenzene (sur.)	%	93	9181293	93	9181293	93	93	N/A	9181293
D4-1,2-Dichloroethane (sur.)	%	76	9181293	77	9181293	78	77	N/A	9181293
O-TERPHENYL (sur.)	%	84	9180616	90	9182368	95	90	N/A	9180616

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B888858
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UN3726		
Sampling Date		2018/10/11 13:30		
COC Number		M045925		
	UNITS	**9907**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9180616
Volatiles				
Benzene	mg/L	0.0032	0.00040	9181293
Toluene	mg/L	0.018	0.00040	9181293
Ethylbenzene	mg/L	<0.00040	0.00040	9181293
m & p-Xylene	mg/L	0.011	0.00080	9181293
o-Xylene	mg/L	0.0045	0.00040	9181293
Xylenes (Total)	mg/L	0.015	0.00089	9179454
F1 (C6-C10) - BTEX	mg/L	0.11	0.10	9179454
F1 (C6-C10)	mg/L	0.14	0.10	9181293
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	117	N/A	9181293
4-Bromofluorobenzene (sur.)	%	93	N/A	9181293
D4-1,2-Dichloroethane (sur.)	%	74	N/A	9181293
O-TERPHENYL (sur.)	%	89	N/A	9180616

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3718	UN3719	UN3720	UN3722	UN3724		
Sampling Date		2018/10/11 13:30	2018/10/11 13:15	2018/10/11 13:00	2018/10/11 10:10	2018/10/11 14:10		
COC Number		M045925	M045925	M045925	M045925	M045925		
	UNITS	**1907**	**1908**	**1910**	**1933**	**1966**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9180424
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9180609
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9180609
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9180609
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9180609
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9180609
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9180609
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9180609
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9180609
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9180609
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	118	115	122	110	116	N/A	9180609
D8-ACENAPHTHYLENE (sur.)	%	96	98	113	97	104	N/A	9180609
D8-NAPHTHALENE (sur.)	%	49 (1)	55	81	62	68	N/A	9180609
TERPHENYL-D14 (sur.)	%	121	120	129	115	123	N/A	9180609

RDL = Reportable Detection Limit
N/A = Not Applicable
(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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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3725	UN3726		
Sampling Date		2018/10/11 13:50	2018/10/11 13:30		
COC Number		M045925	M045925		
	UNITS	**1102**	**9907**	**RDL**	**QC Batch**
Polycyclic Aromatics					
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	0.000010	9180424
Acenaphthene	mg/L	<0.00010	<0.00010	0.00010	9180609
Acenaphthylene	mg/L	<0.00010	<0.00010	0.00010	9180609
Acridine	mg/L	<0.000050	<0.000050	0.000050	9180609
Anthracene	mg/L	<0.000010	<0.000010	0.000010	9180609
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	0.0000085	9180609
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	0.000050	9180609
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	0.0000075	9180609
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	0.000050	9180609
Chrysene	mg/L	<0.0000085	<0.0000085	0.0000085	9180609
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	0.0000075	9180609
Fluoranthene	mg/L	<0.000010	<0.000010	0.000010	9180609
Fluorene	mg/L	<0.000050	<0.000050	0.000050	9180609
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	0.0000085	9180609
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	0.00010	9180609
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	0.00010	9180609
Naphthalene	mg/L	<0.00010	<0.00010	0.00010	9180609
Phenanthrene	mg/L	<0.000050	<0.000050	0.000050	9180609
Perylene	mg/L	<0.000050	<0.000050	0.000050	9180609
Pyrene	mg/L	<0.000020	<0.000020	0.000020	9180609
Quinoline	mg/L	<0.00020	<0.00020	0.00020	9180609
Surrogate Recovery (%)					
D10-ANTHRACENE (sur.)	%	116	115	N/A	9180609
D8-ACENAPHTHYLENE (sur.)	%	96	101	N/A	9180609
D8-NAPHTHALENE (sur.)	%	49 (1)	58	N/A	9180609
TERPHENYL-D14 (sur.)	%	122	121	N/A	9180609

RDL = Reportable Detection Limit
N/A = Not Applicable
(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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Maxxam Job #: B888858
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3718	UN3718	UN3719	UN3720	UN3721		
Sampling Date		2018/10/11 13:30	2018/10/11 13:30	2018/10/11 13:15	2018/10/11 13:00	2018/10/11 11:15		
COC Number		M045925	M045925	M045925	M045925	M045925		
	UNITS	**1907**	**1907 Lab-Dup**	**1908**	**1910**	**1918**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	N/A	<0.0013	<0.0013	<0.0013	0.0013	9180053
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9181314
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,2-dichloroethane	mg/L	<0.00050	<0.00050	0.0013	0.048	<0.00050	0.00050	9181314
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3718	UN3718	UN3719	UN3720	UN3721		
Sampling Date		2018/10/11 13:30	2018/10/11 13:30	2018/10/11 13:15	2018/10/11 13:00	2018/10/11 11:15		
COC Number		M045925	M045925	M045925	M045925	M045925		
	UNITS	**1907**	**1907 Lab-Dup**	**1908**	**1910**	**1918**	**RDL**	**QC Batch**
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	99	99	102	100	N/A	9181314
4-Bromofluorobenzene (sur.)	%	97	98	98	97	98	N/A	9181314
D4-1,2-Dichloroethane (sur.)	%	112	106	106	134	101	N/A	9181314

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3722	UN3723	UN3724	UN3725	UN3726		
Sampling Date		2018/10/11 10:10	2018/10/11 11:30	2018/10/11 14:10	2018/10/11 13:50	2018/10/11 13:30		
COC Number		M045925	M045925	M045925	M045925	M045925		
	UNITS	**1933**	**1953**	**1966**	**1102**	**9907**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9180053
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9181314
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9181314
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9181314
RDL = Reportable Detection Limit								

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3722	UN3723	UN3724	UN3725	UN3726		
Sampling Date		2018/10/11 10:10	2018/10/11 11:30	2018/10/11 14:10	2018/10/11 13:50	2018/10/11 13:30		
COC Number		M045925	M045925	M045925	M045925	M045925		
	UNITS	**1933**	**1953**	**1966**	**1102**	**9907**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9181314
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	99	99	99	99	N/A	9181314
4-Bromofluorobenzene (sur.)	%	99	98	97	99	98	N/A	9181314
D4-1,2-Dichloroethane (sur.)	%	107	103	102	109	111	N/A	9181314

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3727		
Sampling Date		2018/10/11		
COC Number		M045925		
	UNITS	**TRIP BLANK 2**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9180053
Benzene	mg/L	<0.00040	0.00040	9181314
Bromodichloromethane	mg/L	<0.00050	0.00050	9181314
Bromoform	mg/L	<0.00050	0.00050	9181314
Bromomethane	mg/L	<0.0020	0.0020	9181314
Carbon tetrachloride	mg/L	<0.00050	0.00050	9181314
Chlorobenzene	mg/L	<0.00050	0.00050	9181314
Chlorodibromomethane	mg/L	<0.0010	0.0010	9181314
Chloroethane	mg/L	<0.0010	0.0010	9181314
Chloroform	mg/L	<0.00050	0.00050	9181314
Chloromethane	mg/L	<0.0020	0.0020	9181314
1,2-dibromoethane	mg/L	<0.00020	0.00020	9181314
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9181314
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9181314
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9181314
1,1-dichloroethane	mg/L	<0.00050	0.00050	9181314
1,2-dichloroethane	mg/L	<0.00050	0.00050	9181314
1,1-dichloroethene	mg/L	<0.00050	0.00050	9181314
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9181314
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9181314
Dichloromethane	mg/L	<0.0020	0.0020	9181314
1,2-dichloropropane	mg/L	<0.00050	0.00050	9181314
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9181314
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9181314
Ethylbenzene	mg/L	<0.00040	0.00040	9181314
Methyl methacrylate	mg/L	<0.00050	0.00050	9181314
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9181314
Styrene	mg/L	<0.00050	0.00050	9181314
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9181314
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9181314
Tetrachloroethene	mg/L	<0.00050	0.00050	9181314
RDL = Reportable Detection Limit				

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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN3727		
Sampling Date		2018/10/11		
COC Number		M045925		
	UNITS	**TRIP BLANK 2**	**RDL**	**QC Batch**
Toluene	mg/L	<0.00040	0.00040	9181314
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9181314
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9181314
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9181314
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9181314
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9181314
Trichloroethene	mg/L	<0.00050	0.00050	9181314
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9181314
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9181314
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9181314
Vinyl chloride	mg/L	<0.00050	0.00050	9181314
Xylenes (Total)	mg/L	<0.00080	0.00080	9181314
m & p-Xylene	mg/L	<0.00080	0.00080	9181314
o-Xylene	mg/L	<0.00040	0.00040	9181314
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	100	N/A	9181314
4-Bromofluorobenzene (sur.)	%	99	N/A	9181314
D4-1,2-Dichloroethane (sur.)	%	105	N/A	9181314

RDL = Reportable Detection Limit
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GENERAL COMMENTS

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

Package 1	4.7°C

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9180609	NK3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/10/14		103	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/14		88	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/14		45 (1)	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/14		104	%	50 - 130
			Acenaphthene	2018/10/14		83	%	50 - 130
			Acenaphthylene	2018/10/14		89	%	50 - 130
			Acridine	2018/10/14		80	%	50 - 130
			Anthracene	2018/10/14		87	%	50 - 130
			Benzo(a)anthracene	2018/10/14		95	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/14		96	%	50 - 130
			Benzo(k)fluoranthene	2018/10/14		88	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/14		88	%	50 - 130
			Benzo(c)phenanthrene	2018/10/14		93	%	50 - 130
			Benzo(a)pyrene	2018/10/14		93	%	50 - 130
			Benzo[e]pyrene	2018/10/14		86	%	50 - 130
			Chrysene	2018/10/14		89	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/14		93	%	50 - 130
			Fluoranthene	2018/10/14		99	%	50 - 130
			Fluorene	2018/10/14		93	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/14		86	%	50 - 130
			1-Methylnaphthalene	2018/10/14		68	%	50 - 130
			2-Methylnaphthalene	2018/10/14		63	%	50 - 130
			Naphthalene	2018/10/14		59	%	50 - 130
			Phenanthrene	2018/10/14		91	%	50 - 130
			Perylene	2018/10/14		76	%	50 - 130
			Pyrene	2018/10/14		96	%	50 - 130
			Quinoline	2018/10/14		90	%	50 - 130
9180609	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/14		113	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/14		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/14		59	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/14		112	%	50 - 130
			Acenaphthene	2018/10/14		76	%	50 - 130
			Acenaphthylene	2018/10/14		88	%	50 - 130
			Acridine	2018/10/14		86	%	50 - 130
			Anthracene	2018/10/14		91	%	50 - 130
			Benzo(a)anthracene	2018/10/14		111	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/14		114	%	50 - 130
			Benzo(k)fluoranthene	2018/10/14		106	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/14		103	%	50 - 130
			Benzo(c)phenanthrene	2018/10/14		101	%	50 - 130
			Benzo(a)pyrene	2018/10/14		110	%	50 - 130
			Benzo[e]pyrene	2018/10/14		104	%	50 - 130
			Chrysene	2018/10/14		103	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/14		111	%	50 - 130
			Fluoranthene	2018/10/14		108	%	50 - 130
			Fluorene	2018/10/14		86	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/14		104	%	50 - 130
			1-Methylnaphthalene	2018/10/14		72	%	50 - 130
			2-Methylnaphthalene	2018/10/14		66	%	50 - 130
			Naphthalene	2018/10/14		72	%	50 - 130
			Phenanthrene	2018/10/14		89	%	50 - 130
			Perylene	2018/10/14		92	%	50 - 130
			Pyrene	2018/10/14		105	%	50 - 130
			Quinoline	2018/10/14		86	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9180609	NK3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/14		111	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/14		97	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/14		66	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/14		110	%	50 - 130
			Acenaphthene	2018/10/14	<0.00010		mg/L	
			Acenaphthylene	2018/10/14	<0.00010		mg/L	
			Acridine	2018/10/14	<0.000050		mg/L	
			Anthracene	2018/10/14	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/14	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/14	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/14	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/14	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/14	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/14	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/14	<0.000050		mg/L	
			Chrysene	2018/10/14	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/14	<0.0000075		mg/L	
			Fluoranthene	2018/10/14	<0.000010		mg/L	
			Fluorene	2018/10/14	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/14	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/14	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/14	<0.00010		mg/L	
			Naphthalene	2018/10/14	<0.00010		mg/L	
			Phenanthrene	2018/10/14	<0.000050		mg/L	
			Perylene	2018/10/14	<0.000050		mg/L	
			Pyrene	2018/10/14	<0.000020		mg/L	
			Quinoline	2018/10/14	<0.00020		mg/L	
9180609	NK3	RPD	Acenaphthene	2018/10/14	NC		%	30
			Acenaphthylene	2018/10/14	NC		%	30
			Acridine	2018/10/14	NC		%	30
			Anthracene	2018/10/14	NC		%	30
			Benzo(a)anthracene	2018/10/14	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/14	NC		%	30
			Benzo(k)fluoranthene	2018/10/14	NC		%	30
			Benzo(g,h,i)perylene	2018/10/14	NC		%	30
			Benzo(c)phenanthrene	2018/10/14	NC		%	30
			Benzo(a)pyrene	2018/10/14	NC		%	30
			Benzo[e]pyrene	2018/10/14	NC		%	30
			Chrysene	2018/10/14	NC		%	30
			Dibenz(a,h)anthracene	2018/10/14	NC		%	30
			Fluoranthene	2018/10/14	NC		%	30
			Fluorene	2018/10/14	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/14	NC		%	30
			2-Methylnaphthalene	2018/10/14	NC		%	30
			Naphthalene	2018/10/14	NC		%	30
			Phenanthrene	2018/10/14	NC		%	30
			Perylene	2018/10/14	NC		%	30
			Pyrene	2018/10/14	NC		%	30
			Quinoline	2018/10/14	NC		%	30
9180616	MHF	Matrix Spike	O-TERPHENYL (sur.)	2018/10/13		83	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/13		87	%	60 - 140
9180616	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/13		89	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/13		95	%	60 - 140
9180616	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/13		95	%	60 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F2 (C10-C16 Hydrocarbons)	2018/10/13	<0.10		mg/L	
9180616	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/13	NC		%	30
9181293	RSU	Matrix Spike [UN3719-02]	1,4-Difluorobenzene (sur.)	2018/10/12		109	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/12		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/12		77	%	50 - 140
			Benzene	2018/10/12		90	%	50 - 140
			Toluene	2018/10/12		93	%	50 - 140
			Ethylbenzene	2018/10/12		101	%	50 - 140
			m & p-Xylene	2018/10/12		100	%	50 - 140
			o-Xylene	2018/10/12		93	%	50 - 140
			F1 (C6-C10)	2018/10/12		111	%	60 - 140
9181293	RSU	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/12		113	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/12		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/12		80	%	50 - 140
			Benzene	2018/10/12		83	%	60 - 130
			Toluene	2018/10/12		85	%	60 - 130
			Ethylbenzene	2018/10/12		93	%	60 - 130
			m & p-Xylene	2018/10/12		93	%	60 - 130
			o-Xylene	2018/10/12		86	%	60 - 130
			F1 (C6-C10)	2018/10/12		95	%	60 - 140
9181293	RSU	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/12		116	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/12		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/12		77	%	50 - 140
			Benzene	2018/10/12	<0.00040		mg/L	
			Toluene	2018/10/12	<0.00040		mg/L	
			Ethylbenzene	2018/10/12	<0.00040		mg/L	
			m & p-Xylene	2018/10/12	<0.00080		mg/L	
			o-Xylene	2018/10/12	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/12	<0.10		mg/L	
9181293	RSU	RPD [UN3718-02]	Benzene	2018/10/15	1.1		%	30
			Toluene	2018/10/15	0		%	30
			Ethylbenzene	2018/10/15	NC		%	30
			m & p-Xylene	2018/10/15	0		%	30
			o-Xylene	2018/10/15	0.88		%	30
			F1 (C6-C10)	2018/10/15	2.0		%	30
9181314	MZ	Matrix Spike [UN3719-02]	1,4-Difluorobenzene (sur.)	2018/10/13		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		102	%	50 - 140
			Benzene	2018/10/13		91	%	50 - 140
			Bromodichloromethane	2018/10/13		110	%	50 - 140
			Bromoform	2018/10/13		98	%	50 - 140
			Bromomethane	2018/10/13		90	%	50 - 140
			Carbon tetrachloride	2018/10/13		103	%	50 - 140
			Chlorobenzene	2018/10/13		94	%	50 - 140
			Chlorodibromomethane	2018/10/13		100	%	50 - 140
			Chloroethane	2018/10/13		92	%	50 - 140
			Chloroform	2018/10/13		102	%	50 - 140
			Chloromethane	2018/10/13		69	%	50 - 140
			1,2-dibromoethane	2018/10/13		96	%	50 - 140
			1,2-dichlorobenzene	2018/10/13		113	%	50 - 140
			1,3-dichlorobenzene	2018/10/13		108	%	50 - 140
			1,4-dichlorobenzene	2018/10/13		106	%	50 - 140
			1,1-dichloroethane	2018/10/13		102	%	50 - 140
			1,2-dichloroethane	2018/10/13		107	%	50 - 140

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Maxxam Job #: B888858
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1-dichloroethene	2018/10/13		96	%	50 - 140
			cis-1,2-dichloroethene	2018/10/13		100	%	50 - 140
			trans-1,2-dichloroethene	2018/10/13		91	%	50 - 140
			Dichloromethane	2018/10/13		98	%	50 - 140
			1,2-dichloropropane	2018/10/13		107	%	50 - 140
			cis-1,3-dichloropropene	2018/10/13		97	%	50 - 140
			trans-1,3-dichloropropene	2018/10/13		94	%	50 - 140
			Ethylbenzene	2018/10/13		89	%	50 - 140
			Methyl methacrylate	2018/10/13		109	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/13		106	%	50 - 140
			Styrene	2018/10/13		93	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/13		94	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/13		99	%	50 - 140
			Tetrachloroethene	2018/10/13		86	%	50 - 140
			Toluene	2018/10/13		90	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/13		105	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/13		103	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/13		102	%	50 - 140
			1,1,1-trichloroethane	2018/10/13		105	%	50 - 140
			1,1,2-trichloroethane	2018/10/13		109	%	50 - 140
			Trichloroethene	2018/10/13		104	%	50 - 140
			Trichlorofluoromethane	2018/10/13		101	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/13		105	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/13		108	%	50 - 140
			Vinyl chloride	2018/10/13		98	%	50 - 140
			m & p-Xylene	2018/10/13		88	%	50 - 140
			o-Xylene	2018/10/13		88	%	50 - 140
9181314	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/13		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		98	%	50 - 140
			Benzene	2018/10/13		92	%	60 - 130
			Bromodichloromethane	2018/10/13		111	%	60 - 130
			Bromoform	2018/10/13		95	%	60 - 130
			Bromomethane	2018/10/13		92	%	60 - 130
			Carbon tetrachloride	2018/10/13		108	%	60 - 130
			Chlorobenzene	2018/10/13		94	%	60 - 130
			Chlorodibromomethane	2018/10/13		99	%	60 - 130
			Chloroethane	2018/10/13		91	%	60 - 130
			Chloroform	2018/10/13		102	%	60 - 130
			Chloromethane	2018/10/13		96	%	60 - 130
			1,2-dibromoethane	2018/10/13		92	%	60 - 130
			1,2-dichlorobenzene	2018/10/13		111	%	60 - 130
			1,3-dichlorobenzene	2018/10/13		107	%	60 - 130
			1,4-dichlorobenzene	2018/10/13		104	%	60 - 130
			1,1-dichloroethane	2018/10/13		103	%	60 - 130
			1,2-dichloroethane	2018/10/13		104	%	60 - 130
			1,1-dichloroethene	2018/10/13		98	%	60 - 130
			cis-1,2-dichloroethene	2018/10/13		100	%	60 - 130
			trans-1,2-dichloroethene	2018/10/13		90	%	60 - 130
			Dichloromethane	2018/10/13		96	%	60 - 130
			1,2-dichloropropane	2018/10/13		106	%	60 - 130
			cis-1,3-dichloropropene	2018/10/13		101	%	60 - 130
			trans-1,3-dichloropropene	2018/10/13		101	%	60 - 130
			Ethylbenzene	2018/10/13		90	%	60 - 130

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Maxxam Job #: B888858
Report Date: 2018/10/17

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl methacrylate	2018/10/13		103	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/13		106	%	60 - 130
			Styrene	2018/10/13		95	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/13		93	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/13		94	%	60 - 130
			Tetrachloroethene	2018/10/13		87	%	60 - 130
			Toluene	2018/10/13		91	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/13		101	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/13		98	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/13		100	%	60 - 130
			1,1,1-trichloroethane	2018/10/13		109	%	60 - 130
			1,1,2-trichloroethane	2018/10/13		106	%	60 - 130
			Trichloroethene	2018/10/13		107	%	60 - 130
			Trichlorofluoromethane	2018/10/13		103	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/13		106	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/13		111	%	60 - 130
			Vinyl chloride	2018/10/13		98	%	60 - 130
			m & p-Xylene	2018/10/13		89	%	60 - 130
			o-Xylene	2018/10/13		89	%	60 - 130
9181314	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/13		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		103	%	50 - 140
			Benzene	2018/10/13	<0.00040		mg/L	
			Bromodichloromethane	2018/10/13	<0.00050		mg/L	
			Bromoform	2018/10/13	<0.00050		mg/L	
			Bromomethane	2018/10/13	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/13	<0.00050		mg/L	
			Chlorobenzene	2018/10/13	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/13	<0.0010		mg/L	
			Chloroethane	2018/10/13	<0.0010		mg/L	
			Chloroform	2018/10/13	<0.00050		mg/L	
			Chloromethane	2018/10/13	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/13	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/13	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/13	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/13	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/13	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/13	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/13	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/13	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/13	<0.00050		mg/L	
			Dichloromethane	2018/10/13	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/13	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/13	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/13	<0.00050		mg/L	
			Ethylbenzene	2018/10/13	<0.00040		mg/L	
			Methyl methacrylate	2018/10/13	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/13	<0.00050		mg/L	
			Styrene	2018/10/13	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/13	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/13	<0.0020		mg/L	
			Tetrachloroethene	2018/10/13	<0.00050		mg/L	
			Toluene	2018/10/13	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/13	<0.0010		mg/L	

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Sampler Initials: AG

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2,4-trichlorobenzene	2018/10/13	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/13	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/13	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/13	<0.00050		mg/L	
			Trichloroethene	2018/10/13	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/13	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/13	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/13	<0.00050		mg/L	
			Vinyl chloride	2018/10/13	<0.00050		mg/L	
			Xylenes (Total)	2018/10/13	<0.00080		mg/L	
			m & p-Xylene	2018/10/13	<0.00080		mg/L	
			o-Xylene	2018/10/13	<0.00040		mg/L	
9181314	MZ	RPD [UN3718-02]	Bromodichloromethane	2018/10/13	NC		%	30
			Bromoform	2018/10/13	NC		%	30
			Bromomethane	2018/10/13	NC		%	30
			Carbon tetrachloride	2018/10/13	NC		%	30
			Chlorobenzene	2018/10/13	NC		%	30
			Chlorodibromomethane	2018/10/13	NC		%	30
			Chloroethane	2018/10/13	NC		%	30
			Chloroform	2018/10/13	NC		%	30
			Chloromethane	2018/10/13	NC		%	30
			1,2-dibromoethane	2018/10/13	NC		%	30
			1,2-dichlorobenzene	2018/10/13	NC		%	30
			1,3-dichlorobenzene	2018/10/13	NC		%	30
			1,4-dichlorobenzene	2018/10/13	NC		%	30
			1,1-dichloroethane	2018/10/13	NC		%	30
			1,2-dichloroethane	2018/10/13	NC		%	30
			1,1-dichloroethene	2018/10/13	NC		%	30
			cis-1,2-dichloroethene	2018/10/13	NC		%	30
			trans-1,2-dichloroethene	2018/10/13	NC		%	30
			Dichloromethane	2018/10/13	NC		%	30
			1,2-dichloropropane	2018/10/13	NC		%	30
			cis-1,3-dichloropropene	2018/10/13	NC		%	30
			trans-1,3-dichloropropene	2018/10/13	NC		%	30
			Methyl methacrylate	2018/10/13	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/13	NC		%	30
			Styrene	2018/10/13	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/13	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/13	NC		%	30
			Tetrachloroethene	2018/10/13	NC		%	30
			1,2,3-trichlorobenzene	2018/10/13	NC		%	30
			1,2,4-trichlorobenzene	2018/10/13	NC		%	30
			1,3,5-trichlorobenzene	2018/10/13	NC		%	30
			1,1,1-trichloroethane	2018/10/13	NC		%	30
			1,1,2-trichloroethane	2018/10/13	NC		%	30
			Trichloroethene	2018/10/13	NC		%	30
			Trichlorofluoromethane	2018/10/13	NC		%	30
			1,2,4-trimethylbenzene	2018/10/13	NC		%	30
			1,3,5-trimethylbenzene	2018/10/13	NC		%	30
			Vinyl chloride	2018/10/13	NC		%	30
9182368	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/15		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/15		102	%	60 - 140
9182368	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/15		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/15		95	%	60 - 140

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9182368	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/15		93	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/15	<0.10		mg/L	
9182368	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/15	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).

(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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Client Project #: CG2430.1E32
Sampler Initials: AG

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

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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A Bureau Veritas Group Company

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Edmonton: 0331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

0403

CHAIN OF CUSTODY RECORD

M 045925

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Sears Canada Inc.	Company:	Clifton Associates	Quotation #:	567554	☑ 7 Days Regular (Most analyses)
Contact Name:	Wayne E. Prada	Contact Name:	Stephen d'Abadie	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	290 Yonge Street, Suite 700 Toronto ON M5B 2C3	Address:	2222-30 Ave. NE Calgary AB. T2E 7K9	Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied) ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	416-941-2126	Phone:	403-263-2556	Site Location:		
Email:	wprada@sears.ca	Email:	stephen_dabadie@clifton.ca	Site #:		Date Required:
Copies:		Copies:	terryn_kazyk@clifton.ca	Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp:	4	5	5
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp:			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp:			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

Regulatory Criteria: ☑ AT1 ☐ CCME ☐ Drinking Water ☐ DSO (Drilling Waste) ☐ Saskatchewan ☐ Other:

Special Instructions

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	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
1	1907		2018.10.11	13:30	GW	7	✓	✓									✓	
2	1908		↓	13:15	↓	8	✓	✓									✓	
3	1910			13:00		8	✓	✓									✓	
4	1918			11:15		6	✓	✓										
5	1933			10:10		8	✓	✓									✓	
6	1953			11:30		6	✓	✓										
7	1966			14:10		8	✓	✓									✓	
8	1102			13:50	↓	8	✓	✓									✓	
9	9907		↓	13:30	GW	7	✓	✓									✓	
10	Trip Blank 2		2018.10.11		W	2	✓											
	Please indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018/10/11	14:25	Isabella Lum ISABELLA LUM	2018/10/11	14:28

11-Oct-18 14:28
Leanne Cameron
B888858
SIM INS-0146

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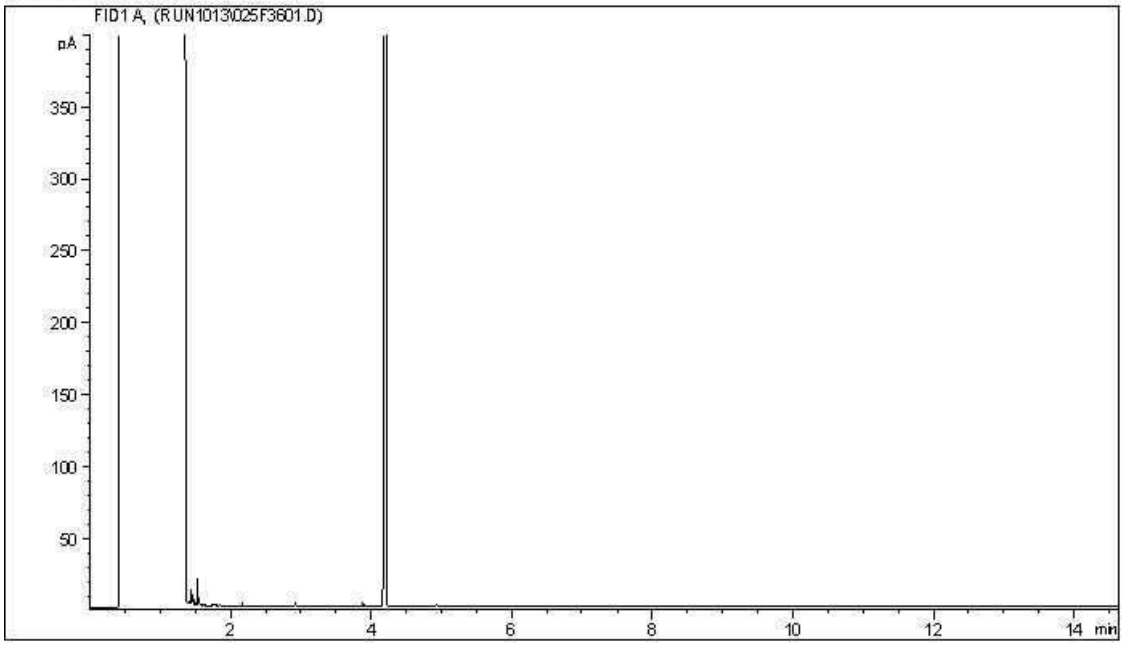
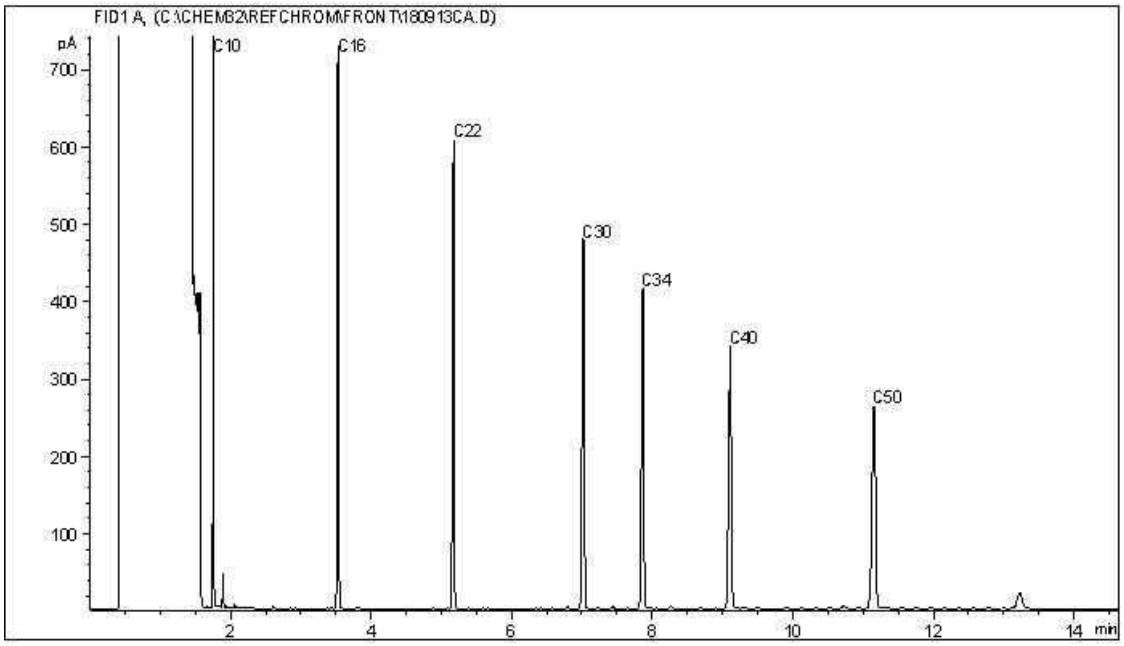
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



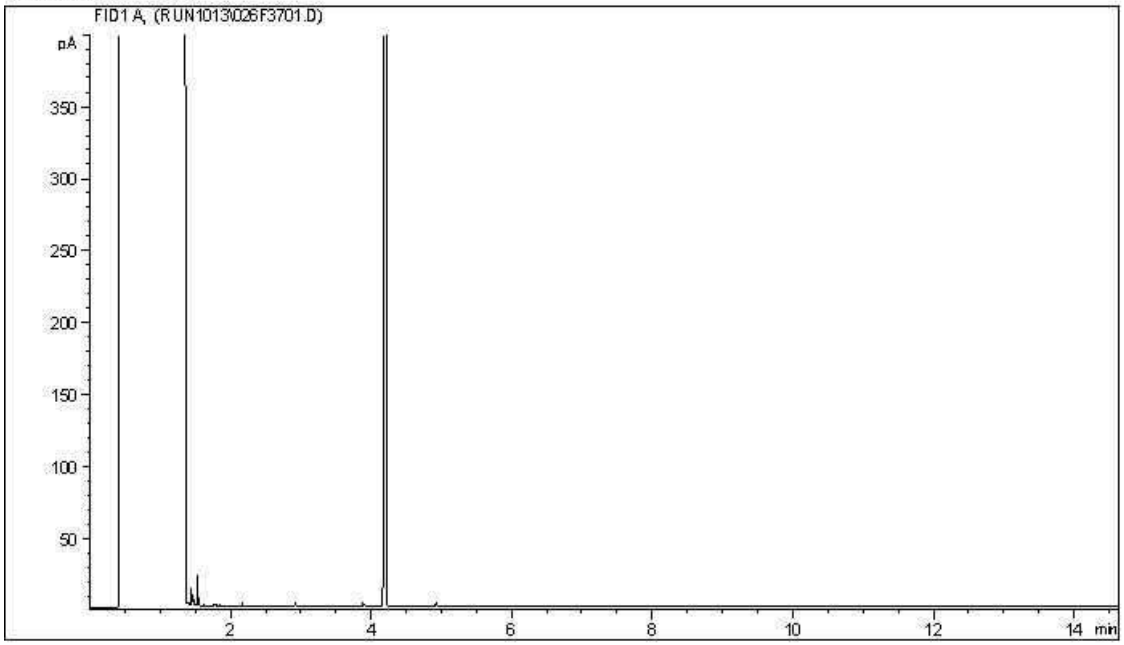
TYPICAL PRODUCT CARBON NUMBER RANGES

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

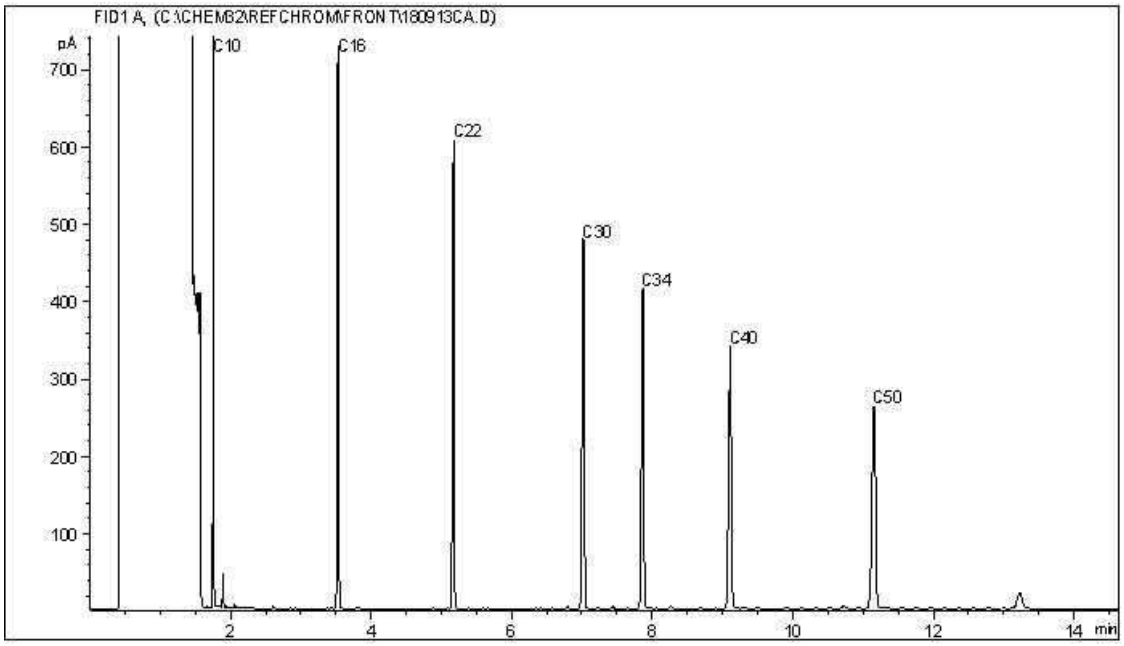
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



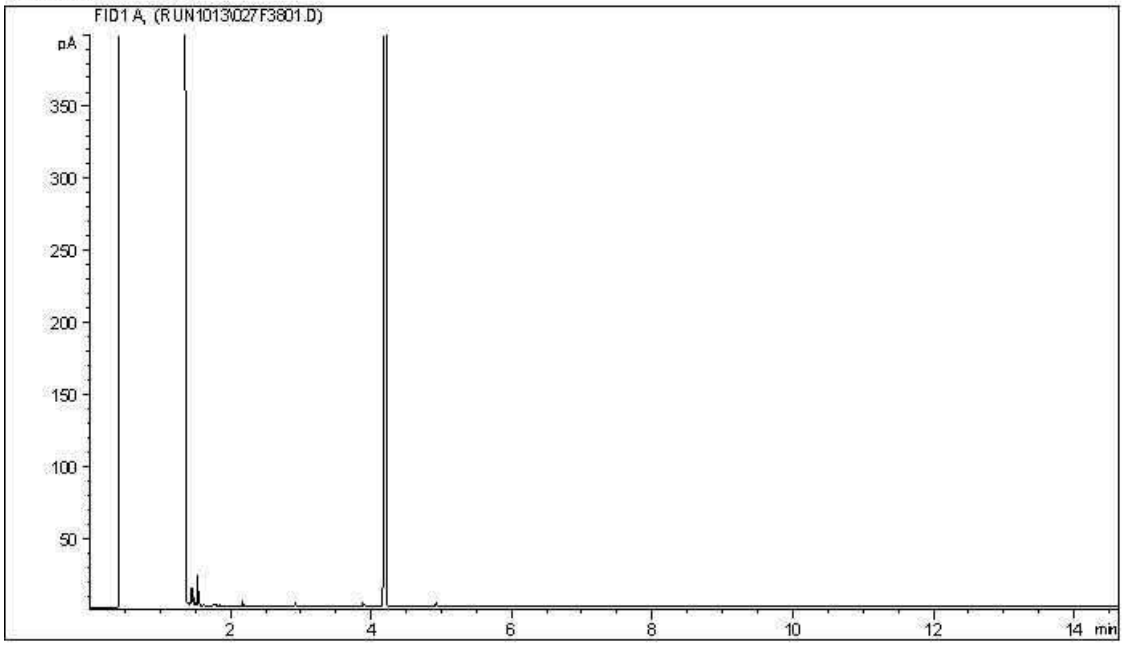
TYPICAL PRODUCT CARBON NUMBER RANGES

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

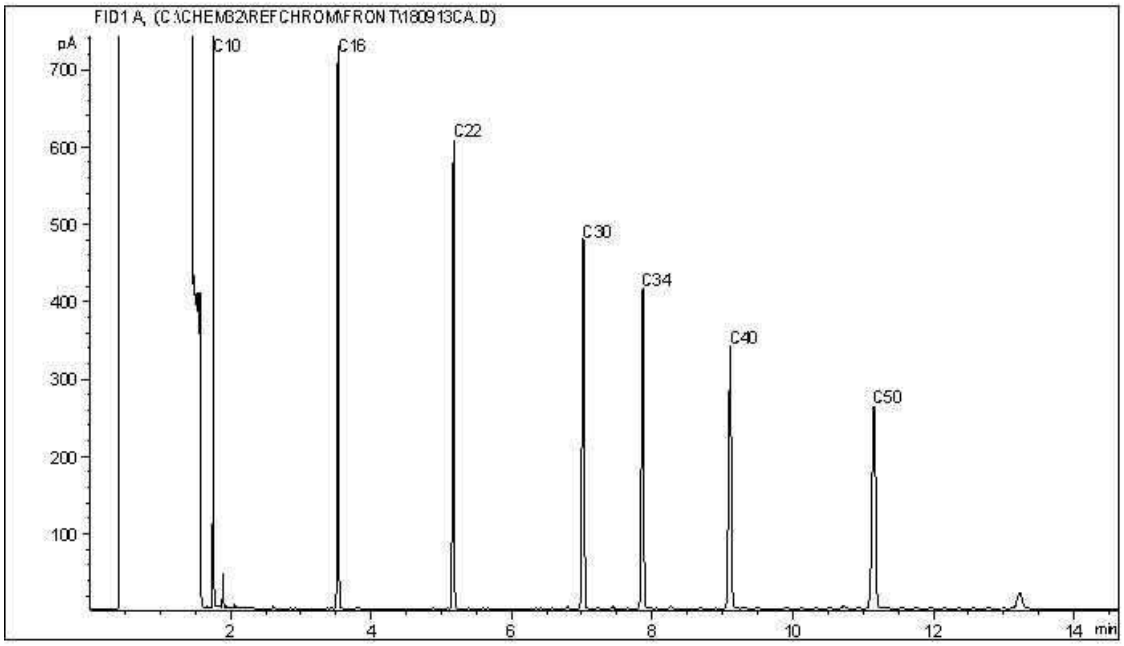
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



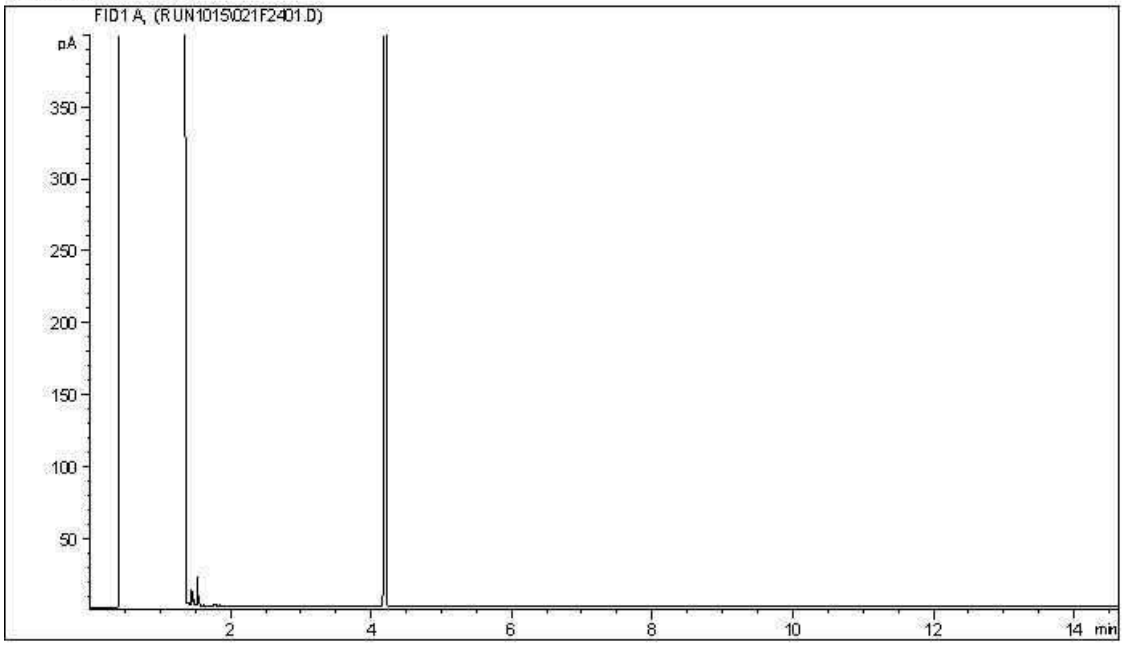
TYPICAL PRODUCT CARBON NUMBER RANGES

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

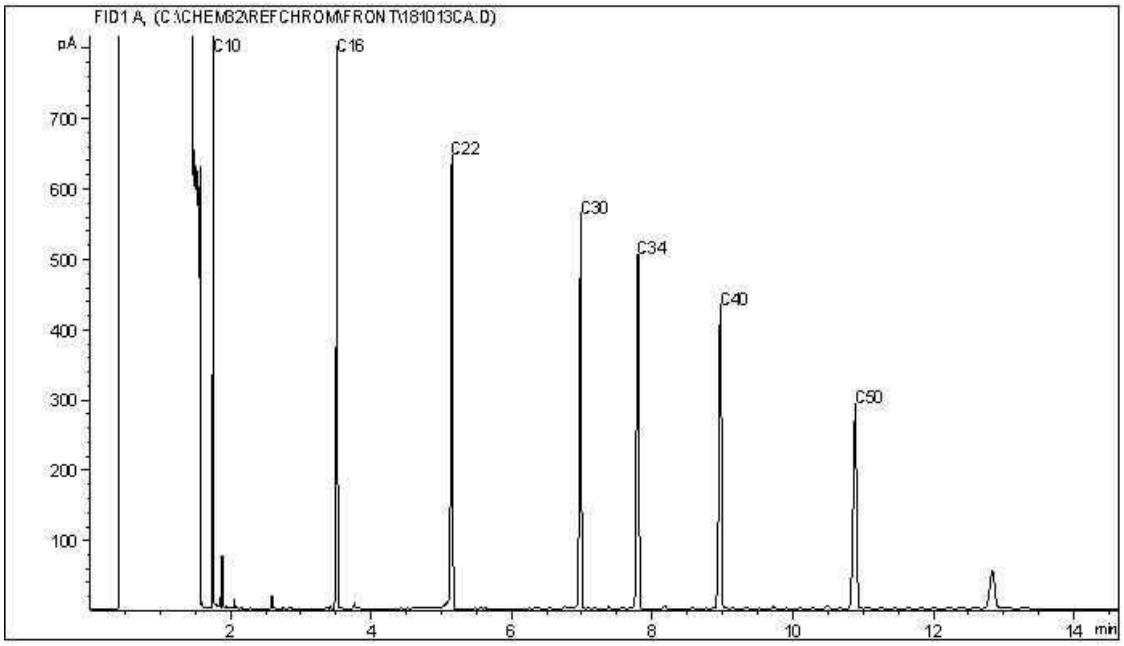
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

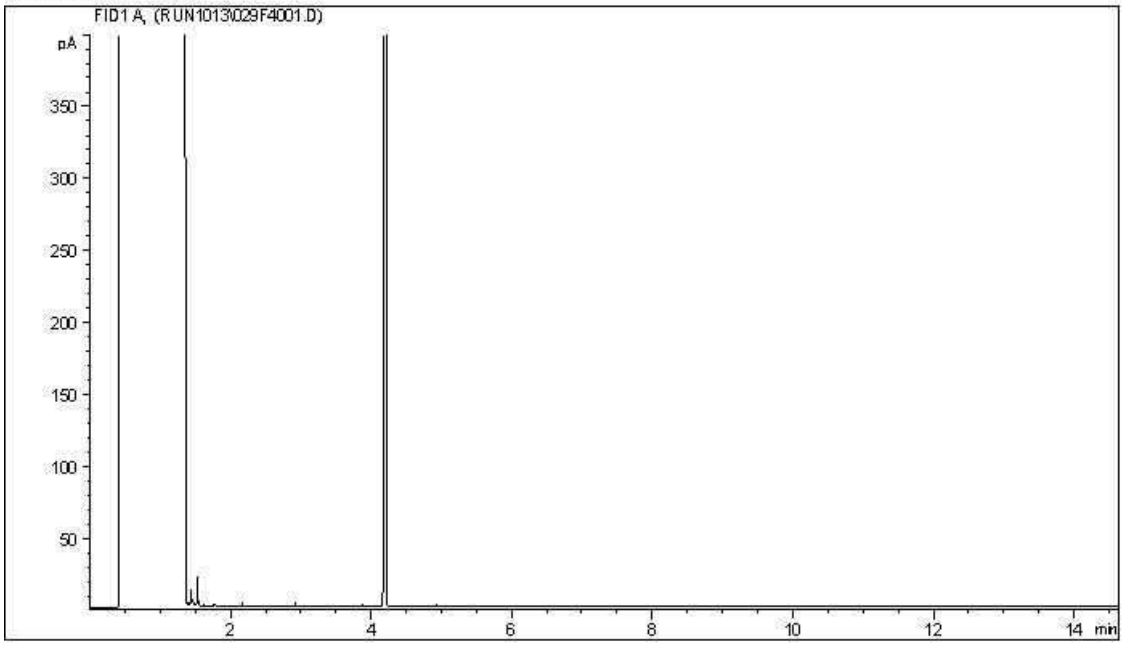
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B888858
Report Date: 2018/10/17
Maxxam Sample: UN3722

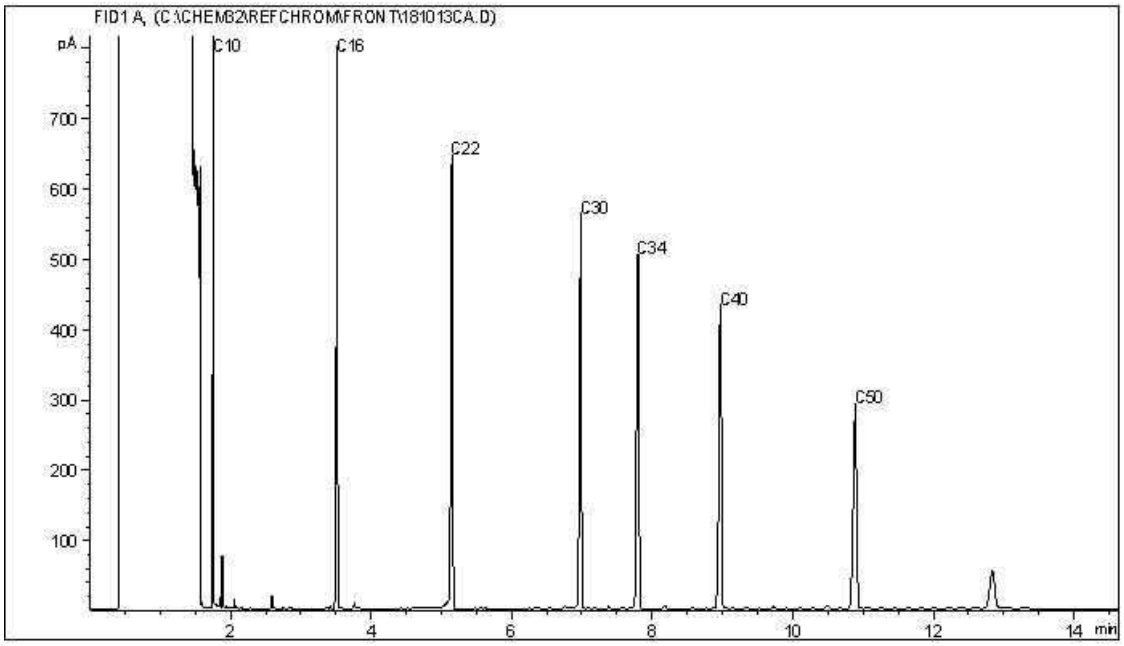
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Client ID: 1933

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

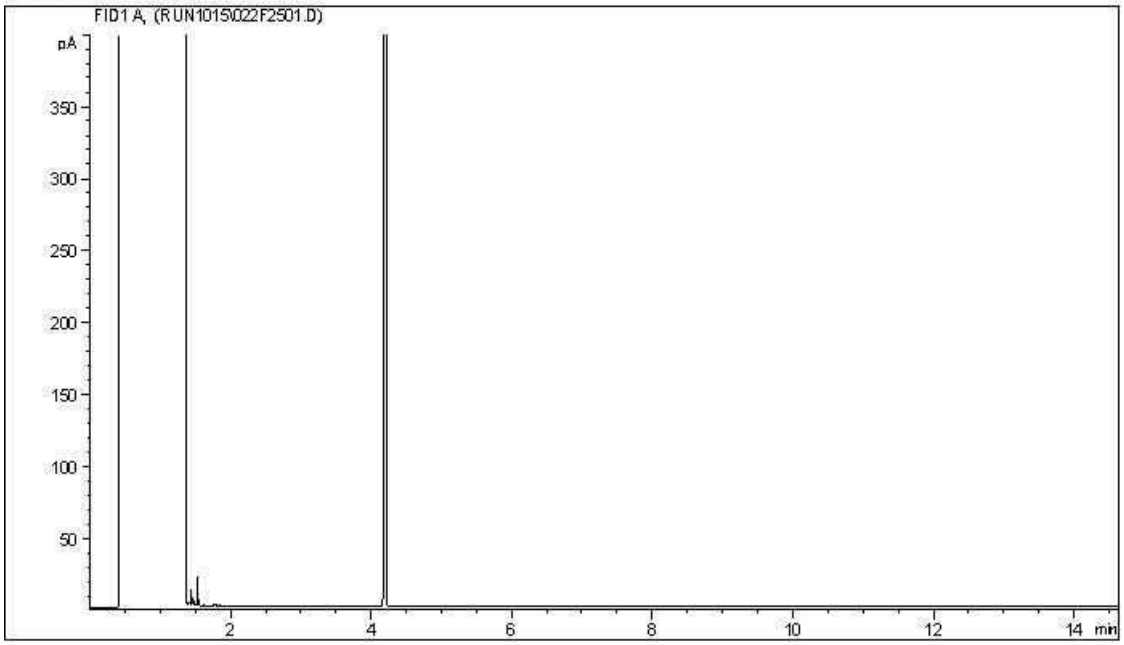
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B888858
Report Date: 2018/10/17
Maxxam Sample: UN3723

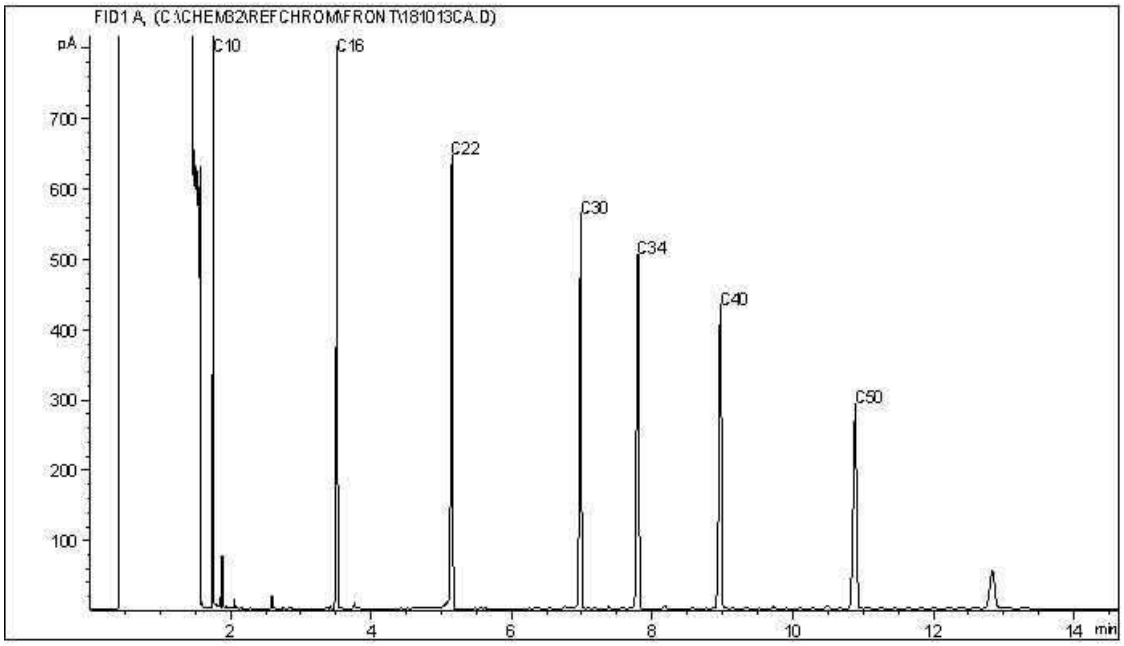
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Client ID: 1953

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

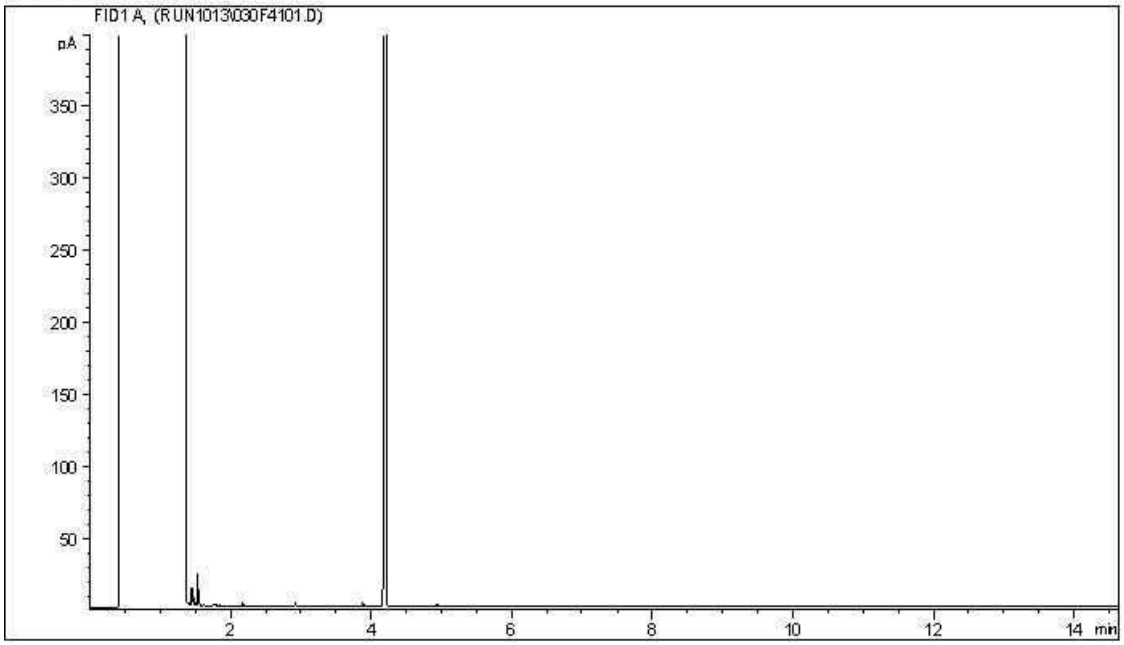
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B888858
Report Date: 2018/10/17
Maxxam Sample: UN3724

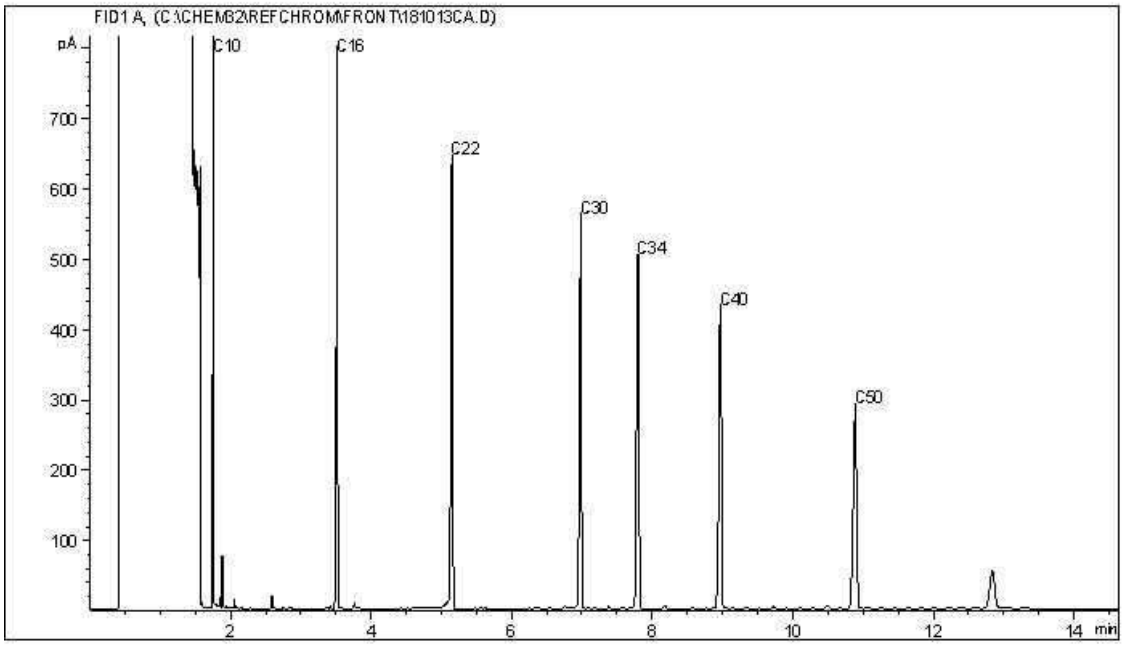
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Client ID: 1966

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

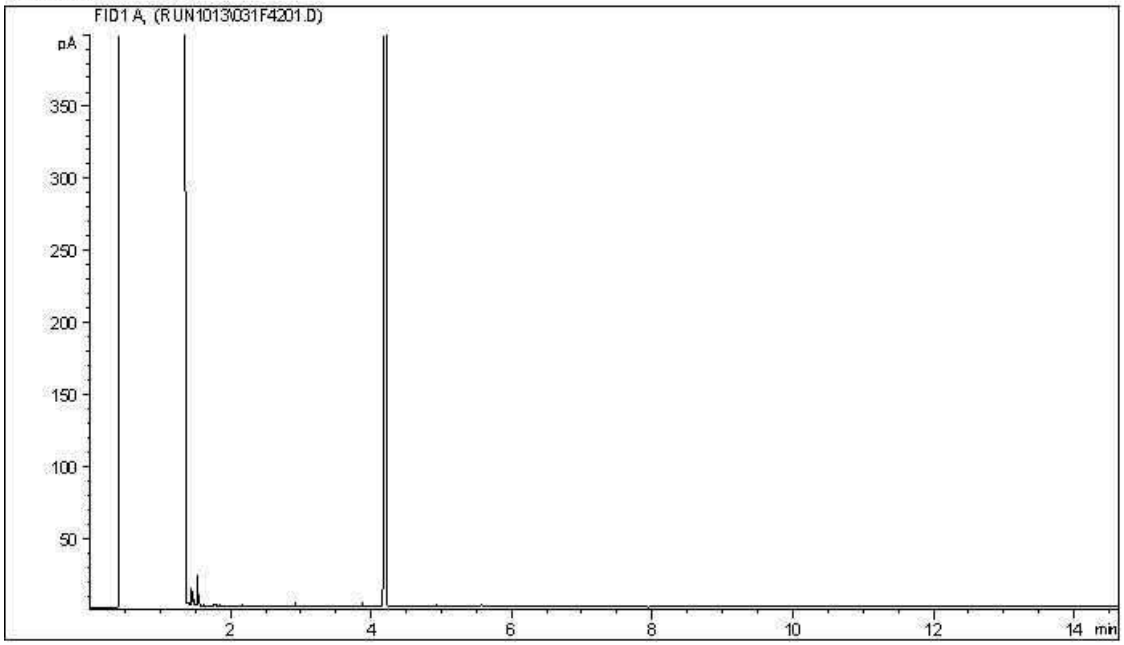
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B888858
Report Date: 2018/10/17
Maxxam Sample: UN3725

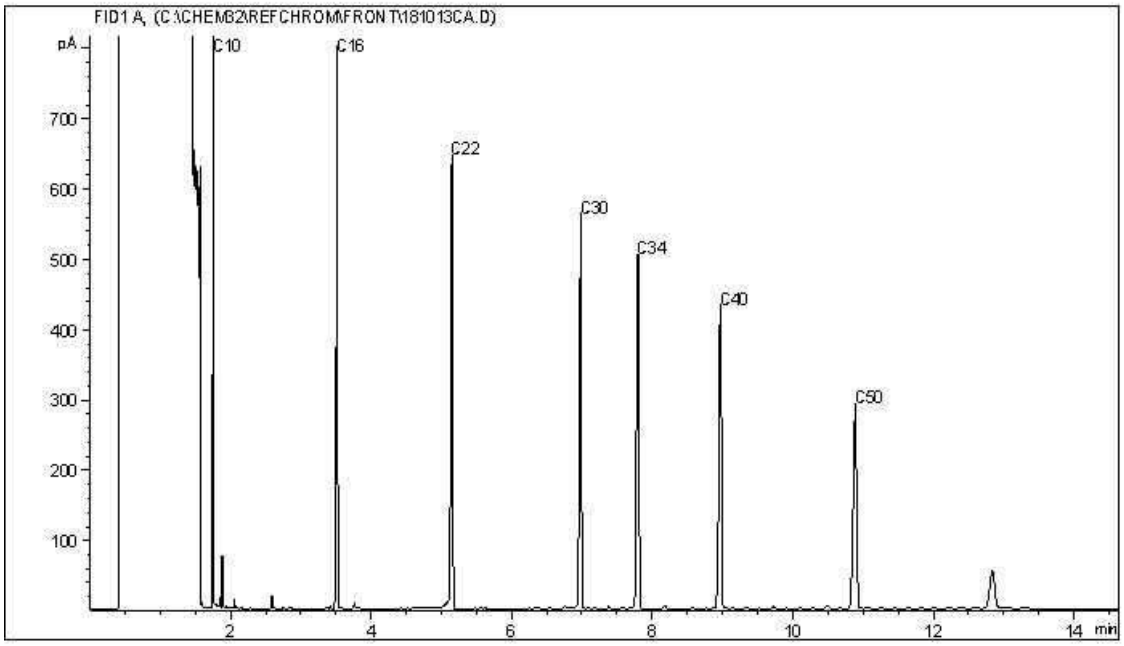
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Client ID: 1102

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

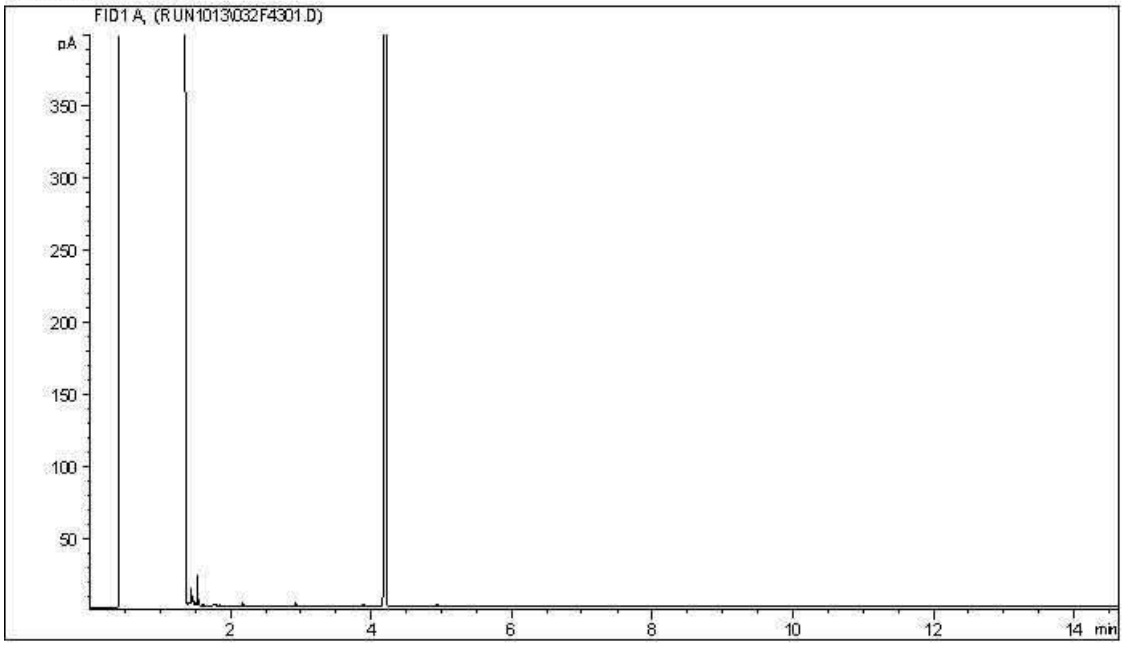
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B888858
Report Date: 2018/10/17
Maxxam Sample: UN3726

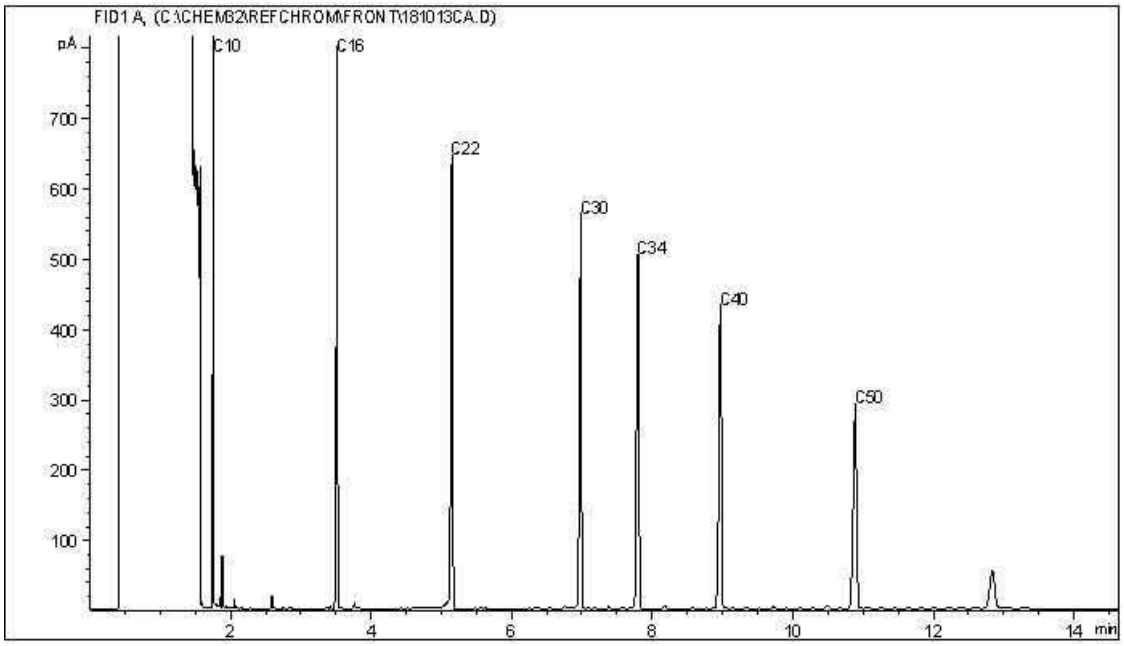
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1E32
Client ID: 9907

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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.

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Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: M070782

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/20
Report #: R2637788
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B889362
Received: 2018/10/12, 14:25

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	6	N/A	2018/10/13	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	6	N/A	2018/10/15	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	2	2018/10/17	2018/10/17	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/17	2018/10/18	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	6	N/A	2018/10/19	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	6	2018/10/17	2018/10/18	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	7	N/A	2018/10/17	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	3	N/A	2018/10/16	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List)	4	N/A	2018/10/17	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: M070782

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/20
Report #: R2637788
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B889362
Received: 2018/10/12, 14:25

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UN6335	UN6335	UN6336	UN6337	UN6338	UN6339		
Sampling Date		2018/10/12 12:35	2018/10/12 12:35	2018/10/12 13:15	2018/10/12 13:50	2018/10/12 13:30	2018/10/12 12:10		
COC Number		M070782	M070782	M070782	M070782	M070782	M070782		
	UNITS	**1924B**	**1924B Lab-Dup**	**1930**	**1952**	**1972**	**1974**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	<0.10	<0.10	<0.10	0.10	9185147
Volatiles									
Benzene	mg/L	0.69	0.66	0.039	<0.00040	<0.00040	<0.00040	0.00040	9182835
Toluene	mg/L	0.0019	0.0018	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9182835
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9182835
m & p-Xylene	mg/L	0.0021	0.0020	<0.00080	<0.00080	<0.00080	0.0014	0.00080	9182835
o-Xylene	mg/L	0.14	0.13	0.077	<0.00040	<0.00040	<0.00040	0.00040	9182835
Xylenes (Total)	mg/L	0.14	N/A	0.077	<0.00089	<0.00089	0.0014	0.00089	9182440
F1 (C6-C10) - BTEX	mg/L	1.1	N/A	<0.10	<0.10	<0.10	<0.10	0.10	9182440
F1 (C6-C10)	mg/L	1.9	1.8	0.20	<0.10	<0.10	<0.10	0.10	9182835
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	113	113	110	115	115	115	N/A	9182835
4-Bromofluorobenzene (sur.)	%	97	97	92	96	95	96	N/A	9182835
D4-1,2-Dichloroethane (sur.)	%	80	82	72	75	76	77	N/A	9182835
O-TERPHENYL (sur.)	%	89	N/A	87	89	91	96	N/A	9185147

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UN6340	UN6340		
Sampling Date		2018/10/12 12:50	2018/10/12 12:50		
COC Number		M070782	M070782		
	UNITS	**2008**	**2008 Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	9185147
Volatiles					
Benzene	mg/L	<0.00040	N/A	0.00040	9182835
Toluene	mg/L	<0.00040	N/A	0.00040	9182835
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	9182835
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	9182835
o-Xylene	mg/L	<0.00040	N/A	0.00040	9182835
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	9182440
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	9182440
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	9182835
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	116	N/A	N/A	9182835
4-Bromofluorobenzene (sur.)	%	95	N/A	N/A	9182835
D4-1,2-Dichloroethane (sur.)	%	76	N/A	N/A	9182835
O-TERPHENYL (sur.)	%	88	86	N/A	9185147

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6335	UN6336	UN6337	UN6338	UN6339		
Sampling Date		2018/10/12 12:35	2018/10/12 13:15	2018/10/12 13:50	2018/10/12 13:30	2018/10/12 12:10		
COC Number		M070782	M070782	M070782	M070782	M070782		
	UNITS	**1924B**	**1930**	**1952**	**1972**	**1974**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9181158
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9185145
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9185145
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9185145
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9185145
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9185145
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9185145
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9185145
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9185145
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9185145
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9185145
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9185145
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9185145
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9185145
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9185145
Naphthalene	mg/L	0.0034	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9185145
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9185145
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9185145
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9185145
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9185145
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	93	104	94	98	94	N/A	9185145
D8-ACENAPHTHYLENE (sur.)	%	87	95	90	88	89	N/A	9185145
D8-NAPHTHALENE (sur.)	%	74	70	77	78	76	N/A	9185145
TERPHENYL-D14 (sur.)	%	103	116	107	109	107	N/A	9185145

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6340	UN6340		
Sampling Date		2018/10/12 12:50	2018/10/12 12:50		
COC Number		M070782	M070782		
	UNITS	**2008**	**2008 Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics					
Benzo[a]pyrene equivalency	mg/L	<0.000010	N/A	0.000010	9181158
Acenaphthene	mg/L	<0.00010	<0.00010	0.00010	9185145
Acenaphthylene	mg/L	<0.00010	<0.00010	0.00010	9185145
Acridine	mg/L	<0.000050	<0.000050	0.000050	9185145
Anthracene	mg/L	<0.000010	<0.000010	0.000010	9185145
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	0.0000085	9185145
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	0.000050	9185145
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	0.0000075	9185145
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	0.000050	9185145
Chrysene	mg/L	<0.0000085	<0.0000085	0.0000085	9185145
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	0.0000075	9185145
Fluoranthene	mg/L	<0.000010	<0.000010	0.000010	9185145
Fluorene	mg/L	<0.000050	<0.000050	0.000050	9185145
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	0.0000085	9185145
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	0.00010	9185145
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	0.00010	9185145
Naphthalene	mg/L	<0.00010	<0.00010	0.00010	9185145
Phenanthrene	mg/L	<0.000050	<0.000050	0.000050	9185145
Perylene	mg/L	<0.000050	<0.000050	0.000050	9185145
Pyrene	mg/L	<0.000020	<0.000020	0.000020	9185145
Quinoline	mg/L	<0.00020	<0.00020	0.00020	9185145
Surrogate Recovery (%)					
D10-ANTHRACENE (sur.)	%	97	101	N/A	9185145
D8-ACENAPHTHYLENE (sur.)	%	91	96	N/A	9185145
D8-NAPHTHALENE (sur.)	%	77	80	N/A	9185145
TERPHENYL-D14 (sur.)	%	107	112	N/A	9185145

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6335	UN6336	UN6337	UN6338	UN6339		
Sampling Date		2018/10/12 12:35	2018/10/12 13:15	2018/10/12 13:50	2018/10/12 13:30	2018/10/12 12:10		
COC Number		M070782	M070782	M070782	M070782	M070782		
	UNITS	**1924B**	**1930**	**1952**	**1972**	**1974**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9181170
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9182837
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9182837
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9182837
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Chloromethane	mg/L	0.0029	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9182837
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9182837
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,2-dichloroethane	mg/L	0.062	<0.00050	<0.00050	<0.00050	0.023	0.00050	9182837
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9182837
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9182837
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9182837
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9182837
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9182837
RDL = Reportable Detection Limit								

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6335	UN6336	UN6337	UN6338	UN6339		
Sampling Date		2018/10/12 12:35	2018/10/12 13:15	2018/10/12 13:50	2018/10/12 13:30	2018/10/12 12:10		
COC Number		M070782	M070782	M070782	M070782	M070782		
	UNITS	**1924B**	**1930**	**1952**	**1972**	**1974**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	0.00050	9182837
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,2,4-trimethylbenzene	mg/L	0.00067	<0.00050	<0.00050	<0.00050	0.00059	0.00050	9182837
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9182837
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	98	98	98	97	N/A	9182837
4-Bromofluorobenzene (sur.)	%	102	105	101	103	105	N/A	9182837
D4-1,2-Dichloroethane (sur.)	%	97	103	101	100	104	N/A	9182837

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6340	UN6341	UN6341		
Sampling Date		2018/10/12 12:50	2018/10/12	2018/10/12		
COC Number		M070782	M070782	M070782		
	UNITS	**2008**	**TRIP BLANK 3**	**TRIP BLANK 3 Lab-Dup**	**RDL**	**QC Batch**
Volatiles						
Total Trihalomethanes	mg/L	<0.0013	<0.0013	N/A	0.0013	9181170
Benzene	mg/L	N/A	<0.00040	<0.00040	0.00040	9182837
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	9182837
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	0.0010	9182837
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	0.0010	9182837
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	9182837
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	0.00020	9182837
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	9182837
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Ethylbenzene	mg/L	N/A	<0.00040	<0.00040	0.00040	9182837
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Styrene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	0.0010	9182837
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	9182837

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6340	UN6341	UN6341		
Sampling Date		2018/10/12 12:50	2018/10/12	2018/10/12		
COC Number		M070782	M070782	M070782		
	UNITS	**2008**	**TRIP BLANK 3**	**TRIP BLANK 3 Lab-Dup**	**RDL**	**QC Batch**
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Toluene	mg/L	N/A	<0.00040	<0.00040	0.00040	9182837
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	0.0010	9182837
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	0.0010	9182837
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	0.00050	9182837
Xylenes (Total)	mg/L	N/A	<0.00080	<0.00080	0.00080	9182837
m & p-Xylene	mg/L	N/A	<0.00080	<0.00080	0.00080	9182837
o-Xylene	mg/L	N/A	<0.00040	<0.00040	0.00040	9182837
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	98	98	97	N/A	9182837
4-Bromofluorobenzene (sur.)	%	104	104	104	N/A	9182837
D4-1,2-Dichloroethane (sur.)	%	104	98	101	N/A	9182837

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	7.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9182835	SAW	Matrix Spike [UN6336-02]	1,4-Difluorobenzene (sur.)	2018/10/13		111	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		77	%	50 - 140
			Benzene	2018/10/13		100	%	50 - 140
			Toluene	2018/10/13		103	%	50 - 140
			Ethylbenzene	2018/10/13		112	%	50 - 140
			m & p-Xylene	2018/10/13		109	%	50 - 140
			o-Xylene	2018/10/13		103	%	50 - 140
			F1 (C6-C10)	2018/10/13		95	%	60 - 140
9182835	SAW	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/13		113	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		76	%	50 - 140
			Benzene	2018/10/13		86	%	60 - 130
			Toluene	2018/10/13		88	%	60 - 130
			Ethylbenzene	2018/10/13		97	%	60 - 130
			m & p-Xylene	2018/10/13		95	%	60 - 130
			o-Xylene	2018/10/13		88	%	60 - 130
			F1 (C6-C10)	2018/10/13		110	%	60 - 140
9182835	SAW	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/13		114	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		77	%	50 - 140
			Benzene	2018/10/13	<0.00040		mg/L	
			Toluene	2018/10/13	<0.00040		mg/L	
			Ethylbenzene	2018/10/13	<0.00040		mg/L	
			m & p-Xylene	2018/10/13	<0.00080		mg/L	
			o-Xylene	2018/10/13	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/13	<0.10		mg/L	
9182835	SAW	RPD [UN6335-02]	Benzene	2018/10/13	3.9		%	30
			Toluene	2018/10/13	5.4		%	30
			Ethylbenzene	2018/10/13	NC		%	30
			m & p-Xylene	2018/10/13	4.9		%	30
			o-Xylene	2018/10/13	4.5		%	30
			F1 (C6-C10)	2018/10/13	4.4		%	30
9182837	QW1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/16		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/16		107	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/16		101	%	50 - 140
			Benzene	2018/10/16		113	%	50 - 140
			Bromodichloromethane	2018/10/16		110	%	50 - 140
			Bromoform	2018/10/16		101	%	50 - 140
			Bromomethane	2018/10/16		109	%	50 - 140
			Carbon tetrachloride	2018/10/16		103	%	50 - 140
			Chlorobenzene	2018/10/16		104	%	50 - 140
			Chlorodibromomethane	2018/10/16		104	%	50 - 140
			Chloroethane	2018/10/16		113	%	50 - 140
			Chloroform	2018/10/16		106	%	50 - 140
			Chloromethane	2018/10/16		126	%	50 - 140
			1,2-dibromoethane	2018/10/16		107	%	50 - 140
			1,2-dichlorobenzene	2018/10/16		109	%	50 - 140
			1,3-dichlorobenzene	2018/10/16		108	%	50 - 140
			1,4-dichlorobenzene	2018/10/16		106	%	50 - 140
			1,1-dichloroethane	2018/10/16		114	%	50 - 140
			1,2-dichloroethane	2018/10/16		112	%	50 - 140
			1,1-dichloroethene	2018/10/16		106	%	50 - 140
			cis-1,2-dichloroethene	2018/10/16		108	%	50 - 140

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,2-dichloroethene	2018/10/16		105	%	50 - 140
			Dichloromethane	2018/10/16		104	%	50 - 140
			1,2-dichloropropane	2018/10/16		116	%	50 - 140
			cis-1,3-dichloropropene	2018/10/16		109	%	50 - 140
			trans-1,3-dichloropropene	2018/10/16		121	%	50 - 140
			Ethylbenzene	2018/10/16		103	%	50 - 140
			Methyl methacrylate	2018/10/16		128	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/16		109	%	50 - 140
			Styrene	2018/10/16		108	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/16		98	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/16		108	%	50 - 140
			Tetrachloroethene	2018/10/16		95	%	50 - 140
			Toluene	2018/10/16		107	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/16		105	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/16		103	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/16		103	%	50 - 140
			1,1,1-trichloroethane	2018/10/16		105	%	50 - 140
			1,1,2-trichloroethane	2018/10/16		112	%	50 - 140
			Trichloroethene	2018/10/16		104	%	50 - 140
			Trichlorofluoromethane	2018/10/16		106	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/16		111	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/16		112	%	50 - 140
			Vinyl chloride	2018/10/16		125	%	50 - 140
			m & p-Xylene	2018/10/16		103	%	50 - 140
			o-Xylene	2018/10/16		102	%	50 - 140
9182837	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/16		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/16		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/16		96	%	50 - 140
			Benzene	2018/10/16		110	%	60 - 130
			Bromodichloromethane	2018/10/16		107	%	60 - 130
			Bromoform	2018/10/16		94	%	60 - 130
			Bromomethane	2018/10/16		112	%	60 - 130
			Carbon tetrachloride	2018/10/16		103	%	60 - 130
			Chlorobenzene	2018/10/16		100	%	60 - 130
			Chlorodibromomethane	2018/10/16		98	%	60 - 130
			Chloroethane	2018/10/16		110	%	60 - 130
			Chloroform	2018/10/16		104	%	60 - 130
			Chloromethane	2018/10/16		126	%	60 - 130
			1,2-dibromoethane	2018/10/16		100	%	60 - 130
			1,2-dichlorobenzene	2018/10/16		107	%	60 - 130
			1,3-dichlorobenzene	2018/10/16		107	%	60 - 130
			1,4-dichlorobenzene	2018/10/16		105	%	60 - 130
			1,1-dichloroethane	2018/10/16		112	%	60 - 130
			1,2-dichloroethane	2018/10/16		106	%	60 - 130
			1,1-dichloroethene	2018/10/16		107	%	60 - 130
			cis-1,2-dichloroethene	2018/10/16		105	%	60 - 130
			trans-1,2-dichloroethene	2018/10/16		104	%	60 - 130
			Dichloromethane	2018/10/16		101	%	60 - 130
			1,2-dichloropropane	2018/10/16		113	%	60 - 130
			cis-1,3-dichloropropene	2018/10/16		111	%	60 - 130
			trans-1,3-dichloropropene	2018/10/16		125	%	60 - 130
			Ethylbenzene	2018/10/16		101	%	60 - 130
			Methyl methacrylate	2018/10/16		120	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/16		107	%	60 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Styrene	2018/10/16		104	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/16		94	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/16		101	%	60 - 130
			Tetrachloroethene	2018/10/16		93	%	60 - 130
			Toluene	2018/10/16		103	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/16		101	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/16		101	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/16		102	%	60 - 130
			1,1,1-trichloroethane	2018/10/16		105	%	60 - 130
			1,1,2-trichloroethane	2018/10/16		105	%	60 - 130
			Trichloroethene	2018/10/16		103	%	60 - 130
			Trichlorofluoromethane	2018/10/16		107	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/16		110	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/16		111	%	60 - 130
			Vinyl chloride	2018/10/16		124	%	60 - 130
			m & p-Xylene	2018/10/16		101	%	60 - 130
			o-Xylene	2018/10/16		100	%	60 - 130
9182837	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/16		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/16		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/16		100	%	50 - 140
			Benzene	2018/10/16	<0.00040		mg/L	
			Bromodichloromethane	2018/10/16	<0.00050		mg/L	
			Bromoform	2018/10/16	<0.00050		mg/L	
			Bromomethane	2018/10/16	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/16	<0.00050		mg/L	
			Chlorobenzene	2018/10/16	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/16	<0.0010		mg/L	
			Chloroethane	2018/10/16	<0.0010		mg/L	
			Chloroform	2018/10/16	<0.00050		mg/L	
			Chloromethane	2018/10/16	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/16	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/16	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/16	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/16	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/16	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/16	<0.00050		mg/L	
			Dichloromethane	2018/10/16	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/16	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/16	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/16	<0.00050		mg/L	
			Ethylbenzene	2018/10/16	<0.00040		mg/L	
			Methyl methacrylate	2018/10/16	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/16	<0.00050		mg/L	
			Styrene	2018/10/16	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/16	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/16	<0.0020		mg/L	
			Tetrachloroethene	2018/10/16	<0.00050		mg/L	
			Toluene	2018/10/16	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/16	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/16	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/16	<0.00050		mg/L	

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			1,1,1-trichloroethane	2018/10/16	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/16	<0.00050		mg/L	
			Trichloroethene	2018/10/16	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/16	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/16	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/16	<0.00050		mg/L	
			Vinyl chloride	2018/10/16	<0.00050		mg/L	
			Xylenes (Total)	2018/10/16	<0.00080		mg/L	
			m & p-Xylene	2018/10/16	<0.00080		mg/L	
			o-Xylene	2018/10/16	<0.00040		mg/L	
9182837	QW1	RPD [UN6341-01]	Benzene	2018/10/16	NC		%	30
			Bromodichloromethane	2018/10/16	NC		%	30
			Bromoform	2018/10/16	NC		%	30
			Bromomethane	2018/10/16	NC		%	30
			Carbon tetrachloride	2018/10/16	NC		%	30
			Chlorobenzene	2018/10/16	NC		%	30
			Chlorodibromomethane	2018/10/16	NC		%	30
			Chloroethane	2018/10/16	NC		%	30
			Chloroform	2018/10/16	NC		%	30
			Chloromethane	2018/10/16	NC		%	30
			1,2-dibromoethane	2018/10/16	NC		%	30
			1,2-dichlorobenzene	2018/10/16	NC		%	30
			1,3-dichlorobenzene	2018/10/16	NC		%	30
			1,4-dichlorobenzene	2018/10/16	NC		%	30
			1,1-dichloroethane	2018/10/16	NC		%	30
			1,2-dichloroethane	2018/10/16	NC		%	30
			1,1-dichloroethene	2018/10/16	NC		%	30
			cis-1,2-dichloroethene	2018/10/16	NC		%	30
			trans-1,2-dichloroethene	2018/10/16	NC		%	30
			Dichloromethane	2018/10/16	NC		%	30
			1,2-dichloropropane	2018/10/16	NC		%	30
			cis-1,3-dichloropropene	2018/10/16	NC		%	30
			trans-1,3-dichloropropene	2018/10/16	NC		%	30
			Ethylbenzene	2018/10/16	NC		%	30
			Methyl methacrylate	2018/10/16	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/16	NC		%	30
			Styrene	2018/10/16	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/16	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/16	NC		%	30
			Tetrachloroethene	2018/10/16	NC		%	30
			Toluene	2018/10/16	NC		%	30
			1,2,3-trichlorobenzene	2018/10/16	NC		%	30
			1,2,4-trichlorobenzene	2018/10/16	NC		%	30
			1,3,5-trichlorobenzene	2018/10/16	NC		%	30
			1,1,1-trichloroethane	2018/10/16	NC		%	30
			1,1,2-trichloroethane	2018/10/16	NC		%	30
			Trichloroethene	2018/10/16	NC		%	30
			Trichlorofluoromethane	2018/10/16	NC		%	30
			1,2,4-trimethylbenzene	2018/10/16	NC		%	30
			1,3,5-trimethylbenzene	2018/10/16	NC		%	30
			Vinyl chloride	2018/10/16	NC		%	30
			Xylenes (Total)	2018/10/16	NC		%	30
			m & p-Xylene	2018/10/16	NC		%	30
			o-Xylene	2018/10/16	NC		%	30

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9185145	LZ3	Matrix Spike [UN6335-01]	D10-ANTHRACENE (sur.)	2018/10/18		111	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		107	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		88	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		125	%	50 - 130
			Acenaphthene	2018/10/18		104	%	50 - 130
			Acenaphthylene	2018/10/18		109	%	50 - 130
			Acridine	2018/10/18		96	%	50 - 130
			Anthracene	2018/10/18		104	%	50 - 130
			Benzo(a)anthracene	2018/10/18		120	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/18		113	%	50 - 130
			Benzo(k)fluoranthene	2018/10/18		110	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/18		102	%	50 - 130
			Benzo(c)phenanthrene	2018/10/18		124	%	50 - 130
			Benzo(a)pyrene	2018/10/18		107	%	50 - 130
			Benzo[e]pyrene	2018/10/18		105	%	50 - 130
			Chrysene	2018/10/18		115	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/18		105	%	50 - 130
			Fluoranthene	2018/10/18		123	%	50 - 130
			Fluorene	2018/10/18		110	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/18		102	%	50 - 130
			1-Methylnaphthalene	2018/10/18		109	%	50 - 130
			2-Methylnaphthalene	2018/10/18		103	%	50 - 130
			Naphthalene	2018/10/18		108	%	50 - 130
			Phenanthrene	2018/10/18		113	%	50 - 130
			Perylene	2018/10/18		85	%	50 - 130
			Pyrene	2018/10/18		119	%	50 - 130
			Quinoline	2018/10/18		104	%	50 - 130
9185145	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/18		93	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		90	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		75	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		106	%	50 - 130
			Acenaphthene	2018/10/18		89	%	50 - 130
			Acenaphthylene	2018/10/18		92	%	50 - 130
			Acridine	2018/10/18		81	%	50 - 130
			Anthracene	2018/10/18		89	%	50 - 130
			Benzo(a)anthracene	2018/10/18		117	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/18		110	%	50 - 130
			Benzo(k)fluoranthene	2018/10/18		111	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/18		103	%	50 - 130
			Benzo(c)phenanthrene	2018/10/18		110	%	50 - 130
			Benzo(a)pyrene	2018/10/18		100	%	50 - 130
			Benzo[e]pyrene	2018/10/18		104	%	50 - 130
			Chrysene	2018/10/18		114	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/18		106	%	50 - 130
			Fluoranthene	2018/10/18		109	%	50 - 130
			Fluorene	2018/10/18		91	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/18		101	%	50 - 130
			1-Methylnaphthalene	2018/10/18		90	%	50 - 130
			2-Methylnaphthalene	2018/10/18		84	%	50 - 130
			Naphthalene	2018/10/18		82	%	50 - 130
			Phenanthrene	2018/10/18		93	%	50 - 130
			Perylene	2018/10/18		96	%	50 - 130
			Pyrene	2018/10/18		106	%	50 - 130
			Quinoline	2018/10/18		104	%	50 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9185145	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/18		98	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		88	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		70	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		109	%	50 - 130
			Acenaphthene	2018/10/18	<0.00010		mg/L	
			Acenaphthylene	2018/10/18	<0.00010		mg/L	
			Acridine	2018/10/18	<0.000050		mg/L	
			Anthracene	2018/10/18	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/18	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/18	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/18	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/18	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/18	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/18	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/18	<0.000050		mg/L	
			Chrysene	2018/10/18	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/18	<0.0000075		mg/L	
			Fluoranthene	2018/10/18	<0.000010		mg/L	
			Fluorene	2018/10/18	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/18	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/18	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/18	<0.00010		mg/L	
			Naphthalene	2018/10/18	<0.00010		mg/L	
			Phenanthrene	2018/10/18	<0.000050		mg/L	
			Perylene	2018/10/18	<0.000050		mg/L	
			Pyrene	2018/10/18	<0.000020		mg/L	
			Quinoline	2018/10/18	<0.00020		mg/L	
9185145	LZ3	RPD [UN6340-01]	Acenaphthene	2018/10/18	NC		%	30
			Acenaphthylene	2018/10/18	NC		%	30
			Acridine	2018/10/18	NC		%	30
			Anthracene	2018/10/18	NC		%	30
			Benzo(a)anthracene	2018/10/18	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/18	NC		%	30
			Benzo(k)fluoranthene	2018/10/18	NC		%	30
			Benzo(g,h,i)perylene	2018/10/18	NC		%	30
			Benzo(c)phenanthrene	2018/10/18	NC		%	30
			Benzo(a)pyrene	2018/10/18	NC		%	30
			Benzo[e]pyrene	2018/10/18	NC		%	30
			Chrysene	2018/10/18	NC		%	30
			Dibenz(a,h)anthracene	2018/10/18	NC		%	30
			Fluoranthene	2018/10/18	NC		%	30
			Fluorene	2018/10/18	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/18	NC		%	30
			1-Methylnaphthalene	2018/10/18	NC		%	30
			2-Methylnaphthalene	2018/10/18	NC		%	30
			Naphthalene	2018/10/18	NC		%	30
			Phenanthrene	2018/10/18	NC		%	30
			Perylene	2018/10/18	NC		%	30
			Pyrene	2018/10/18	NC		%	30
			Quinoline	2018/10/18	NC		%	30
9185147	VP4	Matrix Spike [UN6336-01]	O-TERPHENYL (sur.)	2018/10/17		86	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17		90	%	60 - 140
9185147	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/17		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17		92	%	60 - 140

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9185147	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/17		86	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17	<0.10		mg/L	
9185147	VP4	RPD [UN6340-01]	F2 (C10-C16 Hydrocarbons)	2018/10/18	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).

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889362
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

469

CHAIN OF CUSTODY RECORD

M070782

Page 1 of 1

Invoice Information		Report Information (if differs from Invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Sears Canada Inc.	Company:	Clifton Associates	Quotation #:		☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Wayne Prada	Contact Name:	Stephen d'Abadie	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	290 Yonge St. Suite 700 Toronto ON M5B 2C3	Address:	2222 - 30 Ave. NE Calgary AB T2E 7K9	Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied)
Phone:	416-941-2126	Phone:	403-263-2556	Site Location:		☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Email:	wprada@sears.ca	Email:	stephen_dabadie@clifton.ca	Site #:		Date Required:
Copies:		Copies:	terryn_kuzyk@clifton.ca	Sampled By:	Austin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact		✓	Temp	8	6	9
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of Containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	BTEX F3-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
1	1924B		2018.10.12	12:35	GW	8	✓	✓									✓	
2	1930		↓	13:15	↓	8	✓	✓									✓	
3	1952			13:50		8	✓	✓									✓	
4	1972			13:30		8	✓	✓									✓	
5	1974			12:10		8	✓	✓									✓	
6	2008		2018.10.12	12:50	GW	8	✓	✓									✓	
7																		
8																		
9																		
10	Trip Blank 3		2018.10.12		W	2	✓											
	Please Indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Regulatory Criteria

☑ AT1
☐ CCME
☐ Drinking Water
☐ DSO (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018.10.12		Jasmine M Jasmine Moume	2018/10/12	14:25

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

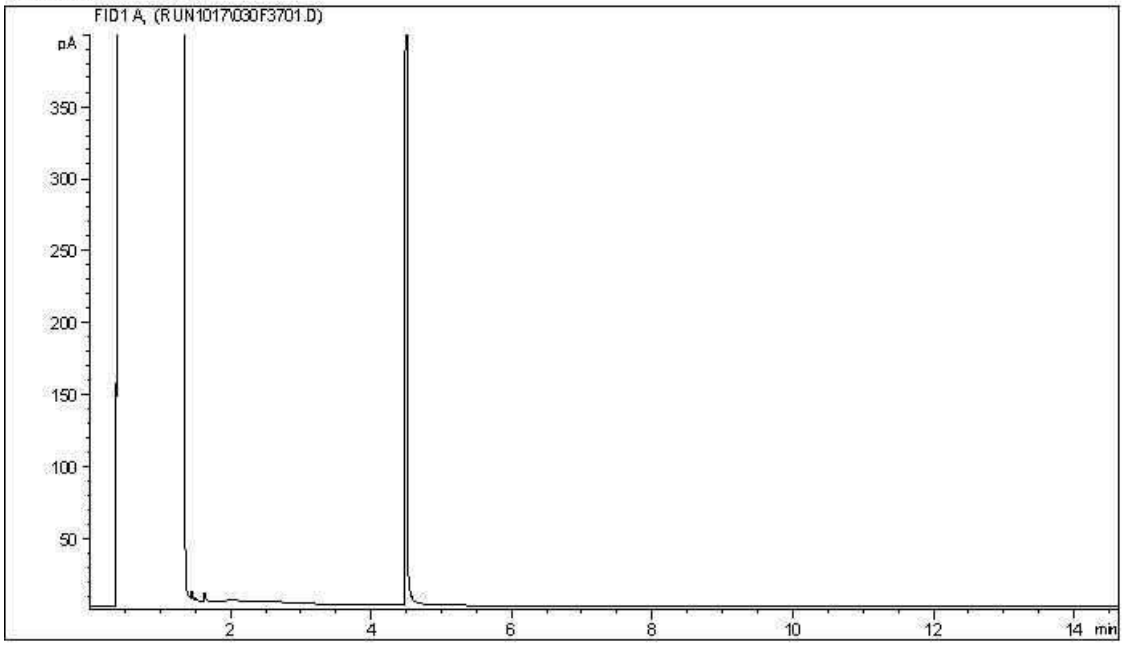
12-Oct-18 14:25
Omran Desouki
B889362

AB FCD-00331/7

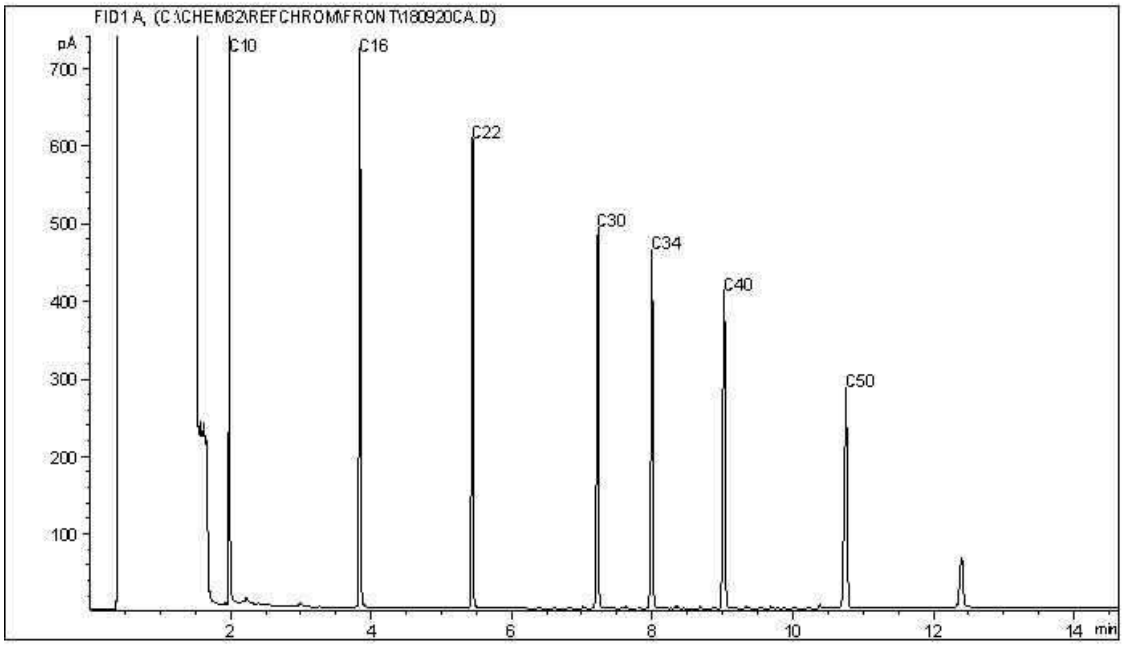
IL4 INS-0003

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



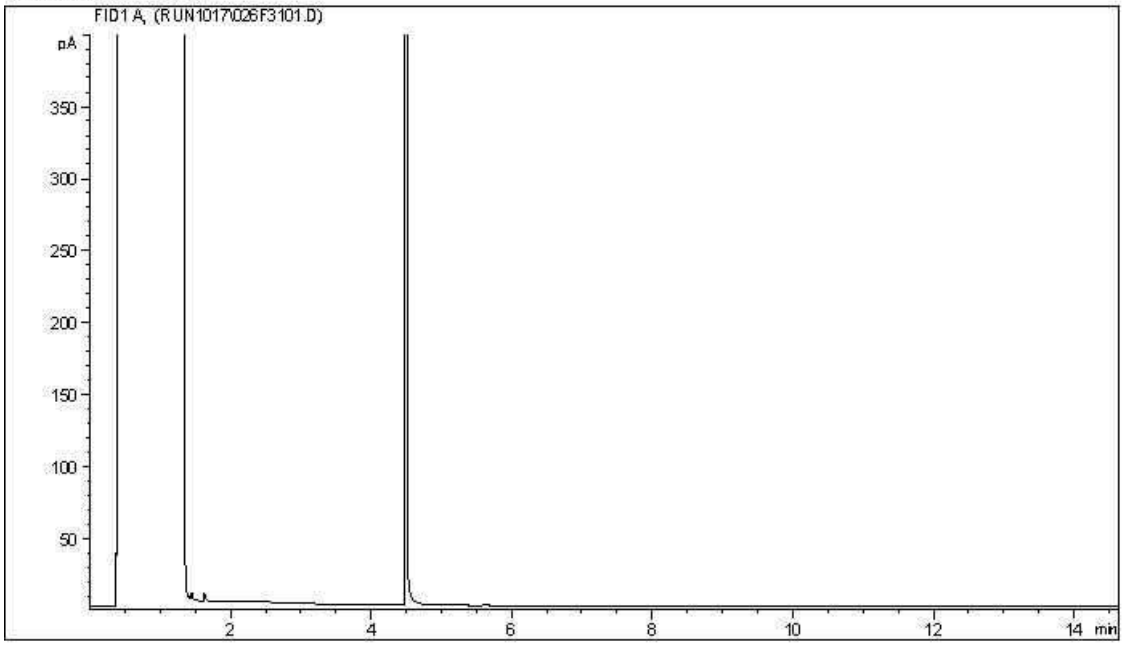
TYPICAL PRODUCT CARBON NUMBER RANGES

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

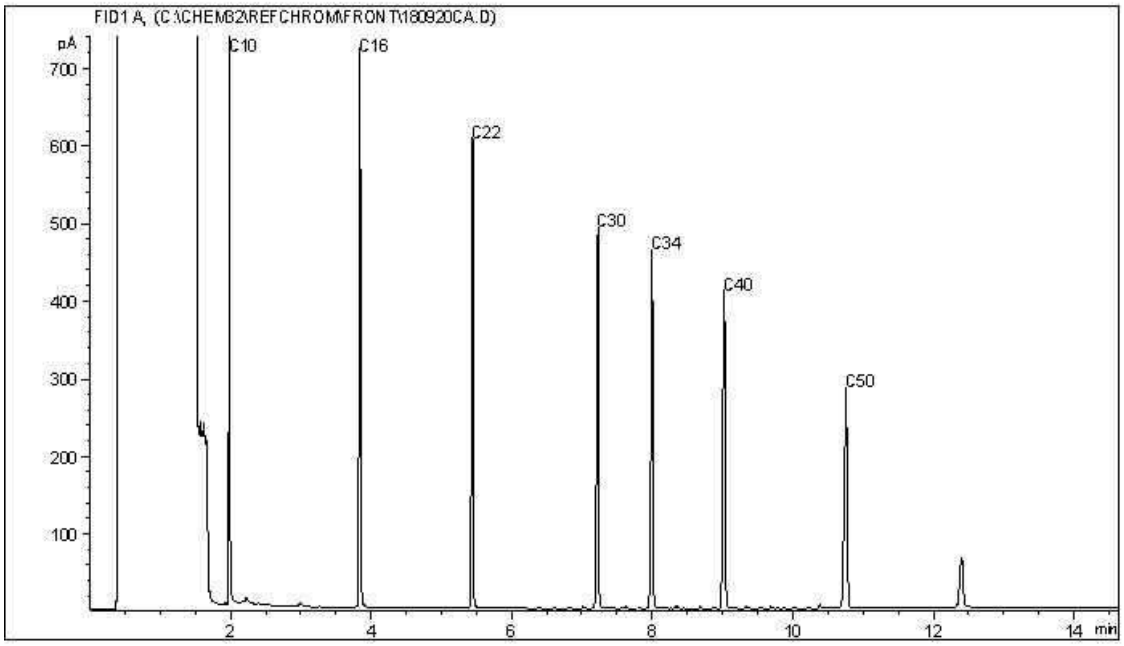
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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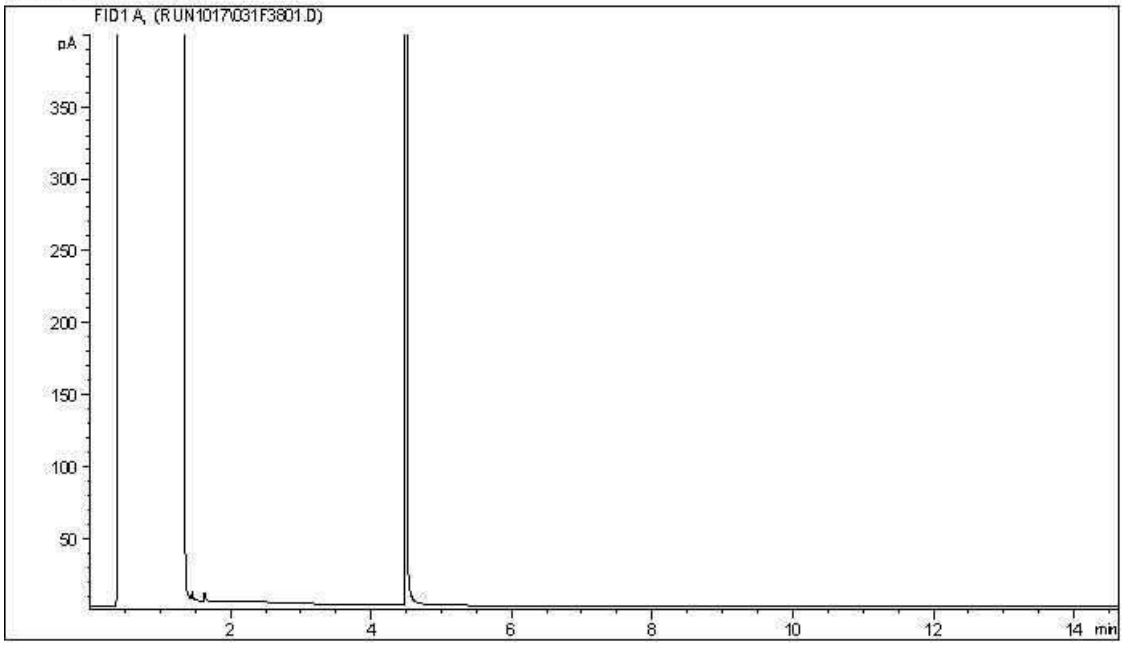
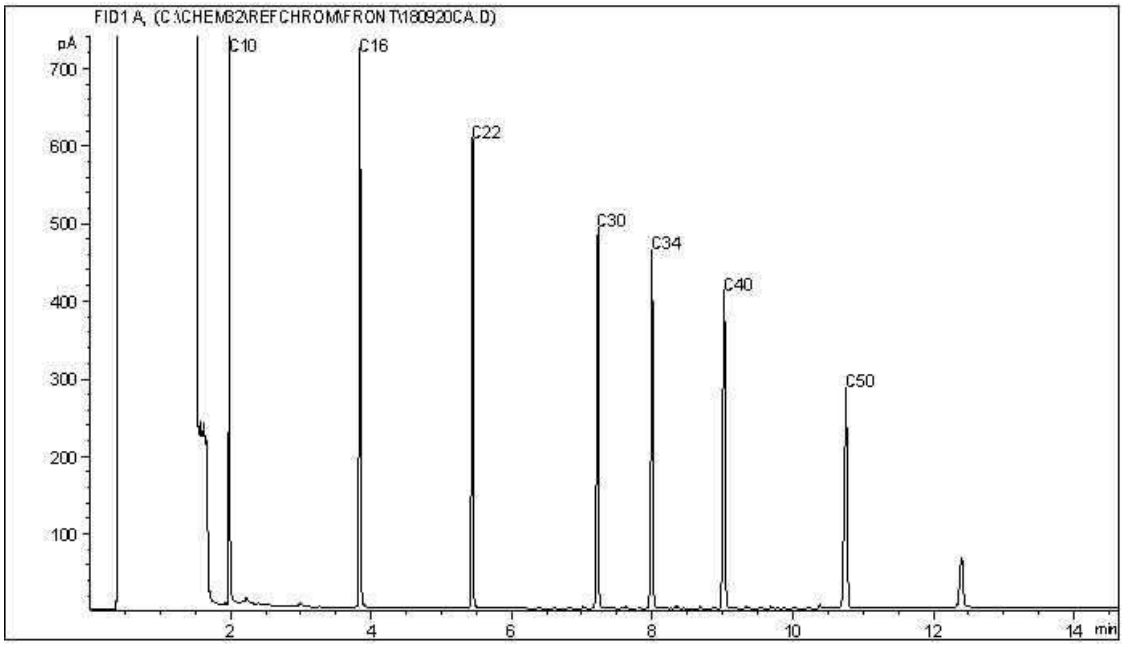
Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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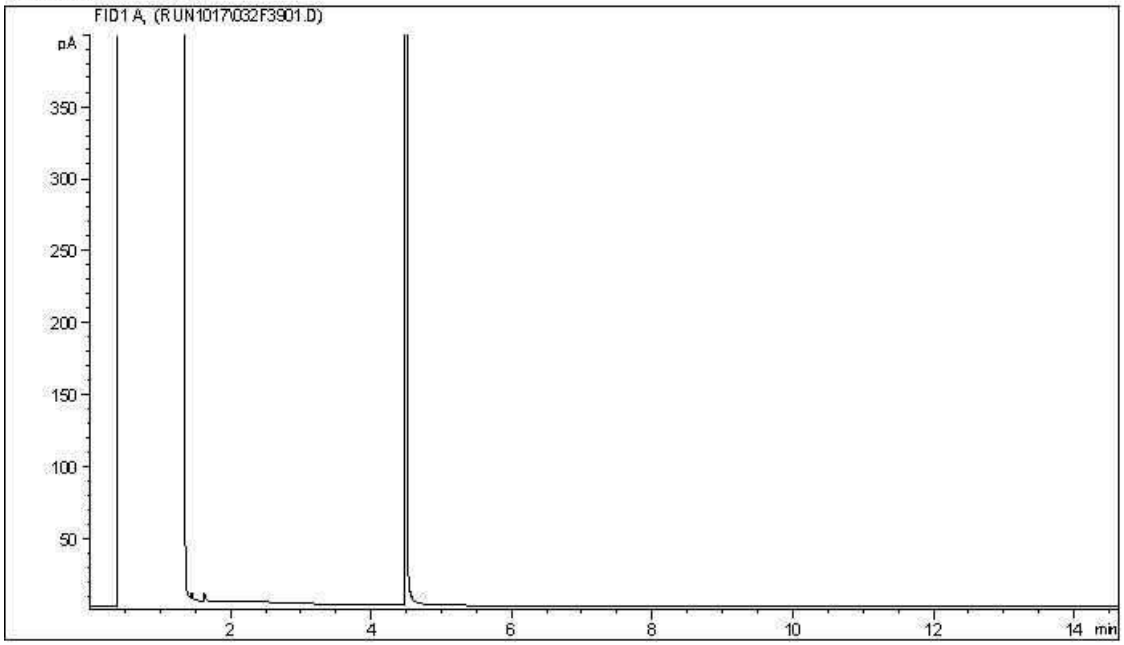
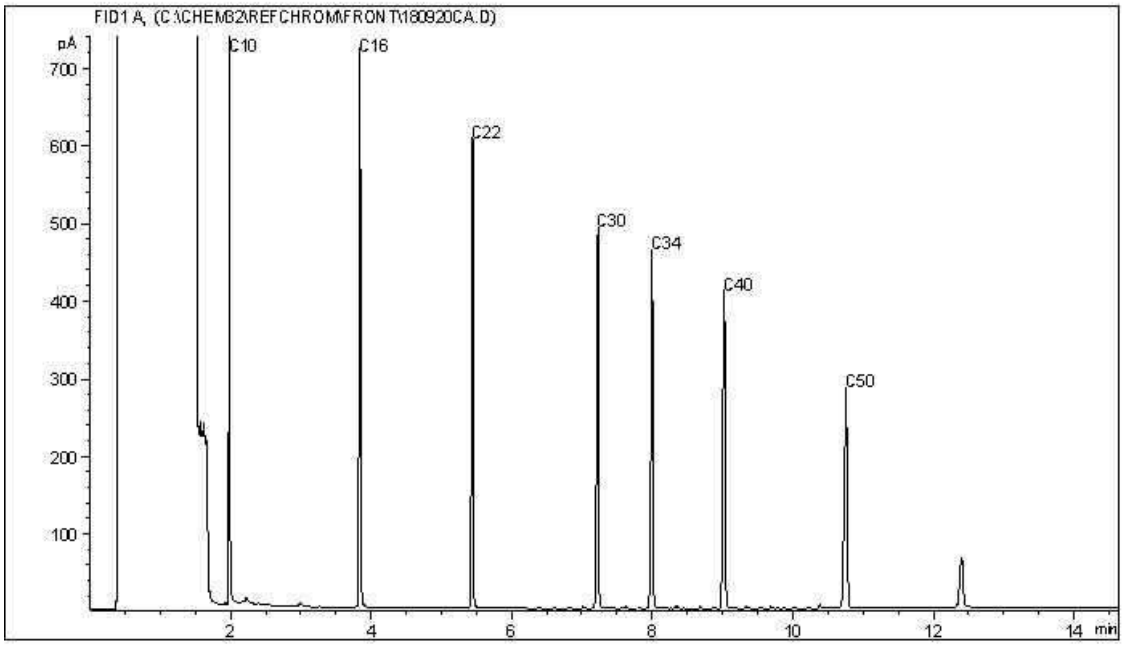
Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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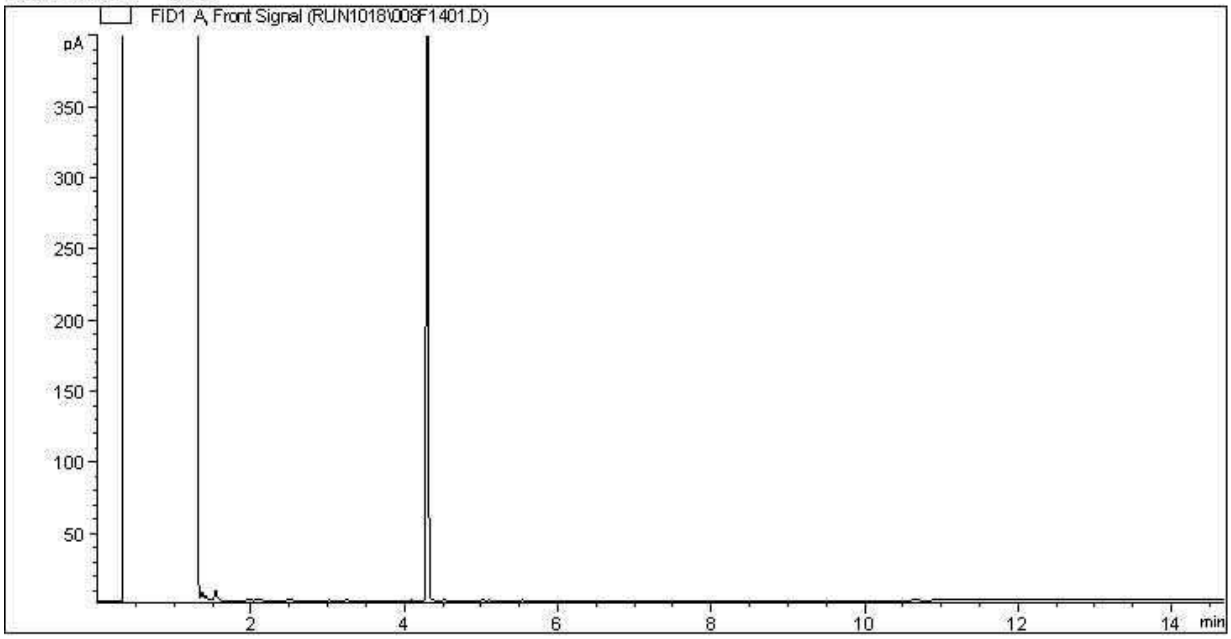
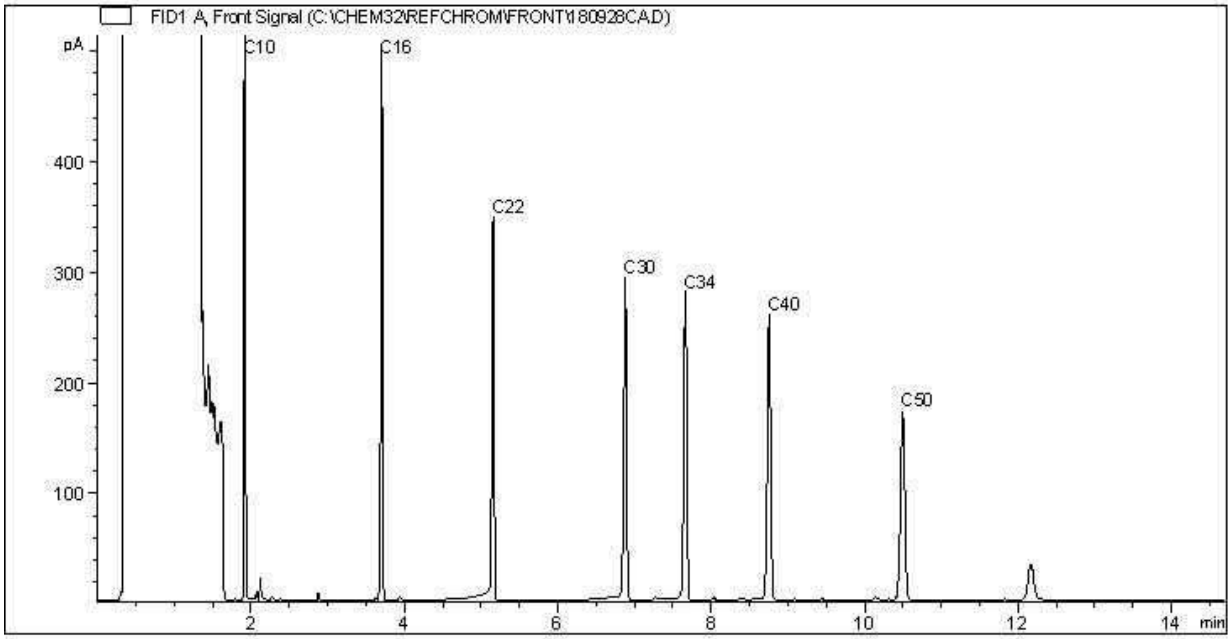
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



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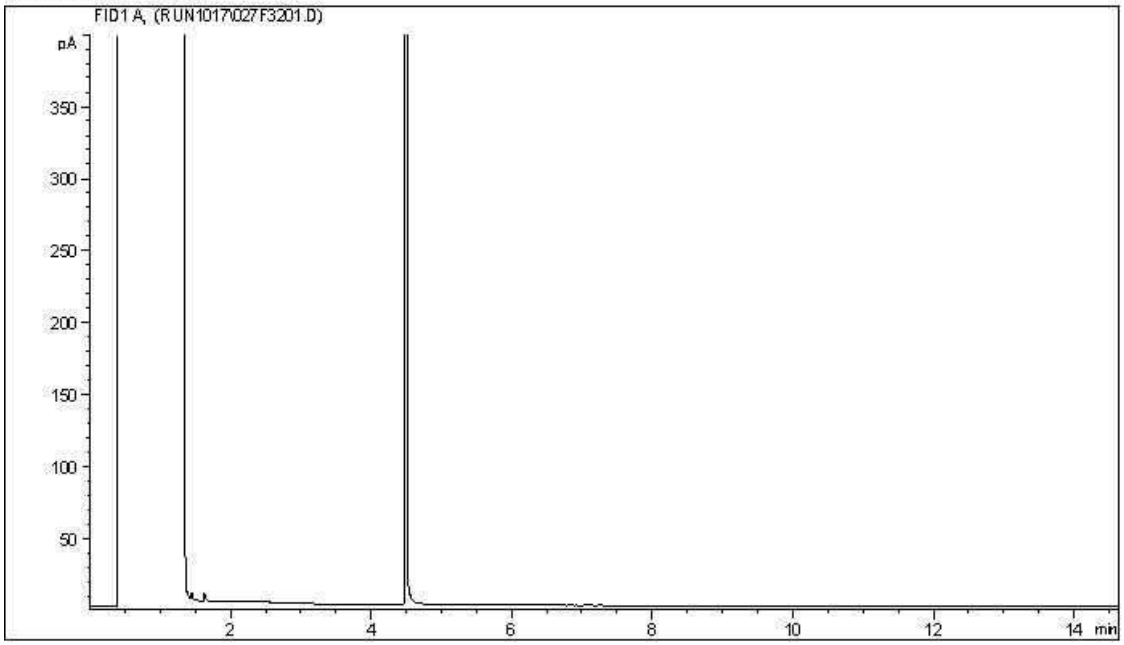
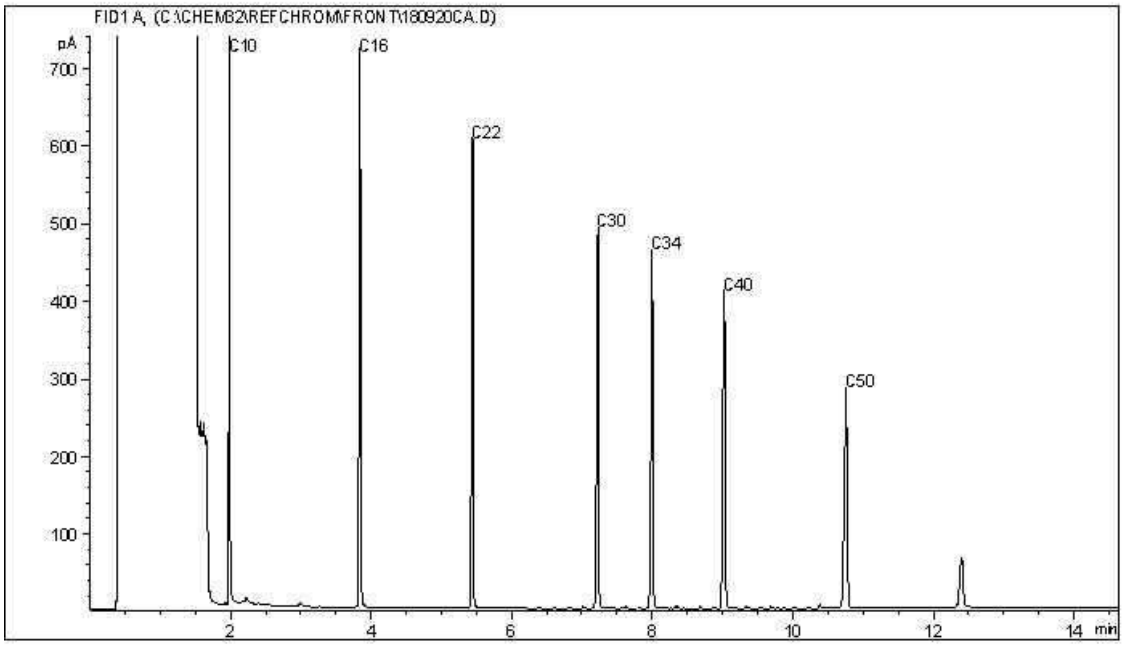
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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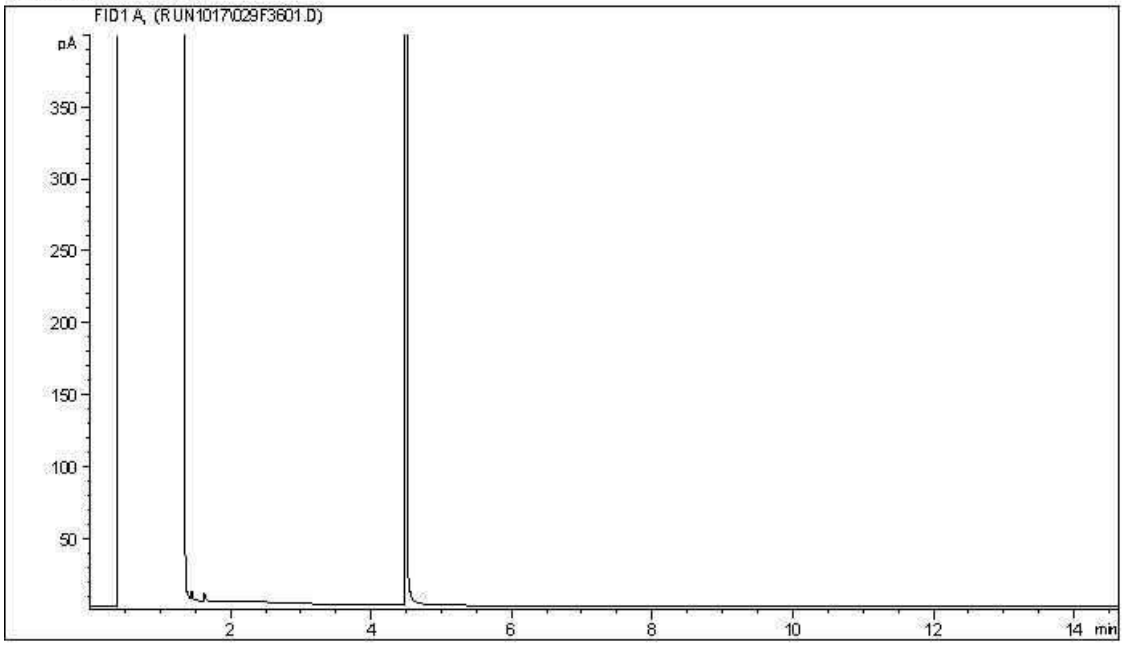
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B889362
Report Date: 2018/10/20
Maxxam Sample: UN6340 Lab-Dup

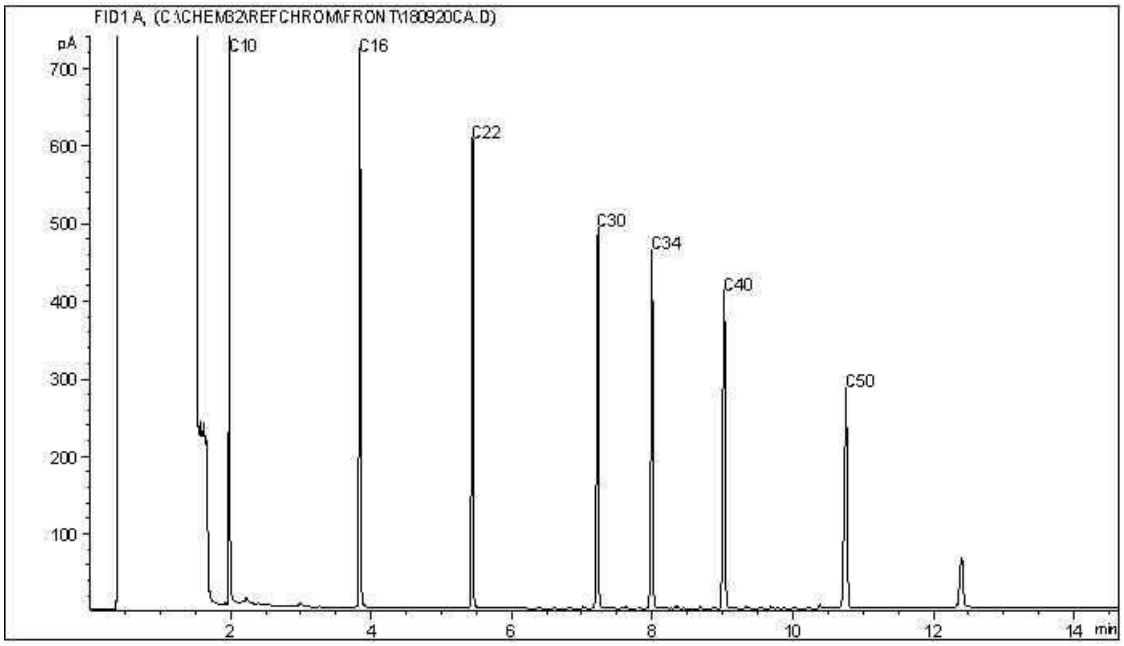
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 2008

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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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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Success Through Science®

Your Project #: CG2430.1 E31
Your C.O.C. #: M070781

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/20
Report #: R2637789
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B889372
Received: 2018/10/12, 14:25

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/10/13	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2018/10/15	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	1	2018/10/17	2018/10/18	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	1	N/A	2018/10/19	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	1	2018/10/17	2018/10/18	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	1	N/A	2018/10/17	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	1	N/A	2018/10/17	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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E31
Your C.O.C. #: M070781

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/20
Report #: R2637789
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B889372
Received: 2018/10/12, 14:25

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889372
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UN6446		
Sampling Date		2018/10/12 11:45		
COC Number		M070781		
	UNITS	**1929**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9185147
Volatiles				
Benzene	mg/L	<0.00040	0.00040	9182835
Toluene	mg/L	<0.00040	0.00040	9182835
Ethylbenzene	mg/L	<0.00040	0.00040	9182835
m & p-Xylene	mg/L	<0.00080	0.00080	9182835
o-Xylene	mg/L	<0.00040	0.00040	9182835
Xylenes (Total)	mg/L	<0.00089	0.00089	9182440
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	9182440
F1 (C6-C10)	mg/L	<0.10	0.10	9182835
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	116	N/A	9182835
4-Bromofluorobenzene (sur.)	%	96	N/A	9182835
D4-1,2-Dichloroethane (sur.)	%	75	N/A	9182835
O-TERPHENYL (sur.)	%	93	N/A	9185147

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889372
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6446		
Sampling Date		2018/10/12 11:45		
COC Number		M070781		
	UNITS	**1929**	**RDL**	**QC Batch**
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	mg/L	<0.000010	0.000010	9181158
Acenaphthene	mg/L	<0.00010	0.00010	9185145
Acenaphthylene	mg/L	<0.00010	0.00010	9185145
Acridine	mg/L	<0.000050	0.000050	9185145
Anthracene	mg/L	<0.000010	0.000010	9185145
Benzo(a)anthracene	mg/L	<0.0000085	0.0000085	9185145
Benzo(b&j)fluoranthene	mg/L	<0.0000085	0.0000085	9185145
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	9185145
Benzo(g,h,i)perylene	mg/L	<0.0000085	0.0000085	9185145
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	9185145
Benzo(a)pyrene	mg/L	<0.0000075	0.0000075	9185145
Benzo[e]pyrene	mg/L	<0.000050	0.000050	9185145
Chrysene	mg/L	<0.0000085	0.0000085	9185145
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	9185145
Fluoranthene	mg/L	<0.000010	0.000010	9185145
Fluorene	mg/L	<0.000050	0.000050	9185145
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	0.0000085	9185145
1-Methylnaphthalene	mg/L	<0.00010	0.00010	9185145
2-Methylnaphthalene	mg/L	<0.00010	0.00010	9185145
Naphthalene	mg/L	<0.00010	0.00010	9185145
Phenanthrene	mg/L	<0.000050	0.000050	9185145
Perylene	mg/L	<0.000050	0.000050	9185145
Pyrene	mg/L	<0.000020	0.000020	9185145
Quinoline	mg/L	<0.00020	0.00020	9185145
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	91	N/A	9185145
D8-ACENAPHTHYLENE (sur.)	%	89	N/A	9185145
D8-NAPHTHALENE (sur.)	%	76	N/A	9185145
TERPHENYL-D14 (sur.)	%	103	N/A	9185145

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889372
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6446		
Sampling Date		2018/10/12 11:45		
COC Number		M070781		
	UNITS	**1929**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9181170
Bromodichloromethane	mg/L	<0.00050	0.00050	9182837
Bromoform	mg/L	<0.00050	0.00050	9182837
Bromomethane	mg/L	<0.0020	0.0020	9182837
Carbon tetrachloride	mg/L	<0.00050	0.00050	9182837
Chlorobenzene	mg/L	<0.00050	0.00050	9182837
Chlorodibromomethane	mg/L	<0.0010	0.0010	9182837
Chloroethane	mg/L	<0.0010	0.0010	9182837
Chloroform	mg/L	<0.00050	0.00050	9182837
Chloromethane	mg/L	<0.0020	0.0020	9182837
1,2-dibromoethane	mg/L	<0.00020	0.00020	9182837
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9182837
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9182837
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9182837
1,1-dichloroethane	mg/L	<0.00050	0.00050	9182837
1,2-dichloroethane	mg/L	0.00082	0.00050	9182837
1,1-dichloroethene	mg/L	<0.00050	0.00050	9182837
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9182837
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9182837
Dichloromethane	mg/L	<0.0020	0.0020	9182837
1,2-dichloropropane	mg/L	<0.00050	0.00050	9182837
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9182837
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9182837
Methyl methacrylate	mg/L	<0.00050	0.00050	9182837
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9182837
Styrene	mg/L	<0.00050	0.00050	9182837
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9182837
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9182837
Tetrachloroethene	mg/L	<0.00050	0.00050	9182837
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9182837
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9182837
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9182837
RDL = Reportable Detection Limit				

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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UN6446		
Sampling Date		2018/10/12 11:45		
COC Number		M070781		
	UNITS	**1929**	**RDL**	**QC Batch**
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9182837
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9182837
Trichloroethene	mg/L	<0.00050	0.00050	9182837
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9182837
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9182837
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9182837
Vinyl chloride	mg/L	<0.00050	0.00050	9182837
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	98	N/A	9182837
4-Bromofluorobenzene (sur.)	%	104	N/A	9182837
D4-1,2-Dichloroethane (sur.)	%	100	N/A	9182837

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	7.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9182835	SAW	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/13		111	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		77	%	50 - 140
			Benzene	2018/10/13		100	%	50 - 140
			Toluene	2018/10/13		103	%	50 - 140
			Ethylbenzene	2018/10/13		112	%	50 - 140
			m & p-Xylene	2018/10/13		109	%	50 - 140
			o-Xylene	2018/10/13		103	%	50 - 140
			F1 (C6-C10)	2018/10/13		95	%	60 - 140
9182835	SAW	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/13		113	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		76	%	50 - 140
			Benzene	2018/10/13		86	%	60 - 130
			Toluene	2018/10/13		88	%	60 - 130
			Ethylbenzene	2018/10/13		97	%	60 - 130
			m & p-Xylene	2018/10/13		95	%	60 - 130
			o-Xylene	2018/10/13		88	%	60 - 130
			F1 (C6-C10)	2018/10/13		110	%	60 - 140
9182835	SAW	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/13		114	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/13		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/13		77	%	50 - 140
			Benzene	2018/10/13	<0.00040		mg/L	
			Toluene	2018/10/13	<0.00040		mg/L	
			Ethylbenzene	2018/10/13	<0.00040		mg/L	
			m & p-Xylene	2018/10/13	<0.00080		mg/L	
			o-Xylene	2018/10/13	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/13	<0.10		mg/L	
9182835	SAW	RPD	Benzene	2018/10/13	3.9		%	30
			Toluene	2018/10/13	5.4		%	30
			Ethylbenzene	2018/10/13	NC		%	30
			m & p-Xylene	2018/10/13	4.9		%	30
			o-Xylene	2018/10/13	4.5		%	30
			F1 (C6-C10)	2018/10/13	4.4		%	30
9182837	QW1	Matrix Spike [UN6446-02]	1,4-Difluorobenzene (sur.)	2018/10/16		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/16		107	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/16		101	%	50 - 140
			Bromodichloromethane	2018/10/16		110	%	50 - 140
			Bromoform	2018/10/16		101	%	50 - 140
			Bromomethane	2018/10/16		109	%	50 - 140
			Carbon tetrachloride	2018/10/16		103	%	50 - 140
			Chlorobenzene	2018/10/16		104	%	50 - 140
			Chlorodibromomethane	2018/10/16		104	%	50 - 140
			Chloroethane	2018/10/16		113	%	50 - 140
			Chloroform	2018/10/16		106	%	50 - 140
			Chloromethane	2018/10/16		126	%	50 - 140
			1,2-dibromoethane	2018/10/16		107	%	50 - 140
			1,2-dichlorobenzene	2018/10/16		109	%	50 - 140
			1,3-dichlorobenzene	2018/10/16		108	%	50 - 140
			1,4-dichlorobenzene	2018/10/16		106	%	50 - 140
			1,1-dichloroethane	2018/10/16		114	%	50 - 140
			1,2-dichloroethane	2018/10/16		112	%	50 - 140
			1,1-dichloroethene	2018/10/16		106	%	50 - 140
			cis-1,2-dichloroethene	2018/10/16		108	%	50 - 140
			trans-1,2-dichloroethene	2018/10/16		105	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dichloromethane	2018/10/16		104	%	50 - 140
			1,2-dichloropropane	2018/10/16		116	%	50 - 140
			cis-1,3-dichloropropene	2018/10/16		109	%	50 - 140
			trans-1,3-dichloropropene	2018/10/16		121	%	50 - 140
			Methyl methacrylate	2018/10/16		128	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/16		109	%	50 - 140
			Styrene	2018/10/16		108	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/16		98	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/16		108	%	50 - 140
			Tetrachloroethene	2018/10/16		95	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/16		105	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/16		103	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/16		103	%	50 - 140
			1,1,1-trichloroethane	2018/10/16		105	%	50 - 140
			1,1,2-trichloroethane	2018/10/16		112	%	50 - 140
			Trichloroethene	2018/10/16		104	%	50 - 140
			Trichlorofluoromethane	2018/10/16		106	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/16		111	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/16		112	%	50 - 140
			Vinyl chloride	2018/10/16		125	%	50 - 140
9182837	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/16		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/16		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/16		96	%	50 - 140
			Bromodichloromethane	2018/10/16		107	%	60 - 130
			Bromoform	2018/10/16		94	%	60 - 130
			Bromomethane	2018/10/16		112	%	60 - 130
			Carbon tetrachloride	2018/10/16		103	%	60 - 130
			Chlorobenzene	2018/10/16		100	%	60 - 130
			Chlorodibromomethane	2018/10/16		98	%	60 - 130
			Chloroethane	2018/10/16		110	%	60 - 130
			Chloroform	2018/10/16		104	%	60 - 130
			Chloromethane	2018/10/16		126	%	60 - 130
			1,2-dibromoethane	2018/10/16		100	%	60 - 130
			1,2-dichlorobenzene	2018/10/16		107	%	60 - 130
			1,3-dichlorobenzene	2018/10/16		107	%	60 - 130
			1,4-dichlorobenzene	2018/10/16		105	%	60 - 130
			1,1-dichloroethane	2018/10/16		112	%	60 - 130
			1,2-dichloroethane	2018/10/16		106	%	60 - 130
			1,1-dichloroethene	2018/10/16		107	%	60 - 130
			cis-1,2-dichloroethene	2018/10/16		105	%	60 - 130
			trans-1,2-dichloroethene	2018/10/16		104	%	60 - 130
			Dichloromethane	2018/10/16		101	%	60 - 130
			1,2-dichloropropane	2018/10/16		113	%	60 - 130
			cis-1,3-dichloropropene	2018/10/16		111	%	60 - 130
			trans-1,3-dichloropropene	2018/10/16		125	%	60 - 130
			Methyl methacrylate	2018/10/16		120	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/16		107	%	60 - 130
			Styrene	2018/10/16		104	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/16		94	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/16		101	%	60 - 130
			Tetrachloroethene	2018/10/16		93	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/16		101	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/16		101	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/16		102	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,1-trichloroethane	2018/10/16		105	%	60 - 130
			1,1,2-trichloroethane	2018/10/16		105	%	60 - 130
			Trichloroethene	2018/10/16		103	%	60 - 130
			Trichlorofluoromethane	2018/10/16		107	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/16		110	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/16		111	%	60 - 130
			Vinyl chloride	2018/10/16		124	%	60 - 130
9182837	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/16		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/16		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/16		100	%	50 - 140
			Bromodichloromethane	2018/10/16	<0.00050		mg/L	
			Bromoform	2018/10/16	<0.00050		mg/L	
			Bromomethane	2018/10/16	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/16	<0.00050		mg/L	
			Chlorobenzene	2018/10/16	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/16	<0.0010		mg/L	
			Chloroethane	2018/10/16	<0.0010		mg/L	
			Chloroform	2018/10/16	<0.00050		mg/L	
			Chloromethane	2018/10/16	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/16	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/16	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/16	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/16	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/16	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/16	<0.00050		mg/L	
			Dichloromethane	2018/10/16	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/16	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/16	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/16	<0.00050		mg/L	
			Methyl methacrylate	2018/10/16	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/16	<0.00050		mg/L	
			Styrene	2018/10/16	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/16	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/16	<0.0020		mg/L	
			Tetrachloroethene	2018/10/16	<0.00050		mg/L	
			1,2,3-trichlorobenzene	2018/10/16	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/16	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/16	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/16	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/16	<0.00050		mg/L	
			Trichloroethene	2018/10/16	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/16	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/16	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/16	<0.00050		mg/L	
			Vinyl chloride	2018/10/16	<0.00050		mg/L	
9182837	QW1	RPD	Bromodichloromethane	2018/10/16	NC		%	30
			Bromoform	2018/10/16	NC		%	30
			Bromomethane	2018/10/16	NC		%	30
			Carbon tetrachloride	2018/10/16	NC		%	30
			Chlorobenzene	2018/10/16	NC		%	30
			Chlorodibromomethane	2018/10/16	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chloroethane	2018/10/16	NC		%	30
			Chloroform	2018/10/16	NC		%	30
			Chloromethane	2018/10/16	NC		%	30
			1,2-dibromoethane	2018/10/16	NC		%	30
			1,2-dichlorobenzene	2018/10/16	NC		%	30
			1,3-dichlorobenzene	2018/10/16	NC		%	30
			1,4-dichlorobenzene	2018/10/16	NC		%	30
			1,1-dichloroethane	2018/10/16	NC		%	30
			1,2-dichloroethane	2018/10/16	NC		%	30
			1,1-dichloroethene	2018/10/16	NC		%	30
			cis-1,2-dichloroethene	2018/10/16	NC		%	30
			trans-1,2-dichloroethene	2018/10/16	NC		%	30
			Dichloromethane	2018/10/16	NC		%	30
			1,2-dichloropropane	2018/10/16	NC		%	30
			cis-1,3-dichloropropene	2018/10/16	NC		%	30
			trans-1,3-dichloropropene	2018/10/16	NC		%	30
			Methyl methacrylate	2018/10/16	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/16	NC		%	30
			Styrene	2018/10/16	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/16	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/16	NC		%	30
			Tetrachloroethene	2018/10/16	NC		%	30
			1,2,3-trichlorobenzene	2018/10/16	NC		%	30
			1,2,4-trichlorobenzene	2018/10/16	NC		%	30
			1,3,5-trichlorobenzene	2018/10/16	NC		%	30
			1,1,1-trichloroethane	2018/10/16	NC		%	30
			1,1,2-trichloroethane	2018/10/16	NC		%	30
			Trichloroethene	2018/10/16	NC		%	30
			Trichlorofluoromethane	2018/10/16	NC		%	30
			1,2,4-trimethylbenzene	2018/10/16	NC		%	30
			1,3,5-trimethylbenzene	2018/10/16	NC		%	30
			Vinyl chloride	2018/10/16	NC		%	30
9185145	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/10/18		111	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		107	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		88	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		125	%	50 - 130
			Acenaphthene	2018/10/18		104	%	50 - 130
			Acenaphthylene	2018/10/18		109	%	50 - 130
			Acridine	2018/10/18		96	%	50 - 130
			Anthracene	2018/10/18		104	%	50 - 130
			Benzo(a)anthracene	2018/10/18		120	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/18		113	%	50 - 130
			Benzo(k)fluoranthene	2018/10/18		110	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/18		102	%	50 - 130
			Benzo(c)phenanthrene	2018/10/18		124	%	50 - 130
			Benzo(a)pyrene	2018/10/18		107	%	50 - 130
			Benzo[e]pyrene	2018/10/18		105	%	50 - 130
			Chrysene	2018/10/18		115	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/18		105	%	50 - 130
			Fluoranthene	2018/10/18		123	%	50 - 130
			Fluorene	2018/10/18		110	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/18		102	%	50 - 130
			1-Methylnaphthalene	2018/10/18		109	%	50 - 130
			2-Methylnaphthalene	2018/10/18		103	%	50 - 130

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Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Naphthalene	2018/10/18		108	%	50 - 130
			Phenanthrene	2018/10/18		113	%	50 - 130
			Perylene	2018/10/18		85	%	50 - 130
			Pyrene	2018/10/18		119	%	50 - 130
			Quinoline	2018/10/18		104	%	50 - 130
9185145	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/18		93	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		90	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		75	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		106	%	50 - 130
			Acenaphthene	2018/10/18		89	%	50 - 130
			Acenaphthylene	2018/10/18		92	%	50 - 130
			Acridine	2018/10/18		81	%	50 - 130
			Anthracene	2018/10/18		89	%	50 - 130
			Benzo(a)anthracene	2018/10/18		117	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/18		110	%	50 - 130
			Benzo(k)fluoranthene	2018/10/18		111	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/18		103	%	50 - 130
			Benzo(c)phenanthrene	2018/10/18		110	%	50 - 130
			Benzo(a)pyrene	2018/10/18		100	%	50 - 130
			Benzo[e]pyrene	2018/10/18		104	%	50 - 130
			Chrysene	2018/10/18		114	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/18		106	%	50 - 130
			Fluoranthene	2018/10/18		109	%	50 - 130
			Fluorene	2018/10/18		91	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/18		101	%	50 - 130
			1-Methylnaphthalene	2018/10/18		90	%	50 - 130
			2-Methylnaphthalene	2018/10/18		84	%	50 - 130
			Naphthalene	2018/10/18		82	%	50 - 130
			Phenanthrene	2018/10/18		93	%	50 - 130
			Perylene	2018/10/18		96	%	50 - 130
			Pyrene	2018/10/18		106	%	50 - 130
			Quinoline	2018/10/18		104	%	50 - 130
9185145	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/18		98	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		88	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		70	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		109	%	50 - 130
			Acenaphthene	2018/10/18	<0.00010		mg/L	
			Acenaphthylene	2018/10/18	<0.00010		mg/L	
			Acridine	2018/10/18	<0.000050		mg/L	
			Anthracene	2018/10/18	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/18	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/18	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/18	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/18	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/18	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/18	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/18	<0.000050		mg/L	
			Chrysene	2018/10/18	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/18	<0.0000075		mg/L	
			Fluoranthene	2018/10/18	<0.000010		mg/L	
			Fluorene	2018/10/18	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/18	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/18	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/18	<0.00010		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B889372
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Naphthalene	2018/10/18	<0.00010		mg/L	
			Phenanthrene	2018/10/18	<0.000050		mg/L	
			Perylene	2018/10/18	<0.000050		mg/L	
			Pyrene	2018/10/18	<0.000020		mg/L	
			Quinoline	2018/10/18	<0.00020		mg/L	
9185145	LZ3	RPD	Acenaphthene	2018/10/18	NC		%	30
			Acenaphthylene	2018/10/18	NC		%	30
			Acridine	2018/10/18	NC		%	30
			Anthracene	2018/10/18	NC		%	30
			Benzo(a)anthracene	2018/10/18	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/18	NC		%	30
			Benzo(k)fluoranthene	2018/10/18	NC		%	30
			Benzo(g,h,i)perylene	2018/10/18	NC		%	30
			Benzo(c)phenanthrene	2018/10/18	NC		%	30
			Benzo(a)pyrene	2018/10/18	NC		%	30
			Benzo[e]pyrene	2018/10/18	NC		%	30
			Chrysene	2018/10/18	NC		%	30
			Dibenz(a,h)anthracene	2018/10/18	NC		%	30
			Fluoranthene	2018/10/18	NC		%	30
			Fluorene	2018/10/18	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/18	NC		%	30
			1-Methylnaphthalene	2018/10/18	NC		%	30
			2-Methylnaphthalene	2018/10/18	NC		%	30
			Naphthalene	2018/10/18	NC		%	30
			Phenanthrene	2018/10/18	NC		%	30
			Perylene	2018/10/18	NC		%	30
			Pyrene	2018/10/18	NC		%	30
			Quinoline	2018/10/18	NC		%	30
9185147	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/17		86	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17		90	%	60 - 140
9185147	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/17		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17		92	%	60 - 140
9185147	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/17		86	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17	<0.10		mg/L	
9185147	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/18	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).

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Maxxam Job #: B889372
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

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Maxxam Job #: B889372
Report Date: 2018/10/20

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Sampler Initials: AUS

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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

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

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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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

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CHAIN OF CUSTODY RECORD

M070781

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Sears Canada Inc.	Company:	Clifton Associates	Quotation #:		☑ 5-7 Days Regular (Most analyses)
Contact Name:	Wayne Prada	Contact Name:	Stephen d'Abadie	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	290 Yonge St. Suite 700 Toronto ON M5B 2C3	Address:	2222 - 30 Ave. NE Calgary AB T2E7K9	Project #:	CG2430.1 E31	Rush TAT (Surcharges will be applied) ☐ Same Day ☐ 1 Day ☐ 2 Days ☐ 3-4 Days
Phone:	416-941-2126	Phone:	403-263-2556	Site Location:		
Email:	wprada@sears.ca	Email:	stephen_dabadie@clifton.ca	Site #:		Date Required:
Copies:		Copies:	terryn_kuzyk@clifton.ca	Sampled By:	Austin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	8	6	9
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1	BTEX F1-F2	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	VOCs	PAHs	HOLD - DO NOT ANALYZE
1	1929		2018.10.12	11:45	GW	7	2	✓									✓	✓	
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
	Please indicate Filtered, Preserved or Both (F, P, F/P)						F	P									P	P	

Regulatory Criteria

- ☑ AT1
- ☐ CCME
- ☐ Drinking Water
- ☐ O50 (Drilling Waste)
- ☐ Saskatchewan
- ☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018/10/12		Jasmine T. Jasmine Mauna	2018/10/12	14:25

12-Oct-18 14:25
Leanne Cameron
B889372
TL8 INS-0189

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 an acceptance and acknowledgement of our terms which are available for viewing at www.maxxam

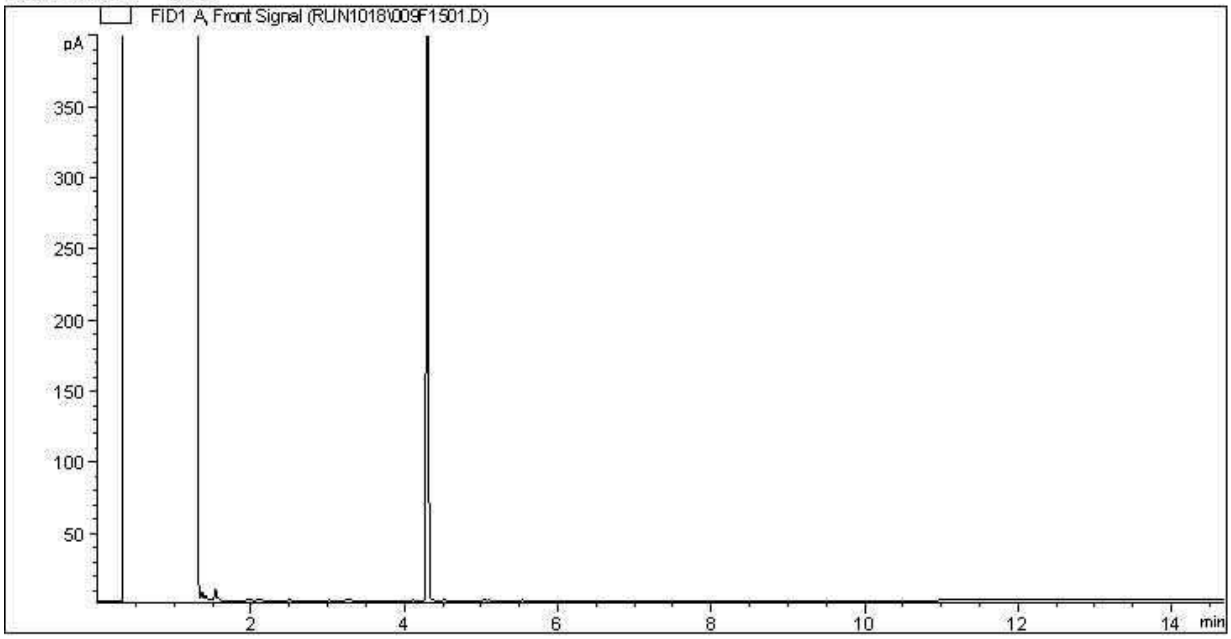
AB FCD-00331/7

Maxxam Job #: B889372
Report Date: 2018/10/20
Maxxam Sample: UN6446

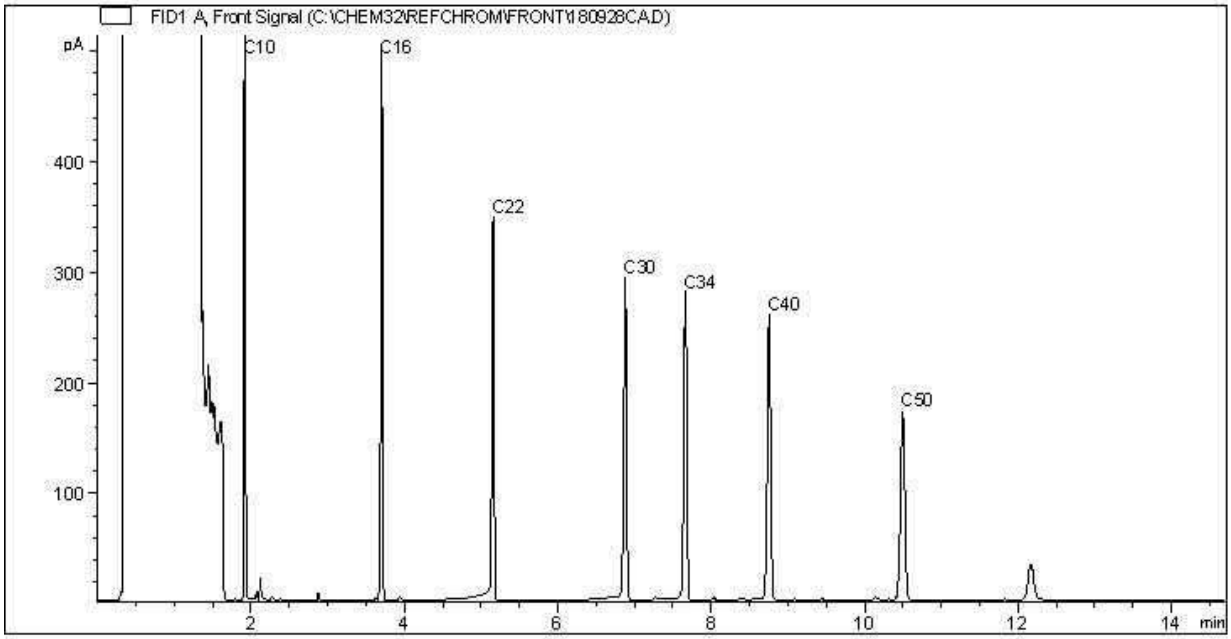
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E31
Client ID: 1929

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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.

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Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: M045914

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/19
Report #: R2637527
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B890269
Received: 2018/10/15, 14:54

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	7	N/A	2018/10/17	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2018/10/18	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/10/18	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	9	2018/10/17	2018/10/18	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	9	N/A	2018/10/19	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	9	2018/10/17	2018/10/18	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	10	N/A	2018/10/19	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	8	N/A	2018/10/17	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List)	2	N/A	2018/10/18	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.

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Your Project #: CG2430.1 E32
Your C.O.C. #: M045914

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/19
Report #: R2637527
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B890269
Received: 2018/10/15, 14:54

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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
==========
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Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO1891	UO1892		UO1893		UO1894		
Sampling Date		2018/10/15 11:15	2018/10/15 11:55		2018/10/15 13:20		2018/10/15 13:30		
COC Number		M045914	M045914		M045914		M045914		
	UNITS	**1923**	**1925**	**RDL**	**1927**	**RDL**	**1928**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	<0.10	0.10	<0.10	0.10	9187022
Volatiles									
Benzene	mg/L	<0.00040	0.47	0.00040	<0.00050 (1)	0.00050	2.7 (2)	0.0040	9186824
Toluene	mg/L	<0.00040	0.0055	0.00040	<0.00040	0.00040	<0.00040	0.00040	9186824
Ethylbenzene	mg/L	<0.00040	0.32	0.00040	<0.00040	0.00040	<0.00040	0.00040	9186824
m & p-Xylene	mg/L	<0.00080	0.0034	0.00080	<0.00080	0.00080	0.0015	0.00080	9186824
o-Xylene	mg/L	<0.00040	0.00095	0.00040	0.0057	0.00040	0.092	0.00040	9186824
Xylenes (Total)	mg/L	<0.00089	0.0043	0.00089	0.0057	0.00089	0.094	0.00089	9185637
F1 (C6-C10) - BTEX	mg/L	<0.10	0.77	0.10	<0.10	0.10	<0.10	0.10	9185637
F1 (C6-C10)	mg/L	<0.10	1.6	0.10	<0.10	0.10	2.8	0.10	9186824
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	87	81	N/A	86	N/A	82	N/A	9186824
4-Bromofluorobenzene (sur.)	%	114	117	N/A	115	N/A	115	N/A	9186824
D4-1,2-Dichloroethane (sur.)	%	89	84	N/A	89	N/A	96	N/A	9186824
O-TERPHENYL (sur.)	%	88	84	N/A	83	N/A	85	N/A	9187022

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limit raised due to interferent.
(2) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO1895		UO1896	UO1897	UO1898	UO1899		
Sampling Date		2018/10/15 10:50		2018/10/15 11:00	2018/10/15 14:00	2018/10/15 11:30	2018/10/15 11:30		
COC Number		M045914		M045914	M045914	M045914	M045914		
	UNITS	**1934**	**QC Batch**	**1935**	**1956**	**510A**	**9510A**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	9187022	<0.10	<0.10	0.13	0.15	0.10	9187022
Volatiles									
Benzene	mg/L	<0.00040	9186824	<0.00040	0.36	0.86	0.84	0.00040	9186824
Toluene	mg/L	<0.00040	9186824	<0.00040	<0.00040	0.019	0.018	0.00040	9186824
Ethylbenzene	mg/L	<0.00040	9186824	<0.00040	<0.00040	0.61	0.59	0.00040	9186824
m & p-Xylene	mg/L	<0.00080	9186824	<0.00080	<0.00080	0.21	0.20	0.00080	9186824
o-Xylene	mg/L	<0.00040	9186824	<0.00040	<0.00040	0.0048	0.0048	0.00040	9186824
Xylenes (Total)	mg/L	<0.00089	9185637	<0.00089	<0.00089	0.21	0.20	0.00089	9186594
F1 (C6-C10) - BTEX	mg/L	<0.10	9185637	<0.10	<0.10	1.6	1.5	0.10	9186594
F1 (C6-C10)	mg/L	<0.10	9186824	<0.10	0.38	3.3	3.1	0.10	9186824
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	88	9186824	88	83	80	79	N/A	9186824
4-Bromofluorobenzene (sur.)	%	116	9186824	116	115	117	121	N/A	9186824
D4-1,2-Dichloroethane (sur.)	%	90	9186824	90	94	79	81	N/A	9186824
O-TERPHENYL (sur.)	%	84	9187022	81	82	82	86	N/A	9187022

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam ID		UO1899		
Sampling Date		2018/10/15 11:30		
COC Number		M045914		
	UNITS	**9510A Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	0.14	0.10	9187022
Surrogate Recovery (%)				
O-TERPHENYL (sur.)	%	86	N/A	9187022

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO1891	UO1892	UO1893	UO1894	UO1895		
Sampling Date		2018/10/15 11:15	2018/10/15 11:55	2018/10/15 13:20	2018/10/15 13:30	2018/10/15 10:50		
COC Number		M045914	M045914	M045914	M045914	M045914		
	UNITS	**1923**	**1925**	**1927**	**1928**	**1934**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9186053
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9187020
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9187020
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9187020
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9187020
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9187020
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9187020
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9187020
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9187020
Naphthalene	mg/L	<0.00010	0.00038	<0.00010	<0.00010	<0.00010	0.00010	9187020
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9187020
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9187020
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	99	101	100	98	100	N/A	9187020
D8-ACENAPHTHYLENE (sur.)	%	96	96	88	90	98	N/A	9187020
D8-NAPHTHALENE (sur.)	%	74	70	60	61	77	N/A	9187020
TERPHENYL-D14 (sur.)	%	110	108	103	101	111	N/A	9187020

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO1896	UO1897	UO1898	UO1899	UO1899		
Sampling Date		2018/10/15 11:00	2018/10/15 14:00	2018/10/15 11:30	2018/10/15 11:30	2018/10/15 11:30		
COC Number		M045914	M045914	M045914	M045914	M045914		
	UNITS	**1935**	**1956**	**510A**	**9510A**	**9510A Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	N/A	0.000010	9186053
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9187020
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9187020
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9187020
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9187020
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9187020
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9187020
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9187020
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	0.00014	0.00014	0.00014	0.00010	9187020
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	0.00012	0.00012	0.00012	0.00010	9187020
Naphthalene	mg/L	<0.00010	<0.00010	0.0029	0.0029	0.0028	0.00010	9187020
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9187020
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	0.000020	<0.000020	0.000020	9187020
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9187020
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	101	98	100	99	94	N/A	9187020
D8-ACENAPHTHYLENE (sur.)	%	101	98	89	92	86	N/A	9187020
D8-NAPHTHALENE (sur.)	%	82	81	75	79	72	N/A	9187020
TERPHENYL-D14 (sur.)	%	111	108	105	107	97	N/A	9187020

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO1891	UO1892	UO1893	UO1894	UO1895		
Sampling Date		2018/10/15 11:15	2018/10/15 11:55	2018/10/15 13:20	2018/10/15 13:30	2018/10/15 10:50		
COC Number		M045914	M045914	M045914	M045914	M045914		
	UNITS	**1923**	**1925**	**1927**	**1928**	**1934**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9185696
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	0.0015	<0.0010	0.0010	9186470
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9186470
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,2-dichloroethane	mg/L	<0.00050	0.022	<0.00050	0.31	<0.00050	0.00050	9186470
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
RDL = Reportable Detection Limit								

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO1891	UO1892	UO1893	UO1894	UO1895		
Sampling Date		2018/10/15 11:15	2018/10/15 11:55	2018/10/15 13:20	2018/10/15 13:30	2018/10/15 10:50		
COC Number		M045914	M045914	M045914	M045914	M045914		
	UNITS	**1923**	**1925**	**1927**	**1928**	**1934**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.0027	<0.00050	0.00050	9186470
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00062	<0.00050	0.00050	9186470
1,3,5-trimethylbenzene	mg/L	<0.00050	0.0014	<0.00050	<0.00050	<0.00050	0.00050	9186470
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	102	101	104	101	N/A	9186470
4-Bromofluorobenzene (sur.)	%	95	93	96	90	96	N/A	9186470
D4-1,2-Dichloroethane (sur.)	%	101	131	105	129	102	N/A	9186470

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO1896	UO1897	UO1898	UO1899	UO1900		
Sampling Date		2018/10/15 11:00	2018/10/15 14:00	2018/10/15 11:30	2018/10/15 11:30	2018/10/15		
COC Number		M045914	M045914	M045914	M045914	M045914		
	UNITS	**1935**	**1956**	**510A**	**9510A**	**TRIP BLANK 4**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9185696
Benzene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9186470
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Chloromethane	mg/L	<0.0020	<0.0020	0.0036	0.0037	<0.0020	0.0020	9186470
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9186470
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,2-dichloroethane	mg/L	<0.00050	0.028	0.044	0.040	<0.00050	0.00050	9186470
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Ethylbenzene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9186470
Methyl methacrylate	mg/L	<0.00050	<0.00050	0.0022 (1)	0.0026 (1)	<0.00050	0.00050	9186470
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9186470

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO1896	UO1897	UO1898	UO1899	UO1900		
Sampling Date		2018/10/15 11:00	2018/10/15 14:00	2018/10/15 11:30	2018/10/15 11:30	2018/10/15		
COC Number		M045914	M045914	M045914	M045914	M045914		
	UNITS	**1935**	**1956**	**510A**	**9510A**	**TRIP BLANK 4**	**RDL**	**QC Batch**
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Toluene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9186470
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9186470
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,1,2-trichloroethane	mg/L	<0.00050	0.00063	<0.00050	<0.00050	<0.00050	0.00050	9186470
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	0.027	0.026	<0.00050	0.00050	9186470
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	0.0015	0.0016	<0.00050	0.00050	9186470
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9186470
Xylenes (Total)	mg/L	N/A	N/A	N/A	N/A	<0.00080	0.00080	9186470
m & p-Xylene	mg/L	N/A	N/A	N/A	N/A	<0.00080	0.00080	9186470
o-Xylene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9186470
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	102	102	102	100	N/A	9186470
4-Bromofluorobenzene (sur.)	%	97	95	97	96	96	N/A	9186470
D4-1,2-Dichloroethane (sur.)	%	106	128	125	126	102	N/A	9186470

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	8.0°C

Results relate only to the items tested.

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Client Project #: CG2430.1 E32
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9186470	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/17		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/17		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		102	%	50 - 140
			Benzene	2018/10/17		92	%	50 - 140
			Bromodichloromethane	2018/10/17		108	%	50 - 140
			Bromoform	2018/10/17		102	%	50 - 140
			Bromomethane	2018/10/17		101	%	50 - 140
			Carbon tetrachloride	2018/10/17		105	%	50 - 140
			Chlorobenzene	2018/10/17		99	%	50 - 140
			Chlorodibromomethane	2018/10/17		104	%	50 - 140
			Chloroethane	2018/10/17		96	%	50 - 140
			Chloroform	2018/10/17		99	%	50 - 140
			Chloromethane	2018/10/17		115	%	50 - 140
			1,2-dibromoethane	2018/10/17		100	%	50 - 140
			1,2-dichlorobenzene	2018/10/17		107	%	50 - 140
			1,3-dichlorobenzene	2018/10/17		104	%	50 - 140
			1,4-dichlorobenzene	2018/10/17		102	%	50 - 140
			1,1-dichloroethane	2018/10/17		100	%	50 - 140
			1,2-dichloroethane	2018/10/17		107	%	50 - 140
			1,1-dichloroethene	2018/10/17		101	%	50 - 140
			cis-1,2-dichloroethene	2018/10/17		100	%	50 - 140
			trans-1,2-dichloroethene	2018/10/17		96	%	50 - 140
			Dichloromethane	2018/10/17		99	%	50 - 140
			1,2-dichloropropane	2018/10/17		103	%	50 - 140
			cis-1,3-dichloropropene	2018/10/17		104	%	50 - 140
			trans-1,3-dichloropropene	2018/10/17		104	%	50 - 140
			Ethylbenzene	2018/10/17		93	%	50 - 140
			Methyl methacrylate	2018/10/17		105	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/17		102	%	50 - 140
			Styrene	2018/10/17		98	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/17		95	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/17		100	%	50 - 140
			Tetrachloroethene	2018/10/17		95	%	50 - 140
			Toluene	2018/10/17		95	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/17		99	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/17		98	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/17		99	%	50 - 140
			1,1,1-trichloroethane	2018/10/17		105	%	50 - 140
			1,1,2-trichloroethane	2018/10/17		105	%	50 - 140
			Trichloroethene	2018/10/17		107	%	50 - 140
			Trichlorofluoromethane	2018/10/17		105	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/17		100	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/17		103	%	50 - 140
			Vinyl chloride	2018/10/17		111	%	50 - 140
			m & p-Xylene	2018/10/17		92	%	50 - 140
			o-Xylene	2018/10/17		91	%	50 - 140
9186470	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/17		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/17		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		100	%	50 - 140
			Benzene	2018/10/17		90	%	60 - 130
			Bromodichloromethane	2018/10/17		105	%	60 - 130
			Bromoform	2018/10/17		94	%	60 - 130
			Bromomethane	2018/10/17		98	%	60 - 130
			Carbon tetrachloride	2018/10/17		105	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorobenzene	2018/10/17		95	%	60 - 130
			Chlorodibromomethane	2018/10/17		98	%	60 - 130
			Chloroethane	2018/10/17		95	%	60 - 130
			Chloroform	2018/10/17		97	%	60 - 130
			Chloromethane	2018/10/17		114	%	60 - 130
			1,2-dibromoethane	2018/10/17		92	%	60 - 130
			1,2-dichlorobenzene	2018/10/17		102	%	60 - 130
			1,3-dichlorobenzene	2018/10/17		100	%	60 - 130
			1,4-dichlorobenzene	2018/10/17		98	%	60 - 130
			1,1-dichloroethane	2018/10/17		99	%	60 - 130
			1,2-dichloroethane	2018/10/17		102	%	60 - 130
			1,1-dichloroethene	2018/10/17		101	%	60 - 130
			cis-1,2-dichloroethene	2018/10/17		98	%	60 - 130
			trans-1,2-dichloroethene	2018/10/17		95	%	60 - 130
			Dichloromethane	2018/10/17		96	%	60 - 130
			1,2-dichloropropane	2018/10/17		100	%	60 - 130
			cis-1,3-dichloropropene	2018/10/17		98	%	60 - 130
			trans-1,3-dichloropropene	2018/10/17		93	%	60 - 130
			Ethylbenzene	2018/10/17		90	%	60 - 130
			Methyl methacrylate	2018/10/17		99	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/17		99	%	60 - 130
			Styrene	2018/10/17		93	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/17		91	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/17		92	%	60 - 130
			Tetrachloroethene	2018/10/17		92	%	60 - 130
			Toluene	2018/10/17		92	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/17		95	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/17		94	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/17		96	%	60 - 130
			1,1,1-trichloroethane	2018/10/17		105	%	60 - 130
			1,1,2-trichloroethane	2018/10/17		100	%	60 - 130
			Trichloroethene	2018/10/17		106	%	60 - 130
			Trichlorofluoromethane	2018/10/17		106	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/17		98	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/17		101	%	60 - 130
			Vinyl chloride	2018/10/17		111	%	60 - 130
			m & p-Xylene	2018/10/17		90	%	60 - 130
			o-Xylene	2018/10/17		88	%	60 - 130
9186470	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/18		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/18		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/18		103	%	50 - 140
			Benzene	2018/10/18	<0.00040		mg/L	
			Bromodichloromethane	2018/10/18	<0.00050		mg/L	
			Bromoform	2018/10/18	<0.00050		mg/L	
			Bromomethane	2018/10/18	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/18	<0.00050		mg/L	
			Chlorobenzene	2018/10/18	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/18	<0.0010		mg/L	
			Chloroethane	2018/10/18	<0.0010		mg/L	
			Chloroform	2018/10/18	<0.00050		mg/L	
			Chloromethane	2018/10/18	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/18	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/18	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/18	<0.00050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,4-dichlorobenzene	2018/10/18	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/18	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/18	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/18	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/18	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/18	<0.00050		mg/L	
			Dichloromethane	2018/10/18	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/18	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/18	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/18	<0.00050		mg/L	
			Ethylbenzene	2018/10/18	<0.00040		mg/L	
			Methyl methacrylate	2018/10/18	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/18	<0.00050		mg/L	
			Styrene	2018/10/18	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/18	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/18	<0.0020		mg/L	
			Tetrachloroethene	2018/10/18	<0.00050		mg/L	
			Toluene	2018/10/18	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/18	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/18	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/18	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/18	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/18	<0.00050		mg/L	
			Trichloroethene	2018/10/18	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/18	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/18	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/18	<0.00050		mg/L	
			Vinyl chloride	2018/10/18	<0.00050		mg/L	
			Xylenes (Total)	2018/10/18	<0.00080		mg/L	
			m & p-Xylene	2018/10/18	<0.00080		mg/L	
			o-Xylene	2018/10/18	<0.00040		mg/L	
9186470	MZ	RPD	Benzene	2018/10/17	NC		%	30
			Chloroform	2018/10/17	NC		%	30
			1,2-dichlorobenzene	2018/10/17	NC		%	30
			1,4-dichlorobenzene	2018/10/17	NC		%	30
			Dichloromethane	2018/10/17	NC		%	30
			Ethylbenzene	2018/10/17	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/17	NC		%	30
			Tetrachloroethene	2018/10/17	NC		%	30
			Toluene	2018/10/17	NC		%	30
			Trichloroethene	2018/10/17	NC		%	30
			Xylenes (Total)	2018/10/17	NC		%	30
			m & p-Xylene	2018/10/17	NC		%	30
			o-Xylene	2018/10/17	NC		%	30
9186824	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/18		86	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/18		115	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/18		95	%	50 - 140
			Benzene	2018/10/18		80	%	50 - 140
			Toluene	2018/10/18		82	%	50 - 140
			Ethylbenzene	2018/10/18		85	%	50 - 140
			m & p-Xylene	2018/10/18		75	%	50 - 140
			o-Xylene	2018/10/18		81	%	50 - 140
			F1 (C6-C10)	2018/10/18		75	%	60 - 140
9186824	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/17		83	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			4-Bromofluorobenzene (sur.)	2018/10/17		118	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		89	%	50 - 140
			Benzene	2018/10/17		81	%	60 - 130
			Toluene	2018/10/17		82	%	60 - 130
			Ethylbenzene	2018/10/17		85	%	60 - 130
			m & p-Xylene	2018/10/17		83	%	60 - 130
			o-Xylene	2018/10/17		83	%	60 - 130
			F1 (C6-C10)	2018/10/17		93	%	60 - 140
9186824	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/17		89	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/17		119	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		93	%	50 - 140
			Benzene	2018/10/17	<0.00040		mg/L	
			Toluene	2018/10/17	<0.00040		mg/L	
			Ethylbenzene	2018/10/17	<0.00040		mg/L	
			m & p-Xylene	2018/10/17	<0.00080		mg/L	
			o-Xylene	2018/10/17	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/17	<0.10		mg/L	
9186824	DO1	RPD	Benzene	2018/10/17	NC		%	30
			Toluene	2018/10/17	NC		%	30
			Ethylbenzene	2018/10/17	NC		%	30
			m & p-Xylene	2018/10/17	NC		%	30
			o-Xylene	2018/10/17	2.9		%	30
			F1 (C6-C10)	2018/10/17	NC		%	30
9187020	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/10/18		109	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		108	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		83	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		116	%	50 - 130
			Acenaphthene	2018/10/18		104	%	50 - 130
			Acenaphthylene	2018/10/18		109	%	50 - 130
			Acridine	2018/10/18		84	%	50 - 130
			Anthracene	2018/10/18		101	%	50 - 130
			Benzo(a)anthracene	2018/10/18		110	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/18		112	%	50 - 130
			Benzo(k)fluoranthene	2018/10/18		105	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/18		104	%	50 - 130
			Benzo(c)phenanthrene	2018/10/18		104	%	50 - 130
			Benzo(a)pyrene	2018/10/18		111	%	50 - 130
			Benzo[e]pyrene	2018/10/18		106	%	50 - 130
			Chrysene	2018/10/18		103	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/18		102	%	50 - 130
			Fluoranthene	2018/10/18		113	%	50 - 130
			Fluorene	2018/10/18		112	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/18		96	%	50 - 130
			1-Methylnaphthalene	2018/10/18		105	%	50 - 130
			2-Methylnaphthalene	2018/10/18		101	%	50 - 130
			Naphthalene	2018/10/18		99	%	50 - 130
			Phenanthrene	2018/10/18		107	%	50 - 130
			Perylene	2018/10/18		92	%	50 - 130
			Pyrene	2018/10/18		108	%	50 - 130
			Quinoline	2018/10/18		95	%	50 - 130
9187020	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/18		97	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		101	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		85	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		107	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2018/10/18		95	%	50 - 130
			Acenaphthylene	2018/10/18		101	%	50 - 130
			Acridine	2018/10/18		85	%	50 - 130
			Anthracene	2018/10/18		95	%	50 - 130
			Benzo(a)anthracene	2018/10/18		113	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/18		116	%	50 - 130
			Benzo(k)fluoranthene	2018/10/18		108	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/18		107	%	50 - 130
			Benzo(c)phenanthrene	2018/10/18		109	%	50 - 130
			Benzo(a)pyrene	2018/10/18		106	%	50 - 130
			Benzo[e]pyrene	2018/10/18		109	%	50 - 130
			Chrysene	2018/10/18		113	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/18		99	%	50 - 130
			Fluoranthene	2018/10/18		108	%	50 - 130
			Fluorene	2018/10/18		99	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/18		91	%	50 - 130
			1-Methylnaphthalene	2018/10/18		93	%	50 - 130
			2-Methylnaphthalene	2018/10/18		88	%	50 - 130
			Naphthalene	2018/10/18		87	%	50 - 130
			Phenanthrene	2018/10/18		100	%	50 - 130
			Perylene	2018/10/18		97	%	50 - 130
			Pyrene	2018/10/18		106	%	50 - 130
			Quinoline	2018/10/18		94	%	50 - 130
9187020	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/18		102	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/18		101	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/18		78	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/18		119	%	50 - 130
			Acenaphthene	2018/10/18	<0.00010		mg/L	
			Acenaphthylene	2018/10/18	<0.00010		mg/L	
			Acridine	2018/10/18	<0.000050		mg/L	
			Anthracene	2018/10/18	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/18	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/18	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/18	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/18	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/18	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/18	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/18	<0.000050		mg/L	
			Chrysene	2018/10/18	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/18	<0.0000075		mg/L	
			Fluoranthene	2018/10/18	<0.000010		mg/L	
			Fluorene	2018/10/18	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/18	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/18	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/18	<0.00010		mg/L	
			Naphthalene	2018/10/18	<0.00010		mg/L	
			Phenanthrene	2018/10/18	<0.000050		mg/L	
			Perylene	2018/10/18	<0.000050		mg/L	
			Pyrene	2018/10/18	<0.000020		mg/L	
			Quinoline	2018/10/18	<0.00020		mg/L	
9187020	LZ3	RPD [UO1899-02]	Acenaphthene	2018/10/18	NC		%	30
			Acenaphthylene	2018/10/18	NC		%	30
			Acridine	2018/10/18	NC		%	30
			Anthracene	2018/10/18	NC		%	30

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)anthracene	2018/10/18	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/18	NC		%	30
			Benzo(k)fluoranthene	2018/10/18	NC		%	30
			Benzo(g,h,i)perylene	2018/10/18	NC		%	30
			Benzo(c)phenanthrene	2018/10/18	NC		%	30
			Benzo(a)pyrene	2018/10/18	NC		%	30
			Benzo[e]pyrene	2018/10/18	NC		%	30
			Chrysene	2018/10/18	NC		%	30
			Dibenz(a,h)anthracene	2018/10/18	NC		%	30
			Fluoranthene	2018/10/18	NC		%	30
			Fluorene	2018/10/18	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/18	NC		%	30
			1-Methylnaphthalene	2018/10/18	2.2		%	30
			2-Methylnaphthalene	2018/10/18	2.5		%	30
			Naphthalene	2018/10/18	2.8		%	30
			Phenanthrene	2018/10/18	NC		%	30
			Perylene	2018/10/18	NC		%	30
			Pyrene	2018/10/18	1.5		%	30
			Quinoline	2018/10/18	NC		%	30
9187022	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/18		83	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/18		85	%	60 - 140
9187022	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/17		84	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17		90	%	60 - 140
9187022	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/17		85	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/17	<0.10		mg/L	
9187022	VP4	RPD [UO1899-02]	F2 (C10-C16 Hydrocarbons)	2018/10/18	0.97		%	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).

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890269
Report Date: 2018/10/19

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AM

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

551

CHAIN OF CUSTODY RECORD

M 045914

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	~~Stears Group~~ Clifton	Company:	Clifton Associates	Quotation #:		☑ 5-7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 - 30 Ave. NE Calgary AB. T2E7K9	Address:				Rush TAT (Surcharges will be applied)
				Project #:	CG2430.1 E32	☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	stephen_dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn_kuzyk@clifton.ca	Copies:		Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp:	7	01	8
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp:			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp:			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	BTEX F1-F4	Flourine 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
1	1923		2018/10/15	11:15	GW	8	✓	✓									✓	
2	1925		↓	11:55	↓	8	✓	✓									✓	
3	1927			13:20		8	✓	✓									✓	
4	1928			13:30		8	✓	✓									✓	
5	1934			10:50		8	✓	✓									✓	
6	1935			11:00		8	✓	✓									✓	
7	1956			14:00		8	✓	✓									✓	
8	510 A			11:30	✓	7	✓	✓									✓	
9	9510 A		✓	11:30	GW	7	✓	✓									✓	
10	Trip Blank 4		2018/10/15		W	2	✓											
	Please Indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Regulatory Criteria

☑ AT1
☐ CCME
☐ Drinking Water
☐ D50 (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

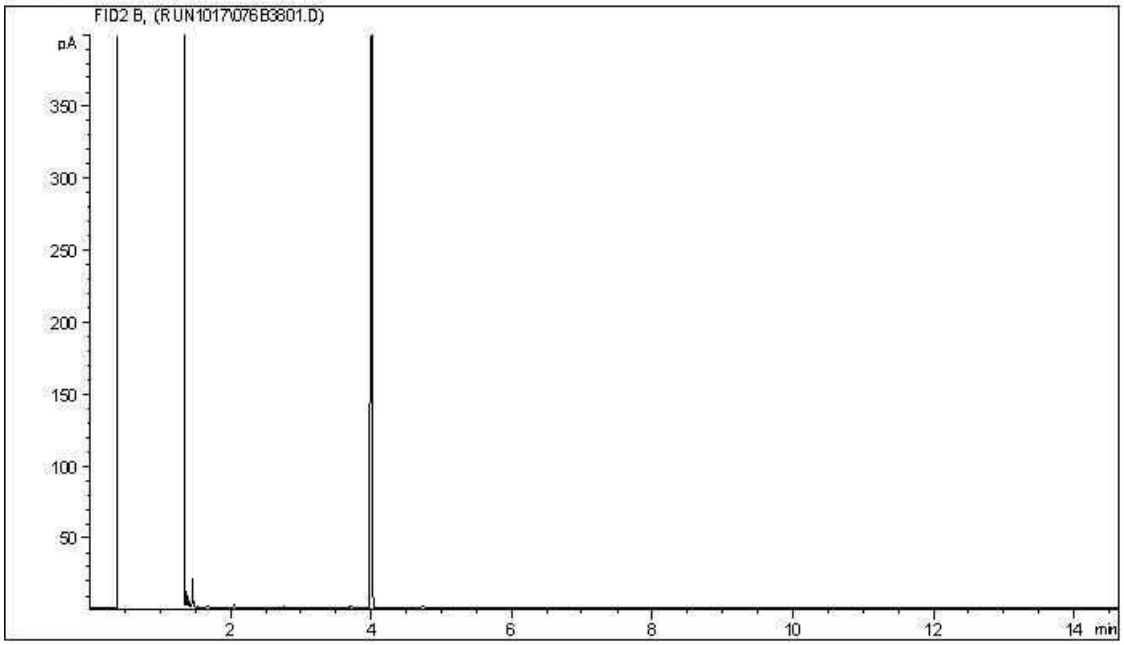
Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Austin Mei	2018/10/15	14:53	Benvan DALGLEISH	2018/10/15	14:54	B890269

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 acknowledgement and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

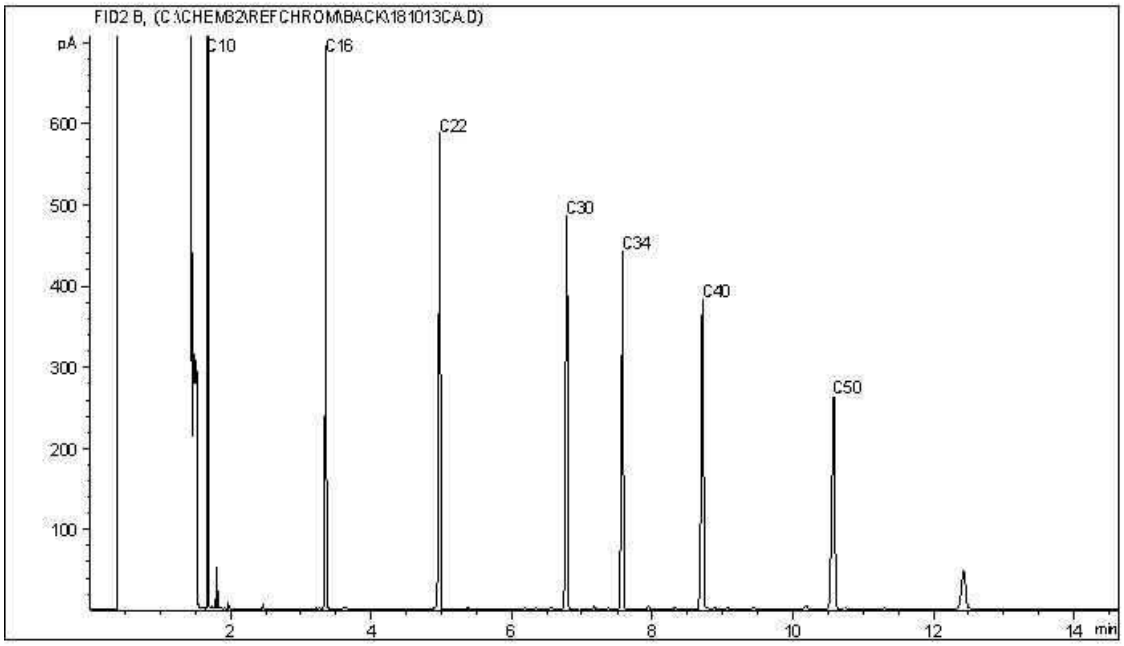
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

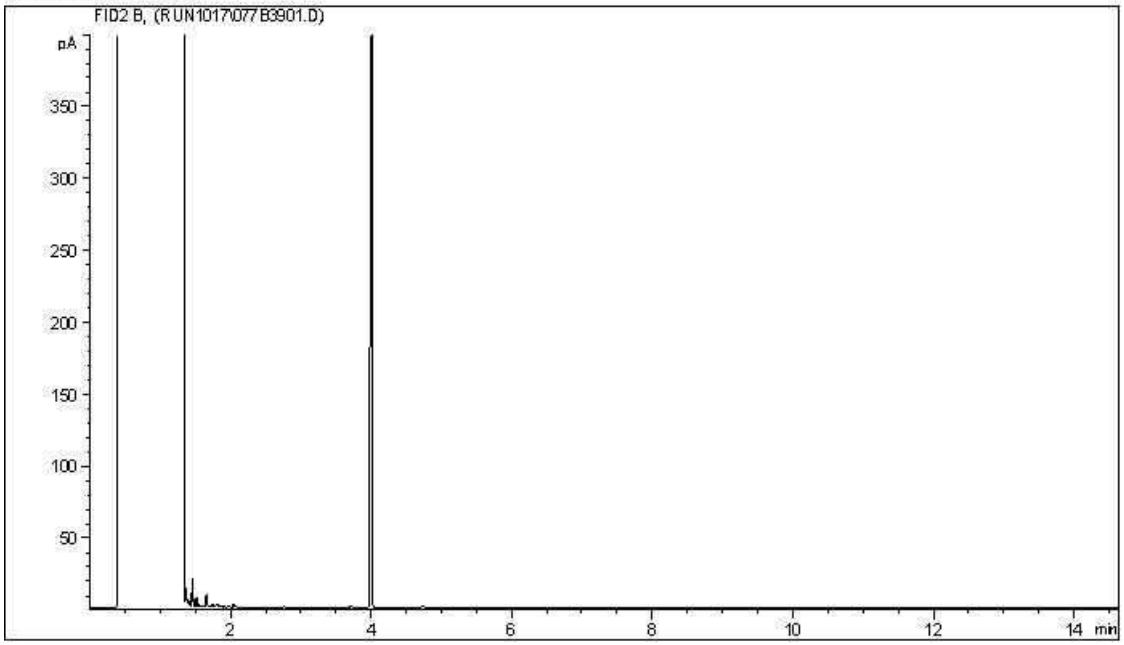
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890269
Report Date: 2018/10/19
Maxxam Sample: UO1892

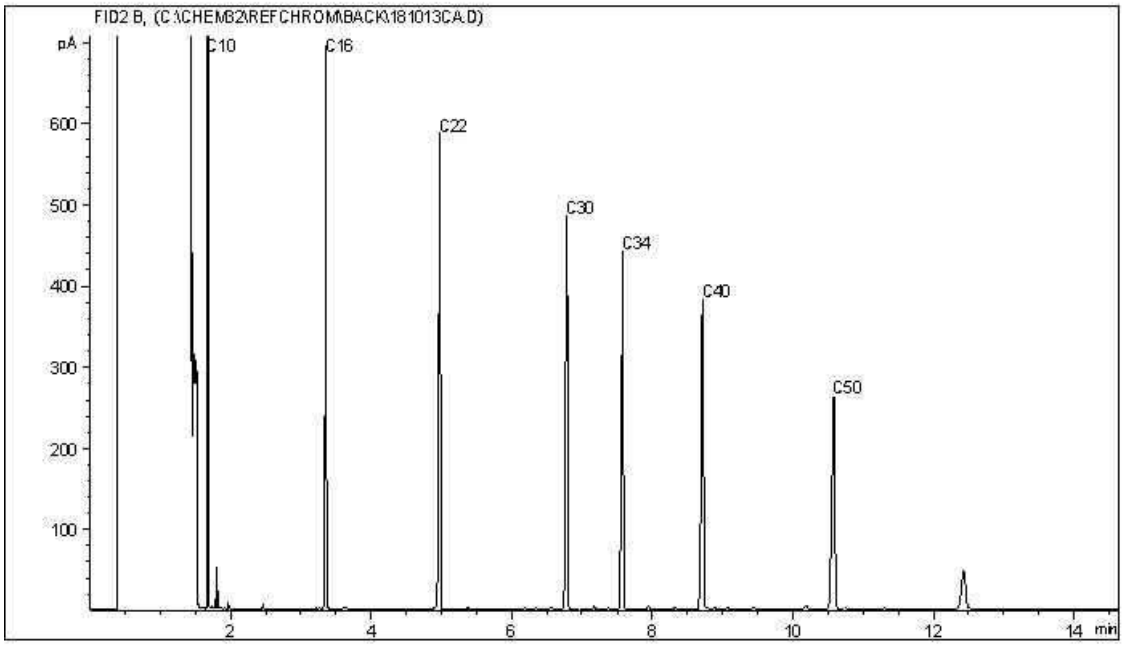
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1925

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



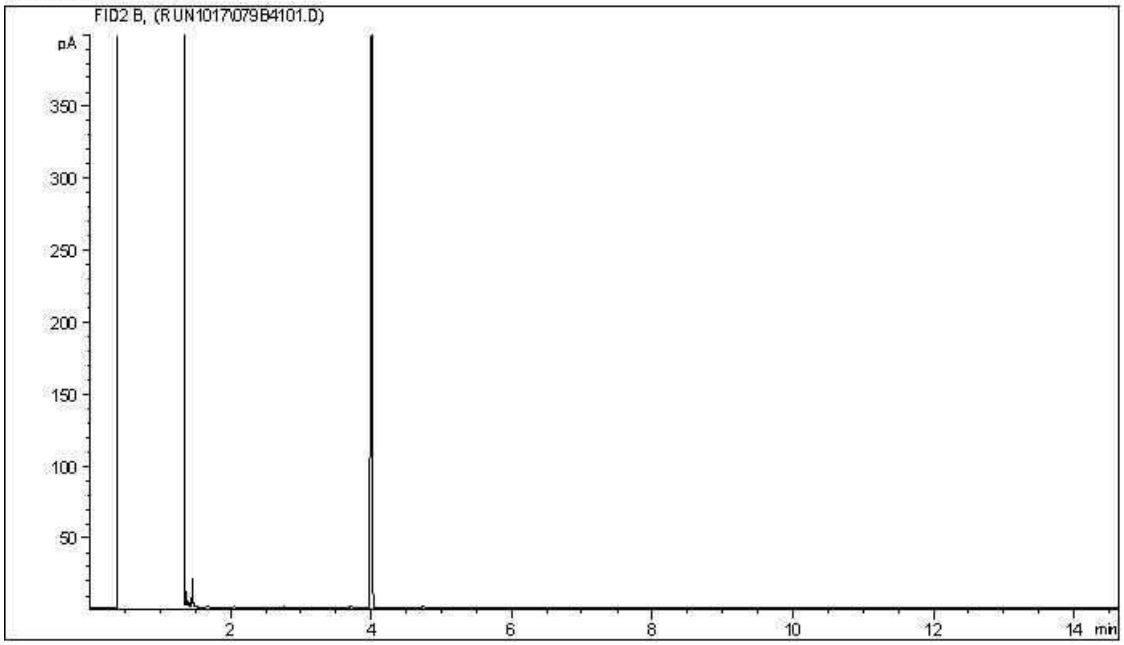
TYPICAL PRODUCT CARBON NUMBER RANGES

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

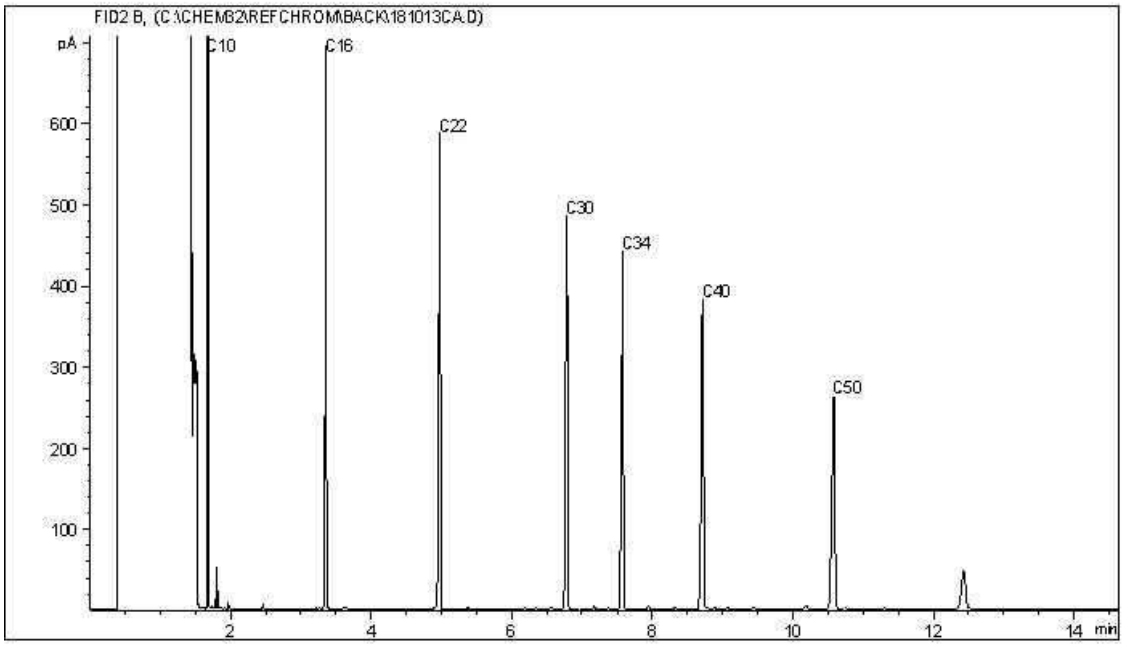
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

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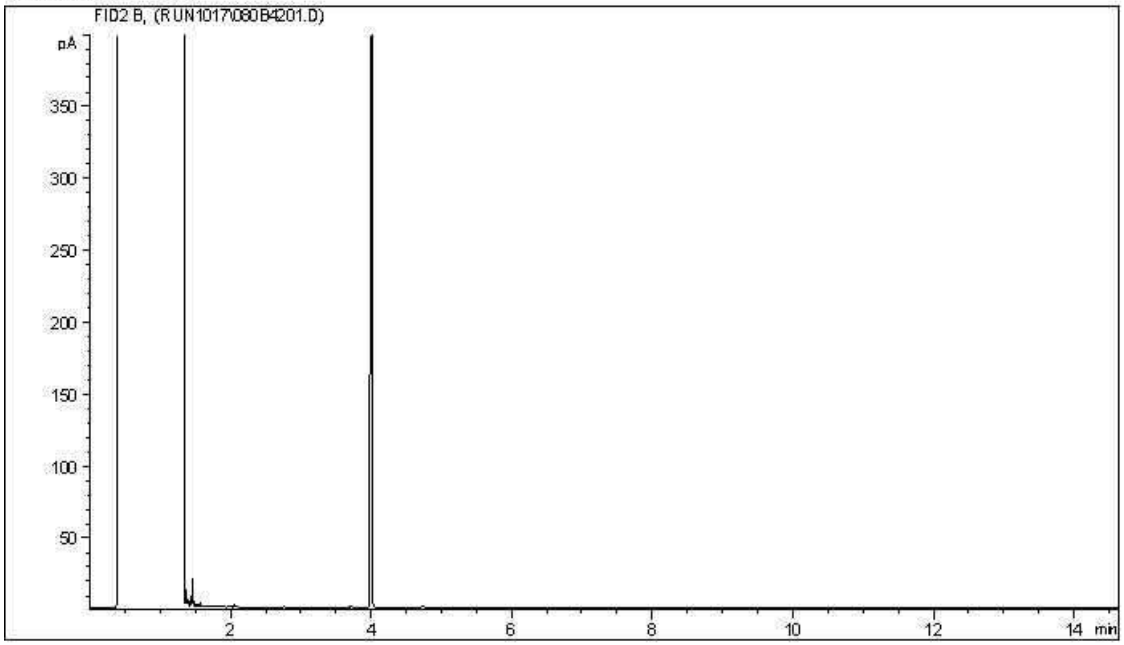
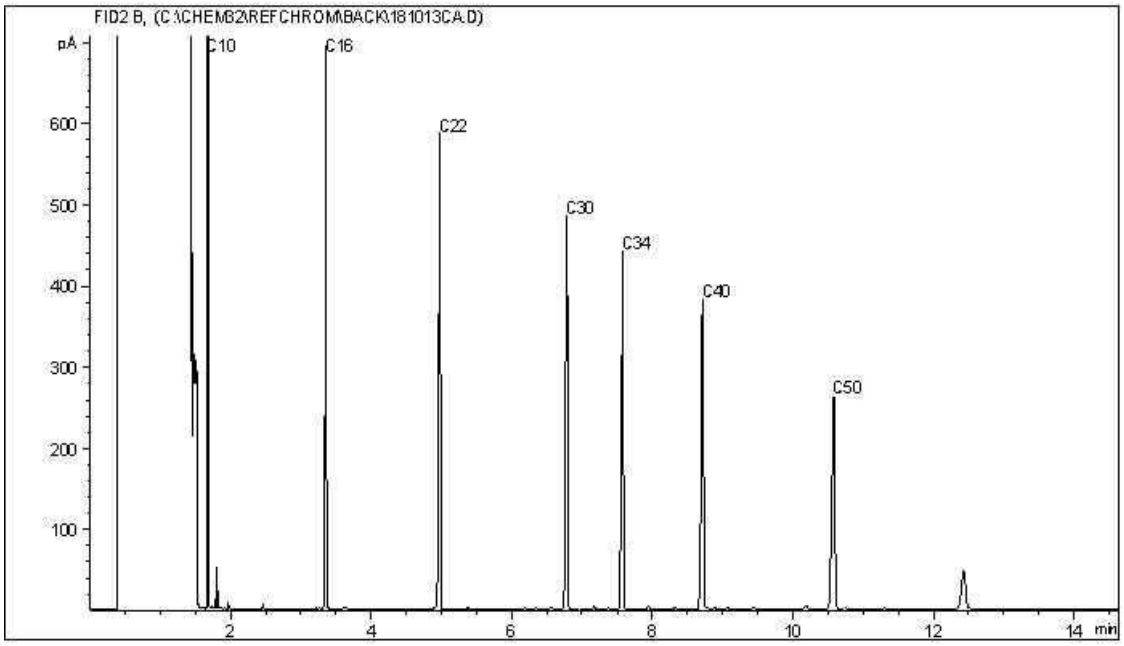
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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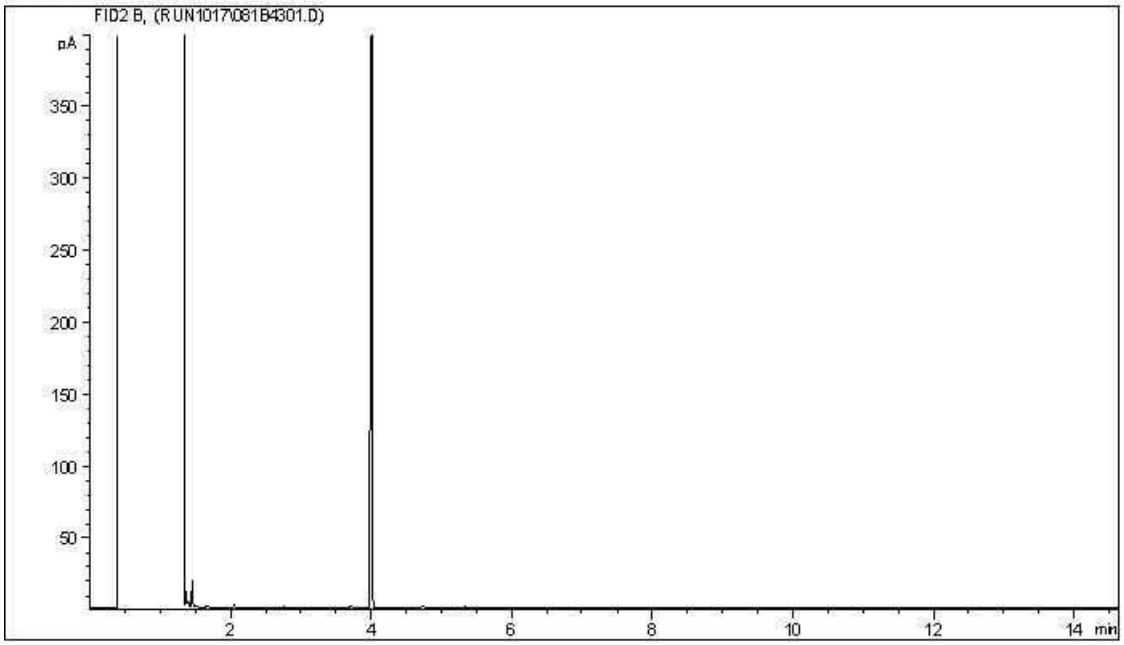
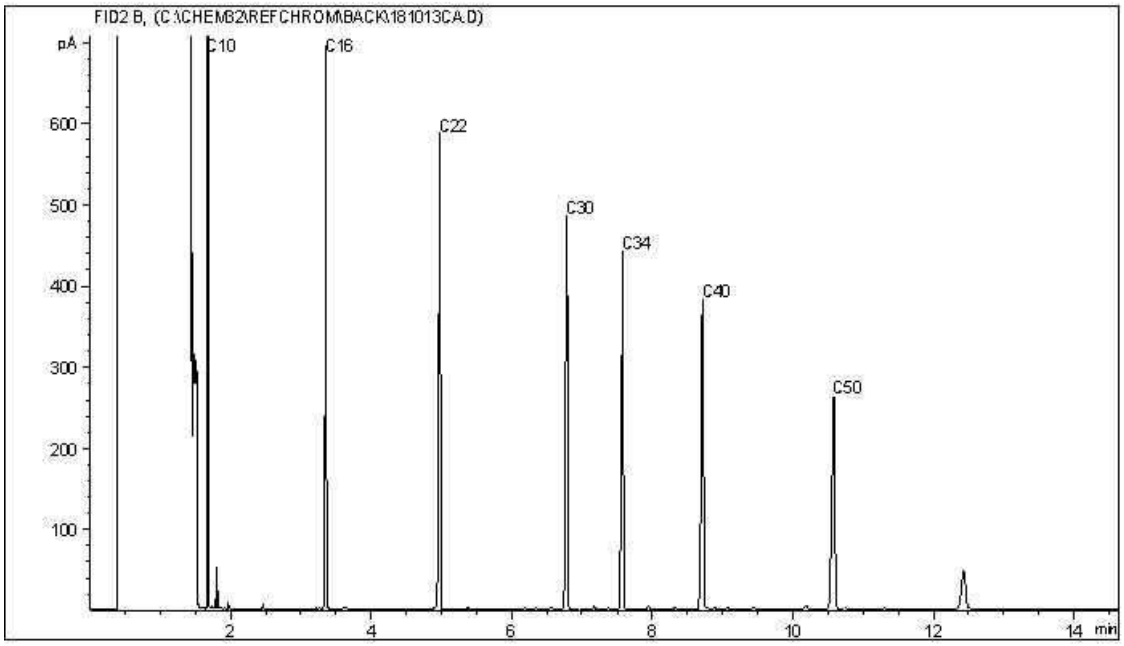
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



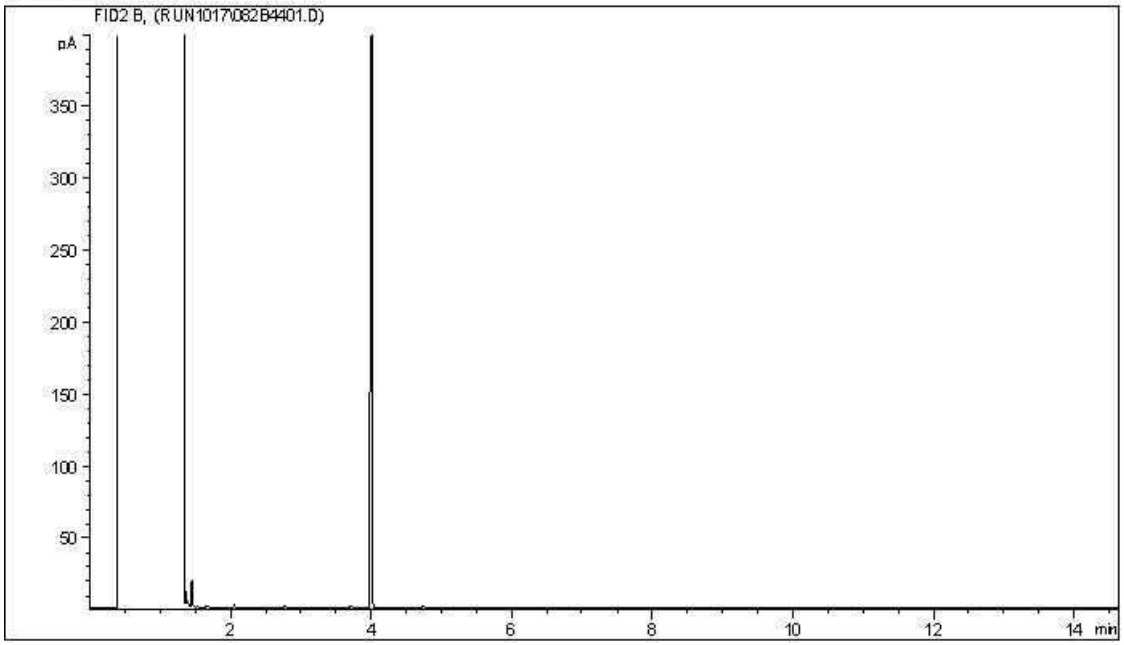
TYPICAL PRODUCT CARBON NUMBER RANGES

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

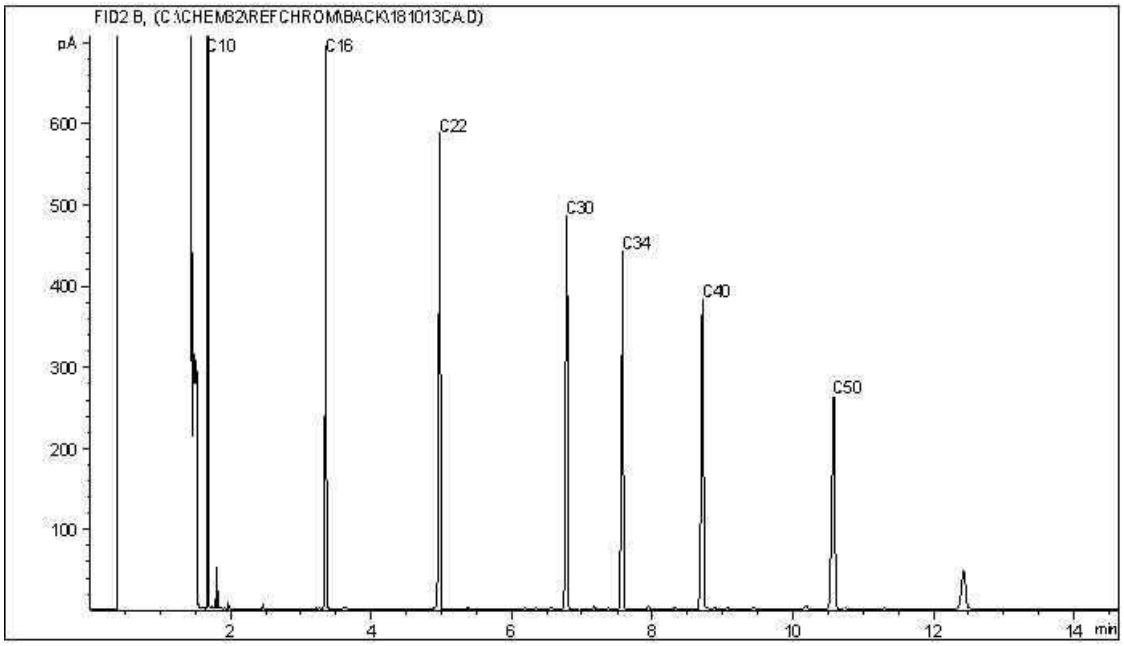
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

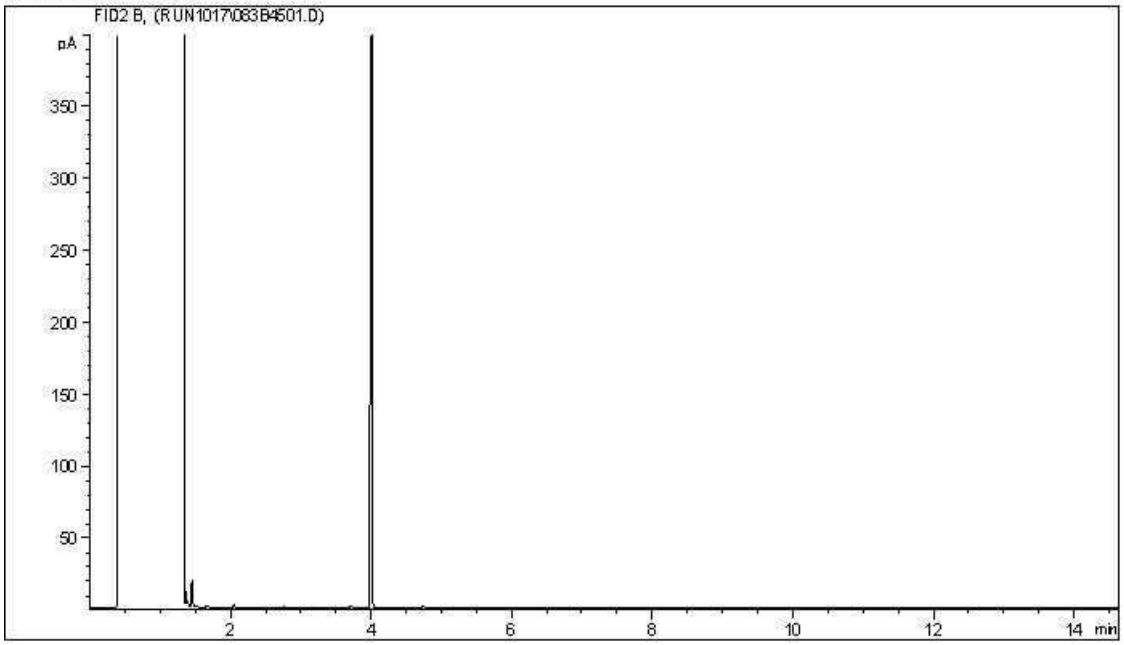
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890269
Report Date: 2018/10/19
Maxxam Sample: UO1897

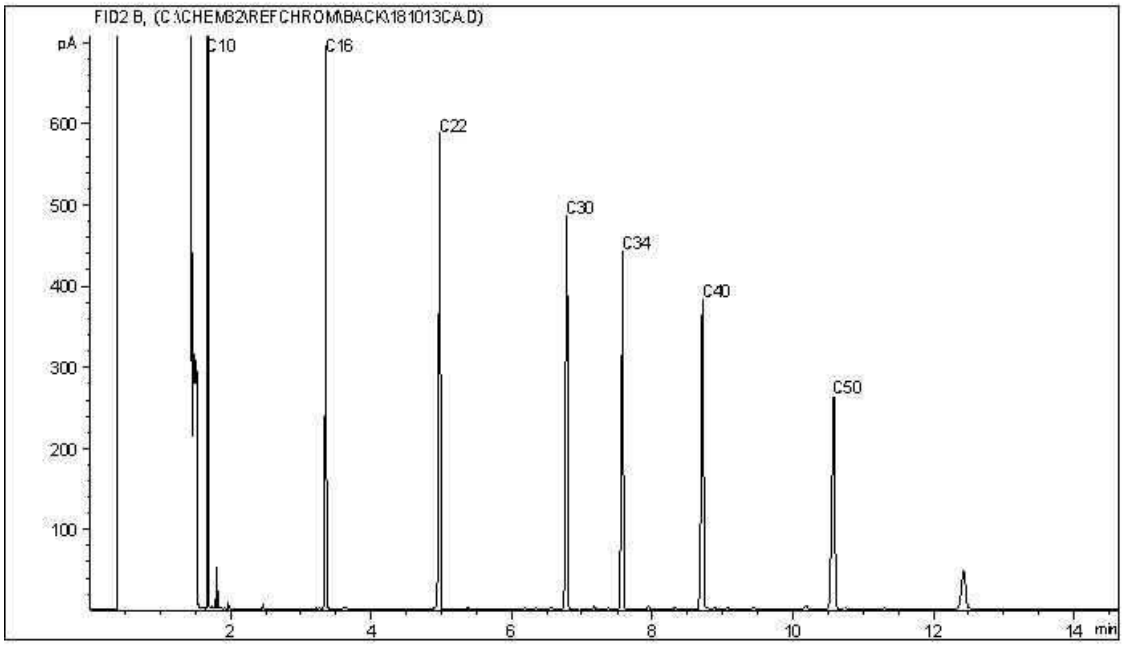
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1956

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



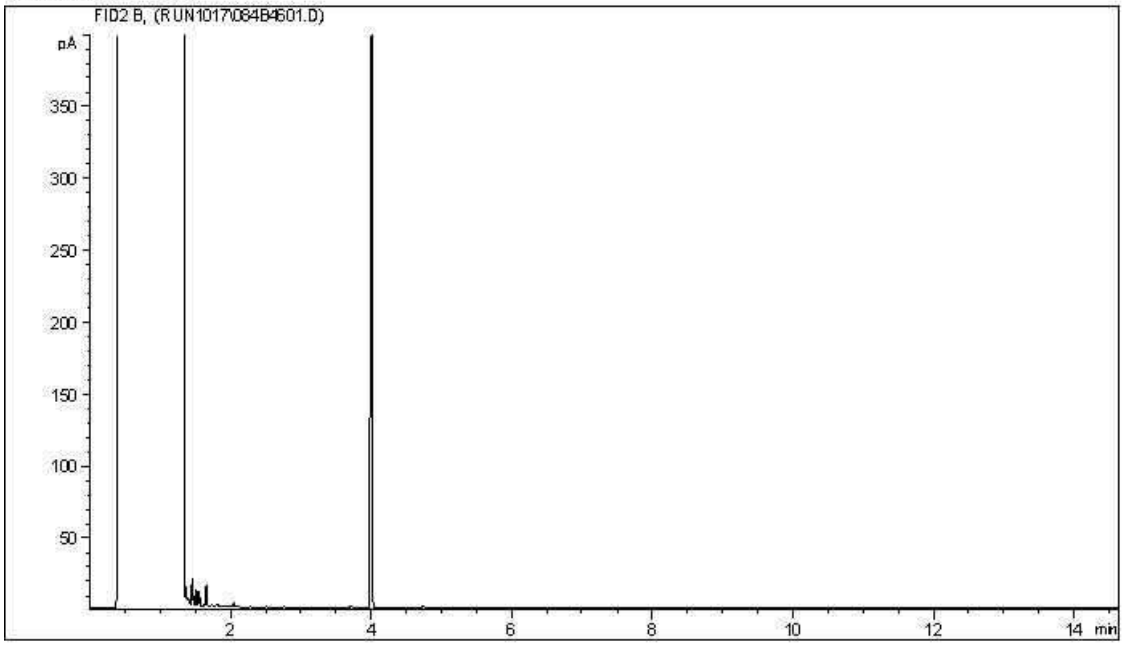
TYPICAL PRODUCT CARBON NUMBER RANGES

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

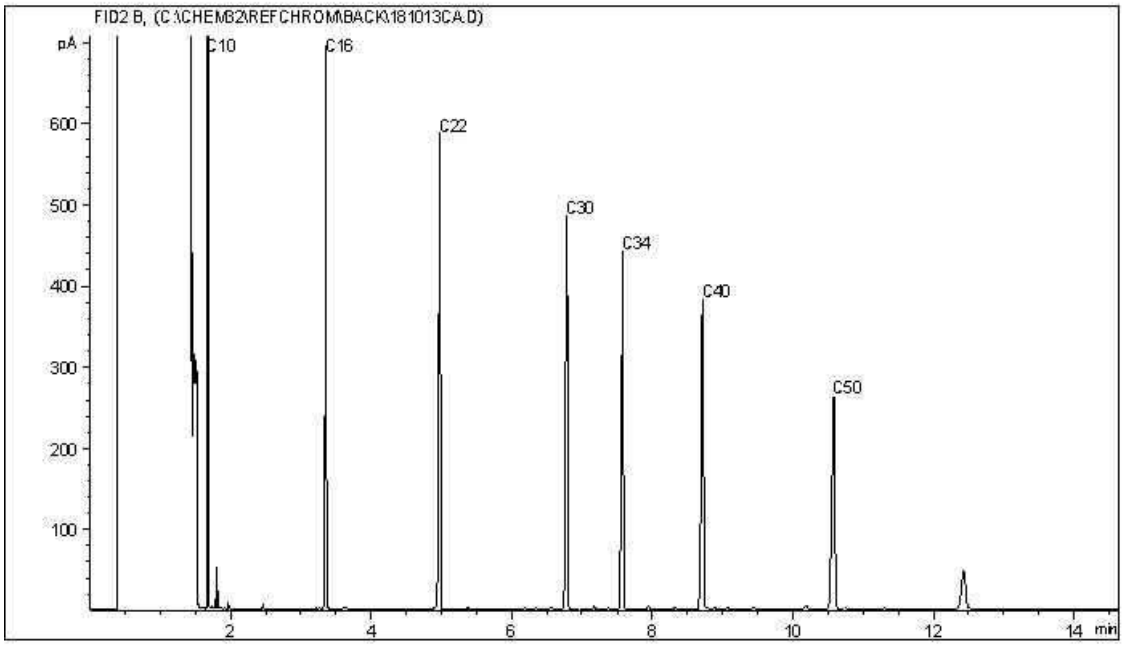
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



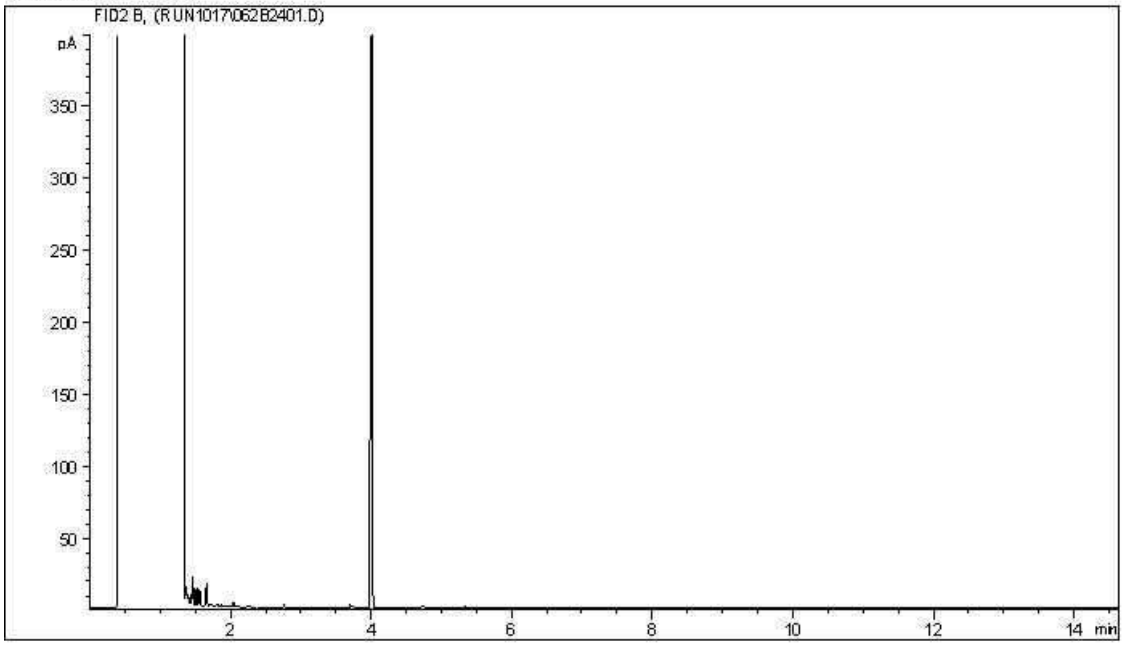
TYPICAL PRODUCT CARBON NUMBER RANGES

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

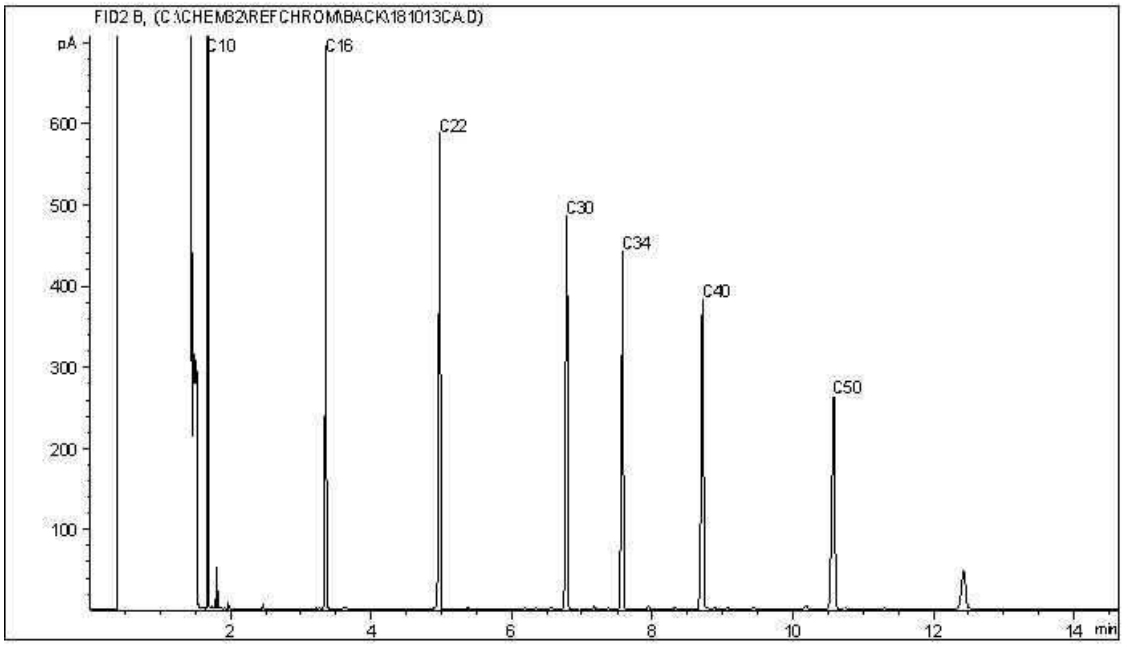
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

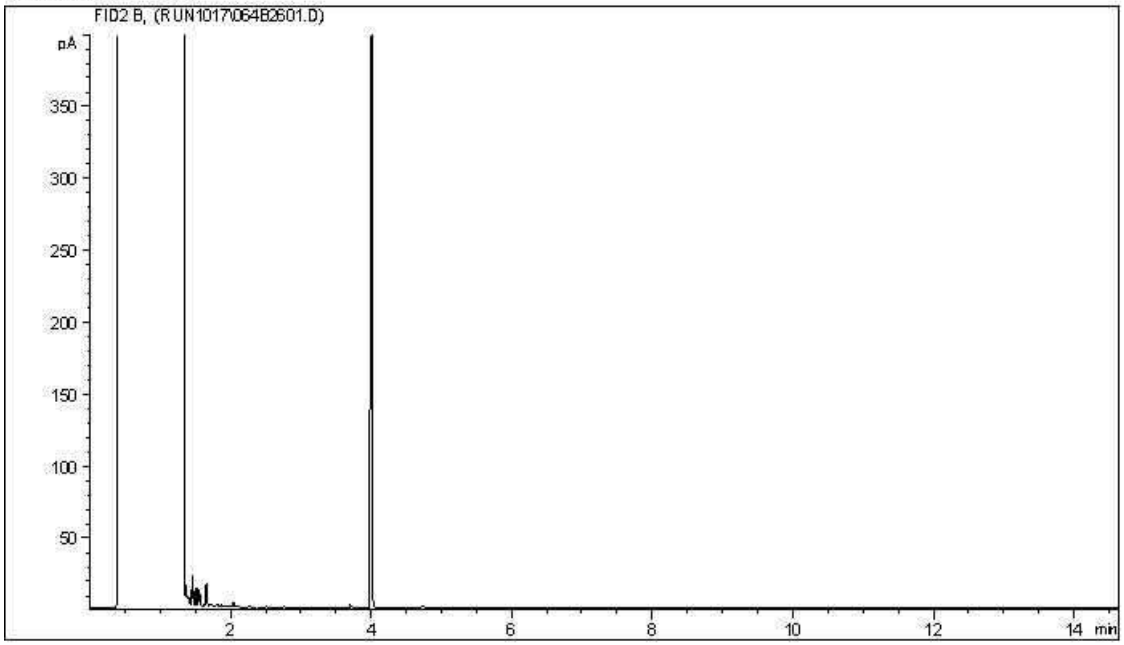
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890269
Report Date: 2018/10/19
Maxxam Sample: UO1899 Lab-Dup

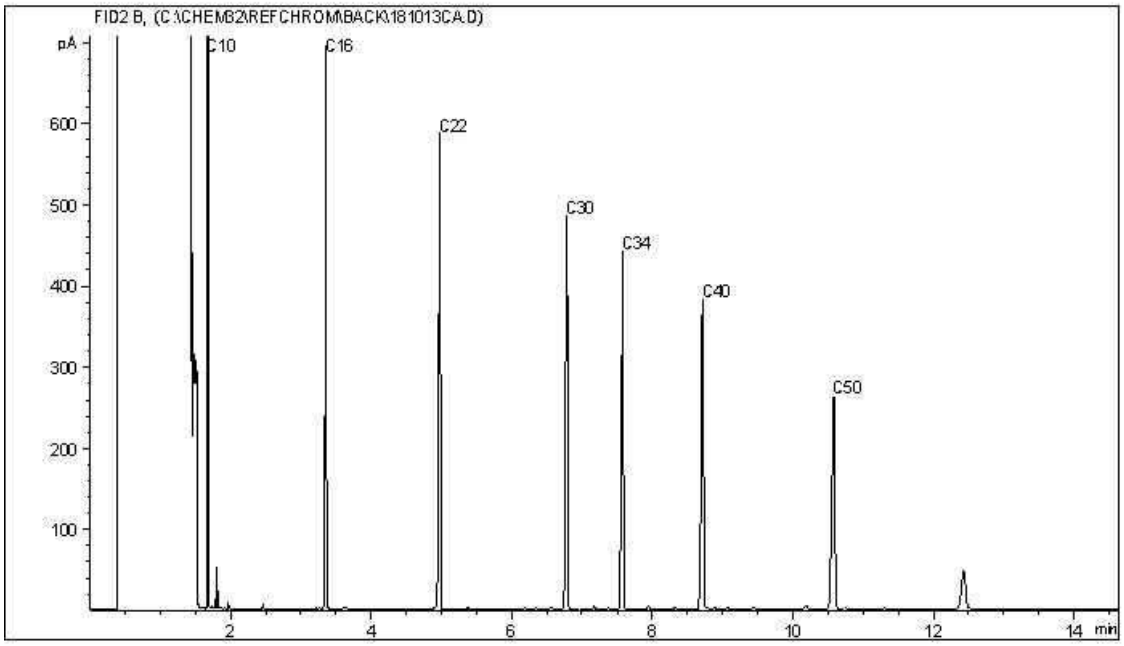
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 9510A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: M045915

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/23
Report #: R2639126
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B890491
Received: 2018/10/16, 14:18

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	9	N/A	2018/10/17	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2018/10/18	AB SOP-00039	Auto Calc
F1-BTEX	1	N/A	2018/10/19	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	2	2018/10/19	2018/10/19	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	7	2018/10/19	2018/10/20	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	5	N/A	2018/10/20	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	5	2018/10/19	2018/10/20	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	10	N/A	2018/10/19	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	10	N/A	2018/10/19	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: M045915

Attention: STEPHEN DABADIE

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

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MAXXAM JOB #: B890491
Received: 2018/10/16, 14:18

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO3886	UO3887		UO3888	UO3889		
Sampling Date		2018/10/16 12:25	2018/10/16 12:40		2018/10/16 13:20	2018/10/16 13:40		
COC Number		M045915	M045915		M045915	M045915		
	UNITS	**1917**	**1919**	**QC Batch**	**1921**	**1922**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	9190016	<0.10	<0.10	0.10	9190012
Volatiles								
Benzene	mg/L	<0.00040	<0.00040	9187468	0.0020	<0.00040	0.00040	9187468
Toluene	mg/L	<0.00040	<0.00040	9187468	<0.00040	<0.00040	0.00040	9187468
Ethylbenzene	mg/L	<0.00040	<0.00040	9187468	0.00046	<0.00040	0.00040	9187468
m & p-Xylene	mg/L	<0.00080	<0.00080	9187468	<0.00080	<0.00080	0.00080	9187468
o-Xylene	mg/L	<0.00040	<0.00040	9187468	<0.00040	<0.00040	0.00040	9187468
Xylenes (Total)	mg/L	<0.00089	<0.00089	9187039	<0.00089	<0.00089	0.00089	9187039
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	9187039	0.21	<0.10	0.10	9187039
F1 (C6-C10)	mg/L	<0.10	<0.10	9187468	0.22	<0.10	0.10	9187468
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	100	9187468	100	100	N/A	9187468
4-Bromofluorobenzene (sur.)	%	94	94	9187468	94	94	N/A	9187468
D4-1,2-Dichloroethane (sur.)	%	97	98	9187468	107	98	N/A	9187468
O-TERPHENYL (sur.)	%	89	82	9190016	104	96	N/A	9190012

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO3890			UO3891		UO3892	UO3893		
Sampling Date		2018/10/16 11:10			2018/10/16 13:00		2018/10/16 10:50	2018/10/16 12:50		
COC Number		M045915			M045915		M045915	M045915		
	UNITS	**1928 B**	**RDL**	**QC Batch**	**1948**	**QC Batch**	**1956 B**	**732**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9190012	<0.10	9190016	<0.10	<0.10	0.10	9190012
Volatiles										
Benzene	mg/L	2.5 (1)	0.0020	9187468	<0.00040	9187468	0.019	<0.00040	0.00040	9187468
Toluene	mg/L	<0.00040	0.00040	9187468	<0.00040	9187468	<0.00040	<0.00040	0.00040	9187468
Ethylbenzene	mg/L	<0.00040	0.00040	9187468	<0.00040	9187468	<0.00040	<0.00040	0.00040	9187468
m & p-Xylene	mg/L	<0.00080	0.00080	9187468	<0.00080	9187468	<0.00080	<0.00080	0.00080	9187468
o-Xylene	mg/L	0.050	0.00040	9187468	<0.00040	9187468	<0.00040	<0.00040	0.00040	9187468
Xylenes (Total)	mg/L	0.050	0.00089	9187039	<0.00089	9187039	<0.00089	<0.00089	0.00089	9187039
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	9187039	<0.10	9187039	<0.10	<0.10	0.10	9187039
F1 (C6-C10)	mg/L	2.4	0.10	9187468	<0.10	9187468	<0.10	<0.10	0.10	9187468
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	104	N/A	9187468	100	9187468	100	100	N/A	9187468
4-Bromofluorobenzene (sur.)	%	94	N/A	9187468	95	9187468	94	94	N/A	9187468
D4-1,2-Dichloroethane (sur.)	%	121	N/A	9187468	97	9187468	97	98	N/A	9187468
O-TERPHENYL (sur.)	%	100	N/A	9190012	80	9190016	93	99	N/A	9190012

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO3894		
Sampling Date		2018/10/16 13:20		
COC Number		M045915		
	UNITS	**9921**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9190016
Volatiles				
Benzene	mg/L	0.0025	0.00040	9187468
Toluene	mg/L	<0.00040	0.00040	9187468
Ethylbenzene	mg/L	0.00065	0.00040	9187468
m & p-Xylene	mg/L	<0.00080	0.00080	9187468
o-Xylene	mg/L	<0.00040	0.00040	9187468
Xylenes (Total)	mg/L	<0.00089	0.00089	9187039
F1 (C6-C10) - BTEX	mg/L	0.21	0.10	9187039
F1 (C6-C10)	mg/L	0.21	0.10	9187468
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	101	N/A	9187468
4-Bromofluorobenzene (sur.)	%	94	N/A	9187468
D4-1,2-Dichloroethane (sur.)	%	109	N/A	9187468
O-TERPHENYL (sur.)	%	82	N/A	9190016

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO3888	UO3889	UO3890	UO3892		
Sampling Date		2018/10/16 13:20	2018/10/16 13:40	2018/10/16 11:10	2018/10/16 10:50		
COC Number		M045915	M045915	M045915	M045915		
	UNITS	**1921**	**1922**	**1928 B**	**1956 B**	**RDL**	**QC Batch**
Polycyclic Aromatics							
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9186990
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9190003
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9190003
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9190003
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9190003
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9190003
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9190003
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9190003
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9190003
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9190003
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9190003
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9190003
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9190003
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9190003
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9190003
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9190003
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9190003
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9190003
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9190003
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9190003
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9190003
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9190003
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9190003
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9190003
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	99	97	96	98	N/A	9190003
D8-ACENAPHTHYLENE (sur.)	%	90	87	93	89	N/A	9190003
D8-NAPHTHALENE (sur.)	%	63	69	72	76	N/A	9190003
TERPHENYL-D14 (sur.)	%	104	106	108	106	N/A	9190003

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO3893		
Sampling Date		2018/10/16 12:50		
COC Number		M045915		
	UNITS	**732**	**RDL**	**QC Batch**
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	mg/L	<0.000010	0.000010	9187170
Acenaphthene	mg/L	<0.00010	0.00010	9190003
Acenaphthylene	mg/L	<0.00010	0.00010	9190003
Acridine	mg/L	<0.000050	0.000050	9190003
Anthracene	mg/L	<0.000010	0.000010	9190003
Benzo(a)anthracene	mg/L	<0.0000085	0.0000085	9190003
Benzo(b&j)fluoranthene	mg/L	<0.0000085	0.0000085	9190003
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	9190003
Benzo(g,h,i)perylene	mg/L	<0.0000085	0.0000085	9190003
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	9190003
Benzo(a)pyrene	mg/L	<0.0000075	0.0000075	9190003
Benzo[e]pyrene	mg/L	<0.000050	0.000050	9190003
Chrysene	mg/L	<0.0000085	0.0000085	9190003
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	9190003
Fluoranthene	mg/L	<0.000010	0.000010	9190003
Fluorene	mg/L	<0.000050	0.000050	9190003
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	0.0000085	9190003
1-Methylnaphthalene	mg/L	<0.00010	0.00010	9190003
2-Methylnaphthalene	mg/L	<0.00010	0.00010	9190003
Naphthalene	mg/L	<0.00010	0.00010	9190003
Phenanthrene	mg/L	<0.000050	0.000050	9190003
Perylene	mg/L	<0.000050	0.000050	9190003
Pyrene	mg/L	<0.000020	0.000020	9190003
Quinoline	mg/L	<0.00020	0.00020	9190003
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	89	N/A	9190003
D8-ACENAPHTHYLENE (sur.)	%	82	N/A	9190003
D8-NAPHTHALENE (sur.)	%	63	N/A	9190003
TERPHENYL-D14 (sur.)	%	98	N/A	9190003

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO3886	UO3887	UO3888	UO3889	UO3890		
Sampling Date		2018/10/16 12:25	2018/10/16 12:40	2018/10/16 13:20	2018/10/16 13:40	2018/10/16 11:10		
COC Number		M045915	M045915	M045915	M045915	M045915		
	UNITS	**1917**	**1919**	**1921**	**1922**	**1928 B**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9185696
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	0.0010	9187483
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9187483
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,2-dichloroethane	mg/L	<0.00050	<0.00050	0.068	<0.00050	0.26	0.00050	9187483
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Methyl methacrylate	mg/L	<0.00050	<0.00050	0.0010 (1)	<0.00050	<0.00050	0.00050	9187483
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483

RDL = Reportable Detection Limit
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B890491
Report Date: 2018/10/23

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO3886	UO3887	UO3888	UO3889	UO3890		
Sampling Date		2018/10/16 12:25	2018/10/16 12:40	2018/10/16 13:20	2018/10/16 13:40	2018/10/16 11:10		
COC Number		M045915	M045915	M045915	M045915	M045915		
	UNITS	**1917**	**1919**	**1921**	**1922**	**1928 B**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	0.00053 (1)	<0.00050	0.0021	0.00050	9187483
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00063	0.00050	9187483
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	101	102	102	101	104	N/A	9187483
4-Bromofluorobenzene (sur.)	%	95	95	94	94	92	N/A	9187483
D4-1,2-Dichloroethane (sur.)	%	107	102	109	101	133	N/A	9187483

RDL = Reportable Detection Limit
N/A = Not Applicable
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO3891	UO3892	UO3893	UO3894	UO3895		
Sampling Date		2018/10/16 13:00	2018/10/16 10:50	2018/10/16 12:50	2018/10/16 13:20	2018/10/16		
COC Number		M045915	M045915	M045915	M045915	M045915		
	UNITS	**1948**	**1956 B**	**732**	**9921**	**TRIP BLANK 5**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	0.015	<0.0013	<0.0013	0.0013	9185696
Benzene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9187483
Bromodichloromethane	mg/L	<0.00050	<0.00050	0.0014	<0.00050	<0.00050	0.00050	9187483
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
Chloroform	mg/L	<0.00050	<0.00050	0.013	<0.00050	<0.00050	0.00050	9187483
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9187483
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,2-dichloroethane	mg/L	<0.00050	0.0021	<0.00050	0.071	<0.00050	0.00050	9187483
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Ethylbenzene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9187483
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	0.0012 (1)	<0.00050	0.00050	9187483
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9187483

RDL = Reportable Detection Limit
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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO3891	UO3892	UO3893	UO3894	UO3895		
Sampling Date		2018/10/16 13:00	2018/10/16 10:50	2018/10/16 12:50	2018/10/16 13:20	2018/10/16		
COC Number		M045915	M045915	M045915	M045915	M045915		
	UNITS	**1948**	**1956 B**	**732**	**9921**	**TRIP BLANK 5**	**RDL**	**QC Batch**
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Toluene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9187483
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9187483
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00056 (1)	<0.00050	0.00050	9187483
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9187483
Xylenes (Total)	mg/L	N/A	N/A	N/A	N/A	<0.00080	0.00080	9187483
m & p-Xylene	mg/L	N/A	N/A	N/A	N/A	<0.00080	0.00080	9187483
o-Xylene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9187483
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	102	101	101	102	N/A	9187483
4-Bromofluorobenzene (sur.)	%	96	95	95	95	96	N/A	9187483
D4-1,2-Dichloroethane (sur.)	%	103	104	103	109	104	N/A	9187483

RDL = Reportable Detection Limit
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GENERAL COMMENTS

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

Package 1	9.3°C

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9187468	GP4	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/17		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/17		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		108	%	50 - 140
			Benzene	2018/10/17		85	%	50 - 140
			Toluene	2018/10/17		84	%	50 - 140
			Ethylbenzene	2018/10/17		88	%	50 - 140
			m & p-Xylene	2018/10/17		84	%	50 - 140
			o-Xylene	2018/10/17		89	%	50 - 140
			F1 (C6-C10)	2018/10/17		83	%	60 - 140
9187468	GP4	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/17		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/17		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		105	%	50 - 140
			Benzene	2018/10/17		84	%	60 - 130
			Toluene	2018/10/17		83	%	60 - 130
			Ethylbenzene	2018/10/17		88	%	60 - 130
			m & p-Xylene	2018/10/17		84	%	60 - 130
			o-Xylene	2018/10/17		88	%	60 - 130
			F1 (C6-C10)	2018/10/17		100	%	60 - 140
9187468	GP4	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/17		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/17		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/17		98	%	50 - 140
			Benzene	2018/10/17	<0.00040		mg/L	
			Toluene	2018/10/17	<0.00040		mg/L	
			Ethylbenzene	2018/10/17	<0.00040		mg/L	
			m & p-Xylene	2018/10/17	<0.00080		mg/L	
			o-Xylene	2018/10/17	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/17	<0.10		mg/L	
9187468	GP4	RPD	Benzene	2018/10/17	NC		%	30
			Toluene	2018/10/17	NC		%	30
			Ethylbenzene	2018/10/17	NC		%	30
			m & p-Xylene	2018/10/17	NC		%	30
			o-Xylene	2018/10/17	NC		%	30
			F1 (C6-C10)	2018/10/17	NC		%	30
9187483	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/18		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/18		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/18		101	%	50 - 140
			Benzene	2018/10/18		91	%	50 - 140
			Bromodichloromethane	2018/10/18		108	%	50 - 140
			Bromoform	2018/10/18		103	%	50 - 140
			Bromomethane	2018/10/18		97	%	50 - 140
			Carbon tetrachloride	2018/10/18		110	%	50 - 140
			Chlorobenzene	2018/10/18		102	%	50 - 140
			Chlorodibromomethane	2018/10/18		105	%	50 - 140
			Chloroethane	2018/10/18		94	%	50 - 140
			Chloroform	2018/10/18		101	%	50 - 140
			Chloromethane	2018/10/18		106	%	50 - 140
			1,2-dibromoethane	2018/10/18		98	%	50 - 140
			1,2-dichlorobenzene	2018/10/18		107	%	50 - 140
			1,3-dichlorobenzene	2018/10/18		105	%	50 - 140
			1,4-dichlorobenzene	2018/10/18		103	%	50 - 140
			1,1-dichloroethane	2018/10/18		100	%	50 - 140
			1,2-dichloroethane	2018/10/18		104	%	50 - 140
			1,1-dichloroethene	2018/10/18		101	%	50 - 140
			cis-1,2-dichloroethene	2018/10/18		101	%	50 - 140

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Client Project #: CG2430.1 E32
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,2-dichloroethene	2018/10/18		97	%	50 - 140
			Dichloromethane	2018/10/18		97	%	50 - 140
			1,2-dichloropropane	2018/10/18		102	%	50 - 140
			cis-1,3-dichloropropene	2018/10/18		97	%	50 - 140
			trans-1,3-dichloropropene	2018/10/18		92	%	50 - 140
			Ethylbenzene	2018/10/18		96	%	50 - 140
			Methyl methacrylate	2018/10/18		102	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/18		103	%	50 - 140
			Styrene	2018/10/18		100	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/18		100	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/18		98	%	50 - 140
			Tetrachloroethene	2018/10/18		100	%	50 - 140
			Toluene	2018/10/18		97	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/18		99	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/18		99	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/18		102	%	50 - 140
			1,1,1-trichloroethane	2018/10/18		108	%	50 - 140
			1,1,2-trichloroethane	2018/10/18		105	%	50 - 140
			Trichloroethene	2018/10/18		110	%	50 - 140
			Trichlorofluoromethane	2018/10/18		109	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/18		101	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/18		104	%	50 - 140
			Vinyl chloride	2018/10/18		108	%	50 - 140
			m & p-Xylene	2018/10/18		97	%	50 - 140
			o-Xylene	2018/10/18		94	%	50 - 140
9187483	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/18		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/18		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/18		107	%	50 - 140
			Benzene	2018/10/18		88	%	60 - 130
			Bromodichloromethane	2018/10/18		104	%	60 - 130
			Bromoform	2018/10/18		98	%	60 - 130
			Bromomethane	2018/10/18		96	%	60 - 130
			Carbon tetrachloride	2018/10/18		102	%	60 - 130
			Chlorobenzene	2018/10/18		95	%	60 - 130
			Chlorodibromomethane	2018/10/18		99	%	60 - 130
			Chloroethane	2018/10/18		91	%	60 - 130
			Chloroform	2018/10/18		97	%	60 - 130
			Chloromethane	2018/10/18		99	%	60 - 130
			1,2-dibromoethane	2018/10/18		95	%	60 - 130
			1,2-dichlorobenzene	2018/10/18		99	%	60 - 130
			1,3-dichlorobenzene	2018/10/18		96	%	60 - 130
			1,4-dichlorobenzene	2018/10/18		94	%	60 - 130
			1,1-dichloroethane	2018/10/18		95	%	60 - 130
			1,2-dichloroethane	2018/10/18		103	%	60 - 130
			1,1-dichloroethene	2018/10/18		96	%	60 - 130
			cis-1,2-dichloroethene	2018/10/18		96	%	60 - 130
			trans-1,2-dichloroethene	2018/10/18		92	%	60 - 130
			Dichloromethane	2018/10/18		94	%	60 - 130
			1,2-dichloropropane	2018/10/18		98	%	60 - 130
			cis-1,3-dichloropropene	2018/10/18		97	%	60 - 130
			trans-1,3-dichloropropene	2018/10/18		95	%	60 - 130
			Ethylbenzene	2018/10/18		87	%	60 - 130
			Methyl methacrylate	2018/10/18		101	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/18		100	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Styrene	2018/10/18		93	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/18		93	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/18		95	%	60 - 130
			Tetrachloroethene	2018/10/18		91	%	60 - 130
			Toluene	2018/10/18		90	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/18		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/18		92	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/18		92	%	60 - 130
			1,1,1-trichloroethane	2018/10/18		101	%	60 - 130
			1,1,2-trichloroethane	2018/10/18		103	%	60 - 130
			Trichloroethene	2018/10/18		102	%	60 - 130
			Trichlorofluoromethane	2018/10/18		104	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/18		91	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/18		95	%	60 - 130
			Vinyl chloride	2018/10/18		104	%	60 - 130
			m & p-Xylene	2018/10/18		88	%	60 - 130
			o-Xylene	2018/10/18		88	%	60 - 130
9187483	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/18		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/18		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/18		104	%	50 - 140
			Benzene	2018/10/18	<0.00040		mg/L	
			Bromodichloromethane	2018/10/18	<0.00050		mg/L	
			Bromoform	2018/10/18	<0.00050		mg/L	
			Bromomethane	2018/10/18	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/18	<0.00050		mg/L	
			Chlorobenzene	2018/10/18	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/18	<0.0010		mg/L	
			Chloroethane	2018/10/18	<0.0010		mg/L	
			Chloroform	2018/10/18	<0.00050		mg/L	
			Chloromethane	2018/10/18	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/18	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/18	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/18	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/18	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/18	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/18	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/18	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/18	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/18	<0.00050		mg/L	
			Dichloromethane	2018/10/18	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/18	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/18	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/18	<0.00050		mg/L	
			Ethylbenzene	2018/10/18	<0.00040		mg/L	
			Methyl methacrylate	2018/10/18	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/18	<0.00050		mg/L	
			Styrene	2018/10/18	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/18	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/18	<0.0020		mg/L	
			Tetrachloroethene	2018/10/18	<0.00050		mg/L	
			Toluene	2018/10/18	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/18	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/18	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/18	<0.00050		mg/L	

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,1-trichloroethane	2018/10/18	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/18	<0.00050		mg/L	
			Trichloroethene	2018/10/18	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/18	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/18	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/18	<0.00050		mg/L	
			Vinyl chloride	2018/10/18	<0.00050		mg/L	
			Xylenes (Total)	2018/10/18	<0.00080		mg/L	
			m & p-Xylene	2018/10/18	<0.00080		mg/L	
			o-Xylene	2018/10/18	<0.00040		mg/L	
9187483	MZ	RPD	Bromodichloromethane	2018/10/18	NC		%	30
			Bromoform	2018/10/18	NC		%	30
			Bromomethane	2018/10/18	NC		%	30
			Carbon tetrachloride	2018/10/18	NC		%	30
			Chlorobenzene	2018/10/18	NC		%	30
			Chlorodibromomethane	2018/10/18	NC		%	30
			Chloroethane	2018/10/18	NC		%	30
			Chloroform	2018/10/18	NC		%	30
			Chloromethane	2018/10/18	NC		%	30
			1,2-dibromoethane	2018/10/18	NC		%	30
			1,2-dichlorobenzene	2018/10/18	NC		%	30
			1,3-dichlorobenzene	2018/10/18	NC		%	30
			1,4-dichlorobenzene	2018/10/18	NC		%	30
			1,1-dichloroethane	2018/10/18	NC		%	30
			1,2-dichloroethane	2018/10/18	NC		%	30
			1,1-dichloroethene	2018/10/18	NC		%	30
			cis-1,2-dichloroethene	2018/10/18	NC		%	30
			trans-1,2-dichloroethene	2018/10/18	NC		%	30
			Dichloromethane	2018/10/18	NC		%	30
			1,2-dichloropropane	2018/10/18	NC		%	30
			cis-1,3-dichloropropene	2018/10/18	NC		%	30
			trans-1,3-dichloropropene	2018/10/18	NC		%	30
			Methyl methacrylate	2018/10/18	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/18	NC		%	30
			Styrene	2018/10/18	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/18	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/18	NC		%	30
			Tetrachloroethene	2018/10/18	NC		%	30
			1,2,3-trichlorobenzene	2018/10/18	NC		%	30
			1,2,4-trichlorobenzene	2018/10/18	NC		%	30
			1,3,5-trichlorobenzene	2018/10/18	NC		%	30
			1,1,1-trichloroethane	2018/10/18	NC		%	30
			1,1,2-trichloroethane	2018/10/18	NC		%	30
			Trichloroethene	2018/10/18	NC		%	30
			Trichlorofluoromethane	2018/10/18	NC		%	30
			1,2,4-trimethylbenzene	2018/10/18	NC		%	30
			1,3,5-trimethylbenzene	2018/10/18	NC		%	30
			Vinyl chloride	2018/10/18	NC		%	30
9190003	LZ3	Matrix Spike [UO3888-01]	D10-ANTHRACENE (sur.)	2018/10/19		103	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/19		98	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/19		72	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/19		109	%	50 - 130
			Acenaphthene	2018/10/19		94	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthylene	2018/10/19		100	%	50 - 130
			Acridine	2018/10/19		87	%	50 - 130
			Anthracene	2018/10/19		94	%	50 - 130
			Benzo(a)anthracene	2018/10/19		118	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/19		107	%	50 - 130
			Benzo(k)fluoranthene	2018/10/19		105	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/19		99	%	50 - 130
			Benzo(c)phenanthrene	2018/10/19		114	%	50 - 130
			Benzo(a)pyrene	2018/10/19		105	%	50 - 130
			Benzo[e]pyrene	2018/10/19		98	%	50 - 130
			Chrysene	2018/10/19		108	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/19		100	%	50 - 130
			Fluoranthene	2018/10/19		114	%	50 - 130
			Fluorene	2018/10/19		101	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/19		100	%	50 - 130
			1-Methylnaphthalene	2018/10/19		92	%	50 - 130
			2-Methylnaphthalene	2018/10/19		86	%	50 - 130
			Naphthalene	2018/10/19		84	%	50 - 130
			Phenanthrene	2018/10/19		102	%	50 - 130
			Perylene	2018/10/19		89	%	50 - 130
			Pyrene	2018/10/19		110	%	50 - 130
			Quinoline	2018/10/19		98	%	50 - 130
9190003	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/19		100	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/19		95	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/19		74	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/19		112	%	50 - 130
			Acenaphthene	2018/10/19		91	%	50 - 130
			Acenaphthylene	2018/10/19		95	%	50 - 130
			Acridine	2018/10/19		83	%	50 - 130
			Anthracene	2018/10/19		92	%	50 - 130
			Benzo(a)anthracene	2018/10/19		125	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/19		117	%	50 - 130
			Benzo(k)fluoranthene	2018/10/19		113	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/19		109	%	50 - 130
			Benzo(c)phenanthrene	2018/10/19		115	%	50 - 130
			Benzo(a)pyrene	2018/10/19		105	%	50 - 130
			Benzo[e]pyrene	2018/10/19		109	%	50 - 130
			Chrysene	2018/10/19		117	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/19		113	%	50 - 130
			Fluoranthene	2018/10/19		115	%	50 - 130
			Fluorene	2018/10/19		96	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/19		113	%	50 - 130
			1-Methylnaphthalene	2018/10/19		90	%	50 - 130
			2-Methylnaphthalene	2018/10/19		84	%	50 - 130
			Naphthalene	2018/10/19		81	%	50 - 130
			Phenanthrene	2018/10/19		96	%	50 - 130
			Perylene	2018/10/19		100	%	50 - 130
			Pyrene	2018/10/19		103	%	50 - 130
			Quinoline	2018/10/19		100	%	50 - 130
9190003	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/19		103	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/19		95	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/19		69	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/19		112	%	50 - 130
			Acenaphthene	2018/10/19	<0.00010		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthylene	2018/10/19	<0.00010		mg/L	
			Acridine	2018/10/19	<0.000050		mg/L	
			Anthracene	2018/10/19	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/19	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/19	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/19	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/19	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/19	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/19	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/19	<0.000050		mg/L	
			Chrysene	2018/10/19	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/19	<0.0000075		mg/L	
			Fluoranthene	2018/10/19	<0.000010		mg/L	
			Fluorene	2018/10/19	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/19	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/19	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/19	<0.00010		mg/L	
			Naphthalene	2018/10/19	<0.00010		mg/L	
			Phenanthrene	2018/10/19	<0.000050		mg/L	
			Perylene	2018/10/19	<0.000050		mg/L	
			Pyrene	2018/10/19	<0.000020		mg/L	
			Quinoline	2018/10/19	<0.00020		mg/L	
9190003	LZ3	RPD	Acenaphthene	2018/10/19	NC		%	30
			Acenaphthylene	2018/10/19	NC		%	30
			Acridine	2018/10/19	NC		%	30
			Anthracene	2018/10/19	NC		%	30
			Benzo(a)anthracene	2018/10/19	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/19	NC		%	30
			Benzo(k)fluoranthene	2018/10/19	NC		%	30
			Benzo(g,h,i)perylene	2018/10/19	NC		%	30
			Benzo(c)phenanthrene	2018/10/19	NC		%	30
			Benzo(a)pyrene	2018/10/19	NC		%	30
			Benzo[e]pyrene	2018/10/19	NC		%	30
			Chrysene	2018/10/19	NC		%	30
			Dibenz(a,h)anthracene	2018/10/19	NC		%	30
			Fluoranthene	2018/10/19	NC		%	30
			Fluorene	2018/10/19	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/19	NC		%	30
			1-Methylnaphthalene	2018/10/19	NC		%	30
			2-Methylnaphthalene	2018/10/19	NC		%	30
			Naphthalene	2018/10/19	NC		%	30
			Phenanthrene	2018/10/19	NC		%	30
			Perylene	2018/10/19	NC		%	30
			Pyrene	2018/10/19	NC		%	30
			Quinoline	2018/10/19	NC		%	30
9190012	LSH	Matrix Spike [UO3889-01]	O-TERPHENYL (sur.)	2018/10/20		97	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		94	%	60 - 140
9190012	LSH	Spiked Blank	O-TERPHENYL (sur.)	2018/10/19		100	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/19		97	%	60 - 140
9190012	LSH	Method Blank	O-TERPHENYL (sur.)	2018/10/20		96	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20	<0.10		mg/L	
9190012	LSH	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/20	NC		%	30
9190016	LSH	Matrix Spike	O-TERPHENYL (sur.)	2018/10/20		87	%	60 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F2 (C10-C16 Hydrocarbons)	2018/10/20		97	%	60 - 140
9190016	LSH	Spiked Blank	O-TERPHENYL (sur.)	2018/10/19		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/19		98	%	60 - 140
9190016	LSH	Method Blank	O-TERPHENYL (sur.)	2018/10/20		86	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20	<0.10		mg/L	
9190016	LSH	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/20	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).

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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).

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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

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

M045915

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 – 30 Ave NE Calgary AB T2E 7K9	Address:		Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-268-2566	Phone:		Site Location:		
Email:	stephen_dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn_kuzyk@clifton.ca	Copies:		Sampled By:	Austin/Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	11	10	7
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

Regulatory Criteria: ☑ AT1 ☐ CCME ☐ Drinking Water ☐ D50 (Drilling Waste) ☐ Saskatchewan ☐ Other:

Special Instructions

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	BTEX F3-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
1	1917		2018.10.16	12:25	GW	6	✓	✓										
2	1919		↓	12:40	↓	6	✓	✓										
3	1921		↓	13:20	↓	8	✓	✓									✓	
4	1922		↓	13:40	↓	8	✓	✓									✓	
5	1928 B		↓	11:10	↓	8	✓	✓									✓	
6	1948		↓	13:00	↓	6	✓	✓										
7	1956 B		↓	10:50	↓	8	✓	✓									✓	
8	732		↓	12:50	↓	8	✓	✓									✓	
9	9921		↓	13:20	GW	6	✓	✓										
10	Trip Blank 5		2018.10.16		W	2	✓											
	Please indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018-10.16	14:17	Jordan Bark	2018/10/16	14:18

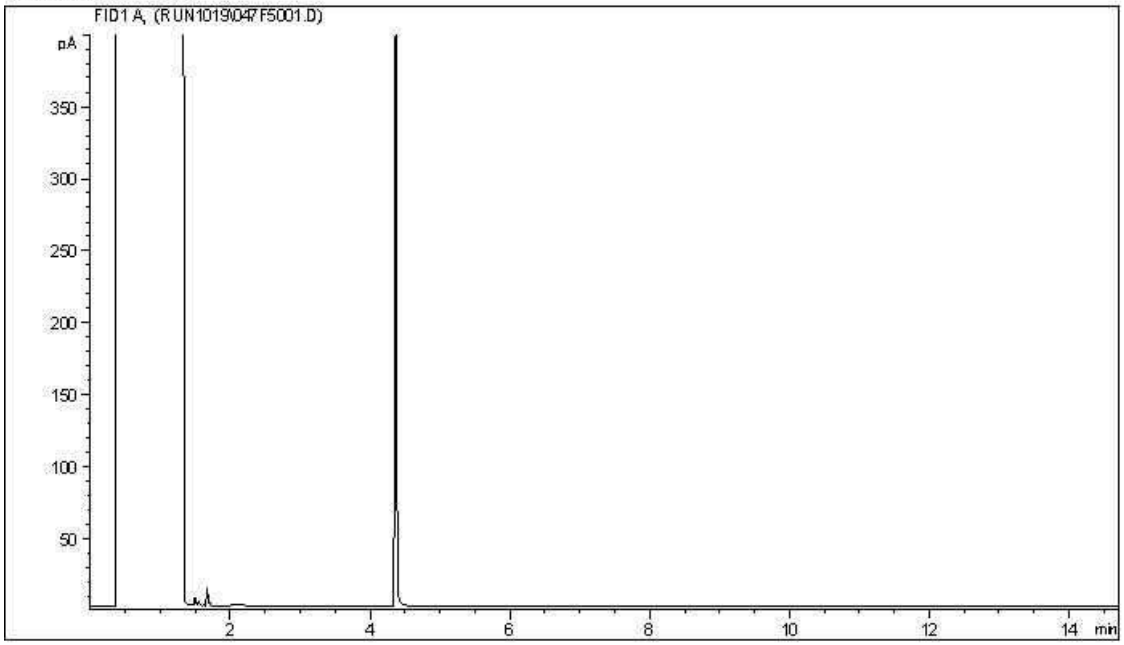
16-Oct-18 14:18
Leanne Cameron
B890491
ASQ INS-0174

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 acknowledgement and acceptance of our terms which are available for viewing at www.maxxam.ca

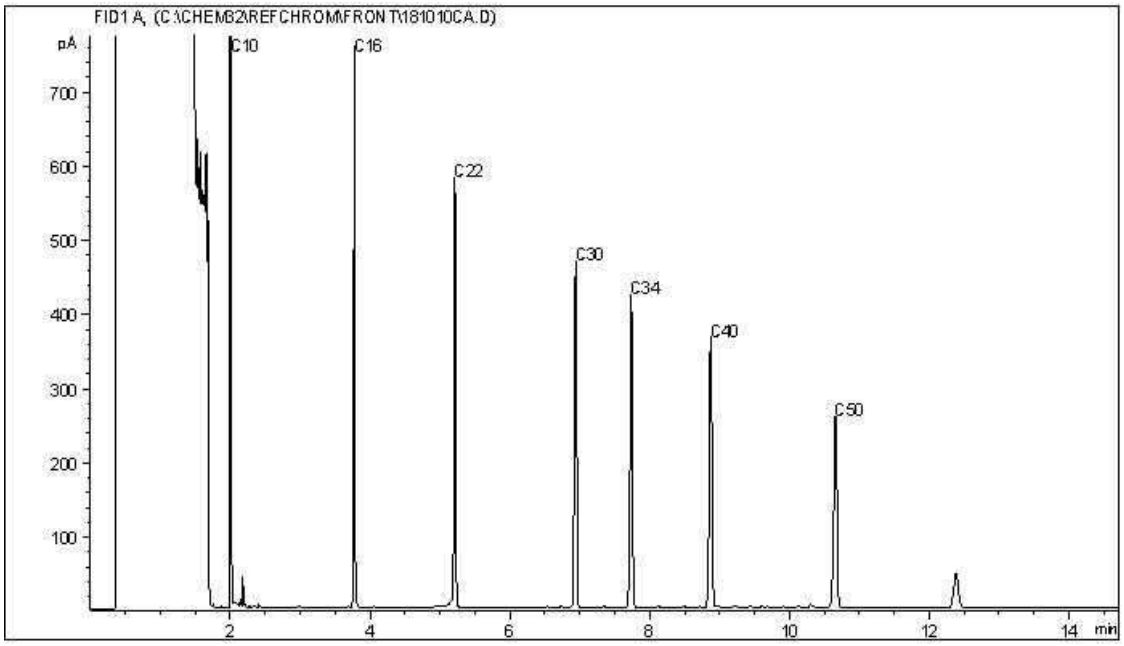
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



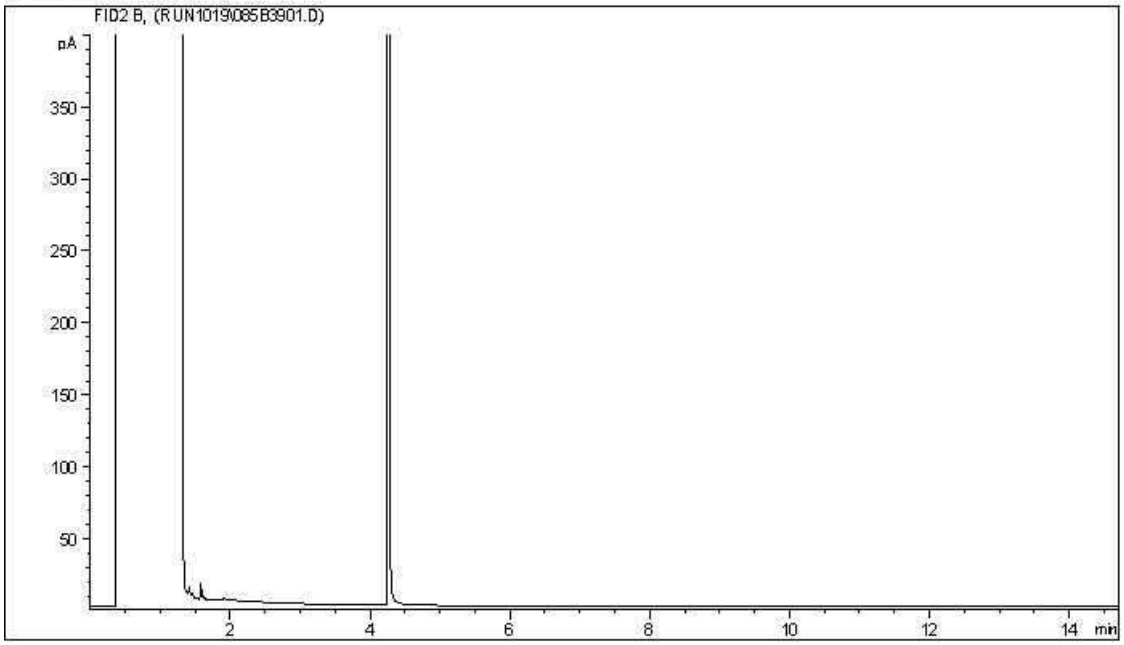
TYPICAL PRODUCT CARBON NUMBER RANGES

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

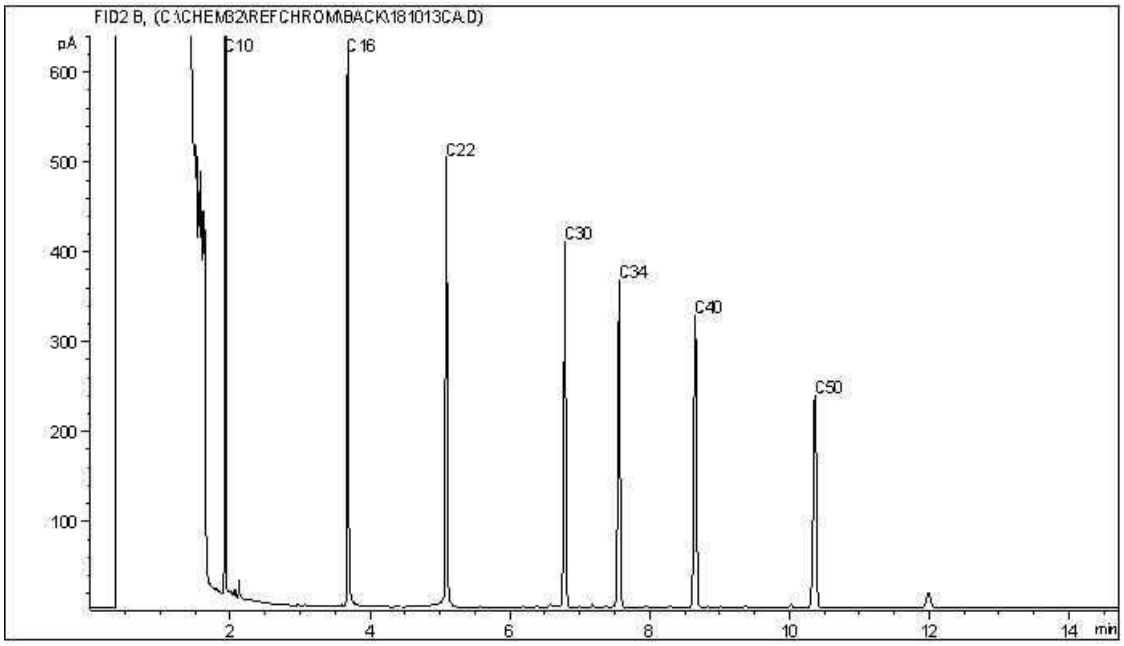
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



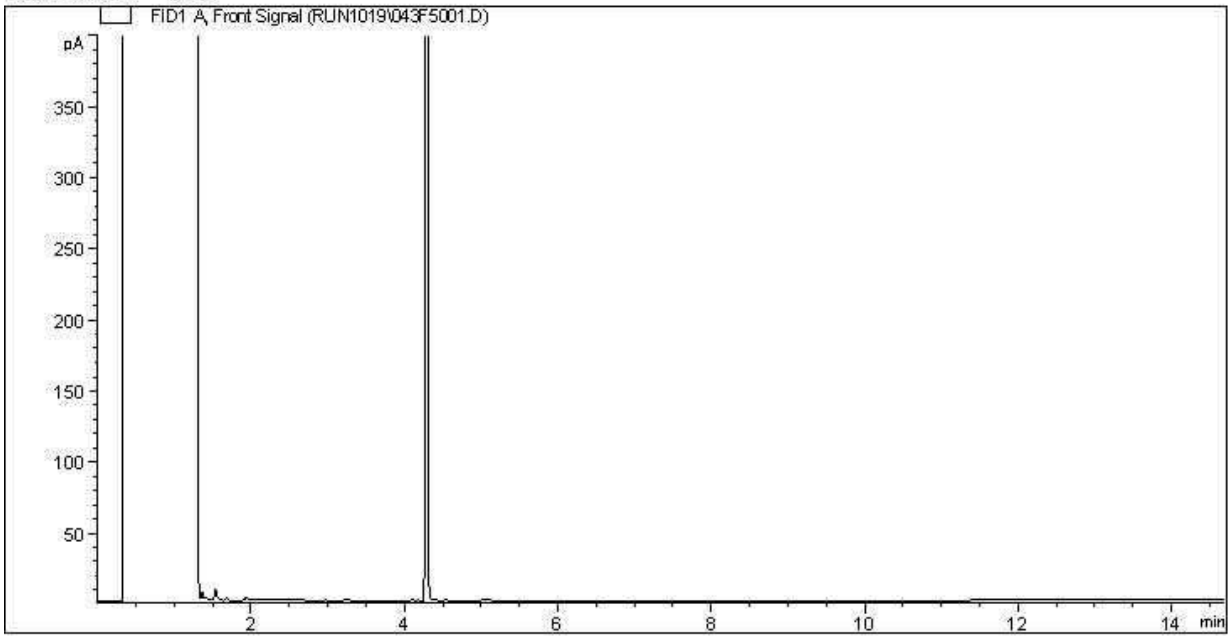
TYPICAL PRODUCT CARBON NUMBER RANGES

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

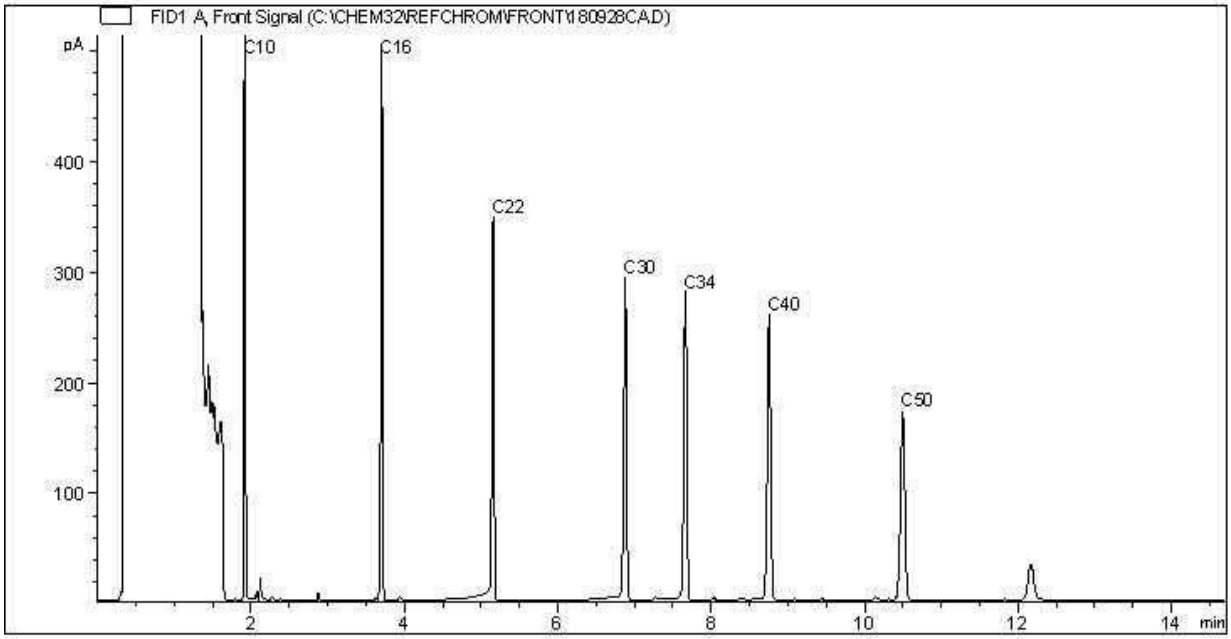
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



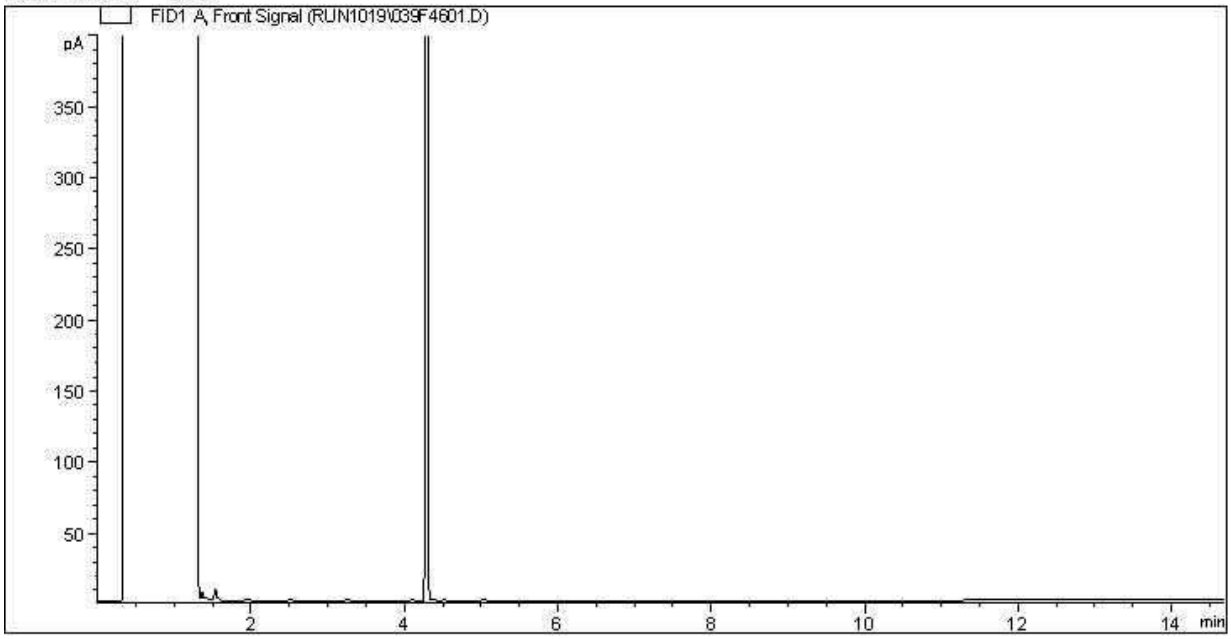
TYPICAL PRODUCT CARBON NUMBER RANGES

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

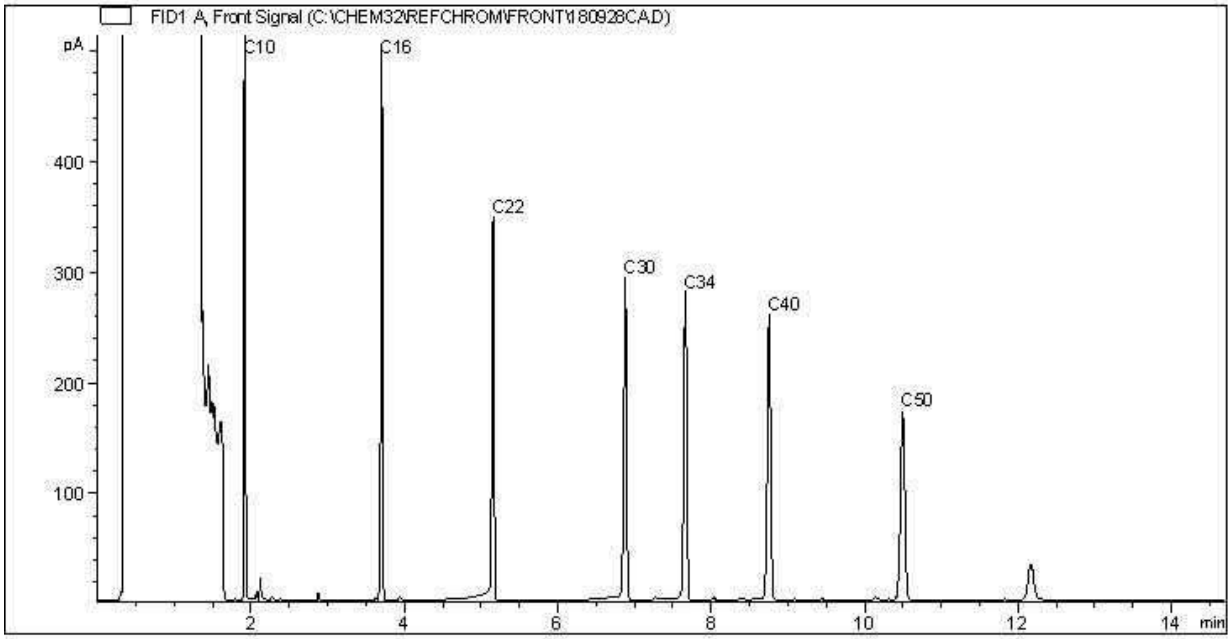
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

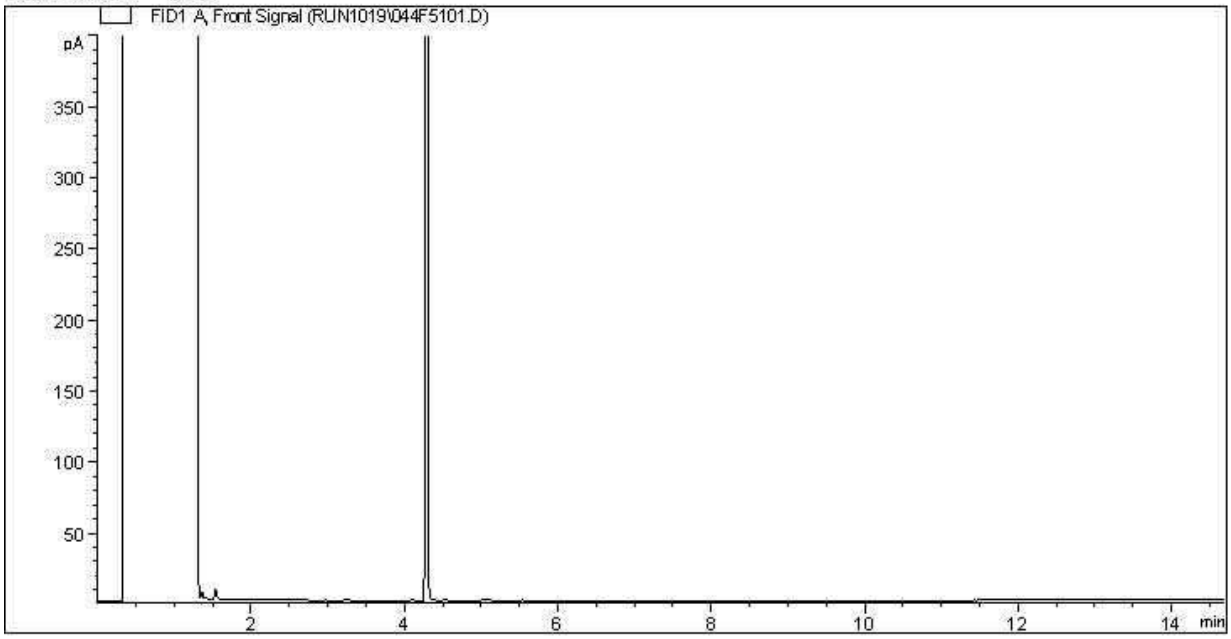
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890491
Report Date: 2018/10/23
Maxxam Sample: UO3890

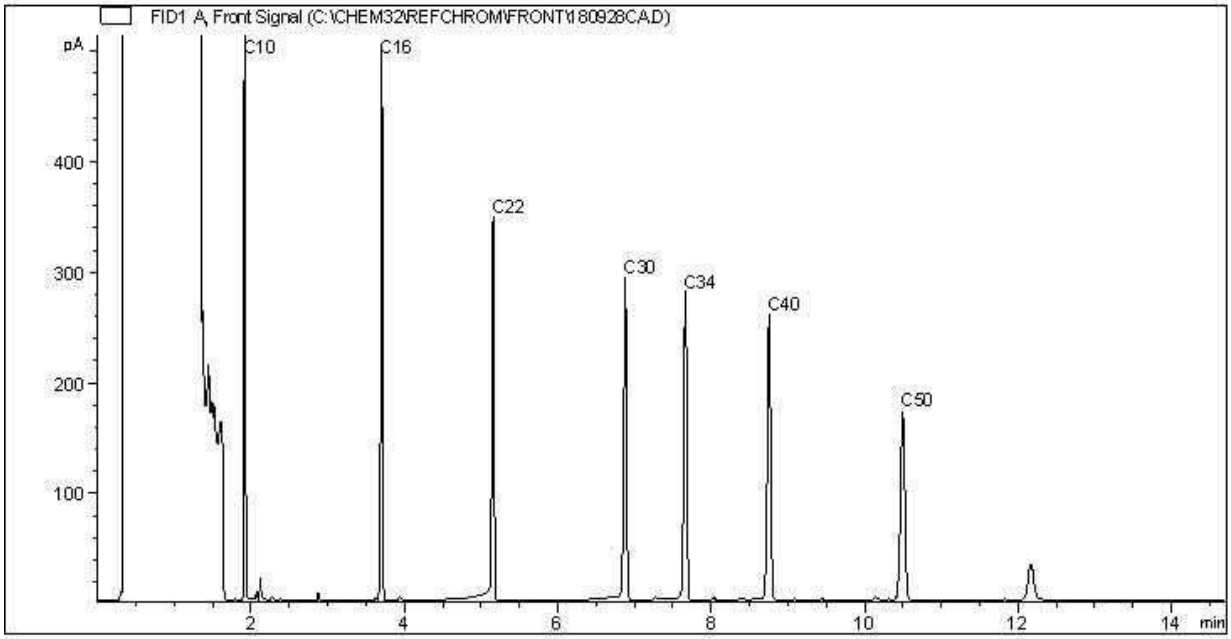
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1928 B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

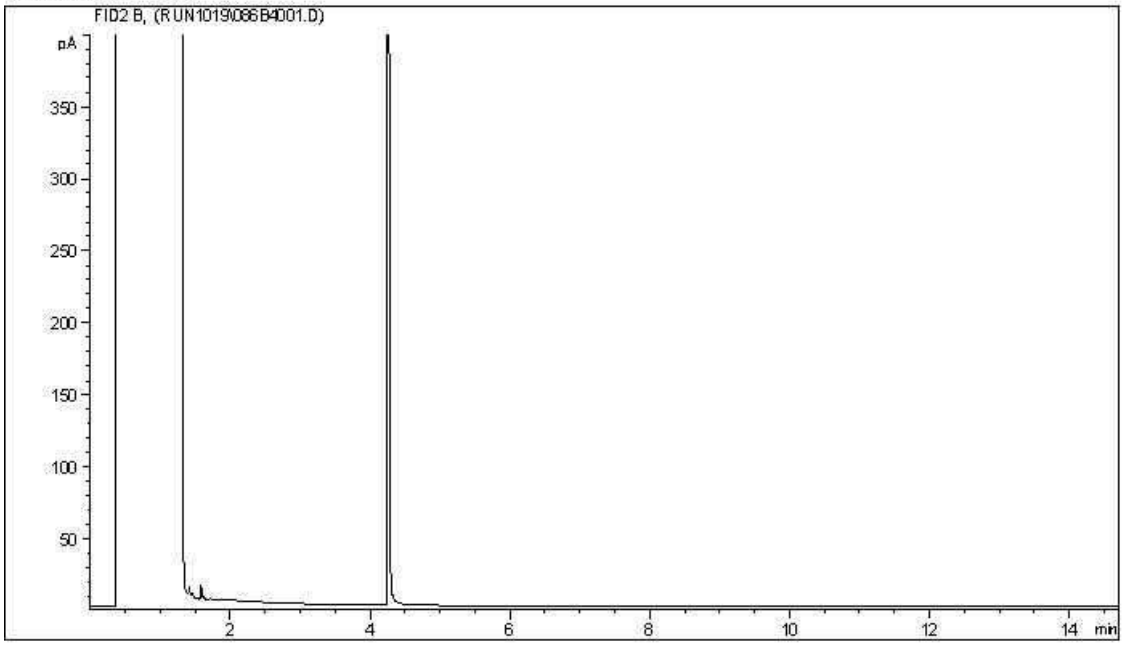
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890491
Report Date: 2018/10/23
Maxxam Sample: UO3891

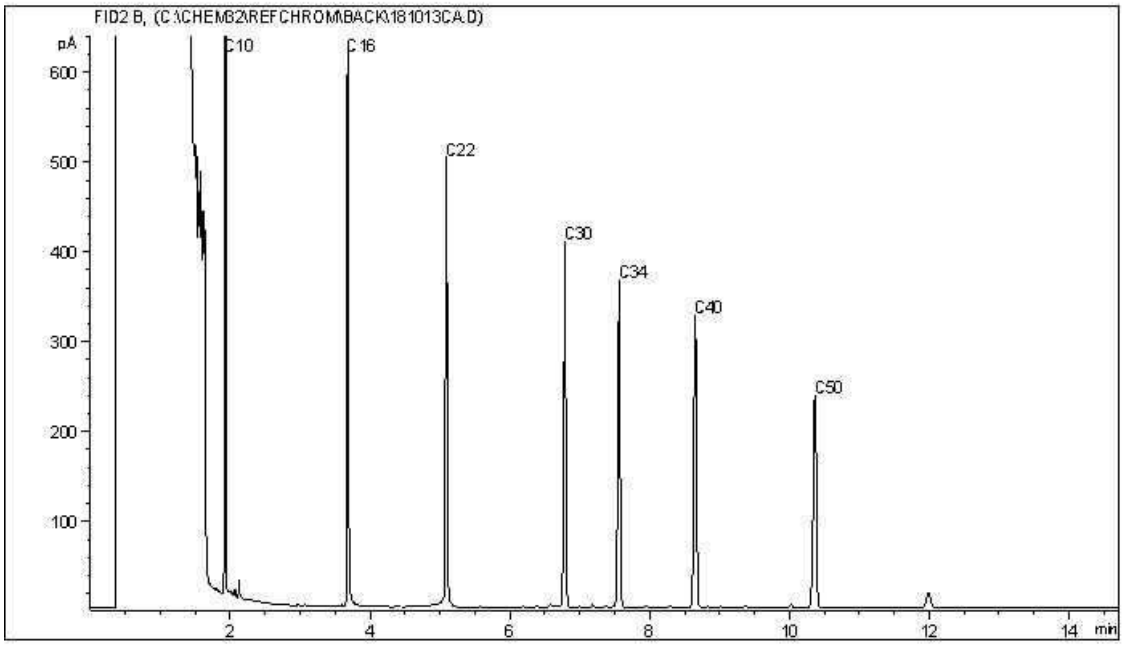
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1948

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



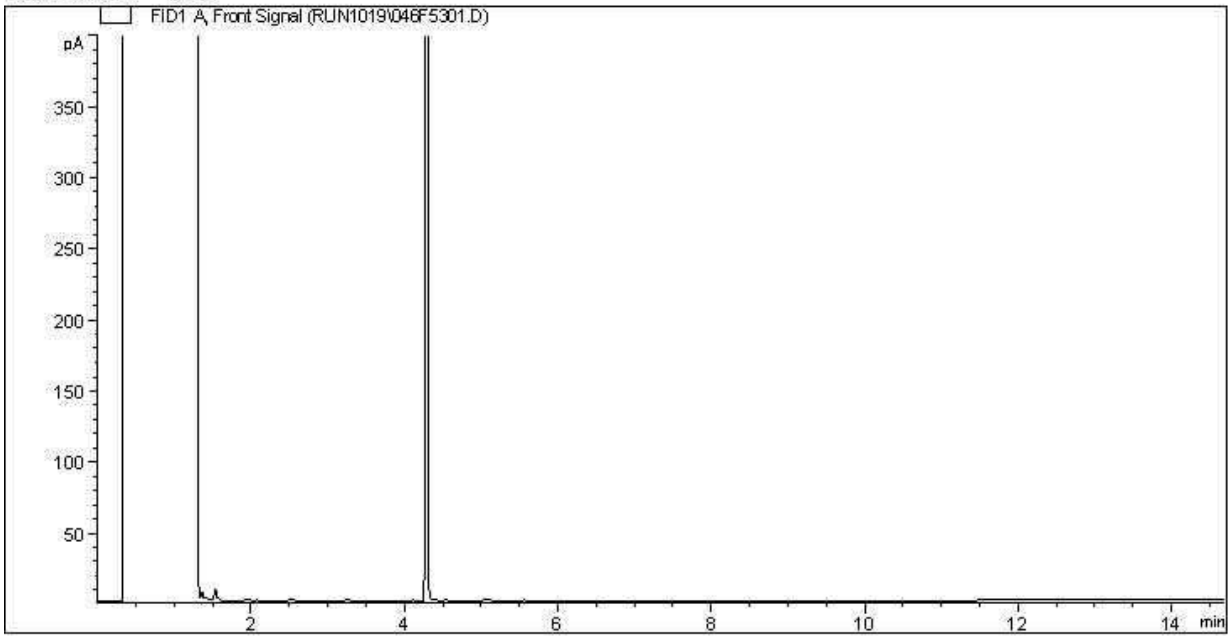
TYPICAL PRODUCT CARBON NUMBER RANGES

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

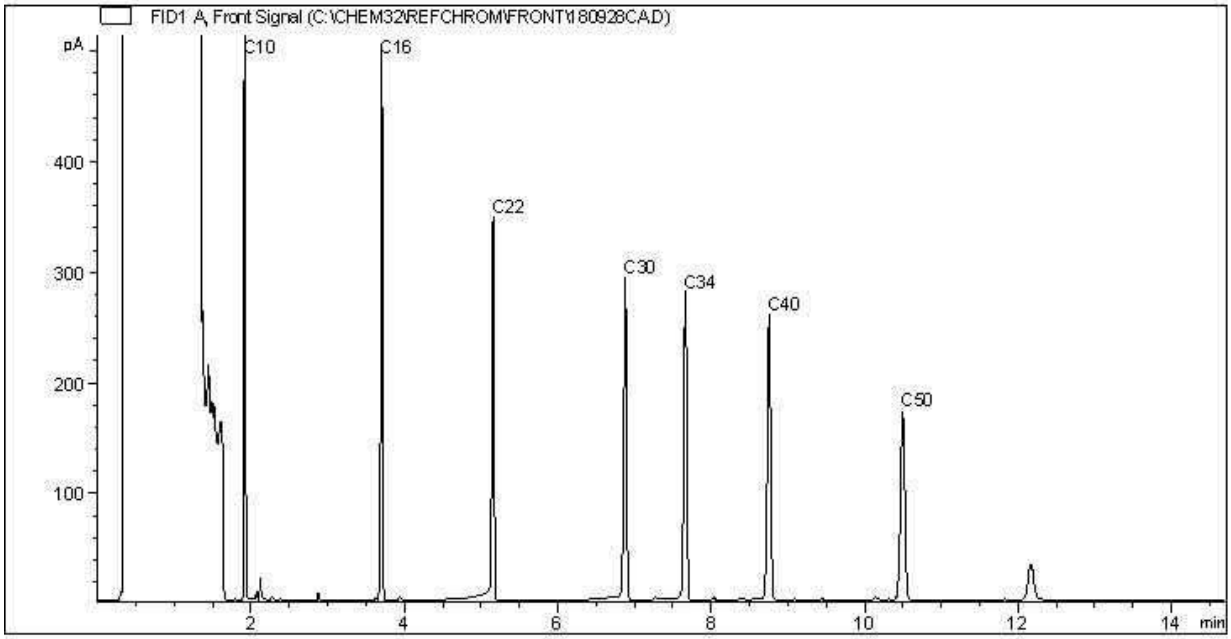
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

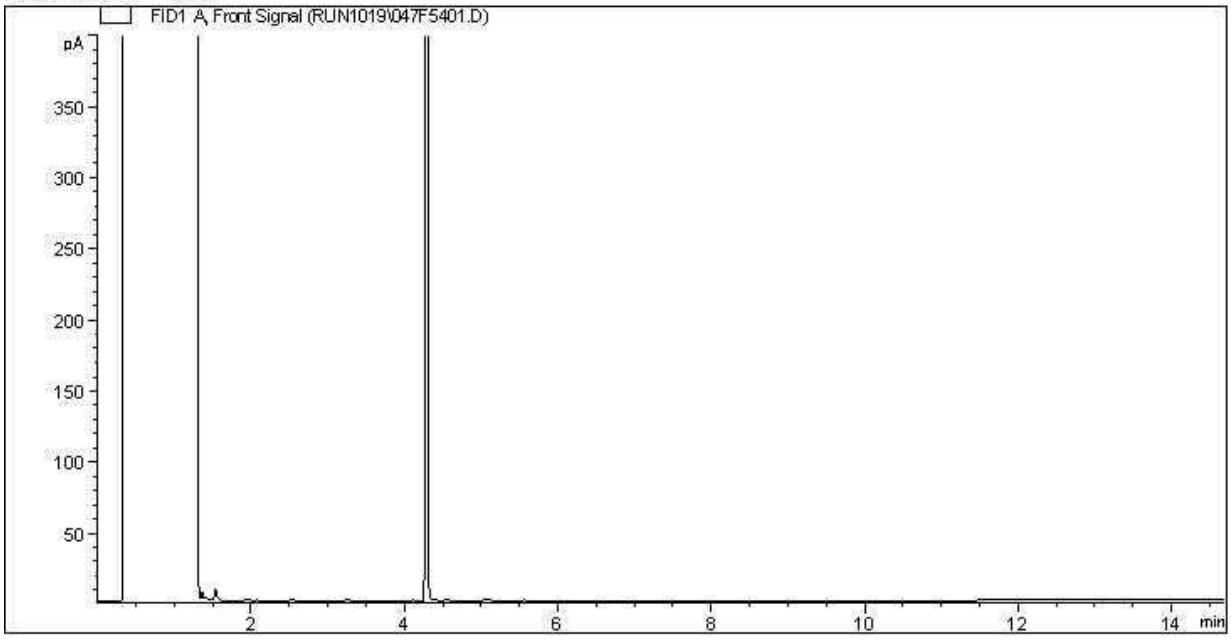
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890491
Report Date: 2018/10/23
Maxxam Sample: UO3893

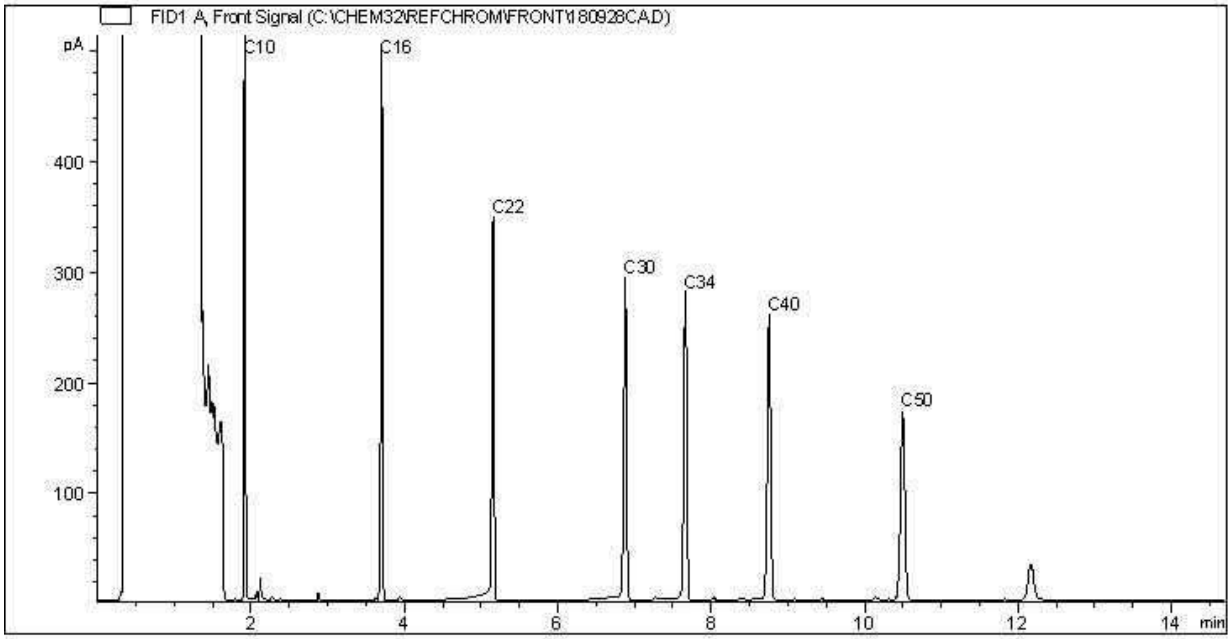
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 732

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

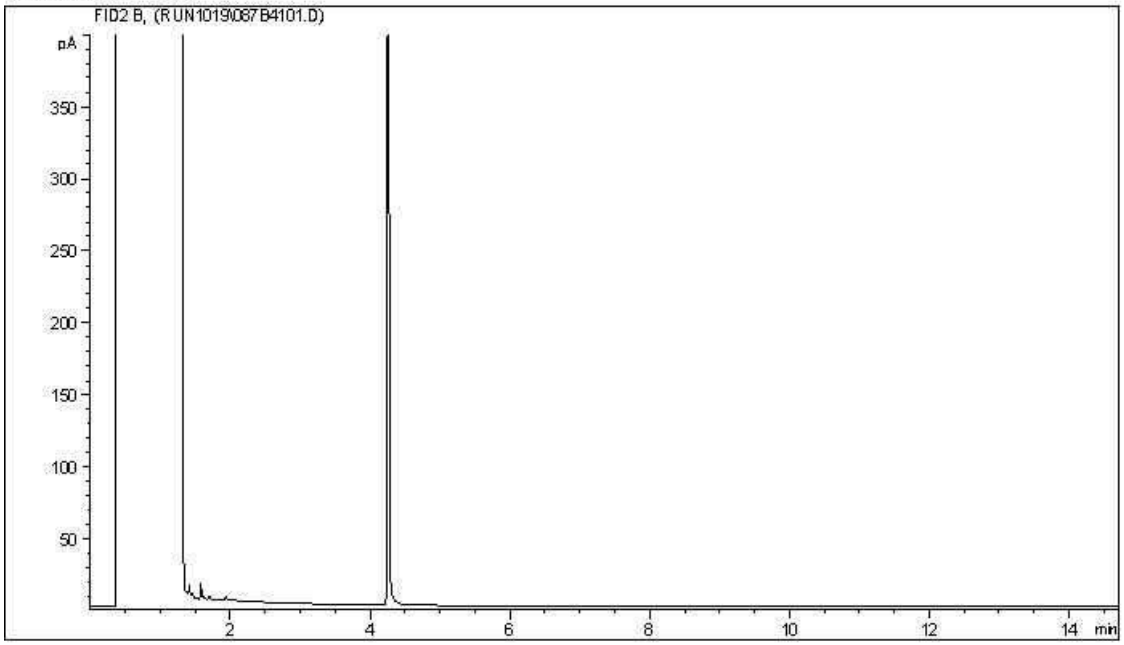
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B890491
Report Date: 2018/10/23
Maxxam Sample: UO3894

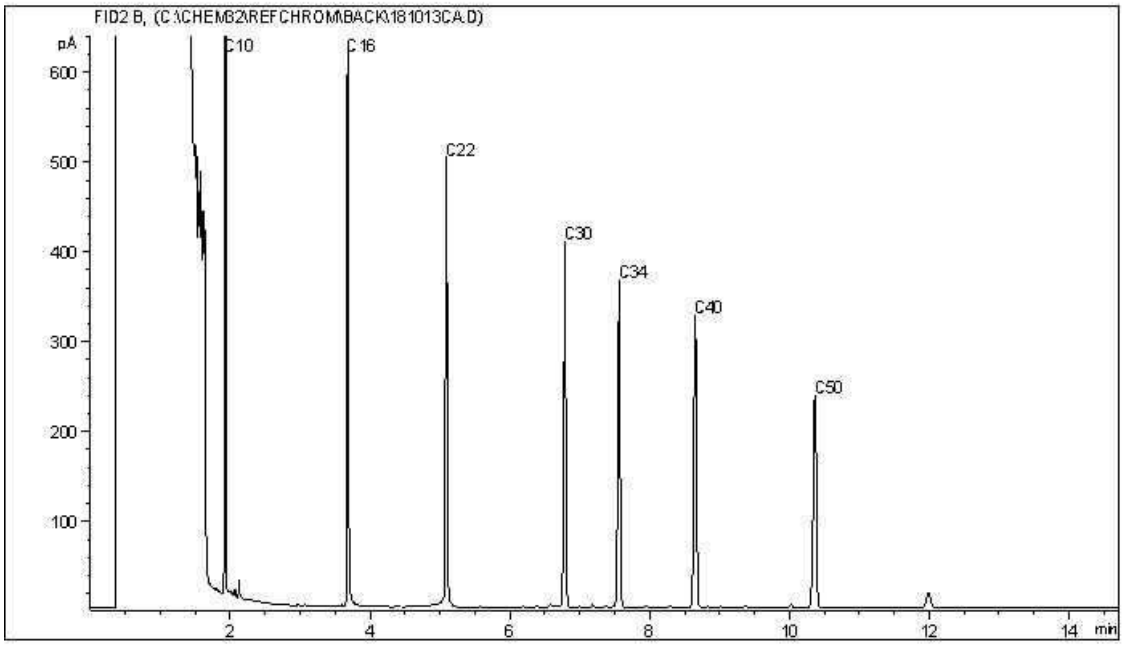
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 9921

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: M045916

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/22
Report #: R2638457
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B891159
Received: 2018/10/17, 13:44

Sample Matrix: GROUND WATER
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	10	N/A	2018/10/19	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	10	N/A	2018/10/20	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	5	2018/10/19	2018/10/20	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/20	2018/10/21	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	1	N/A	2018/10/20	AB SOP-00003	Auto Calc
Benzo[a]pyrene Equivalency (2)	4	N/A	2018/10/22	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	5	2018/10/19	2018/10/20	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	10	N/A	2018/10/22	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	10	N/A	2018/10/19	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: M045916

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/22
Report #: R2638457
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B891159
Received: 2018/10/17, 13:44

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UO7482	UO7482	UO7483	UO7484		UO7485		
Sampling Date		2018/10/17 09:30	2018/10/17 09:30	2018/10/17 12:00	2018/10/17 12:15		2018/10/17 12:30		
COC Number		M045916	M045916	M045916	M045916		M045916		
	UNITS	**1907B**	**1907B Lab-Dup**	**1936**	**1937**	**QC Batch**	**1941**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	<0.10	9191536	<0.10	0.10	9192636
Volatiles									
Benzene	mg/L	0.0043	0.0043	0.030	<0.00040	9191520	<0.00040	0.00040	9191520
Toluene	mg/L	0.018	0.017	0.00098	<0.00040	9191520	<0.00040	0.00040	9191520
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	9191520	<0.00040	0.00040	9191520
m & p-Xylene	mg/L	0.012	0.011	0.0024	<0.00080	9191520	<0.00080	0.00080	9191520
o-Xylene	mg/L	0.013	0.012	0.00042	<0.00040	9191520	<0.00040	0.00040	9191520
Xylenes (Total)	mg/L	0.024	N/A	0.0028	<0.00089	9190746	<0.00089	0.00089	9190746
F1 (C6-C10) - BTEX	mg/L	0.24	N/A	0.32	<0.10	9190746	<0.10	0.10	9190746
F1 (C6-C10)	mg/L	0.29	0.29	0.36	<0.10	9191520	<0.10	0.10	9191520
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	97	98	99	100	9191520	99	N/A	9191520
4-Bromofluorobenzene (sur.)	%	94	94	96	95	9191520	95	N/A	9191520
D4-1,2-Dichloroethane (sur.)	%	94	94	118	99	9191520	98	N/A	9191520
O-TERPHENYL (sur.)	%	88	N/A	89	89	9191536	93	N/A	9192636

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UO7486	UO7487		UO7488	UO7489		
Sampling Date		2018/10/17 12:45	2018/10/17 13:00		2018/10/17 09:10	2018/10/17 13:10		
COC Number		M045916	M045916		M045916	M045916		
	UNITS	**1942**	**1954**	**QC Batch**	**1967**	**1981**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	9192636	0.19	<0.10	0.10	9191536
Volatiles								
Benzene	mg/L	<0.00040	0.0013	9191520	0.13	<0.00040	0.00040	9191520
Toluene	mg/L	<0.00040	<0.00040	9191520	0.016	<0.00040	0.00040	9191520
Ethylbenzene	mg/L	<0.00040	<0.00040	9191520	0.094	<0.00040	0.00040	9191520
m & p-Xylene	mg/L	<0.00080	<0.00080	9191520	0.0031	<0.00080	0.00080	9191520
o-Xylene	mg/L	<0.00040	<0.00040	9191520	0.00087	<0.00040	0.00040	9191520
Xylenes (Total)	mg/L	<0.00089	<0.00089	9190746	0.0040	<0.00089	0.00089	9190746
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	9190746	2.4	<0.10	0.10	9190746
F1 (C6-C10)	mg/L	<0.10	<0.10	9191520	2.6	<0.10	0.10	9191520
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	99	99	9191520	99	99	N/A	9191520
4-Bromofluorobenzene (sur.)	%	95	95	9191520	95	94	N/A	9191520
D4-1,2-Dichloroethane (sur.)	%	99	98	9191520	87	100	N/A	9191520
O-TERPHENYL (sur.)	%	94	93	9192636	86	88	N/A	9191536

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UO7490		
Sampling Date		2018/10/17 09:10		
COC Number		M045916		
	UNITS	**9967**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	0.19	0.10	9192636
Volatiles				
Benzene	mg/L	0.13	0.00040	9191520
Toluene	mg/L	0.016	0.00040	9191520
Ethylbenzene	mg/L	0.091	0.00040	9191520
m & p-Xylene	mg/L	0.0030	0.00080	9191520
o-Xylene	mg/L	0.00085	0.00040	9191520
Xylenes (Total)	mg/L	0.0039	0.00089	9190746
F1 (C6-C10) - BTEX	mg/L	2.4	0.10	9190746
F1 (C6-C10)	mg/L	2.6	0.10	9191520
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99	N/A	9191520
4-Bromofluorobenzene (sur.)	%	95	N/A	9191520
D4-1,2-Dichloroethane (sur.)	%	80	N/A	9191520
O-TERPHENYL (sur.)	%	95	N/A	9192636

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7482	UO7483	UO7484	UO7488	UO7489		
Sampling Date		2018/10/17 09:30	2018/10/17 12:00	2018/10/17 12:15	2018/10/17 09:10	2018/10/17 13:10		
COC Number		M045916	M045916	M045916	M045916	M045916		
	UNITS	**1907B**	**1936**	**1937**	**1967**	**1981**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9190452
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9191526
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9191526
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9191526
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9191526
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00050	<0.00010	0.00010	9191526
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00067	<0.00010	0.00010	9191526
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9191526
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9191526
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	97	95	96	93	86	N/A	9191526
D8-ACENAPHTHYLENE (sur.)	%	93	81	89	81	85	N/A	9191526
D8-NAPHTHALENE (sur.)	%	67	48 (1)	61	55	64	N/A	9191526
TERPHENYL-D14 (sur.)	%	108	107	108	106	103	N/A	9191526

RDL = Reportable Detection Limit
N/A = Not Applicable
(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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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7482	UO7482		UO7483	UO7484	UO7485		
Sampling Date		2018/10/17 09:30	2018/10/17 09:30		2018/10/17 12:00	2018/10/17 12:15	2018/10/17 12:30		
COC Number		M045916	M045916		M045916	M045916	M045916		
	UNITS	**1907B**	**1907B Lab-Dup**	**RDL**	**1936**	**1937**	**1941**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	N/A	0.0013	<0.0013	<0.0013	<0.0013	0.0013	9189223
Bromodichloromethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Bromoform	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Bromomethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	9191533
Carbon tetrachloride	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Chlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Chlorodibromomethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	9191533
Chloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	9191533
Chloroform	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Chloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	9191533
1,2-dibromoethane	mg/L	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	9191533
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,1-dichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,2-dichloroethane	mg/L	<0.00050	<0.00050	0.00050	0.078	0.0032	<0.00050	0.00050	9191533
1,1-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Dichloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	9191533
1,2-dichloropropane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Methyl methacrylate	mg/L	<0.0012 (1)	<0.0012	0.0012	<0.00050	<0.00050	<0.00050	0.00050	9191533
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Styrene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	9191533
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	9191533
Tetrachloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7482	UO7482		UO7483	UO7484	UO7485		
Sampling Date		2018/10/17 09:30	2018/10/17 09:30		2018/10/17 12:00	2018/10/17 12:15	2018/10/17 12:30		
COC Number		M045916	M045916		M045916	M045916	M045916		
	UNITS	**1907B**	**1907B Lab-Dup**	**RDL**	**1936**	**1937**	**1941**	**RDL**	**QC Batch**
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	9191533
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	9191533
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	0.00090	<0.00050	<0.00050	0.00050	9191533
Trichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,2,4-trimethylbenzene	mg/L	0.00096	0.00098	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
1,3,5-trimethylbenzene	mg/L	0.0030	0.0031	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Vinyl chloride	mg/L	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	9191533
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	102	N/A	102	102	101	N/A	9191533
4-Bromofluorobenzene (sur.)	%	92	93	N/A	93	94	94	N/A	9191533
D4-1,2-Dichloroethane (sur.)	%	110	112	N/A	117	102	101	N/A	9191533

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7486	UO7487	UO7488	UO7489		UO7490		
Sampling Date		2018/10/17 12:45	2018/10/17 13:00	2018/10/17 09:10	2018/10/17 13:10		2018/10/17 09:10		
COC Number		M045916	M045916	M045916	M045916		M045916		
	UNITS	**1942**	**1954**	**1967**	**1981**	**RDL**	**9967**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	<0.0013	0.0013	9189223
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9191533
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9191533
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9191533
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9191533
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	0.00020	9191533
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,2-dichloroethane	mg/L	<0.00050	0.00076	0.028	0.021	0.00050	0.030	0.00050	9191533
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9191533
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.0080 (1)	0.0080	9191533
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9191533
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9191533
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9191533
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9191533

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7486	UO7487	UO7488	UO7489		UO7490		
Sampling Date		2018/10/17 12:45	2018/10/17 13:00	2018/10/17 09:10	2018/10/17 13:10		2018/10/17 09:10		
COC Number		M045916	M045916	M045916	M045916		M045916		
	UNITS	**1942**	**1954**	**1967**	**1981**	**RDL**	**9967**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	0.0029	<0.00050	0.00050	0.0029	0.00050	9191533
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9191533
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	103	102	102	101	N/A	102	N/A	9191533
4-Bromofluorobenzene (sur.)	%	93	93	93	94	N/A	92	N/A	9191533
D4-1,2-Dichloroethane (sur.)	%	98	102	106	103	N/A	109	N/A	9191533

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7491		
Sampling Date		2018/10/17		
COC Number		M045916		
	UNITS	**TRIP BLANK 6**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9189223
Benzene	mg/L	<0.00040	0.00040	9191520
Bromodichloromethane	mg/L	<0.00050	0.00050	9191533
Toluene	mg/L	<0.00040	0.00040	9191520
Bromoform	mg/L	<0.00050	0.00050	9191533
Ethylbenzene	mg/L	<0.00040	0.00040	9191520
Bromomethane	mg/L	<0.0020	0.0020	9191533
m & p-Xylene	mg/L	<0.00080	0.00080	9191520
Carbon tetrachloride	mg/L	<0.00050	0.00050	9191533
o-Xylene	mg/L	<0.00040	0.00040	9191520
Chlorobenzene	mg/L	<0.00050	0.00050	9191533
Chlorodibromomethane	mg/L	<0.0010	0.0010	9191533
Xylenes (Total)	mg/L	<0.00089	0.00089	9190746
Chloroethane	mg/L	<0.0010	0.0010	9191533
Chloroform	mg/L	<0.00050	0.00050	9191533
Chloromethane	mg/L	<0.0020	0.0020	9191533
1,2-dibromoethane	mg/L	<0.00020	0.00020	9191533
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9191533
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9191533
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9191533
1,1-dichloroethane	mg/L	<0.00050	0.00050	9191533
1,2-dichloroethane	mg/L	<0.00050	0.00050	9191533
1,1-dichloroethene	mg/L	<0.00050	0.00050	9191533
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9191533
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9191533
Dichloromethane	mg/L	<0.0020	0.0020	9191533
1,2-dichloropropane	mg/L	<0.00050	0.00050	9191533
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9191533
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9191533
Methyl methacrylate	mg/L	<0.00050	0.00050	9191533
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9191533
RDL = Reportable Detection Limit				

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CLIFTON ASSOCIATES LTD.
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Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UO7491		
Sampling Date		2018/10/17		
COC Number		M045916		
	UNITS	**TRIP BLANK 6**	**RDL**	**QC Batch**
Styrene	mg/L	<0.00050	0.00050	9191533
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9191533
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9191533
Tetrachloroethene	mg/L	<0.00050	0.00050	9191533
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9191533
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9191533
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9191533
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9191533
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9191533
Trichloroethene	mg/L	<0.00050	0.00050	9191533
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9191533
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9191533
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9191533
Vinyl chloride	mg/L	<0.00050	0.00050	9191533
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	98	N/A	9191520
4-Bromofluorobenzene (sur.)	%	95	N/A	9191520
D4-1,2-Dichloroethane (sur.)	%	98	N/A	9191520
1,4-Difluorobenzene (sur.)	%	101	N/A	9191533
4-Bromofluorobenzene (sur.)	%	94	N/A	9191533
D4-1,2-Dichloroethane (sur.)	%	102	N/A	9191533

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	8.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9191520	DO1	Matrix Spike [UO7483-01]	1,4-Difluorobenzene (sur.)	2018/10/19		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/19		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/19		99	%	50 - 140
			Benzene	2018/10/19		89	%	50 - 140
			Toluene	2018/10/19		88	%	50 - 140
			Ethylbenzene	2018/10/19		93	%	50 - 140
			m & p-Xylene	2018/10/19		91	%	50 - 140
			o-Xylene	2018/10/19		94	%	50 - 140
			F1 (C6-C10)	2018/10/19		81	%	60 - 140
9191520	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/19		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/19		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/19		106	%	50 - 140
			Benzene	2018/10/19		92	%	60 - 130
			Toluene	2018/10/19		89	%	60 - 130
			Ethylbenzene	2018/10/19		95	%	60 - 130
			m & p-Xylene	2018/10/19		92	%	60 - 130
			o-Xylene	2018/10/19		95	%	60 - 130
			F1 (C6-C10)	2018/10/19		92	%	60 - 140
9191520	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/19		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/19		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/19		97	%	50 - 140
			Benzene	2018/10/19	<0.00040		mg/L	
			Toluene	2018/10/19	<0.00040		mg/L	
			Ethylbenzene	2018/10/19	<0.00040		mg/L	
			m & p-Xylene	2018/10/19	<0.00080		mg/L	
			o-Xylene	2018/10/19	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/19	<0.10		mg/L	
9191520	DO1	RPD [UO7482-01]	Benzene	2018/10/19	2.1		%	30
			Toluene	2018/10/19	2.8		%	30
			Ethylbenzene	2018/10/19	NC		%	30
			m & p-Xylene	2018/10/19	2.6		%	30
			o-Xylene	2018/10/19	2.4		%	30
			F1 (C6-C10)	2018/10/19	0.34		%	30
9191526	LZ3	Matrix Spike [UO7482-02]	D10-ANTHRACENE (sur.)	2018/10/20		93	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/20		86	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/20		62	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/20		111	%	50 - 130
			Acenaphthene	2018/10/20		88	%	50 - 130
			Acenaphthylene	2018/10/20		92	%	50 - 130
			Acridine	2018/10/20		79	%	50 - 130
			Anthracene	2018/10/20		85	%	50 - 130
			Benzo(a)anthracene	2018/10/20		114	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/20		107	%	50 - 130
			Benzo(k)fluoranthene	2018/10/20		101	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/20		95	%	50 - 130
			Benzo(c)phenanthrene	2018/10/20		109	%	50 - 130
			Benzo(a)pyrene	2018/10/20		103	%	50 - 130
			Benzo[e]pyrene	2018/10/20		97	%	50 - 130
			Chrysene	2018/10/20		108	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/20		97	%	50 - 130
			Fluoranthene	2018/10/20		104	%	50 - 130
			Fluorene	2018/10/20		93	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Indeno(1,2,3-cd)pyrene	2018/10/20		96	%	50 - 130
			1-Methylnaphthalene	2018/10/20		88	%	50 - 130
			2-Methylnaphthalene	2018/10/20		84	%	50 - 130
			Naphthalene	2018/10/20		76	%	50 - 130
			Phenanthrene	2018/10/20		90	%	50 - 130
			Perylene	2018/10/20		87	%	50 - 130
			Pyrene	2018/10/20		101	%	50 - 130
			Quinoline	2018/10/20		101	%	50 - 130
9191526	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/20		95	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/20		85	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/20		65	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/20		113	%	50 - 130
			Acenaphthene	2018/10/20		77	%	50 - 130
			Acenaphthylene	2018/10/20		83	%	50 - 130
			Acridine	2018/10/20		78	%	50 - 130
			Anthracene	2018/10/20		86	%	50 - 130
			Benzo(a)anthracene	2018/10/20		116	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/20		108	%	50 - 130
			Benzo(k)fluoranthene	2018/10/20		109	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/20		98	%	50 - 130
			Benzo(c)phenanthrene	2018/10/20		109	%	50 - 130
			Benzo(a)pyrene	2018/10/20		101	%	50 - 130
			Benzo[e]pyrene	2018/10/20		102	%	50 - 130
			Chrysene	2018/10/20		112	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/20		101	%	50 - 130
			Fluoranthene	2018/10/20		107	%	50 - 130
			Fluorene	2018/10/20		84	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/20		96	%	50 - 130
			1-Methylnaphthalene	2018/10/20		77	%	50 - 130
			2-Methylnaphthalene	2018/10/20		72	%	50 - 130
			Naphthalene	2018/10/20		73	%	50 - 130
			Phenanthrene	2018/10/20		89	%	50 - 130
			Perylene	2018/10/20		93	%	50 - 130
			Pyrene	2018/10/20		104	%	50 - 130
			Quinoline	2018/10/20		98	%	50 - 130
9191526	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/20		92	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/20		82	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/20		62	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/20		109	%	50 - 130
			Acenaphthene	2018/10/20	<0.00010		mg/L	
			Acenaphthylene	2018/10/20	<0.00010		mg/L	
			Acridine	2018/10/20	<0.000050		mg/L	
			Anthracene	2018/10/20	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/20	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/20	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/20	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/20	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/20	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/20	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/20	<0.000050		mg/L	
			Chrysene	2018/10/20	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/20	<0.0000075		mg/L	
			Fluoranthene	2018/10/20	<0.000010		mg/L	
			Fluorene	2018/10/20	<0.000050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Indeno(1,2,3-cd)pyrene	2018/10/20	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/20	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/20	<0.00010		mg/L	
			Naphthalene	2018/10/20	<0.00010		mg/L	
			Phenanthrene	2018/10/20	<0.000050		mg/L	
			Perylene	2018/10/20	<0.000050		mg/L	
			Pyrene	2018/10/20	<0.000020		mg/L	
			Quinoline	2018/10/20	<0.00020		mg/L	
9191526	LZ3	RPD	Acenaphthene	2018/10/20	NC		%	30
			Acenaphthylene	2018/10/20	NC		%	30
			Acridine	2018/10/20	NC		%	30
			Anthracene	2018/10/20	NC		%	30
			Benzo(a)anthracene	2018/10/20	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/20	NC		%	30
			Benzo(k)fluoranthene	2018/10/20	NC		%	30
			Benzo(g,h,i)perylene	2018/10/20	NC		%	30
			Benzo(c)phenanthrene	2018/10/20	NC		%	30
			Benzo(a)pyrene	2018/10/20	NC		%	30
			Benzo[e]pyrene	2018/10/20	NC		%	30
			Chrysene	2018/10/20	NC		%	30
			Dibenz(a,h)anthracene	2018/10/20	NC		%	30
			Fluoranthene	2018/10/20	NC		%	30
			Fluorene	2018/10/20	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/20	NC		%	30
			1-Methylnaphthalene	2018/10/20	NC		%	30
			2-Methylnaphthalene	2018/10/20	NC		%	30
			Naphthalene	2018/10/20	NC		%	30
			Phenanthrene	2018/10/20	NC		%	30
			Perylene	2018/10/20	NC		%	30
			Pyrene	2018/10/20	NC		%	30
			Quinoline	2018/10/20	NC		%	30
9191533	MZ	Matrix Spike [UO7483-01]	1,4-Difluorobenzene (sur.)	2018/10/19		105	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/19		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/19		92	%	50 - 140
			Bromodichloromethane	2018/10/19		104	%	50 - 140
			Bromoform	2018/10/19		98	%	50 - 140
			Bromomethane	2018/10/19		94	%	50 - 140
			Carbon tetrachloride	2018/10/19		103	%	50 - 140
			Chlorobenzene	2018/10/19		95	%	50 - 140
			Chlorodibromomethane	2018/10/19		99	%	50 - 140
			Chloroethane	2018/10/19		87	%	50 - 140
			Chloroform	2018/10/19		98	%	50 - 140
			Chloromethane	2018/10/19		99	%	50 - 140
			1,2-dibromoethane	2018/10/19		93	%	50 - 140
			1,2-dichlorobenzene	2018/10/19		101	%	50 - 140
			1,3-dichlorobenzene	2018/10/19		100	%	50 - 140
			1,4-dichlorobenzene	2018/10/19		98	%	50 - 140
			1,1-dichloroethane	2018/10/19		95	%	50 - 140
			1,2-dichloroethane	2018/10/19		97	%	50 - 140
			1,1-dichloroethene	2018/10/19		96	%	50 - 140
			cis-1,2-dichloroethene	2018/10/19		97	%	50 - 140
			trans-1,2-dichloroethene	2018/10/19		91	%	50 - 140
			Dichloromethane	2018/10/19		92	%	50 - 140

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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-dichloropropane	2018/10/19		98	%	50 - 140
			cis-1,3-dichloropropene	2018/10/19		104	%	50 - 140
			trans-1,3-dichloropropene	2018/10/19		103	%	50 - 140
			Methyl methacrylate	2018/10/19		98	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/19		98	%	50 - 140
			Styrene	2018/10/19		95	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/19		94	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/19		93	%	50 - 140
			Tetrachloroethene	2018/10/19		92	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/19		96	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/19		97	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/19		98	%	50 - 140
			1,1,1-trichloroethane	2018/10/19		102	%	50 - 140
			1,1,2-trichloroethane	2018/10/19		101	%	50 - 140
			Trichloroethene	2018/10/19		105	%	50 - 140
			Trichlorofluoromethane	2018/10/19		102	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/19		96	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/19		99	%	50 - 140
			Vinyl chloride	2018/10/19		101	%	50 - 140
9191533	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/19		105	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/19		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/19		99	%	50 - 140
			Bromodichloromethane	2018/10/19		103	%	60 - 130
			Bromoform	2018/10/19		95	%	60 - 130
			Bromomethane	2018/10/19		96	%	60 - 130
			Carbon tetrachloride	2018/10/19		105	%	60 - 130
			Chlorobenzene	2018/10/19		94	%	60 - 130
			Chlorodibromomethane	2018/10/19		97	%	60 - 130
			Chloroethane	2018/10/19		91	%	60 - 130
			Chloroform	2018/10/19		96	%	60 - 130
			Chloromethane	2018/10/19		105	%	60 - 130
			1,2-dibromoethane	2018/10/19		90	%	60 - 130
			1,2-dichlorobenzene	2018/10/19		100	%	60 - 130
			1,3-dichlorobenzene	2018/10/19		97	%	60 - 130
			1,4-dichlorobenzene	2018/10/19		96	%	60 - 130
			1,1-dichloroethane	2018/10/19		94	%	60 - 130
			1,2-dichloroethane	2018/10/19		98	%	60 - 130
			1,1-dichloroethene	2018/10/19		98	%	60 - 130
			cis-1,2-dichloroethene	2018/10/19		96	%	60 - 130
			trans-1,2-dichloroethene	2018/10/19		92	%	60 - 130
			Dichloromethane	2018/10/19		92	%	60 - 130
			1,2-dichloropropane	2018/10/19		97	%	60 - 130
			cis-1,3-dichloropropene	2018/10/19		99	%	60 - 130
			trans-1,3-dichloropropene	2018/10/19		95	%	60 - 130
			Methyl methacrylate	2018/10/19		96	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/19		99	%	60 - 130
			Styrene	2018/10/19		94	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/19		93	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/19		90	%	60 - 130
			Tetrachloroethene	2018/10/19		92	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/19		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/19		93	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/19		95	%	60 - 130
			1,1,1-trichloroethane	2018/10/19		104	%	60 - 130

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,2-trichloroethane	2018/10/19		99	%	60 - 130
			Trichloroethene	2018/10/19		105	%	60 - 130
			Trichlorofluoromethane	2018/10/19		106	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/19		95	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/19		98	%	60 - 130
			Vinyl chloride	2018/10/19		107	%	60 - 130
9191533	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/19		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/19		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/19		100	%	50 - 140
			Bromodichloromethane	2018/10/19	<0.00050		mg/L	
			Bromoform	2018/10/19	<0.00050		mg/L	
			Bromomethane	2018/10/19	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/19	<0.00050		mg/L	
			Chlorobenzene	2018/10/19	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/19	<0.0010		mg/L	
			Chloroethane	2018/10/19	<0.0010		mg/L	
			Chloroform	2018/10/19	<0.00050		mg/L	
			Chloromethane	2018/10/19	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/19	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/19	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/19	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/19	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/19	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/19	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/19	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/19	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/19	<0.00050		mg/L	
			Dichloromethane	2018/10/19	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/19	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/19	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/19	<0.00050		mg/L	
			Methyl methacrylate	2018/10/19	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/19	<0.00050		mg/L	
			Styrene	2018/10/19	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/19	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/19	<0.0020		mg/L	
			Tetrachloroethene	2018/10/19	<0.00050		mg/L	
			1,2,3-trichlorobenzene	2018/10/19	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/19	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/19	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/19	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/19	<0.00050		mg/L	
			Trichloroethene	2018/10/19	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/19	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/19	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/19	<0.00050		mg/L	
			Vinyl chloride	2018/10/19	<0.00050		mg/L	
9191533	MZ	RPD [UO7482-01]	Bromodichloromethane	2018/10/19	NC		%	30
			Bromoform	2018/10/19	NC		%	30
			Bromomethane	2018/10/19	NC		%	30
			Carbon tetrachloride	2018/10/19	NC		%	30
			Chlorobenzene	2018/10/19	NC		%	30
			Chlorodibromomethane	2018/10/19	NC		%	30
			Chloroethane	2018/10/19	NC		%	30

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chloroform	2018/10/19	NC		%	30
			Chloromethane	2018/10/19	NC		%	30
			1,2-dibromoethane	2018/10/19	NC		%	30
			1,2-dichlorobenzene	2018/10/19	NC		%	30
			1,3-dichlorobenzene	2018/10/19	NC		%	30
			1,4-dichlorobenzene	2018/10/19	NC		%	30
			1,1-dichloroethane	2018/10/19	NC		%	30
			1,2-dichloroethane	2018/10/19	NC		%	30
			1,1-dichloroethene	2018/10/19	NC		%	30
			cis-1,2-dichloroethene	2018/10/19	NC		%	30
			trans-1,2-dichloroethene	2018/10/19	NC		%	30
			Dichloromethane	2018/10/19	NC		%	30
			1,2-dichloropropane	2018/10/19	NC		%	30
			cis-1,3-dichloropropene	2018/10/19	NC		%	30
			trans-1,3-dichloropropene	2018/10/19	NC		%	30
			Methyl methacrylate	2018/10/19	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/19	NC		%	30
			Styrene	2018/10/19	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/19	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/19	NC		%	30
			Tetrachloroethene	2018/10/19	NC		%	30
			1,2,3-trichlorobenzene	2018/10/19	NC		%	30
			1,2,4-trichlorobenzene	2018/10/19	NC		%	30
			1,3,5-trichlorobenzene	2018/10/19	NC		%	30
			1,1,1-trichloroethane	2018/10/19	NC		%	30
			1,1,2-trichloroethane	2018/10/19	NC		%	30
			Trichloroethene	2018/10/19	NC		%	30
			Trichlorofluoromethane	2018/10/19	NC		%	30
			1,2,4-trimethylbenzene	2018/10/19	2.6		%	30
			1,3,5-trimethylbenzene	2018/10/19	2.9		%	30
			Vinyl chloride	2018/10/19	NC		%	30
9191536	LSH	Matrix Spike [UO7483-02]	O-TERPHENYL (sur.)	2018/10/20		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		92	%	60 - 140
9191536	LSH	Spiked Blank	O-TERPHENYL (sur.)	2018/10/20		88	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		89	%	60 - 140
9191536	LSH	Method Blank	O-TERPHENYL (sur.)	2018/10/20		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20	<0.10		mg/L	
9191536	LSH	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/20	NC		%	30
9192636	MHF	Matrix Spike	O-TERPHENYL (sur.)	2018/10/20		89	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		81	%	60 - 140
9192636	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/20		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		75	%	60 - 140
9192636	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/20		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20	<0.10		mg/L	

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9192636	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/20	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).

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

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Maxxam Job #: B891159
Report Date: 2018/10/22

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

697

CHAIN OF CUSTODY RECORD

M 045916

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 - 30 Ave NE Calgary AB. T2E 7K9	Address:		Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	stephen_dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn_kuzyk@clifton.ca	Copies:		Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	7	8	11
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F2-F3	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
1	1907 B		2018.10.17	9:30	GW	8	✓	✓									✓	
2	1936		↓	12:00	↓	8	✓	✓									✓	
3	1937		↓	12:15	↓	8	✓	✓									✓	
4	1941		↓	12:30	↓	6	✓	✓										
5	1942		↓	12:45	↓	6	✓	✓										
6	1954		↓	13:00	↓	6	✓	✓										
7	1967		↓	9:10	↓	7	✓	✓									✓	
8	1981		↓	13:10	↓	8	✓	✓									✓	
9	9967		↓	9:10	GW	6	✓	✓										
10	Trip Blank 6		2018.10.17		W	2	✓											

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

Regulatory Criteria

☑ AT1
☐ CCME
☐ Drinking Water
☐ D50 (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018.10.17	13:44	Jordan Bank	2018/10/17	13:44

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 acknowledgement and acceptance of our terms which are available for viewing at www.maxxam.ca

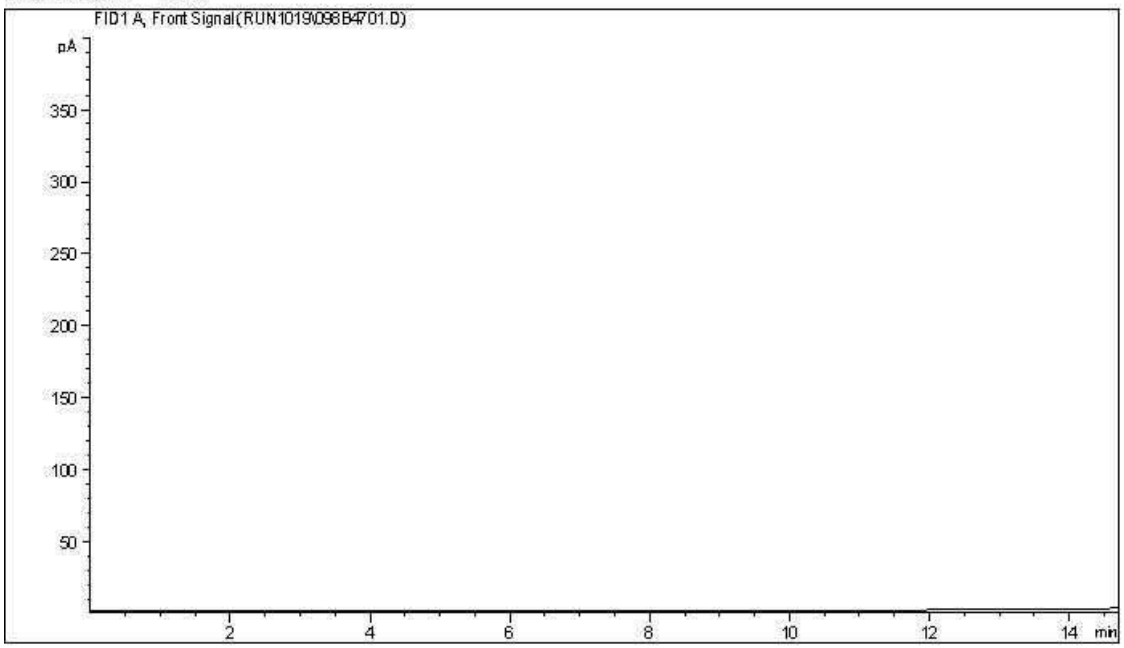
17-Oct-18 13:44
Leanne Cameron
B891159

BD2

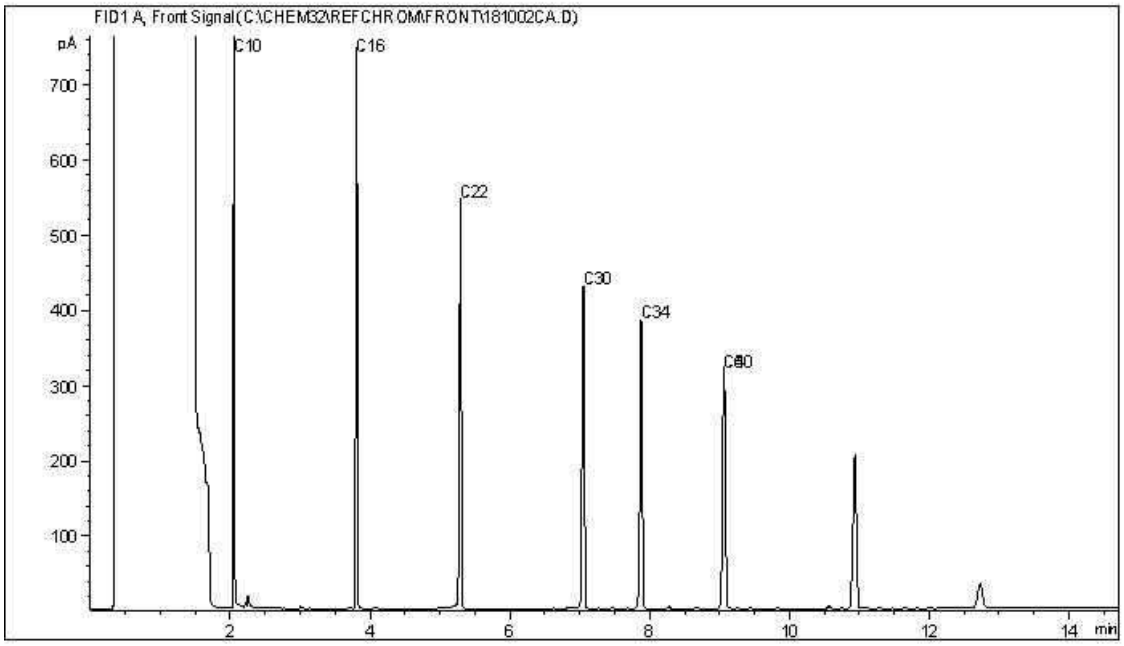
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



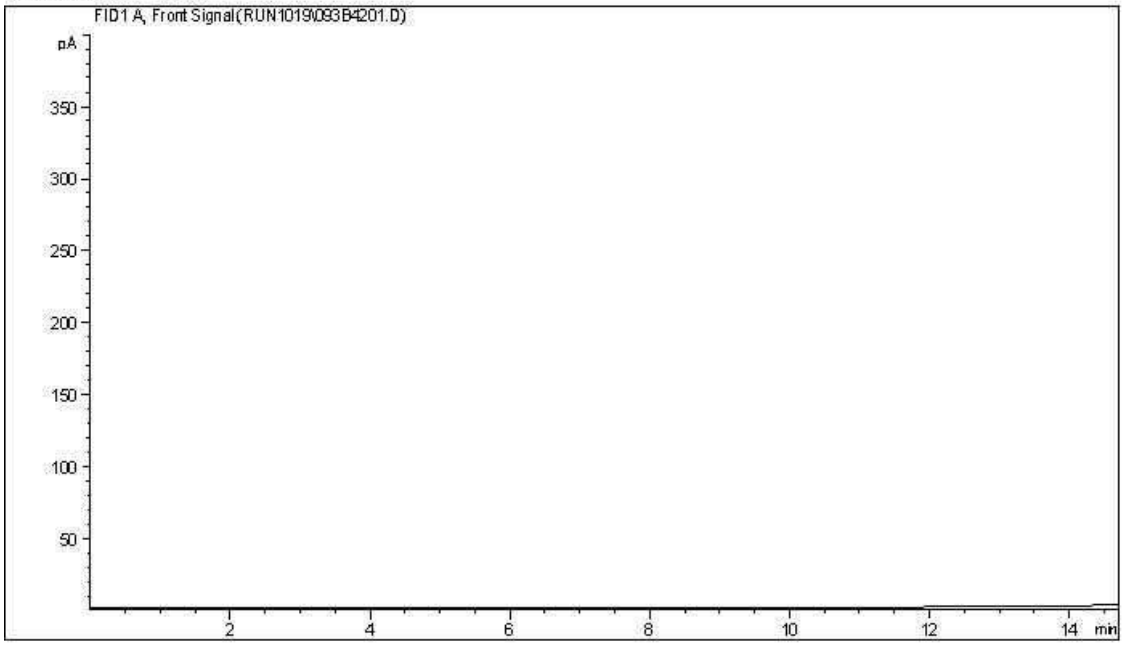
TYPICAL PRODUCT CARBON NUMBER RANGES

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

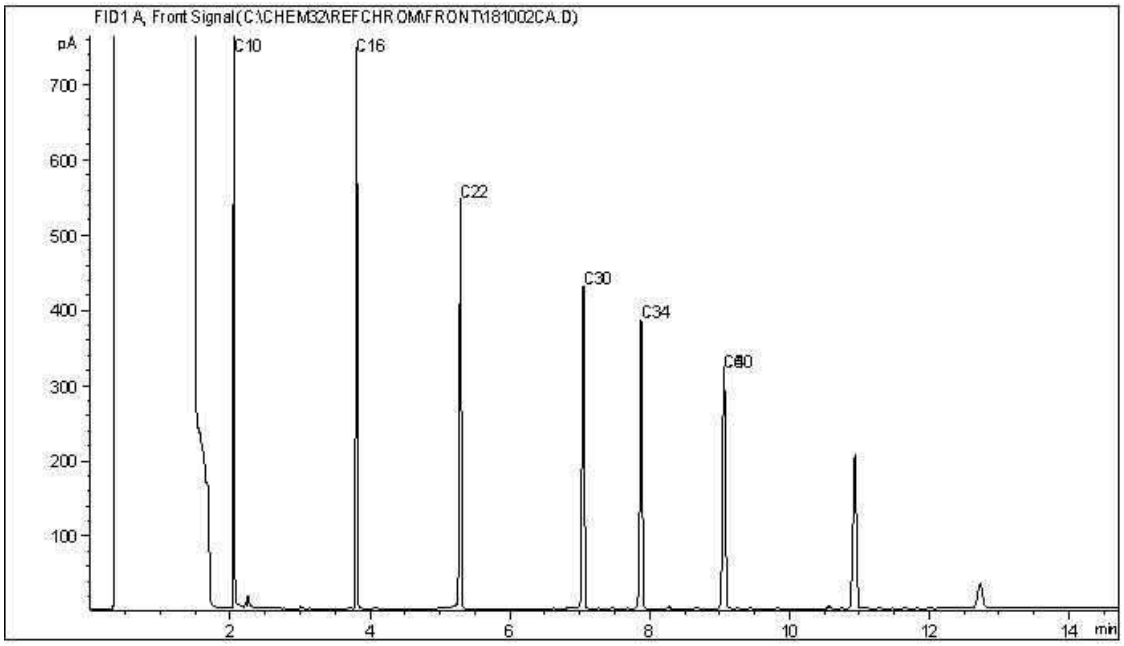
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



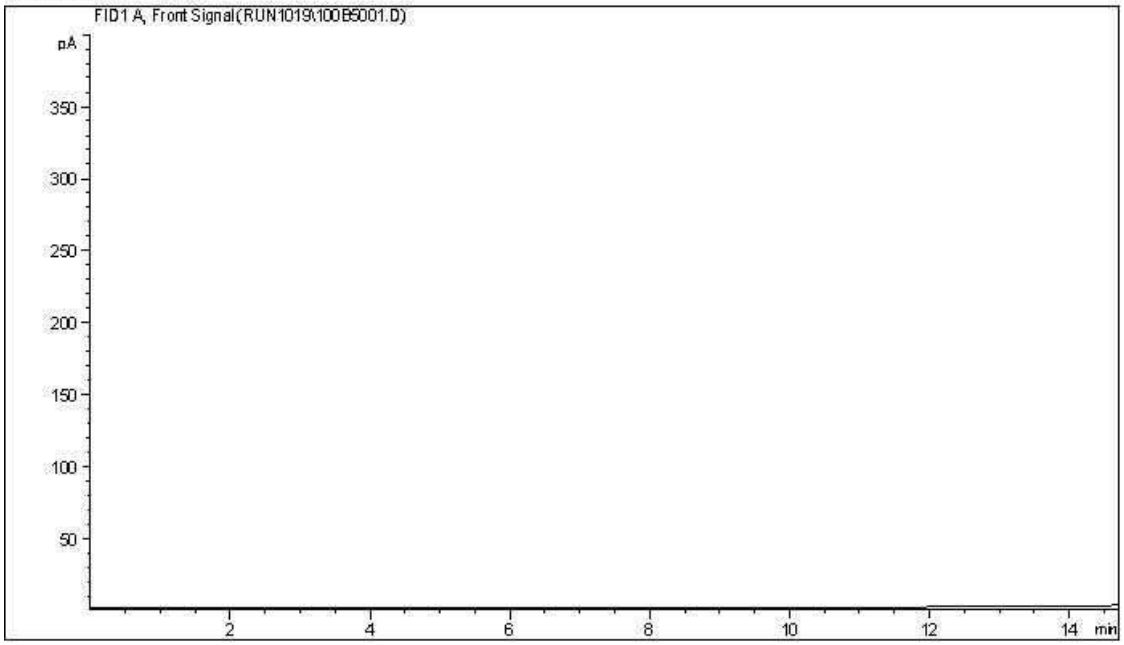
TYPICAL PRODUCT CARBON NUMBER RANGES

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

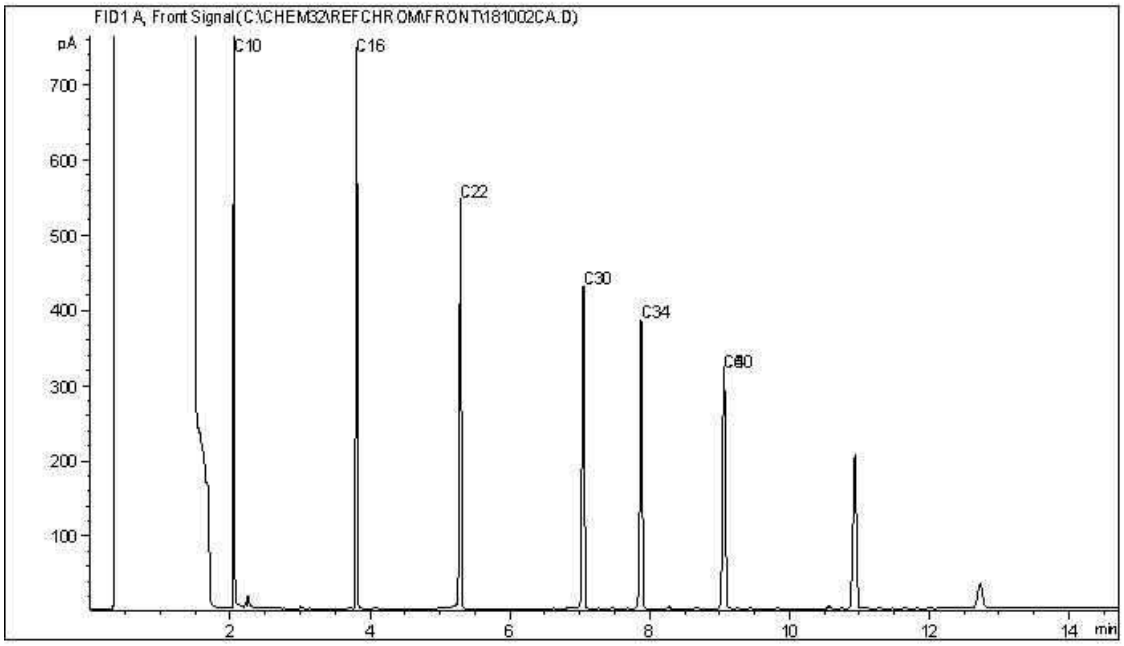
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



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+

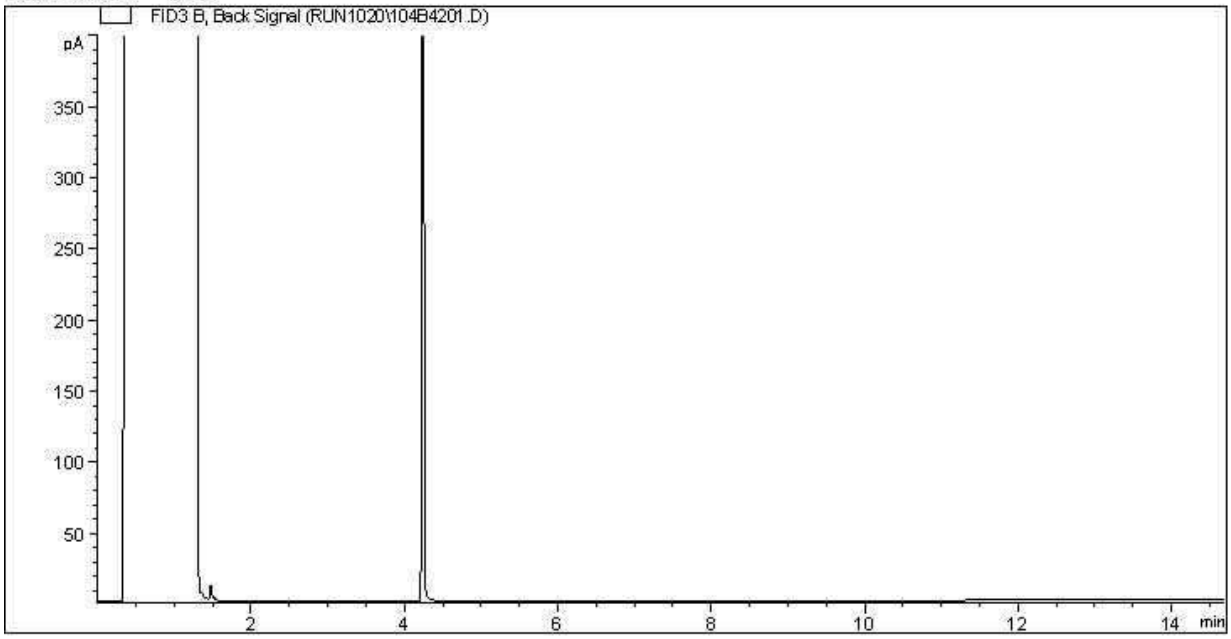
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B891159
Report Date: 2018/10/22
Maxxam Sample: UO7485

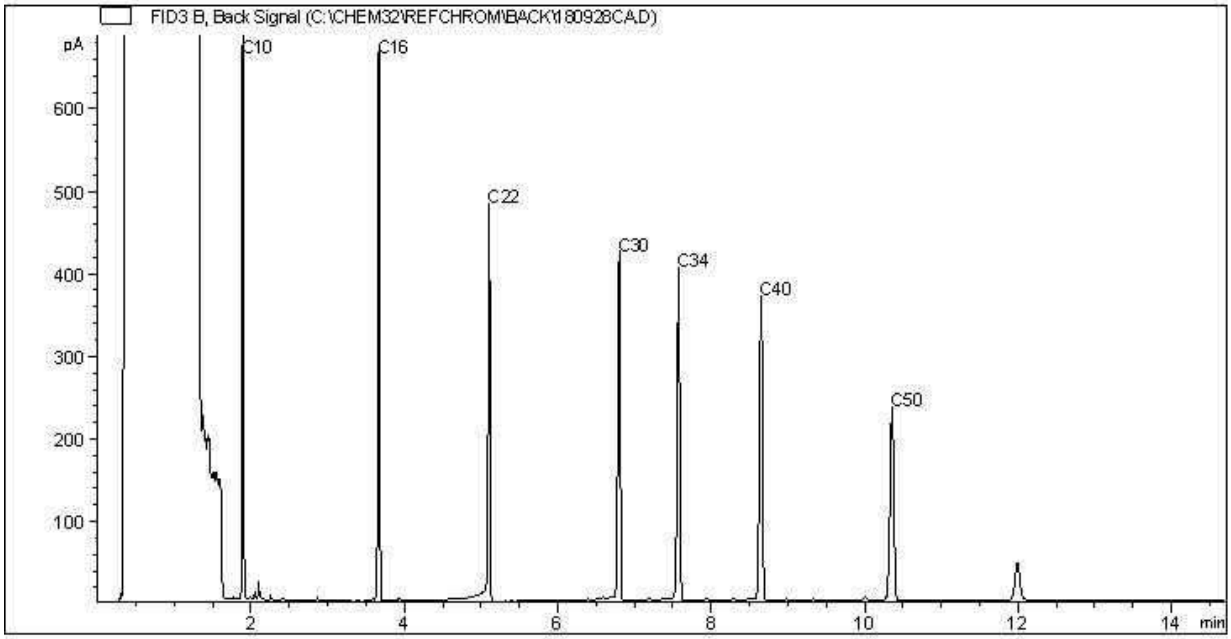
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1941

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



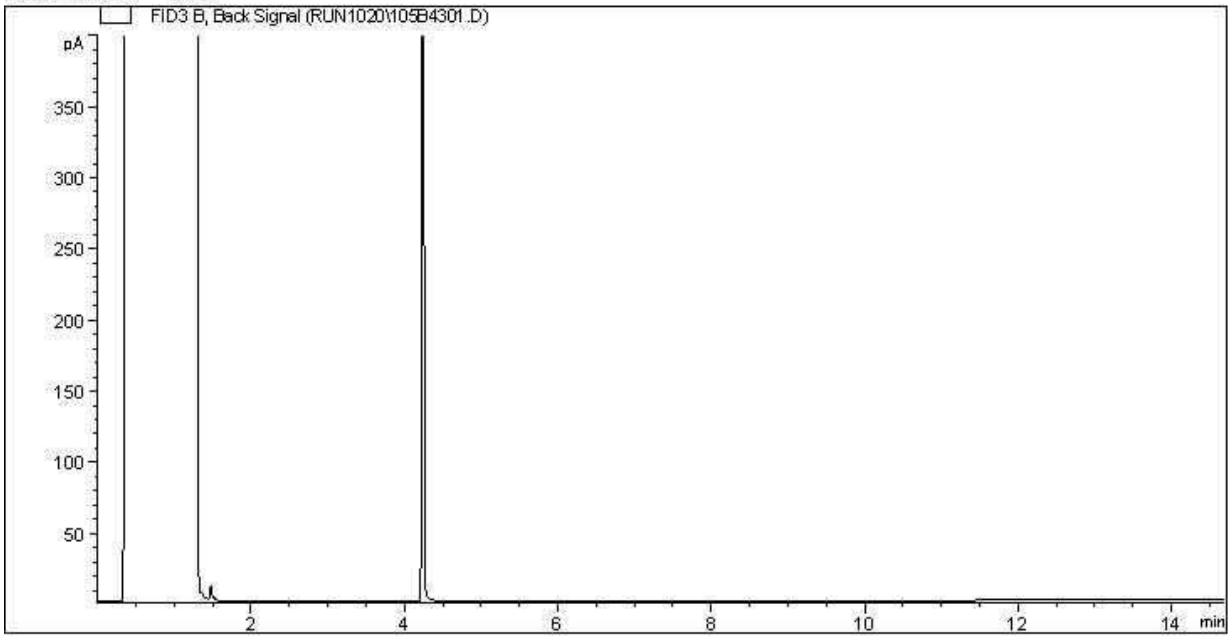
TYPICAL PRODUCT CARBON NUMBER RANGES

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

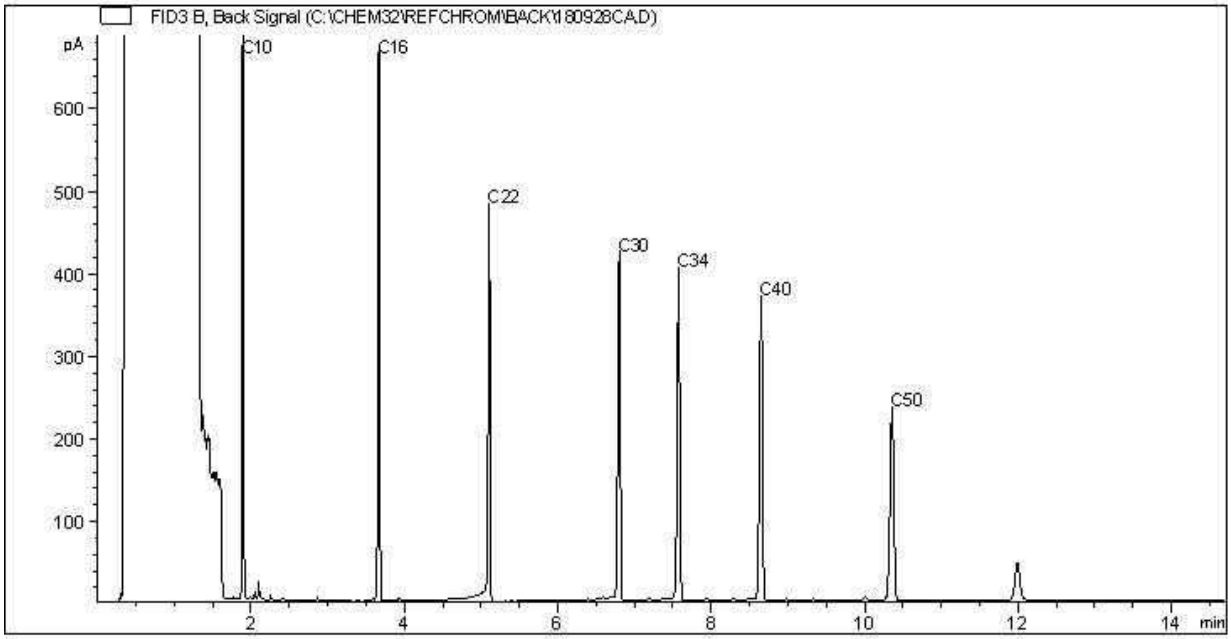
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

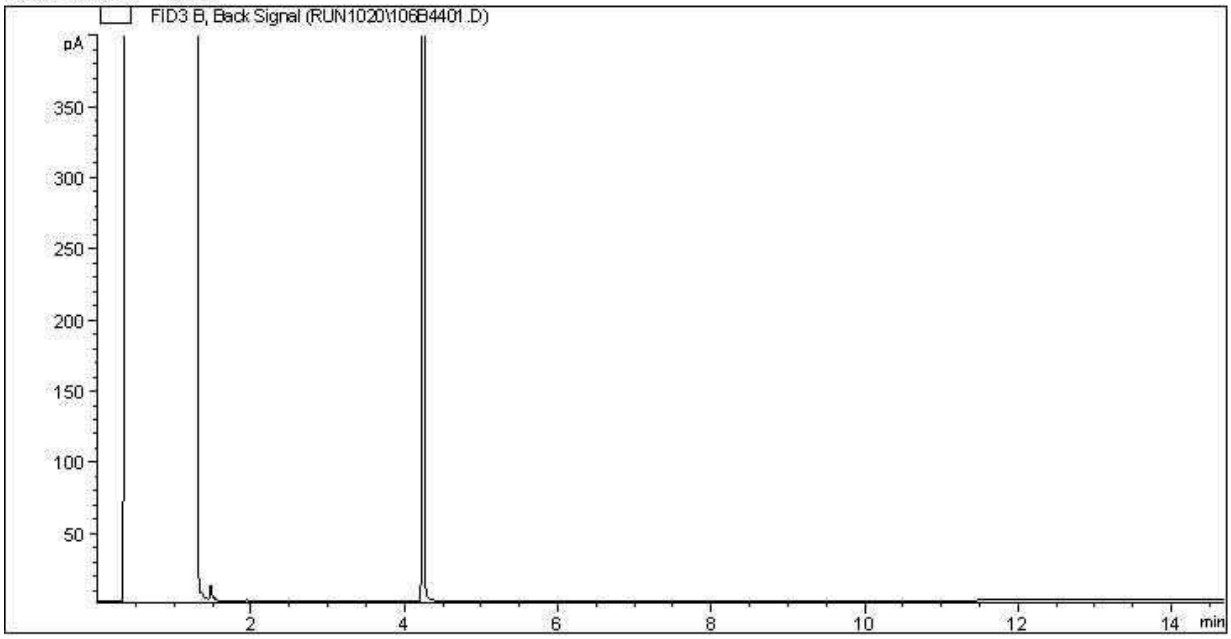
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B891159
Report Date: 2018/10/22
Maxxam Sample: UO7487

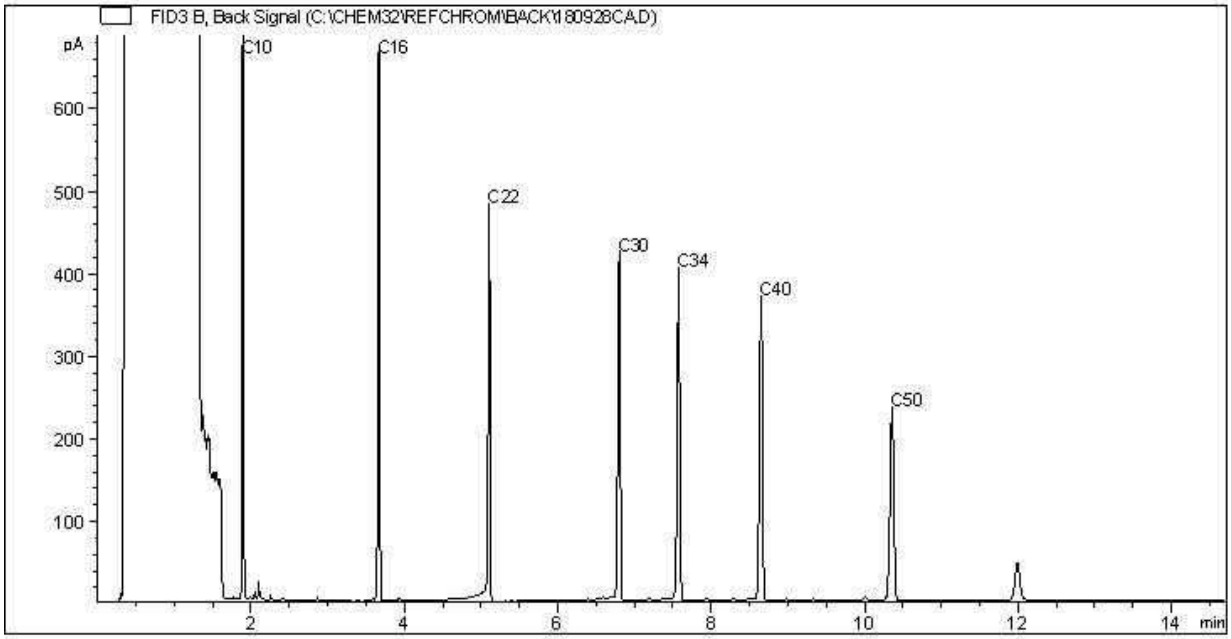
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1954

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



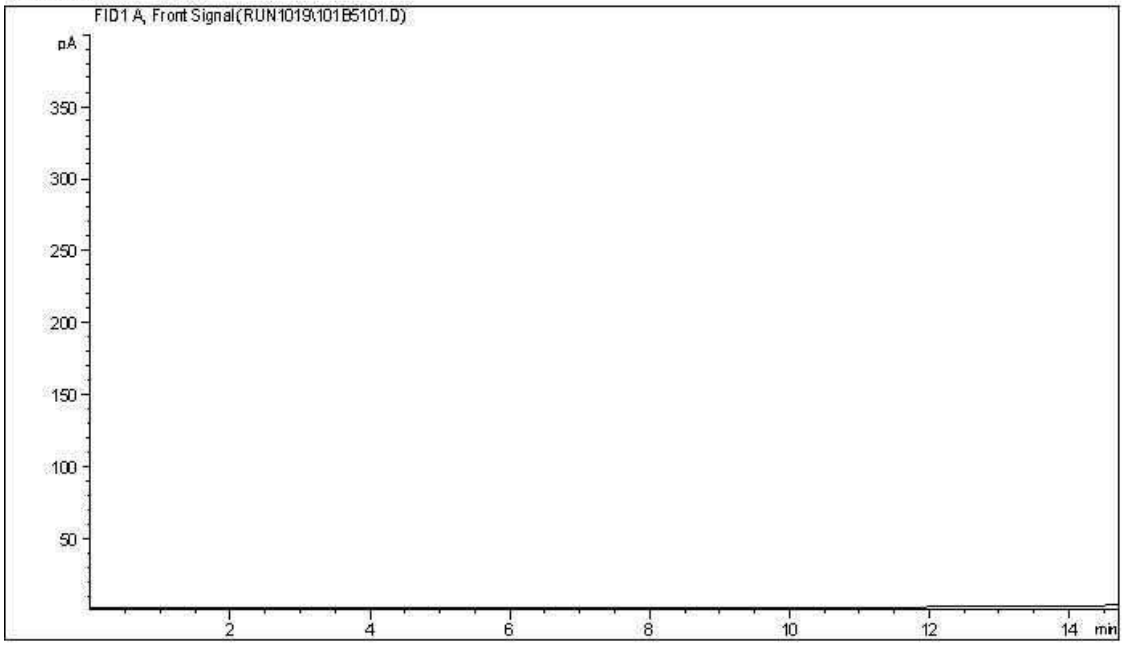
TYPICAL PRODUCT CARBON NUMBER RANGES

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

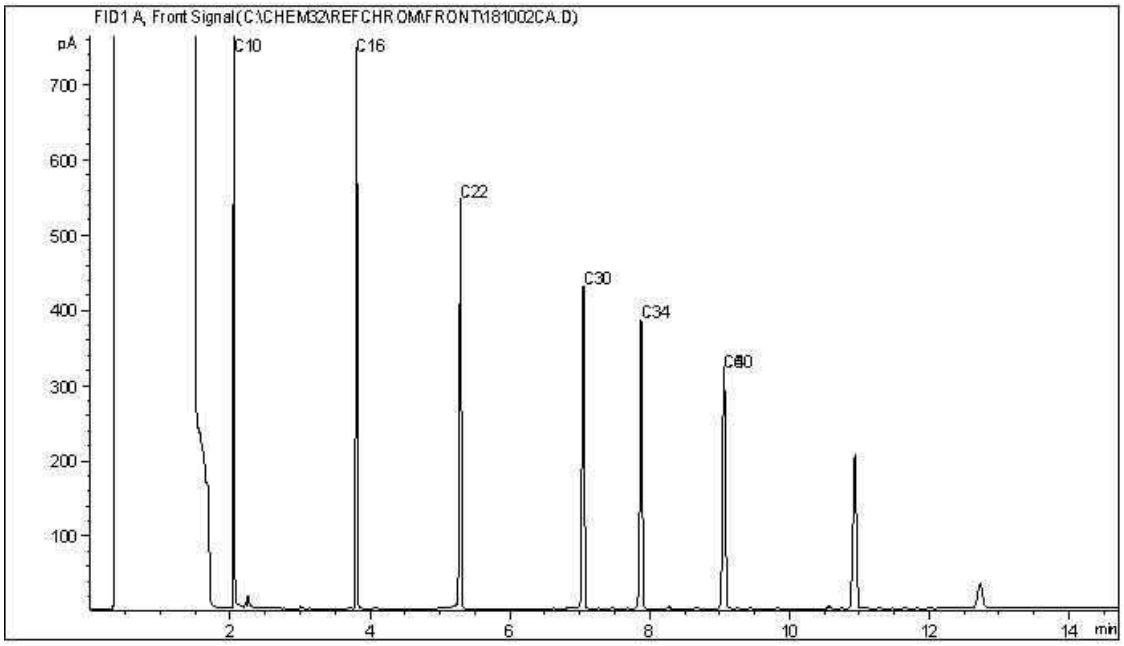
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



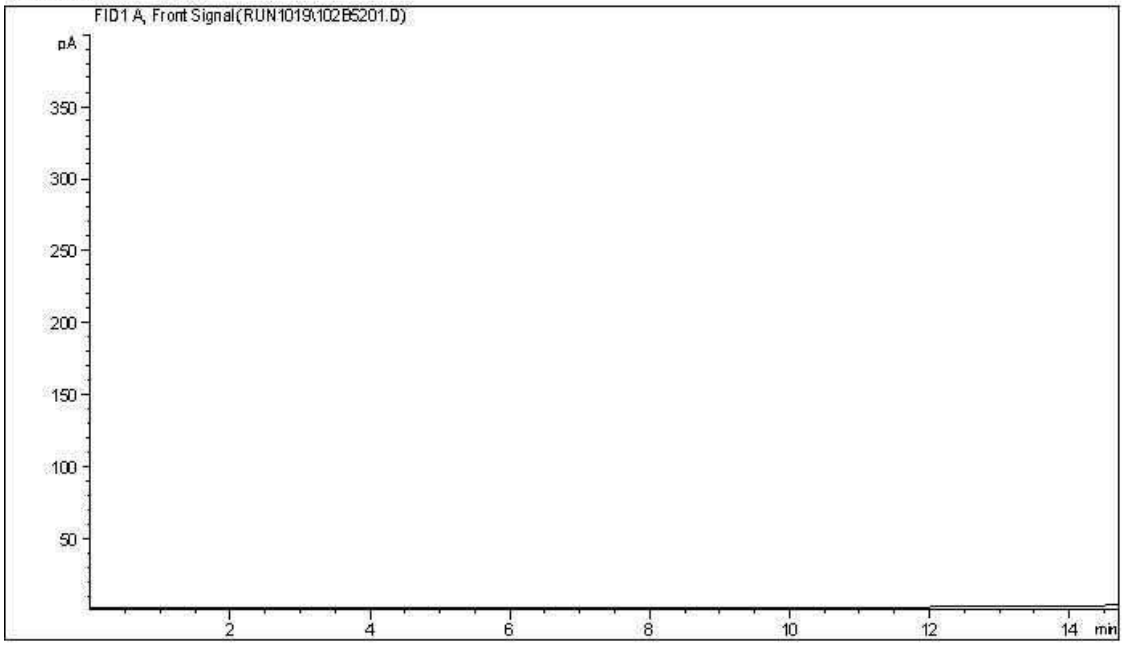
TYPICAL PRODUCT CARBON NUMBER RANGES

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

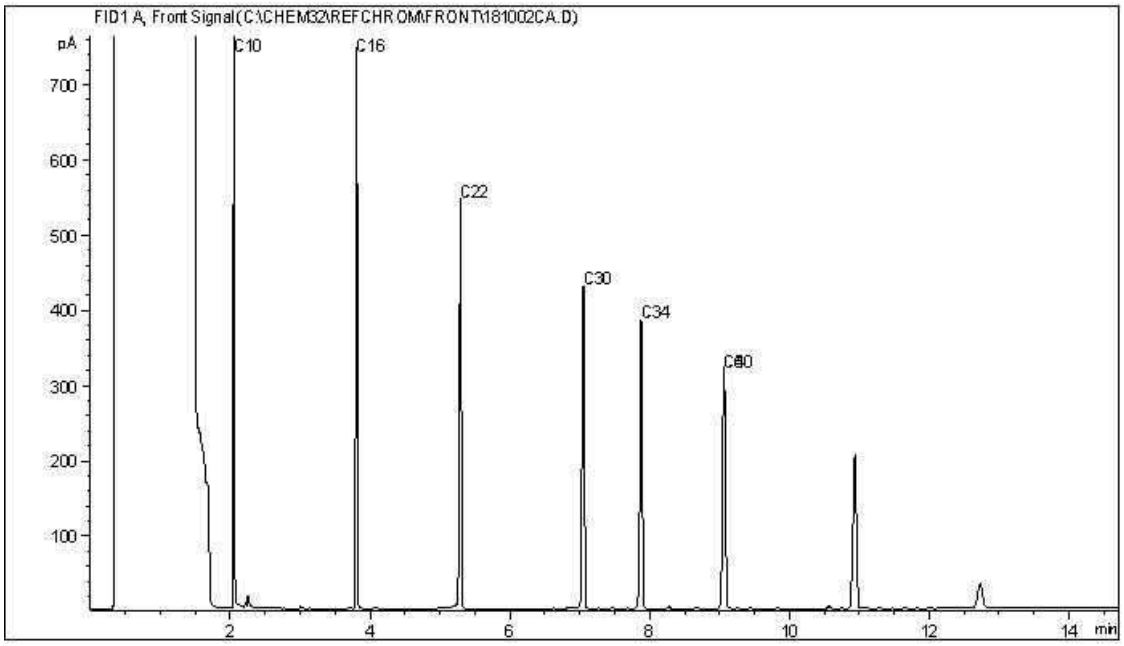
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



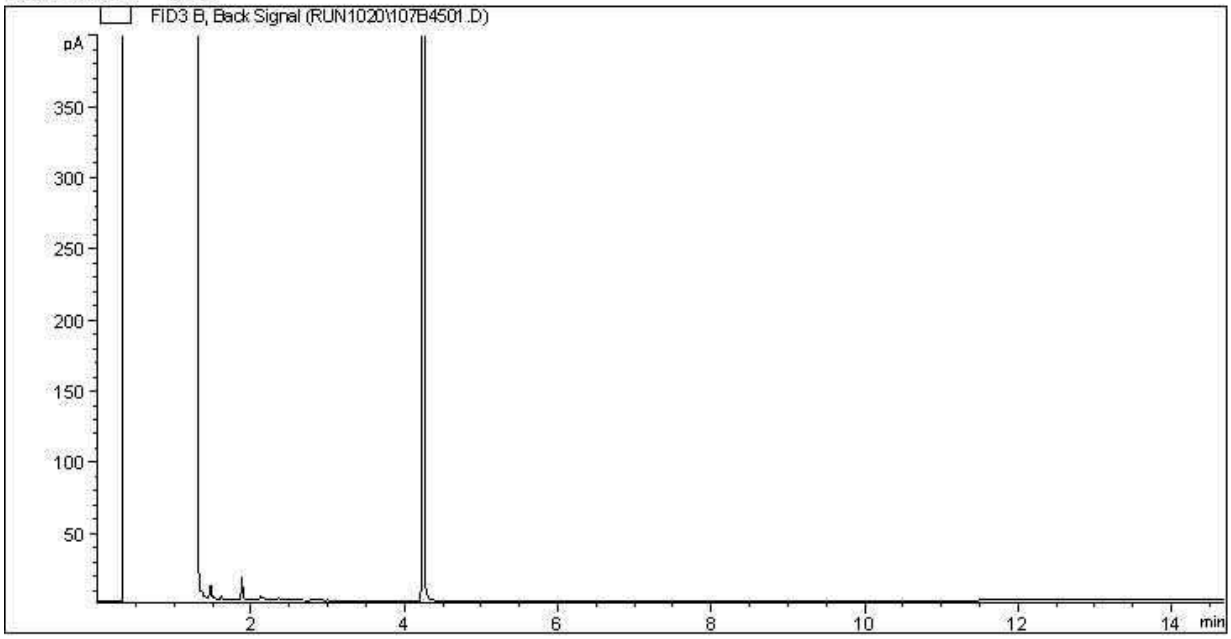
TYPICAL PRODUCT CARBON NUMBER RANGES

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

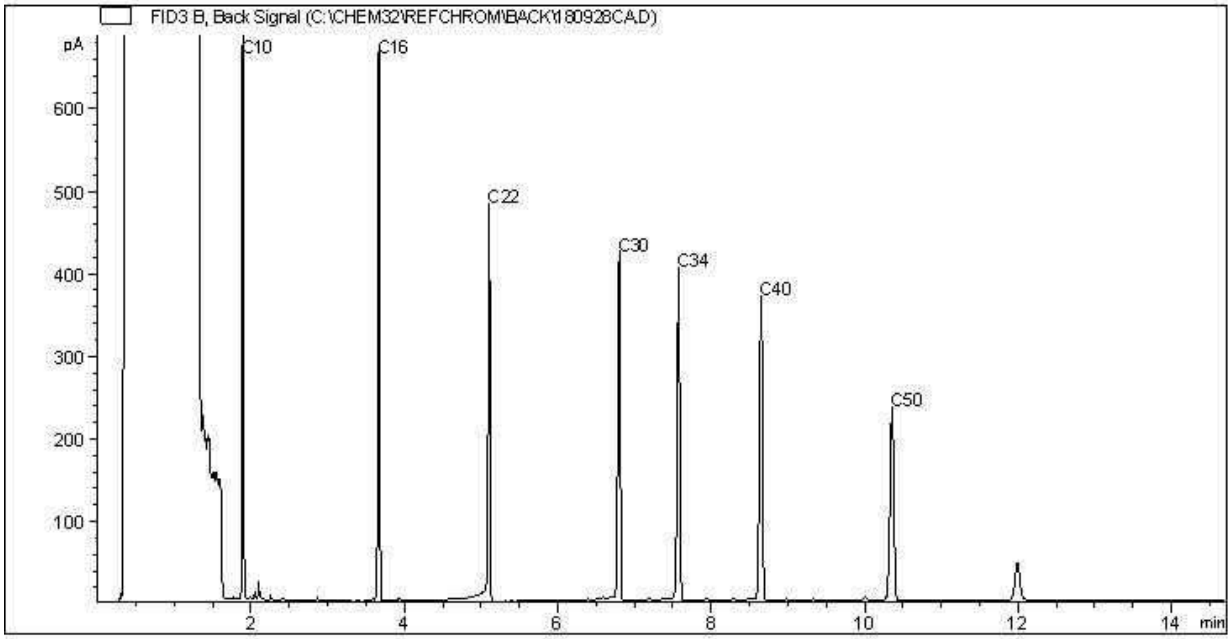
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: M045917

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/25
Report #: R2640663
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B891543
Received: 2018/10/18, 14:47

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	6	N/A	2018/10/20	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2018/10/22	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2018/10/22	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	3	2018/10/19	2018/10/20	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	5	2018/10/20	2018/10/21	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	1	N/A	2018/10/20	AB SOP-00003	Auto Calc
Benzo[a]pyrene Equivalency (2)	2	N/A	2018/10/22	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	3	2018/10/19	2018/10/20	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	9	N/A	2018/10/22	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	8	N/A	2018/10/20	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List)	1	N/A	2018/10/23	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: M045917

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/25
Report #: R2640663
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B891543
Received: 2018/10/18, 14:47

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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891543
Report Date: 2018/10/25

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO9536	UO9536		UO9537			UO9538		
Sampling Date		2018/10/18 14:00	2018/10/18 14:00		2018/10/18 13:45			2018/10/18 14:00		
COC Number		M045917	M045917		M045917			M045917		
	UNITS	**1939**	**1939 Lab-Dup**	**RDL**	**1982**	**RDL**	**QC Batch**	**9939**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	<0.10	0.10	9191536	<0.10	0.10	9192653
Volatiles										
Benzene	mg/L	0.15	0.15	0.00040	3.2 (1)	0.0040	9191543	0.15	0.00040	9191543
Toluene	mg/L	0.0013	0.0012	0.00040	0.0066	0.00040	9191543	0.0012	0.00040	9191543
Ethylbenzene	mg/L	0.041	0.038	0.00040	0.018	0.00040	9191543	0.041	0.00040	9191543
m & p-Xylene	mg/L	0.0034	0.0030	0.00080	0.0035	0.00080	9191543	0.0030	0.00080	9191543
o-Xylene	mg/L	0.00064	0.00058	0.00040	0.0012	0.00040	9191543	0.00063	0.00040	9191543
Xylenes (Total)	mg/L	0.0040	N/A	0.00089	0.0047	0.00089	9190746	0.0036	0.00089	9190746
F1 (C6-C10) - BTEX	mg/L	0.14	N/A	0.10	<1.0	1.0	9190746	0.13	0.10	9190746
F1 (C6-C10)	mg/L	0.34	0.37	0.10	3.5 (1)	1.0	9191543	0.32	0.10	9191543
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	103	101	N/A	105	N/A	9191543	97	N/A	9191543
4-Bromofluorobenzene (sur.)	%	95	88	N/A	96	N/A	9191543	96	N/A	9191543
D4-1,2-Dichloroethane (sur.)	%	101	100	N/A	96	N/A	9191543	137	N/A	9191543
O-TERPHENYL (sur.)	%	90	90	N/A	88	N/A	9191536	93	N/A	9192653

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891543
Report Date: 2018/10/25

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO9539			UO9540	UO9541		
Sampling Date		2018/10/18 13:45			2018/10/18 12:00	2018/10/18 12:30		
COC Number		M045917			M045917	M045917		
	UNITS	**9982**	**RDL**	**QC Batch**	**EX1**	**EX3**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9191536	<0.10	<0.10	0.10	9192653
Volatiles								
Benzene	mg/L	3.0 (1)	0.0040	9191543	0.13	<0.00040	0.00040	9191543
Toluene	mg/L	0.0068	0.00040	9191543	0.0025	<0.00040	0.00040	9191543
Ethylbenzene	mg/L	0.018	0.00040	9191543	0.020	<0.00040	0.00040	9191543
m & p-Xylene	mg/L	0.0029	0.00080	9191543	0.018	<0.00080	0.00080	9191543
o-Xylene	mg/L	0.0011	0.00040	9191543	0.0018	<0.00040	0.00040	9191543
Xylenes (Total)	mg/L	0.0040	0.00089	9190746	0.020	<0.00089	0.00089	9190746
F1 (C6-C10) - BTEX	mg/L	<1.0	1.0	9190746	<0.10	<0.10	0.10	9190746
F1 (C6-C10)	mg/L	3.0 (1)	1.0	9191543	0.17	<0.10	0.10	9191543
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	106	N/A	9191543	103	104	N/A	9191543
4-Bromofluorobenzene (sur.)	%	93	N/A	9191543	93	94	N/A	9191543
D4-1,2-Dichloroethane (sur.)	%	94	N/A	9191543	98	96	N/A	9191543
O-TERPHENYL (sur.)	%	90	N/A	9191536	93	92	N/A	9192653

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891543
Report Date: 2018/10/25

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UO9542	UO9543		
Sampling Date		2018/10/18 13:30	2018/10/18 13:30		
COC Number		M045917	M045917		
	UNITS	**EX5**	**EX95**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	0.63	0.62	0.10	9190346
Volatiles					
Benzene	mg/L	2.3 (1)	1.9 (1)	0.040	9191543
Toluene	mg/L	5.8 (1)	5.3 (1)	0.040	9191543
Ethylbenzene	mg/L	1.5 (1)	1.4 (1)	0.040	9191543
m & p-Xylene	mg/L	4.0 (1)	3.7 (1)	0.080	9191543
o-Xylene	mg/L	0.27	0.25	0.00040	9191543
Xylenes (Total)	mg/L	4.2	4.0	0.080	9190746
F1 (C6-C10) - BTEX	mg/L	<10	<10	10	9190746
F1 (C6-C10)	mg/L	14 (1)	14 (1)	10	9191543
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	108	105	N/A	9191543
4-Bromofluorobenzene (sur.)	%	99	100	N/A	9191543
D4-1,2-Dichloroethane (sur.)	%	100	99	N/A	9191543
O-TERPHENYL (sur.)	%	86	85	N/A	9190346

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891543
Report Date: 2018/10/25

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO9536	UO9536	UO9537	UO9539		
Sampling Date		2018/10/18 14:00	2018/10/18 14:00	2018/10/18 13:45	2018/10/18 13:45		
COC Number		M045917	M045917	M045917	M045917		
	UNITS	**1939**	**1939 Lab-Dup**	**1982**	**9982**	**RDL**	**QC Batch**
Polycyclic Aromatics							
Benzo[a]pyrene equivalency	mg/L	<0.000010	N/A	<0.000010	<0.000010	0.000010	9190452
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9191526
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9191526
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9191526
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9191526
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9191526
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9191526
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9191526
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9191526
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9191526
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	97	98	88	86	N/A	9191526
D8-ACENAPHTHYLENE (sur.)	%	89	74	86	84	N/A	9191526
D8-NAPHTHALENE (sur.)	%	55	30 (1)	66	65	N/A	9191526
TERPHENYL-D14 (sur.)	%	109	107	105	105	N/A	9191526

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B891543
Report Date: 2018/10/25

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO9536	UO9537	UO9538	UO9539	UO9540		
Sampling Date		2018/10/18 14:00	2018/10/18 13:45	2018/10/18 14:00	2018/10/18 13:45	2018/10/18 12:00		
COC Number		M045917	M045917	M045917	M045917	M045917		
	UNITS	**1939**	**1982**	**9939**	**9982**	**EX1**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9189223
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9190209
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9190209
Chloroethane	mg/L	0.0011	<0.0010	0.0011	<0.0010	<0.0010	0.0010	9190209
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9190209
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9190209
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,2-dichloroethane	mg/L	0.12	0.068	0.12	0.067	0.0022	0.00050	9190209
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9190209
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9190209
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9190209
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9190209
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9190209
RDL = Reportable Detection Limit								

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Maxxam Job #: B891543
Report Date: 2018/10/25

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO9536	UO9537	UO9538	UO9539	UO9540		
Sampling Date		2018/10/18 14:00	2018/10/18 13:45	2018/10/18 14:00	2018/10/18 13:45	2018/10/18 12:00		
COC Number		M045917	M045917	M045917	M045917	M045917		
	UNITS	**1939**	**1982**	**9939**	**9982**	**EX1**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1,2-trichloroethane	mg/L	0.0014	0.0010	0.0014	0.0011	<0.00050	0.00050	9190209
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,2,4-trimethylbenzene	mg/L	0.00052	<0.00050	<0.00050	<0.00050	0.0041	0.00050	9190209
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.0012	0.00050	9190209
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9190209
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	98	99	98	98	98	N/A	9190209
4-Bromofluorobenzene (sur.)	%	102	105	102	104	106	N/A	9190209
D4-1,2-Dichloroethane (sur.)	%	98	100	99	94	106	N/A	9190209

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO9541		UO9542	UO9543	UO9544		
Sampling Date		2018/10/18 12:30		2018/10/18 13:30	2018/10/18 13:30	2018/10/18		
COC Number		M045917		M045917	M045917	M045917		
	UNITS	**EX3**	**QC Batch**	**EX5**	**EX95**	**TRIP BLANK 7**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	9189223	<0.0013	<0.0013	<0.0013	0.0013	9190950
Benzene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9190209
Bromodichloromethane	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Bromoform	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Bromomethane	mg/L	<0.0020	9190209	<0.0020	<0.0020	<0.0020	0.0020	9190209
Carbon tetrachloride	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Chlorobenzene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Chlorodibromomethane	mg/L	<0.0010	9190209	<0.0010	<0.0010	<0.0010	0.0010	9190209
Chloroethane	mg/L	<0.0010	9190209	<0.0010	<0.0010	<0.0010	0.0010	9190209
Chloroform	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Chloromethane	mg/L	<0.0020	9190209	0.0066	0.0076	<0.0020	0.0020	9190209
1,2-dibromoethane	mg/L	<0.00020	9190209	0.00047	0.00047	<0.00020	0.00020	9190209
1,2-dichlorobenzene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,3-dichlorobenzene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,4-dichlorobenzene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1-dichloroethane	mg/L	<0.00050	9190209	0.0013 (1)	0.0018 (1)	<0.00050	0.00050	9190209
1,2-dichloroethane	mg/L	<0.00050	9190209	0.054	0.056	<0.00050	0.00050	9190209
1,1-dichloroethene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
cis-1,2-dichloroethene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
trans-1,2-dichloroethene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Dichloromethane	mg/L	<0.0020	9190209	<0.0020	<0.0020	<0.0020	0.0020	9190209
1,2-dichloropropane	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
cis-1,3-dichloropropene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
trans-1,3-dichloropropene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Ethylbenzene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9190209
Methyl methacrylate	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Styrene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1,1,2-tetrachloroethane	mg/L	<0.0010	9190209	<0.0010	<0.0010	<0.0010	0.0010	9190209
1,1,2,2-tetrachloroethane	mg/L	<0.0020	9190209	<0.0020	<0.0020	<0.0020	0.0020	9190209

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UO9541		UO9542	UO9543	UO9544		
Sampling Date		2018/10/18 12:30		2018/10/18 13:30	2018/10/18 13:30	2018/10/18		
COC Number		M045917		M045917	M045917	M045917		
	UNITS	**EX3**	**QC Batch**	**EX5**	**EX95**	**TRIP BLANK 7**	**RDL**	**QC Batch**
Tetrachloroethene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Toluene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9190209
1,2,3-trichlorobenzene	mg/L	<0.0010	9190209	<0.0010	<0.0010	<0.0010	0.0010	9190209
1,2,4-trichlorobenzene	mg/L	<0.0010	9190209	<0.0010	<0.0010	<0.0010	0.0010	9190209
1,3,5-trichlorobenzene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1,1-trichloroethane	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,1,2-trichloroethane	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Trichloroethene	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Trichlorofluoromethane	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
1,2,4-trimethylbenzene	mg/L	<0.00050	9190209	0.32	0.36	<0.00050	0.00050	9190209
1,3,5-trimethylbenzene	mg/L	<0.00050	9190209	0.17	0.20	<0.00050	0.00050	9190209
Vinyl chloride	mg/L	<0.00050	9190209	<0.00050	<0.00050	<0.00050	0.00050	9190209
Xylenes (Total)	mg/L	N/A	N/A	N/A	N/A	<0.00080	0.00080	9190209
m & p-Xylene	mg/L	N/A	N/A	N/A	N/A	<0.00080	0.00080	9190209
o-Xylene	mg/L	N/A	N/A	N/A	N/A	<0.00040	0.00040	9190209
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	97	9190209	98	99	101	N/A	9190209
4-Bromofluorobenzene (sur.)	%	104	9190209	104	102	95	N/A	9190209
D4-1,2-Dichloroethane (sur.)	%	101	9190209	95	95	100	N/A	9190209

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GENERAL COMMENTS

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

Package 1	8.7°C

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9190209	QW1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/20		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/20		108	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/20		103	%	50 - 140
			Benzene	2018/10/20		103	%	50 - 140
			Bromodichloromethane	2018/10/20		105	%	50 - 140
			Bromoform	2018/10/20		86	%	50 - 140
			Bromomethane	2018/10/20		90	%	50 - 140
			Carbon tetrachloride	2018/10/20		93	%	50 - 140
			Chlorobenzene	2018/10/20		88	%	50 - 140
			Chlorodibromomethane	2018/10/20		89	%	50 - 140
			Chloroethane	2018/10/20		100	%	50 - 140
			Chloroform	2018/10/20		99	%	50 - 140
			Chloromethane	2018/10/20		110	%	50 - 140
			1,2-dibromoethane	2018/10/20		92	%	50 - 140
			1,2-dichlorobenzene	2018/10/20		103	%	50 - 140
			1,3-dichlorobenzene	2018/10/20		101	%	50 - 140
			1,4-dichlorobenzene	2018/10/20		100	%	50 - 140
			1,1-dichloroethane	2018/10/20		108	%	50 - 140
			1,2-dichloroethane	2018/10/20		108	%	50 - 140
			1,1-dichloroethene	2018/10/20		93	%	50 - 140
			cis-1,2-dichloroethene	2018/10/20		98	%	50 - 140
			trans-1,2-dichloroethene	2018/10/20		92	%	50 - 140
			Dichloromethane	2018/10/20		95	%	50 - 140
			1,2-dichloropropane	2018/10/20		114	%	50 - 140
			cis-1,3-dichloropropene	2018/10/20		96	%	50 - 140
			trans-1,3-dichloropropene	2018/10/20		109	%	50 - 140
			Ethylbenzene	2018/10/20		88	%	50 - 140
			Methyl methacrylate	2018/10/20		128	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/20		106	%	50 - 140
			Styrene	2018/10/20		92	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/20		84	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/20		97	%	50 - 140
			Tetrachloroethene	2018/10/20		77	%	50 - 140
			Toluene	2018/10/20		89	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/20		96	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/20		95	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/20		94	%	50 - 140
			1,1,1-trichloroethane	2018/10/20		96	%	50 - 140
			1,1,2-trichloroethane	2018/10/20		107	%	50 - 140
			Trichloroethene	2018/10/20		93	%	50 - 140
			Trichlorofluoromethane	2018/10/20		94	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/20		104	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/20		105	%	50 - 140
			Vinyl chloride	2018/10/20		109	%	50 - 140
			m & p-Xylene	2018/10/20		86	%	50 - 140
			o-Xylene	2018/10/20		87	%	50 - 140
9190209	QW1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/20		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/20		108	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/20		99	%	50 - 140
			Benzene	2018/10/20		103	%	60 - 130
			Bromodichloromethane	2018/10/20		103	%	60 - 130
			Bromoform	2018/10/20		82	%	60 - 130
			Bromomethane	2018/10/20		95	%	60 - 130
			Carbon tetrachloride	2018/10/20		96	%	60 - 130

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorobenzene	2018/10/20		88	%	60 - 130
			Chlorodibromomethane	2018/10/20		87	%	60 - 130
			Chloroethane	2018/10/20		102	%	60 - 130
			Chloroform	2018/10/20		101	%	60 - 130
			Chloromethane	2018/10/20		110	%	60 - 130
			1,2-dibromoethane	2018/10/20		87	%	60 - 130
			1,2-dichlorobenzene	2018/10/20		102	%	60 - 130
			1,3-dichlorobenzene	2018/10/20		101	%	60 - 130
			1,4-dichlorobenzene	2018/10/20		99	%	60 - 130
			1,1-dichloroethane	2018/10/20		109	%	60 - 130
			1,2-dichloroethane	2018/10/20		103	%	60 - 130
			1,1-dichloroethene	2018/10/20		96	%	60 - 130
			cis-1,2-dichloroethene	2018/10/20		99	%	60 - 130
			trans-1,2-dichloroethene	2018/10/20		93	%	60 - 130
			Dichloromethane	2018/10/20		94	%	60 - 130
			1,2-dichloropropane	2018/10/20		111	%	60 - 130
			cis-1,3-dichloropropene	2018/10/20		101	%	60 - 130
			trans-1,3-dichloropropene	2018/10/20		114	%	60 - 130
			Ethylbenzene	2018/10/20		89	%	60 - 130
			Methyl methacrylate	2018/10/20		119	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/20		104	%	60 - 130
			Styrene	2018/10/20		91	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/20		84	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/20		91	%	60 - 130
			Tetrachloroethene	2018/10/20		79	%	60 - 130
			Toluene	2018/10/20		90	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/20		95	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/20		94	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/20		95	%	60 - 130
			1,1,1-trichloroethane	2018/10/20		99	%	60 - 130
			1,1,2-trichloroethane	2018/10/20		102	%	60 - 130
			Trichloroethene	2018/10/20		95	%	60 - 130
			Trichlorofluoromethane	2018/10/20		98	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/20		105	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/20		106	%	60 - 130
			Vinyl chloride	2018/10/20		111	%	60 - 130
			m & p-Xylene	2018/10/20		88	%	60 - 130
			o-Xylene	2018/10/20		87	%	60 - 130
9190209	QW1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/20		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/20		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/20		104	%	50 - 140
			Benzene	2018/10/20	<0.00040		mg/L	
			Bromodichloromethane	2018/10/20	<0.00050		mg/L	
			Bromoform	2018/10/20	<0.00050		mg/L	
			Bromomethane	2018/10/20	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/20	<0.00050		mg/L	
			Chlorobenzene	2018/10/20	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/20	<0.0010		mg/L	
			Chloroethane	2018/10/20	<0.0010		mg/L	
			Chloroform	2018/10/20	<0.00050		mg/L	
			Chloromethane	2018/10/20	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/20	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/20	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/20	<0.00050		mg/L	

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Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,4-dichlorobenzene	2018/10/20	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/20	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/20	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/20	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/20	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/20	<0.00050		mg/L	
			Dichloromethane	2018/10/20	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/20	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/20	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/20	<0.00050		mg/L	
			Ethylbenzene	2018/10/20	<0.00040		mg/L	
			Methyl methacrylate	2018/10/20	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/20	<0.00050		mg/L	
			Styrene	2018/10/20	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/20	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/20	<0.0020		mg/L	
			Tetrachloroethene	2018/10/20	<0.00050		mg/L	
			Toluene	2018/10/20	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/20	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/20	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/20	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/20	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/20	<0.00050		mg/L	
			Trichloroethene	2018/10/20	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/20	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/20	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/20	<0.00050		mg/L	
			Vinyl chloride	2018/10/20	<0.00050		mg/L	
			Xylenes (Total)	2018/10/20	<0.00080		mg/L	
			m & p-Xylene	2018/10/20	<0.00080		mg/L	
			o-Xylene	2018/10/20	<0.00040		mg/L	
9190209	QW1	RPD	Bromodichloromethane	2018/10/20	0.72		%	30
			Bromoform	2018/10/20	NC		%	30
			Bromomethane	2018/10/20	NC		%	30
			Carbon tetrachloride	2018/10/20	NC		%	30
			Chlorobenzene	2018/10/20	NC		%	30
			Chlorodibromomethane	2018/10/20	0.77		%	30
			Chloroethane	2018/10/20	NC		%	30
			Chloroform	2018/10/20	0.98		%	30
			Chloromethane	2018/10/20	NC		%	30
			1,2-dibromoethane	2018/10/20	NC		%	30
			1,2-dichlorobenzene	2018/10/20	NC		%	30
			1,3-dichlorobenzene	2018/10/20	NC		%	30
			1,4-dichlorobenzene	2018/10/20	NC		%	30
			1,1-dichloroethane	2018/10/20	NC		%	30
			1,2-dichloroethane	2018/10/20	NC		%	30
			1,1-dichloroethene	2018/10/20	NC		%	30
			cis-1,2-dichloroethene	2018/10/20	NC		%	30
			trans-1,2-dichloroethene	2018/10/20	NC		%	30
			Dichloromethane	2018/10/20	NC		%	30
			1,2-dichloropropane	2018/10/20	NC		%	30
			cis-1,3-dichloropropene	2018/10/20	NC		%	30
			trans-1,3-dichloropropene	2018/10/20	NC		%	30
			Methyl methacrylate	2018/10/20	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl-tert-butylether (MTBE)	2018/10/20	NC		%	30
			Styrene	2018/10/20	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/20	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/20	NC		%	30
			Tetrachloroethene	2018/10/20	NC		%	30
			1,2,3-trichlorobenzene	2018/10/20	NC		%	30
			1,2,4-trichlorobenzene	2018/10/20	NC		%	30
			1,3,5-trichlorobenzene	2018/10/20	NC		%	30
			1,1,1-trichloroethane	2018/10/20	NC		%	30
			1,1,2-trichloroethane	2018/10/20	NC		%	30
			Trichloroethene	2018/10/20	NC		%	30
			Trichlorofluoromethane	2018/10/20	NC		%	30
			1,2,4-trimethylbenzene	2018/10/20	NC		%	30
			1,3,5-trimethylbenzene	2018/10/20	NC		%	30
			Vinyl chloride	2018/10/20	NC		%	30
9190346	MHF	Matrix Spike	O-TERPHENYL (sur.)	2018/10/21		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/21		91	%	60 - 140
9190346	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/21		86	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/21		88	%	60 - 140
9190346	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/21		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/21	<0.10		mg/L	
9190346	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/21	NC		%	30
9191526	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/10/20		93	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/20		86	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/20		62	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/20		111	%	50 - 130
			Acenaphthene	2018/10/20		88	%	50 - 130
			Acenaphthylene	2018/10/20		92	%	50 - 130
			Acridine	2018/10/20		79	%	50 - 130
			Anthracene	2018/10/20		85	%	50 - 130
			Benzo(a)anthracene	2018/10/20		114	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/20		107	%	50 - 130
			Benzo(k)fluoranthene	2018/10/20		101	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/20		95	%	50 - 130
			Benzo(c)phenanthrene	2018/10/20		109	%	50 - 130
			Benzo(a)pyrene	2018/10/20		103	%	50 - 130
			Benzo[e]pyrene	2018/10/20		97	%	50 - 130
			Chrysene	2018/10/20		108	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/20		97	%	50 - 130
			Fluoranthene	2018/10/20		104	%	50 - 130
			Fluorene	2018/10/20		93	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/20		96	%	50 - 130
			1-Methylnaphthalene	2018/10/20		88	%	50 - 130
			2-Methylnaphthalene	2018/10/20		84	%	50 - 130
			Naphthalene	2018/10/20		76	%	50 - 130
			Phenanthrene	2018/10/20		90	%	50 - 130
			Perylene	2018/10/20		87	%	50 - 130
			Pyrene	2018/10/20		101	%	50 - 130
			Quinoline	2018/10/20		101	%	50 - 130
9191526	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/20		95	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/20		85	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/20		65	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/20		113	%	50 - 130
			Acenaphthene	2018/10/20		77	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthylene	2018/10/20		83	%	50 - 130
			Acridine	2018/10/20		78	%	50 - 130
			Anthracene	2018/10/20		86	%	50 - 130
			Benzo(a)anthracene	2018/10/20		116	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/20		108	%	50 - 130
			Benzo(k)fluoranthene	2018/10/20		109	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/20		98	%	50 - 130
			Benzo(c)phenanthrene	2018/10/20		109	%	50 - 130
			Benzo(a)pyrene	2018/10/20		101	%	50 - 130
			Benzo[e]pyrene	2018/10/20		102	%	50 - 130
			Chrysene	2018/10/20		112	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/20		101	%	50 - 130
			Fluoranthene	2018/10/20		107	%	50 - 130
			Fluorene	2018/10/20		84	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/20		96	%	50 - 130
			1-Methylnaphthalene	2018/10/20		77	%	50 - 130
			2-Methylnaphthalene	2018/10/20		72	%	50 - 130
			Naphthalene	2018/10/20		73	%	50 - 130
			Phenanthrene	2018/10/20		89	%	50 - 130
			Perylene	2018/10/20		93	%	50 - 130
			Pyrene	2018/10/20		104	%	50 - 130
			Quinoline	2018/10/20		98	%	50 - 130
9191526	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/20		92	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/20		82	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/20		62	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/20		109	%	50 - 130
			Acenaphthene	2018/10/20	<0.00010		mg/L	
			Acenaphthylene	2018/10/20	<0.00010		mg/L	
			Acridine	2018/10/20	<0.000050		mg/L	
			Anthracene	2018/10/20	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/20	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/20	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/20	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/20	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/20	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/20	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/20	<0.000050		mg/L	
			Chrysene	2018/10/20	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/20	<0.0000075		mg/L	
			Fluoranthene	2018/10/20	<0.000010		mg/L	
			Fluorene	2018/10/20	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/20	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/20	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/20	<0.00010		mg/L	
			Naphthalene	2018/10/20	<0.00010		mg/L	
			Phenanthrene	2018/10/20	<0.000050		mg/L	
			Perylene	2018/10/20	<0.000050		mg/L	
			Pyrene	2018/10/20	<0.000020		mg/L	
			Quinoline	2018/10/20	<0.00020		mg/L	
9191526	LZ3	RPD [UO9536-02]	Acenaphthene	2018/10/20	NC		%	30
			Acenaphthylene	2018/10/20	NC		%	30
			Acridine	2018/10/20	NC		%	30
			Anthracene	2018/10/20	NC		%	30
			Benzo(a)anthracene	2018/10/20	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(b&j)fluoranthene	2018/10/20	NC		%	30
			Benzo(k)fluoranthene	2018/10/20	NC		%	30
			Benzo(g,h,i)perylene	2018/10/20	NC		%	30
			Benzo(c)phenanthrene	2018/10/20	NC		%	30
			Benzo(a)pyrene	2018/10/20	NC		%	30
			Benzo[e]pyrene	2018/10/20	NC		%	30
			Chrysene	2018/10/20	NC		%	30
			Dibenz(a,h)anthracene	2018/10/20	NC		%	30
			Fluoranthene	2018/10/20	NC		%	30
			Fluorene	2018/10/20	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/20	NC		%	30
			1-Methylnaphthalene	2018/10/20	NC		%	30
			2-Methylnaphthalene	2018/10/20	NC		%	30
			Naphthalene	2018/10/20	NC		%	30
			Phenanthrene	2018/10/20	NC		%	30
			Perylene	2018/10/20	NC		%	30
			Pyrene	2018/10/20	NC		%	30
			Quinoline	2018/10/20	NC		%	30
9191536	LSH	Matrix Spike	O-TERPHENYL (sur.)	2018/10/20		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		92	%	60 - 140
9191536	LSH	Spiked Blank	O-TERPHENYL (sur.)	2018/10/20		88	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20		89	%	60 - 140
9191536	LSH	Method Blank	O-TERPHENYL (sur.)	2018/10/20		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/20	<0.10		mg/L	
9191536	LSH	RPD [UO9536-02]	F2 (C10-C16 Hydrocarbons)	2018/10/20	NC		%	30
9191543	DO1	Matrix Spike [UO9537-01]	1,4-Difluorobenzene (sur.)	2018/10/20		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/20		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/20		136	%	50 - 140
			Benzene	2018/10/20		NC	%	50 - 140
			Toluene	2018/10/20		102	%	50 - 140
			Ethylbenzene	2018/10/20		101	%	50 - 140
			m & p-Xylene	2018/10/20		103	%	50 - 140
			o-Xylene	2018/10/20		97	%	50 - 140
			F1 (C6-C10)	2018/10/20		85	%	60 - 140
9191543	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/20		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/20		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/20		102	%	50 - 140
			Benzene	2018/10/20		106	%	60 - 130
			Toluene	2018/10/20		107	%	60 - 130
			Ethylbenzene	2018/10/20		106	%	60 - 130
			m & p-Xylene	2018/10/20		110	%	60 - 130
			o-Xylene	2018/10/20		103	%	60 - 130
			F1 (C6-C10)	2018/10/20		86	%	60 - 140
9191543	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/20		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/20		90	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/20		96	%	50 - 140
			Benzene	2018/10/20	<0.00040		mg/L	
			Toluene	2018/10/20	<0.00040		mg/L	
			Ethylbenzene	2018/10/20	<0.00040		mg/L	
			m & p-Xylene	2018/10/20	<0.00080		mg/L	
			o-Xylene	2018/10/20	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/20	<0.10		mg/L	
9191543	DO1	RPD [UO9536-01]	Benzene	2018/10/20	2.7		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2018/10/20	3.2		%	30
			Ethylbenzene	2018/10/20	8.4		%	30
			m & p-Xylene	2018/10/20	10		%	30
			o-Xylene	2018/10/20	10		%	30
			F1 (C6-C10)	2018/10/20	9.6		%	30
9192653	MHF	Matrix Spike	O-TERPHENYL (sur.)	2018/10/21		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/21		89	%	60 - 140
9192653	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/21		88	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/21		83	%	60 - 140
9192653	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/21		93	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/21	<0.10		mg/L	
9192653	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/21	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).

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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).

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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

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CHAIN OF CUSTODY RECORD

M045917

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Invoice Information		Report Information (if differs from Invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 5-7 Days Regular (Most analyses)
Contact Name:	Stephen dAbadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222-30 Ave. NE Calgary. AB T2E7K9	Address:		Project #:	CG24701 E32	Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	Stephen.dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn.kuzyk@clifton.ca	Copies:		Sampled By:	Austin/Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp:	12	6	8
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp:			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp:			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	BTEX F1-F4	Hexane 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
1	1939		2018.10.18	14:00	GW	8	✓	✓									✓	
2	1982		↓	13:45	↓	7	✓	✓									✓	
3	9939		↓	14:00	↓	6	✓	✓										
4	9982		↓	13:45	↓	7	✓	✓									✓	
5	EX1		↓	12:00	↓	8	✓	✓										
6	EX3		↓	12:30	↓	8	✓	✓										
7	EX5		↓	13:30	↓	6	✓	✓										
8	EX95		↓	13:30	GW	6	✓	✓										
9	Trip Blank 7		2018.10.18		W	2	✓											
10																		
	Please Indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Regulatory Criteria

- ☑ ATL
- ☐ CCME
- ☐ Drinking Water
- ☐ DSD (Drilling Waste)
- ☐ Saskatchewan
- ☐ Other:

Special Instructions

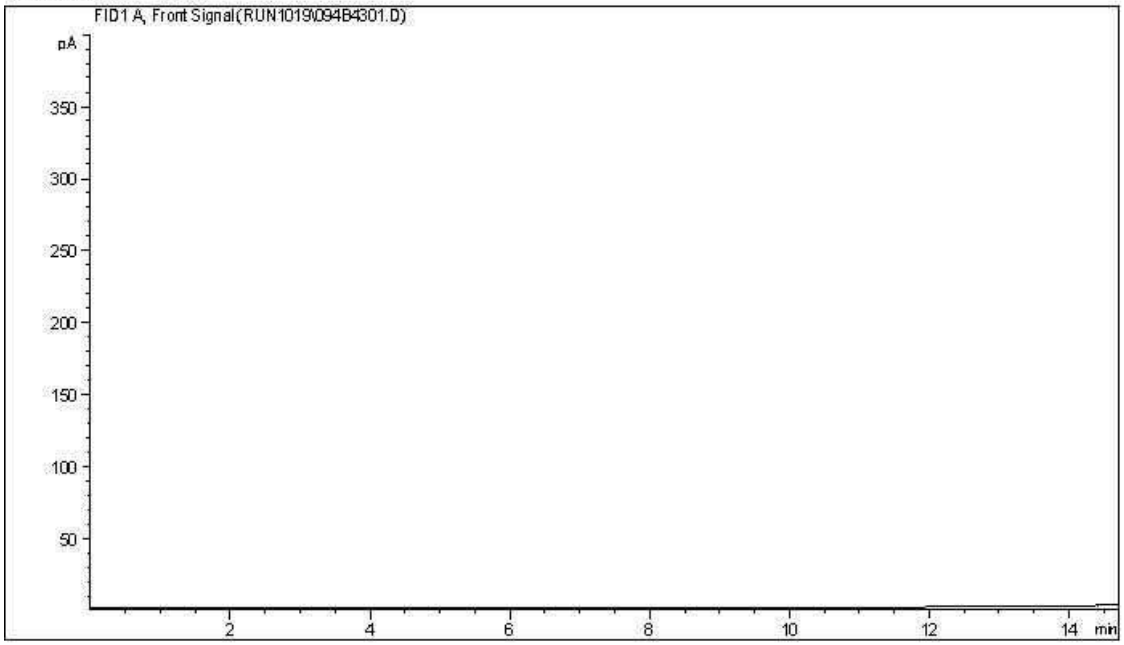
Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Austin Mei	2018.10.18	14:44	[illegible]	2018/10/18	14:47	B891543

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

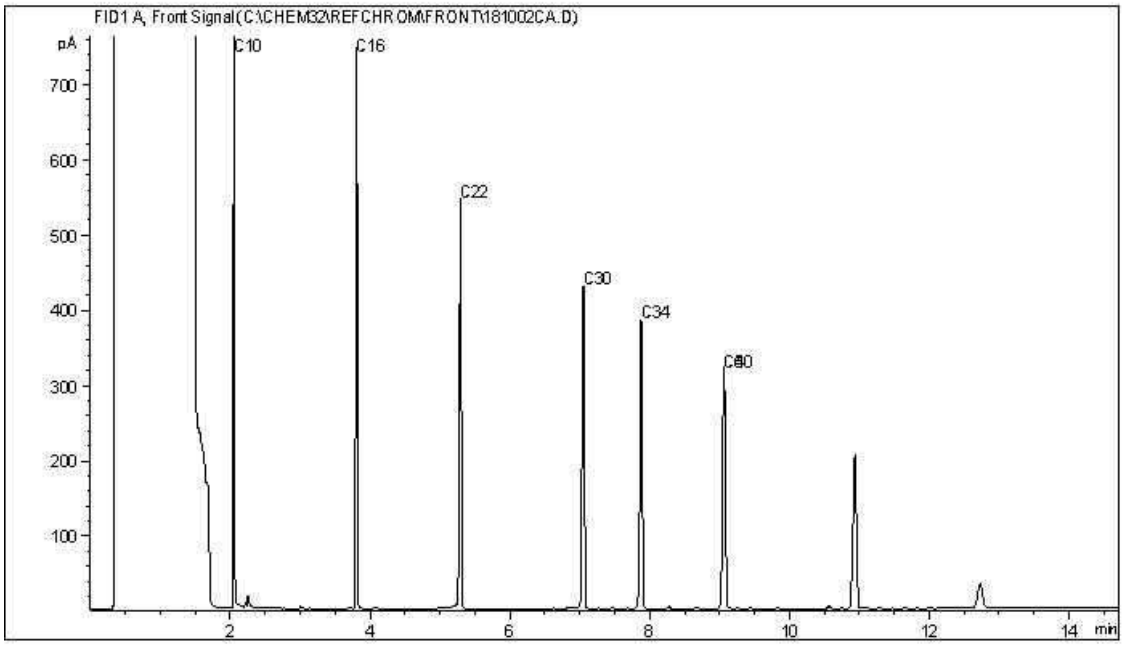
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



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+

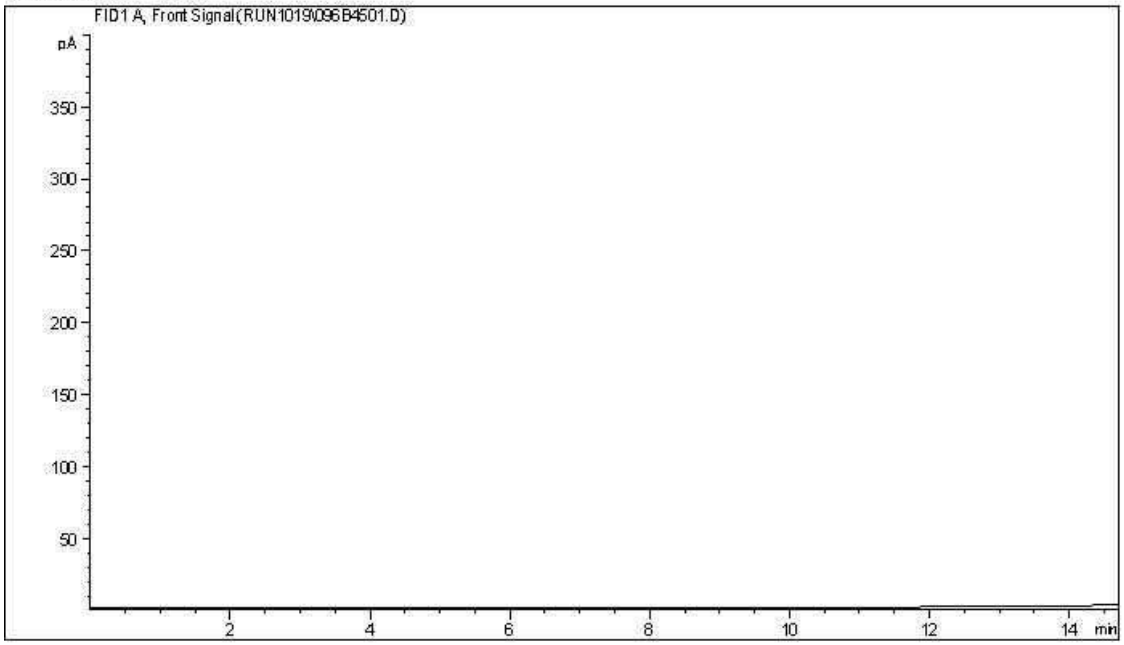
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B891543
Report Date: 2018/10/25
Maxxam Sample: UO9536 Lab-Dup

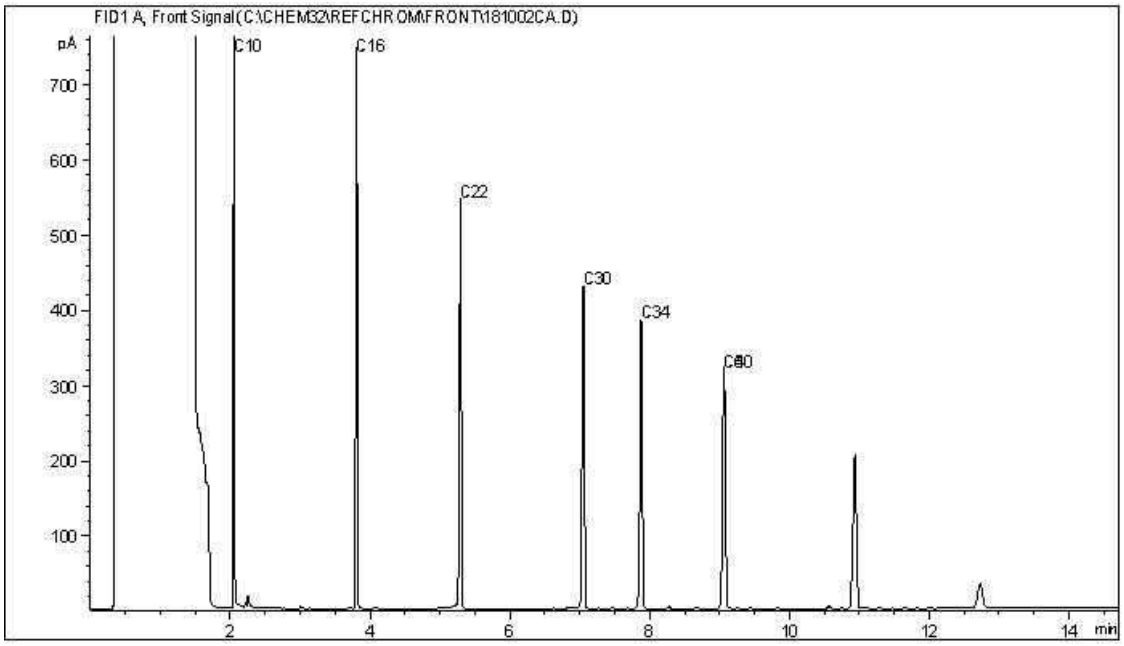
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1939

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



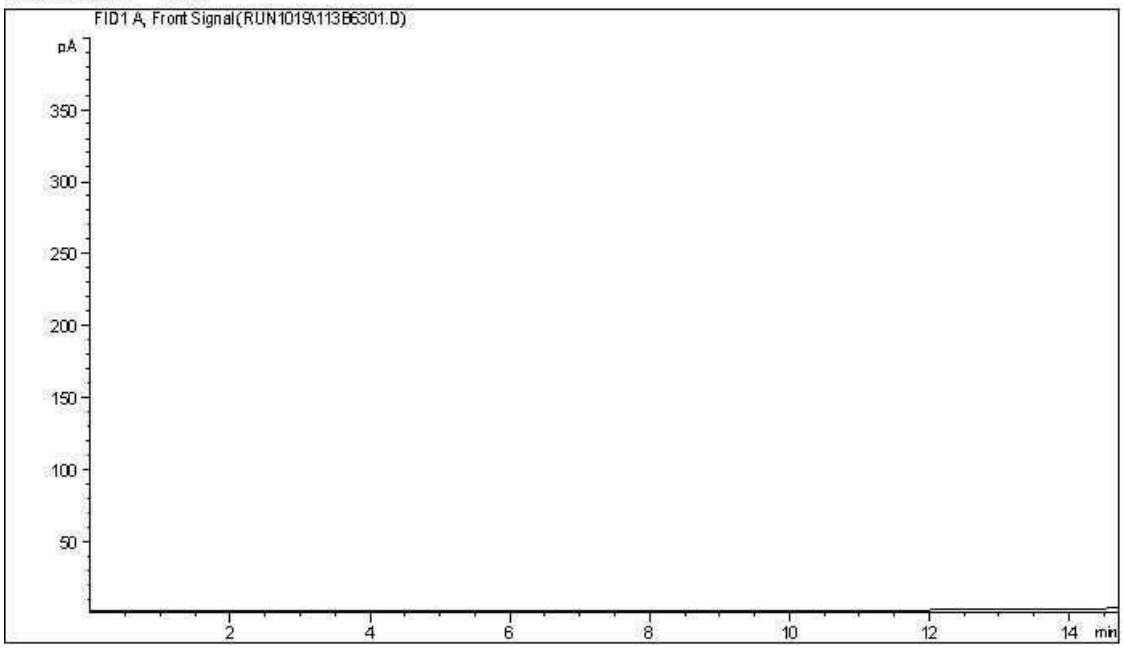
TYPICAL PRODUCT CARBON NUMBER RANGES

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

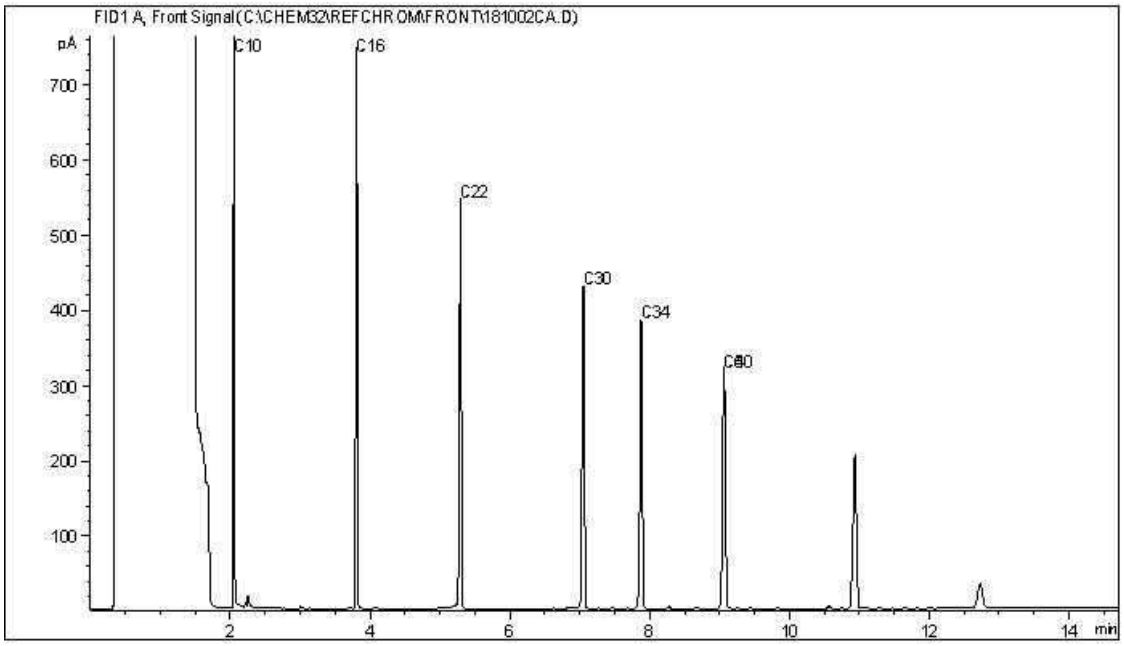
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



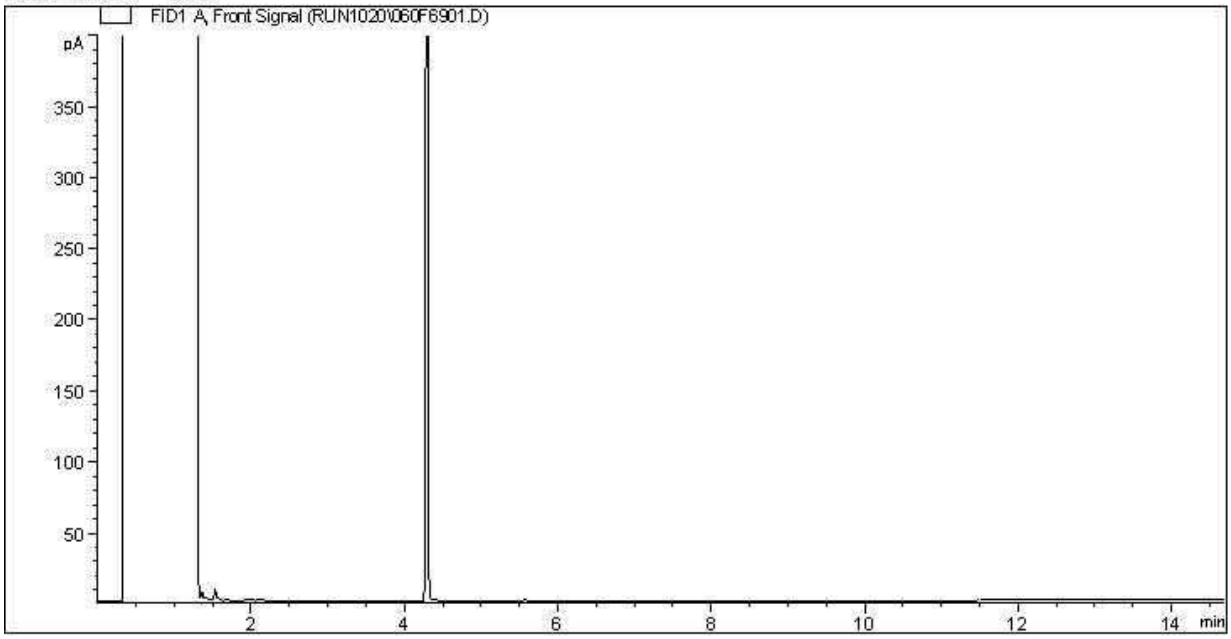
TYPICAL PRODUCT CARBON NUMBER RANGES

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

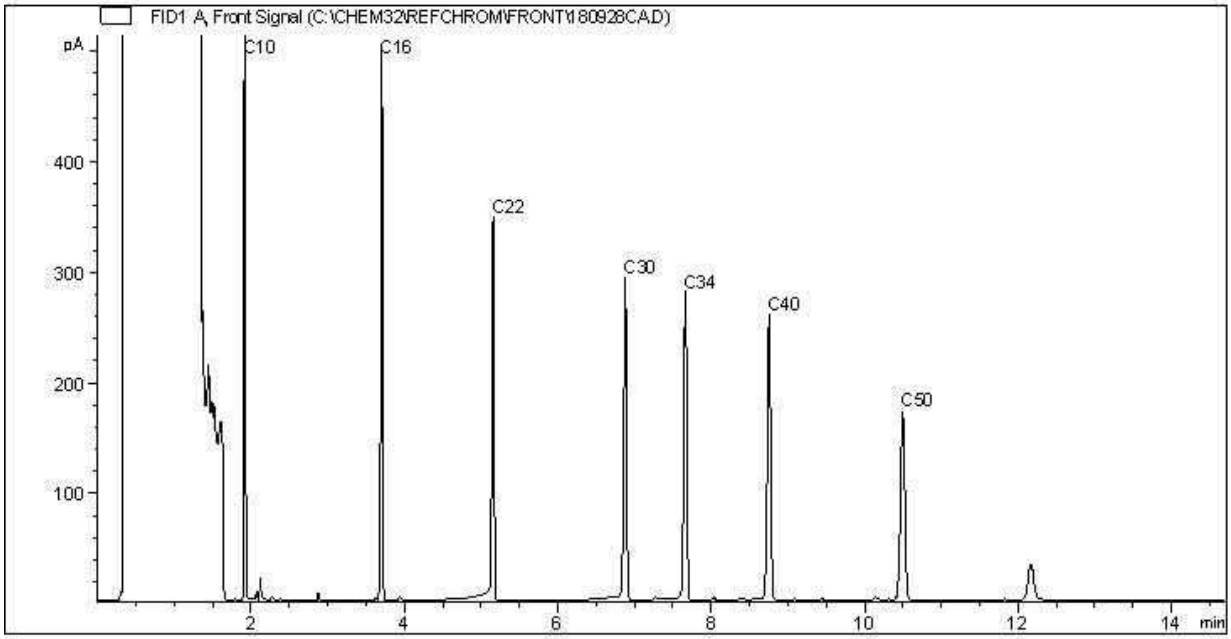
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



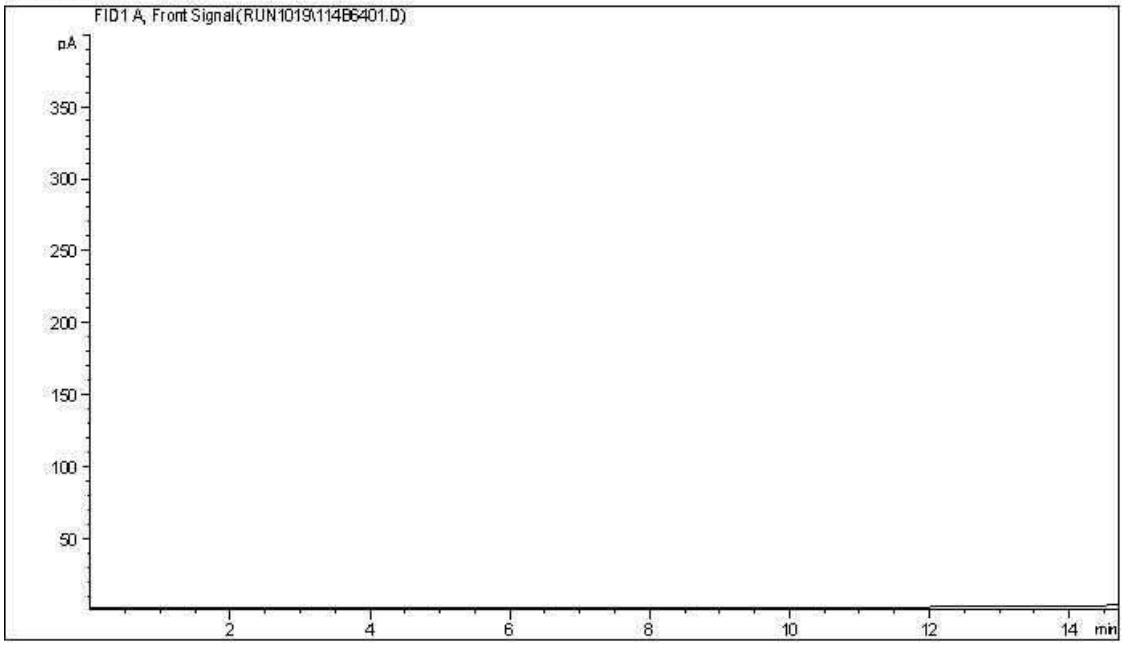
TYPICAL PRODUCT CARBON NUMBER RANGES

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

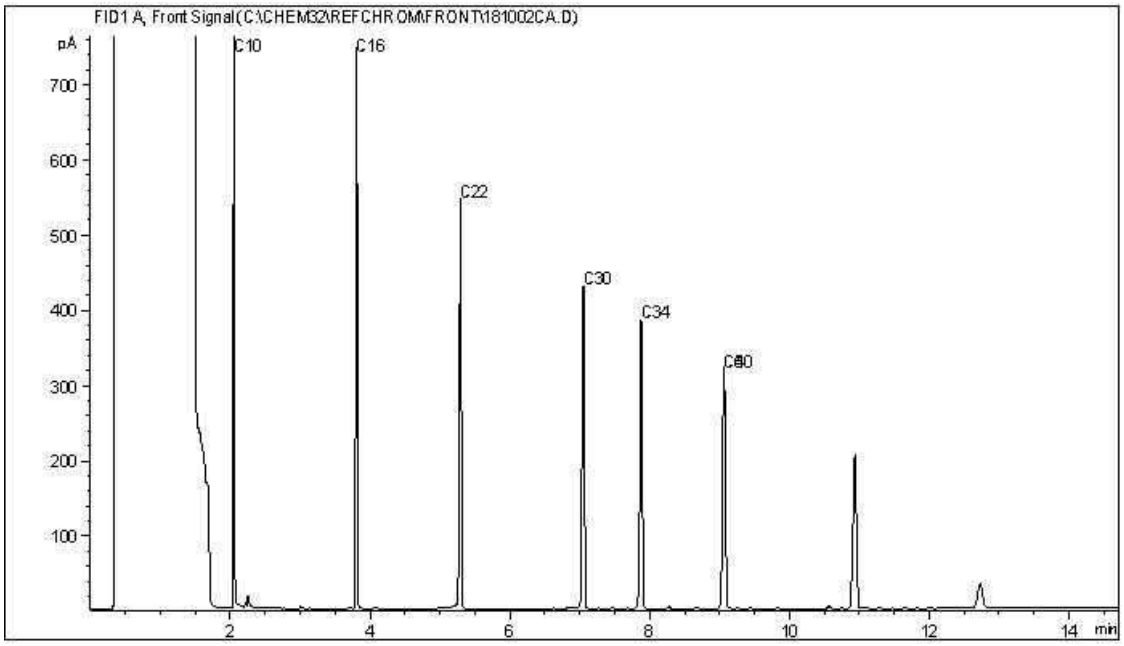
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



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

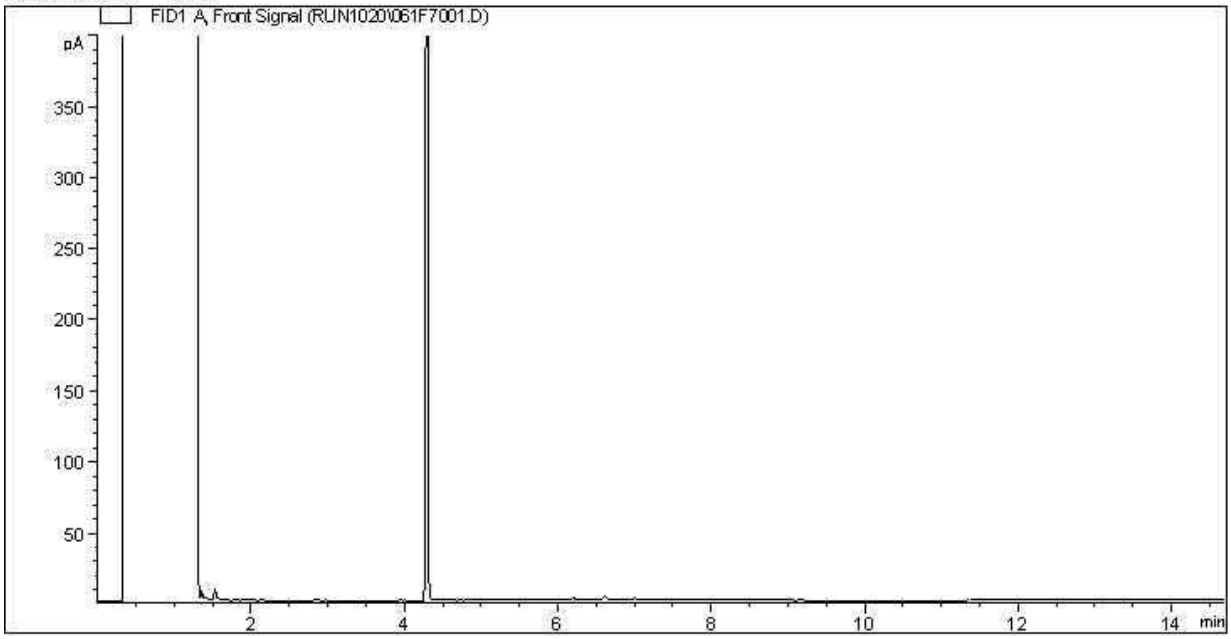
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B891543
Report Date: 2018/10/25
Maxxam Sample: UO9540

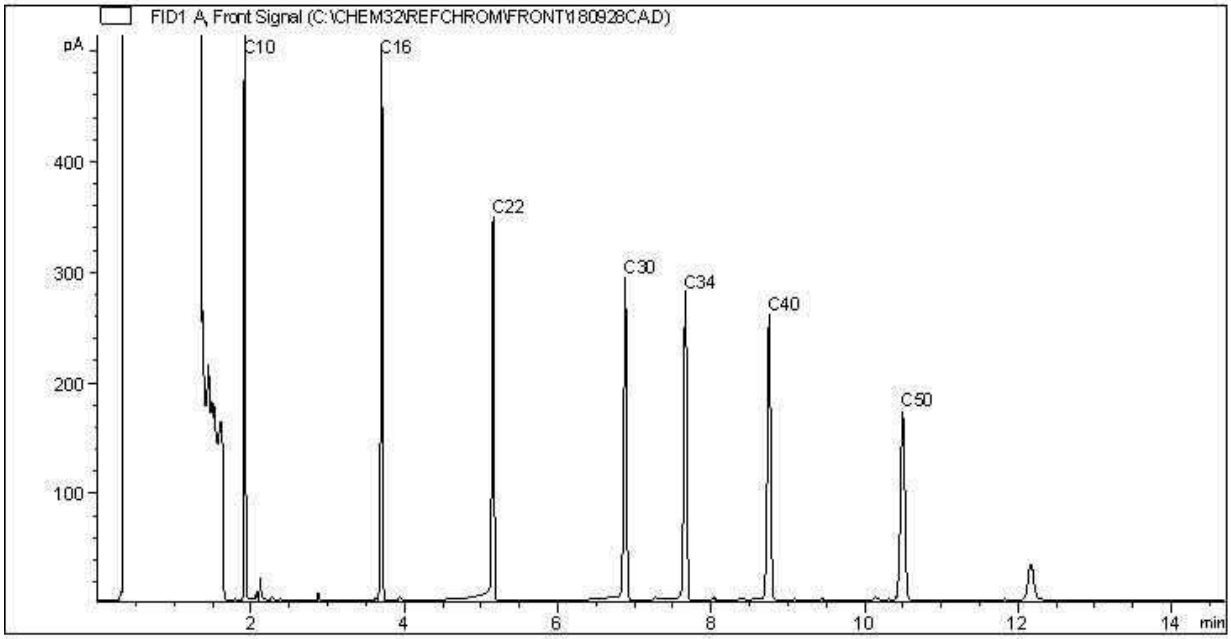
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: EX1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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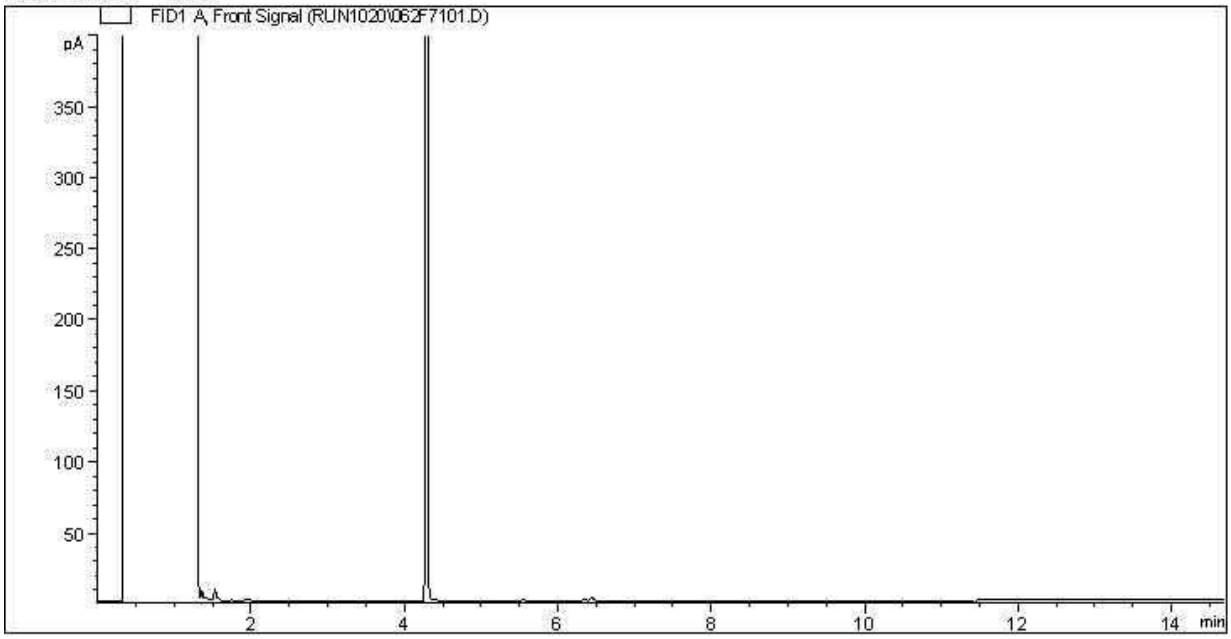
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

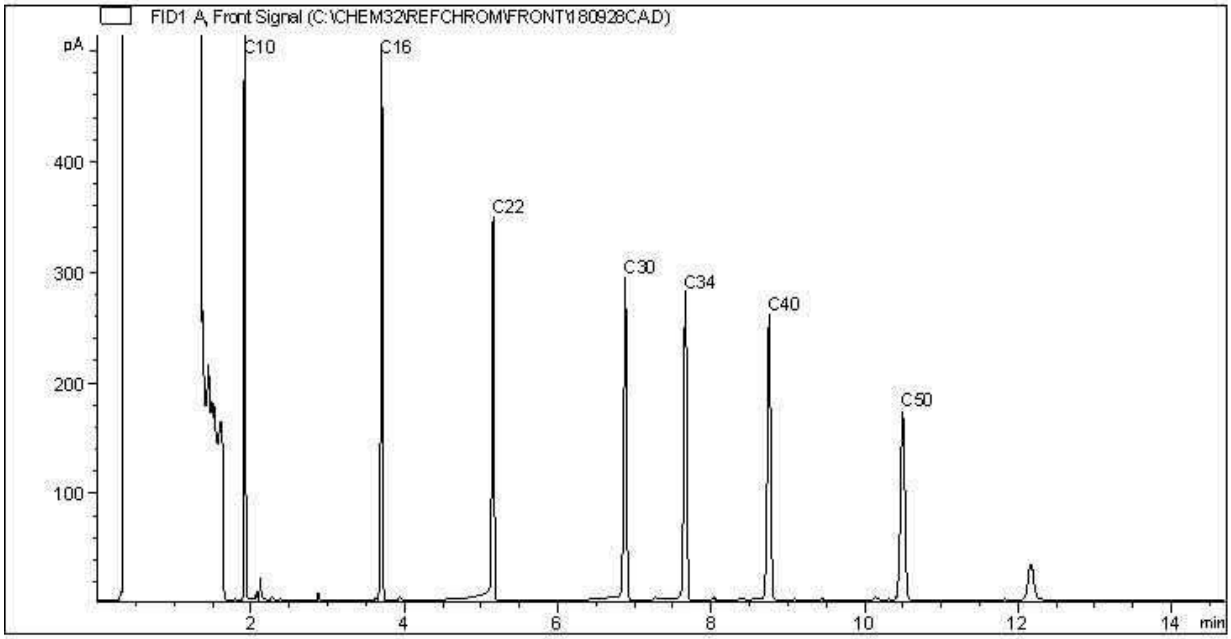
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



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

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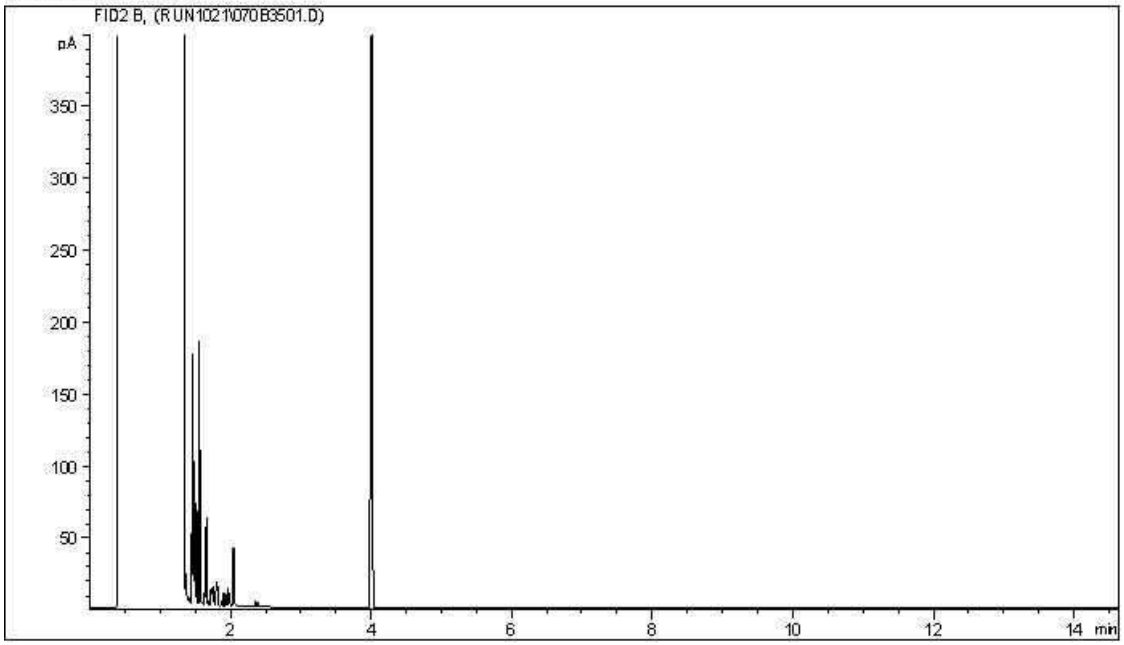
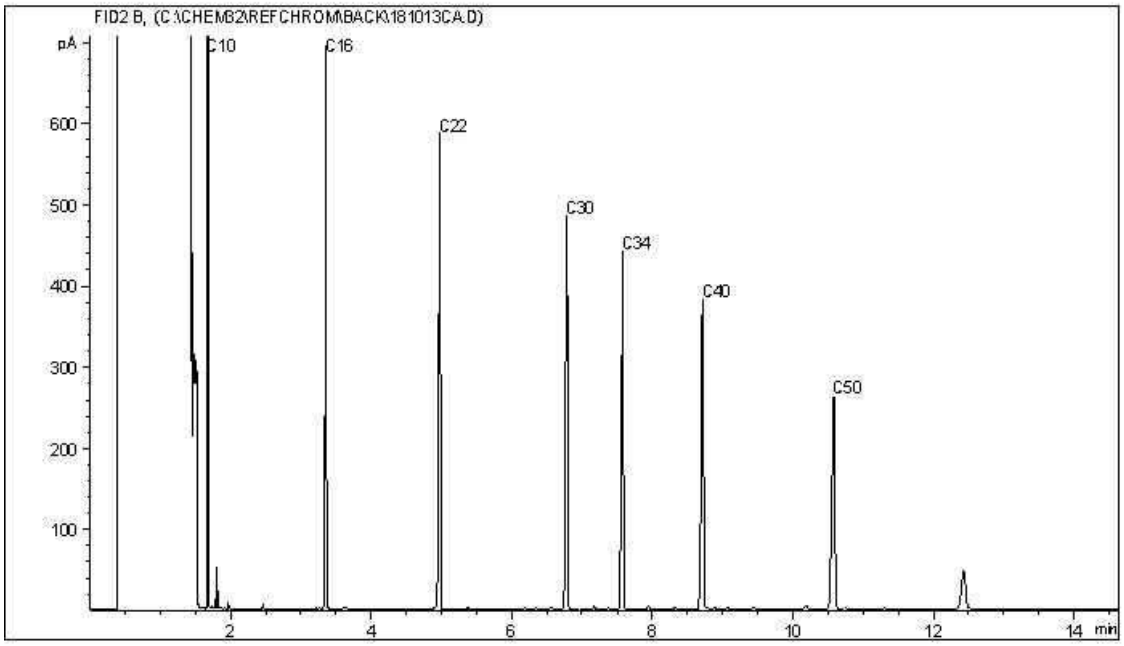
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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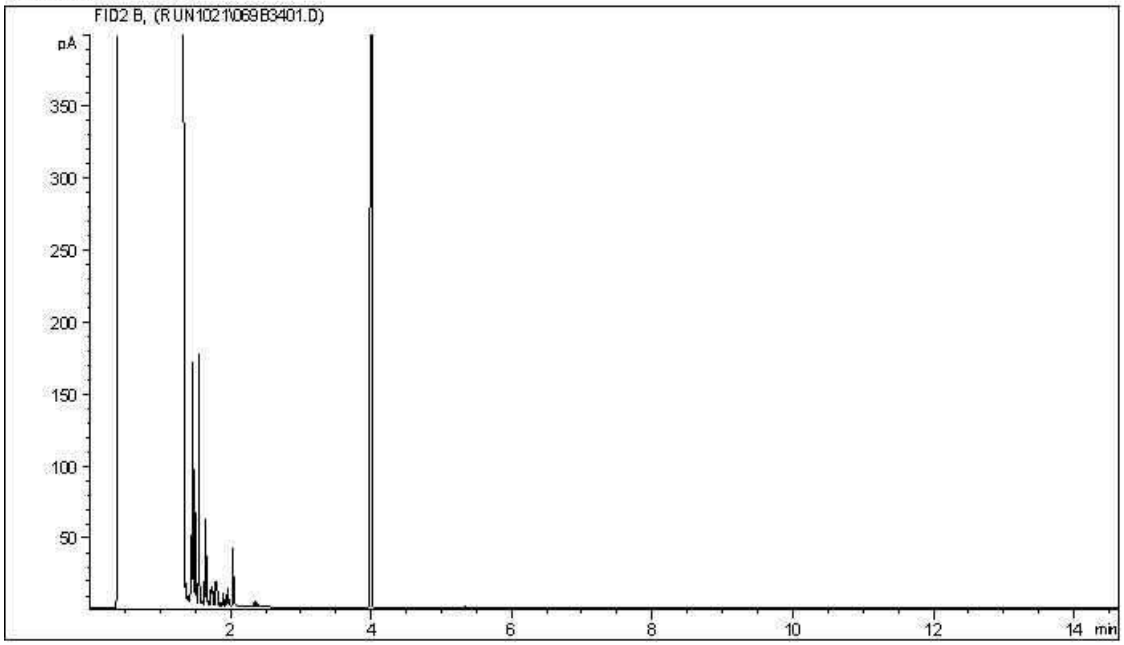
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

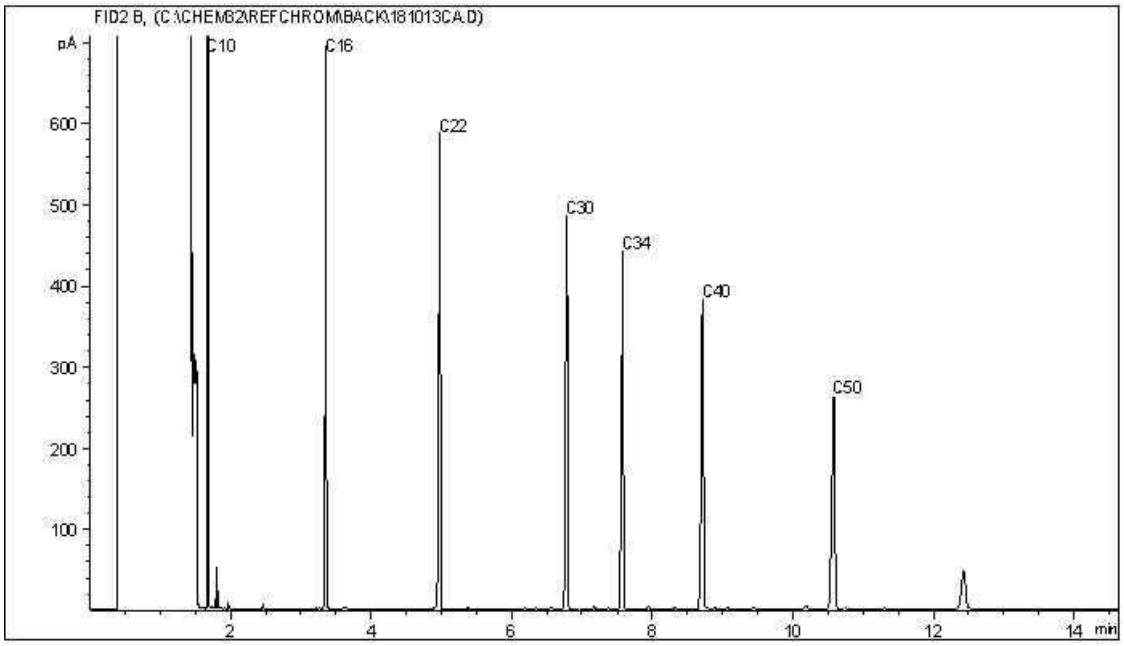
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



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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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your C.O.C. #: M045918

Attention: Stephen D'Abadie

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

Report Date: 2018/10/24
Report #: R2639664
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B892043
Received: 2018/10/19, 13:22

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	7	N/A	2018/10/22	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/10/23	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2018/10/22	AB SOP-00039	Auto Calc
F1-BTEX	1	N/A	2018/10/24	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/22	2018/10/22	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	3	2018/10/22	2018/10/23	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	2	N/A	2018/10/23	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	2	2018/10/22	2018/10/23	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	8	N/A	2018/10/23	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	8	N/A	2018/10/23	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your C.O.C. #: M045918

Attention: Stephen D'Abadie

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

Report Date: 2018/10/24
Report #: R2639664
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B892043
Received: 2018/10/19, 13:22

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) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B892043
Report Date: 2018/10/24

CLIFTON ASSOCIATES LTD.

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UP2605	UP2606	UP2607	UP2608	UP2609	UP2610		
Sampling Date		2018/10/19 10:15	2018/10/19 11:30	2018/10/19 11:15	2018/10/19 10:45	2018/10/19 11:00	2018/10/19 10:30		
COC Number		M045918	M045918	M045918	M045918	M045918	M045918		
	UNITS	**1950A**	**1961**	**1963**	**1977**	**2005**	**EX2**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	9194335
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.040	0.41	0.00040	9193407
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.012	0.00040	9193407
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.15	0.00040	9193407
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.029	0.00080	9193407
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.0017	0.00040	9193407
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	0.031	0.00089	9192934
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.53	0.10	9192934
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	1.1	0.10	9193407
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	107	107	107	107	106	109	N/A	9193407
4-Bromofluorobenzene (sur.)	%	97	95	95	95	96	96	N/A	9193407
D4-1,2-Dichloroethane (sur.)	%	98	98	100	97	98	108	N/A	9193407
O-TERPHENYL (sur.)	%	85	88	83	88	83	86	N/A	9194335

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B892043
Report Date: 2018/10/24

CLIFTON ASSOCIATES LTD.

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UP2611	UP2611		
Sampling Date		2018/10/19 12:00	2018/10/19 12:00		
COC Number		M045918	M045918		
	UNITS	**HYDRA 1**	**HYDRA 1 Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	9194335
Volatiles					
Benzene	mg/L	<0.00040	N/A	0.00040	9194330
Toluene	mg/L	<0.00040	N/A	0.00040	9194330
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	9194330
m & p-Xylene	mg/L	<0.00080	N/A	0.00080	9194330
o-Xylene	mg/L	<0.00040	N/A	0.00040	9194330
Xylenes (Total)	mg/L	<0.00089	N/A	0.00089	9194745
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	0.10	9194745
F1 (C6-C10)	mg/L	<0.10	N/A	0.10	9194330
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	101	N/A	N/A	9194330
4-Bromofluorobenzene (sur.)	%	95	N/A	N/A	9194330
D4-1,2-Dichloroethane (sur.)	%	96	N/A	N/A	9194330
O-TERPHENYL (sur.)	%	91	89	N/A	9194335

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B892043
Report Date: 2018/10/24

CLIFTON ASSOCIATES LTD.

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP2605	UP2611	UP2611		
Sampling Date		2018/10/19 10:15	2018/10/19 12:00	2018/10/19 12:00		
COC Number		M045918	M045918	M045918		
	UNITS	**1950A**	**HYDRA 1**	**HYDRA 1 Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics						
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	N/A	0.000010	9192844
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9194333
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9194333
Acridine	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9194333
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	0.000010	9194333
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9194333
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9194333
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9194333
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9194333
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9194333
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	0.0000075	9194333
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9194333
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9194333
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	0.0000075	9194333
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	0.000010	9194333
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9194333
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9194333
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9194333
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9194333
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9194333
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9194333
Perylene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9194333
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	0.000020	9194333
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	0.00020	9194333
Surrogate Recovery (%)						
D10-ANTHRACENE (sur.)	%	99	98	101	N/A	9194333
D8-ACENAPHTHYLENE (sur.)	%	89	93	98	N/A	9194333
D8-NAPHTHALENE (sur.)	%	66	74	79	N/A	9194333
TERPHENYL-D14 (sur.)	%	105	107	113	N/A	9194333

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B892043
Report Date: 2018/10/24

CLIFTON ASSOCIATES LTD.

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP2605	UP2606	UP2607	UP2608	UP2609		
Sampling Date		2018/10/19 10:15	2018/10/19 11:30	2018/10/19 11:15	2018/10/19 10:45	2018/10/19 11:00		
COC Number		M045918	M045918	M045918	M045918	M045918		
	UNITS	**1950A**	**1961**	**1963**	**1977**	**2005**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9191070
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9193465
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9193465
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9193465
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9193465
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9193465
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.0019	0.0034	0.00050	9193465
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9193465
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9193465
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9193465
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9193465
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9193465
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
RDL = Reportable Detection Limit								

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CLIFTON ASSOCIATES LTD.

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP2605	UP2606	UP2607	UP2608	UP2609		
Sampling Date		2018/10/19 10:15	2018/10/19 11:30	2018/10/19 11:15	2018/10/19 10:45	2018/10/19 11:00		
COC Number		M045918	M045918	M045918	M045918	M045918		
	UNITS	**1950A**	**1961**	**1963**	**1977**	**2005**	**RDL**	**QC Batch**
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9193465
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	101	99	100	99	100	N/A	9193465
4-Bromofluorobenzene (sur.)	%	98	97	99	99	98	N/A	9193465
D4-1,2-Dichloroethane (sur.)	%	103	100	101	100	106	N/A	9193465

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP2610		UP2611	UP2612		
Sampling Date		2018/10/19 10:30		2018/10/19 12:00	2018/10/19		
COC Number		M045918		M045918	M045918		
	UNITS	**EX2**	**RDL**	**HYDRA 1**	**TRIP BLANK 8**	**RDL**	**QC Batch**
Volatiles							
Total Trihalomethanes	mg/L	<0.0013	0.0013	<0.0013	<0.0013	0.0013	9191070
Benzene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9193407
Bromodichloromethane	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Toluene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9193407
Bromoform	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Ethylbenzene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9193407
Bromomethane	mg/L	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9193465
m & p-Xylene	mg/L	N/A	N/A	N/A	<0.00080	0.00080	9193407
Carbon tetrachloride	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
o-Xylene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9193407
Chlorobenzene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Chlorodibromomethane	mg/L	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9193465
Xylenes (Total)	mg/L	N/A	N/A	N/A	<0.00089	0.00089	9192934
Chloroethane	mg/L	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9193465
Chloroform	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Chloromethane	mg/L	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9193465
1,2-dibromoethane	mg/L	<0.00020	0.00020	<0.00020	<0.00020	0.00020	9193465
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,1-dichloroethane	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,2-dichloroethane	mg/L	0.048	0.00050	<0.00050	<0.00050	0.00050	9193465
1,1-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Dichloromethane	mg/L	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9193465
1,2-dichloropropane	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Methyl methacrylate	mg/L	<0.00081 (1)	0.00081	<0.00050	<0.00050	0.00050	9193465
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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CLIFTON ASSOCIATES LTD.

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP2610		UP2611	UP2612		
Sampling Date		2018/10/19 10:30		2018/10/19 12:00	2018/10/19		
COC Number		M045918		M045918	M045918		
	UNITS	**EX2**	**RDL**	**HYDRA 1**	**TRIP BLANK 8**	**RDL**	**QC Batch**
Styrene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9193465
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9193465
Tetrachloroethene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9193465
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9193465
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,1,2-trichloroethane	mg/L	0.0018 (1)	0.00050	<0.00050	<0.00050	0.00050	9193465
Trichloroethene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Trichlorofluoromethane	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
1,2,4-trimethylbenzene	mg/L	0.0022	0.00050	<0.00050	<0.00050	0.00050	9193465
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Vinyl chloride	mg/L	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9193465
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	N/A	N/A	N/A	107	N/A	9193407
4-Bromofluorobenzene (sur.)	%	N/A	N/A	N/A	96	N/A	9193407
D4-1,2-Dichloroethane (sur.)	%	N/A	N/A	N/A	99	N/A	9193407
1,4-Difluorobenzene (sur.)	%	102	N/A	99	100	N/A	9193465
4-Bromofluorobenzene (sur.)	%	95	N/A	99	99	N/A	9193465
D4-1,2-Dichloroethane (sur.)	%	117	N/A	102	108	N/A	9193465

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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CLIFTON ASSOCIATES LTD.

GENERAL COMMENTS

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

Package 1	4.0°C

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9193407	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/21		107	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/21		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/21		95	%	50 - 140
			Benzene	2018/10/21		91	%	50 - 140
			Toluene	2018/10/21		88	%	50 - 140
			Ethylbenzene	2018/10/21		89	%	50 - 140
			m & p-Xylene	2018/10/21		80	%	50 - 140
			o-Xylene	2018/10/21		89	%	50 - 140
			F1 (C6-C10)	2018/10/21		78	%	60 - 140
9193407	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/21		110	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/21		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/21		94	%	50 - 140
			Benzene	2018/10/21		89	%	60 - 130
			Toluene	2018/10/21		86	%	60 - 130
			Ethylbenzene	2018/10/21		87	%	60 - 130
			m & p-Xylene	2018/10/21		88	%	60 - 130
			o-Xylene	2018/10/21		89	%	60 - 130
			F1 (C6-C10)	2018/10/21		88	%	60 - 140
9193407	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/21		107	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/21		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/21		98	%	50 - 140
			Benzene	2018/10/21	<0.00040		mg/L	
			Toluene	2018/10/21	<0.00040		mg/L	
			Ethylbenzene	2018/10/21	<0.00040		mg/L	
			m & p-Xylene	2018/10/21	<0.00080		mg/L	
			o-Xylene	2018/10/21	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/21	<0.10		mg/L	
9193407	DO1	RPD	Benzene	2018/10/21	NC		%	30
			Toluene	2018/10/21	NC		%	30
			Ethylbenzene	2018/10/21	NC		%	30
			m & p-Xylene	2018/10/21	NC		%	30
			o-Xylene	2018/10/21	NC		%	30
			F1 (C6-C10)	2018/10/21	NC		%	30
9193465	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/22		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/22		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/22		96	%	50 - 140
			Bromodichloromethane	2018/10/22		106	%	50 - 140
			Bromoform	2018/10/22		90	%	50 - 140
			Bromomethane	2018/10/22		93	%	50 - 140
			Carbon tetrachloride	2018/10/22		102	%	50 - 140
			Chlorobenzene	2018/10/22		92	%	50 - 140
			Chlorodibromomethane	2018/10/22		95	%	50 - 140
			Chloroethane	2018/10/22		92	%	50 - 140
			Chloroform	2018/10/22		99	%	50 - 140
			Chloromethane	2018/10/22		102	%	50 - 140
			1,2-dibromoethane	2018/10/22		89	%	50 - 140
			1,2-dichlorobenzene	2018/10/22		107	%	50 - 140
			1,3-dichlorobenzene	2018/10/22		103	%	50 - 140
			1,4-dichlorobenzene	2018/10/22		101	%	50 - 140
			1,1-dichloroethane	2018/10/22		100	%	50 - 140
			1,2-dichloroethane	2018/10/22		101	%	50 - 140
			1,1-dichloroethene	2018/10/22		96	%	50 - 140
			cis-1,2-dichloroethene	2018/10/22		98	%	50 - 140
			trans-1,2-dichloroethene	2018/10/22		90	%	50 - 140
			Dichloromethane	2018/10/22		95	%	50 - 140

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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-dichloropropane	2018/10/22		105	%	50 - 140
			cis-1,3-dichloropropene	2018/10/22		101	%	50 - 140
			trans-1,3-dichloropropene	2018/10/22		106	%	50 - 140
			Methyl methacrylate	2018/10/22		102	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/22		100	%	50 - 140
			Styrene	2018/10/22		90	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/22		89	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/22		92	%	50 - 140
			Tetrachloroethene	2018/10/22		85	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/22		96	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/22		96	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/22		97	%	50 - 140
			1,1,1-trichloroethane	2018/10/22		104	%	50 - 140
			1,1,2-trichloroethane	2018/10/22		102	%	50 - 140
			Trichloroethene	2018/10/22		103	%	50 - 140
			Trichlorofluoromethane	2018/10/22		101	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/22		103	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/22		106	%	50 - 140
			Vinyl chloride	2018/10/22		104	%	50 - 140
9193465	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/22		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/22		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/22		99	%	50 - 140
			Bromodichloromethane	2018/10/22		101	%	60 - 130
			Bromoform	2018/10/22		86	%	60 - 130
			Bromomethane	2018/10/22		87	%	60 - 130
			Carbon tetrachloride	2018/10/22		98	%	60 - 130
			Chlorobenzene	2018/10/22		89	%	60 - 130
			Chlorodibromomethane	2018/10/22		90	%	60 - 130
			Chloroethane	2018/10/22		89	%	60 - 130
			Chloroform	2018/10/22		95	%	60 - 130
			Chloromethane	2018/10/22		97	%	60 - 130
			1,2-dibromoethane	2018/10/22		85	%	60 - 130
			1,2-dichlorobenzene	2018/10/22		101	%	60 - 130
			1,3-dichlorobenzene	2018/10/22		99	%	60 - 130
			1,4-dichlorobenzene	2018/10/22		97	%	60 - 130
			1,1-dichloroethane	2018/10/22		96	%	60 - 130
			1,2-dichloroethane	2018/10/22		95	%	60 - 130
			1,1-dichloroethene	2018/10/22		92	%	60 - 130
			cis-1,2-dichloroethene	2018/10/22		93	%	60 - 130
			trans-1,2-dichloroethene	2018/10/22		87	%	60 - 130
			Dichloromethane	2018/10/22		90	%	60 - 130
			1,2-dichloropropane	2018/10/22		100	%	60 - 130
			cis-1,3-dichloropropene	2018/10/22		92	%	60 - 130
			trans-1,3-dichloropropene	2018/10/22		87	%	60 - 130
			Methyl methacrylate	2018/10/22		97	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/22		96	%	60 - 130
			Styrene	2018/10/22		88	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/22		86	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/22		88	%	60 - 130
			Tetrachloroethene	2018/10/22		83	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/22		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/22		93	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/22		95	%	60 - 130
			1,1,1-trichloroethane	2018/10/22		99	%	60 - 130
			1,1,2-trichloroethane	2018/10/22		97	%	60 - 130

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			Trichloroethene	2018/10/22		99	%	60 - 130
			Trichlorofluoromethane	2018/10/22		98	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/22		98	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/22		101	%	60 - 130
			Vinyl chloride	2018/10/22		100	%	60 - 130
9193465	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/22		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/22		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/22		109	%	50 - 140
			Bromodichloromethane	2018/10/22	<0.00050		mg/L	
			Bromoform	2018/10/22	<0.00050		mg/L	
			Bromomethane	2018/10/22	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/22	<0.00050		mg/L	
			Chlorobenzene	2018/10/22	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/22	<0.0010		mg/L	
			Chloroethane	2018/10/22	<0.0010		mg/L	
			Chloroform	2018/10/22	<0.00050		mg/L	
			Chloromethane	2018/10/22	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/22	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/22	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/22	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/22	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/22	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/22	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/22	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/22	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/22	<0.00050		mg/L	
			Dichloromethane	2018/10/22	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/22	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/22	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/22	<0.00050		mg/L	
			Methyl methacrylate	2018/10/22	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/22	<0.00050		mg/L	
			Styrene	2018/10/22	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/22	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/22	<0.0020		mg/L	
			Tetrachloroethene	2018/10/22	<0.00050		mg/L	
			1,2,3-trichlorobenzene	2018/10/22	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/22	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/22	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/22	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/22	<0.00050		mg/L	
			Trichloroethene	2018/10/22	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/22	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/22	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/22	<0.00050		mg/L	
			Vinyl chloride	2018/10/22	<0.00050		mg/L	
9193465	MZ	RPD	Bromodichloromethane	2018/10/22	NC		%	30
			Bromoform	2018/10/22	NC		%	30
			Bromomethane	2018/10/22	NC		%	30
			Carbon tetrachloride	2018/10/22	NC		%	30
			Chlorobenzene	2018/10/22	NC		%	30
			Chlorodibromomethane	2018/10/22	NC		%	30
			Chloroethane	2018/10/22	NC		%	30
			Chloroform	2018/10/22	NC		%	30
			Chloromethane	2018/10/22	NC		%	30

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			1,2-dibromoethane	2018/10/22	NC		%	30
			1,2-dichlorobenzene	2018/10/22	NC		%	30
			1,3-dichlorobenzene	2018/10/22	NC		%	30
			1,4-dichlorobenzene	2018/10/22	NC		%	30
			1,1-dichloroethane	2018/10/22	NC		%	30
			1,2-dichloroethane	2018/10/22	NC		%	30
			1,1-dichloroethene	2018/10/22	NC		%	30
			cis-1,2-dichloroethene	2018/10/22	NC		%	30
			trans-1,2-dichloroethene	2018/10/22	NC		%	30
			Dichloromethane	2018/10/22	NC		%	30
			1,2-dichloropropane	2018/10/22	NC		%	30
			cis-1,3-dichloropropene	2018/10/22	NC		%	30
			trans-1,3-dichloropropene	2018/10/22	NC		%	30
			Methyl methacrylate	2018/10/22	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/22	NC		%	30
			Styrene	2018/10/22	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/22	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/22	NC		%	30
			Tetrachloroethene	2018/10/22	NC		%	30
			1,2,3-trichlorobenzene	2018/10/22	NC		%	30
			1,2,4-trichlorobenzene	2018/10/22	NC		%	30
			1,3,5-trichlorobenzene	2018/10/22	NC		%	30
			1,1,1-trichloroethane	2018/10/22	NC		%	30
			1,1,2-trichloroethane	2018/10/22	NC		%	30
			Trichloroethene	2018/10/22	NC		%	30
			Trichlorofluoromethane	2018/10/22	NC		%	30
			1,2,4-trimethylbenzene	2018/10/22	NC		%	30
			1,3,5-trimethylbenzene	2018/10/22	NC		%	30
			Vinyl chloride	2018/10/22	NC		%	30
9194330	RSU	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/22		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/22		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/22		96	%	50 - 140
			Benzene	2018/10/22		112	%	50 - 140
			Toluene	2018/10/22		107	%	50 - 140
			Ethylbenzene	2018/10/22		108	%	50 - 140
			m & p-Xylene	2018/10/22		98	%	50 - 140
			o-Xylene	2018/10/22		104	%	50 - 140
			F1 (C6-C10)	2018/10/22		97	%	60 - 140
9194330	RSU	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/22		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/22		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/22		93	%	50 - 140
			Benzene	2018/10/22		104	%	60 - 130
			Toluene	2018/10/22		101	%	60 - 130
			Ethylbenzene	2018/10/22		103	%	60 - 130
			m & p-Xylene	2018/10/22		101	%	60 - 130
			o-Xylene	2018/10/22		98	%	60 - 130
			F1 (C6-C10)	2018/10/22		84	%	60 - 140
9194330	RSU	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/22		107	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/22		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/22		98	%	50 - 140
			Benzene	2018/10/22	<0.00040		mg/L	
			Toluene	2018/10/22	<0.00040		mg/L	
			Ethylbenzene	2018/10/22	<0.00040		mg/L	
			m & p-Xylene	2018/10/22	<0.00080		mg/L	
			o-Xylene	2018/10/22	<0.00040		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F1 (C6-C10)	2018/10/22	<0.10		mg/L	
9194330	RSU	RPD	Benzene	2018/10/22	NC		%	30
			Toluene	2018/10/22	NC		%	30
			Ethylbenzene	2018/10/22	NC		%	30
			m & p-Xylene	2018/10/22	NC		%	30
			o-Xylene	2018/10/22	NC		%	30
			F1 (C6-C10)	2018/10/22	NC		%	30
9194333	NK3	Matrix Spike [UP2605-02]	D10-ANTHRACENE (sur.)	2018/10/23		104	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/23		97	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/23		73	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/23		113	%	50 - 130
			Acenaphthene	2018/10/23		90	%	50 - 130
			Acenaphthylene	2018/10/23		97	%	50 - 130
			Acridine	2018/10/23		76	%	50 - 130
			Anthracene	2018/10/23		92	%	50 - 130
			Benzo(a)anthracene	2018/10/23		101	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/23		103	%	50 - 130
			Benzo(k)fluoranthene	2018/10/23		100	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/23		96	%	50 - 130
			Benzo(c)phenanthrene	2018/10/23		101	%	50 - 130
			Benzo(a)pyrene	2018/10/23		98	%	50 - 130
			Benzo[e]pyrene	2018/10/23		94	%	50 - 130
			Chrysene	2018/10/23		102	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/23		95	%	50 - 130
			Fluoranthene	2018/10/23		104	%	50 - 130
			Fluorene	2018/10/23		95	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/23		82	%	50 - 130
			1-Methylnaphthalene	2018/10/23		91	%	50 - 130
			2-Methylnaphthalene	2018/10/23		84	%	50 - 130
			Naphthalene	2018/10/23		85	%	50 - 130
			Phenanthrene	2018/10/23		98	%	50 - 130
			Perylene	2018/10/23		86	%	50 - 130
			Pyrene	2018/10/23		101	%	50 - 130
			Quinoline	2018/10/23		90	%	50 - 130
9194333	NK3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/23		100	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/23		95	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/23		73	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/23		109	%	50 - 130
			Acenaphthene	2018/10/23		87	%	50 - 130
			Acenaphthylene	2018/10/23		93	%	50 - 130
			Acridine	2018/10/23		80	%	50 - 130
			Anthracene	2018/10/23		87	%	50 - 130
			Benzo(a)anthracene	2018/10/23		104	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/23		108	%	50 - 130
			Benzo(k)fluoranthene	2018/10/23		112	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/23		100	%	50 - 130
			Benzo(c)phenanthrene	2018/10/23		100	%	50 - 130
			Benzo(a)pyrene	2018/10/23		104	%	50 - 130
			Benzo[e]pyrene	2018/10/23		101	%	50 - 130
			Chrysene	2018/10/23		105	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/23		100	%	50 - 130
			Fluoranthene	2018/10/23		101	%	50 - 130
			Fluorene	2018/10/23		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/23		86	%	50 - 130
			1-Methylnaphthalene	2018/10/23		86	%	50 - 130

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			2-Methylnaphthalene	2018/10/23		80	%	50 - 130
			Naphthalene	2018/10/23		80	%	50 - 130
			Phenanthrene	2018/10/23		93	%	50 - 130
			Perylene	2018/10/23		92	%	50 - 130
			Pyrene	2018/10/23		99	%	50 - 130
			Quinoline	2018/10/23		87	%	50 - 130
9194333	NK3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/23		104	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/23		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/23		68	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/23		116	%	50 - 130
			Acenaphthene	2018/10/23	<0.00010		mg/L	
			Acenaphthylene	2018/10/23	<0.00010		mg/L	
			Acridine	2018/10/23	<0.000050		mg/L	
			Anthracene	2018/10/23	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/23	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/23	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/23	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/23	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/23	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/23	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/23	<0.000050		mg/L	
			Chrysene	2018/10/23	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/23	<0.0000075		mg/L	
			Fluoranthene	2018/10/23	<0.000010		mg/L	
			Fluorene	2018/10/23	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/23	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/23	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/23	<0.00010		mg/L	
			Naphthalene	2018/10/23	<0.00010		mg/L	
			Phenanthrene	2018/10/23	<0.000050		mg/L	
			Perylene	2018/10/23	<0.000050		mg/L	
			Pyrene	2018/10/23	<0.000020		mg/L	
			Quinoline	2018/10/23	<0.00020		mg/L	
9194333	NK3	RPD [UP2611-02]	Acenaphthene	2018/10/23	NC		%	30
			Acenaphthylene	2018/10/23	NC		%	30
			Acridine	2018/10/23	NC		%	30
			Anthracene	2018/10/23	NC		%	30
			Benzo(a)anthracene	2018/10/23	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/23	NC		%	30
			Benzo(k)fluoranthene	2018/10/23	NC		%	30
			Benzo(g,h,i)perylene	2018/10/23	NC		%	30
			Benzo(c)phenanthrene	2018/10/23	NC		%	30
			Benzo(a)pyrene	2018/10/23	NC		%	30
			Benzo[e]pyrene	2018/10/23	NC		%	30
			Chrysene	2018/10/23	NC		%	30
			Dibenz(a,h)anthracene	2018/10/23	NC		%	30
			Fluoranthene	2018/10/23	NC		%	30
			Fluorene	2018/10/23	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/23	NC		%	30
			1-Methylnaphthalene	2018/10/23	NC		%	30
			2-Methylnaphthalene	2018/10/23	NC		%	30
			Naphthalene	2018/10/23	NC		%	30
			Phenanthrene	2018/10/23	NC		%	30
			Perylene	2018/10/23	NC		%	30
			Pyrene	2018/10/23	NC		%	30

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Quinoline	2018/10/23	NC		%	30
9194335	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/22		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/22		94	%	60 - 140
9194335	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/22		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/22		99	%	60 - 140
9194335	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/22		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/22	<0.10		mg/L	
9194335	VP4	RPD [UP2611-02]	F2 (C10-C16 Hydrocarbons)	2018/10/22	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).

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B892043
Report Date: 2018/10/24

CLIFTON ASSOCIATES LTD.

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B892043
Report Date: 2018/10/24

CLIFTON ASSOCIATES LTD.

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

Gita Pokhrel, Senior Analyst

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

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

841

CHAIN OF CUSTODY RECORD

M 045918

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. / AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 - 30 Ave NE Calgary AB T2E 7K9	Address:		Project #:		Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	stephen.dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn.kuzyk@clifton.ca	Copies:		Sampled By:		Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	4	5	3
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

Regulatory Criteria: ☑ AT1 ☐ CCME ☐ Drinking Water ☐ D50 (Drilling Waste) ☐ Saskatchewan ☐ Other:

Special Instructions

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals ☐ Tot ☐ Dis	Mercury Total ☐ Dissolved	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	PAHs	HOLD - DO NOT ANALYZE
1	1950A		2018.10.19	10:15	GW	8	✓	✓									✓	
2	1961			10:30		6	✓	✓										
3	1963			11:15		6	✓	✓										
4	1977			10:45		6	✓	✓										
5	2005			11:00		6	✓	✓										
6	EX2			10:30		6	✓	✓										
7	Hydra 1			12:00	GW	8	✓	✓									✓	
8	Trip Blank 8		2018.10.19		W	2	✓											
9																		
10																		
	Please indicate Filtered, Preserved or Both (F, P, F/P)						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)
Austin Mei	2018.10.19	13:21	Amita Sharma AMITA SHARMA	2018/10/19	13:22

19-Oct-18 13:22
Leanne Cameron
B892043
TL8 INS-0029

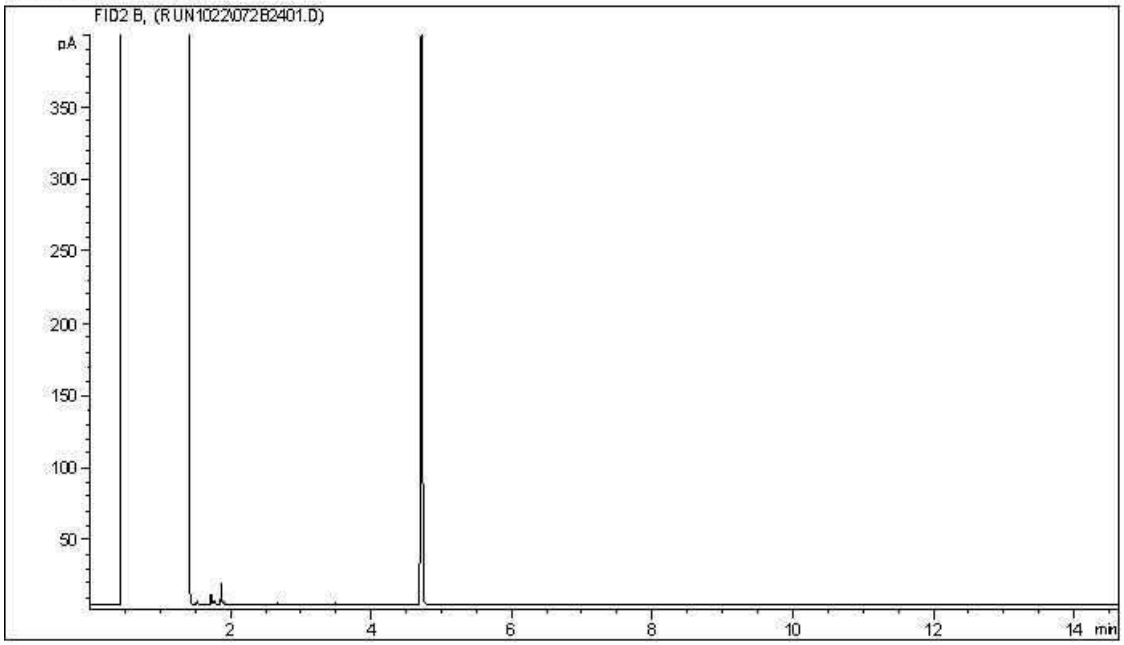
AB FCD-00331/7

Maxxam Job #: B892043
Report Date: 2018/10/24
Maxxam Sample: UP2605

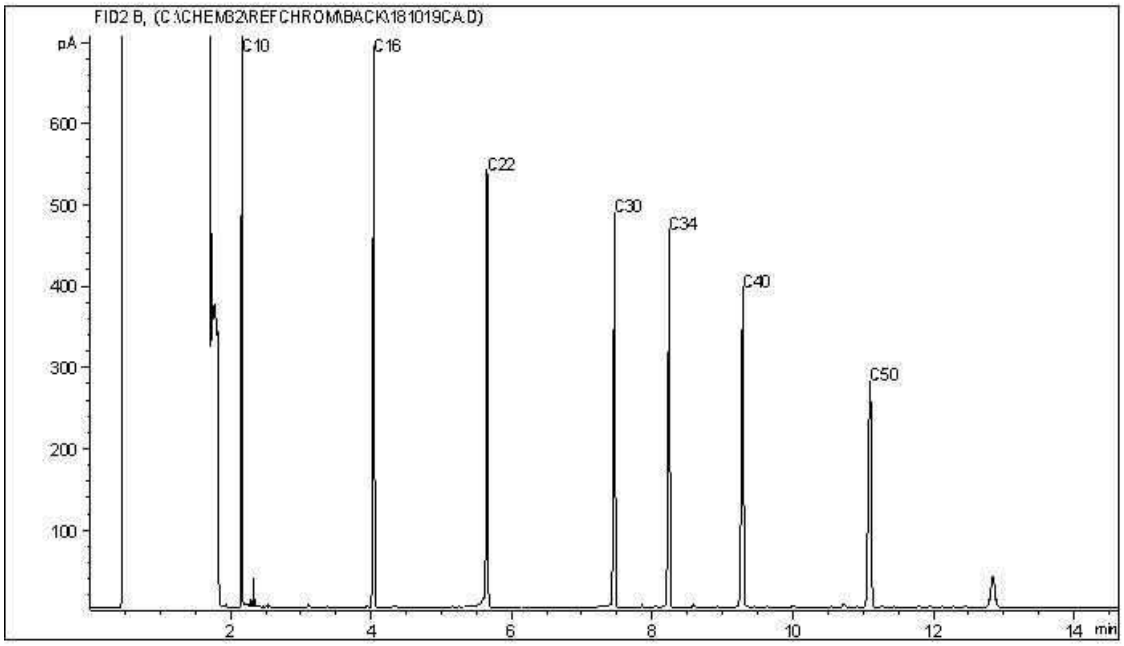
CLIFTON ASSOCIATES LTD.
Client ID: 1950A

CCME Hydrocarbons in Water (F2; C10-C16) 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+

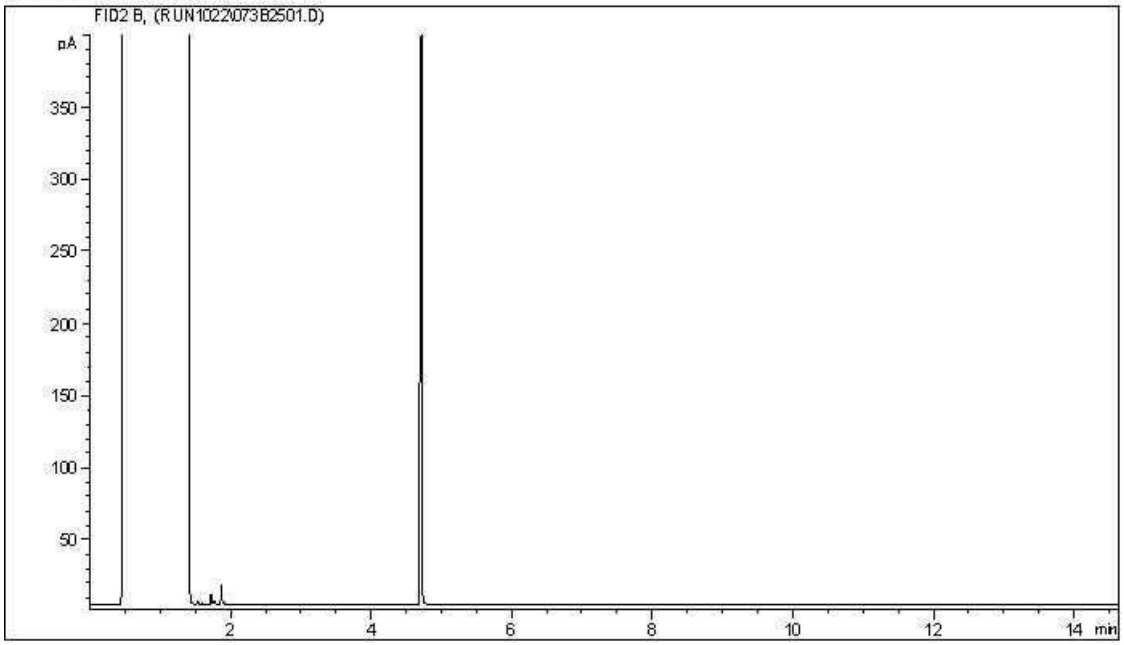
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B892043
Report Date: 2018/10/24
Maxxam Sample: UP2606

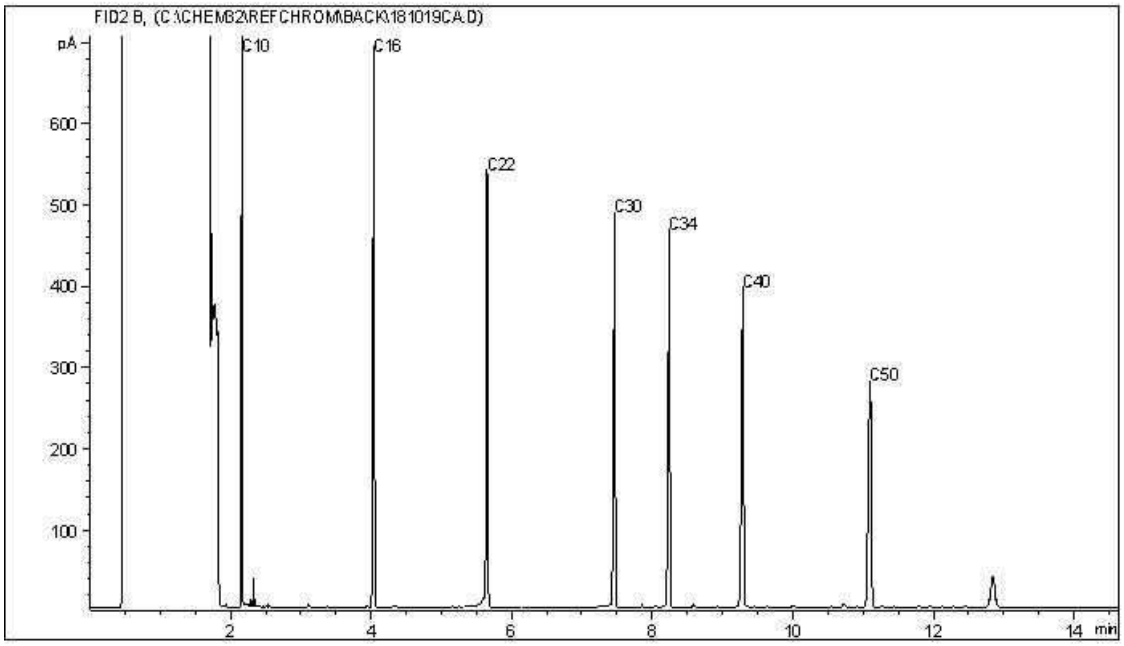
CLIFTON ASSOCIATES LTD.
Client ID: 1961

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



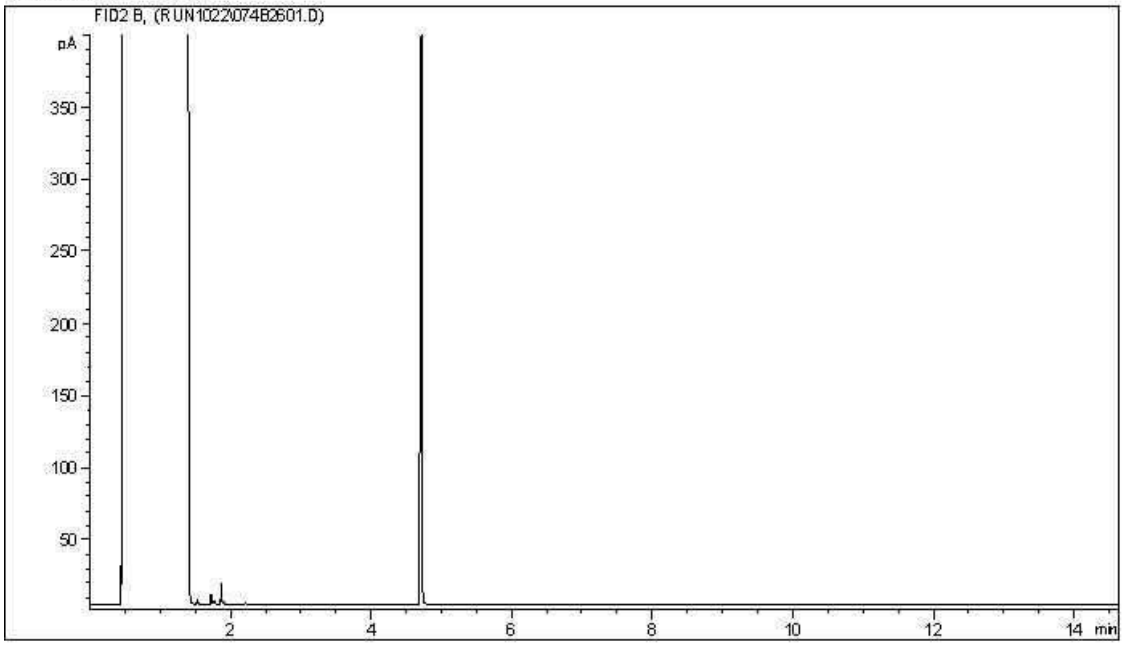
TYPICAL PRODUCT CARBON NUMBER RANGES

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

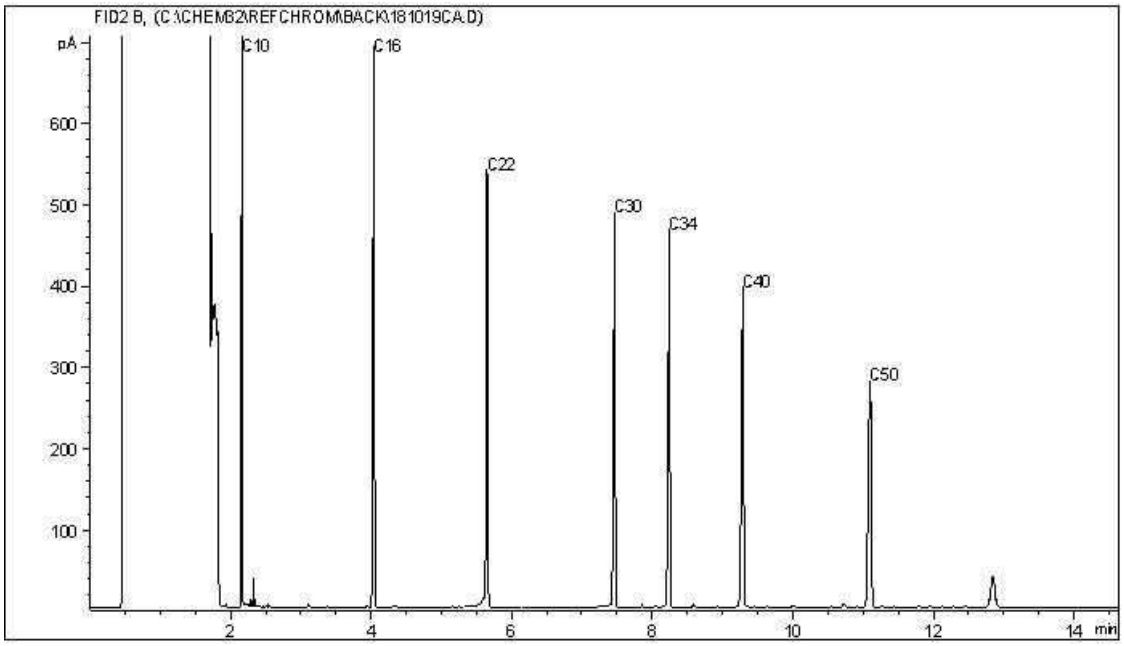
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



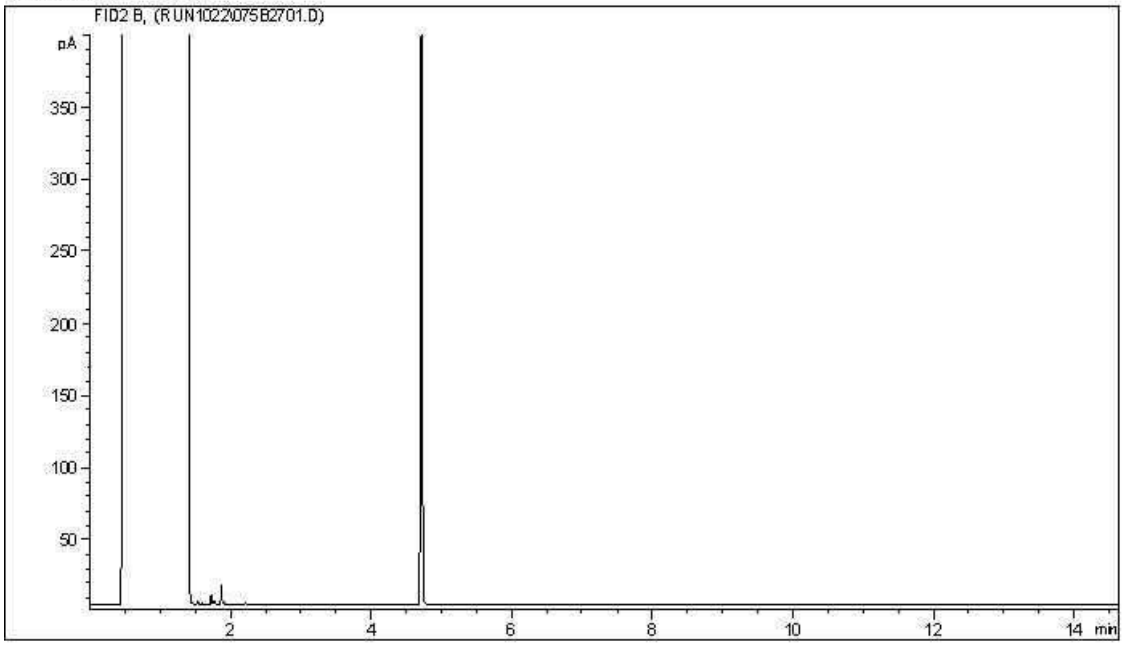
TYPICAL PRODUCT CARBON NUMBER RANGES

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

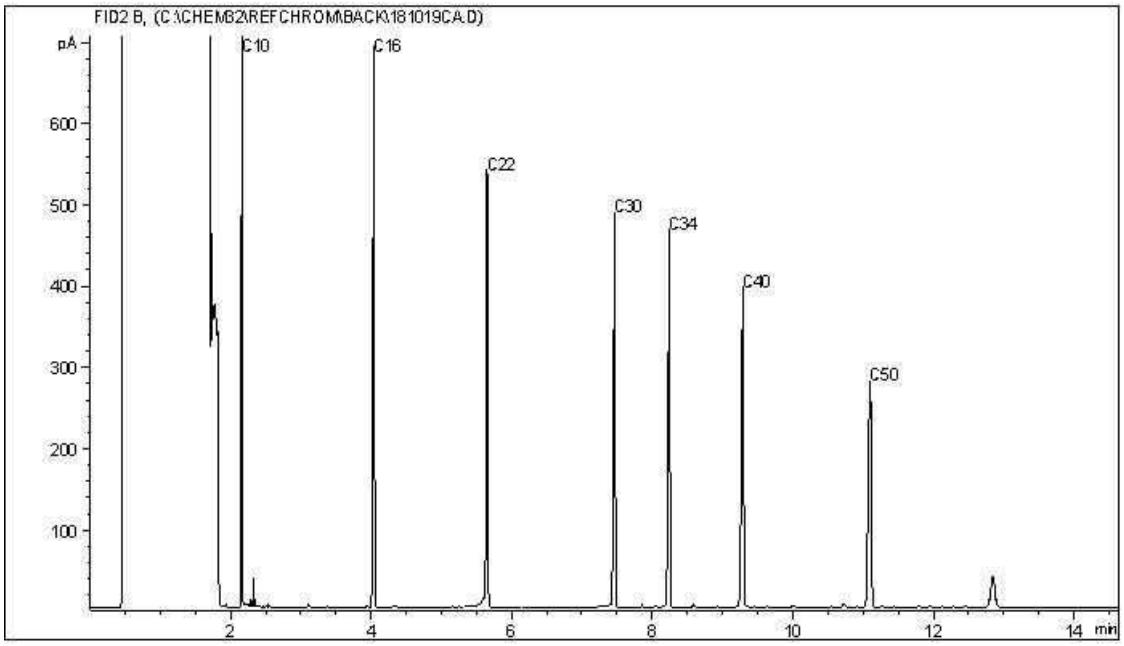
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) 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+

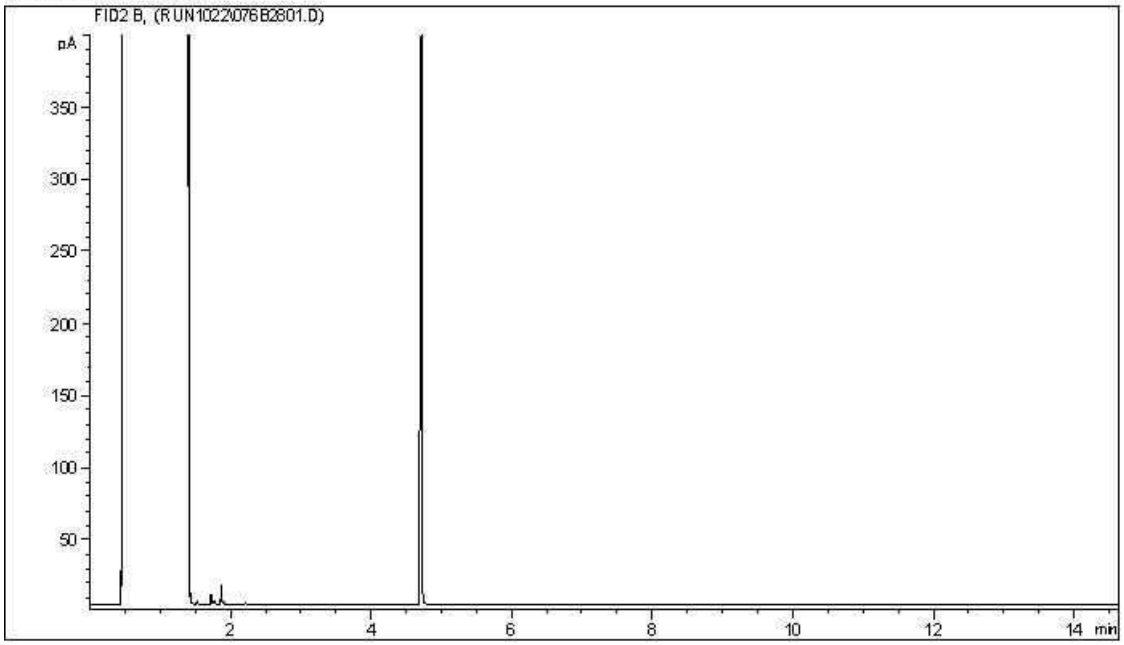
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B892043
Report Date: 2018/10/24
Maxxam Sample: UP2609

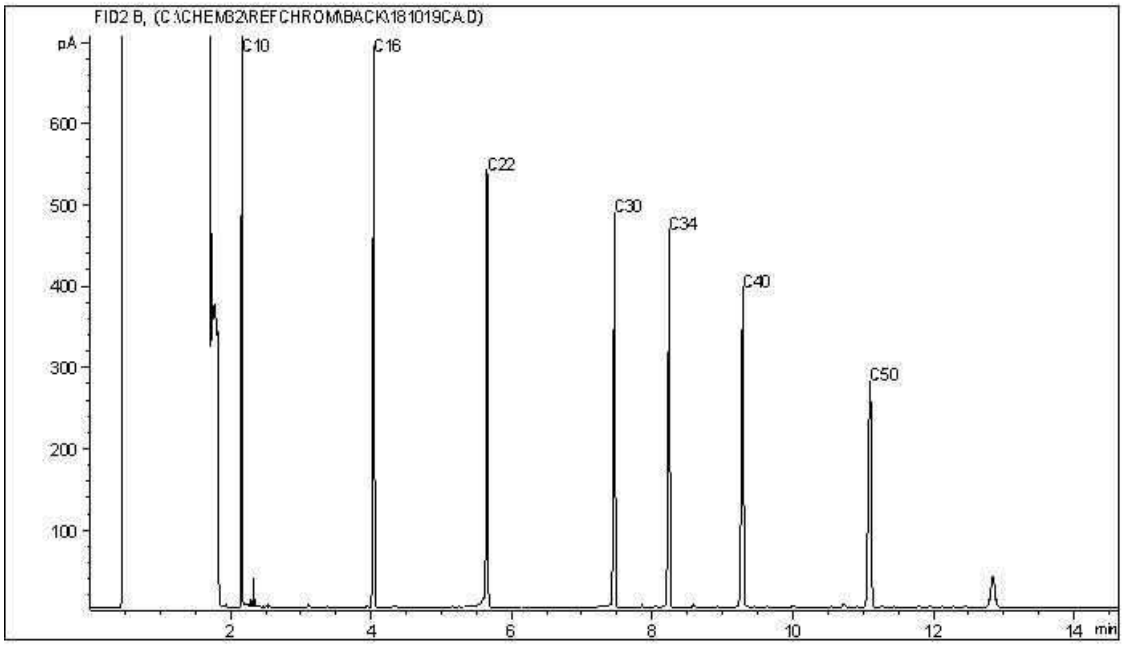
CLIFTON ASSOCIATES LTD.
Client ID: 2005

CCME Hydrocarbons in Water (F2; C10-C16) 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+

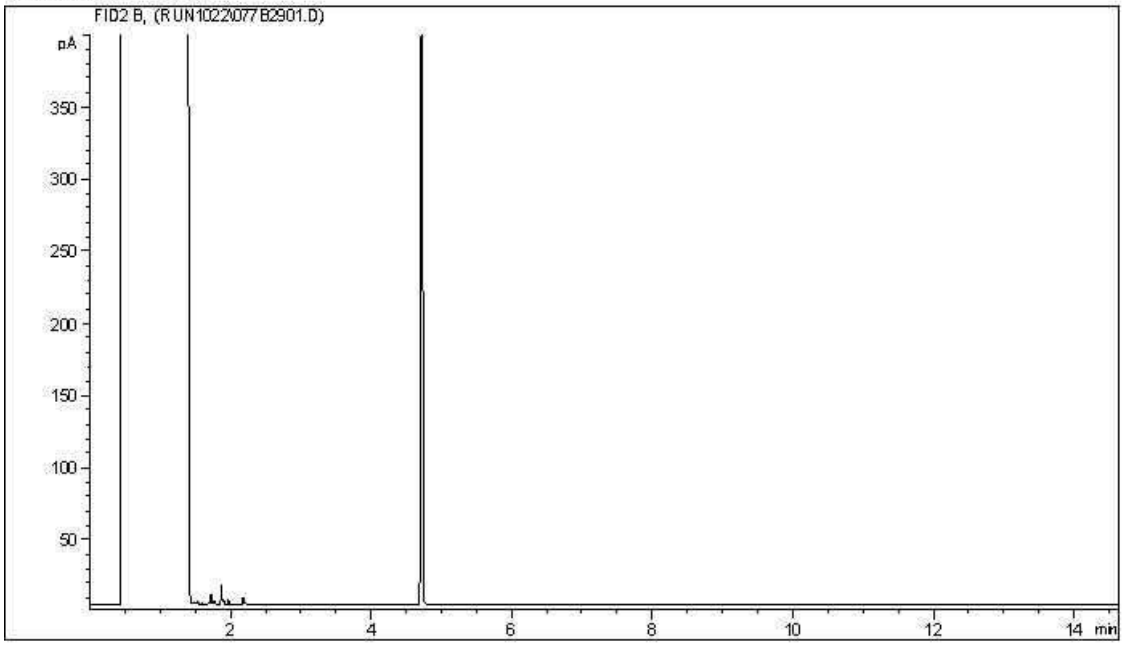
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B892043
Report Date: 2018/10/24
Maxxam Sample: UP2610

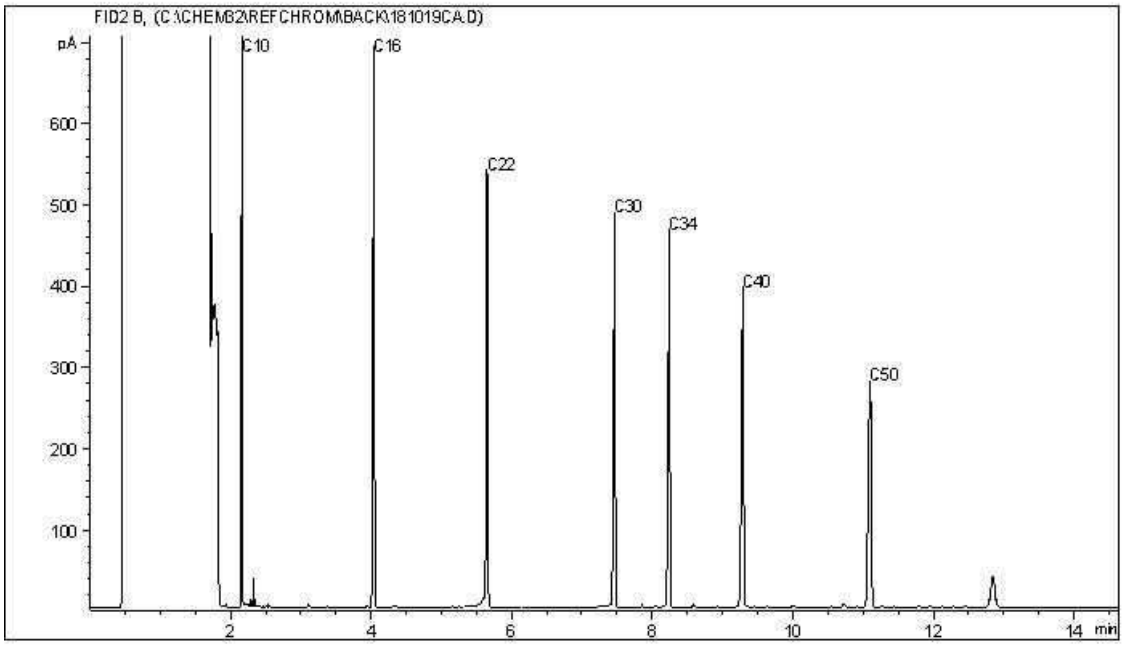
CLIFTON ASSOCIATES LTD.
Client ID: EX2

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



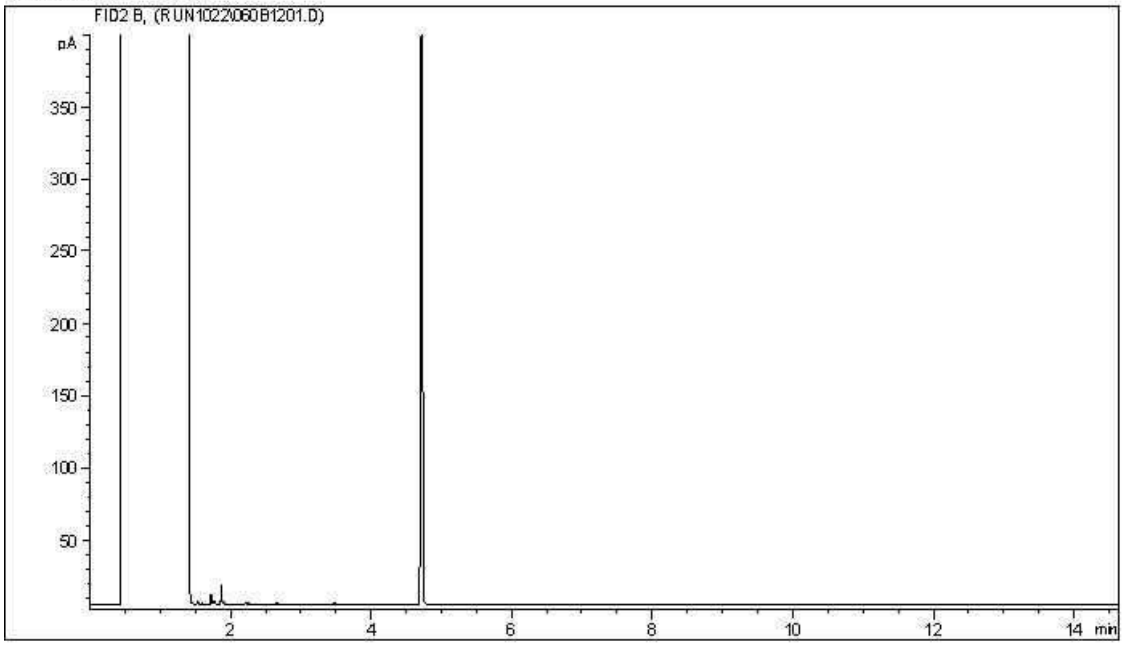
TYPICAL PRODUCT CARBON NUMBER RANGES

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

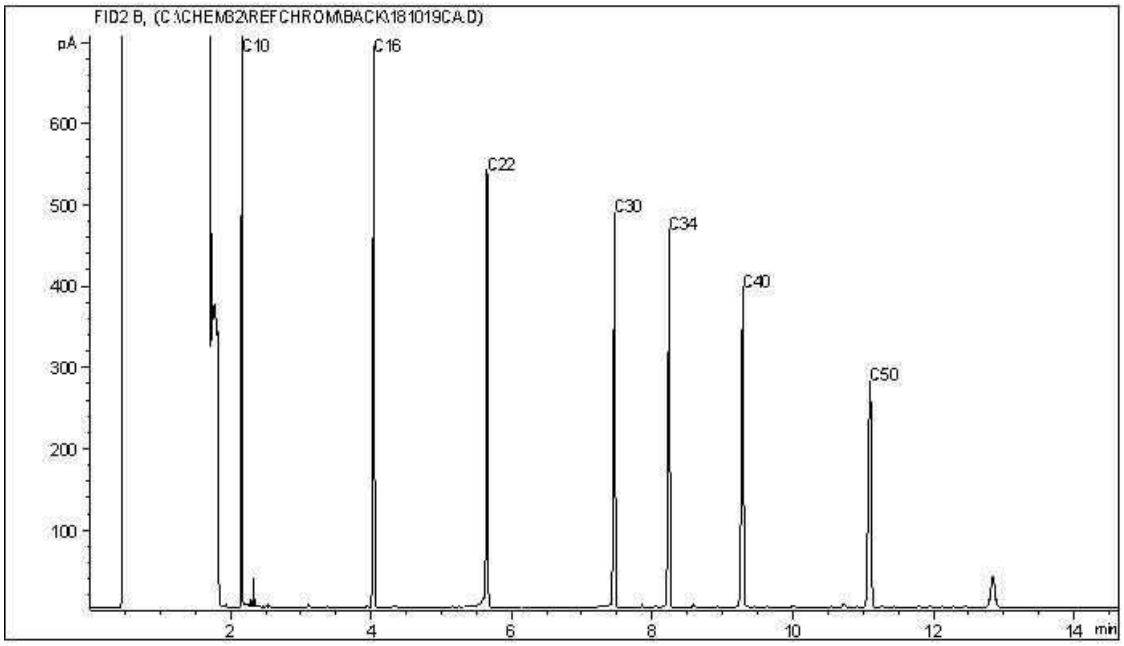
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) 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+

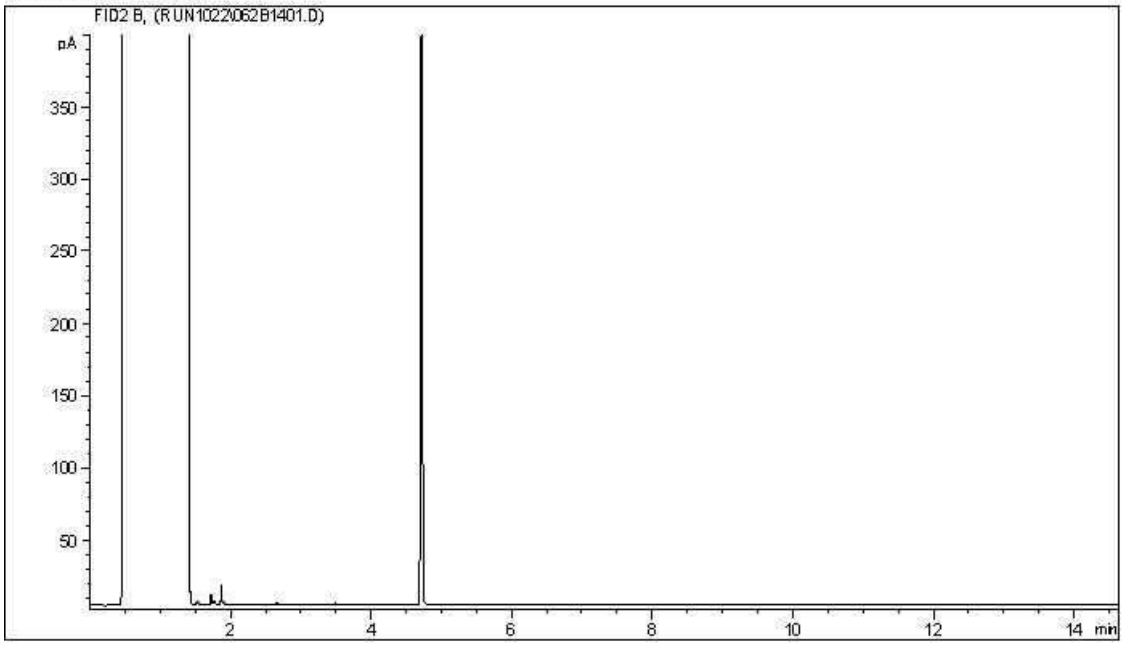
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B892043
Report Date: 2018/10/24
Maxxam Sample: UP2611 Lab-Dup

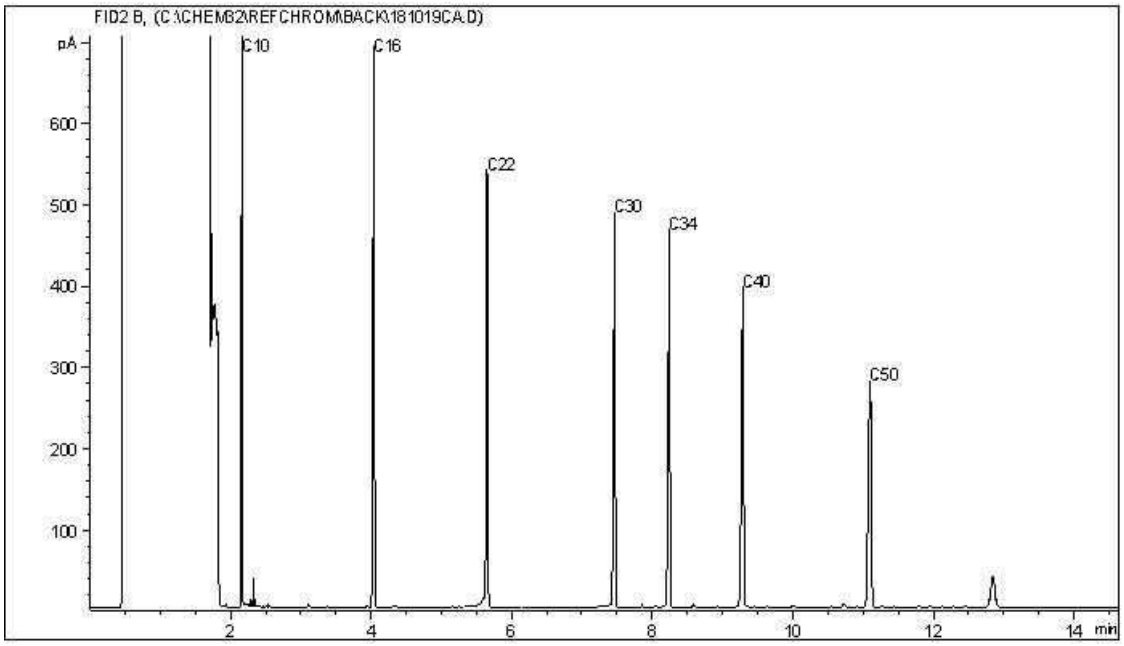
CLIFTON ASSOCIATES LTD.
Client ID: HYDRA 1

CCME Hydrocarbons in Water (F2; C10-C16) 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.

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Your Project #: CG24301.1 E32
Your C.O.C. #: M045919

Attention: Stephen D'Abadie

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

Report Date: 2018/10/29
Report #: R2642292
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B892864
Received: 2018/10/23, 14:42

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/10/24	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2018/10/25	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/10/25	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	1	2018/10/25	2018/10/25	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	8	2018/10/25	2018/10/26	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	1	N/A	2018/10/29	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	1	2018/10/25	2018/10/26	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	10	N/A	2018/10/25	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	4	N/A	2018/10/24	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List)	6	N/A	2018/10/25	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG24301.1 E32
Your C.O.C. #: M045919

Attention: Stephen D'Abadie

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

Report Date: 2018/10/29
Report #: R2642292
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B892864
Received: 2018/10/23, 14:42

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) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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
==========
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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Maxxam Job #: B892864
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UP7161	UP7162	UP7163	UP7164	UP7165	UP7166		
Sampling Date		2018/10/23 09:50	2018/10/23 11:00	2018/10/23 09:40	2018/10/23 09:25	2018/10/23 10:10	2018/10/23 10:20		
COC Number		M045919	M045919	M045919	M045919	M045919	M045919		
	UNITS	**1944**	**1945**	**1946**	**1947**	**1951**	**1980**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	9197683
Volatiles									
Benzene	mg/L	0.016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9197419
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9197419
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9197419
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	9197419
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	9197419
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	<0.00089	0.00089	9197305
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	9197305
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	9197419
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	93	92	93	93	93	93	N/A	9197419
4-Bromofluorobenzene (sur.)	%	90	90	91	90	91	91	N/A	9197419
D4-1,2-Dichloroethane (sur.)	%	90	93	90	92	90	92	N/A	9197419
O-TERPHENYL (sur.)	%	76	85	76	85	86	86	N/A	9197683

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B892864
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UP7167		UP7168	UP7169		
Sampling Date		2018/10/23 10:40		2018/10/23 10:30	2018/10/23 10:00		
COC Number		M045919		M045919	M045919		
	UNITS	**2002**	**QC Batch**	**2003**	**2004**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	9199528	<0.10	<0.10	0.10	9197683
Volatiles							
Benzene	mg/L	<0.00040	9197419	<0.00040	<0.00040	0.00040	9197419
Toluene	mg/L	<0.00040	9197419	<0.00040	<0.00040	0.00040	9197419
Ethylbenzene	mg/L	<0.00040	9197419	<0.00040	<0.00040	0.00040	9197419
m & p-Xylene	mg/L	<0.00080	9197419	<0.00080	<0.00080	0.00080	9197419
o-Xylene	mg/L	<0.00040	9197419	<0.00040	<0.00040	0.00040	9197419
Xylenes (Total)	mg/L	<0.00089	9197305	<0.00089	<0.00089	0.00089	9197305
F1 (C6-C10) - BTEX	mg/L	<0.10	9197305	<0.10	<0.10	0.10	9197305
F1 (C6-C10)	mg/L	<0.10	9197419	<0.10	<0.10	0.10	9197419
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	94	9197419	95	95	N/A	9197419
4-Bromofluorobenzene (sur.)	%	90	9197419	90	89	N/A	9197419
D4-1,2-Dichloroethane (sur.)	%	92	9197419	92	93	N/A	9197419
O-TERPHENYL (sur.)	%	82	9199528	83	91	N/A	9197683

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B892864
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP7167		
Sampling Date		2018/10/23 10:40		
COC Number		M045919		
	UNITS	**2002**	**RDL**	**QC Batch**
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	mg/L	<0.000010	0.000010	9196862
Acenaphthene	mg/L	<0.00010	0.00010	9197679
Acenaphthylene	mg/L	<0.00010	0.00010	9197679
Acridine	mg/L	<0.000050	0.000050	9197679
Anthracene	mg/L	<0.000010	0.000010	9197679
Benzo(a)anthracene	mg/L	<0.0000085	0.0000085	9197679
Benzo(b&j)fluoranthene	mg/L	<0.0000085	0.0000085	9197679
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	9197679
Benzo(g,h,i)perylene	mg/L	<0.0000085	0.0000085	9197679
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	9197679
Benzo(a)pyrene	mg/L	<0.0000075	0.0000075	9197679
Benzo[e]pyrene	mg/L	<0.000050	0.000050	9197679
Chrysene	mg/L	<0.0000085	0.0000085	9197679
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	9197679
Fluoranthene	mg/L	<0.000010	0.000010	9197679
Fluorene	mg/L	<0.000050	0.000050	9197679
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	0.0000085	9197679
1-Methylnaphthalene	mg/L	<0.00010	0.00010	9197679
2-Methylnaphthalene	mg/L	<0.00010	0.00010	9197679
Naphthalene	mg/L	<0.00010	0.00010	9197679
Phenanthrene	mg/L	<0.000050	0.000050	9197679
Perylene	mg/L	<0.000050	0.000050	9197679
Pyrene	mg/L	<0.000020	0.000020	9197679
Quinoline	mg/L	<0.00020	0.00020	9197679
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	108	N/A	9197679
D8-ACENAPHTHYLENE (sur.)	%	99	N/A	9197679
D8-NAPHTHALENE (sur.)	%	83	N/A	9197679
TERPHENYL-D14 (sur.)	%	121	N/A	9197679

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Maxxam Job #: B892864
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP7161	UP7162	UP7163	UP7164	UP7165		
Sampling Date		2018/10/23 09:50	2018/10/23 11:00	2018/10/23 09:40	2018/10/23 09:25	2018/10/23 10:10		
COC Number		M045919	M045919	M045919	M045919	M045919		
	UNITS	**1944**	**1945**	**1946**	**1947**	**1951**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9196588
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9197418
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
RDL = Reportable Detection Limit								

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Maxxam Job #: B892864
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP7161	UP7162	UP7163	UP7164	UP7165		
Sampling Date		2018/10/23 09:50	2018/10/23 11:00	2018/10/23 09:40	2018/10/23 09:25	2018/10/23 10:10		
COC Number		M045919	M045919	M045919	M045919	M045919		
	UNITS	**1944**	**1945**	**1946**	**1947**	**1951**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	101	101	101	99	N/A	9197418
4-Bromofluorobenzene (sur.)	%	98	97	97	98	97	N/A	9197418
D4-1,2-Dichloroethane (sur.)	%	108	101	102	101	100	N/A	9197418

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP7166	UP7167	UP7168	UP7169	UP7170		
Sampling Date		2018/10/23 10:20	2018/10/23 10:40	2018/10/23 10:30	2018/10/23 10:00	2018/10/23		
COC Number		M045919	M045919	M045919	M045919	M045919		
	UNITS	**1980**	**2002**	**2003**	**2004**	**TRIP BLANK 9**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9196588
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9197418
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9197418
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9197418
RDL = Reportable Detection Limit								

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Maxxam Job #: B892864
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UP7166	UP7167	UP7168	UP7169	UP7170		
Sampling Date		2018/10/23 10:20	2018/10/23 10:40	2018/10/23 10:30	2018/10/23 10:00	2018/10/23		
COC Number		M045919	M045919	M045919	M045919	M045919		
	UNITS	**1980**	**2002**	**2003**	**2004**	**TRIP BLANK 9**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9197418
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	100	101	100	100	N/A	9197418
4-Bromofluorobenzene (sur.)	%	97	98	98	98	97	N/A	9197418
D4-1,2-Dichloroethane (sur.)	%	103	105	103	102	99	N/A	9197418

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
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Sampler Initials: AM

GENERAL COMMENTS

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

Package 1	2.0°C

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AM

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9197418	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/24		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/24		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/24		99	%	50 - 140
			Bromodichloromethane	2018/10/24		110	%	50 - 140
			Bromoform	2018/10/24		106	%	50 - 140
			Bromomethane	2018/10/24		106	%	50 - 140
			Carbon tetrachloride	2018/10/24		110	%	50 - 140
			Chlorobenzene	2018/10/24		106	%	50 - 140
			Chlorodibromomethane	2018/10/24		109	%	50 - 140
			Chloroethane	2018/10/24		101	%	50 - 140
			Chloroform	2018/10/24		102	%	50 - 140
			Chloromethane	2018/10/24		126	%	50 - 140
			1,2-dibromoethane	2018/10/24		105	%	50 - 140
			1,2-dichlorobenzene	2018/10/24		111	%	50 - 140
			1,3-dichlorobenzene	2018/10/24		108	%	50 - 140
			1,4-dichlorobenzene	2018/10/24		107	%	50 - 140
			1,1-dichloroethane	2018/10/24		103	%	50 - 140
			1,2-dichloroethane	2018/10/24		107	%	50 - 140
			1,1-dichloroethene	2018/10/24		107	%	50 - 140
			cis-1,2-dichloroethene	2018/10/24		104	%	50 - 140
			trans-1,2-dichloroethene	2018/10/24		101	%	50 - 140
			Dichloromethane	2018/10/24		102	%	50 - 140
			1,2-dichloropropane	2018/10/24		107	%	50 - 140
			cis-1,3-dichloropropene	2018/10/24		103	%	50 - 140
			trans-1,3-dichloropropene	2018/10/24		103	%	50 - 140
			Methyl methacrylate	2018/10/24		107	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/24		103	%	50 - 140
			Styrene	2018/10/24		105	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/24		100	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/24		104	%	50 - 140
			Tetrachloroethene	2018/10/24		102	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/24		102	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/24		101	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/24		102	%	50 - 140
			1,1,1-trichloroethane	2018/10/24		108	%	50 - 140
			1,1,2-trichloroethane	2018/10/24		107	%	50 - 140
			Trichloroethene	2018/10/24		112	%	50 - 140
			Trichlorofluoromethane	2018/10/24		111	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/24		107	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/24		109	%	50 - 140
			Vinyl chloride	2018/10/24		119	%	50 - 140
9197418	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/24		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/24		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/24		100	%	50 - 140
			Bromodichloromethane	2018/10/24		109	%	60 - 130
			Bromoform	2018/10/24		105	%	60 - 130
			Bromomethane	2018/10/24		110	%	60 - 130
			Carbon tetrachloride	2018/10/24		109	%	60 - 130
			Chlorobenzene	2018/10/24		106	%	60 - 130
			Chlorodibromomethane	2018/10/24		109	%	60 - 130
			Chloroethane	2018/10/24		103	%	60 - 130
			Chloroform	2018/10/24		101	%	60 - 130
			Chloromethane	2018/10/24		128	%	60 - 130
			1,2-dibromoethane	2018/10/24		104	%	60 - 130

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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-dichlorobenzene	2018/10/24		107	%	60 - 130
			1,3-dichlorobenzene	2018/10/24		105	%	60 - 130
			1,4-dichlorobenzene	2018/10/24		103	%	60 - 130
			1,1-dichloroethane	2018/10/24		103	%	60 - 130
			1,2-dichloroethane	2018/10/24		106	%	60 - 130
			1,1-dichloroethene	2018/10/24		108	%	60 - 130
			cis-1,2-dichloroethene	2018/10/24		104	%	60 - 130
			trans-1,2-dichloroethene	2018/10/24		101	%	60 - 130
			Dichloromethane	2018/10/24		102	%	60 - 130
			1,2-dichloropropane	2018/10/24		106	%	60 - 130
			cis-1,3-dichloropropene	2018/10/24		102	%	60 - 130
			trans-1,3-dichloropropene	2018/10/24		99	%	60 - 130
			Methyl methacrylate	2018/10/24		105	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/24		103	%	60 - 130
			Styrene	2018/10/24		105	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/24		100	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/24		103	%	60 - 130
			Tetrachloroethene	2018/10/24		103	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/24		95	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/24		95	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/24		98	%	60 - 130
			1,1,1-trichloroethane	2018/10/24		109	%	60 - 130
			1,1,2-trichloroethane	2018/10/24		106	%	60 - 130
			Trichloroethene	2018/10/24		111	%	60 - 130
			Trichlorofluoromethane	2018/10/24		112	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/24		103	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/24		106	%	60 - 130
			Vinyl chloride	2018/10/24		122	%	60 - 130
9197418	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/24		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/24		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/24		102	%	50 - 140
			Bromodichloromethane	2018/10/24	<0.00050		mg/L	
			Bromoform	2018/10/24	<0.00050		mg/L	
			Bromomethane	2018/10/24	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/24	<0.00050		mg/L	
			Chlorobenzene	2018/10/24	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/24	<0.0010		mg/L	
			Chloroethane	2018/10/24	<0.0010		mg/L	
			Chloroform	2018/10/24	<0.00050		mg/L	
			Chloromethane	2018/10/24	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/24	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/24	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/24	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/24	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/24	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/24	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/24	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/24	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/24	<0.00050		mg/L	
			Dichloromethane	2018/10/24	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/24	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/24	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/24	<0.00050		mg/L	
			Methyl methacrylate	2018/10/24	<0.00050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl-tert-butylether (MTBE)	2018/10/24	<0.00050		mg/L	
			Styrene	2018/10/24	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/24	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/24	<0.0020		mg/L	
			Tetrachloroethene	2018/10/24	<0.00050		mg/L	
			1,2,3-trichlorobenzene	2018/10/24	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/24	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/24	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/24	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/24	<0.00050		mg/L	
			Trichloroethene	2018/10/24	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/24	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/24	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/24	<0.00050		mg/L	
			Vinyl chloride	2018/10/24	<0.00050		mg/L	
9197418	MZ	RPD	1,2-dibromoethane	2018/10/24	NC		%	30
			1,2-dichloroethane	2018/10/24	NC		%	30
9197419	WZ0	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/24		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/24		93	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/24		97	%	50 - 140
			Benzene	2018/10/24		92	%	50 - 140
			Toluene	2018/10/24		88	%	50 - 140
			Ethylbenzene	2018/10/24		93	%	50 - 140
			m & p-Xylene	2018/10/24		91	%	50 - 140
			o-Xylene	2018/10/24		95	%	50 - 140
			F1 (C6-C10)	2018/10/24		72	%	60 - 140
9197419	WZ0	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/24		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/24		91	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/24		107	%	50 - 140
			Benzene	2018/10/24		87	%	60 - 130
			Toluene	2018/10/24		89	%	60 - 130
			Ethylbenzene	2018/10/24		89	%	60 - 130
			m & p-Xylene	2018/10/24		87	%	60 - 130
			o-Xylene	2018/10/24		91	%	60 - 130
			F1 (C6-C10)	2018/10/24		86	%	60 - 140
9197419	WZ0	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/24		94	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/24		91	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/24		94	%	50 - 140
			Benzene	2018/10/24	<0.00040		mg/L	
			Toluene	2018/10/24	<0.00040		mg/L	
			Ethylbenzene	2018/10/24	<0.00040		mg/L	
			m & p-Xylene	2018/10/24	<0.00080		mg/L	
			o-Xylene	2018/10/24	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/24	<0.10		mg/L	
9197419	WZ0	RPD	Benzene	2018/10/24	NC		%	30
			Toluene	2018/10/24	NC		%	30
			Ethylbenzene	2018/10/24	NC		%	30
			m & p-Xylene	2018/10/24	NC		%	30
			o-Xylene	2018/10/24	NC		%	30
			F1 (C6-C10)	2018/10/24	NC		%	30
9197679	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/10/26		119	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/26		115	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/26		95	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/26		123	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2018/10/26		94	%	50 - 130
			Acenaphthylene	2018/10/26		101	%	50 - 130
			Acridine	2018/10/26		91	%	50 - 130
			Anthracene	2018/10/26		99	%	50 - 130
			Benzo(a)anthracene	2018/10/26		114	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/26		115	%	50 - 130
			Benzo(k)fluoranthene	2018/10/26		111	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/26		108	%	50 - 130
			Benzo(c)phenanthrene	2018/10/26		113	%	50 - 130
			Benzo(a)pyrene	2018/10/26		113	%	50 - 130
			Benzo[e]pyrene	2018/10/26		108	%	50 - 130
			Chrysene	2018/10/26		114	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/26		112	%	50 - 130
			Fluoranthene	2018/10/26		115	%	50 - 130
			Fluorene	2018/10/26		99	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/26		95	%	50 - 130
			1-Methylnaphthalene	2018/10/26		95	%	50 - 130
			2-Methylnaphthalene	2018/10/26		89	%	50 - 130
			Naphthalene	2018/10/26		91	%	50 - 130
			Phenanthrene	2018/10/26		105	%	50 - 130
			Perylene	2018/10/26		98	%	50 - 130
			Pyrene	2018/10/26		111	%	50 - 130
			Quinoline	2018/10/26		86	%	50 - 130
9197679	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/26		102	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/26		100	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/26		77	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/26		110	%	50 - 130
			Acenaphthene	2018/10/26		86	%	50 - 130
			Acenaphthylene	2018/10/26		91	%	50 - 130
			Acridine	2018/10/26		81	%	50 - 130
			Anthracene	2018/10/26		85	%	50 - 130
			Benzo(a)anthracene	2018/10/26		101	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/26		103	%	50 - 130
			Benzo(k)fluoranthene	2018/10/26		100	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/26		97	%	50 - 130
			Benzo(c)phenanthrene	2018/10/26		95	%	50 - 130
			Benzo(a)pyrene	2018/10/26		102	%	50 - 130
			Benzo[e]pyrene	2018/10/26		96	%	50 - 130
			Chrysene	2018/10/26		100	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/26		102	%	50 - 130
			Fluoranthene	2018/10/26		98	%	50 - 130
			Fluorene	2018/10/26		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/26		88	%	50 - 130
			1-Methylnaphthalene	2018/10/26		83	%	50 - 130
			2-Methylnaphthalene	2018/10/26		78	%	50 - 130
			Naphthalene	2018/10/26		77	%	50 - 130
			Phenanthrene	2018/10/26		91	%	50 - 130
			Perylene	2018/10/26		87	%	50 - 130
			Pyrene	2018/10/26		96	%	50 - 130
			Quinoline	2018/10/26		84	%	50 - 130
9197679	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/26		105	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/26		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/26		67	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/26		115	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2018/10/26	<0.00010		mg/L	
			Acenaphthylene	2018/10/26	<0.00010		mg/L	
			Acridine	2018/10/26	<0.000050		mg/L	
			Anthracene	2018/10/26	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/26	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/26	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/26	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/26	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/26	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/26	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/26	<0.000050		mg/L	
			Chrysene	2018/10/26	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/26	<0.0000075		mg/L	
			Fluoranthene	2018/10/26	<0.000010		mg/L	
			Fluorene	2018/10/26	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/26	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/26	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/26	<0.00010		mg/L	
			Naphthalene	2018/10/26	<0.00010		mg/L	
			Phenanthrene	2018/10/26	<0.000050		mg/L	
			Perylene	2018/10/26	<0.000050		mg/L	
			Pyrene	2018/10/26	<0.000020		mg/L	
			Quinoline	2018/10/26	<0.00020		mg/L	
9197679	LZ3	RPD	Acenaphthene	2018/10/26	NC		%	30
			Acenaphthylene	2018/10/26	NC		%	30
			Acridine	2018/10/26	NC		%	30
			Anthracene	2018/10/26	NC		%	30
			Benzo(a)anthracene	2018/10/26	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/26	NC		%	30
			Benzo(k)fluoranthene	2018/10/26	NC		%	30
			Benzo(g,h,i)perylene	2018/10/26	NC		%	30
			Benzo(c)phenanthrene	2018/10/26	NC		%	30
			Benzo(a)pyrene	2018/10/26	NC		%	30
			Benzo[e]pyrene	2018/10/26	NC		%	30
			Chrysene	2018/10/26	NC		%	30
			Dibenz(a,h)anthracene	2018/10/26	NC		%	30
			Fluoranthene	2018/10/26	NC		%	30
			Fluorene	2018/10/26	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/26	NC		%	30
			1-Methylnaphthalene	2018/10/26	NC		%	30
			2-Methylnaphthalene	2018/10/26	NC		%	30
			Naphthalene	2018/10/26	NC		%	30
			Phenanthrene	2018/10/26	NC		%	30
			Perylene	2018/10/26	NC		%	30
			Pyrene	2018/10/26	NC		%	30
			Quinoline	2018/10/26	NC		%	30
9197683	VP4	Matrix Spike [UP7161-02]	O-TERPHENYL (sur.)	2018/10/26		80	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/26		92	%	60 - 140
9197683	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/26		75	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/26		84	%	60 - 140
9197683	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/26		77	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/26	<0.10		mg/L	
9197683	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/26	NC		%	30
9199528	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/25		86	%	60 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F2 (C10-C16 Hydrocarbons)	2018/10/25		90	%	60 - 140
9199528	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/25		92	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/25		106	%	60 - 140
9199528	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/25		92	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/25	<0.10		mg/L	
9199528	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/25	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).

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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).

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6P8. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

CHAIN OF CUSTODY RECORD

0958

M 045919

Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☐ 5-7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abrade	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 - 30 Ave. NE Calgary AB T2E 7K9	Address:		Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	Stephen.dabrade@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn.kuzyk@Clifton.ca	Copies:		Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	2	2	2
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	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
1	1944		2018.10.23	9:50	GW	6	✓	✓										
2	1945		↓	11:00	↓	6	✓	✓										
3	1946			9:40		6	✓	✓										
4	1947			9:25		6	✓	✓										
5	1951			10:10		6	✓	✓										
6	1980			10:20		6	✓	✓										
7	2002			10:40		8	✓	✓									✓	
8	2003			10:30	✓	6	✓	✓										
9	2004		✓	10:00	GW	6	✓	✓										
10	Trip Blank 9		2018.10.23		W	2	✓											
	Please Indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Regulatory Criteria: ☑ AT1 ☐ CCME ☐ Drinking Water ☐ D50 (Drilling Waste) ☐ Saskatchewan ☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018.10.23	14:35	Isabella Lum ISABELLA LUM	2018/10/23	14:42

23-Oct-18 14:42
Leanne Cameron
B892864

IL4 INS-0003

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

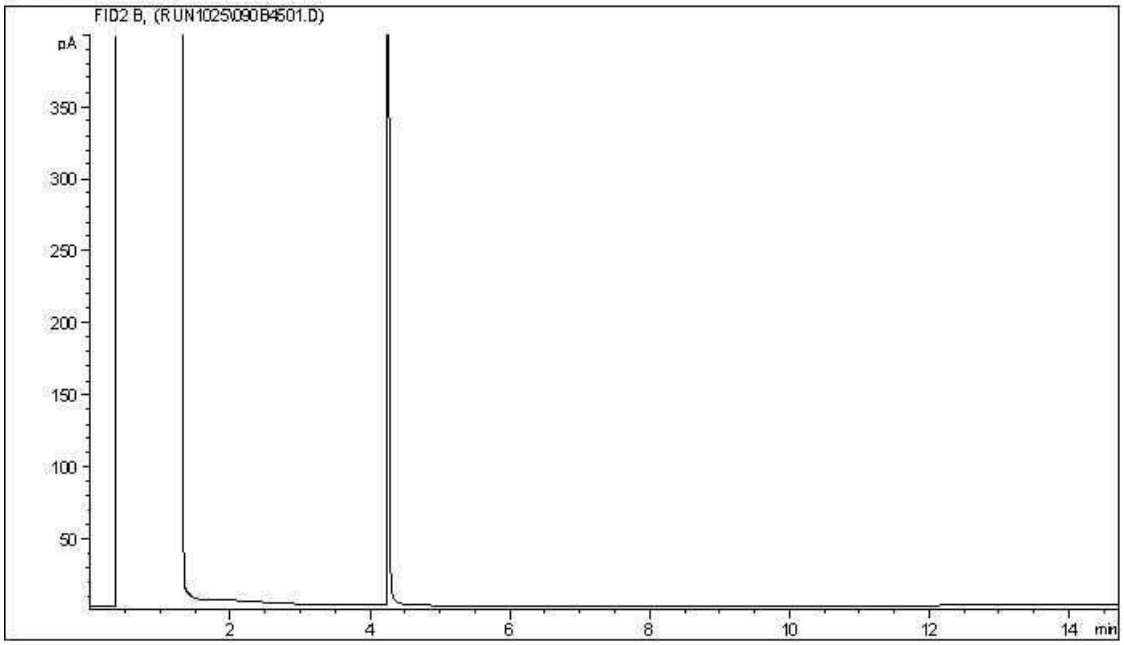
AB FCD-00331/7

Maxxam Job #: B892864
Report Date: 2018/10/29
Maxxam Sample: UP7161

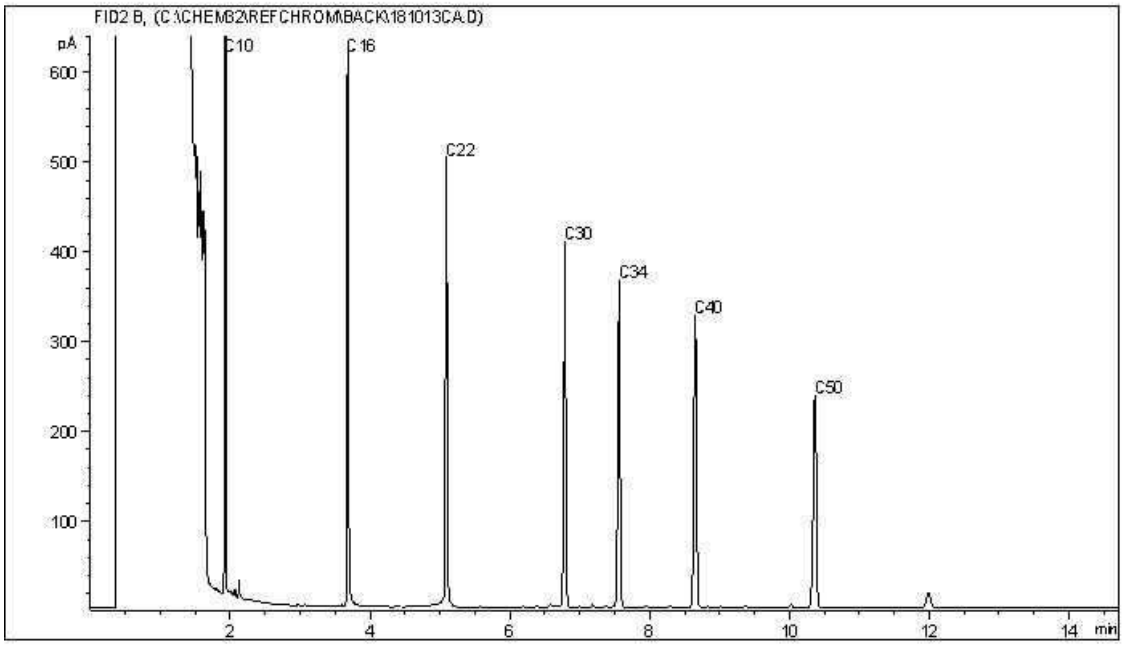
CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Client ID: 1944

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



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+

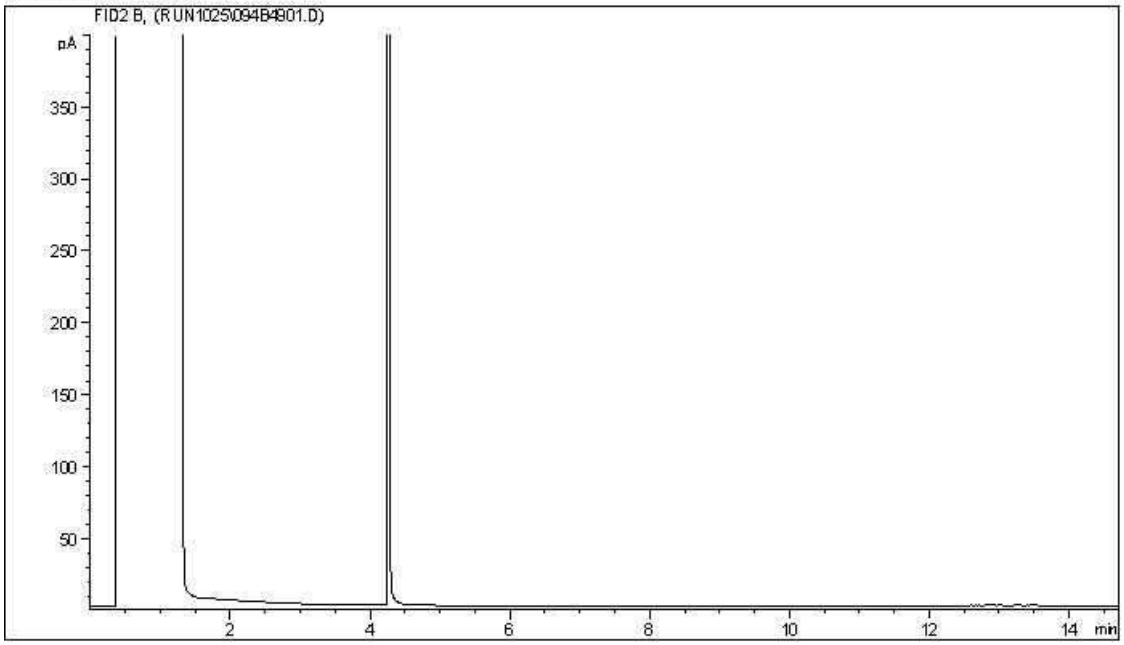
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B892864
Report Date: 2018/10/29
Maxxam Sample: UP7162

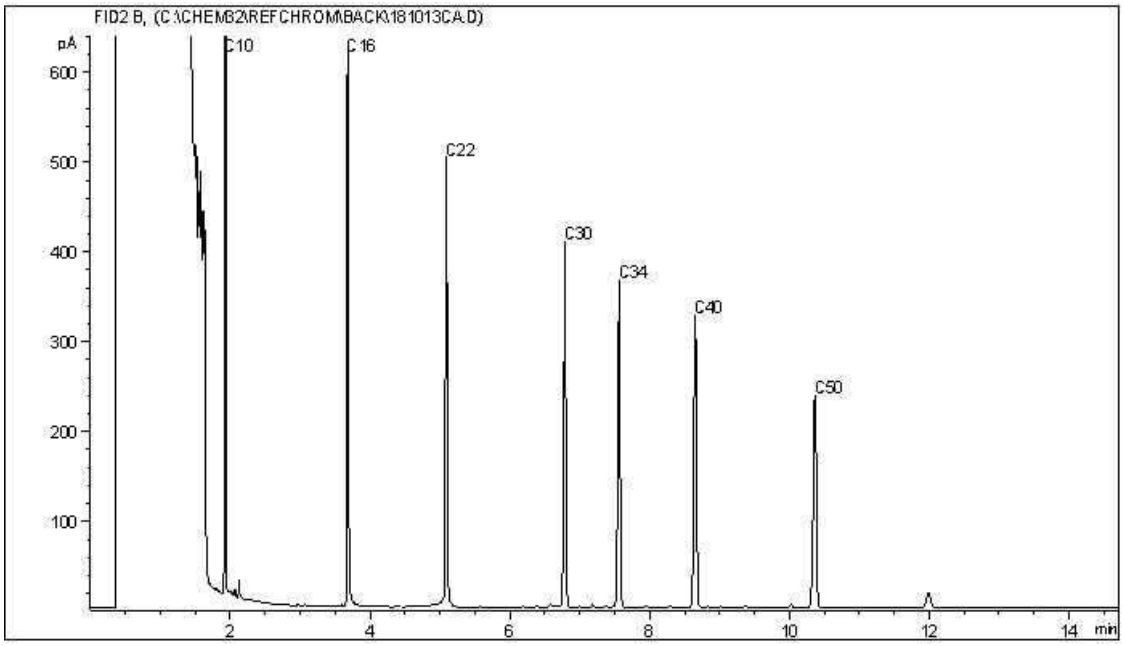
CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Client ID: 1945

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



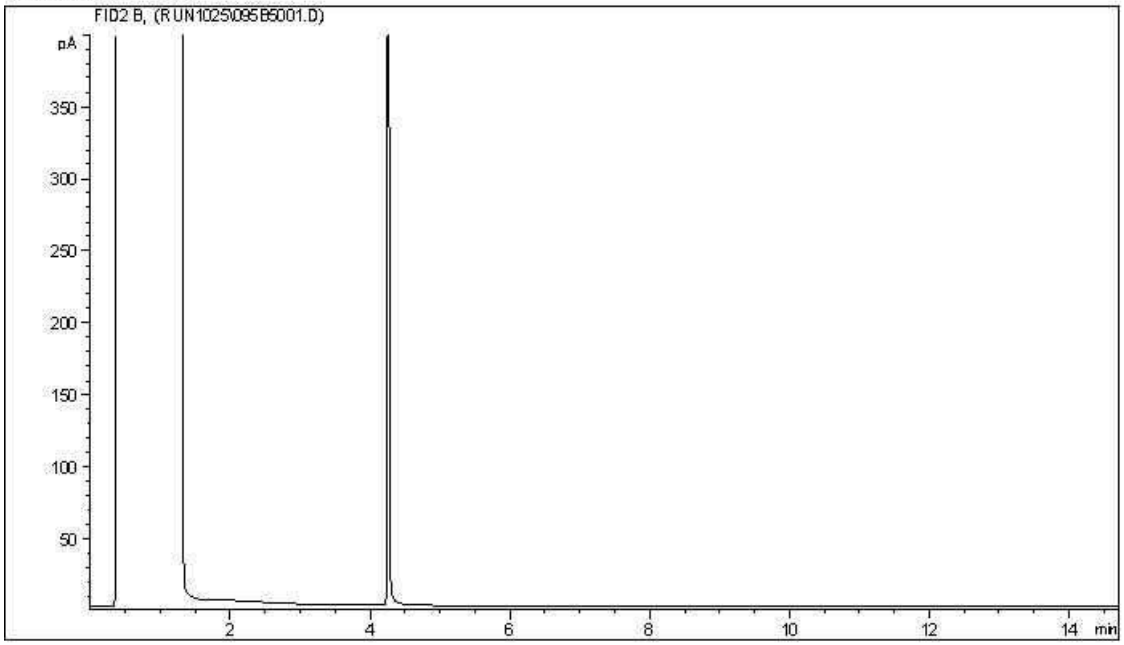
TYPICAL PRODUCT CARBON NUMBER RANGES

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

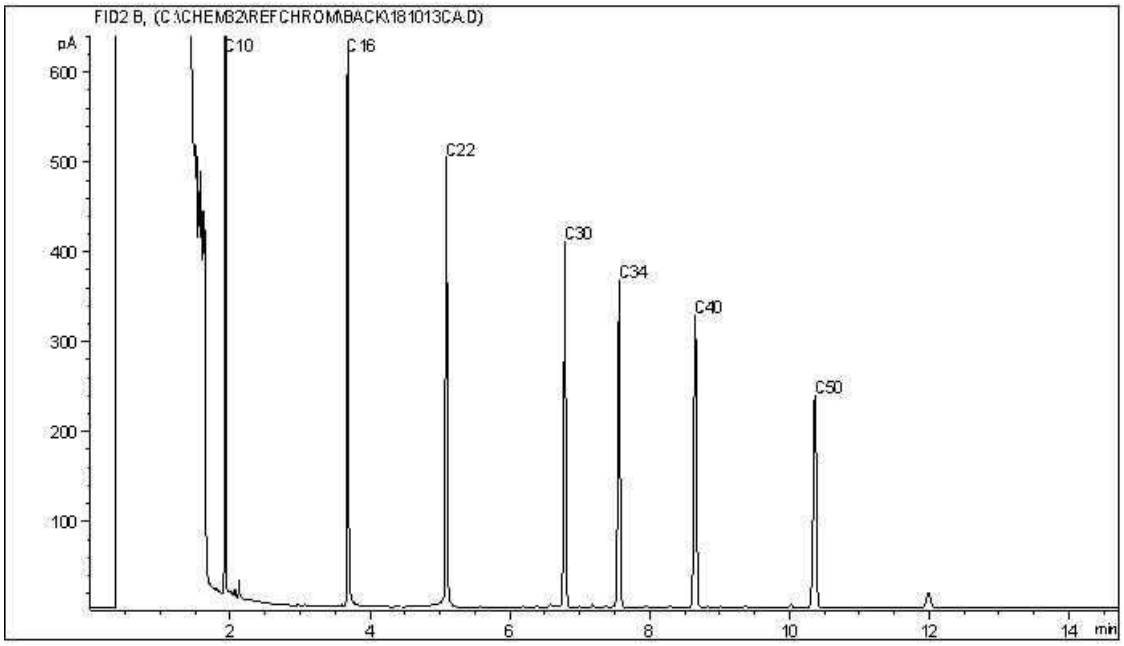
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



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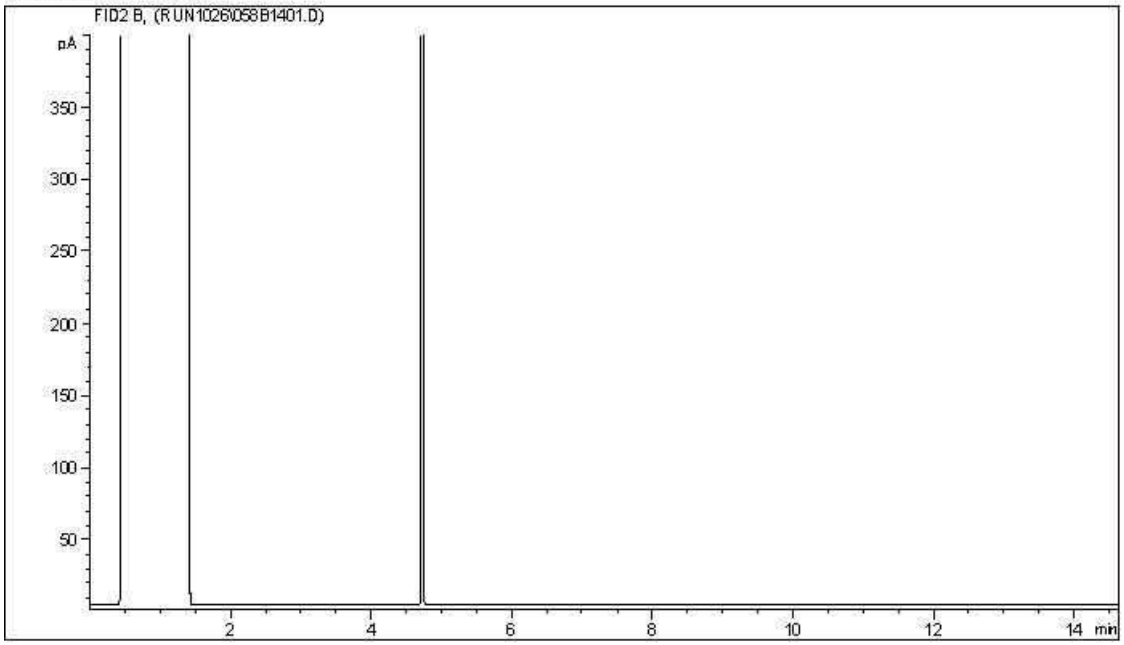
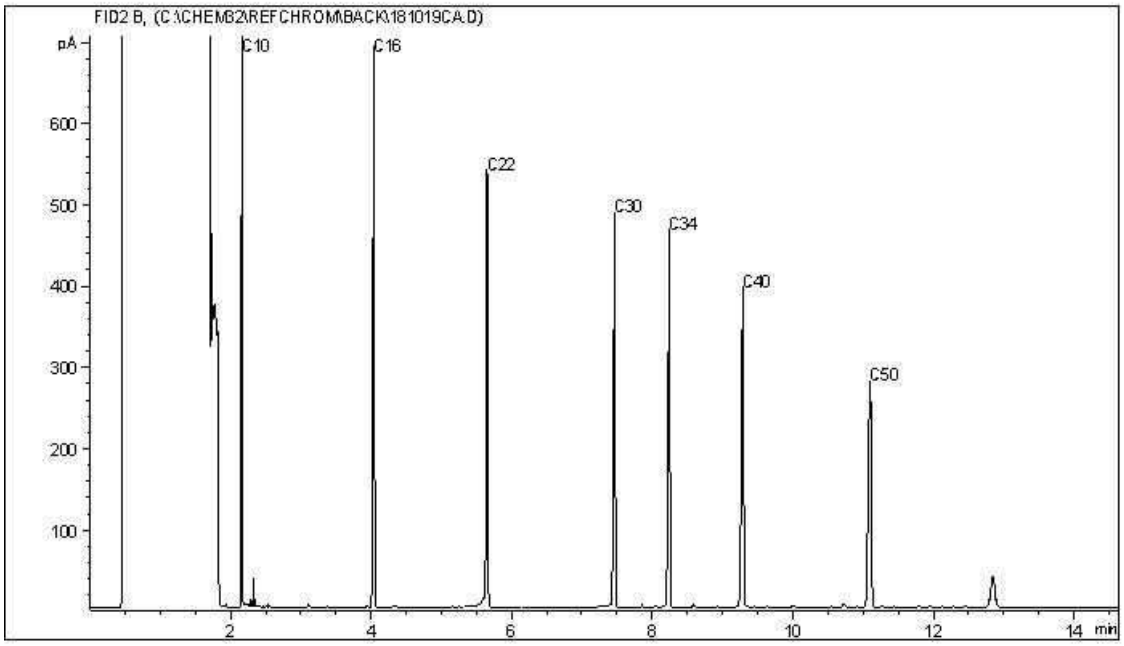
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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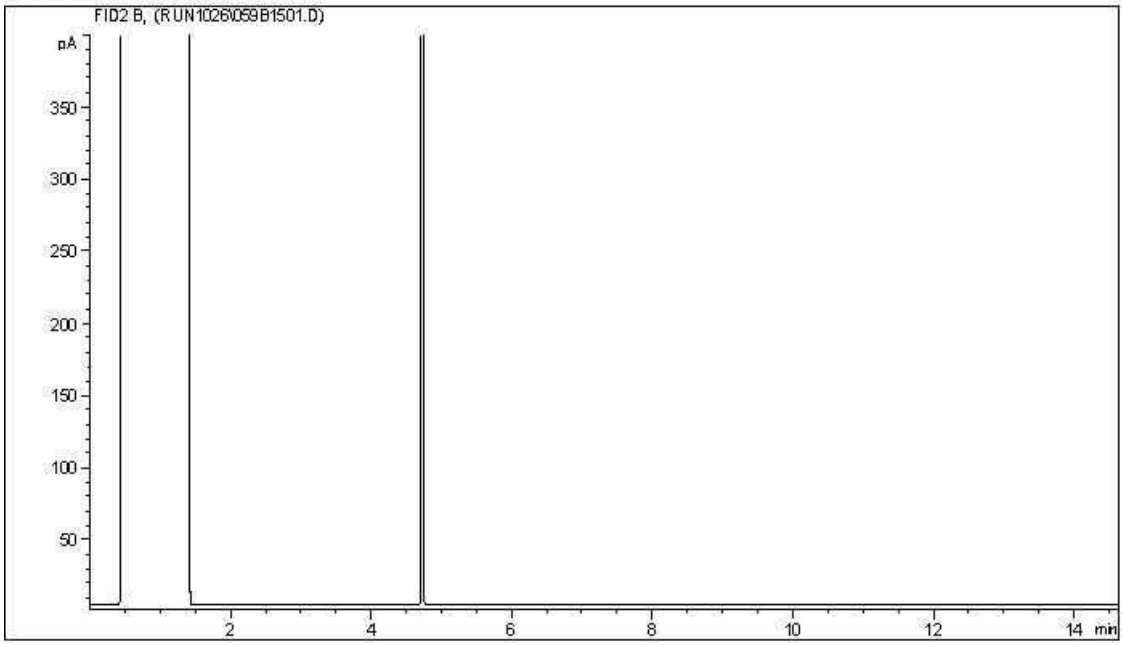
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

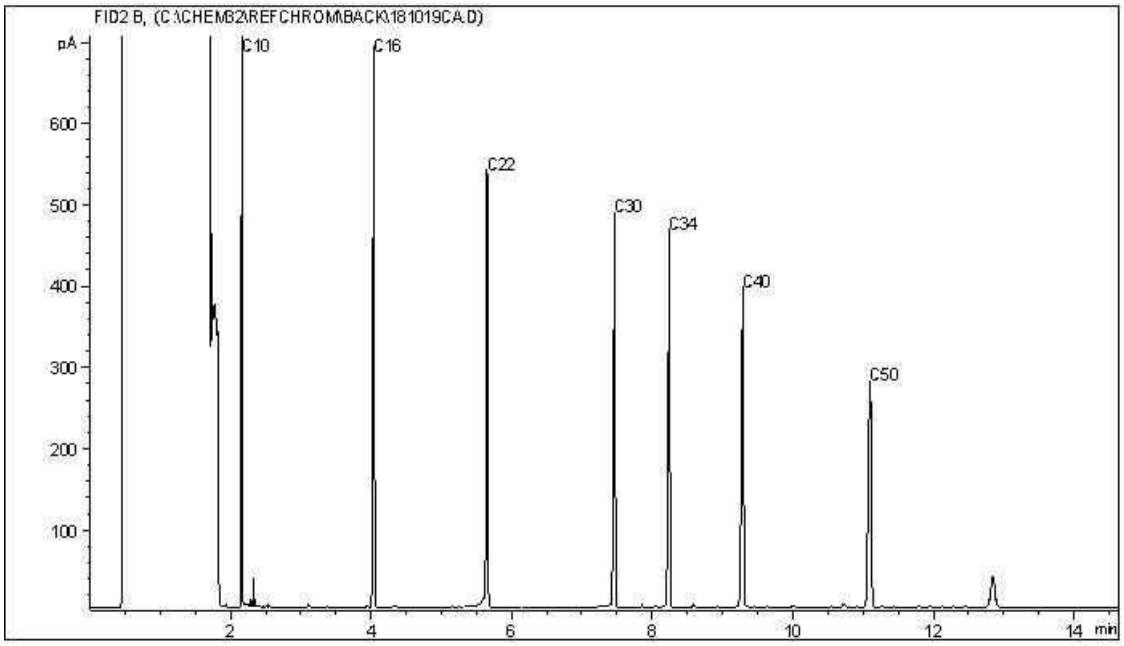
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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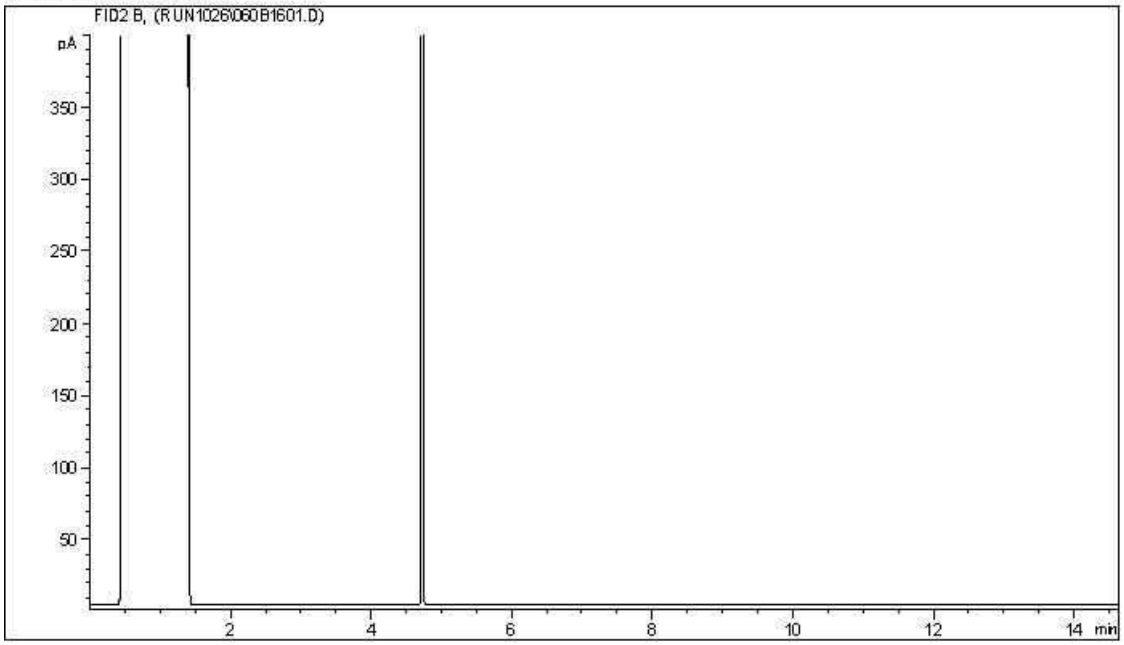
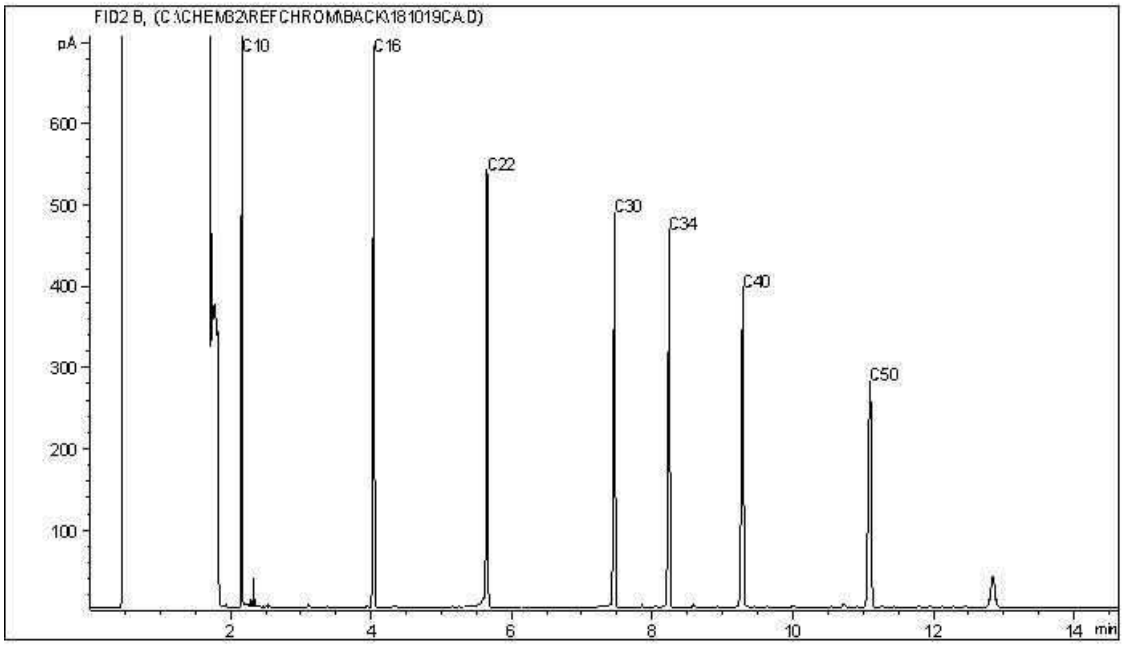


Carbon Range Distribution - Reference Chromatogram



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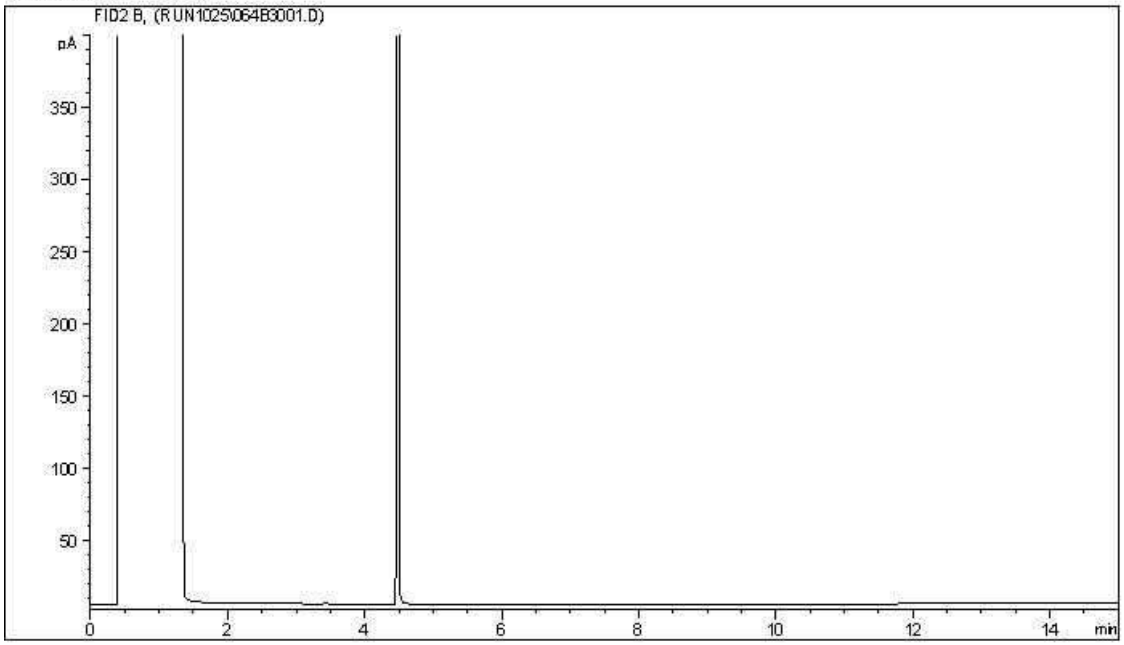
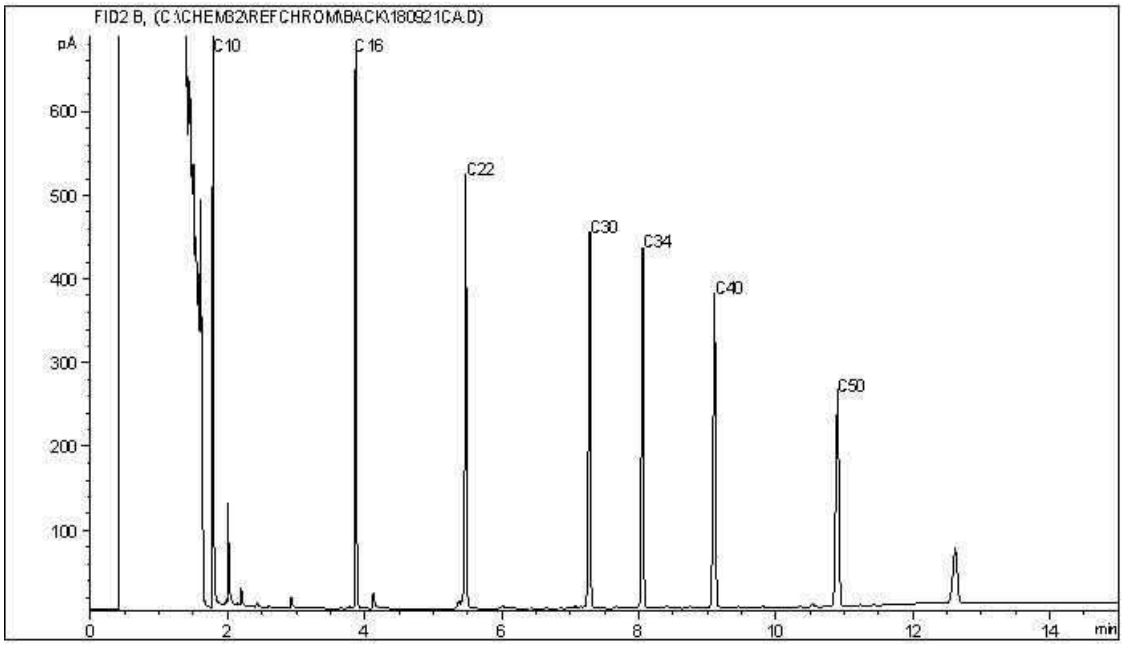
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

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

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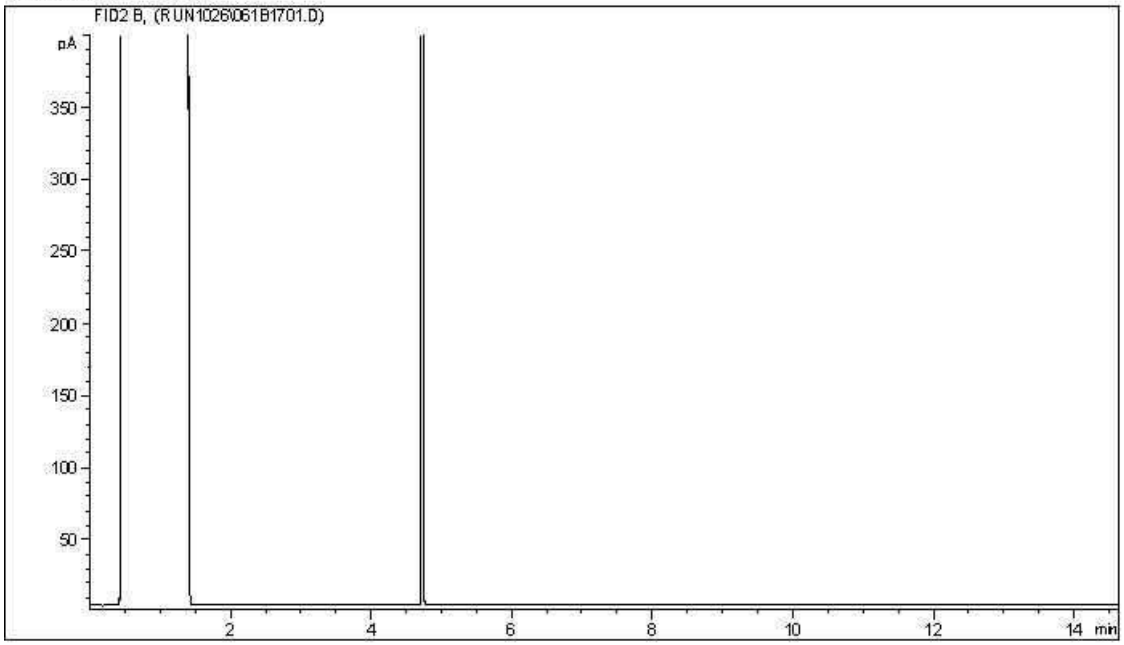
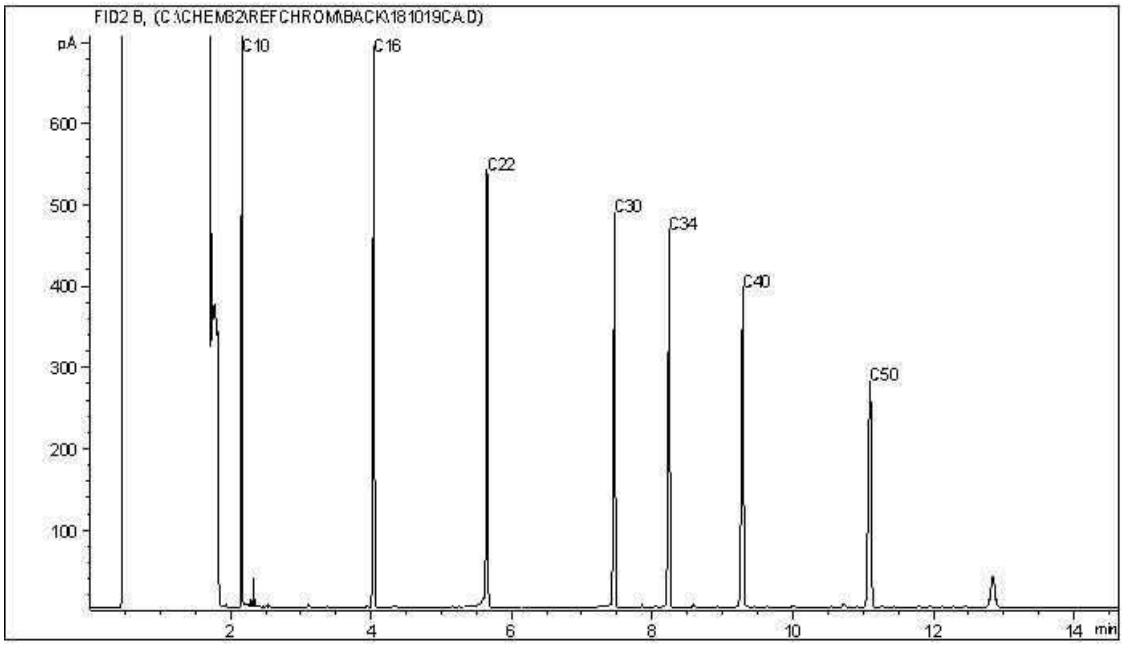
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



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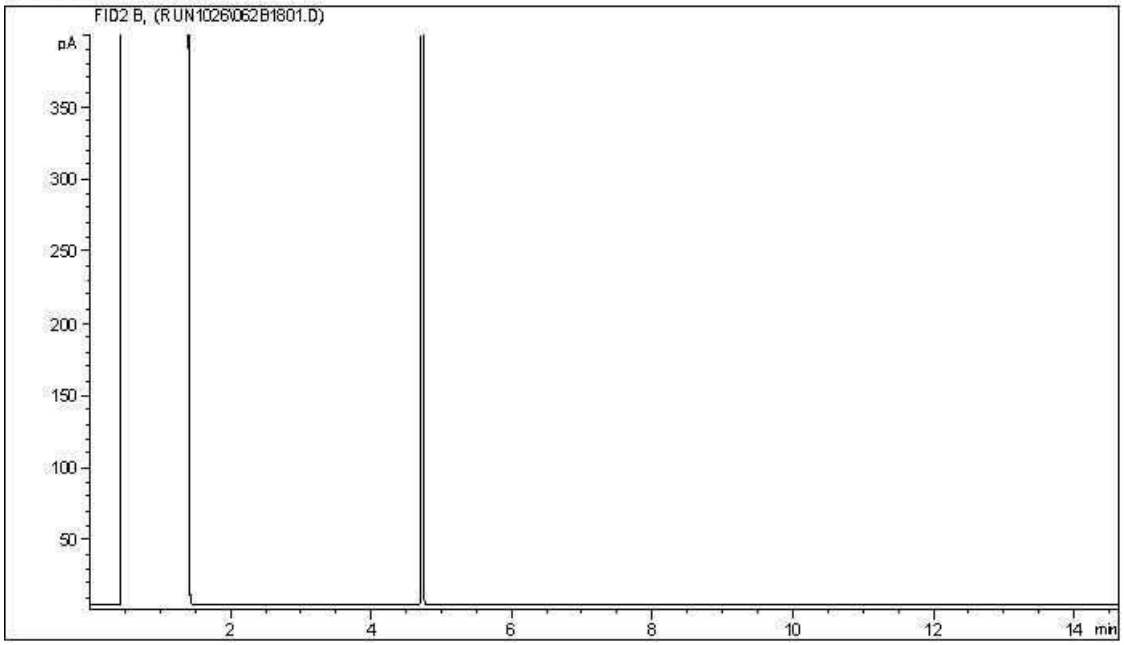

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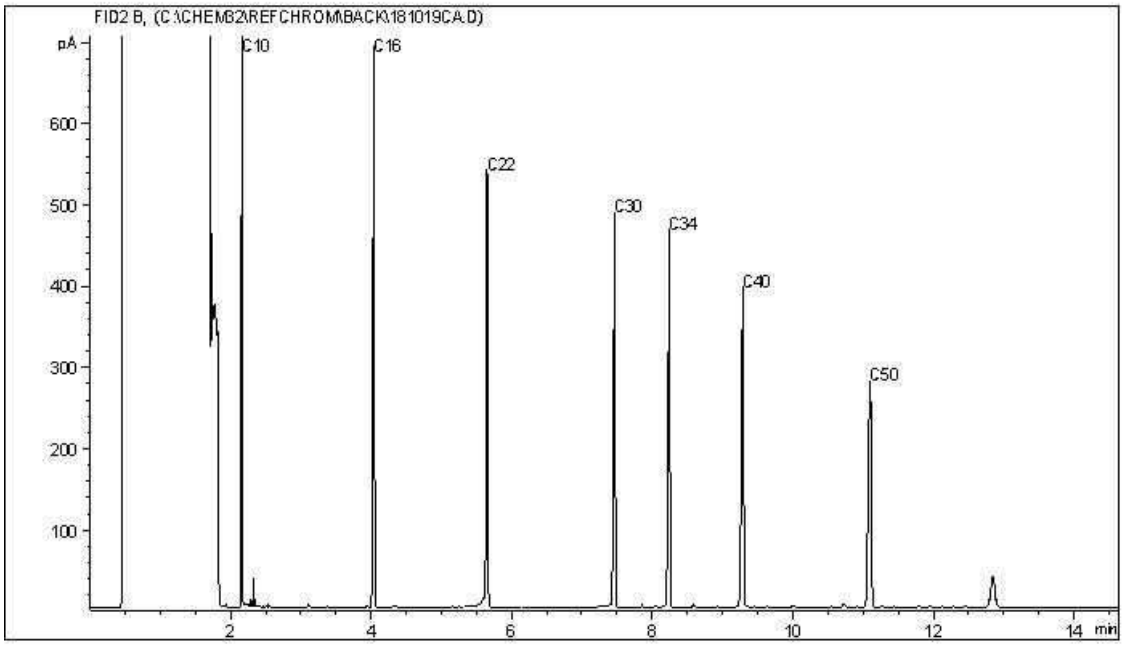

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Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam
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Success Through Science®

Your Project #: CG2430-.1 E32
Your C.O.C. #: m045920

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/29
Report #: R2642181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B893451
Received: 2018/10/24, 14:04

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	9	N/A	2018/10/26	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2018/10/27	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	9	2018/10/26	2018/10/27	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Total Trihalomethanes Calculation	10	N/A	2018/10/29	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	10	N/A	2018/10/26	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.
(1) Silica gel clean up employed.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430-.1 E32
Your C.O.C. #: m045920

Attention: STEPHEN DABADIE

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

Report Date: 2018/10/29
Report #: R2642181
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B893451
Received: 2018/10/24, 14:04

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UQ0359	UQ0360	UQ0361	UQ0362		UQ0363		
Sampling Date		2018/10/24 11:10	2018/10/24 11:40	2018/10/24 11:20	2018/10/24 10:30		2018/10/24 10:45		
COC Number		m045920	m045920	m045920	m045920		m045920		
	UNITS	**1955A**	**1962**	**1964**	**1978**	**RDL**	**2001**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	0.10	9201492
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	<0.00060 (1)	0.00060	9200767
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	<0.00040	0.00040	9200767
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	<0.00040	0.00040	9200767
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	<0.00080	0.00080	9200767
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	<0.00040	0.00040	9200767
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	<0.00089	0.00089	<0.00089	0.00089	9199421
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	0.10	9199421
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	0.10	9200767
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	91	92	91	84	N/A	79	N/A	9200767
4-Bromofluorobenzene (sur.)	%	87	91	89	82	N/A	82	N/A	9200767
D4-1,2-Dichloroethane (sur.)	%	88	91	91	81	N/A	79	N/A	9200767
O-TERPHENYL (sur.)	%	100	100	94	101	N/A	89	N/A	9201492

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limit raised due to interferent.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UQ0364	UQ0365	UQ0366		UQ0367		
Sampling Date		2018/10/24 11:20	2018/10/24 10:55	2018/10/24 13:00		2018/10/24 12:45		
COC Number		m045920	m045920	m045920		m045920		
	UNITS	**2006**	**912**	**EX4**	**RDL**	**EX7**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.55	0.10	0.28	0.10	9201492
Volatiles								
Benzene	mg/L	<0.00040	<0.00040	0.26	0.00040	1.9 (1)	0.0020	9200767
Toluene	mg/L	<0.00040	<0.00040	0.022	0.00040	0.049	0.00040	9200767
Ethylbenzene	mg/L	<0.00040	<0.00040	0.38	0.00040	0.48	0.00040	9200767
m & p-Xylene	mg/L	<0.00080	<0.00080	0.88	0.00080	0.21	0.00080	9200767
o-Xylene	mg/L	<0.00040	<0.00040	0.081	0.00040	0.047	0.00040	9200767
Xylenes (Total)	mg/L	<0.00089	<0.00089	0.96	0.00089	0.25	0.00089	9199421
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	1.9	0.10	1.9	0.10	9199421
F1 (C6-C10)	mg/L	<0.10	<0.10	3.5	0.10	4.6	0.10	9200767
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	93	91	83	N/A	85	N/A	9200767
4-Bromofluorobenzene (sur.)	%	89	91	87	N/A	93	N/A	9200767
D4-1,2-Dichloroethane (sur.)	%	91	90	72	N/A	80	N/A	9200767
O-TERPHENYL (sur.)	%	91	89	97	N/A	91	N/A	9201492

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ0359	UQ0360	UQ0361	UQ0362		UQ0363		
Sampling Date		2018/10/24 11:10	2018/10/24 11:40	2018/10/24 11:20	2018/10/24 10:30		2018/10/24 10:45		
COC Number		m045920	m045920	m045920	m045920		m045920		
	UNITS	**1955A**	**1962**	**1964**	**1978**	**RDL**	**2001**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	<0.0013	0.0013	9199760
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00043 (1)	0.00043	9200774
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	0.0015	0.00050	9200774
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ0359	UQ0360	UQ0361	UQ0362		UQ0363		
Sampling Date		2018/10/24 11:10	2018/10/24 11:40	2018/10/24 11:20	2018/10/24 10:30		2018/10/24 10:45		
COC Number		m045920	m045920	m045920	m045920		m045920		
	UNITS	**1955A**	**1962**	**1964**	**1978**	**RDL**	**2001**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	101	101	101	N/A	101	N/A	9200774
4-Bromofluorobenzene (sur.)	%	96	96	95	95	N/A	96	N/A	9200774
D4-1,2-Dichloroethane (sur.)	%	103	101	102	106	N/A	107	N/A	9200774

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ0364	UQ0365		UQ0366		UQ0367		
Sampling Date		2018/10/24 11:20	2018/10/24 10:55		2018/10/24 13:00		2018/10/24 12:45		
COC Number		m045920	m045920		m045920		m045920		
	UNITS	**2006**	**912**	**RDL**	**EX4**	**RDL**	**EX7**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	<0.0013	0.0013	<0.0013	0.0013	<0.0013	0.0013	9199760
Bromodichloromethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Bromoform	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Bromomethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
Carbon tetrachloride	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Chlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Chlorodibromomethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
Chloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
Chloroform	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Chloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	0.0081	0.0020	9200774
1,2-dibromoethane	mg/L	<0.00020	<0.00020	0.00020	0.00047 (1)	0.00020	<0.00020	0.00020	9200774
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1-dichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,2-dichloroethane	mg/L	0.0068	<0.00050	0.00050	0.014	0.00050	0.25	0.00050	9200774
1,1-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Dichloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
1,2-dichloropropane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Methyl methacrylate	mg/L	<0.00050	<0.00050	0.00050	<0.0045 (2)	0.0045	<0.0045 (2)	0.0045	9200774
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Styrene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	0.0020	<0.0020	0.0020	<0.0020	0.0020	9200774
Tetrachloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774

RDL = Reportable Detection Limit
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.
(2) Detection limits raised due to matrix interference.

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ0364	UQ0365		UQ0366		UQ0367		
Sampling Date		2018/10/24 11:20	2018/10/24 10:55		2018/10/24 13:00		2018/10/24 12:45		
COC Number		m045920	m045920		m045920		m045920		
	UNITS	**2006**	**912**	**RDL**	**EX4**	**RDL**	**EX7**	**RDL**	**QC Batch**
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9200774
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.00090 (1)	0.00090	0.0066 (2)	0.00050	9200774
Trichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	0.00050	0.18	0.00050	0.031	0.00050	9200774
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	0.00050	0.023	0.00050	0.035	0.00050	9200774
Vinyl chloride	mg/L	<0.00050	<0.00050	0.00050	<0.00050	0.00050	<0.00050	0.00050	9200774
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	101	N/A	103	N/A	104	N/A	9200774
4-Bromofluorobenzene (sur.)	%	96	96	N/A	98	N/A	95	N/A	9200774
D4-1,2-Dichloroethane (sur.)	%	105	102	N/A	139	N/A	121	N/A	9200774

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
(2) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ0368		
Sampling Date		2018/10/24		
COC Number		m045920		
	UNITS	**TRIP BLANK 10**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9199760
Benzene	mg/L	<0.00040	0.00040	9200774
Bromodichloromethane	mg/L	<0.00050	0.00050	9200774
Bromoform	mg/L	<0.00050	0.00050	9200774
Bromomethane	mg/L	<0.0020	0.0020	9200774
Carbon tetrachloride	mg/L	<0.00050	0.00050	9200774
Chlorobenzene	mg/L	<0.00050	0.00050	9200774
Chlorodibromomethane	mg/L	<0.0010	0.0010	9200774
Chloroethane	mg/L	<0.0010	0.0010	9200774
Chloroform	mg/L	<0.00050	0.00050	9200774
Chloromethane	mg/L	<0.0020	0.0020	9200774
1,2-dibromoethane	mg/L	<0.00020	0.00020	9200774
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9200774
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9200774
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9200774
1,1-dichloroethane	mg/L	<0.00050	0.00050	9200774
1,2-dichloroethane	mg/L	<0.00050	0.00050	9200774
1,1-dichloroethene	mg/L	<0.00050	0.00050	9200774
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9200774
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9200774
Dichloromethane	mg/L	<0.0020	0.0020	9200774
1,2-dichloropropane	mg/L	<0.00050	0.00050	9200774
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9200774
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9200774
Ethylbenzene	mg/L	<0.00040	0.00040	9200774
Methyl methacrylate	mg/L	<0.00050	0.00050	9200774
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9200774
Styrene	mg/L	<0.00050	0.00050	9200774
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9200774
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9200774
Tetrachloroethene	mg/L	<0.00050	0.00050	9200774
RDL = Reportable Detection Limit				

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ0368		
Sampling Date		2018/10/24		
COC Number		m045920		
	UNITS	**TRIP BLANK 10**	**RDL**	**QC Batch**
Toluene	mg/L	<0.00040	0.00040	9200774
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9200774
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9200774
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9200774
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9200774
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9200774
Trichloroethene	mg/L	<0.00050	0.00050	9200774
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9200774
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9200774
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9200774
Vinyl chloride	mg/L	<0.00050	0.00050	9200774
Xylenes (Total)	mg/L	<0.00080	0.00080	9200774
m & p-Xylene	mg/L	<0.00080	0.00080	9200774
o-Xylene	mg/L	<0.00040	0.00040	9200774
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99	N/A	9200774
4-Bromofluorobenzene (sur.)	%	97	N/A	9200774
D4-1,2-Dichloroethane (sur.)	%	101	N/A	9200774

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

GENERAL COMMENTS

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

Package 1	6.7°C

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9200767	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/26		90	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/26		92	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/26		89	%	50 - 140
			Benzene	2018/10/26		86	%	50 - 140
			Toluene	2018/10/26		94	%	50 - 140
			Ethylbenzene	2018/10/26		96	%	50 - 140
			m & p-Xylene	2018/10/26		93	%	50 - 140
			o-Xylene	2018/10/26		97	%	50 - 140
			F1 (C6-C10)	2018/10/26		88	%	60 - 140
9200767	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/26		90	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/26		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/26		100	%	50 - 140
			Benzene	2018/10/26		85	%	60 - 130
			Toluene	2018/10/26		93	%	60 - 130
			Ethylbenzene	2018/10/26		98	%	60 - 130
			m & p-Xylene	2018/10/26		100	%	60 - 130
			o-Xylene	2018/10/26		100	%	60 - 130
			F1 (C6-C10)	2018/10/26		90	%	60 - 140
9200767	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/26		83	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/26		85	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/26		83	%	50 - 140
			Benzene	2018/10/26	<0.00040		mg/L	
			Toluene	2018/10/26	<0.00040		mg/L	
			Ethylbenzene	2018/10/26	<0.00040		mg/L	
			m & p-Xylene	2018/10/26	<0.00080		mg/L	
			o-Xylene	2018/10/26	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/26	<0.10		mg/L	
9200767	DO1	RPD	Benzene	2018/10/26	NC		%	30
			Toluene	2018/10/26	NC		%	30
			Ethylbenzene	2018/10/26	NC		%	30
			m & p-Xylene	2018/10/26	NC		%	30
			o-Xylene	2018/10/26	NC		%	30
			F1 (C6-C10)	2018/10/26	NC		%	30
9200774	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/26		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/26		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/26		94	%	50 - 140
			Benzene	2018/10/26		97	%	50 - 140
			Bromodichloromethane	2018/10/26		110	%	50 - 140
			Bromoform	2018/10/26		103	%	50 - 140
			Bromomethane	2018/10/26		111	%	50 - 140
			Carbon tetrachloride	2018/10/26		109	%	50 - 140
			Chlorobenzene	2018/10/26		103	%	50 - 140
			Chlorodibromomethane	2018/10/26		105	%	50 - 140
			Chloroethane	2018/10/26		101	%	50 - 140
			Chloroform	2018/10/26		103	%	50 - 140
			Chloromethane	2018/10/26		121	%	50 - 140
			1,2-dibromoethane	2018/10/26		102	%	50 - 140
			1,2-dichlorobenzene	2018/10/26		107	%	50 - 140
			1,3-dichlorobenzene	2018/10/26		106	%	50 - 140
			1,4-dichlorobenzene	2018/10/26		104	%	50 - 140
			1,1-dichloroethane	2018/10/26		103	%	50 - 140
			1,2-dichloroethane	2018/10/26		107	%	50 - 140
			1,1-dichloroethene	2018/10/26		106	%	50 - 140
			cis-1,2-dichloroethene	2018/10/26		104	%	50 - 140

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Maxxam Job #: B893451
Report Date: 2018/10/29

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,2-dichloroethene	2018/10/26		101	%	50 - 140
			Dichloromethane	2018/10/26		102	%	50 - 140
			1,2-dichloropropane	2018/10/26		108	%	50 - 140
			cis-1,3-dichloropropene	2018/10/26		116	%	50 - 140
			trans-1,3-dichloropropene	2018/10/26		115	%	50 - 140
			Ethylbenzene	2018/10/26		97	%	50 - 140
			Methyl methacrylate	2018/10/26		110	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/26		105	%	50 - 140
			Styrene	2018/10/26		102	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/26		98	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/26		102	%	50 - 140
			Tetrachloroethene	2018/10/26		99	%	50 - 140
			Toluene	2018/10/26		99	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/26		100	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/26		100	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/26		101	%	50 - 140
			1,1,1-trichloroethane	2018/10/26		108	%	50 - 140
			1,1,2-trichloroethane	2018/10/26		108	%	50 - 140
			Trichloroethene	2018/10/26		112	%	50 - 140
			Trichlorofluoromethane	2018/10/26		110	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/26		103	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/26		106	%	50 - 140
			Vinyl chloride	2018/10/26		117	%	50 - 140
			m & p-Xylene	2018/10/26		97	%	50 - 140
			o-Xylene	2018/10/26		96	%	50 - 140
9200774	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/26		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/26		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/26		99	%	50 - 140
			Benzene	2018/10/26		91	%	60 - 130
			Bromodichloromethane	2018/10/26		105	%	60 - 130
			Bromoform	2018/10/26		98	%	60 - 130
			Bromomethane	2018/10/26		107	%	60 - 130
			Carbon tetrachloride	2018/10/26		103	%	60 - 130
			Chlorobenzene	2018/10/26		97	%	60 - 130
			Chlorodibromomethane	2018/10/26		100	%	60 - 130
			Chloroethane	2018/10/26		98	%	60 - 130
			Chloroform	2018/10/26		97	%	60 - 130
			Chloromethane	2018/10/26		124	%	60 - 130
			1,2-dibromoethane	2018/10/26		97	%	60 - 130
			1,2-dichlorobenzene	2018/10/26		102	%	60 - 130
			1,3-dichlorobenzene	2018/10/26		100	%	60 - 130
			1,4-dichlorobenzene	2018/10/26		98	%	60 - 130
			1,1-dichloroethane	2018/10/26		98	%	60 - 130
			1,2-dichloroethane	2018/10/26		102	%	60 - 130
			1,1-dichloroethene	2018/10/26		102	%	60 - 130
			cis-1,2-dichloroethene	2018/10/26		99	%	60 - 130
			trans-1,2-dichloroethene	2018/10/26		96	%	60 - 130
			Dichloromethane	2018/10/26		97	%	60 - 130
			1,2-dichloropropane	2018/10/26		102	%	60 - 130
			cis-1,3-dichloropropene	2018/10/26		108	%	60 - 130
			trans-1,3-dichloropropene	2018/10/26		106	%	60 - 130
			Ethylbenzene	2018/10/26		92	%	60 - 130
			Methyl methacrylate	2018/10/26		104	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/26		100	%	60 - 130

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Styrene	2018/10/26		97	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/26		92	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/26		97	%	60 - 130
			Tetrachloroethene	2018/10/26		93	%	60 - 130
			Toluene	2018/10/26		94	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/26		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/26		93	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/26		94	%	60 - 130
			1,1,1-trichloroethane	2018/10/26		103	%	60 - 130
			1,1,2-trichloroethane	2018/10/26		102	%	60 - 130
			Trichloroethene	2018/10/26		106	%	60 - 130
			Trichlorofluoromethane	2018/10/26		105	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/26		98	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/26		101	%	60 - 130
			Vinyl chloride	2018/10/26		117	%	60 - 130
			m & p-Xylene	2018/10/26		92	%	60 - 130
			o-Xylene	2018/10/26		90	%	60 - 130
9200774	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/26		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/26		95	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/26		101	%	50 - 140
			Benzene	2018/10/26	<0.00040		mg/L	
			Bromodichloromethane	2018/10/26	<0.00050		mg/L	
			Bromoform	2018/10/26	<0.00050		mg/L	
			Bromomethane	2018/10/26	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/26	<0.00050		mg/L	
			Chlorobenzene	2018/10/26	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/26	<0.0010		mg/L	
			Chloroethane	2018/10/26	<0.0010		mg/L	
			Chloroform	2018/10/26	<0.00050		mg/L	
			Chloromethane	2018/10/26	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/26	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/26	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/26	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/26	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/26	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/26	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/26	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/26	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/26	<0.00050		mg/L	
			Dichloromethane	2018/10/26	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/26	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/26	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/26	<0.00050		mg/L	
			Ethylbenzene	2018/10/26	<0.00040		mg/L	
			Methyl methacrylate	2018/10/26	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/26	<0.00050		mg/L	
			Styrene	2018/10/26	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/26	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/26	<0.0020		mg/L	
			Tetrachloroethene	2018/10/26	<0.00050		mg/L	
			Toluene	2018/10/26	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/26	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/26	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/26	<0.00050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,1-trichloroethane	2018/10/26	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/26	<0.00050		mg/L	
			Trichloroethene	2018/10/26	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/26	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/26	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/26	<0.00050		mg/L	
			Vinyl chloride	2018/10/26	<0.00050		mg/L	
			Xylenes (Total)	2018/10/26	<0.00080		mg/L	
			m & p-Xylene	2018/10/26	<0.00080		mg/L	
			o-Xylene	2018/10/26	<0.00040		mg/L	
9200774	MZ	RPD	Benzene	2018/10/26	NC		%	30
			Bromodichloromethane	2018/10/26	NC		%	30
			Bromoform	2018/10/26	NC		%	30
			Bromomethane	2018/10/26	NC		%	30
			Carbon tetrachloride	2018/10/26	NC		%	30
			Chlorobenzene	2018/10/26	NC		%	30
			Chlorodibromomethane	2018/10/26	NC		%	30
			Chloroethane	2018/10/26	NC		%	30
			Chloroform	2018/10/26	NC		%	30
			Chloromethane	2018/10/26	NC		%	30
			1,2-dibromoethane	2018/10/26	NC		%	30
			1,2-dichlorobenzene	2018/10/26	NC		%	30
			1,3-dichlorobenzene	2018/10/26	NC		%	30
			1,4-dichlorobenzene	2018/10/26	NC		%	30
			1,1-dichloroethane	2018/10/26	NC		%	30
			1,2-dichloroethane	2018/10/26	NC		%	30
			1,1-dichloroethene	2018/10/26	NC		%	30
			cis-1,2-dichloroethene	2018/10/26	NC		%	30
			trans-1,2-dichloroethene	2018/10/26	NC		%	30
			Dichloromethane	2018/10/26	NC		%	30
			1,2-dichloropropane	2018/10/26	NC		%	30
			cis-1,3-dichloropropene	2018/10/26	NC		%	30
			trans-1,3-dichloropropene	2018/10/26	NC		%	30
			Ethylbenzene	2018/10/26	NC		%	30
			Methyl methacrylate	2018/10/26	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/26	NC		%	30
			Styrene	2018/10/26	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/26	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/26	NC		%	30
			Tetrachloroethene	2018/10/26	NC		%	30
			Toluene	2018/10/26	NC		%	30
			1,2,3-trichlorobenzene	2018/10/26	NC		%	30
			1,2,4-trichlorobenzene	2018/10/26	NC		%	30
			1,3,5-trichlorobenzene	2018/10/26	NC		%	30
			1,1,1-trichloroethane	2018/10/26	NC		%	30
			1,1,2-trichloroethane	2018/10/26	NC		%	30
			Trichloroethene	2018/10/26	NC		%	30
			Trichlorofluoromethane	2018/10/26	NC		%	30
			1,2,4-trimethylbenzene	2018/10/26	NC		%	30
			1,3,5-trimethylbenzene	2018/10/26	NC		%	30
			Vinyl chloride	2018/10/26	NC		%	30
			Xylenes (Total)	2018/10/26	NC		%	30
			m & p-Xylene	2018/10/26	NC		%	30
			o-Xylene	2018/10/26	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9201492	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/27		91	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/27		105	%	60 - 140
9201492	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/27		94	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/27		105	%	60 - 140
9201492	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/27		92	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/27	<0.10		mg/L	
9201492	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/27	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).

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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).

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

M 045920

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Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 – 30 Ave NE Calgary. AB T2E 7K9	Address:		Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	stephen_dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn_kuzyk@clifton.ca	Copies:		Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact		✓	Temp:	8	5	7
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp:			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp:			
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	BTEX F1-F4	Routine Water	Regulated Metals Tot ☐ Diss ☐	Mercury Total ☐ Dissolved ☐	Salinity #	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	HOLD - DO NOT ANALYZE
1	1955A		2018.10.24	11:10	GW	6	✓	✓									
2	1962			11:40		6	✓	✓									
3	1964			11:20		6	✓	✓									
4	1978			10:30		6	✓	✓									
5	2001			10:45		6	✓	✓									
6	2006			11:20		6	✓	✓									
7	912			10:55		6	✓	✓									
8	EX4			13:00		6	✓	✓									
9	EX7			12:45	GW	6	✓	✓									
10	Trip Blank 10		2018.10.24		W	2	✓										
	Please indicate Filtered, Preserved or Both (F, P, F/P)						P	P									

Regulatory Criteria
☑ AT1
☐ CCME
☐ Drinking Water
☐ DSO (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

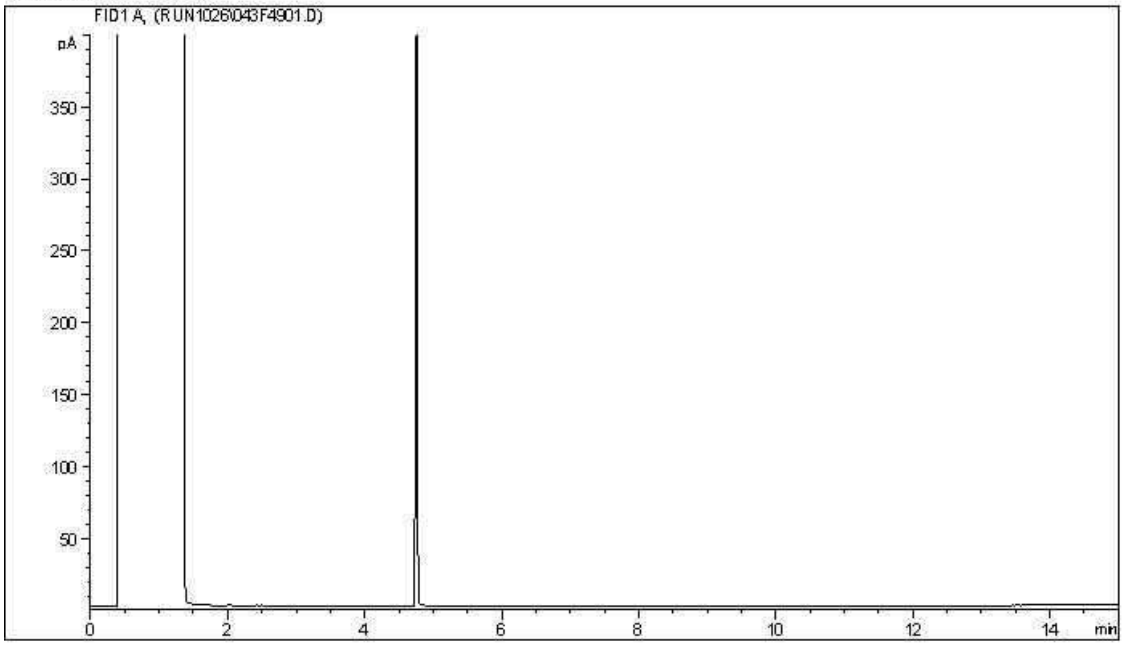
Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Austin Mei	2018.10.29	13:58	ARDEIN VILLAMAYOR	2018/10/29	14:29	B893451

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

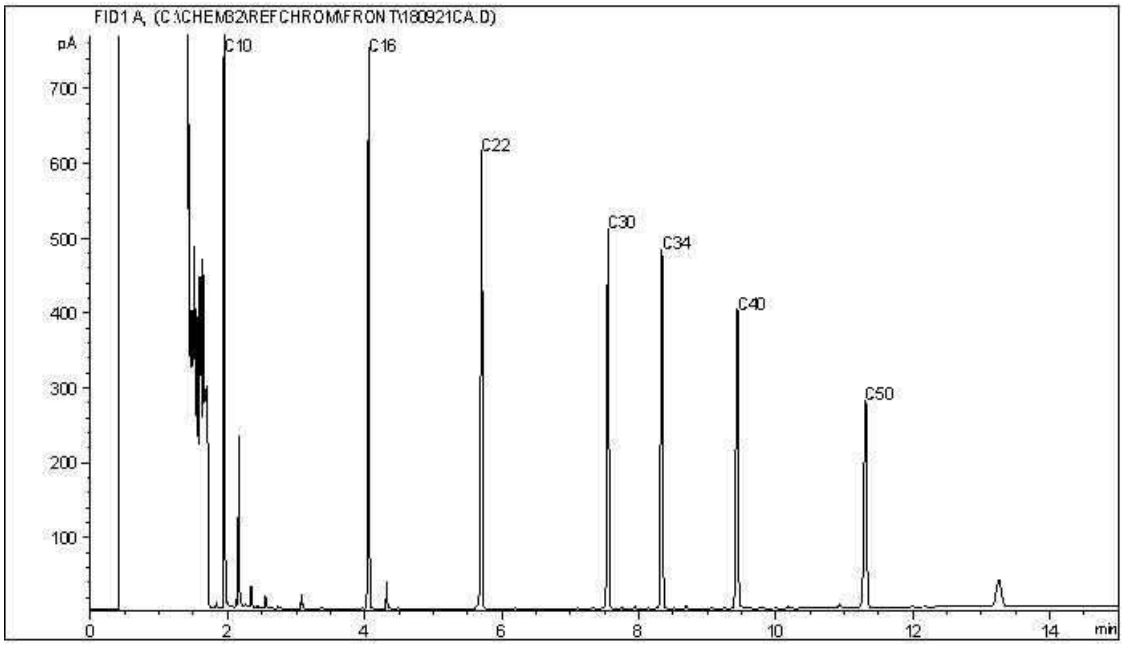
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



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+

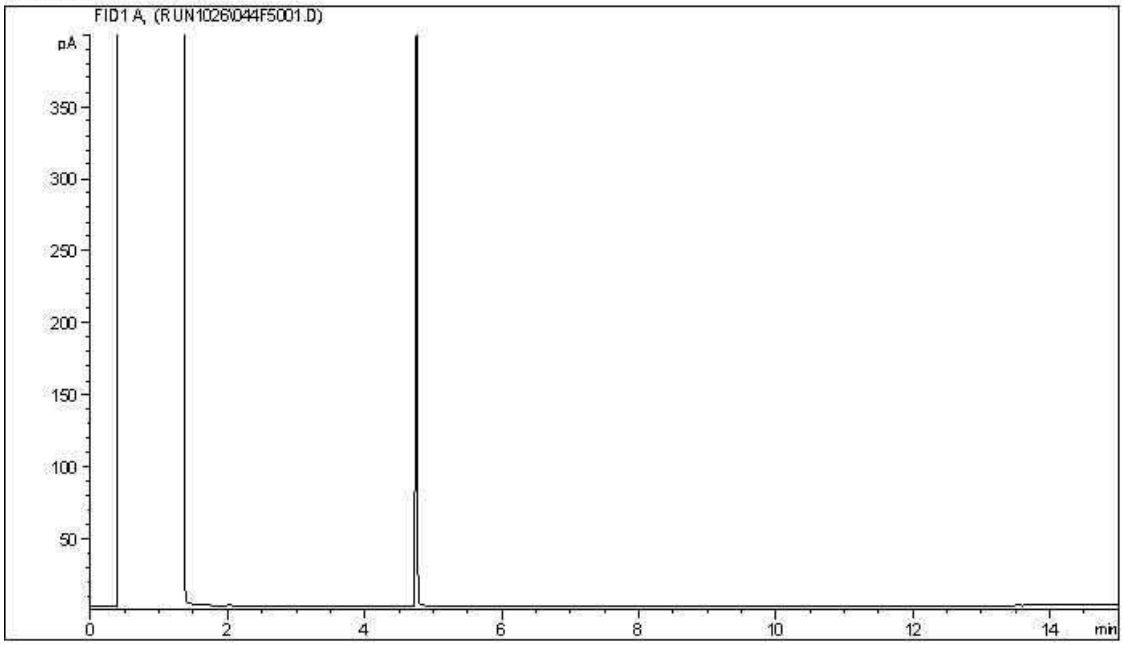
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B893451
Report Date: 2018/10/29
Maxxam Sample: UQ0360

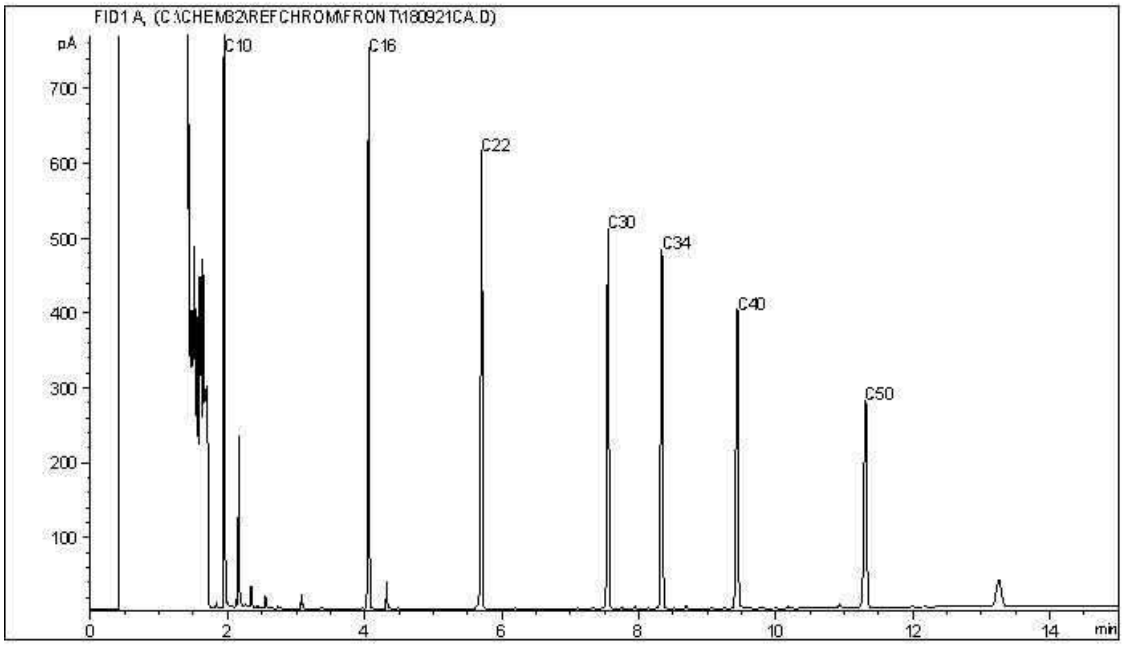
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Client ID: 1962

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



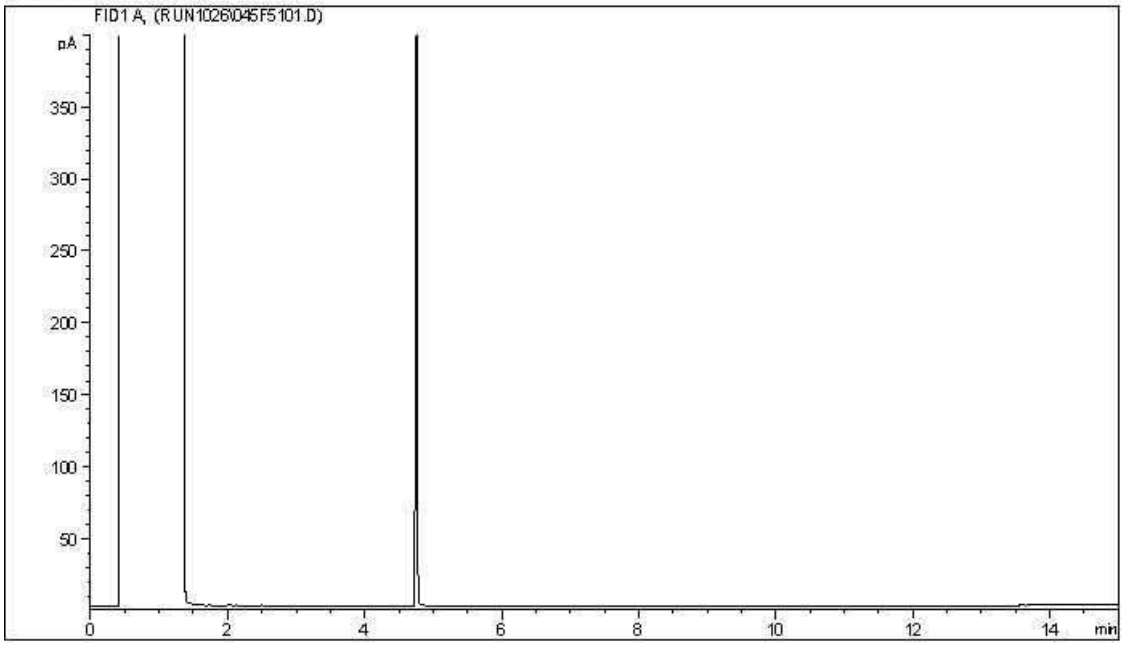
TYPICAL PRODUCT CARBON NUMBER RANGES

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

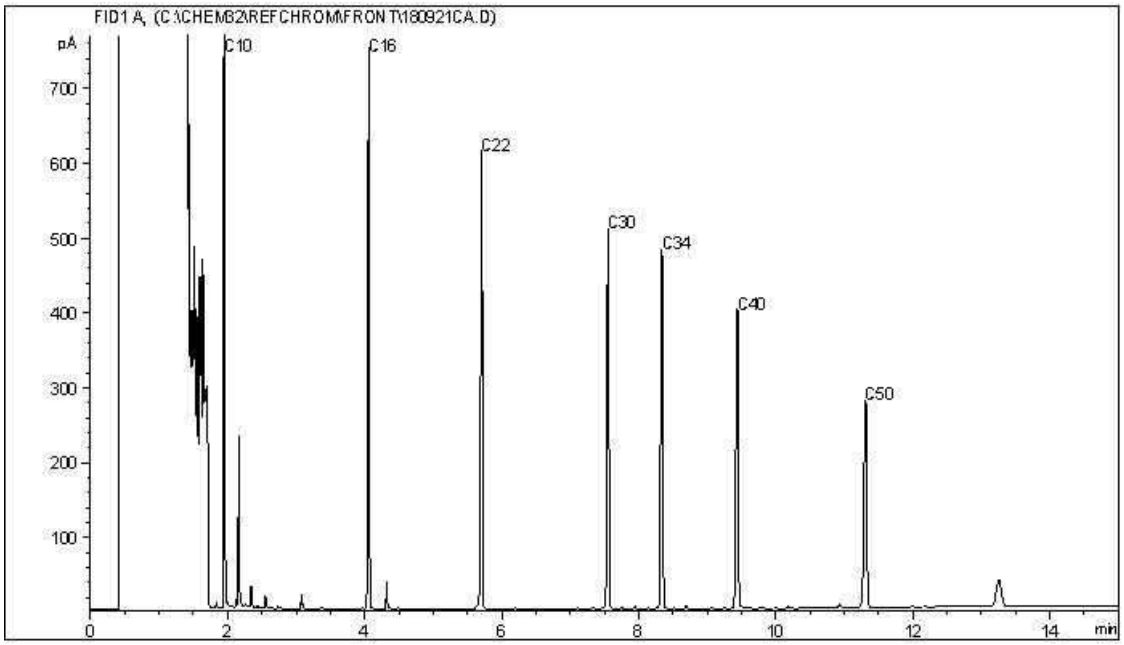
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



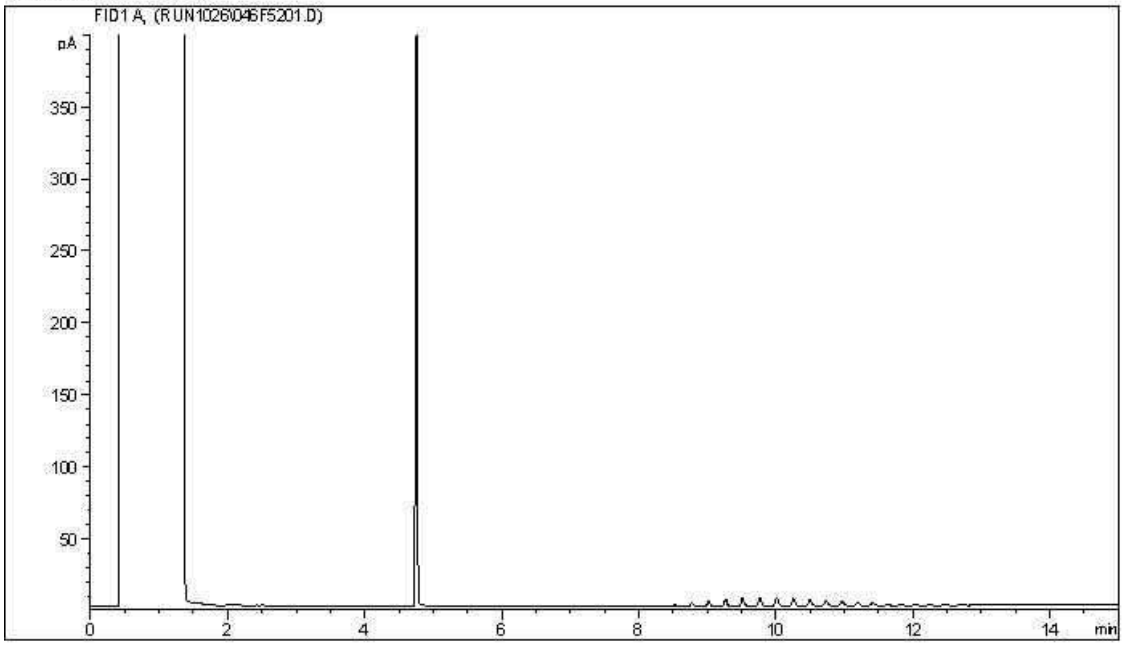
TYPICAL PRODUCT CARBON NUMBER RANGES

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

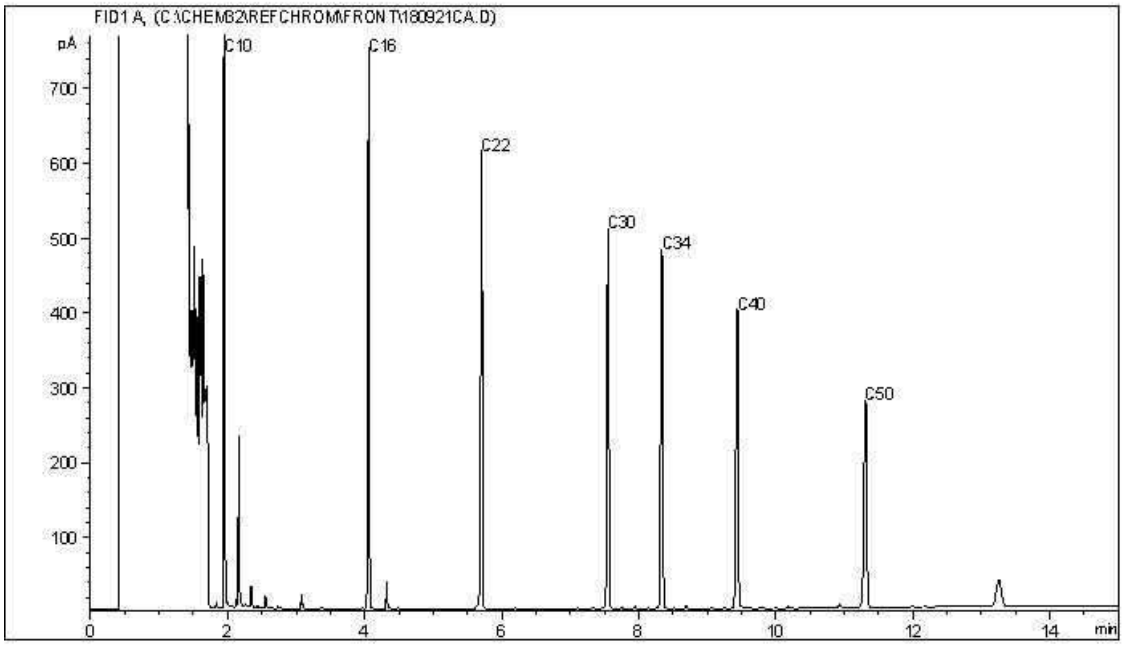
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



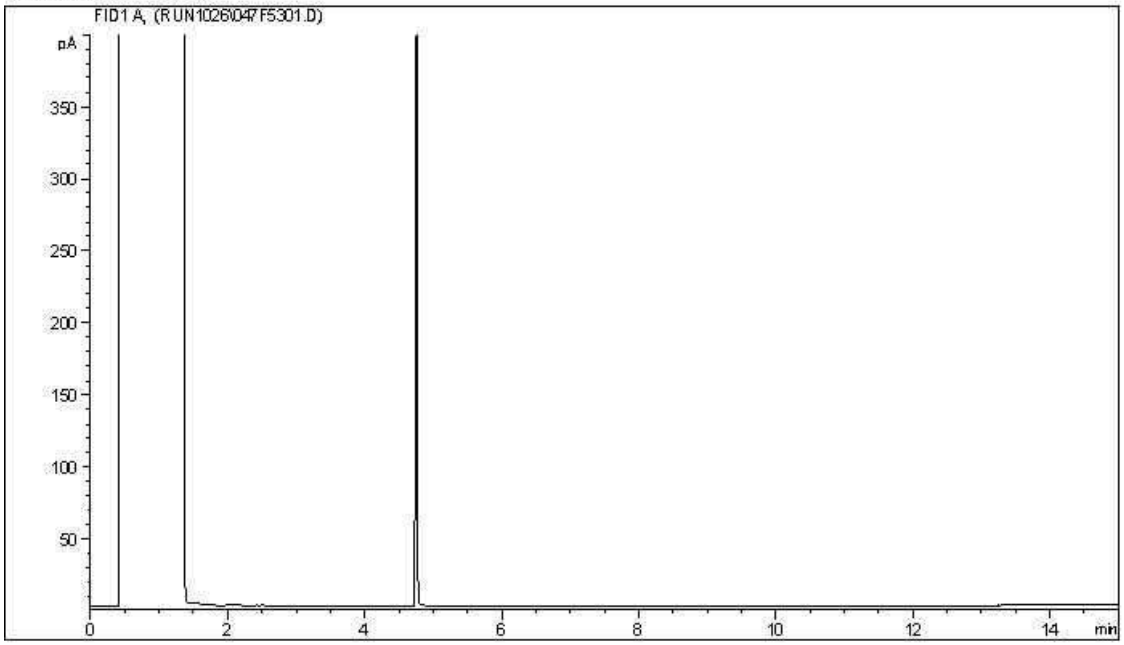
TYPICAL PRODUCT CARBON NUMBER RANGES

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

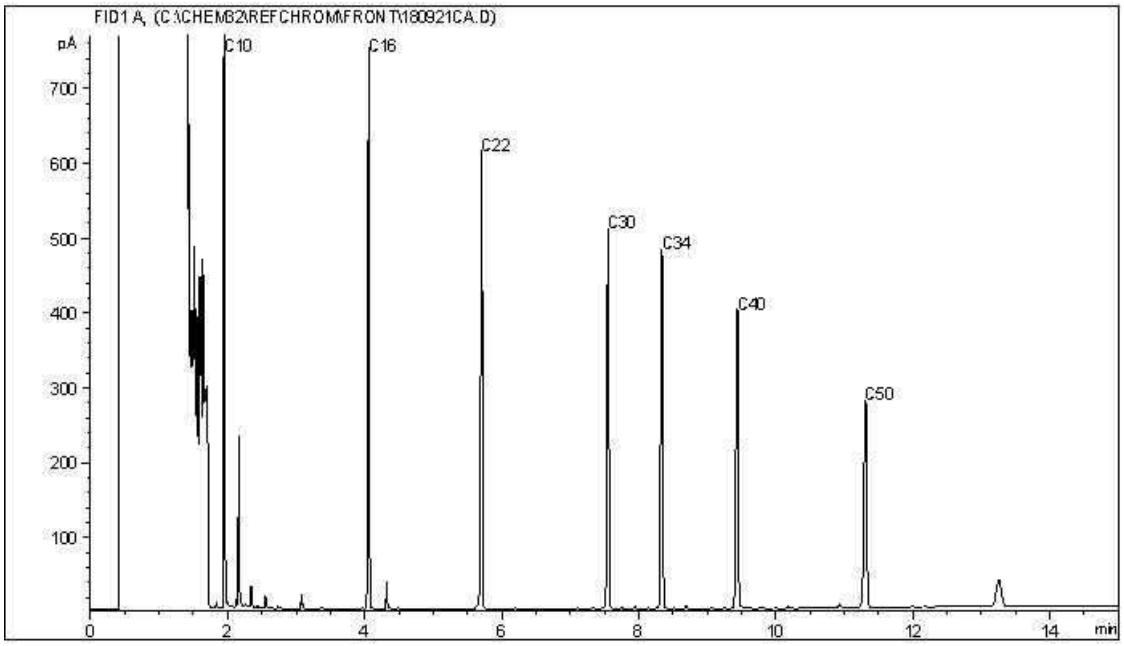
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



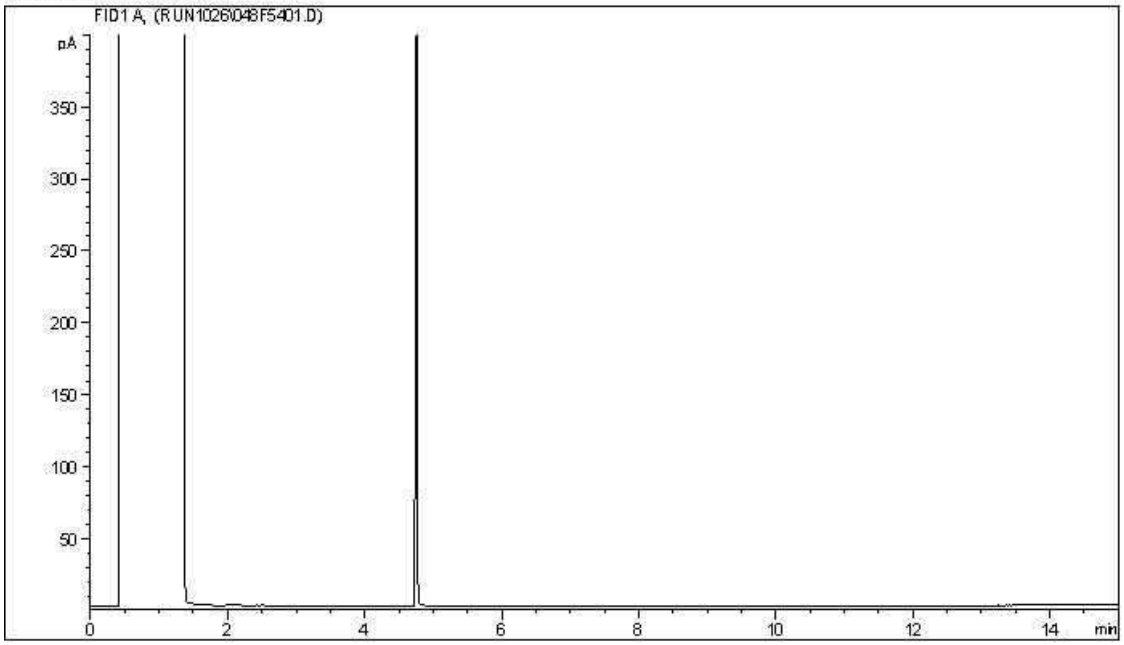
TYPICAL PRODUCT CARBON NUMBER RANGES

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

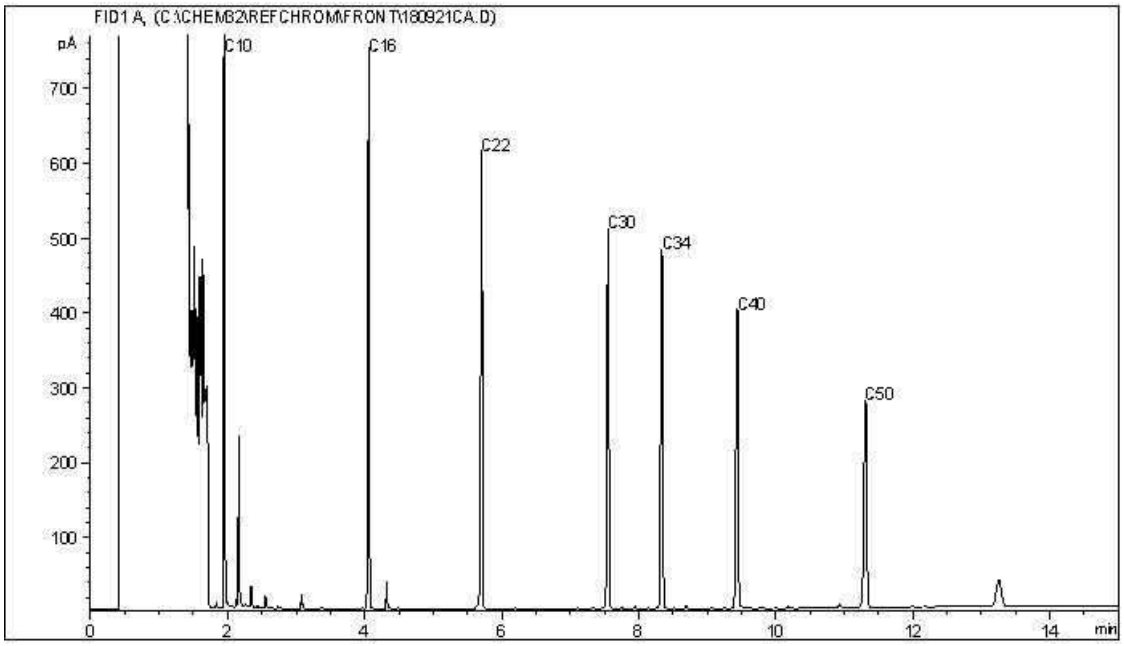
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



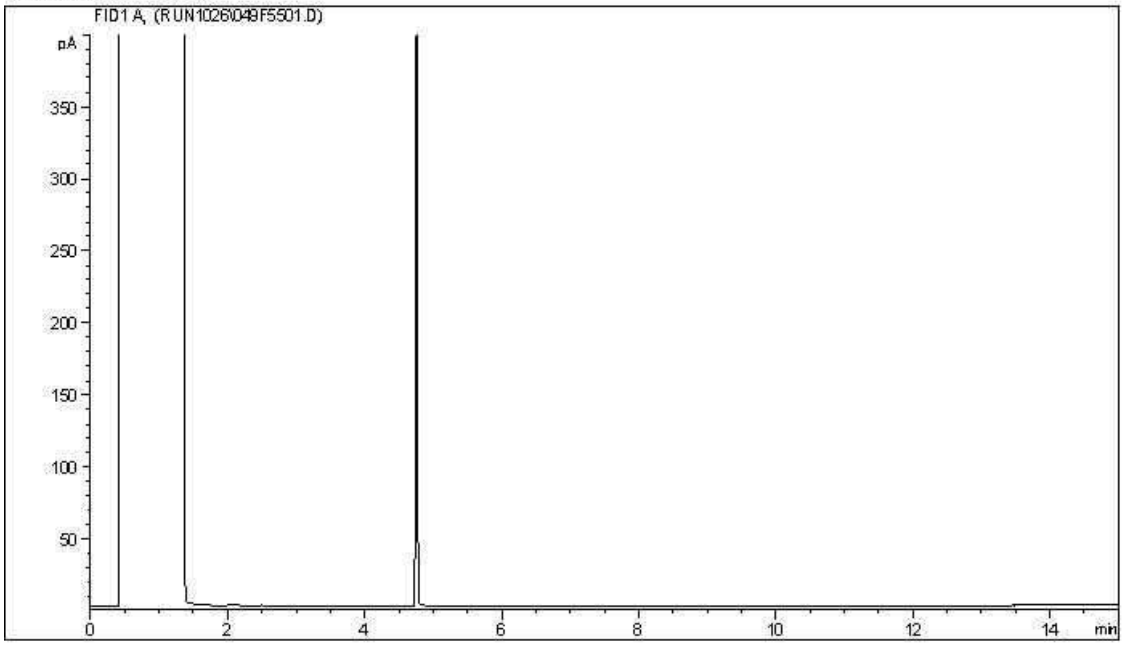
TYPICAL PRODUCT CARBON NUMBER RANGES

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

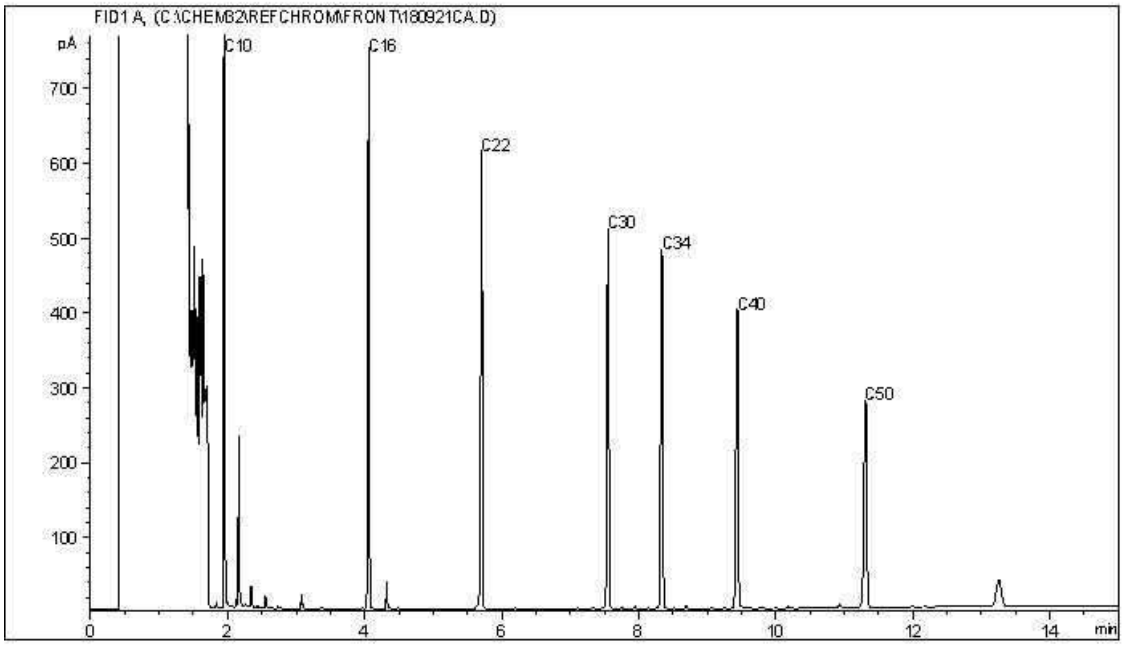
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



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+

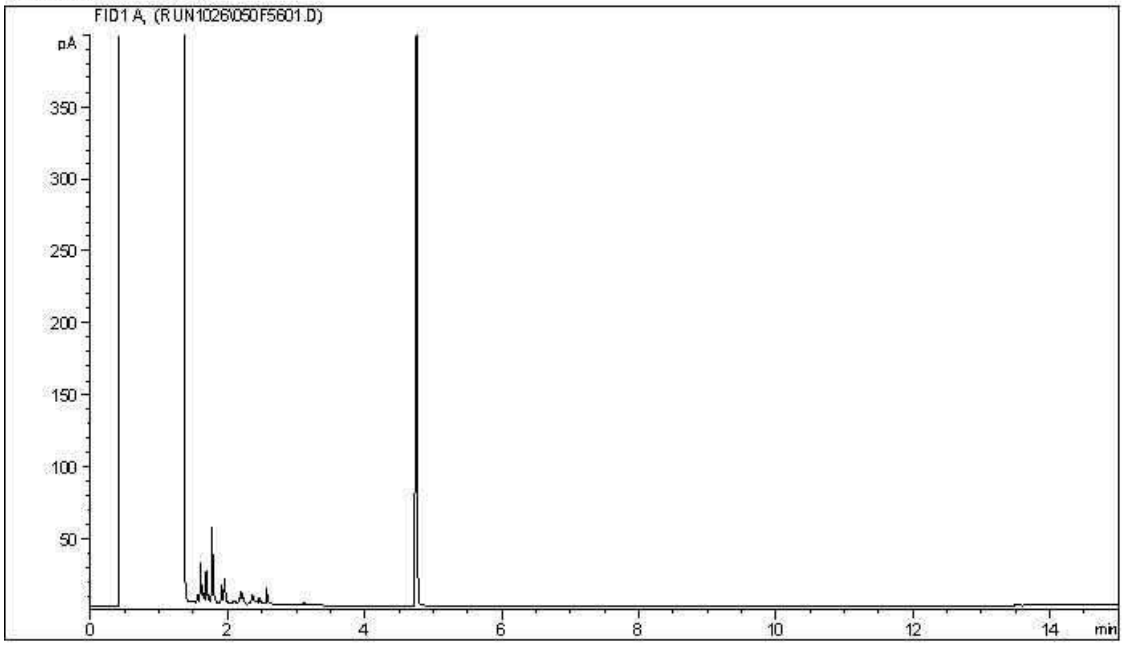
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B893451
Report Date: 2018/10/29
Maxxam Sample: UQ0366

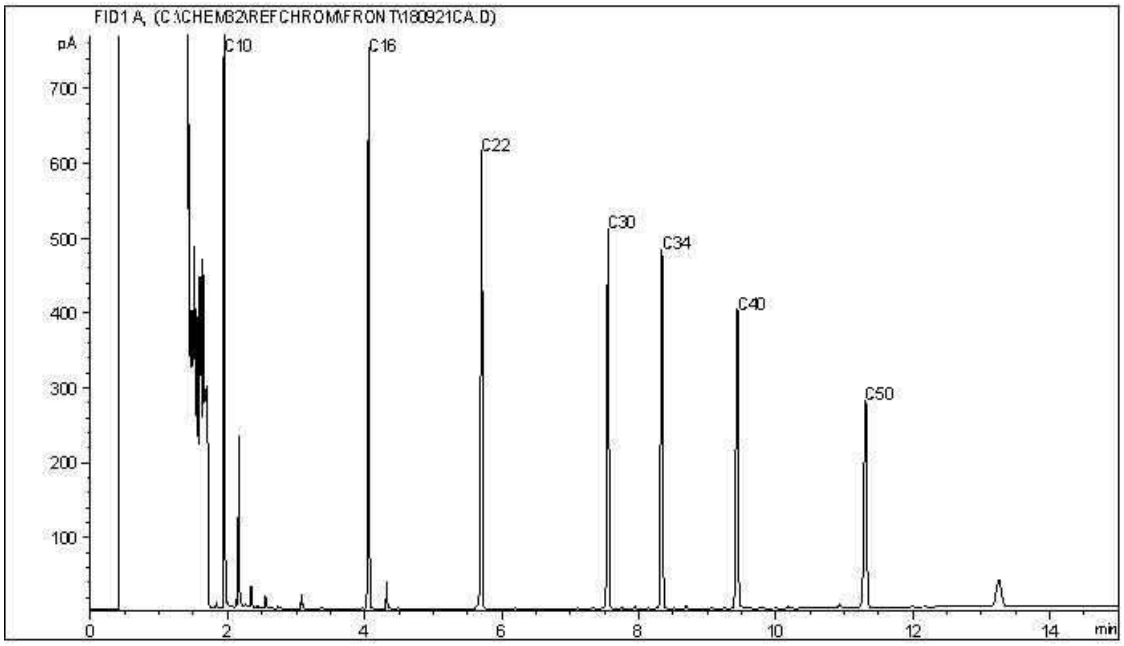
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Client ID: EX4

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



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+

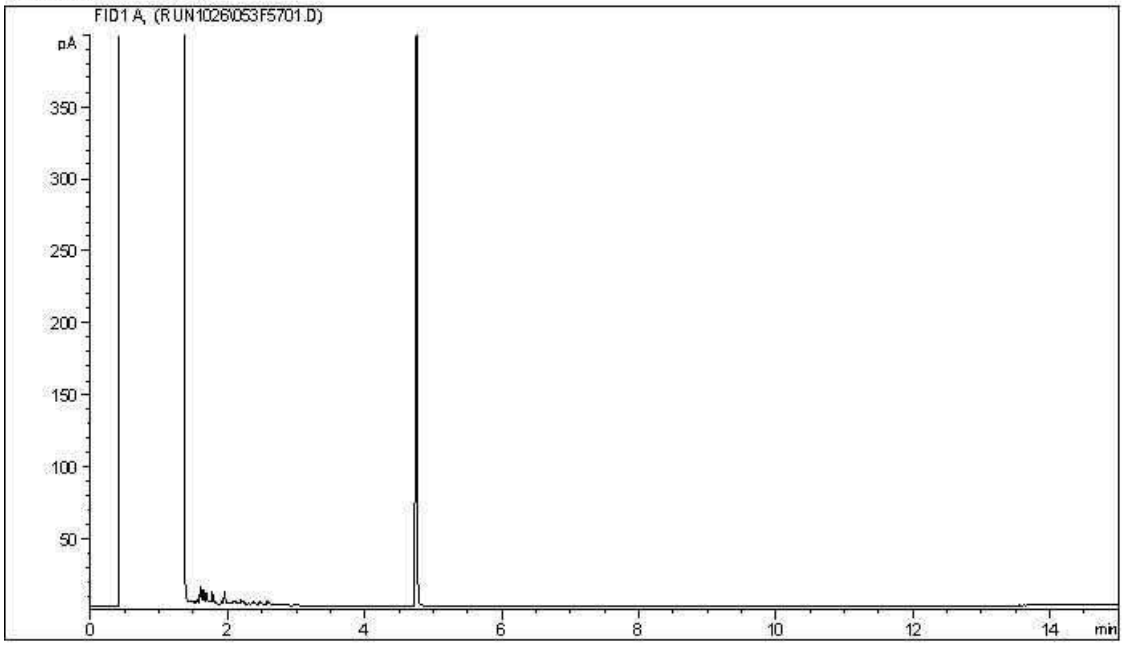
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B893451
Report Date: 2018/10/29
Maxxam Sample: UQ0367

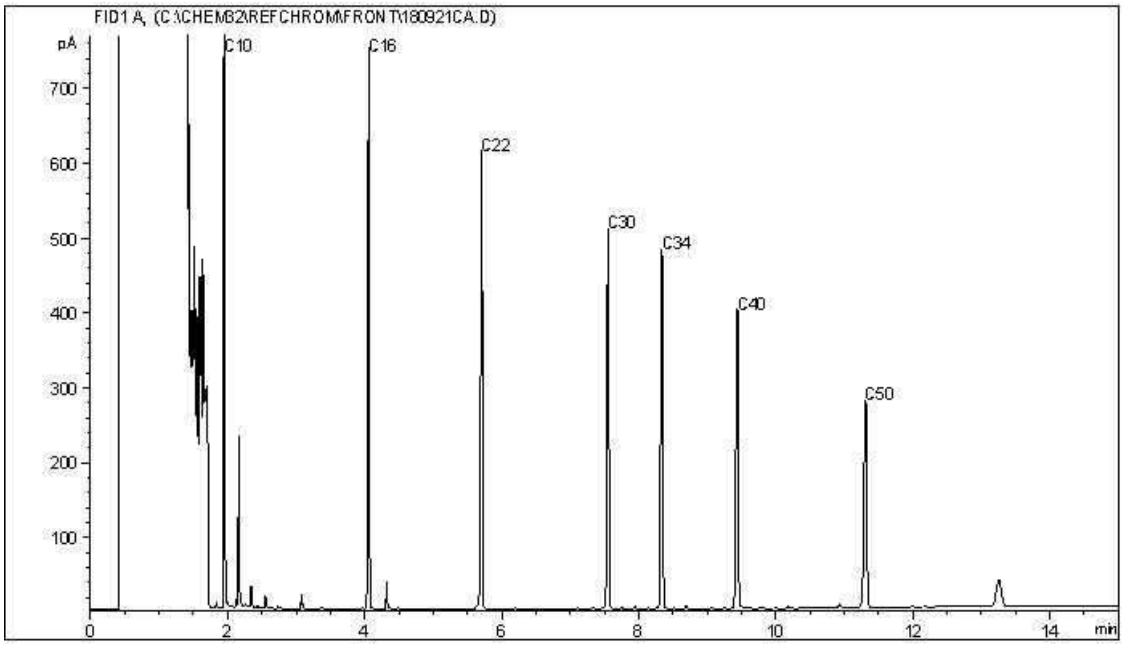
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430-.1 E32
Client ID: EX7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: M045921

Attention: Stephen D'Abadie

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

Report Date: 2018/11/01
Report #: R2644045
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B894183
Received: 2018/10/25, 13:18

Sample Matrix: GROUND WATER
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	6	N/A	2018/10/29	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/10/30	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2018/10/30	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/28	2018/10/28	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	3	2018/10/29	2018/10/29	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	3	N/A	2018/10/31	AB SOP-00003	Auto Calc
Benzo[a]pyrene Equivalency (2)	1	N/A	2018/11/01	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	3	2018/10/28	2018/10/30	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
PAH in Water by GC/MS	1	2018/10/28	2018/11/01	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	7	N/A	2018/10/30	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	7	N/A	2018/10/29	AB SOP-00056	EPA 5021a/8260d m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Trihalomethanes Calculation	1	N/A	2018/10/30	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	1	N/A	2018/10/29	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 International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: M045921

Attention: Stephen D'Abadie

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

Report Date: 2018/11/01
Report #: R2644045
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B894183
Received: 2018/10/25, 13:18

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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UQ4313		UQ4314			UQ4315	UQ4315		
Sampling Date		2018/10/25 10:40		2018/10/25 13:00			2018/10/25 11:10	2018/10/25 11:10		
COC Number		M045921		M045921			M045921	M045921		
	UNITS	**1701**	**RDL**	**1704**	**RDL**	**QC Batch**	**EX6**	**EX6 Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	3.4	0.10	9202777	0.54	N/A	0.10	9202783
Volatiles										
Benzene	mg/L	<0.00040	0.00040	0.39	0.00040	9204874	0.29	0.30	0.00040	9204874
Toluene	mg/L	<0.00040	0.00040	0.36	0.00040	9204874	0.23	0.22	0.00040	9204874
Ethylbenzene	mg/L	<0.00040	0.00040	0.19	0.00040	9204874	1.2 (1)	1.2	0.00080	9204874
m & p-Xylene	mg/L	<0.00080	0.00080	5.6 (1)	0.0080	9204874	1.1	1.1	0.00080	9204874
o-Xylene	mg/L	<0.00040	0.00040	2.3 (1)	0.0040	9204874	0.090	0.089	0.00040	9204874
Xylenes (Total)	mg/L	<0.00089	0.00089	7.9	0.0089	9202657	1.2	N/A	0.00089	9202657
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	8.1	0.10	9202657	4.4	N/A	0.10	9202657
F1 (C6-C10)	mg/L	<0.10	0.10	17	0.10	9204874	7.4	7.1	0.10	9204874
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	100	N/A	87	N/A	9204874	101	101	N/A	9204874
4-Bromofluorobenzene (sur.)	%	88	N/A	99	N/A	9204874	87	93	N/A	9204874
D4-1,2-Dichloroethane (sur.)	%	96	N/A	96	N/A	9204874	74	72	N/A	9204874
O-TERPHENYL (sur.)	%	80	N/A	80	N/A	9202777	93	N/A	N/A	9202783

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

Maxxam ID		UQ4316	UQ4317		UQ4318	UQ4319		
Sampling Date		2018/10/25 12:30	2018/10/25 12:45		2018/10/25 10:40	2018/10/25 10:45		
COC Number		M045921	M045921		M045921	M045921		
	UNITS	**3002A**	**3002B**	**QC Batch**	**HYDRA 2**	**HYDRA 3**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	9202783	<0.10	<0.10	0.10	9202777
Volatiles								
Benzene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	0.00040	9204874
Toluene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	0.00040	9204874
Ethylbenzene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	0.00040	9204874
m & p-Xylene	mg/L	<0.00080	<0.00080	9204874	<0.00080	<0.00080	0.00080	9204874
o-Xylene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	0.00040	9204874
Xylenes (Total)	mg/L	<0.00089	<0.00089	9202657	<0.00089	<0.00089	0.00089	9202657
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	9202657	<0.10	<0.10	0.10	9202657
F1 (C6-C10)	mg/L	<0.10	<0.10	9204874	<0.10	<0.10	0.10	9204874
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	92	98	9204874	93	94	N/A	9204874
4-Bromofluorobenzene (sur.)	%	91	88	9204874	90	100	N/A	9204874
D4-1,2-Dichloroethane (sur.)	%	86	87	9204874	80	96	N/A	9204874
O-TERPHENYL (sur.)	%	89	88	9202783	82	84	N/A	9202777

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UQ4313		UQ4314		UQ4318		
Sampling Date		2018/10/25 10:40		2018/10/25 13:00		2018/10/25 10:40		
COC Number		M045921		M045921		M045921		
	UNITS	**1701**	**RDL**	**1704**	**RDL**	**HYDRA 2**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	0.000010	0.000011	0.000010	<0.000010	0.000010	9202692
Acenaphthene	mg/L	<0.00010	0.00010	0.00056	0.00010	<0.00010	0.00010	9202776
Acenaphthylene	mg/L	<0.00010	0.00010	0.00012	0.00010	<0.00010	0.00010	9202776
Acridine	mg/L	<0.000050	0.000050	0.00047	0.000050	<0.000050	0.000050	9202776
Anthracene	mg/L	<0.000010	0.000010	0.000093	0.000010	<0.000010	0.000010	9202776
Benzo(a)anthracene	mg/L	<0.0000085	0.0000085	0.000014	0.0000085	<0.0000085	0.0000085	9202776
Benzo(b&j)fluoranthene	mg/L	<0.0000085	0.0000085	0.000011	0.0000085	<0.0000085	0.0000085	9202776
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	<0.0000085	0.0000085	<0.0000085	0.0000085	9202776
Benzo(g,h,i)perylene	mg/L	<0.0000085	0.0000085	<0.0000085	0.0000085	<0.0000085	0.0000085	9202776
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	9202776
Benzo(a)pyrene	mg/L	<0.0000075	0.0000075	<0.0000075	0.0000075	<0.0000075	0.0000075	9202776
Benzo[e]pyrene	mg/L	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	9202776
Chrysene	mg/L	<0.0000085	0.0000085	0.000017	0.0000085	<0.0000085	0.0000085	9202776
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	<0.0000075	0.0000075	<0.0000075	0.0000075	9202776
Fluoranthene	mg/L	<0.000010	0.000010	0.000093	0.000010	<0.000010	0.000010	9202776
Fluorene	mg/L	<0.000050	0.000050	0.00071	0.000050	<0.000050	0.000050	9202776
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	0.0000085	<0.0000085	0.0000085	<0.0000085	0.0000085	9202776
1-Methylnaphthalene	mg/L	<0.00010	0.00010	0.054	0.00010	<0.00010	0.00010	9202776
2-Methylnaphthalene	mg/L	<0.00010	0.00010	0.15 (1)	0.0010	<0.00010	0.00010	9202776
Naphthalene	mg/L	<0.00010	0.00010	0.23 (1)	0.0010	<0.00010	0.00010	9202776
Phenanthrene	mg/L	<0.000050	0.000050	0.00081	0.000050	<0.000050	0.000050	9202776
Perylene	mg/L	<0.000050	0.000050	<0.000050	0.000050	<0.000050	0.000050	9202776
Pyrene	mg/L	<0.000020	0.000020	0.00022	0.000020	<0.000020	0.000020	9202776
Quinoline	mg/L	<0.00020	0.00020	0.0063	0.00020	<0.00020	0.00020	9202776
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	95	N/A	91	N/A	90	N/A	9202776
D8-ACENAPHTHYLENE (sur.)	%	90	N/A	70	N/A	86	N/A	9202776
D8-NAPHTHALENE (sur.)	%	87	N/A	34 (2)	N/A	75	N/A	9202776
TERPHENYL-D14 (sur.)	%	105	N/A	97	N/A	100	N/A	9202776

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.
(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UQ4319		
Sampling Date		2018/10/25 10:45		
COC Number		M045921		
	UNITS	**HYDRA 3**	**RDL**	**QC Batch**
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	mg/L	<0.000010	0.000010	9202692
Acenaphthene	mg/L	<0.00010	0.00010	9202776
Acenaphthylene	mg/L	<0.00010	0.00010	9202776
Acridine	mg/L	<0.000050	0.000050	9202776
Anthracene	mg/L	<0.000010	0.000010	9202776
Benzo(a)anthracene	mg/L	<0.0000085	0.0000085	9202776
Benzo(b&j)fluoranthene	mg/L	<0.0000085	0.0000085	9202776
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	9202776
Benzo(g,h,i)perylene	mg/L	<0.0000085	0.0000085	9202776
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	9202776
Benzo(a)pyrene	mg/L	<0.0000075	0.0000075	9202776
Benzo[e]pyrene	mg/L	<0.000050	0.000050	9202776
Chrysene	mg/L	<0.0000085	0.0000085	9202776
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	9202776
Fluoranthene	mg/L	<0.000010	0.000010	9202776
Fluorene	mg/L	<0.000050	0.000050	9202776
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	0.0000085	9202776
1-Methylnaphthalene	mg/L	<0.00010	0.00010	9202776
2-Methylnaphthalene	mg/L	<0.00010	0.00010	9202776
Naphthalene	mg/L	<0.00010	0.00010	9202776
Phenanthrene	mg/L	<0.000050	0.000050	9202776
Perylene	mg/L	<0.000050	0.000050	9202776
Pyrene	mg/L	<0.000020	0.000020	9202776
Quinoline	mg/L	<0.00020	0.00020	9202776
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	89	N/A	9202776
D8-ACENAPHTHYLENE (sur.)	%	79	N/A	9202776
D8-NAPHTHALENE (sur.)	%	67	N/A	9202776
TERPHENYL-D14 (sur.)	%	101	N/A	9202776

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UQ4313	UQ4313		UQ4314		UQ4315		
Sampling Date		2018/10/25 10:40	2018/10/25 10:40		2018/10/25 13:00		2018/10/25 11:10		
COC Number		M045921	M045921		M045921		M045921		
	UNITS	**1701**	**1701 Lab-Dup**	**RDL**	**1704**	**RDL**	**EX6**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	N/A	0.0013	<0.0066	0.0066	<0.0013	0.0013	9202214
Bromodichloromethane	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Bromoform	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Bromomethane	mg/L	<0.0020	<0.0020	0.0020	<0.010	0.010	<0.0020	0.0020	9204886
Carbon tetrachloride	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Chlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Chlorodibromomethane	mg/L	<0.0010	<0.0010	0.0010	<0.0050	0.0050	<0.0010	0.0010	9204886
Chloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0050	0.0050	<0.0010	0.0010	9204886
Chloroform	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Chloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.010	0.010	0.0035	0.0020	9204886
1,2-dibromoethane	mg/L	<0.00020	<0.00020	0.00020	<0.0010	0.0010	<0.00020	0.00020	9204886
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,1-dichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	0.0014 (1)	0.00050	9204886
1,2-dichloroethane	mg/L	<0.00050	<0.00050	0.00050	0.048	0.0025	0.031	0.00050	9204886
1,1-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Dichloromethane	mg/L	<0.0020	<0.0020	0.0020	<0.010	0.010	<0.0020	0.0020	9204886
1,2-dichloropropane	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Methyl methacrylate	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Styrene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	0.0010	<0.0050	0.0050	<0.0010	0.0010	9204886
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	0.0020	<0.010	0.010	<0.0020	0.0020	9204886
Tetrachloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0050	0.0050	<0.0010	0.0010	9204886

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UQ4313	UQ4313		UQ4314		UQ4315		
Sampling Date		2018/10/25 10:40	2018/10/25 10:40		2018/10/25 13:00		2018/10/25 11:10		
COC Number		M045921	M045921		M045921		M045921		
	UNITS	**1701**	**1701 Lab-Dup**	**RDL**	**1704**	**RDL**	**EX6**	**RDL**	**QC Batch**
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	0.0010	<0.0050	0.0050	<0.0010	0.0010	9204886
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Trichloroethene	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	0.00050	1.5	0.0025	0.014	0.00050	9204886
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	0.00050	0.59	0.0025	0.16	0.00050	9204886
Vinyl chloride	mg/L	<0.00050	<0.00050	0.00050	<0.0025	0.0025	<0.00050	0.00050	9204886
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	100	N/A	102	N/A	102	N/A	9204886
4-Bromofluorobenzene (sur.)	%	96	95	N/A	97	N/A	95	N/A	9204886
D4-1,2-Dichloroethane (sur.)	%	102	104	N/A	127	N/A	95	N/A	9204886

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UQ4316	UQ4317	UQ4318	UQ4319		
Sampling Date		2018/10/25 12:30	2018/10/25 12:45	2018/10/25 10:40	2018/10/25 10:45		
COC Number		M045921	M045921	M045921	M045921		
	UNITS	**3002A**	**3002B**	**HYDRA 2**	**HYDRA 3**	**RDL**	**QC Batch**
Volatiles							
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9202214
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9204886
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Methyl-tert-butylether (MTBE)	mg/L	0.0022	<0.00050	<0.00050	<0.00050	0.00050	9204886
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
RDL = Reportable Detection Limit							

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		UQ4316	UQ4317	UQ4318	UQ4319		
Sampling Date		2018/10/25 12:30	2018/10/25 12:45	2018/10/25 10:40	2018/10/25 10:45		
COC Number		M045921	M045921	M045921	M045921		
	UNITS	**3002A**	**3002B**	**HYDRA 2**	**HYDRA 3**	**RDL**	**QC Batch**
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	100	101	100	100	N/A	9204886
4-Bromofluorobenzene (sur.)	%	95	96	96	97	N/A	9204886
D4-1,2-Dichloroethane (sur.)	%	98	102	104	102	N/A	9204886

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ4320		
Sampling Date		2018/10/25		
COC Number		M045921		
	UNITS	**TRIP BLANK II**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9202214
Benzene	mg/L	<0.00040	0.00040	9204886
Bromodichloromethane	mg/L	<0.00050	0.00050	9204886
Bromoform	mg/L	<0.00050	0.00050	9204886
Bromomethane	mg/L	<0.0020	0.0020	9204886
Carbon tetrachloride	mg/L	<0.00050	0.00050	9204886
Chlorobenzene	mg/L	<0.00050	0.00050	9204886
Chlorodibromomethane	mg/L	<0.0010	0.0010	9204886
Chloroethane	mg/L	<0.0010	0.0010	9204886
Chloroform	mg/L	<0.00050	0.00050	9204886
Chloromethane	mg/L	<0.0020	0.0020	9204886
1,2-dibromoethane	mg/L	<0.00020	0.00020	9204886
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9204886
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9204886
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9204886
1,1-dichloroethane	mg/L	<0.00050	0.00050	9204886
1,2-dichloroethane	mg/L	<0.00050	0.00050	9204886
1,1-dichloroethene	mg/L	<0.00050	0.00050	9204886
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9204886
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9204886
Dichloromethane	mg/L	<0.0020	0.0020	9204886
1,2-dichloropropane	mg/L	<0.00050	0.00050	9204886
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9204886
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9204886
Ethylbenzene	mg/L	<0.00040	0.00040	9204886
Methyl methacrylate	mg/L	<0.00050	0.00050	9204886
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9204886
Styrene	mg/L	<0.00050	0.00050	9204886
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9204886
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9204886
Tetrachloroethene	mg/L	<0.00050	0.00050	9204886
Toluene	mg/L	<0.00040	0.00040	9204886
RDL = Reportable Detection Limit				

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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ4320		
Sampling Date		2018/10/25		
COC Number		M045921		
	UNITS	**TRIP BLANK II**	**RDL**	**QC Batch**
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9204886
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9204886
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9204886
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9204886
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9204886
Trichloroethene	mg/L	<0.00050	0.00050	9204886
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9204886
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9204886
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9204886
Vinyl chloride	mg/L	<0.00050	0.00050	9204886
Xylenes (Total)	mg/L	<0.00080	0.00080	9204886
m & p-Xylene	mg/L	<0.00080	0.00080	9204886
o-Xylene	mg/L	<0.00040	0.00040	9204886
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99	N/A	9204886
4-Bromofluorobenzene (sur.)	%	97	N/A	9204886
D4-1,2-Dichloroethane (sur.)	%	98	N/A	9204886

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	5.7°C

VOLATILE ORGANICS BY GC-MS (GROUND WATER) Comments

Sample UQ4314 [1704] VOCs in Water by HS GC/MS (Std List): Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9202776	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/10/29		88	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/29		91	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/29		72	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/29		98	%	50 - 130
			Acenaphthene	2018/10/29		101	%	50 - 130
			Acenaphthylene	2018/10/29		92	%	50 - 130
			Acridine	2018/10/29		65	%	50 - 130
			Anthracene	2018/10/29		82	%	50 - 130
			Benzo(a)anthracene	2018/10/29		111	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/29		110	%	50 - 130
			Benzo(k)fluoranthene	2018/10/29		104	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/29		99	%	50 - 130
			Benzo(c)phenanthrene	2018/10/29		104	%	50 - 130
			Benzo(a)pyrene	2018/10/29		108	%	50 - 130
			Benzo[e]pyrene	2018/10/29		102	%	50 - 130
			Chrysene	2018/10/29		104	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/29		103	%	50 - 130
			Fluoranthene	2018/10/29		82	%	50 - 130
			Fluorene	2018/10/29		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/29		92	%	50 - 130
			1-Methylnaphthalene	2018/10/29		99	%	50 - 130
			2-Methylnaphthalene	2018/10/29		95	%	50 - 130
			Naphthalene	2018/10/29		87	%	50 - 130
			Phenanthrene	2018/10/29		93	%	50 - 130
			Perylene	2018/10/29		90	%	50 - 130
			Pyrene	2018/10/29		81	%	50 - 130
			Quinoline	2018/10/29		94	%	50 - 130
9202776	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/10/29		98	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/29		81	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/29		66	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/29		100	%	50 - 130
			Acenaphthene	2018/10/29		79	%	50 - 130
			Acenaphthylene	2018/10/29		82	%	50 - 130
			Acridine	2018/10/29		94	%	50 - 130
			Anthracene	2018/10/29		101	%	50 - 130
			Benzo(a)anthracene	2018/10/29		104	%	50 - 130
			Benzo(b&j)fluoranthene	2018/10/29		104	%	50 - 130
			Benzo(k)fluoranthene	2018/10/29		98	%	50 - 130
			Benzo(g,h,i)perylene	2018/10/29		96	%	50 - 130
			Benzo(c)phenanthrene	2018/10/29		104	%	50 - 130
			Benzo(a)pyrene	2018/10/29		101	%	50 - 130
			Benzo[e]pyrene	2018/10/29		97	%	50 - 130
			Chrysene	2018/10/29		103	%	50 - 130
			Dibenz(a,h)anthracene	2018/10/29		100	%	50 - 130
			Fluoranthene	2018/10/29		97	%	50 - 130
			Fluorene	2018/10/29		92	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/10/29		87	%	50 - 130
			1-Methylnaphthalene	2018/10/29		71	%	50 - 130
			2-Methylnaphthalene	2018/10/29		65	%	50 - 130
			Naphthalene	2018/10/29		71	%	50 - 130
			Phenanthrene	2018/10/29		93	%	50 - 130
			Perylene	2018/10/29		87	%	50 - 130
			Pyrene	2018/10/29		92	%	50 - 130
			Quinoline	2018/10/29		96	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9202776	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/10/29		82	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/10/29		72	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/10/29		47 (1)	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/10/29		101	%	50 - 130
			Acenaphthene	2018/10/29	<0.00010		mg/L	
			Acenaphthylene	2018/10/29	<0.00010		mg/L	
			Acridine	2018/10/29	<0.000050		mg/L	
			Anthracene	2018/10/29	<0.000010		mg/L	
			Benzo(a)anthracene	2018/10/29	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/10/29	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/10/29	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/10/29	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/10/29	<0.000050		mg/L	
			Benzo(a)pyrene	2018/10/29	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/10/29	<0.000050		mg/L	
			Chrysene	2018/10/29	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/10/29	<0.0000075		mg/L	
			Fluoranthene	2018/10/29	<0.000010		mg/L	
			Fluorene	2018/10/29	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/10/29	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/10/29	<0.00010		mg/L	
			2-Methylnaphthalene	2018/10/29	<0.00010		mg/L	
			Naphthalene	2018/10/29	<0.00010		mg/L	
			Phenanthrene	2018/10/29	<0.000050		mg/L	
			Perylene	2018/10/29	<0.000050		mg/L	
			Pyrene	2018/10/29	<0.000020		mg/L	
			Quinoline	2018/10/29	<0.00020		mg/L	
9202776	LZ3	RPD	Acenaphthene	2018/10/29	NC		%	30
			Acenaphthylene	2018/10/29	NC		%	30
			Acridine	2018/10/29	NC		%	30
			Anthracene	2018/10/29	NC		%	30
			Benzo(a)anthracene	2018/10/29	NC		%	30
			Benzo(b&j)fluoranthene	2018/10/29	NC		%	30
			Benzo(k)fluoranthene	2018/10/29	NC		%	30
			Benzo(g,h,i)perylene	2018/10/29	NC		%	30
			Benzo(c)phenanthrene	2018/10/29	NC		%	30
			Benzo(a)pyrene	2018/10/29	NC		%	30
			Benzo[e]pyrene	2018/10/29	NC		%	30
			Chrysene	2018/10/29	NC		%	30
			Dibenz(a,h)anthracene	2018/10/29	NC		%	30
			Fluoranthene	2018/10/29	NC		%	30
			Fluorene	2018/10/29	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/10/29	NC		%	30
			1-Methylnaphthalene	2018/10/29	NC		%	30
			2-Methylnaphthalene	2018/10/29	NC		%	30
			Naphthalene	2018/10/29	NC		%	30
			Phenanthrene	2018/10/29	NC		%	30
			Perylene	2018/10/29	NC		%	30
			Pyrene	2018/10/29	NC		%	30
			Quinoline	2018/10/29	NC		%	30
9202777	MHF	Matrix Spike	O-TERPHENYL (sur.)	2018/10/28		87	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/28		98	%	60 - 140
9202777	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/28		85	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/28		93	%	60 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9202777	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/28		84	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/28	<0.10		mg/L	
9202777	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/28	NC		%	30
9202783	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/29		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/29		99	%	60 - 140
9202783	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/29		94	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/29		103	%	60 - 140
9202783	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/29		101	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/29	<0.10		mg/L	
9202783	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/29	NC		%	30
9204874	WZ0	Matrix Spike [UQ4316-02]	1,4-Difluorobenzene (sur.)	2018/10/29		106	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		84	%	50 - 140
			Benzene	2018/10/29		85	%	50 - 140
			Toluene	2018/10/29		103	%	50 - 140
			Ethylbenzene	2018/10/29		96	%	50 - 140
			m & p-Xylene	2018/10/29		93	%	50 - 140
			o-Xylene	2018/10/29		96	%	50 - 140
			F1 (C6-C10)	2018/10/29		79	%	60 - 140
9204874	WZ0	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/29		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		86	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		92	%	50 - 140
			Benzene	2018/10/29		94	%	60 - 130
			Toluene	2018/10/29		104	%	60 - 130
			Ethylbenzene	2018/10/29		102	%	60 - 130
			m & p-Xylene	2018/10/29		97	%	60 - 130
			o-Xylene	2018/10/29		95	%	60 - 130
			F1 (C6-C10)	2018/10/29		89	%	60 - 140
9204874	WZ0	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/29		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		92	%	50 - 140
			Benzene	2018/10/29	<0.00040		mg/L	
			Toluene	2018/10/29	<0.00040		mg/L	
			Ethylbenzene	2018/10/29	<0.00040		mg/L	
			m & p-Xylene	2018/10/29	<0.00080		mg/L	
			o-Xylene	2018/10/29	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/29	<0.10		mg/L	
9204874	WZ0	RPD [UQ4315-02]	Benzene	2018/10/30	1.7		%	30
			Toluene	2018/10/30	5.3		%	30
			Ethylbenzene	2018/10/30	1.9		%	30
			m & p-Xylene	2018/10/30	4.9		%	30
			o-Xylene	2018/10/30	0.89		%	30
			F1 (C6-C10)	2018/10/30	4.0		%	30
9204886	MZ	Matrix Spike [UQ4315-02]	1,4-Difluorobenzene (sur.)	2018/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		94	%	50 - 140
			Benzene	2018/10/29		NC	%	50 - 140
			Bromodichloromethane	2018/10/29		107	%	50 - 140
			Bromoform	2018/10/29		99	%	50 - 140
			Bromomethane	2018/10/29		111	%	50 - 140
			Carbon tetrachloride	2018/10/29		106	%	50 - 140
			Chlorobenzene	2018/10/29		102	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorodibromomethane	2018/10/29		100	%	50 - 140
			Chloroethane	2018/10/29		107	%	50 - 140
			Chloroform	2018/10/29		102	%	50 - 140
			Chloromethane	2018/10/29		131	%	50 - 140
			1,2-dibromoethane	2018/10/29		99	%	50 - 140
			1,2-dichlorobenzene	2018/10/29		104	%	50 - 140
			1,3-dichlorobenzene	2018/10/29		106	%	50 - 140
			1,4-dichlorobenzene	2018/10/29		104	%	50 - 140
			1,1-dichloroethane	2018/10/29		100	%	50 - 140
			1,2-dichloroethane	2018/10/29		100	%	50 - 140
			1,1-dichloroethene	2018/10/29		110	%	50 - 140
			cis-1,2-dichloroethene	2018/10/29		103	%	50 - 140
			trans-1,2-dichloroethene	2018/10/29		100	%	50 - 140
			Dichloromethane	2018/10/29		104	%	50 - 140
			1,2-dichloropropane	2018/10/29		106	%	50 - 140
			cis-1,3-dichloropropene	2018/10/29		106	%	50 - 140
			trans-1,3-dichloropropene	2018/10/29		104	%	50 - 140
			Ethylbenzene	2018/10/29		NC	%	50 - 140
			Methyl methacrylate	2018/10/29		114	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/29		101	%	50 - 140
			Styrene	2018/10/29		103	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/29		97	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/29		97	%	50 - 140
			Tetrachloroethene	2018/10/29		98	%	50 - 140
			Toluene	2018/10/29		NC	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/29		102	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/29		102	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/29		103	%	50 - 140
			1,1,1-trichloroethane	2018/10/29		108	%	50 - 140
			1,1,2-trichloroethane	2018/10/29		120	%	50 - 140
			Trichloroethene	2018/10/29		111	%	50 - 140
			Trichlorofluoromethane	2018/10/29		114	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/29		100	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/29		100	%	50 - 140
			Vinyl chloride	2018/10/29		128	%	50 - 140
			m & p-Xylene	2018/10/29		NC	%	50 - 140
			o-Xylene	2018/10/29		86	%	50 - 140
9204886	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/29		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		118	%	50 - 140
			Benzene	2018/10/29		92	%	60 - 130
			Bromodichloromethane	2018/10/29		105	%	60 - 130
			Bromoform	2018/10/29		96	%	60 - 130
			Bromomethane	2018/10/29		100	%	60 - 130
			Carbon tetrachloride	2018/10/29		105	%	60 - 130
			Chlorobenzene	2018/10/29		98	%	60 - 130
			Chlorodibromomethane	2018/10/29		100	%	60 - 130
			Chloroethane	2018/10/29		96	%	60 - 130
			Chloroform	2018/10/29		97	%	60 - 130
			Chloromethane	2018/10/29		114	%	60 - 130
			1,2-dibromoethane	2018/10/29		96	%	60 - 130
			1,2-dichlorobenzene	2018/10/29		101	%	60 - 130
			1,3-dichlorobenzene	2018/10/29		100	%	60 - 130
			1,4-dichlorobenzene	2018/10/29		98	%	60 - 130

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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-dichloroethane	2018/10/29		100	%	60 - 130
			1,2-dichloroethane	2018/10/29		101	%	60 - 130
			1,1-dichloroethene	2018/10/29		102	%	60 - 130
			cis-1,2-dichloroethene	2018/10/29		99	%	60 - 130
			trans-1,2-dichloroethene	2018/10/29		96	%	60 - 130
			Dichloromethane	2018/10/29		97	%	60 - 130
			1,2-dichloropropane	2018/10/29		103	%	60 - 130
			cis-1,3-dichloropropene	2018/10/29		105	%	60 - 130
			trans-1,3-dichloropropene	2018/10/29		100	%	60 - 130
			Ethylbenzene	2018/10/29		94	%	60 - 130
			Methyl methacrylate	2018/10/29		103	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/29		101	%	60 - 130
			Styrene	2018/10/29		98	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/29		93	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/29		95	%	60 - 130
			Tetrachloroethene	2018/10/29		95	%	60 - 130
			Toluene	2018/10/29		96	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/29		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/29		93	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/29		95	%	60 - 130
			1,1,1-trichloroethane	2018/10/29		104	%	60 - 130
			1,1,2-trichloroethane	2018/10/29		102	%	60 - 130
			Trichloroethene	2018/10/29		106	%	60 - 130
			Trichlorofluoromethane	2018/10/29		104	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/29		99	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/29		103	%	60 - 130
			Vinyl chloride	2018/10/29		111	%	60 - 130
			m & p-Xylene	2018/10/29		93	%	60 - 130
			o-Xylene	2018/10/29		91	%	60 - 130
9204886	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/29		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		101	%	50 - 140
			Benzene	2018/10/29	<0.00040		mg/L	
			Bromodichloromethane	2018/10/29	<0.00050		mg/L	
			Bromoform	2018/10/29	<0.00050		mg/L	
			Bromomethane	2018/10/29	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/29	<0.00050		mg/L	
			Chlorobenzene	2018/10/29	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/29	<0.0010		mg/L	
			Chloroethane	2018/10/29	<0.0010		mg/L	
			Chloroform	2018/10/29	<0.00050		mg/L	
			Chloromethane	2018/10/29	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/29	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/29	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/29	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/29	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/29	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/29	<0.00050		mg/L	
			Dichloromethane	2018/10/29	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/29	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/29	<0.00050		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,3-dichloropropene	2018/10/29	<0.00050		mg/L	
			Ethylbenzene	2018/10/29	<0.00040		mg/L	
			Methyl methacrylate	2018/10/29	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/29	<0.00050		mg/L	
			Styrene	2018/10/29	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/29	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/29	<0.0020		mg/L	
			Tetrachloroethene	2018/10/29	<0.00050		mg/L	
			Toluene	2018/10/29	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/29	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/29	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/10/29	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/29	<0.00050		mg/L	
			Trichloroethene	2018/10/29	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/29	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/29	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/29	<0.00050		mg/L	
			Vinyl chloride	2018/10/29	<0.00050		mg/L	
			Xylenes (Total)	2018/10/29	<0.00080		mg/L	
			m & p-Xylene	2018/10/29	<0.00080		mg/L	
			o-Xylene	2018/10/29	<0.00040		mg/L	
9204886	MZ	RPD [UQ4313-02]	Bromodichloromethane	2018/10/29	NC		%	30
			Bromoform	2018/10/29	NC		%	30
			Bromomethane	2018/10/29	NC		%	30
			Carbon tetrachloride	2018/10/29	NC		%	30
			Chlorobenzene	2018/10/29	NC		%	30
			Chlorodibromomethane	2018/10/29	NC		%	30
			Chloroethane	2018/10/29	NC		%	30
			Chloroform	2018/10/29	NC		%	30
			Chloromethane	2018/10/29	NC		%	30
			1,2-dibromoethane	2018/10/29	NC		%	30
			1,2-dichlorobenzene	2018/10/29	NC		%	30
			1,3-dichlorobenzene	2018/10/29	NC		%	30
			1,4-dichlorobenzene	2018/10/29	NC		%	30
			1,1-dichloroethane	2018/10/29	NC		%	30
			1,2-dichloroethane	2018/10/29	NC		%	30
			1,1-dichloroethene	2018/10/29	NC		%	30
			cis-1,2-dichloroethene	2018/10/29	NC		%	30
			trans-1,2-dichloroethene	2018/10/29	NC		%	30
			Dichloromethane	2018/10/29	NC		%	30
			1,2-dichloropropane	2018/10/29	NC		%	30
			cis-1,3-dichloropropene	2018/10/29	NC		%	30
			trans-1,3-dichloropropene	2018/10/29	NC		%	30
			Methyl methacrylate	2018/10/29	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/29	NC		%	30
			Styrene	2018/10/29	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/29	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/29	NC		%	30
			Tetrachloroethene	2018/10/29	NC		%	30
			1,2,3-trichlorobenzene	2018/10/29	NC		%	30
			1,2,4-trichlorobenzene	2018/10/29	NC		%	30
			1,3,5-trichlorobenzene	2018/10/29	NC		%	30
			1,1,1-trichloroethane	2018/10/29	NC		%	30

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,2-trichloroethane	2018/10/29	NC		%	30
			Trichloroethene	2018/10/29	NC		%	30
			Trichlorofluoromethane	2018/10/29	NC		%	30
			1,2,4-trimethylbenzene	2018/10/29	NC		%	30
			1,3,5-trimethylbenzene	2018/10/29	NC		%	30
			Vinyl chloride	2018/10/29	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) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894183
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6PB, Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4, Toll Free (800) 386-7247
maxxam.ca

1976

CHAIN OF CUSTODY RECORD

M 045921

Page 1 of 1

Invoice Information

Company: Clifton Associates
Contact Name: Stephen d'Abadie
Address: 2222 - 30 Ave NE
Calgary AB T2E7K9
Phone: 403-263-2556
Email: Stephen_dabadie@clifton.ca
Copies: Terry.Kazyk@clifton.ca

Report Information (if differs from invoice)

Company:
Contact Name:
Address:
Phone:
Email:
Copies:

Project Information

Quotation #:
P.O. #/ AFE#:
Project #: C42430.1 E32
Site Location:
Site #:
Sampled By: Austin / Gavin

Turnaround Time (TAT) Required

☑ 5 - 7 Days Regular (Most analyses)

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)

☐ Same Day ☐ 2 Days
☐ 1 Day ☐ 3-4 Days

Date Required:
Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓				
Seal Intact		✓	Temp	6	4	7
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						
	YES	NO	Cooler ID			
Seal Present						
Seal Intact			Temp			
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	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
1	1701		2018.10.25	10:40	GW	8	✓	✓									✓	
2	1704		↓	13:00	↓	8	✓	✓									✓	
3	EX6			11:10		6	✓	✓										
4	3002A			12:30		6	✓	✓										
5	3002B			12:45		6	✓	✓										
6	Hydra 2			10:40	↓	8	✓	✓									✓	
7	Hydra 3		↓	10:45	GW	8	✓	✓									✓	
8	Trip Blank 11		2018.10.25		W	2	✓											
9																		
10																		
	Please indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Regulatory Criteria

☑ AT1
☐ CCME
☐ Drinking Water
☐ DSO (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

→ heavy contaminated LB SHELLY

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018.10.25	13:15	BDL Benton Daglish	2018/10/25	13:18

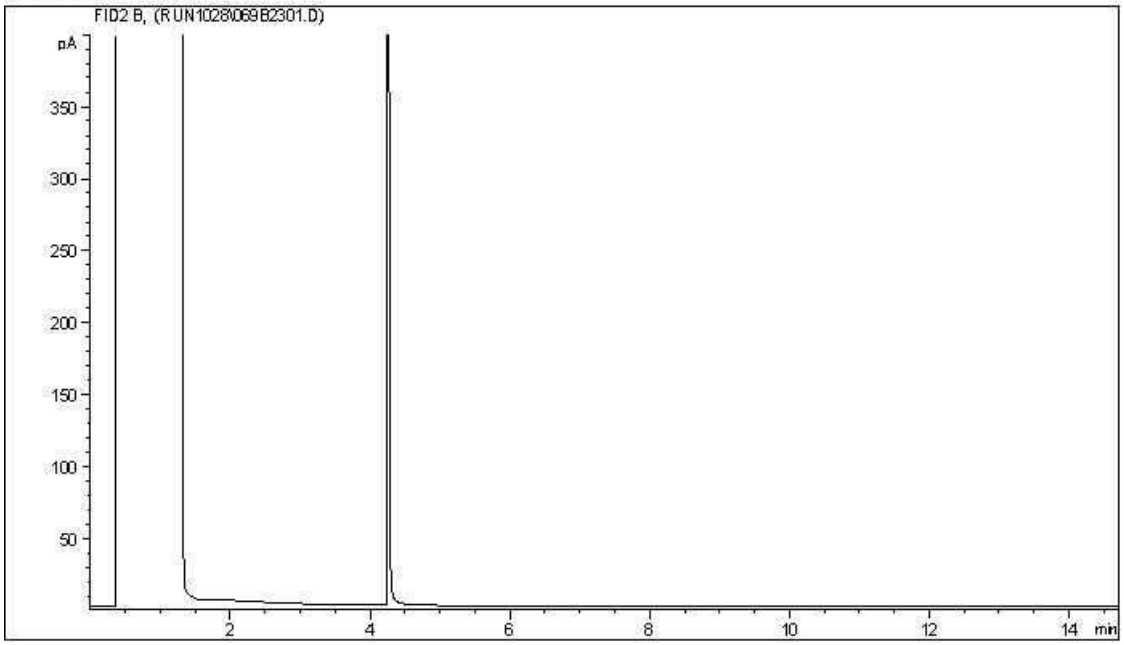
25-Oct-18 13:18
Leanne Cameron
B894183
S1M INS-0029

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

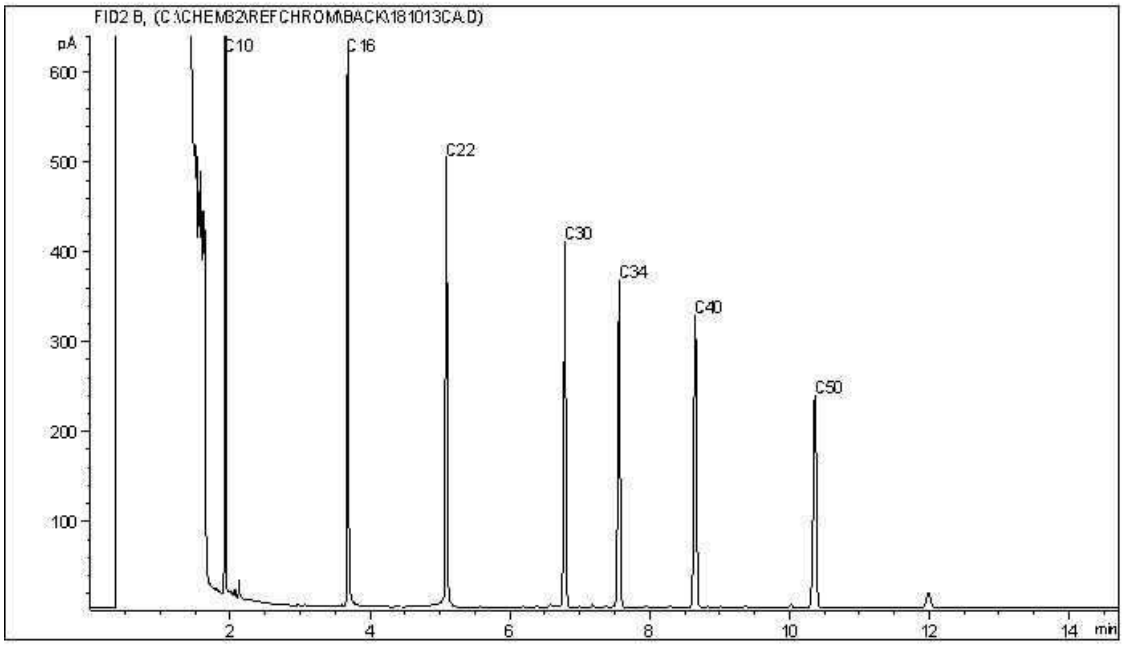
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



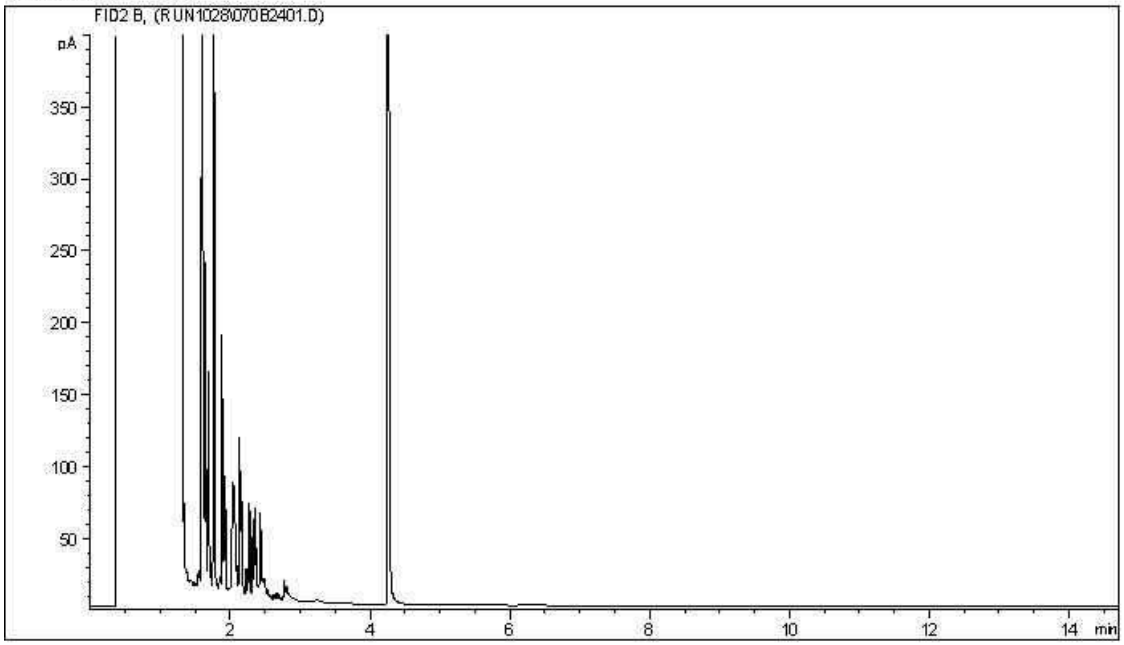
TYPICAL PRODUCT CARBON NUMBER RANGES

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

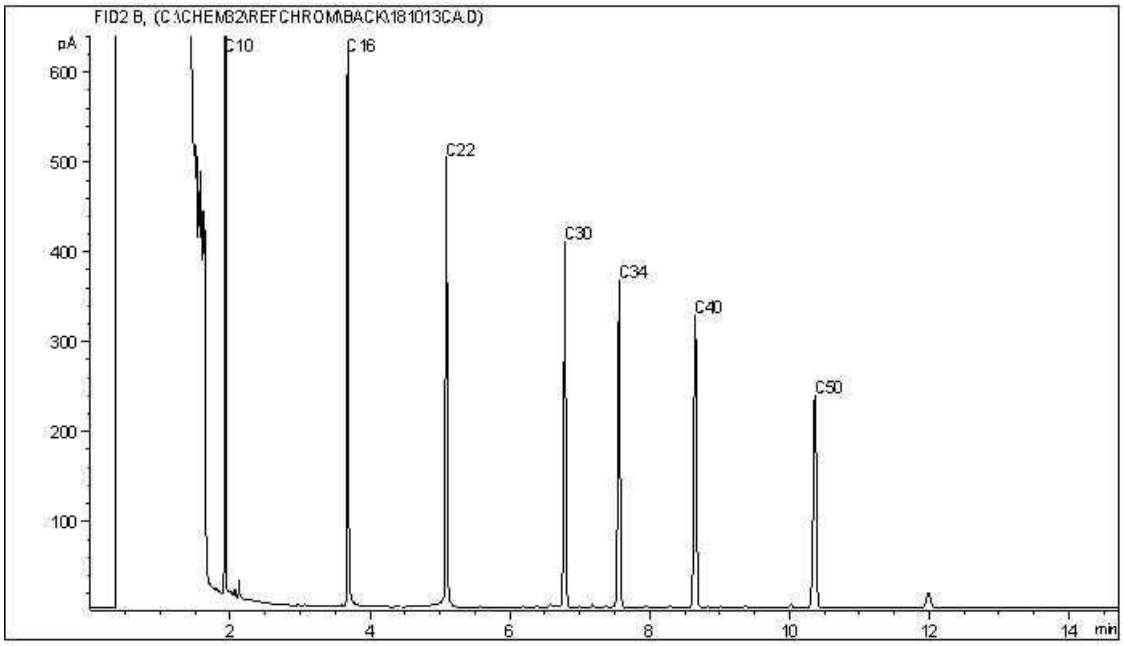
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



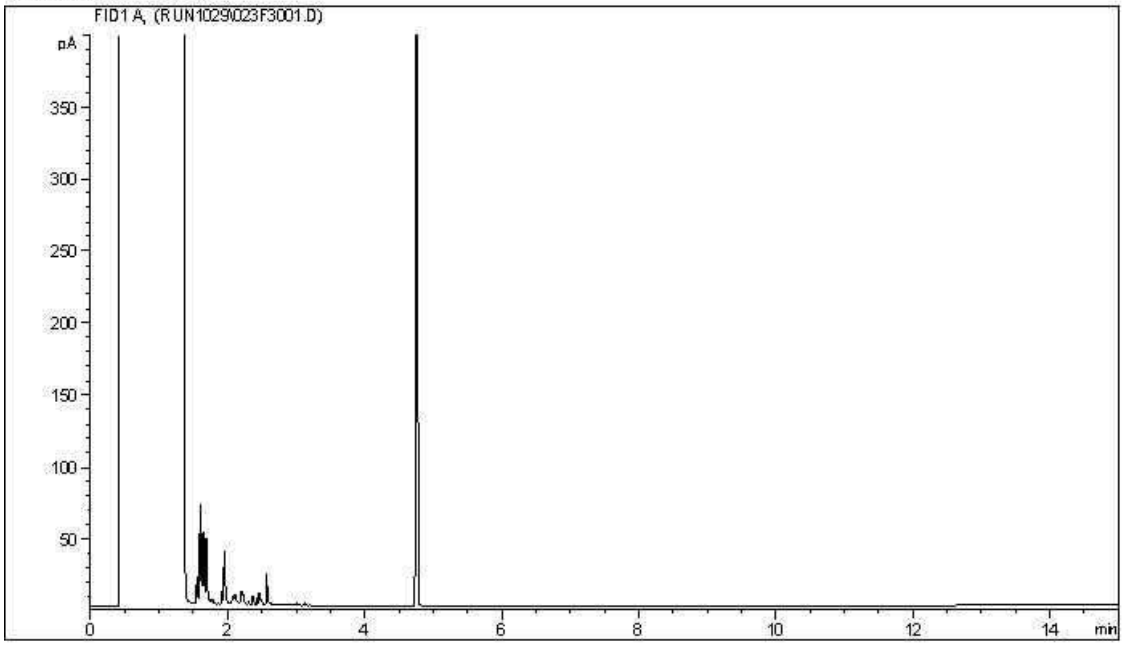
TYPICAL PRODUCT CARBON NUMBER RANGES

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

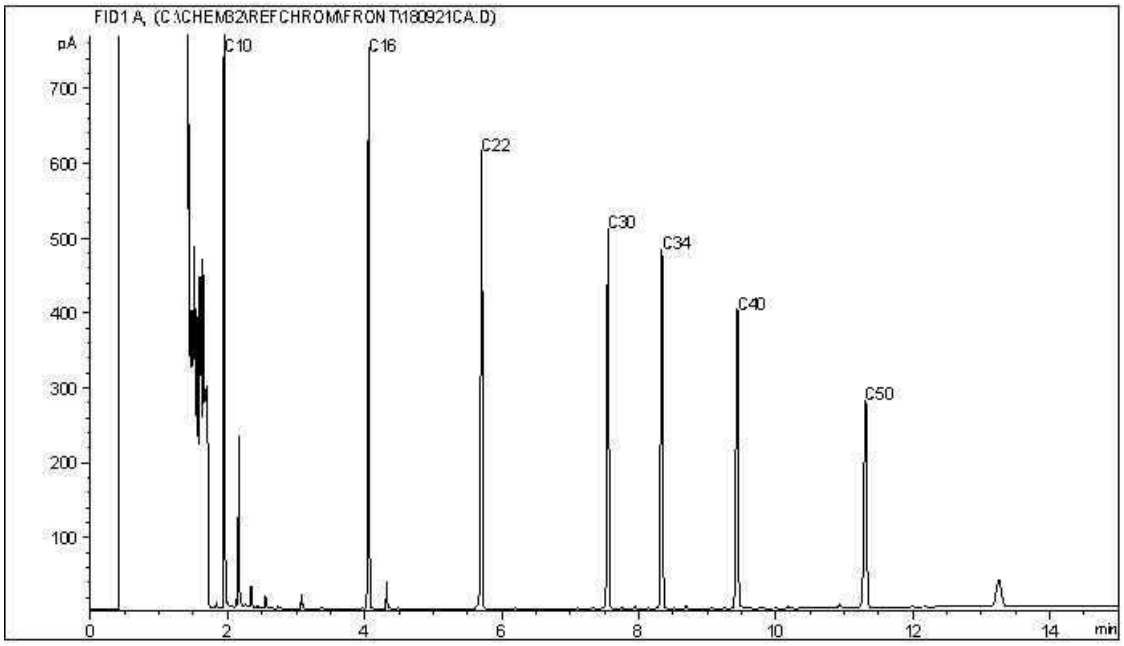
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



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+

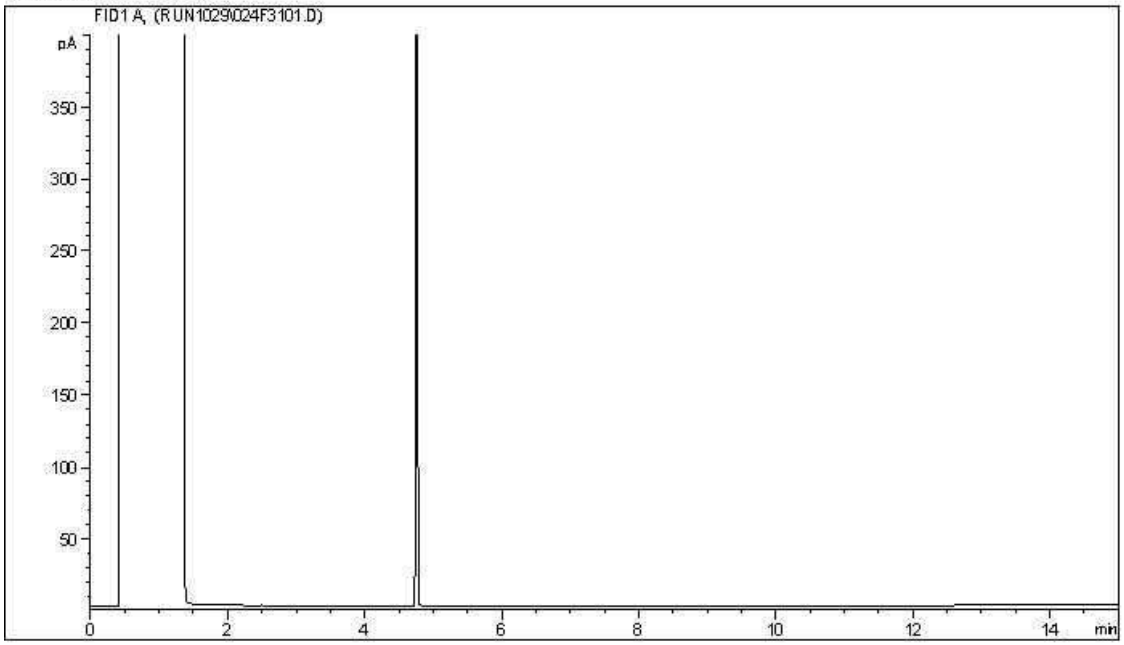
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894183
Report Date: 2018/11/01
Maxxam Sample: UQ4316

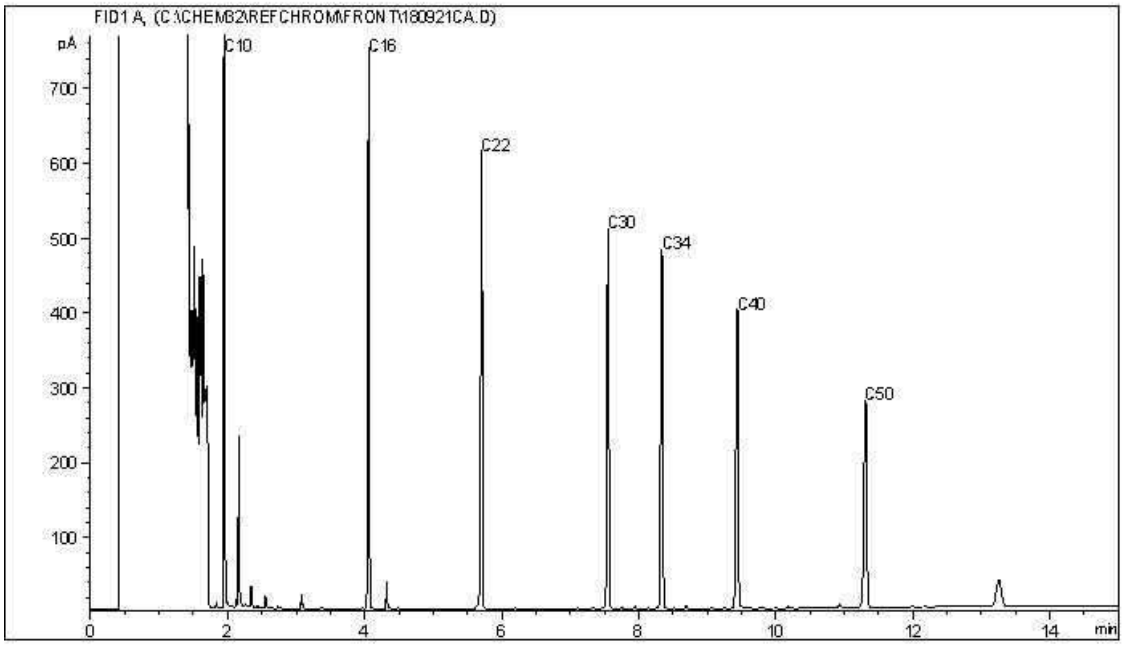
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 3002A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



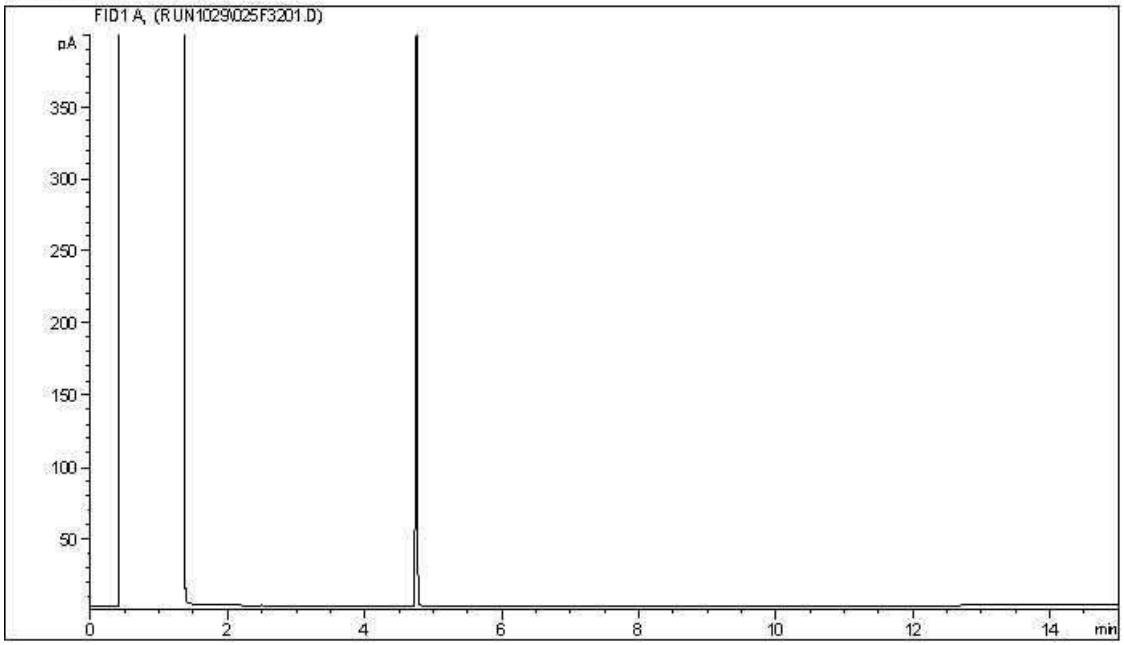
TYPICAL PRODUCT CARBON NUMBER RANGES

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

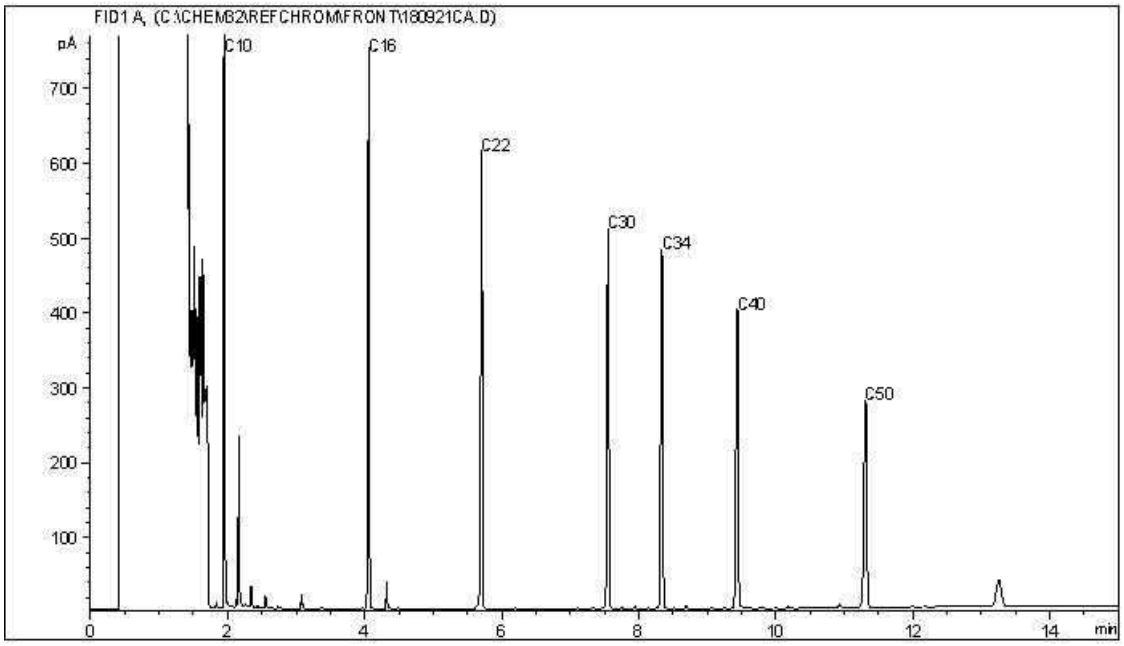
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



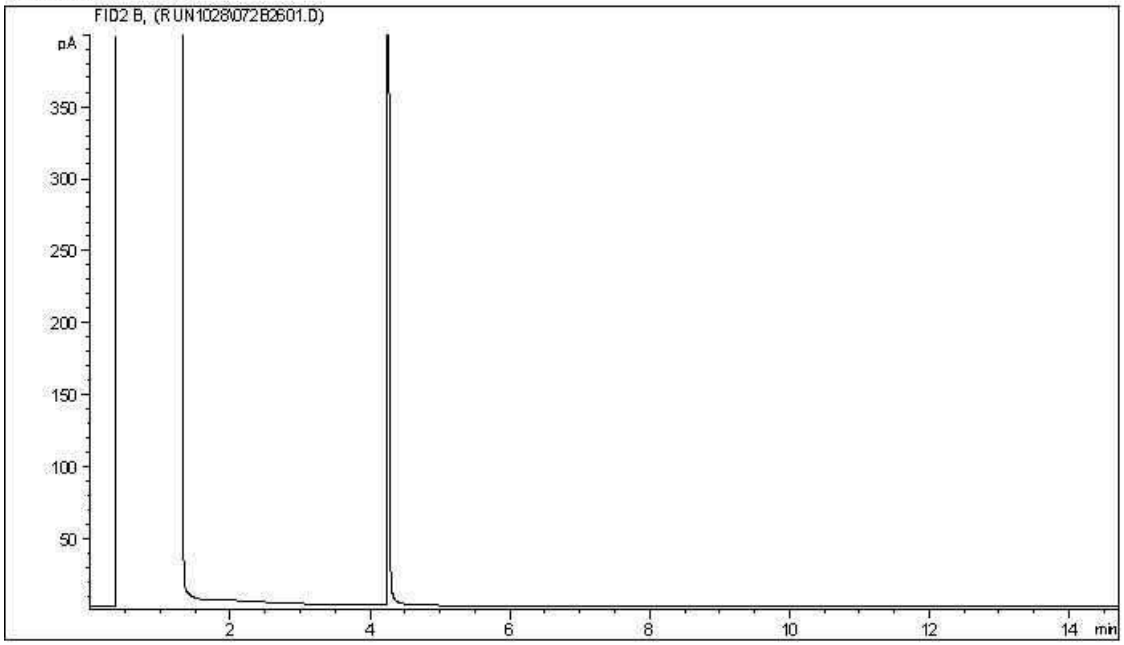
TYPICAL PRODUCT CARBON NUMBER RANGES

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

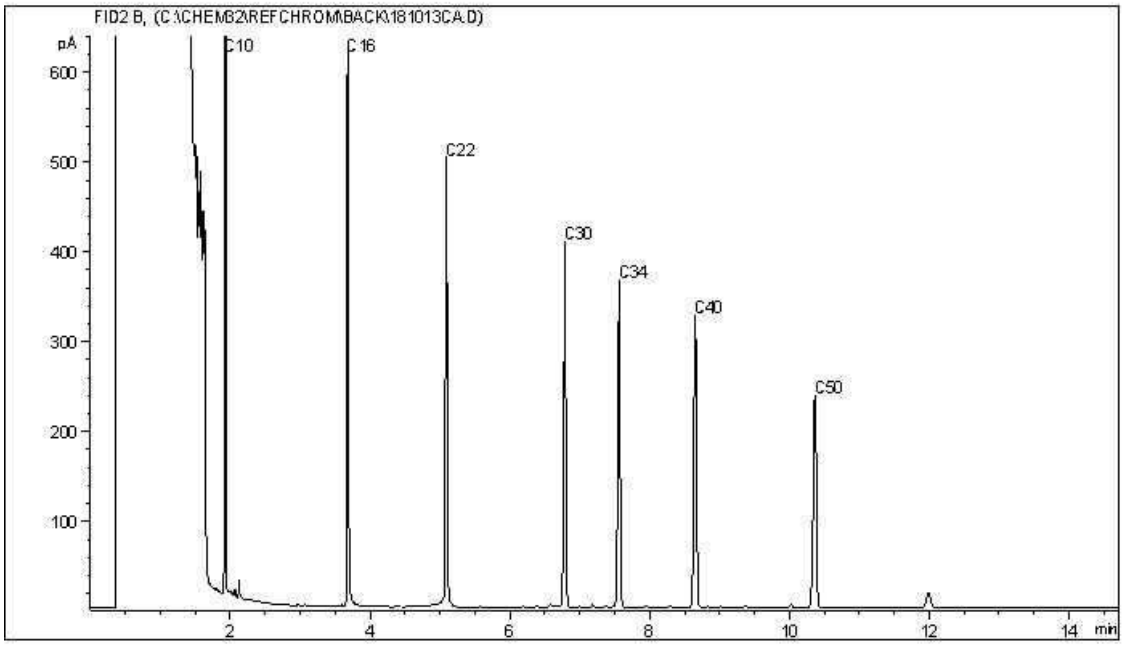
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



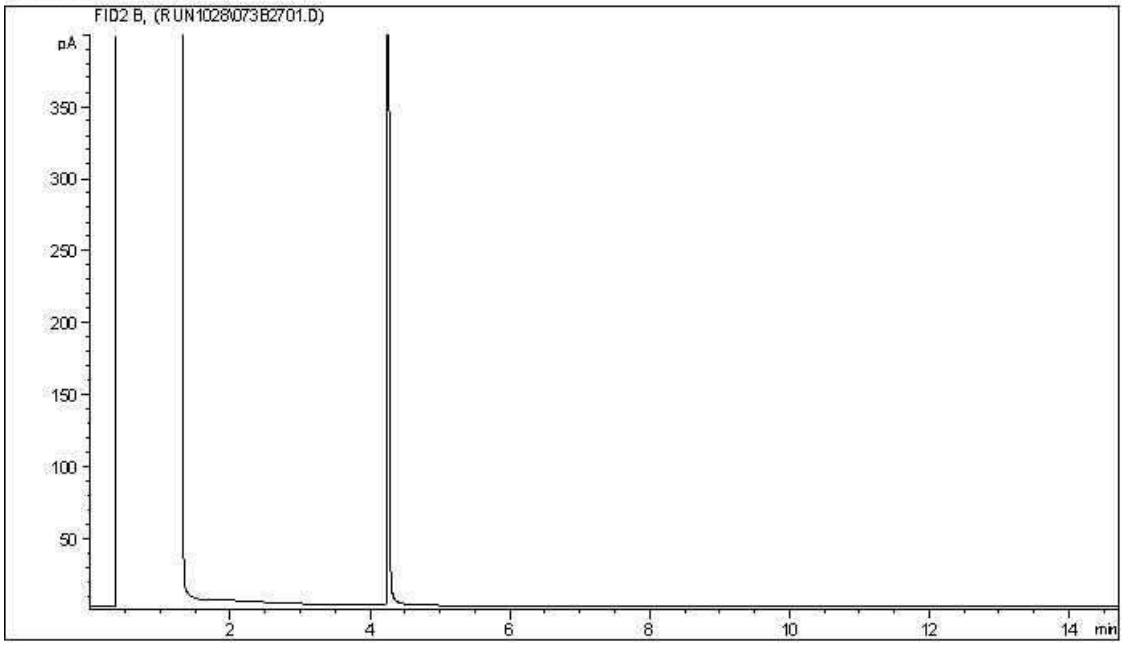
TYPICAL PRODUCT CARBON NUMBER RANGES

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

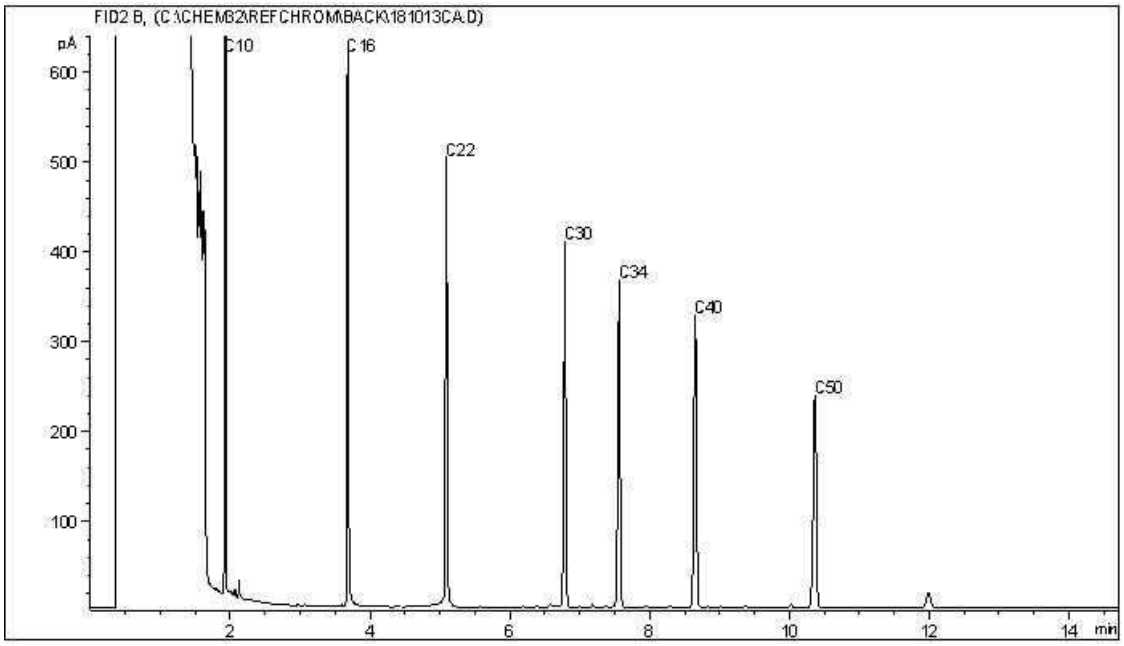
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC7



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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: m045922

Attention: STEPHEN DABADIE

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

Report Date: 2018/11/01
Report #: R2644301
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B894334
Received: 2018/10/26, 12:13

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	8	N/A	2018/10/29	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2018/10/30	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	2	2018/10/30	2018/10/30	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	6	2018/10/30	2018/10/31	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	3	N/A	2018/11/01	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	3	2018/10/30	2018/11/01	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	9	N/A	2018/10/30	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	9	N/A	2018/10/29	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: m045922

Attention: STEPHEN DABADIE

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

Report Date: 2018/11/01
Report #: R2644301
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B894334
Received: 2018/10/26, 12:13

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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 Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UQ5383	UQ5384		UQ5385	UQ5386	UQ5387		
Sampling Date		2018/10/26 09:45	2018/10/26 10:00		2018/10/26 10:10	2018/10/26 09:15	2018/10/26 09:25		
COC Number		m045922	m045922		m045922	m045922	m045922		
	UNITS	**3001 A**	**3001 B**	**QC Batch**	**3001 C**	**3003 A**	**3003 B**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	9205911	<0.10	<0.10	<0.10	0.10	9205911
Volatiles									
Benzene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	<0.00040	0.00040	9204874
Toluene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	<0.00040	0.00040	9204874
Ethylbenzene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	<0.00040	0.00040	9204874
m & p-Xylene	mg/L	<0.00080	<0.00080	9204874	<0.00080	<0.00080	<0.00080	0.00080	9204874
o-Xylene	mg/L	<0.00040	<0.00040	9204874	<0.00040	<0.00040	<0.00040	0.00040	9204874
Xylenes (Total)	mg/L	<0.00089	<0.00089	9203742	<0.00089	<0.00089	<0.00089	0.00089	9203822
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	9203742	<0.10	<0.10	<0.10	0.10	9203822
F1 (C6-C10)	mg/L	<0.10	<0.10	9204874	<0.10	<0.10	<0.10	0.10	9204874
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	88	90	9204874	100	92	97	N/A	9204874
4-Bromofluorobenzene (sur.)	%	91	78	9204874	85	101	97	N/A	9204874
D4-1,2-Dichloroethane (sur.)	%	78	81	9204874	89	103	87	N/A	9204874
O-TERPHENYL (sur.)	%	80	85	9205911	82	80	81	N/A	9205911

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UQ5388	UQ5389	UQ5390		
Sampling Date		2018/10/26 10:20	2018/10/26 10:25	2018/10/26 10:30		
COC Number		m045922	m045922	m045922		
	UNITS	**BAILER 1**	**BAILER 2**	**BAILER 3**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	9205897
Volatiles						
Benzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9204874
Toluene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9204874
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9204874
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	0.00080	9204874
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9204874
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	0.00089	9203822
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	0.10	9203822
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	0.10	9204874
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	92	91	103	N/A	9204874
4-Bromofluorobenzene (sur.)	%	91	87	105	N/A	9204874
D4-1,2-Dichloroethane (sur.)	%	97	85	93	N/A	9204874
O-TERPHENYL (sur.)	%	95	93	94	N/A	9205897

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ5388	UQ5389	UQ5390		
Sampling Date		2018/10/26 10:20	2018/10/26 10:25	2018/10/26 10:30		
COC Number		m045922	m045922	m045922		
	UNITS	**BAILER 1**	**BAILER 2**	**BAILER 3**	**RDL**	**QC Batch**
Polycyclic Aromatics						
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	0.000010	9203420
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9205887
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9205887
Acridine	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9205887
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	0.000010	9205887
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9205887
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9205887
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9205887
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9205887
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9205887
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	0.0000075	9205887
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9205887
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9205887
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	0.0000075	9205887
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	0.000010	9205887
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9205887
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	0.0000085	9205887
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9205887
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9205887
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.00010	9205887
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9205887
Perylene	mg/L	<0.000050	<0.000050	<0.000050	0.000050	9205887
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	0.000020	9205887
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	0.00020	9205887
Surrogate Recovery (%)						
D10-ANTHRACENE (sur.)	%	90	94	89	N/A	9205887
D8-ACENAPHTHYLENE (sur.)	%	91	95	91	N/A	9205887
D8-NAPHTHALENE (sur.)	%	77	82	78	N/A	9205887
TERPHENYL-D14 (sur.)	%	112	111	116	N/A	9205887

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ5383	UQ5384	UQ5385	UQ5386	UQ5387		
Sampling Date		2018/10/26 09:45	2018/10/26 10:00	2018/10/26 10:10	2018/10/26 09:15	2018/10/26 09:25		
COC Number		m045922	m045922	m045922	m045922	m045922		
	UNITS	**3001 A**	**3001 B**	**3001 C**	**3003 A**	**3003 B**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9203422
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9204886
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	0.0015	<0.00050	0.00050	9204886
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
RDL = Reportable Detection Limit								

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ5383	UQ5384	UQ5385	UQ5386	UQ5387		
Sampling Date		2018/10/26 09:45	2018/10/26 10:00	2018/10/26 10:10	2018/10/26 09:15	2018/10/26 09:25		
COC Number		m045922	m045922	m045922	m045922	m045922		
	UNITS	**3001 A**	**3001 B**	**3001 C**	**3003 A**	**3003 B**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	101	100	100	100	100	N/A	9204886
4-Bromofluorobenzene (sur.)	%	96	95	96	97	97	N/A	9204886
D4-1,2-Dichloroethane (sur.)	%	101	98	102	102	101	N/A	9204886

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ5388	UQ5389	UQ5390	UQ5391		
Sampling Date		2018/10/26 10:20	2018/10/26 10:25	2018/10/26 10:30	2018/10/26		
COC Number		m045922	m045922	m045922	m045922		
	UNITS	**BAILER 1**	**BAILER 2**	**BAILER 3**	**TRIP BLANK 12**	**RDL**	**QC Batch**
Volatiles							
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	<0.0013	0.0013	9203422
Benzene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9204886
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9204886
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Ethylbenzene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9204886
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9204886
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886

RDL = Reportable Detection Limit
N/A = Not Applicable

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ5388	UQ5389	UQ5390	UQ5391		
Sampling Date		2018/10/26 10:20	2018/10/26 10:25	2018/10/26 10:30	2018/10/26		
COC Number		m045922	m045922	m045922	m045922		
	UNITS	**BAILER 1**	**BAILER 2**	**BAILER 3**	**TRIP BLANK 12**	**RDL**	**QC Batch**
Toluene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9204886
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9204886
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9204886
Xylenes (Total)	mg/L	N/A	N/A	N/A	<0.00080	0.00080	9204886
m & p-Xylene	mg/L	N/A	N/A	N/A	<0.00080	0.00080	9204886
o-Xylene	mg/L	N/A	N/A	N/A	<0.00040	0.00040	9204886
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	100	100	100	101	N/A	9204886
4-Bromofluorobenzene (sur.)	%	96	96	96	96	N/A	9204886
D4-1,2-Dichloroethane (sur.)	%	101	102	98	95	N/A	9204886

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	7.0°C

Results relate only to the items tested.

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Client Project #: CG2430.1 E32
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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9204874	WZ0	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/29		106	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		84	%	50 - 140
			Benzene	2018/10/29		85	%	50 - 140
			Toluene	2018/10/29		103	%	50 - 140
			Ethylbenzene	2018/10/29		96	%	50 - 140
			m & p-Xylene	2018/10/29		93	%	50 - 140
			o-Xylene	2018/10/29		96	%	50 - 140
			F1 (C6-C10)	2018/10/29		79	%	60 - 140
9204874	WZ0	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/29		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		86	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		92	%	50 - 140
			Benzene	2018/10/29		94	%	60 - 130
			Toluene	2018/10/29		104	%	60 - 130
			Ethylbenzene	2018/10/29		102	%	60 - 130
			m & p-Xylene	2018/10/29		97	%	60 - 130
			o-Xylene	2018/10/29		95	%	60 - 130
			F1 (C6-C10)	2018/10/29		89	%	60 - 140
9204874	WZ0	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/29		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		92	%	50 - 140
			Benzene	2018/10/29	<0.00040		mg/L	
			Toluene	2018/10/29	<0.00040		mg/L	
			Ethylbenzene	2018/10/29	<0.00040		mg/L	
			m & p-Xylene	2018/10/29	<0.00080		mg/L	
			o-Xylene	2018/10/29	<0.00040		mg/L	
			F1 (C6-C10)	2018/10/29	<0.10		mg/L	
9204874	WZ0	RPD	Benzene	2018/10/30	1.7		%	30
			Toluene	2018/10/30	5.3		%	30
			Ethylbenzene	2018/10/30	1.9		%	30
			m & p-Xylene	2018/10/30	4.9		%	30
			o-Xylene	2018/10/30	0.89		%	30
			F1 (C6-C10)	2018/10/30	4.0		%	30
9204886	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		94	%	50 - 140
			Benzene	2018/10/29		NC	%	50 - 140
			Bromodichloromethane	2018/10/29		107	%	50 - 140
			Bromoform	2018/10/29		99	%	50 - 140
			Bromomethane	2018/10/29		111	%	50 - 140
			Carbon tetrachloride	2018/10/29		106	%	50 - 140
			Chlorobenzene	2018/10/29		102	%	50 - 140
			Chlorodibromomethane	2018/10/29		100	%	50 - 140
			Chloroethane	2018/10/29		107	%	50 - 140
			Chloroform	2018/10/29		102	%	50 - 140
			Chloromethane	2018/10/29		131	%	50 - 140
			1,2-dibromoethane	2018/10/29		99	%	50 - 140
			1,2-dichlorobenzene	2018/10/29		104	%	50 - 140
			1,3-dichlorobenzene	2018/10/29		106	%	50 - 140
			1,4-dichlorobenzene	2018/10/29		104	%	50 - 140
			1,1-dichloroethane	2018/10/29		100	%	50 - 140
			1,2-dichloroethane	2018/10/29		100	%	50 - 140
			1,1-dichloroethene	2018/10/29		110	%	50 - 140
			cis-1,2-dichloroethene	2018/10/29		103	%	50 - 140

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,2-dichloroethene	2018/10/29		100	%	50 - 140
			Dichloromethane	2018/10/29		104	%	50 - 140
			1,2-dichloropropane	2018/10/29		106	%	50 - 140
			cis-1,3-dichloropropene	2018/10/29		106	%	50 - 140
			trans-1,3-dichloropropene	2018/10/29		104	%	50 - 140
			Ethylbenzene	2018/10/29		NC	%	50 - 140
			Methyl methacrylate	2018/10/29		114	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/10/29		101	%	50 - 140
			Styrene	2018/10/29		103	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/10/29		97	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/10/29		97	%	50 - 140
			Tetrachloroethene	2018/10/29		98	%	50 - 140
			Toluene	2018/10/29		NC	%	50 - 140
			1,2,3-trichlorobenzene	2018/10/29		102	%	50 - 140
			1,2,4-trichlorobenzene	2018/10/29		102	%	50 - 140
			1,3,5-trichlorobenzene	2018/10/29		103	%	50 - 140
			1,1,1-trichloroethane	2018/10/29		108	%	50 - 140
			1,1,2-trichloroethane	2018/10/29		120	%	50 - 140
			Trichloroethene	2018/10/29		111	%	50 - 140
			Trichlorofluoromethane	2018/10/29		114	%	50 - 140
			1,2,4-trimethylbenzene	2018/10/29		100	%	50 - 140
			1,3,5-trimethylbenzene	2018/10/29		100	%	50 - 140
			Vinyl chloride	2018/10/29		128	%	50 - 140
			m & p-Xylene	2018/10/29		NC	%	50 - 140
			o-Xylene	2018/10/29		86	%	50 - 140
9204886	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/29		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		118	%	50 - 140
			Benzene	2018/10/29		92	%	60 - 130
			Bromodichloromethane	2018/10/29		105	%	60 - 130
			Bromoform	2018/10/29		96	%	60 - 130
			Bromomethane	2018/10/29		100	%	60 - 130
			Carbon tetrachloride	2018/10/29		105	%	60 - 130
			Chlorobenzene	2018/10/29		98	%	60 - 130
			Chlorodibromomethane	2018/10/29		100	%	60 - 130
			Chloroethane	2018/10/29		96	%	60 - 130
			Chloroform	2018/10/29		97	%	60 - 130
			Chloromethane	2018/10/29		114	%	60 - 130
			1,2-dibromoethane	2018/10/29		96	%	60 - 130
			1,2-dichlorobenzene	2018/10/29		101	%	60 - 130
			1,3-dichlorobenzene	2018/10/29		100	%	60 - 130
			1,4-dichlorobenzene	2018/10/29		98	%	60 - 130
			1,1-dichloroethane	2018/10/29		100	%	60 - 130
			1,2-dichloroethane	2018/10/29		101	%	60 - 130
			1,1-dichloroethene	2018/10/29		102	%	60 - 130
			cis-1,2-dichloroethene	2018/10/29		99	%	60 - 130
			trans-1,2-dichloroethene	2018/10/29		96	%	60 - 130
			Dichloromethane	2018/10/29		97	%	60 - 130
			1,2-dichloropropane	2018/10/29		103	%	60 - 130
			cis-1,3-dichloropropene	2018/10/29		105	%	60 - 130
			trans-1,3-dichloropropene	2018/10/29		100	%	60 - 130
			Ethylbenzene	2018/10/29		94	%	60 - 130
			Methyl methacrylate	2018/10/29		103	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/10/29		101	%	60 - 130

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Styrene	2018/10/29		98	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/10/29		93	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/10/29		95	%	60 - 130
			Tetrachloroethene	2018/10/29		95	%	60 - 130
			Toluene	2018/10/29		96	%	60 - 130
			1,2,3-trichlorobenzene	2018/10/29		92	%	60 - 130
			1,2,4-trichlorobenzene	2018/10/29		93	%	60 - 130
			1,3,5-trichlorobenzene	2018/10/29		95	%	60 - 130
			1,1,1-trichloroethane	2018/10/29		104	%	60 - 130
			1,1,2-trichloroethane	2018/10/29		102	%	60 - 130
			Trichloroethene	2018/10/29		106	%	60 - 130
			Trichlorofluoromethane	2018/10/29		104	%	60 - 130
			1,2,4-trimethylbenzene	2018/10/29		99	%	60 - 130
			1,3,5-trimethylbenzene	2018/10/29		103	%	60 - 130
			Vinyl chloride	2018/10/29		111	%	60 - 130
			m & p-Xylene	2018/10/29		93	%	60 - 130
			o-Xylene	2018/10/29		91	%	60 - 130
9204886	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/29		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/29		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/29		101	%	50 - 140
			Benzene	2018/10/29	<0.00040		mg/L	
			Bromodichloromethane	2018/10/29	<0.00050		mg/L	
			Bromoform	2018/10/29	<0.00050		mg/L	
			Bromomethane	2018/10/29	<0.0020		mg/L	
			Carbon tetrachloride	2018/10/29	<0.00050		mg/L	
			Chlorobenzene	2018/10/29	<0.00050		mg/L	
			Chlorodibromomethane	2018/10/29	<0.0010		mg/L	
			Chloroethane	2018/10/29	<0.0010		mg/L	
			Chloroform	2018/10/29	<0.00050		mg/L	
			Chloromethane	2018/10/29	<0.0020		mg/L	
			1,2-dibromoethane	2018/10/29	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/10/29	<0.00050		mg/L	
			1,1-dichloroethane	2018/10/29	<0.00050		mg/L	
			1,2-dichloroethane	2018/10/29	<0.00050		mg/L	
			1,1-dichloroethene	2018/10/29	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/10/29	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/10/29	<0.00050		mg/L	
			Dichloromethane	2018/10/29	<0.0020		mg/L	
			1,2-dichloropropane	2018/10/29	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/10/29	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/10/29	<0.00050		mg/L	
			Ethylbenzene	2018/10/29	<0.00040		mg/L	
			Methyl methacrylate	2018/10/29	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/10/29	<0.00050		mg/L	
			Styrene	2018/10/29	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/10/29	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/10/29	<0.0020		mg/L	
			Tetrachloroethene	2018/10/29	<0.00050		mg/L	
			Toluene	2018/10/29	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/10/29	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/10/29	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/10/29	<0.00050		mg/L	

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CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,1-trichloroethane	2018/10/29	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/10/29	<0.00050		mg/L	
			Trichloroethene	2018/10/29	<0.00050		mg/L	
			Trichlorofluoromethane	2018/10/29	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/10/29	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/10/29	<0.00050		mg/L	
			Vinyl chloride	2018/10/29	<0.00050		mg/L	
			Xylenes (Total)	2018/10/29	<0.00080		mg/L	
			m & p-Xylene	2018/10/29	<0.00080		mg/L	
			o-Xylene	2018/10/29	<0.00040		mg/L	
9204886	MZ	RPD	Bromodichloromethane	2018/10/29	NC		%	30
			Bromoform	2018/10/29	NC		%	30
			Bromomethane	2018/10/29	NC		%	30
			Carbon tetrachloride	2018/10/29	NC		%	30
			Chlorobenzene	2018/10/29	NC		%	30
			Chlorodibromomethane	2018/10/29	NC		%	30
			Chloroethane	2018/10/29	NC		%	30
			Chloroform	2018/10/29	NC		%	30
			Chloromethane	2018/10/29	NC		%	30
			1,2-dibromoethane	2018/10/29	NC		%	30
			1,2-dichlorobenzene	2018/10/29	NC		%	30
			1,3-dichlorobenzene	2018/10/29	NC		%	30
			1,4-dichlorobenzene	2018/10/29	NC		%	30
			1,1-dichloroethane	2018/10/29	NC		%	30
			1,2-dichloroethane	2018/10/29	NC		%	30
			1,1-dichloroethene	2018/10/29	NC		%	30
			cis-1,2-dichloroethene	2018/10/29	NC		%	30
			trans-1,2-dichloroethene	2018/10/29	NC		%	30
			Dichloromethane	2018/10/29	NC		%	30
			1,2-dichloropropane	2018/10/29	NC		%	30
			cis-1,3-dichloropropene	2018/10/29	NC		%	30
			trans-1,3-dichloropropene	2018/10/29	NC		%	30
			Methyl methacrylate	2018/10/29	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/10/29	NC		%	30
			Styrene	2018/10/29	NC		%	30
			1,1,1,2-tetrachloroethane	2018/10/29	NC		%	30
			1,1,2,2-tetrachloroethane	2018/10/29	NC		%	30
			Tetrachloroethene	2018/10/29	NC		%	30
			1,2,3-trichlorobenzene	2018/10/29	NC		%	30
			1,2,4-trichlorobenzene	2018/10/29	NC		%	30
			1,3,5-trichlorobenzene	2018/10/29	NC		%	30
			1,1,1-trichloroethane	2018/10/29	NC		%	30
			1,1,2-trichloroethane	2018/10/29	NC		%	30
			Trichloroethene	2018/10/29	NC		%	30
			Trichlorofluoromethane	2018/10/29	NC		%	30
			1,2,4-trimethylbenzene	2018/10/29	NC		%	30
			1,3,5-trimethylbenzene	2018/10/29	NC		%	30
			Vinyl chloride	2018/10/29	NC		%	30
9205887	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/11/01		92	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/01		92	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/01		78	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/01		88	%	50 - 130
			Acenaphthene	2018/11/01		NC	%	50 - 130
			Acenaphthylene	2018/11/01		103	%	50 - 130

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acridine	2018/11/01		NC	%	50 - 130
			Anthracene	2018/11/01		85	%	50 - 130
			Benzo(a)anthracene	2018/11/01		88	%	50 - 130
			Benzo(b&j)fluoranthene	2018/11/01		93	%	50 - 130
			Benzo(k)fluoranthene	2018/11/01		85	%	50 - 130
			Benzo(g,h,i)perylene	2018/11/01		76	%	50 - 130
			Benzo(c)phenanthrene	2018/11/01		84	%	50 - 130
			Benzo(a)pyrene	2018/11/01		81	%	50 - 130
			Benzo[e]pyrene	2018/11/01		70	%	50 - 130
			Chrysene	2018/11/01		98	%	50 - 130
			Dibenz(a,h)anthracene	2018/11/01		84	%	50 - 130
			Fluoranthene	2018/11/01		85	%	50 - 130
			Fluorene	2018/11/01		NC	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/11/01		88	%	50 - 130
			1-Methylnaphthalene	2018/11/01		NC	%	50 - 130
			2-Methylnaphthalene	2018/11/01		NC	%	50 - 130
			Naphthalene	2018/11/01		NC	%	50 - 130
			Phenanthrene	2018/11/01		NC	%	50 - 130
			Perylene	2018/11/01		81	%	50 - 130
			Pyrene	2018/11/01		NC	%	50 - 130
			Quinoline	2018/11/01		NC	%	50 - 130
9205887	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/11/01		90	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/01		85	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/01		68	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/01		107	%	50 - 130
			Acenaphthene	2018/11/01		82	%	50 - 130
			Acenaphthylene	2018/11/01		85	%	50 - 130
			Acridine	2018/11/01		76	%	50 - 130
			Anthracene	2018/11/01		82	%	50 - 130
			Benzo(a)anthracene	2018/11/01		112	%	50 - 130
			Benzo(b&j)fluoranthene	2018/11/01		110	%	50 - 130
			Benzo(k)fluoranthene	2018/11/01		104	%	50 - 130
			Benzo(g,h,i)perylene	2018/11/01		95	%	50 - 130
			Benzo(c)phenanthrene	2018/11/01		103	%	50 - 130
			Benzo(a)pyrene	2018/11/01		105	%	50 - 130
			Benzo[e]pyrene	2018/11/01		102	%	50 - 130
			Chrysene	2018/11/01		103	%	50 - 130
			Dibenz(a,h)anthracene	2018/11/01		99	%	50 - 130
			Fluoranthene	2018/11/01		101	%	50 - 130
			Fluorene	2018/11/01		83	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/11/01		91	%	50 - 130
			1-Methylnaphthalene	2018/11/01		81	%	50 - 130
			2-Methylnaphthalene	2018/11/01		75	%	50 - 130
			Naphthalene	2018/11/01		74	%	50 - 130
			Phenanthrene	2018/11/01		88	%	50 - 130
			Perylene	2018/11/01		98	%	50 - 130
			Pyrene	2018/11/01		98	%	50 - 130
			Quinoline	2018/11/01		101	%	50 - 130
9205887	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/11/01		85	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/01		85	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/01		67	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/01		98	%	50 - 130
			Acenaphthene	2018/11/01	<0.00010		mg/L	
			Acenaphthylene	2018/11/01	<0.00010		mg/L	

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acridine	2018/11/01	<0.000050		mg/L	
			Anthracene	2018/11/01	<0.000010		mg/L	
			Benzo(a)anthracene	2018/11/01	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/11/01	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/11/01	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/11/01	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/11/01	<0.000050		mg/L	
			Benzo(a)pyrene	2018/11/01	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/11/01	<0.000050		mg/L	
			Chrysene	2018/11/01	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/11/01	<0.0000075		mg/L	
			Fluoranthene	2018/11/01	<0.000010		mg/L	
			Fluorene	2018/11/01	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/11/01	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/11/01	<0.00010		mg/L	
			2-Methylnaphthalene	2018/11/01	<0.00010		mg/L	
			Naphthalene	2018/11/01	<0.00010		mg/L	
			Phenanthrene	2018/11/01	<0.000050		mg/L	
			Perylene	2018/11/01	<0.000050		mg/L	
			Pyrene	2018/11/01	<0.000020		mg/L	
			Quinoline	2018/11/01	<0.00020		mg/L	
9205887	LZ3	RPD	Acenaphthene	2018/11/01	NC		%	30
			Acenaphthylene	2018/11/01	NC		%	30
			Acridine	2018/11/01	NC		%	30
			Anthracene	2018/11/01	NC		%	30
			Benzo(a)anthracene	2018/11/01	NC		%	30
			Benzo(b&j)fluoranthene	2018/11/01	NC		%	30
			Benzo(k)fluoranthene	2018/11/01	NC		%	30
			Benzo(g,h,i)perylene	2018/11/01	NC		%	30
			Benzo(c)phenanthrene	2018/11/01	NC		%	30
			Benzo(a)pyrene	2018/11/01	NC		%	30
			Benzo[e]pyrene	2018/11/01	NC		%	30
			Chrysene	2018/11/01	NC		%	30
			Dibenz(a,h)anthracene	2018/11/01	NC		%	30
			Fluoranthene	2018/11/01	NC		%	30
			Fluorene	2018/11/01	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/11/01	NC		%	30
			1-Methylnaphthalene	2018/11/01	NC		%	30
			2-Methylnaphthalene	2018/11/01	NC		%	30
			Naphthalene	2018/11/01	NC		%	30
			Phenanthrene	2018/11/01	NC		%	30
			Perylene	2018/11/01	NC		%	30
			Pyrene	2018/11/01	NC		%	30
			Quinoline	2018/11/01	NC		%	30
9205897	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/30		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/30		102	%	60 - 140
9205897	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/30		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/30		101	%	60 - 140
9205897	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/30		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/30	<0.10		mg/L	
9205897	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/30	NC		%	30
9205911	VP4	Matrix Spike	O-TERPHENYL (sur.)	2018/10/30		80	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/30		88	%	60 - 140
9205911	VP4	Spiked Blank	O-TERPHENYL (sur.)	2018/10/30		83	%	60 - 140

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F2 (C10-C16 Hydrocarbons)	2018/10/30		92	%	60 - 140
9205911	VP4	Method Blank	O-TERPHENYL (sur.)	2018/10/30		82	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/30	<0.10		mg/L	
9205911	VP4	RPD	F2 (C10-C16 Hydrocarbons)	2018/10/30	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).

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Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894334
Report Date: 2018/11/01

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6PB. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

1137

CHAIN OF CUSTODY RECORD

M 045922

Page 1 of 1

Invoice Information		Report Information (if differs from Invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222-30 Ave NE Calgary AB T2E 7K9	Address:				Rush TAT (Surcharges will be applied)
				Project #:	C424301E32	☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	stephen.dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn.kuzyk@clifton.ca	Copies:		Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	7	7	7
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	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
1	3001A		2018.10.26	9:45	GW	6	✓	✓										
2	3001 B		↓	10:00	GW	6	✓	✓										
3	3001 C			10:10	GW	6	✓	✓										
4	3003 A			9:15	GW	6	✓	✓										
5	3003 B			9:25	GW	6	✓	✓										
6	Bailer 1			10:20	W	8	✓	✓									✓	
7	Bailer 2			10:25	W	8	✓	✓									✓	
8	Bailer 3		✓	10:30	W	8	✓	✓									✓	
9	Trip Blank 12		2018.10.26		W	2	✓											
10																		

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

Regulatory Criteria

- ☑ AT1
- ☐ CCME
- ☐ Drinking Water
- ☐ DSO (Drilling Waste)
- ☐ Saskatchewan
- ☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018.10.26	12:13	Isabella Lima	2018/10/26	12:13

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

26-Oct-18 12:13
Leanne Cameron
B894334
JMQ INS-0001

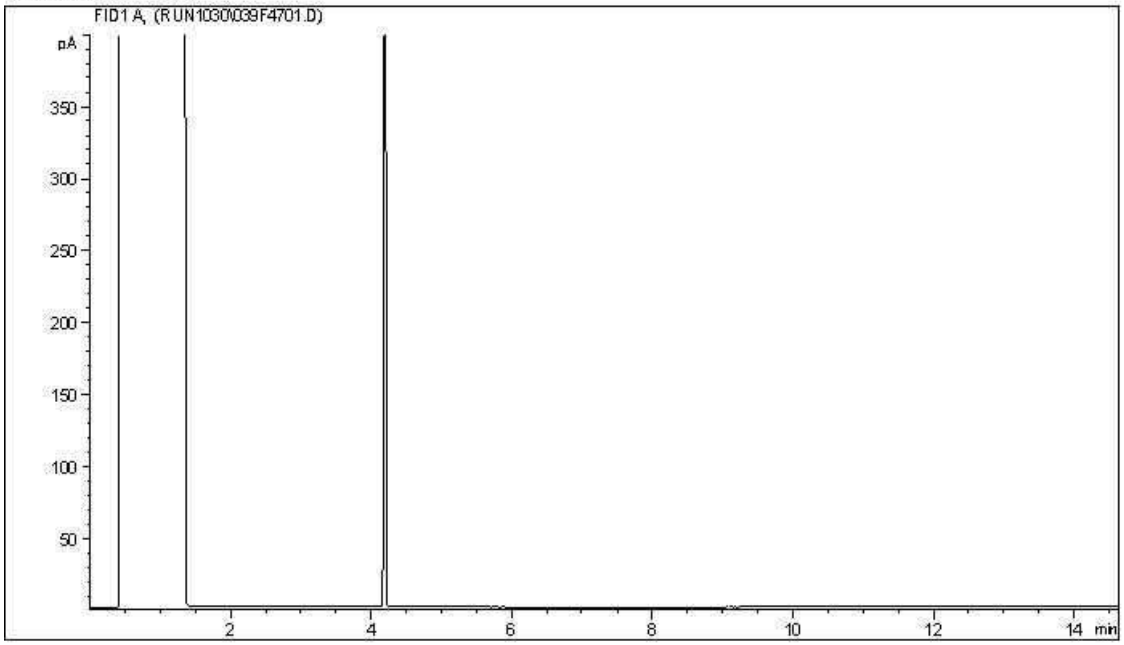
AB FCD-00331/7

Maxxam Job #: B894334
Report Date: 2018/11/01
Maxxam Sample: UQ5383

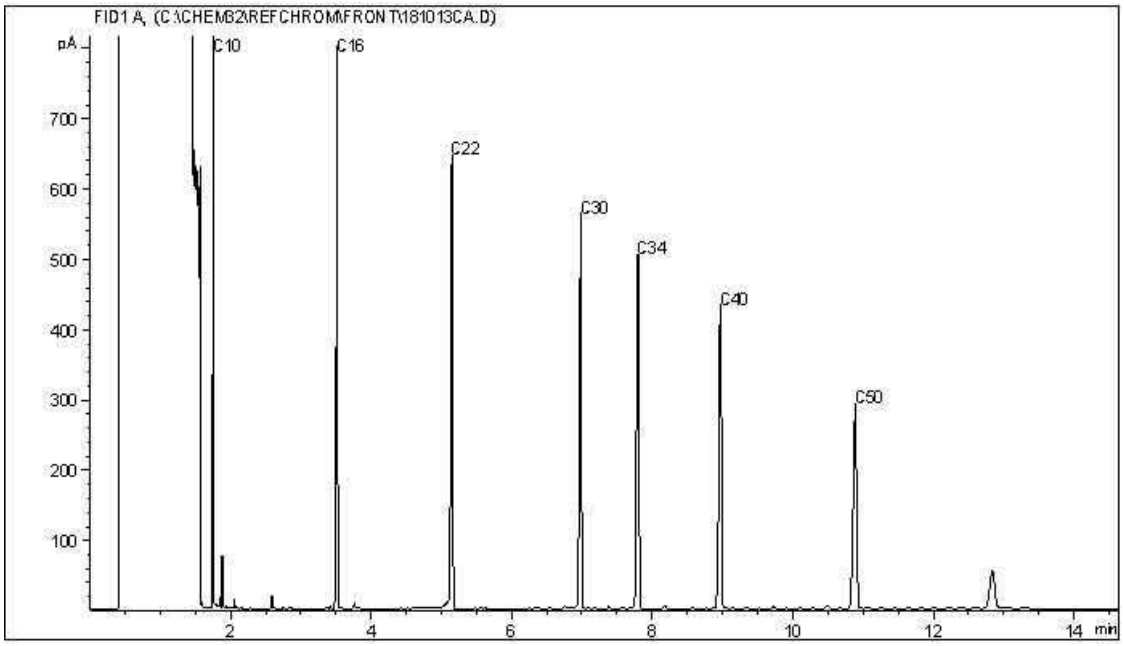
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 3001 A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

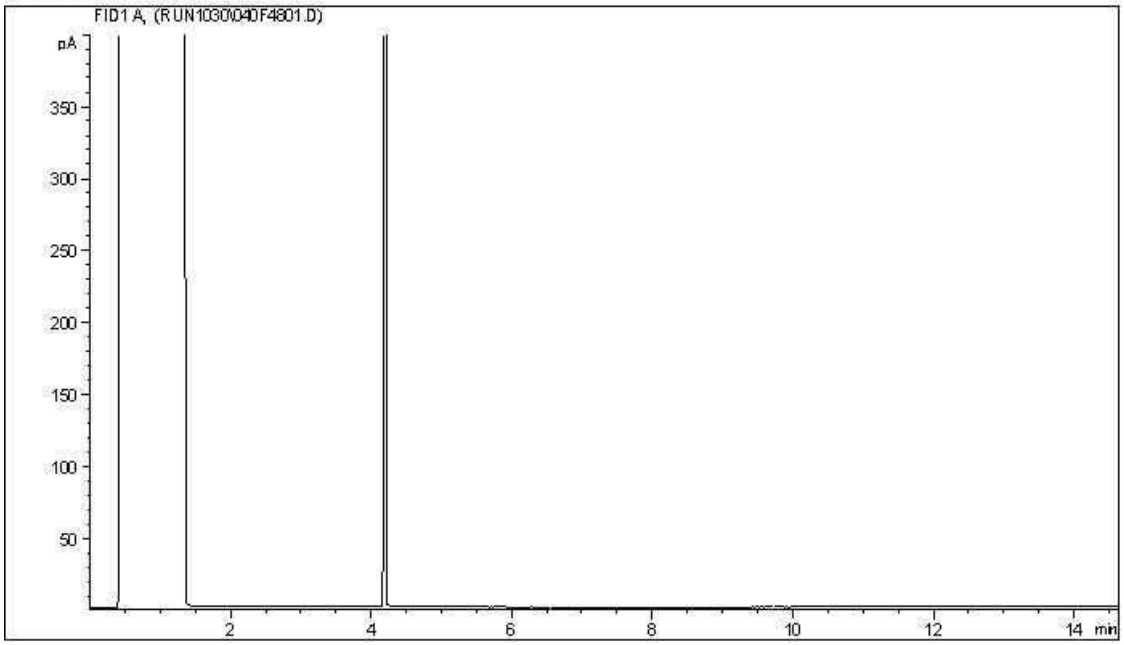
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894334
Report Date: 2018/11/01
Maxxam Sample: UQ5384

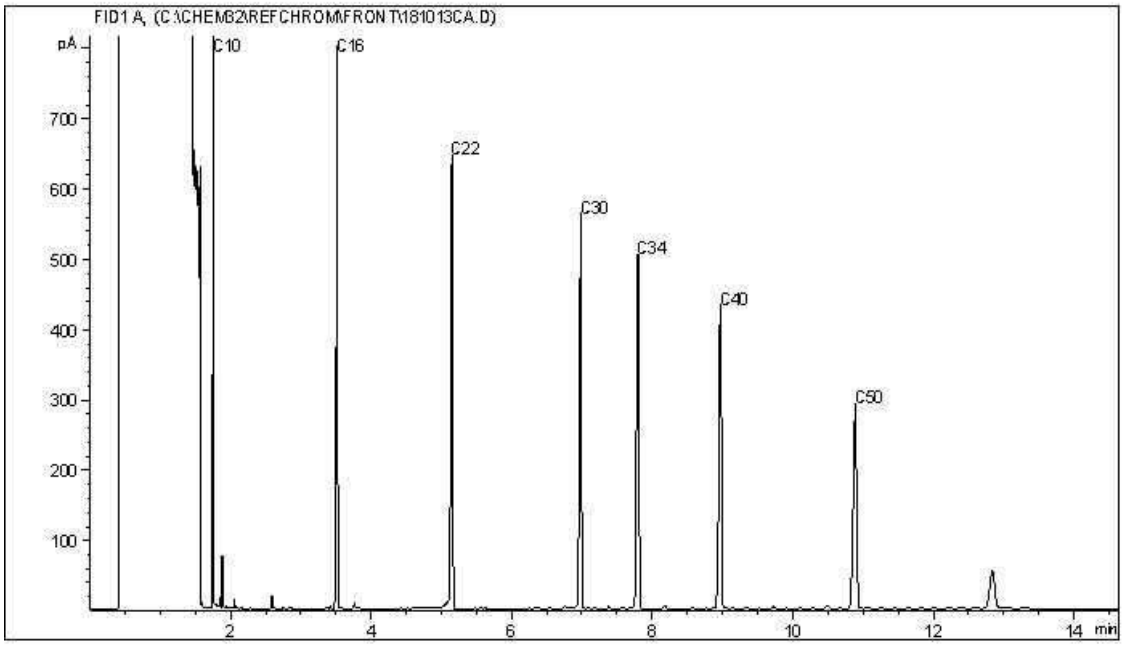
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 3001 B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

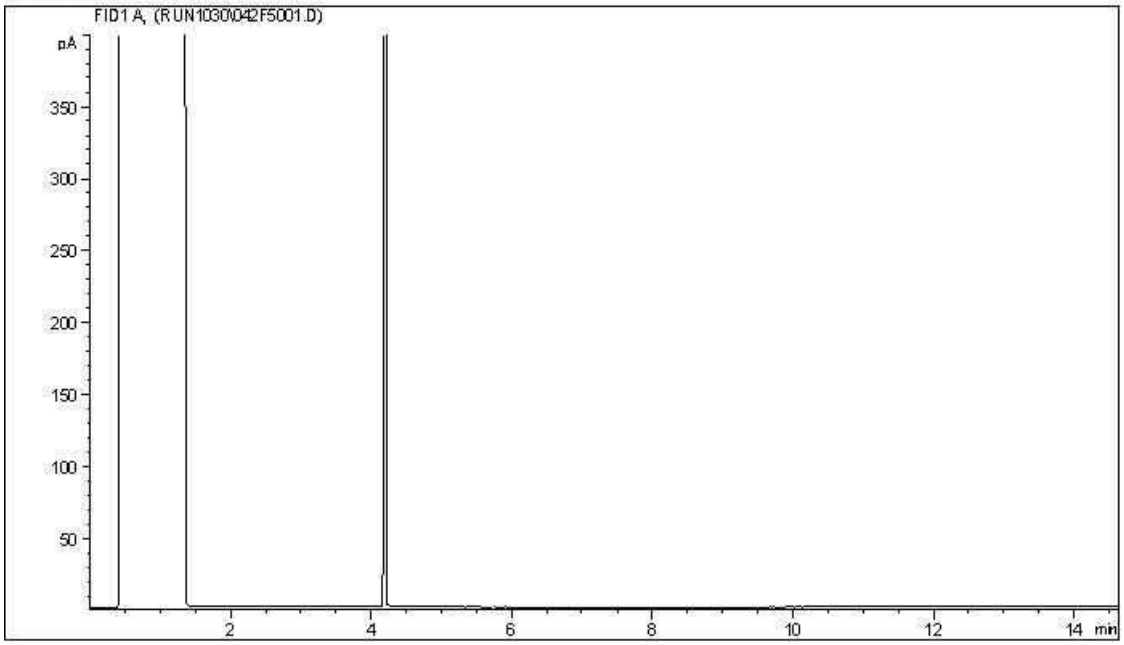
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894334
Report Date: 2018/11/01
Maxxam Sample: UQ5385

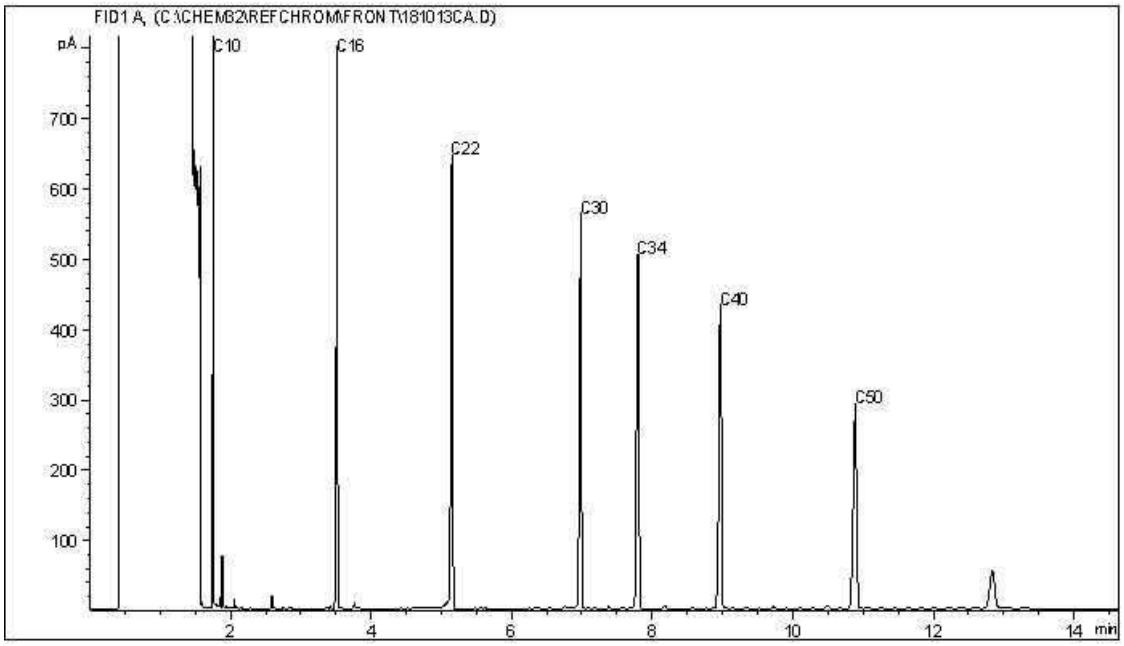
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 3001 C

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



Carbon Range Distribution - Reference Chromatogram



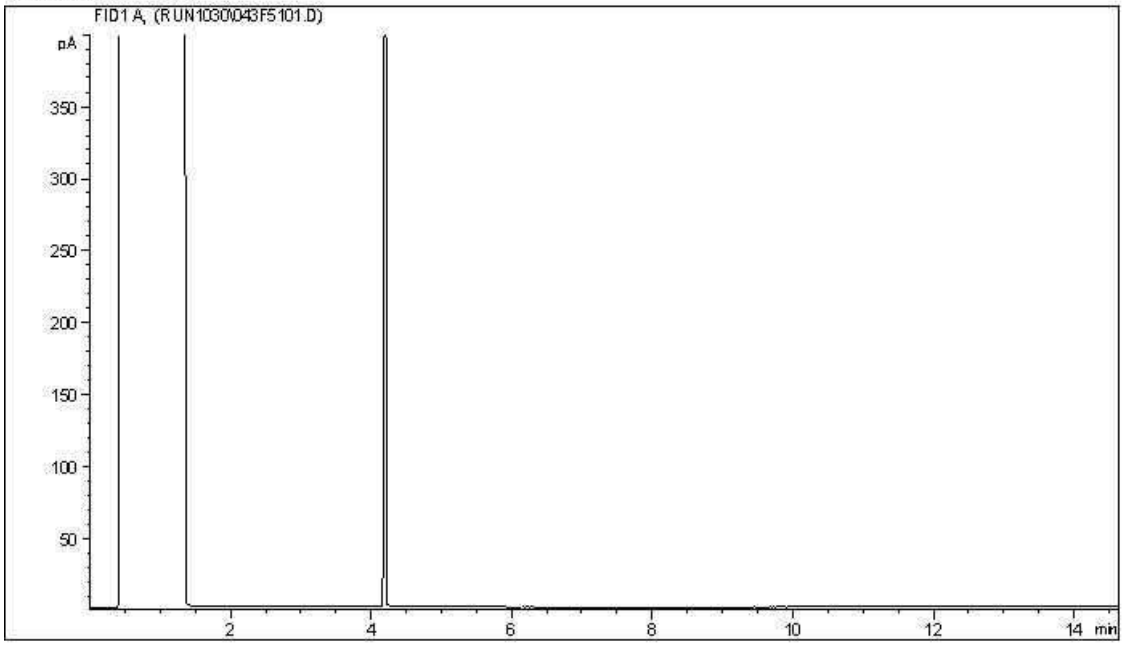
TYPICAL PRODUCT CARBON NUMBER RANGES

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

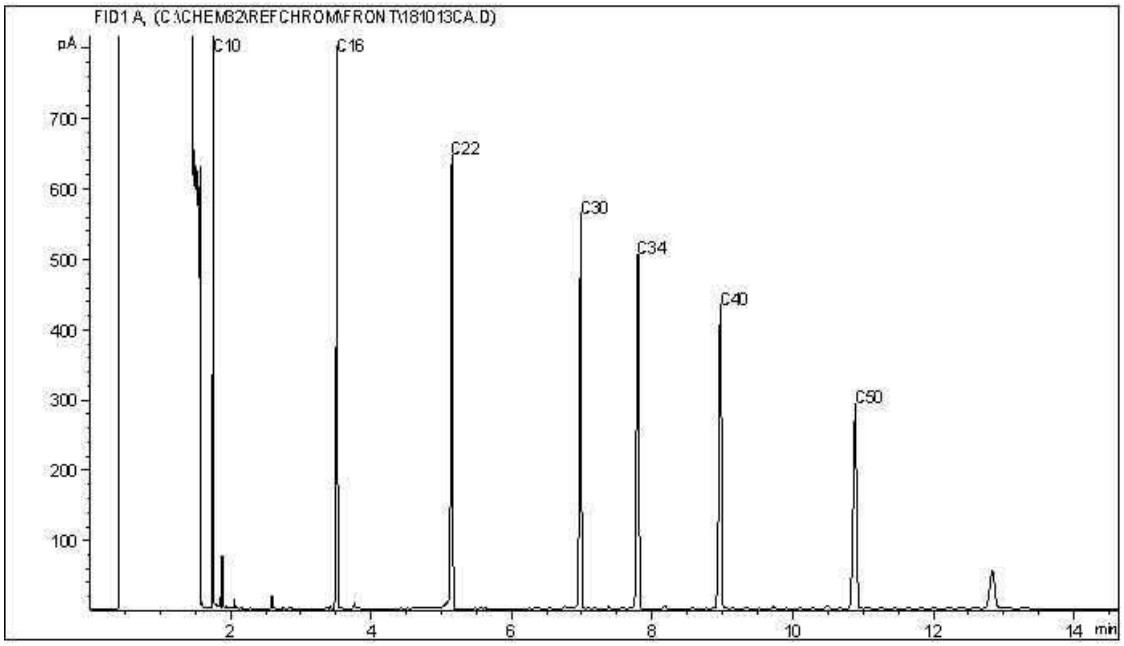
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

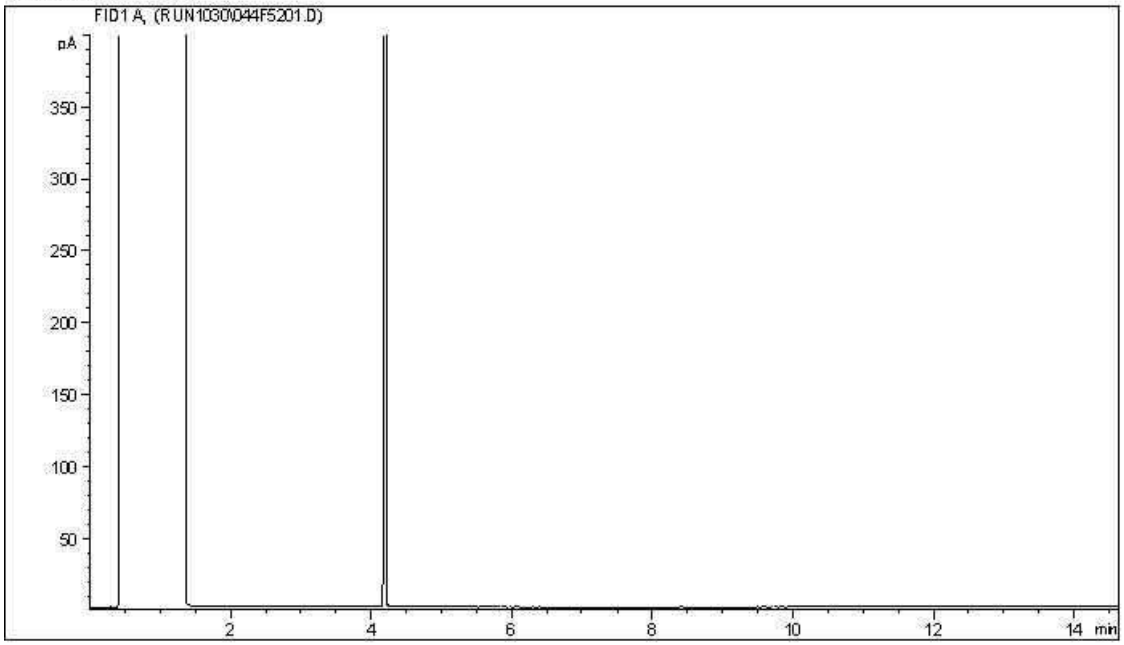
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894334
Report Date: 2018/11/01
Maxxam Sample: UQ5387

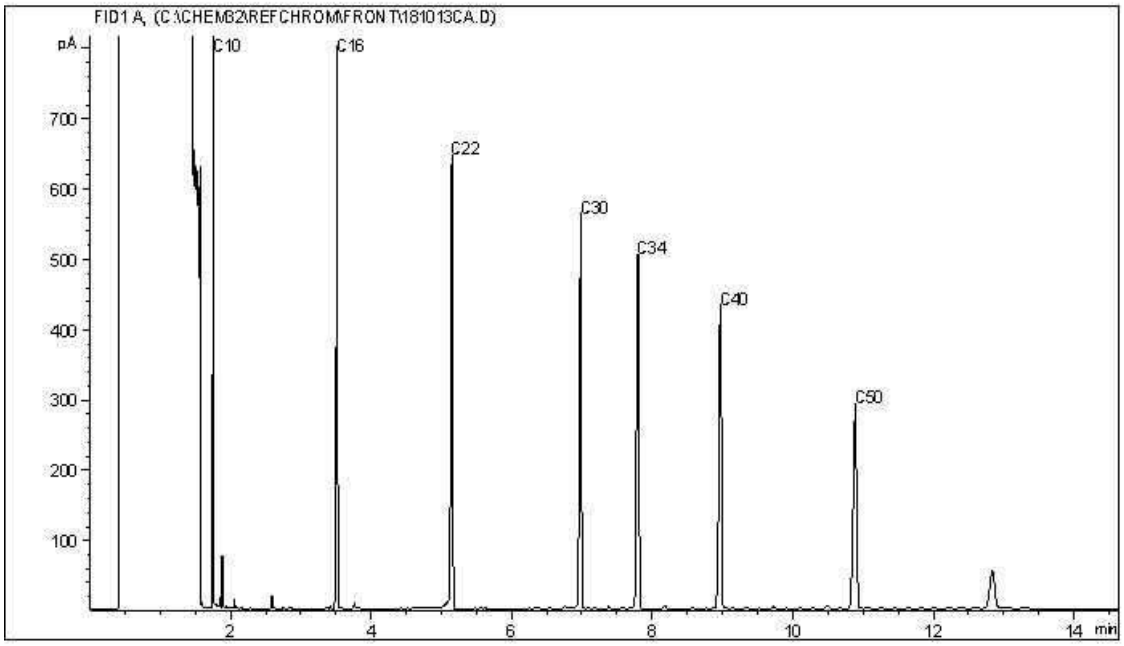
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 3003 B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC6



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+

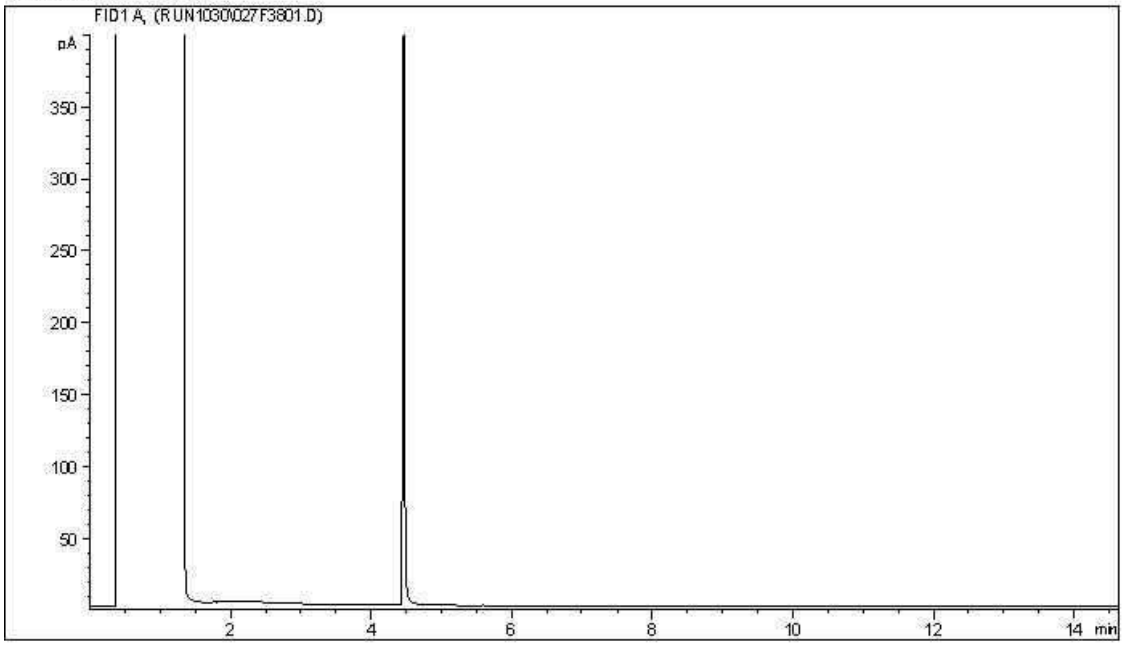
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894334
Report Date: 2018/11/01
Maxxam Sample: UQ5388

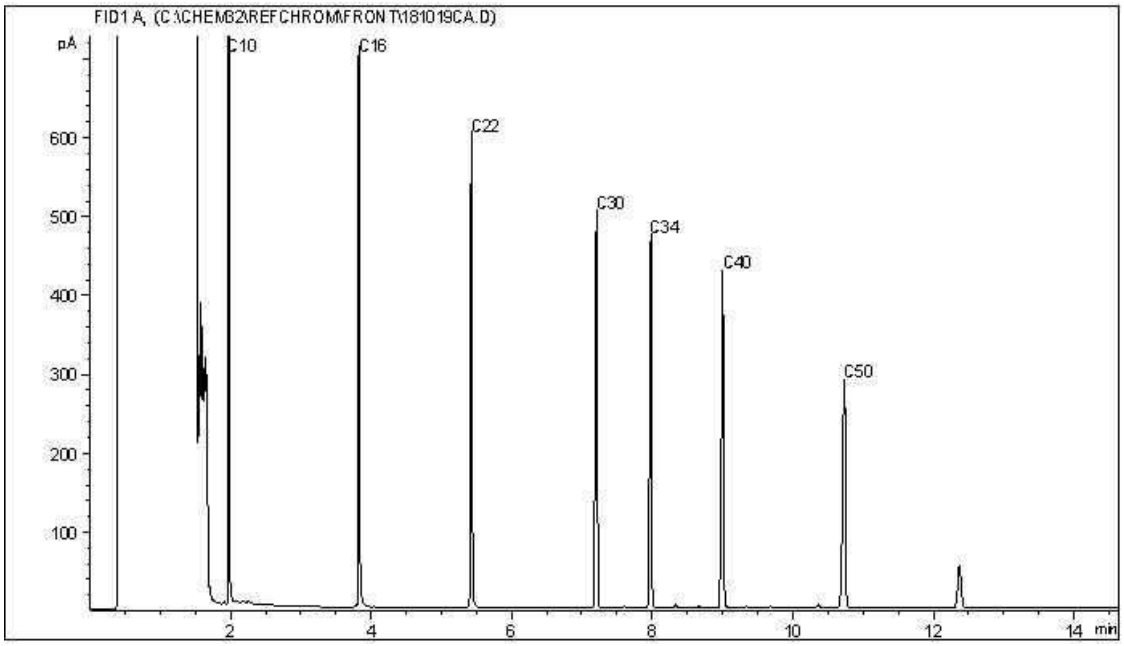
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: BAILER 1

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC10



Carbon Range Distribution - Reference Chromatogram



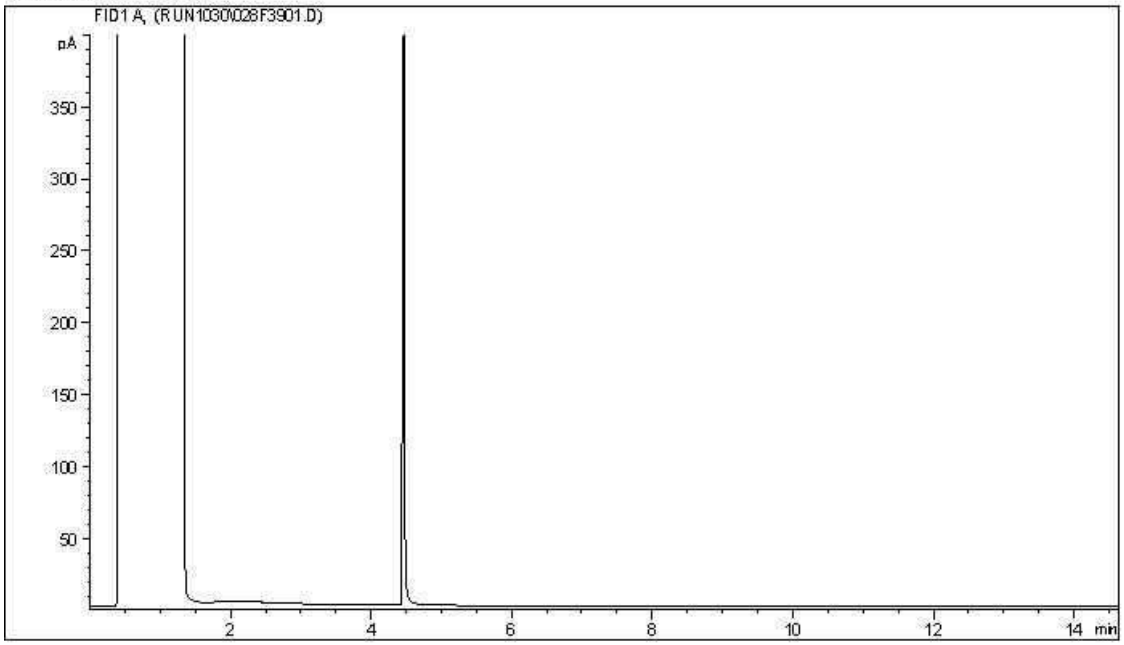
TYPICAL PRODUCT CARBON NUMBER RANGES

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

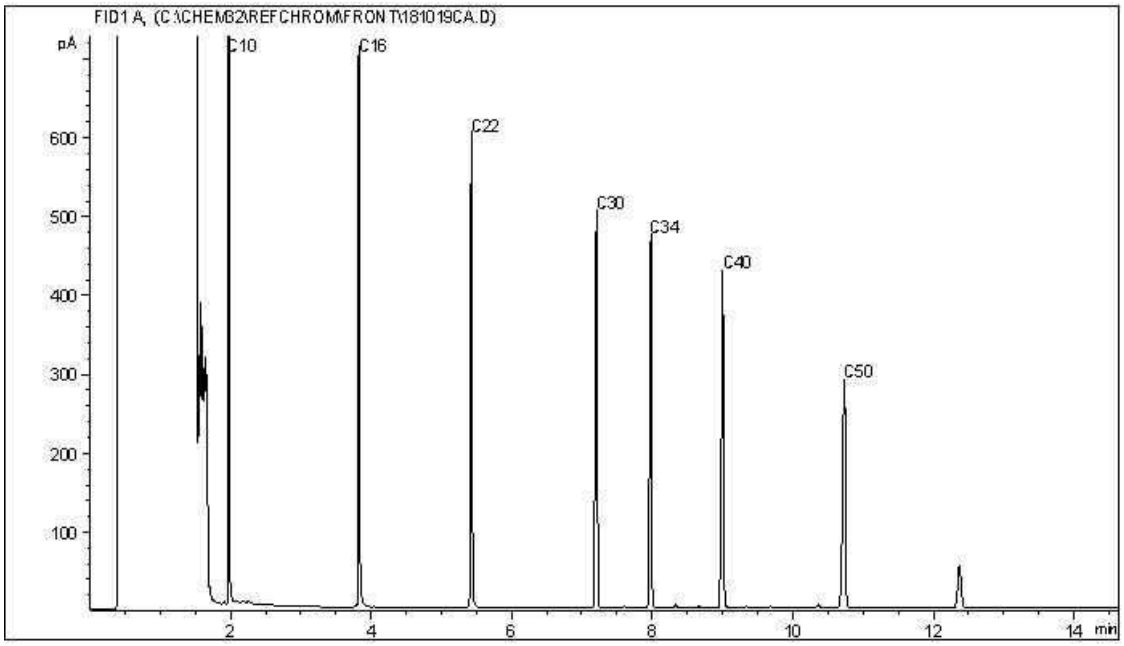
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) 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+

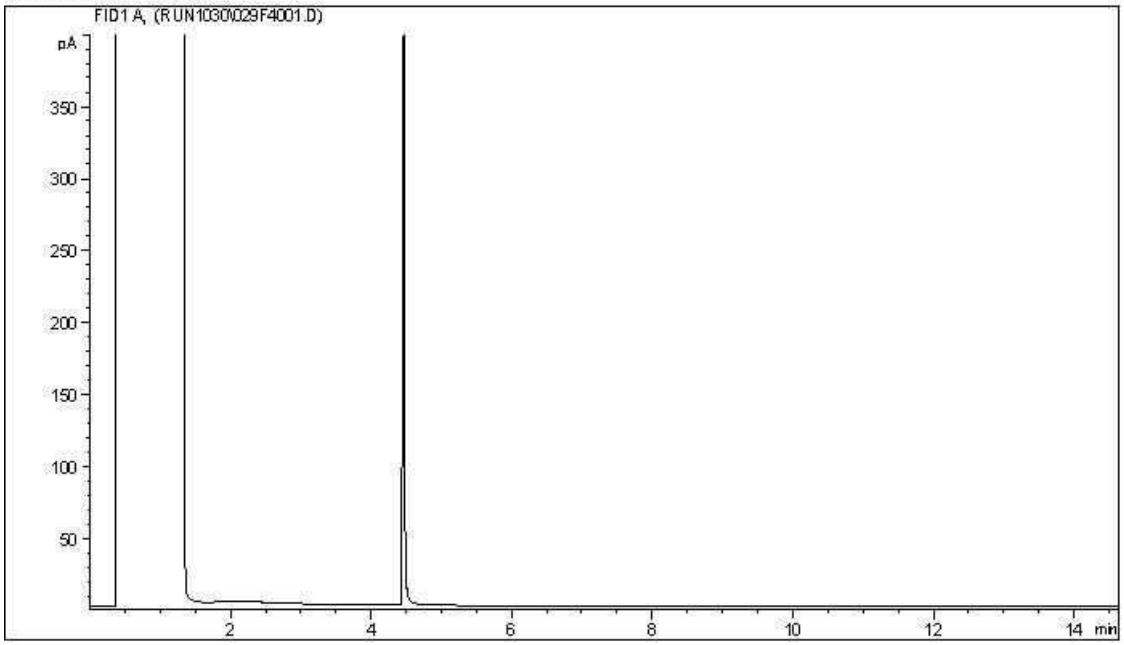
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894334
Report Date: 2018/11/01
Maxxam Sample: UQ5390

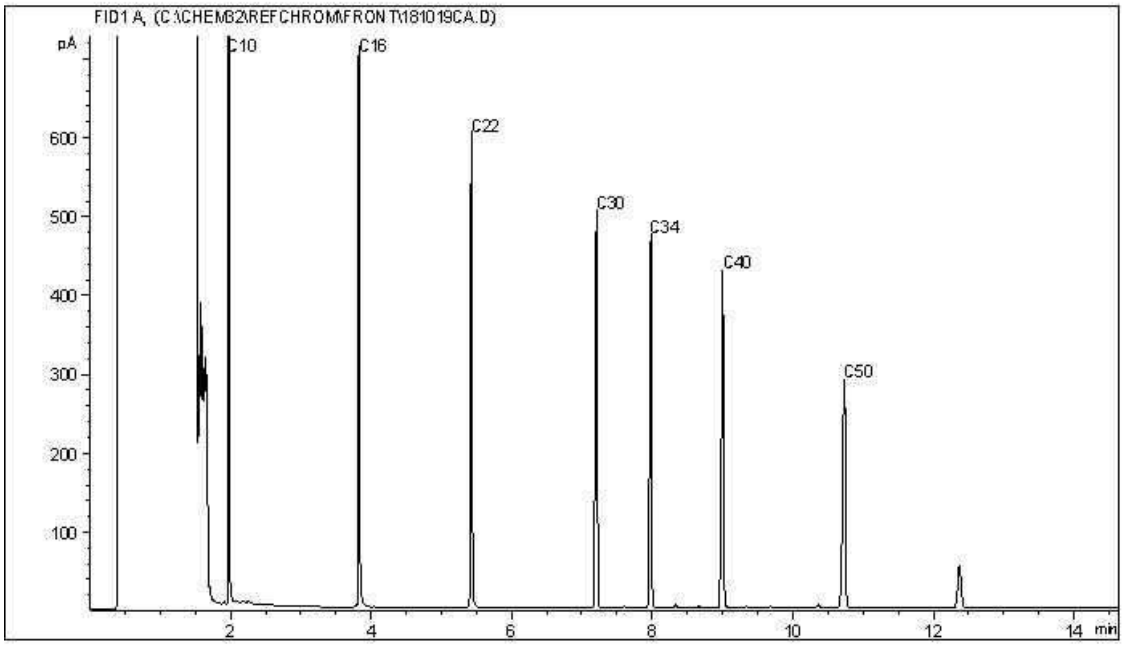
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: BAILER 3

CCME Hydrocarbons in Water (F2; C10-C16) 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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG24301.1 E32
Your C.O.C. #: M070783

Attention: Stephen D'Abadie

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

Report Date: 2018/11/13
Report #: R2649666
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B894790
Received: 2018/10/29, 14:54

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	3	N/A	2018/11/01	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	5	N/A	2018/11/02	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	8	N/A	2018/11/02	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/31	2018/10/31	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/10/31	2018/11/01	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	1	N/A	2018/11/01	AB SOP-00003	Auto Calc
Benzo[a]pyrene Equivalency (2)	7	N/A	2018/11/03	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	1	2018/10/31	2018/11/01	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
PAH in Water by GC/MS	7	2018/10/31	2018/11/02	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	9	N/A	2018/11/02	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	9	N/A	2018/11/01	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG24301.1 E32
Your C.O.C. #: M070783

Attention: Stephen D'Abadie

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

Report Date: 2018/11/13
Report #: R2649666
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B894790
Received: 2018/10/29, 14:54

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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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
==========
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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UQ8397	UQ8398	UQ8399	UQ8400		UQ8400		
Sampling Date		2018/10/29 10:25	2018/10/29 10:45	2018/10/29 13:20	2018/10/29 10:10		2018/10/29 10:10		
COC Number		M070783	M070783	M070783	M070783		M070783		
	UNITS	**1912**	**1913**	**1914**	**1915**	**QC Batch**	**1915 REPEAT**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.35	9207730	N/A	0.10	9207730
Volatiles									
Benzene	mg/L	0.18	<0.00040	<0.00040	0.044	9206846	N/A	0.00040	9206846
Toluene	mg/L	0.00067	<0.00040	<0.00040	0.0011	9206846	0.0011	0.00040	9219815
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	0.00079	9206846	N/A	0.00040	N/A
m & p-Xylene	mg/L	0.0011	<0.00080	<0.00080	0.070	9206846	N/A	0.00080	N/A
o-Xylene	mg/L	0.00052	<0.00040	<0.00040	0.060	9206846	N/A	0.00040	N/A
Xylenes (Total)	mg/L	0.0016	<0.00089	<0.00089	0.13	9205600	N/A	0.00089	N/A
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	1.2	9205600	N/A	0.10	N/A
F1 (C6-C10)	mg/L	0.18	<0.10	<0.10	1.4	9206846	N/A	0.10	N/A
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	107	103	104	105	9206846	111	N/A	9219815
4-Bromofluorobenzene (sur.)	%	102	105	104	106	9206846	94	N/A	9219815
D4-1,2-Dichloroethane (sur.)	%	80	89	85	81	9206846	75	N/A	9219815
O-TERPHENYL (sur.)	%	94	89	89	93	9207730	N/A	N/A	N/A

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		UQ8401		UQ8402	UQ8403	UQ8404	UQ8404		
Sampling Date		2018/10/29 12:45		2018/10/29 10:10	2018/10/29 13:00	2018/10/29 13:00	2018/10/29 13:00		
COC Number		M070783		M070783	M070783	M070783	M070783		
	UNITS	**1916**	**QC Batch**	**9915**	**1915B**	**9915B**	**9915B Lab-Dup**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	9207730	0.36	0.30	0.32	0.37	0.10	9207730
Volatiles									
Benzene	mg/L	<0.00040	9206846	0.043	0.043	0.033	N/A	0.00040	9206846
Toluene	mg/L	<0.00040	9206846	0.0011	0.00072	0.00089	N/A	0.00040	9219815
Ethylbenzene	mg/L	<0.00040	9206846	0.00096	0.00086	0.00062	N/A	0.00040	9206846
m & p-Xylene	mg/L	<0.00080	9206846	0.076	0.051	0.037	N/A	0.00080	9206846
o-Xylene	mg/L	<0.00040	9206846	0.062	0.046	0.037	N/A	0.00040	9206846
Xylenes (Total)	mg/L	<0.00089	9205600	0.14	0.096	0.074	N/A	0.00089	9205600
F1 (C6-C10) - BTEX	mg/L	<0.10	9205600	1.7	0.99	0.62	N/A	0.10	9205600
F1 (C6-C10)	mg/L	<0.10	9206846	1.9	1.1	0.73	N/A	0.10	9206846
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	9206846	107	110	88	N/A	N/A	9206846
4-Bromofluorobenzene (sur.)	%	105	9206846	102	101	114	N/A	N/A	9206846
D4-1,2-Dichloroethane (sur.)	%	90	9206846	72	79	112	N/A	N/A	9206846
O-TERPHENYL (sur.)	%	89	9207730	90	96	90	95	N/A	9207730

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8397	UQ8398	UQ8399	UQ8400	UQ8401		
Sampling Date		2018/10/29 10:25	2018/10/29 10:45	2018/10/29 13:20	2018/10/29 10:10	2018/10/29 12:45		
COC Number		M070783	M070783	M070783	M070783	M070783		
	UNITS	**1912**	**1913**	**1914**	**1915**	**1916**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9205797
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9207729
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9207729
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9207729
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9207729
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9207729
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9207729
Fluorene	mg/L	<0.000050	<0.000050	<0.000050	0.00010	<0.000050	0.000050	9207729
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
1-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.011	<0.00010	0.00010	9207729
2-Methylnaphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.023	<0.00010	0.00010	9207729
Naphthalene	mg/L	<0.00010	<0.00010	<0.00010	0.016	<0.00010	0.00010	9207729
Phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	0.000056	<0.000050	0.000050	9207729
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9207729
Quinoline	mg/L	<0.00020	<0.00020	<0.00020	0.00079	<0.00020	0.00020	9207729
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	98	98	97	99	99	N/A	9207729
D8-ACENAPHTHYLENE (sur.)	%	88	90	87	90	91	N/A	9207729
D8-NAPHTHALENE (sur.)	%	67	69	66	68	74	N/A	9207729
TERPHENYL-D14 (sur.)	%	100	98	94	95	99	N/A	9207729

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8402	UQ8403	UQ8404	UQ8404		
Sampling Date		2018/10/29 10:10	2018/10/29 13:00	2018/10/29 13:00	2018/10/29 13:00		
COC Number		M070783	M070783	M070783	M070783		
	UNITS	**9915**	**1915B**	**9915B**	**9915B Lab-Dup**	**RDL**	**QC Batch**
Polycyclic Aromatics							
Benzo[a]pyrene equivalency	mg/L	<0.000010	<0.000010	<0.000010	N/A	0.000010	9205797
Acenaphthene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9207729
Acenaphthylene	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	9207729
Acridine	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Anthracene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9207729
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(b&j)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9207729
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Chrysene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	<0.0000075	<0.0000075	0.0000075	9207729
Fluoranthene	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	9207729
Fluorene	mg/L	0.000098	0.000064	0.000061	0.000062	0.000050	9207729
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	<0.0000085	<0.0000085	0.0000085	9207729
1-Methylnaphthalene	mg/L	0.011	0.0077	0.0079	0.0076	0.00010	9207729
2-Methylnaphthalene	mg/L	0.023	0.015	0.016	0.015	0.00010	9207729
Naphthalene	mg/L	0.016	0.011	0.011	0.011	0.00010	9207729
Phenanthrene	mg/L	0.000052	<0.000050	<0.000050	<0.000050	0.000050	9207729
Perylene	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	9207729
Pyrene	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	9207729
Quinoline	mg/L	0.00083	0.00063	0.00062	0.00062	0.00020	9207729
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	96	98	83	96	N/A	9207729
D8-ACENAPHTHYLENE (sur.)	%	92	90	84	92	N/A	9207729
D8-NAPHTHALENE (sur.)	%	75	72	67	76	N/A	9207729
TERPHENYL-D14 (sur.)	%	98	103	88	96	N/A	9207729

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8397	UQ8398	UQ8399		UQ8400		
Sampling Date		2018/10/29 10:25	2018/10/29 10:45	2018/10/29 13:20		2018/10/29 10:10		
COC Number		M070783	M070783	M070783		M070783		
	UNITS	**1912**	**1913**	**1914**	**RDL**	**1915**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	<0.0013	<0.0013	0.0013	<0.0013	0.0013	9205488
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9206838
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9206838
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9206838
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9206838
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	0.00020	9206838
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,2-dichloroethane	mg/L	0.041	<0.00050	<0.00050	0.00050	0.010	0.00050	9206838
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9206838
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Styrene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9206838
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	0.0020	9206838
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9206838
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	0.0010	9206838
RDL = Reportable Detection Limit								

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8397	UQ8398	UQ8399		UQ8400		
Sampling Date		2018/10/29 10:25	2018/10/29 10:45	2018/10/29 13:20		2018/10/29 10:10		
COC Number		M070783	M070783	M070783		M070783		
	UNITS	**1912**	**1913**	**1914**	**RDL**	**1915**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.0060 (1)	0.0060	9206838
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	0.11	0.00050	9206838
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	0.00050	0.035	0.00050	9206838
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	0.00050	9206838
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	99	99	N/A	99	N/A	9206838
4-Bromofluorobenzene (sur.)	%	95	98	98	N/A	101	N/A	9206838
D4-1,2-Dichloroethane (sur.)	%	117	96	99	N/A	102	N/A	9206838

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8401		UQ8402		UQ8403	UQ8404		
Sampling Date		2018/10/29 12:45		2018/10/29 10:10		2018/10/29 13:00	2018/10/29 13:00		
COC Number		M070783		M070783		M070783	M070783		
	UNITS	**1916**	**RDL**	**9915**	**RDL**	**1915B**	**9915B**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	0.0013	<0.0013	0.0013	<0.0013	<0.0013	0.0013	9205488
Bromodichloromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Bromoform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Bromomethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9206838
Carbon tetrachloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Chlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Chlorodibromomethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9206838
Chloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9206838
Chloroform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Chloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9206838
1,2-dibromoethane	mg/L	<0.00020	0.00020	<0.00020	0.00020	<0.00020	<0.00020	0.00020	9206838
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,1-dichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,2-dichloroethane	mg/L	<0.00050	0.00050	0.011	0.00050	0.018	0.019	0.00050	9206838
1,1-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Dichloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9206838
1,2-dichloropropane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Methyl methacrylate	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Styrene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9206838
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9206838
Tetrachloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9206838
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9206838
RDL = Reportable Detection Limit									

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8401		UQ8402		UQ8403	UQ8404		
Sampling Date		2018/10/29 12:45		2018/10/29 10:10		2018/10/29 13:00	2018/10/29 13:00		
COC Number		M070783		M070783		M070783	M070783		
	UNITS	**1916**	**RDL**	**9915**	**RDL**	**1915B**	**9915B**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	<0.0040 (1)	0.0040	<0.030 (1)	<0.030 (1)	0.030	9206838
Trichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Trichlorofluoromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	0.11	0.00050	0.067	0.067	0.00050	9206838
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	0.034	0.00050	0.026	0.025	0.00050	9206838
Vinyl chloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9206838
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	99	N/A	100	N/A	99	100	N/A	9206838
4-Bromofluorobenzene (sur.)	%	99	N/A	102	N/A	100	101	N/A	9206838
D4-1,2-Dichloroethane (sur.)	%	99	N/A	104	N/A	99	96	N/A	9206838

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8405		
Sampling Date		2018/10/29		
COC Number		M070783		
	UNITS	**TRIP BLANK /3**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9206047
Benzene	mg/L	<0.00040	0.00040	9206838
Bromodichloromethane	mg/L	<0.00050	0.00050	9206838
Bromoform	mg/L	<0.00050	0.00050	9206838
Bromomethane	mg/L	<0.0020	0.0020	9206838
Carbon tetrachloride	mg/L	<0.00050	0.00050	9206838
Chlorobenzene	mg/L	<0.00050	0.00050	9206838
Chlorodibromomethane	mg/L	<0.0010	0.0010	9206838
Chloroethane	mg/L	<0.0010	0.0010	9206838
Chloroform	mg/L	<0.00050	0.00050	9206838
Chloromethane	mg/L	<0.0020	0.0020	9206838
1,2-dibromoethane	mg/L	<0.00020	0.00020	9206838
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9206838
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9206838
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9206838
1,1-dichloroethane	mg/L	<0.00050	0.00050	9206838
1,2-dichloroethane	mg/L	<0.00050	0.00050	9206838
1,1-dichloroethene	mg/L	<0.00050	0.00050	9206838
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9206838
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9206838
Dichloromethane	mg/L	<0.0020	0.0020	9206838
1,2-dichloropropane	mg/L	<0.00050	0.00050	9206838
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9206838
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9206838
Ethylbenzene	mg/L	<0.00040	0.00040	9206838
Methyl methacrylate	mg/L	<0.00050	0.00050	9206838
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9206838
Styrene	mg/L	<0.00050	0.00050	9206838
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9206838
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9206838
Tetrachloroethene	mg/L	<0.00050	0.00050	9206838
RDL = Reportable Detection Limit				

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		UQ8405		
Sampling Date		2018/10/29		
COC Number		M070783		
	UNITS	**TRIP BLANK /3**	**RDL**	**QC Batch**
Toluene	mg/L	<0.00040	0.00040	9206838
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9206838
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9206838
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9206838
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9206838
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9206838
Trichloroethene	mg/L	<0.00050	0.00050	9206838
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9206838
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9206838
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9206838
Vinyl chloride	mg/L	<0.00050	0.00050	9206838
Xylenes (Total)	mg/L	<0.00080	0.00080	9206838
m & p-Xylene	mg/L	<0.00080	0.00080	9206838
o-Xylene	mg/L	<0.00040	0.00040	9206838
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	100	N/A	9206838
4-Bromofluorobenzene (sur.)	%	99	N/A	9206838
D4-1,2-Dichloroethane (sur.)	%	95	N/A	9206838

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

GENERAL COMMENTS

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

Package 1	6.3°C

Report reissued with revised results for toluene for select parameters. 2018/11/13

Sample UQ8402, BTEX/F1 in Water by HS GC/MS/FID: Test repeated.
Sample UQ8403, BTEX/F1 in Water by HS GC/MS/FID: Test repeated.
Sample UQ8404, BTEX/F1 in Water by HS GC/MS/FID: Test repeated.

Results relate only to the items tested.

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CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9206838	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/11/01		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/01		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/01		95	%	50 - 140
			Benzene	2018/11/01		97	%	50 - 140
			Bromodichloromethane	2018/11/01		109	%	50 - 140
			Bromoform	2018/11/01		95	%	50 - 140
			Bromomethane	2018/11/01		101	%	50 - 140
			Carbon tetrachloride	2018/11/01		106	%	50 - 140
			Chlorobenzene	2018/11/01		97	%	50 - 140
			Chlorodibromomethane	2018/11/01		100	%	50 - 140
			Chloroethane	2018/11/01		96	%	50 - 140
			Chloroform	2018/11/01		101	%	50 - 140
			Chloromethane	2018/11/01		111	%	50 - 140
			1,2-dibromoethane	2018/11/01		96	%	50 - 140
			1,2-dichlorobenzene	2018/11/01		107	%	50 - 140
			1,3-dichlorobenzene	2018/11/01		105	%	50 - 140
			1,4-dichlorobenzene	2018/11/01		102	%	50 - 140
			1,1-dichloroethane	2018/11/01		104	%	50 - 140
			1,2-dichloroethane	2018/11/01		105	%	50 - 140
			1,1-dichloroethene	2018/11/01		100	%	50 - 140
			cis-1,2-dichloroethene	2018/11/01		102	%	50 - 140
			trans-1,2-dichloroethene	2018/11/01		94	%	50 - 140
			Dichloromethane	2018/11/01		94	%	50 - 140
			1,2-dichloropropane	2018/11/01		109	%	50 - 140
			cis-1,3-dichloropropene	2018/11/01		117	%	50 - 140
			trans-1,3-dichloropropene	2018/11/01		126	%	50 - 140
			Ethylbenzene	2018/11/01		94	%	50 - 140
			Methyl methacrylate	2018/11/01		108	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/11/01		104	%	50 - 140
			Styrene	2018/11/01		101	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/11/01		94	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/11/01		99	%	50 - 140
			Tetrachloroethene	2018/11/01		90	%	50 - 140
			Toluene	2018/11/01		94	%	50 - 140
			1,2,3-trichlorobenzene	2018/11/01		102	%	50 - 140
			1,2,4-trichlorobenzene	2018/11/01		99	%	50 - 140
			1,3,5-trichlorobenzene	2018/11/01		98	%	50 - 140
			1,1,1-trichloroethane	2018/11/01		108	%	50 - 140
			1,1,2-trichloroethane	2018/11/01		105	%	50 - 140
			Trichloroethene	2018/11/01		107	%	50 - 140
			Trichlorofluoromethane	2018/11/01		102	%	50 - 140
			1,2,4-trimethylbenzene	2018/11/01		105	%	50 - 140
			1,3,5-trimethylbenzene	2018/11/01		109	%	50 - 140
			Vinyl chloride	2018/11/01		105	%	50 - 140
			m & p-Xylene	2018/11/01		92	%	50 - 140
			o-Xylene	2018/11/01		90	%	50 - 140
9206838	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/11/01		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/01		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/01		92	%	50 - 140
			Benzene	2018/11/01		93	%	60 - 130
			Bromodichloromethane	2018/11/01		102	%	60 - 130
			Bromoform	2018/11/01		89	%	60 - 130
			Bromomethane	2018/11/01		94	%	60 - 130
			Carbon tetrachloride	2018/11/01		102	%	60 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chlorobenzene	2018/11/01		93	%	60 - 130
			Chlorodibromomethane	2018/11/01		94	%	60 - 130
			Chloroethane	2018/11/01		93	%	60 - 130
			Chloroform	2018/11/01		96	%	60 - 130
			Chloromethane	2018/11/01		107	%	60 - 130
			1,2-dibromoethane	2018/11/01		90	%	60 - 130
			1,2-dichlorobenzene	2018/11/01		100	%	60 - 130
			1,3-dichlorobenzene	2018/11/01		99	%	60 - 130
			1,4-dichlorobenzene	2018/11/01		97	%	60 - 130
			1,1-dichloroethane	2018/11/01		100	%	60 - 130
			1,2-dichloroethane	2018/11/01		97	%	60 - 130
			1,1-dichloroethene	2018/11/01		97	%	60 - 130
			cis-1,2-dichloroethene	2018/11/01		97	%	60 - 130
			trans-1,2-dichloroethene	2018/11/01		91	%	60 - 130
			Dichloromethane	2018/11/01		89	%	60 - 130
			1,2-dichloropropane	2018/11/01		103	%	60 - 130
			cis-1,3-dichloropropene	2018/11/01		105	%	60 - 130
			trans-1,3-dichloropropene	2018/11/01		109	%	60 - 130
			Ethylbenzene	2018/11/01		91	%	60 - 130
			Methyl methacrylate	2018/11/01		101	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/11/01		98	%	60 - 130
			Styrene	2018/11/01		96	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/11/01		90	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/11/01		93	%	60 - 130
			Tetrachloroethene	2018/11/01		88	%	60 - 130
			Toluene	2018/11/01		91	%	60 - 130
			1,2,3-trichlorobenzene	2018/11/01		96	%	60 - 130
			1,2,4-trichlorobenzene	2018/11/01		95	%	60 - 130
			1,3,5-trichlorobenzene	2018/11/01		95	%	60 - 130
			1,1,1-trichloroethane	2018/11/01		104	%	60 - 130
			1,1,2-trichloroethane	2018/11/01		97	%	60 - 130
			Trichloroethene	2018/11/01		104	%	60 - 130
			Trichlorofluoromethane	2018/11/01		100	%	60 - 130
			1,2,4-trimethylbenzene	2018/11/01		100	%	60 - 130
			1,3,5-trimethylbenzene	2018/11/01		103	%	60 - 130
			Vinyl chloride	2018/11/01		101	%	60 - 130
			m & p-Xylene	2018/11/01		90	%	60 - 130
			o-Xylene	2018/11/01		88	%	60 - 130
9206838	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/11/01		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/01		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/01		99	%	50 - 140
			Benzene	2018/11/01	<0.00040		mg/L	
			Bromodichloromethane	2018/11/01	<0.00050		mg/L	
			Bromoform	2018/11/01	<0.00050		mg/L	
			Bromomethane	2018/11/01	<0.0020		mg/L	
			Carbon tetrachloride	2018/11/01	<0.00050		mg/L	
			Chlorobenzene	2018/11/01	<0.00050		mg/L	
			Chlorodibromomethane	2018/11/01	<0.0010		mg/L	
			Chloroethane	2018/11/01	<0.0010		mg/L	
			Chloroform	2018/11/01	<0.00050		mg/L	
			Chloromethane	2018/11/01	<0.0020		mg/L	
			1,2-dibromoethane	2018/11/01	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/11/01	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/11/01	<0.00050		mg/L	

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			1,4-dichlorobenzene	2018/11/01	<0.00050		mg/L	
			1,1-dichloroethane	2018/11/01	<0.00050		mg/L	
			1,2-dichloroethane	2018/11/01	<0.00050		mg/L	
			1,1-dichloroethene	2018/11/01	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/11/01	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/11/01	<0.00050		mg/L	
			Dichloromethane	2018/11/01	<0.0020		mg/L	
			1,2-dichloropropane	2018/11/01	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/11/01	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/11/01	<0.00050		mg/L	
			Ethylbenzene	2018/11/01	<0.00040		mg/L	
			Methyl methacrylate	2018/11/01	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/11/01	<0.00050		mg/L	
			Styrene	2018/11/01	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/11/01	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/11/01	<0.0020		mg/L	
			Tetrachloroethene	2018/11/01	<0.00050		mg/L	
			Toluene	2018/11/01	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/11/01	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/11/01	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/11/01	<0.00050		mg/L	
			1,1,1-trichloroethane	2018/11/01	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/11/01	<0.00050		mg/L	
			Trichloroethene	2018/11/01	<0.00050		mg/L	
			Trichlorofluoromethane	2018/11/01	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/11/01	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/11/01	<0.00050		mg/L	
			Vinyl chloride	2018/11/01	<0.00050		mg/L	
			Xylenes (Total)	2018/11/01	<0.00080		mg/L	
			m & p-Xylene	2018/11/01	<0.00080		mg/L	
			o-Xylene	2018/11/01	<0.00040		mg/L	
9206838	MZ	RPD	Bromodichloromethane	2018/11/01	NC		%	30
			Bromoform	2018/11/01	NC		%	30
			Bromomethane	2018/11/01	NC		%	30
			Carbon tetrachloride	2018/11/01	NC		%	30
			Chlorobenzene	2018/11/01	NC		%	30
			Chlorodibromomethane	2018/11/01	NC		%	30
			Chloroethane	2018/11/01	2.1		%	30
			Chloroform	2018/11/01	NC		%	30
			Chloromethane	2018/11/01	NC		%	30
			1,2-dibromoethane	2018/11/01	NC		%	30
			1,2-dichlorobenzene	2018/11/01	NC		%	30
			1,3-dichlorobenzene	2018/11/01	NC		%	30
			1,4-dichlorobenzene	2018/11/01	NC		%	30
			1,1-dichloroethane	2018/11/01	0.52		%	30
			1,2-dichloroethane	2018/11/01	NC		%	30
			1,1-dichloroethene	2018/11/01	NC		%	30
			cis-1,2-dichloroethene	2018/11/01	0.38		%	30
			trans-1,2-dichloroethene	2018/11/01	NC		%	30
			Dichloromethane	2018/11/01	NC		%	30
			1,2-dichloropropane	2018/11/01	NC		%	30
			cis-1,3-dichloropropene	2018/11/01	NC		%	30
			trans-1,3-dichloropropene	2018/11/01	NC		%	30
			Methyl methacrylate	2018/11/01	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl-tert-butylether (MTBE)	2018/11/01	NC		%	30
			Styrene	2018/11/01	NC		%	30
			1,1,1,2-tetrachloroethane	2018/11/01	NC		%	30
			1,1,2,2-tetrachloroethane	2018/11/01	NC		%	30
			Tetrachloroethene	2018/11/01	NC		%	30
			1,2,3-trichlorobenzene	2018/11/01	NC		%	30
			1,2,4-trichlorobenzene	2018/11/01	NC		%	30
			1,3,5-trichlorobenzene	2018/11/01	NC		%	30
			1,1,1-trichloroethane	2018/11/01	NC		%	30
			1,1,2-trichloroethane	2018/11/01	NC		%	30
			Trichloroethene	2018/11/01	NC		%	30
			Trichlorofluoromethane	2018/11/01	NC		%	30
			1,2,4-trimethylbenzene	2018/11/01	1.9		%	30
			1,3,5-trimethylbenzene	2018/11/01	4.9		%	30
			Vinyl chloride	2018/11/01	2.2		%	30
9206846	GP4	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/10/31		109	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/31		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/31		78	%	50 - 140
			Benzene	2018/10/31		79	%	50 - 140
			Toluene	2018/10/31		81	%	50 - 140
			Ethylbenzene	2018/10/31		86	%	50 - 140
			m & p-Xylene	2018/10/31		85	%	50 - 140
			o-Xylene	2018/10/31		79	%	50 - 140
			F1 (C6-C10)	2018/10/31		72	%	60 - 140
9206846	GP4	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/10/31		106	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/31		104	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/31		74	%	50 - 140
			Benzene	2018/10/31		81	%	60 - 130
			Toluene	2018/10/31		83	%	60 - 130
			Ethylbenzene	2018/10/31		92	%	60 - 130
			m & p-Xylene	2018/10/31		91	%	60 - 130
			o-Xylene	2018/10/31		84	%	60 - 130
			F1 (C6-C10)	2018/10/31		109	%	60 - 140
9206846	GP4	Method Blank	1,4-Difluorobenzene (sur.)	2018/10/31		109	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/10/31		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/10/31		77	%	50 - 140
			Benzene	2018/10/31	<0.00040		mg/L	
			Toluene	2018/10/31	<0.00040		mg/L	
			Ethylbenzene	2018/10/31	<0.00040		mg/L	
			m & p-Xylene	2018/10/31	<0.00080		mg/L	
			o-Xylene	2018/10/31	<0.00040		mg/L	
			Xylenes (Total)	2018/10/31	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2018/10/31	<0.10		mg/L	
			F1 (C6-C10)	2018/10/31	<0.10		mg/L	
9206846	GP4	RPD	Benzene	2018/10/31	NC		%	30
			Toluene	2018/10/31	NC		%	30
			Ethylbenzene	2018/10/31	NC		%	30
			m & p-Xylene	2018/10/31	NC		%	30
			o-Xylene	2018/10/31	NC		%	30
			F1 (C6-C10)	2018/10/31	NC		%	30
9207729	LZ3	Matrix Spike	D10-ANTHRACENE (sur.)	2018/11/01		98	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/01		96	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/01		78	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/01		98	%	50 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2018/11/01		93	%	50 - 130
			Acenaphthylene	2018/11/01		98	%	50 - 130
			Acridine	2018/11/01		79	%	50 - 130
			Anthracene	2018/11/01		88	%	50 - 130
			Benzo(a)anthracene	2018/11/01		88	%	50 - 130
			Benzo(b&j)fluoranthene	2018/11/01		94	%	50 - 130
			Benzo(k)fluoranthene	2018/11/01		95	%	50 - 130
			Benzo(g,h,i)perylene	2018/11/01		90	%	50 - 130
			Benzo(c)phenanthrene	2018/11/01		92	%	50 - 130
			Benzo(a)pyrene	2018/11/01		90	%	50 - 130
			Benzo[e]pyrene	2018/11/01		85	%	50 - 130
			Chrysene	2018/11/01		89	%	50 - 130
			Dibenz(a,h)anthracene	2018/11/01		89	%	50 - 130
			Fluoranthene	2018/11/01		102	%	50 - 130
			Fluorene	2018/11/01		93	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/11/01		77	%	50 - 130
			1-Methylnaphthalene	2018/11/01		93	%	50 - 130
			2-Methylnaphthalene	2018/11/01		88	%	50 - 130
			Naphthalene	2018/11/01		83	%	50 - 130
			Phenanthrene	2018/11/01		94	%	50 - 130
			Perylene	2018/11/01		82	%	50 - 130
			Pyrene	2018/11/01		99	%	50 - 130
			Quinoline	2018/11/01		98	%	50 - 130
9207729	LZ3	Spiked Blank	D10-ANTHRACENE (sur.)	2018/11/01		100	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/01		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/01		78	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/01		98	%	50 - 130
			Acenaphthene	2018/11/01		88	%	50 - 130
			Acenaphthylene	2018/11/01		94	%	50 - 130
			Acridine	2018/11/01		81	%	50 - 130
			Anthracene	2018/11/01		89	%	50 - 130
			Benzo(a)anthracene	2018/11/01		97	%	50 - 130
			Benzo(b&j)fluoranthene	2018/11/01		104	%	50 - 130
			Benzo(k)fluoranthene	2018/11/01		102	%	50 - 130
			Benzo(g,h,i)perylene	2018/11/01		97	%	50 - 130
			Benzo(c)phenanthrene	2018/11/01		95	%	50 - 130
			Benzo(a)pyrene	2018/11/01		105	%	50 - 130
			Benzo[e]pyrene	2018/11/01		94	%	50 - 130
			Chrysene	2018/11/01		95	%	50 - 130
			Dibenz(a,h)anthracene	2018/11/01		99	%	50 - 130
			Fluoranthene	2018/11/01		104	%	50 - 130
			Fluorene	2018/11/01		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/11/01		86	%	50 - 130
			1-Methylnaphthalene	2018/11/01		90	%	50 - 130
			2-Methylnaphthalene	2018/11/01		85	%	50 - 130
			Naphthalene	2018/11/01		85	%	50 - 130
			Phenanthrene	2018/11/01		93	%	50 - 130
			Perylene	2018/11/01		90	%	50 - 130
			Pyrene	2018/11/01		101	%	50 - 130
			Quinoline	2018/11/01		97	%	50 - 130
9207729	LZ3	Method Blank	D10-ANTHRACENE (sur.)	2018/11/01		98	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/01		90	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/01		69	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/01		97	%	50 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthene	2018/11/01	<0.00010		mg/L	
			Acenaphthylene	2018/11/01	<0.00010		mg/L	
			Acridine	2018/11/01	<0.000050		mg/L	
			Anthracene	2018/11/01	<0.000010		mg/L	
			Benzo(a)anthracene	2018/11/01	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/11/01	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/11/01	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/11/01	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/11/01	<0.000050		mg/L	
			Benzo(a)pyrene	2018/11/01	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/11/01	<0.000050		mg/L	
			Chrysene	2018/11/01	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/11/01	<0.0000075		mg/L	
			Fluoranthene	2018/11/01	<0.000010		mg/L	
			Fluorene	2018/11/01	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/11/01	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/11/01	<0.00010		mg/L	
			2-Methylnaphthalene	2018/11/01	<0.00010		mg/L	
			Naphthalene	2018/11/01	<0.00010		mg/L	
			Phenanthrene	2018/11/01	<0.000050		mg/L	
			Perylene	2018/11/01	<0.000050		mg/L	
			Pyrene	2018/11/01	<0.000020		mg/L	
			Quinoline	2018/11/01	<0.00020		mg/L	
9207729	LZ3	RPD [UQ8404-01]	Acenaphthene	2018/11/01	NC		%	30
			Acenaphthylene	2018/11/01	NC		%	30
			Acridine	2018/11/01	NC		%	30
			Anthracene	2018/11/01	NC		%	30
			Benzo(a)anthracene	2018/11/01	NC		%	30
			Benzo(b&j)fluoranthene	2018/11/01	NC		%	30
			Benzo(k)fluoranthene	2018/11/01	NC		%	30
			Benzo(g,h,i)perylene	2018/11/01	NC		%	30
			Benzo(c)phenanthrene	2018/11/01	NC		%	30
			Benzo(a)pyrene	2018/11/01	NC		%	30
			Benzo[e]pyrene	2018/11/01	NC		%	30
			Chrysene	2018/11/01	NC		%	30
			Dibenz(a,h)anthracene	2018/11/01	NC		%	30
			Fluoranthene	2018/11/01	NC		%	30
			Fluorene	2018/11/01	1.8		%	30
			Indeno(1,2,3-cd)pyrene	2018/11/01	NC		%	30
			1-Methylnaphthalene	2018/11/01	3.4		%	30
			2-Methylnaphthalene	2018/11/01	2.6		%	30
			Naphthalene	2018/11/01	2.8		%	30
			Phenanthrene	2018/11/01	NC		%	30
			Perylene	2018/11/01	NC		%	30
			Pyrene	2018/11/01	NC		%	30
			Quinoline	2018/11/01	0.80		%	30
9207730	MHF	Matrix Spike	O-TERPHENYL (sur.)	2018/10/31		92	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/31		94	%	60 - 140
9207730	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/10/31		92	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/31		94	%	60 - 140
9207730	MHF	Method Blank	O-TERPHENYL (sur.)	2018/10/31		88	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/10/31	<0.10		mg/L	
9207730	MHF	RPD [UQ8404-01]	F2 (C10-C16 Hydrocarbons)	2018/10/31	12		%	30
9219815	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/11/08		95	%	50 - 140

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			4-Bromofluorobenzene (sur.)	2018/11/08		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/08		89	%	50 - 140
			Benzene	2018/11/08		86	%	50 - 140
			Toluene	2018/11/08		82	%	50 - 140
			Ethylbenzene	2018/11/08		83	%	50 - 140
			m & p-Xylene	2018/11/08		83	%	50 - 140
			o-Xylene	2018/11/08		85	%	50 - 140
			F1 (C6-C10)	2018/11/08		86	%	60 - 140
9219815	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/11/08		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/08		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/08		88	%	50 - 140
			Benzene	2018/11/08		90	%	60 - 130
			Toluene	2018/11/08		87	%	60 - 130
			Ethylbenzene	2018/11/08		90	%	60 - 130
			m & p-Xylene	2018/11/08		89	%	60 - 130
			o-Xylene	2018/11/08		89	%	60 - 130
			F1 (C6-C10)	2018/11/08		97	%	60 - 140
9219815	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2018/11/08		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/08		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/08		83	%	50 - 140
			Benzene	2018/11/08	<0.00040		mg/L	
			Toluene	2018/11/08	<0.00040		mg/L	
			Ethylbenzene	2018/11/08	<0.00040		mg/L	
			m & p-Xylene	2018/11/08	<0.00080		mg/L	
			o-Xylene	2018/11/08	<0.00040		mg/L	
			Xylenes (Total)	2018/11/08	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2018/11/08	<0.10		mg/L	
			F1 (C6-C10)	2018/11/08	<0.10		mg/L	
9219815	DO1	RPD	Toluene	2018/11/08	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).

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Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B894790
Report Date: 2018/11/13

CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Sampler Initials: AG

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

Jingyuan Song, QP, Organics – Senior Analyst

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

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 Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam
A Bureau Veritas Group Company

Calgary: 4000 19th St. NE, T2E 6PB. Toll Free (800) 386-7247
Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
maxxam.ca

1216

CHAIN OF CUSTODY RECORD

M070783

Page 1 of 1

Invoice Information		Report Information (If differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 5-7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 – 30 Ave NE Calgary, AB, T2E 7K9	Address:		Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403-263-2556	Phone:		Site Location:		
Email:	stephen_dabadie@clifton.ca	Email:		Site #:		Date Required:
Copies:	terryn.kuzyk@clifton.ca	Copies:		Sampled By:	Austin / Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present		✓	Temp	6	7	6
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F2-F2	BTEX F3-F4	Routine Water	Regulated Metals ☐ Diss ☐ Tot	Mercury ☐ Dissolved ☐ Total	Salinity 4	Sieve (75 micron)	Texture (% Sand, Silt, Clay)	Basic Class II Landfill	PAHs	HOLD - DO NOT ANALYZE
1	1912		2018.10.29	10:25	GW	8	✓	✓									✓	
2	1913		↓	10:45	↓	8	✓	✓									✓	
3	1914			13:20		8	✓	✓									✓	
4	1915			10:10		7	✓	✓									✓	
5	1916			12:45		8	✓	✓									✓	
6	9915			10:10		7	✓	✓									✓	
7	1915B		↓	13:00	↓	7	✓	✓									✓	
8	9915B		2018.10.29	13:00	GW	7	✓	✓									✓	
9	~~1907B~~				~~GW~~													
10	Trip Blank #3		2018.10.29		W	2	✓											
	Please indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Regulatory Criteria

☑ AT1
☐ CCME
☐ Drinking Water
☐ D50 (Drilling Waste)
☐ Saskatchewan
☐ Other:

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)
Austin Mei	2018-10-29	14:45	BDL Benton Dalgleish	2018/10/29	14:54

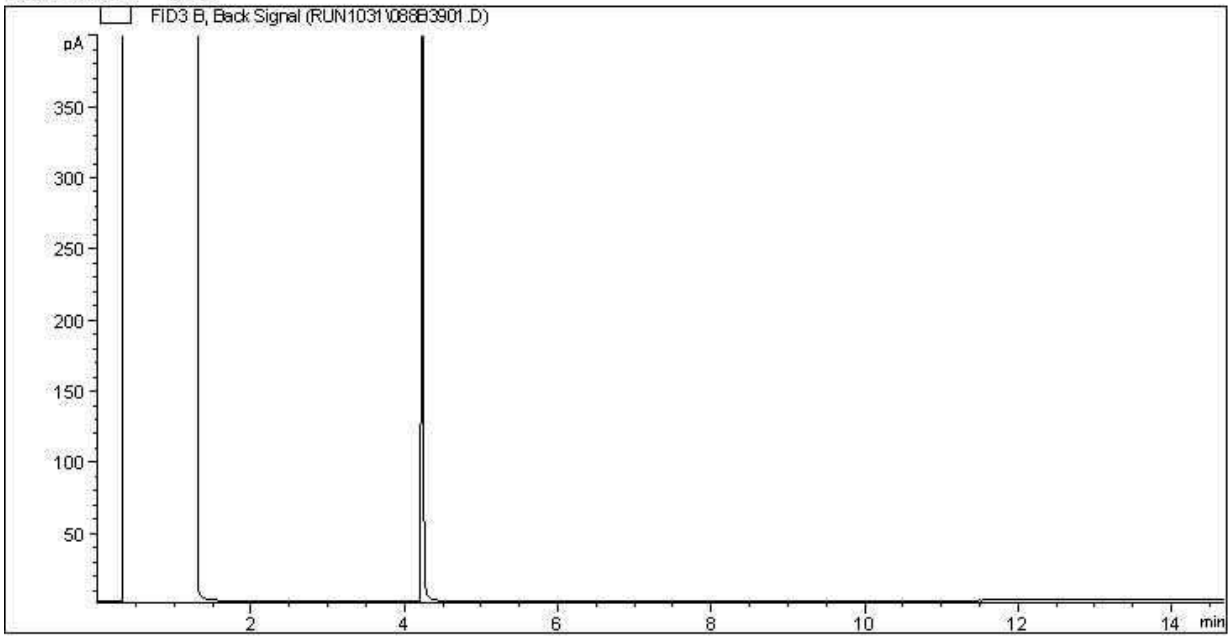
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgement and acceptance of our terms which are available for viewing at www.maxxam.ca

29-Oct-18 14:54
Leanne Cameron
B894790
BD2 INS-0001

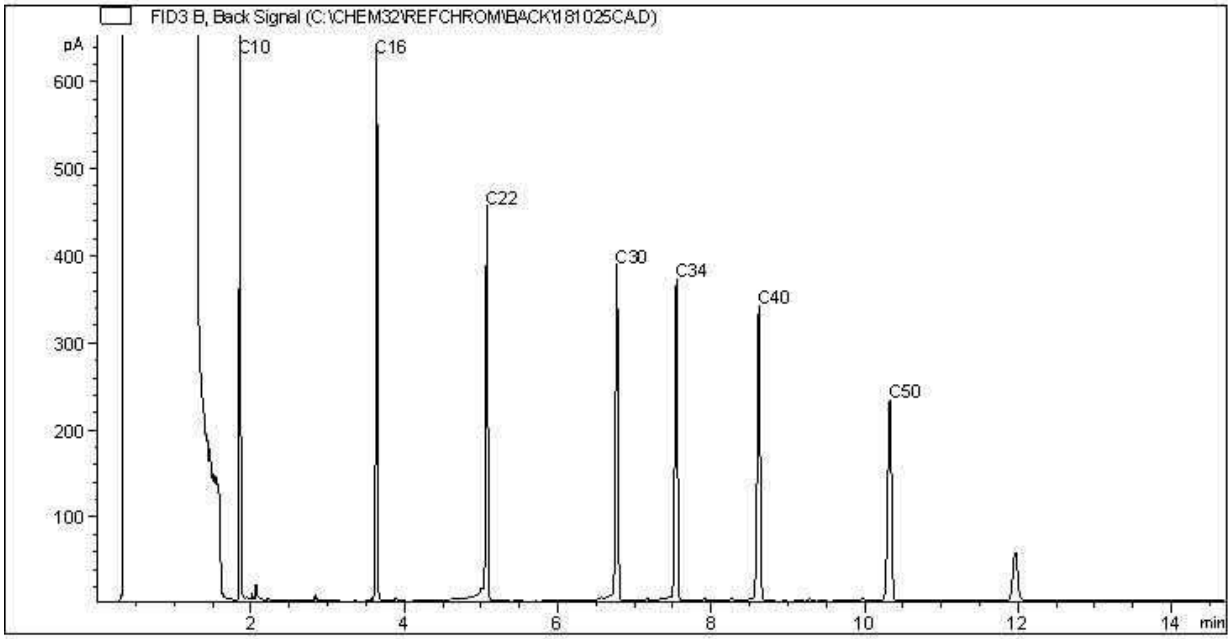
AB FCD-00331/7

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



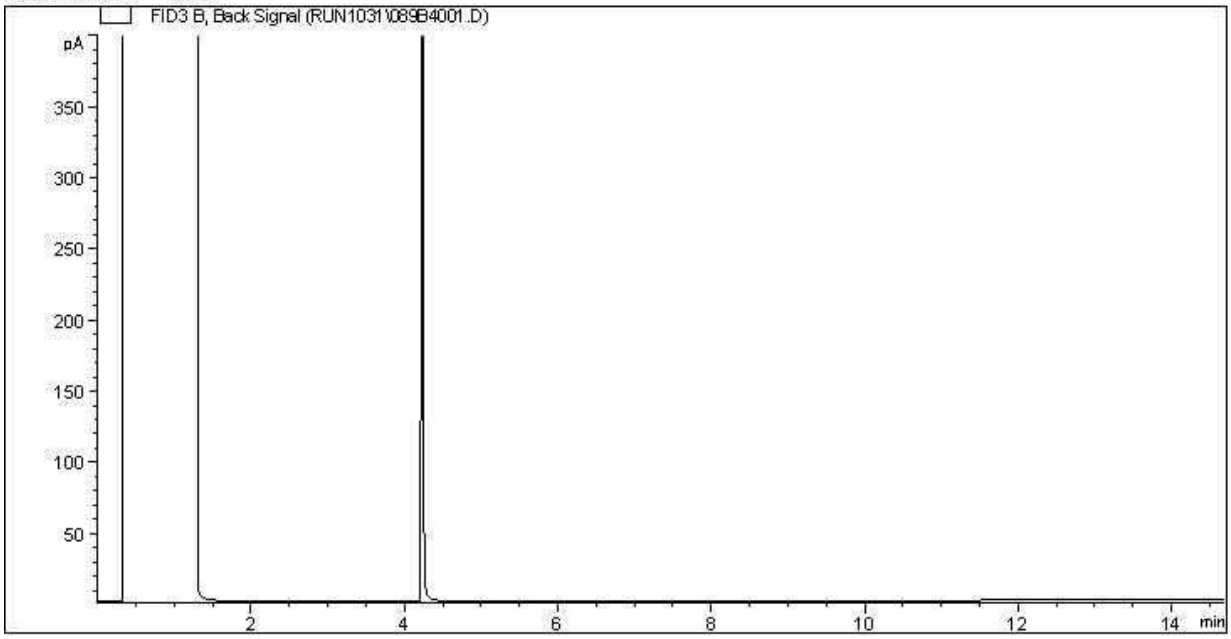
TYPICAL PRODUCT CARBON NUMBER RANGES

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

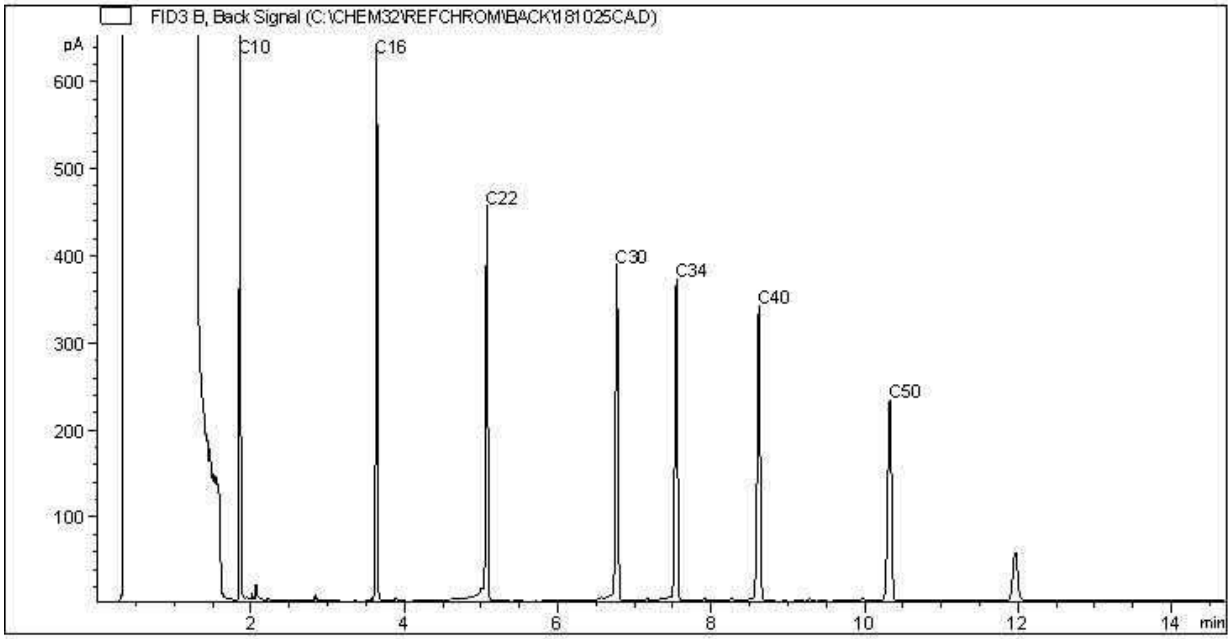
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



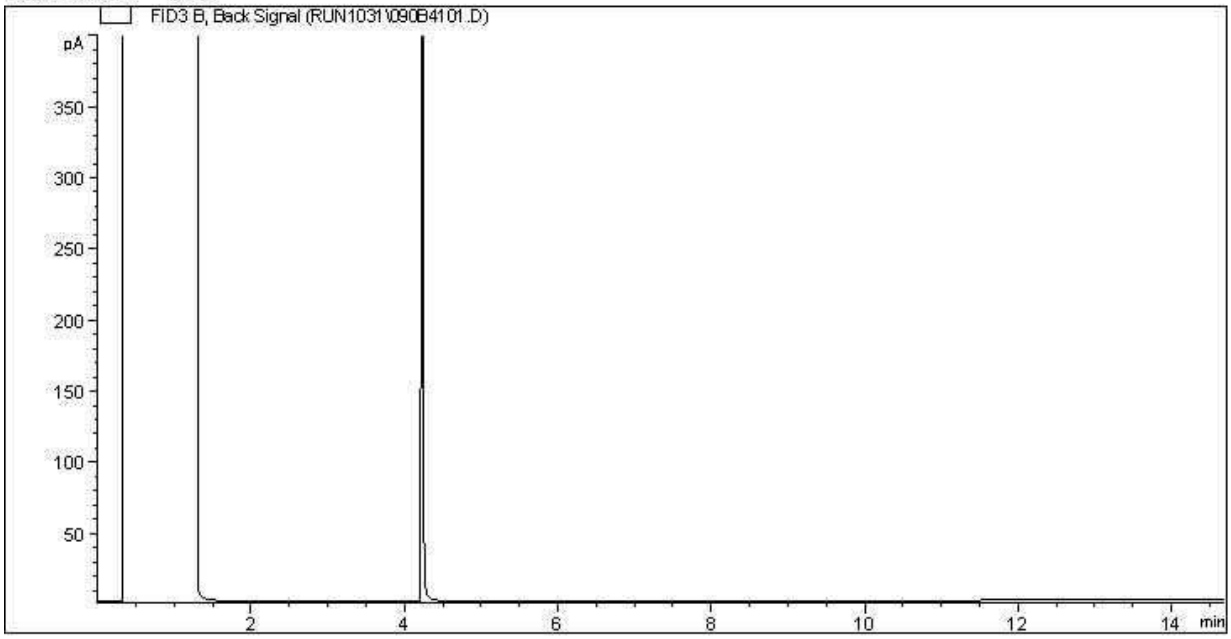
TYPICAL PRODUCT CARBON NUMBER RANGES

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

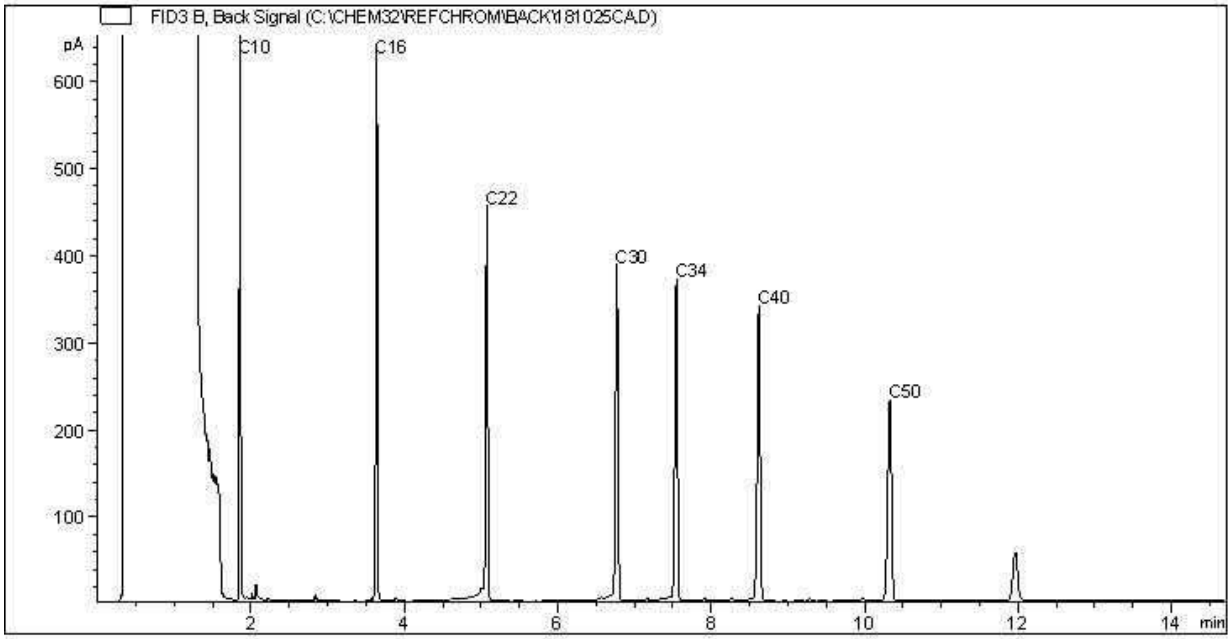
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



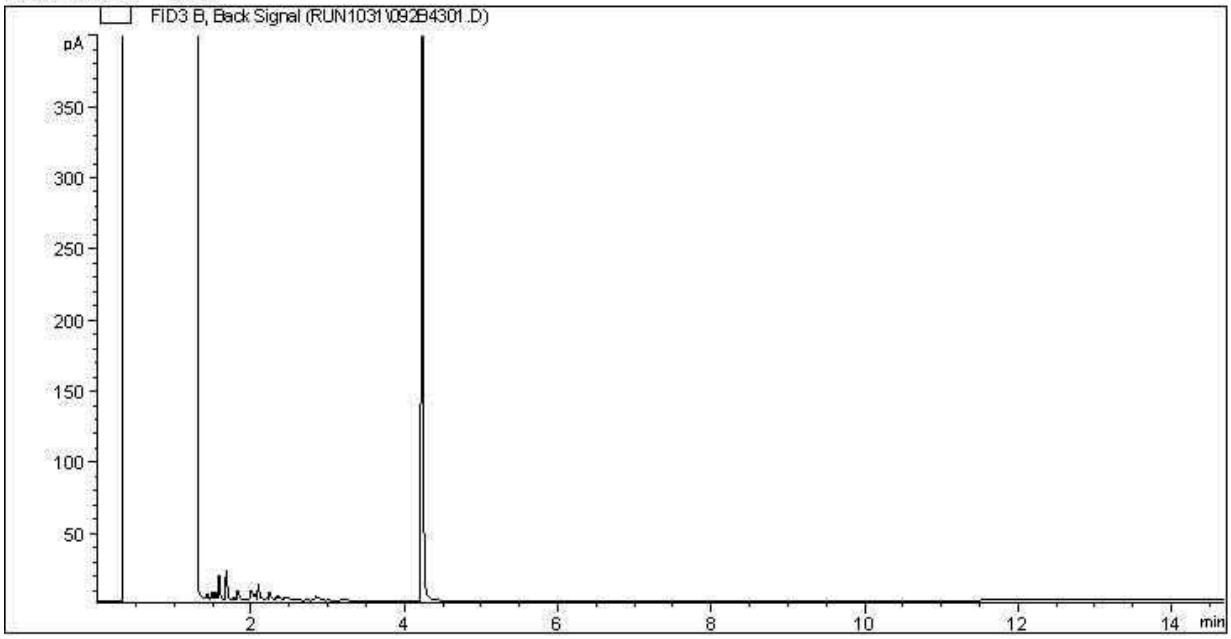
TYPICAL PRODUCT CARBON NUMBER RANGES

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

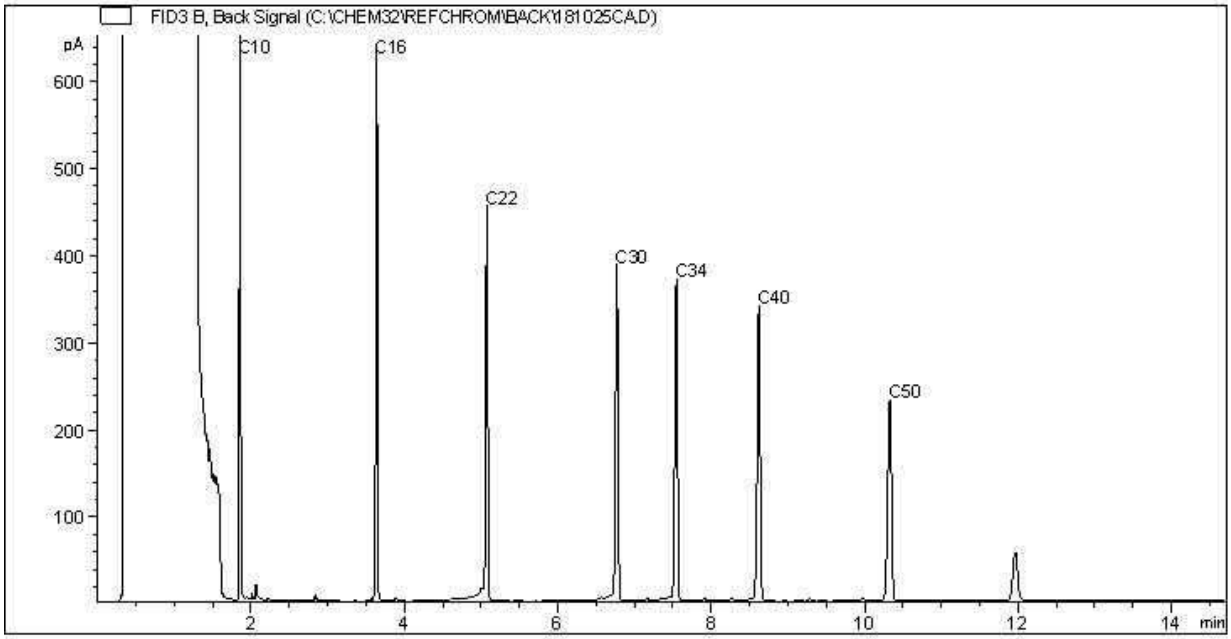
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



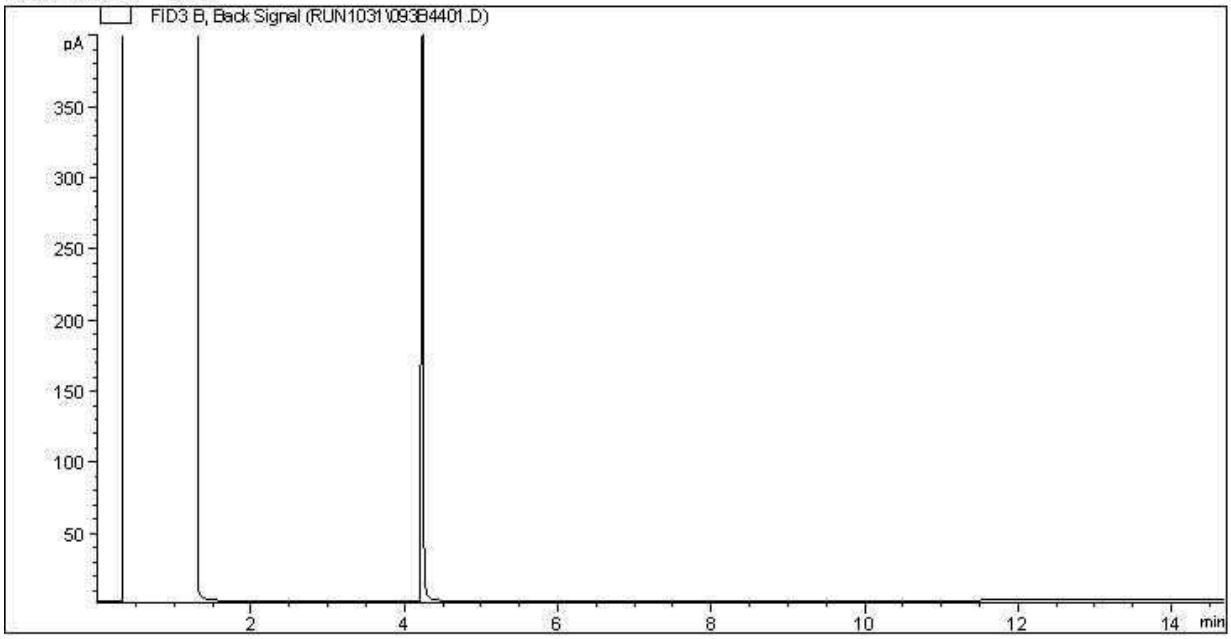
TYPICAL PRODUCT CARBON NUMBER RANGES

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

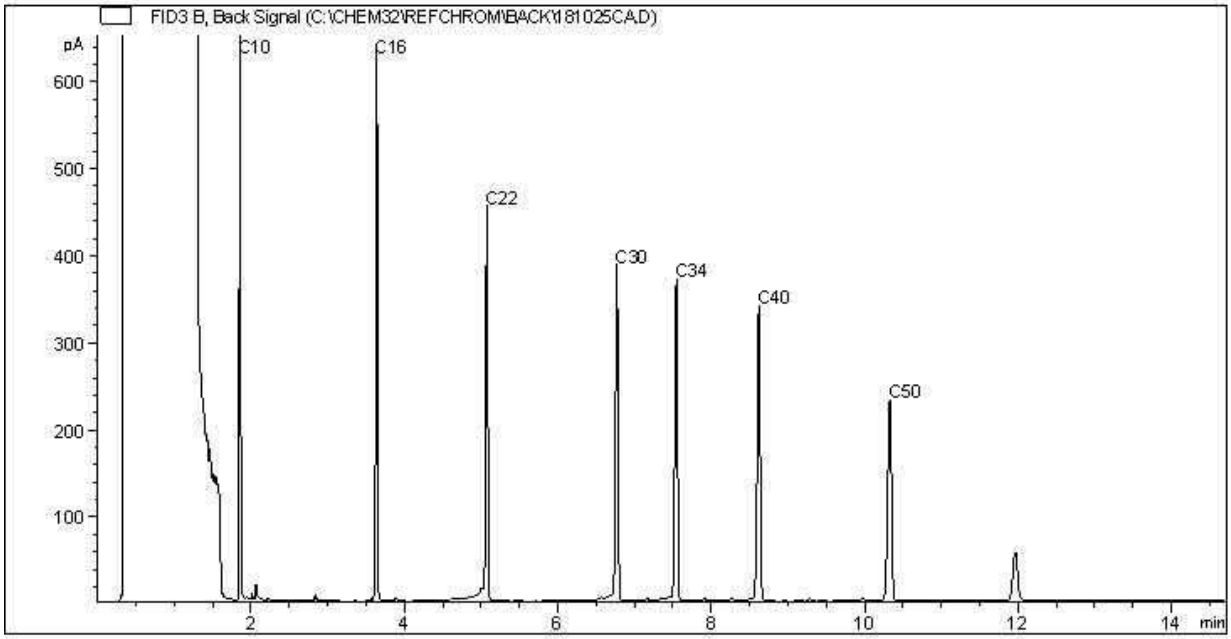
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

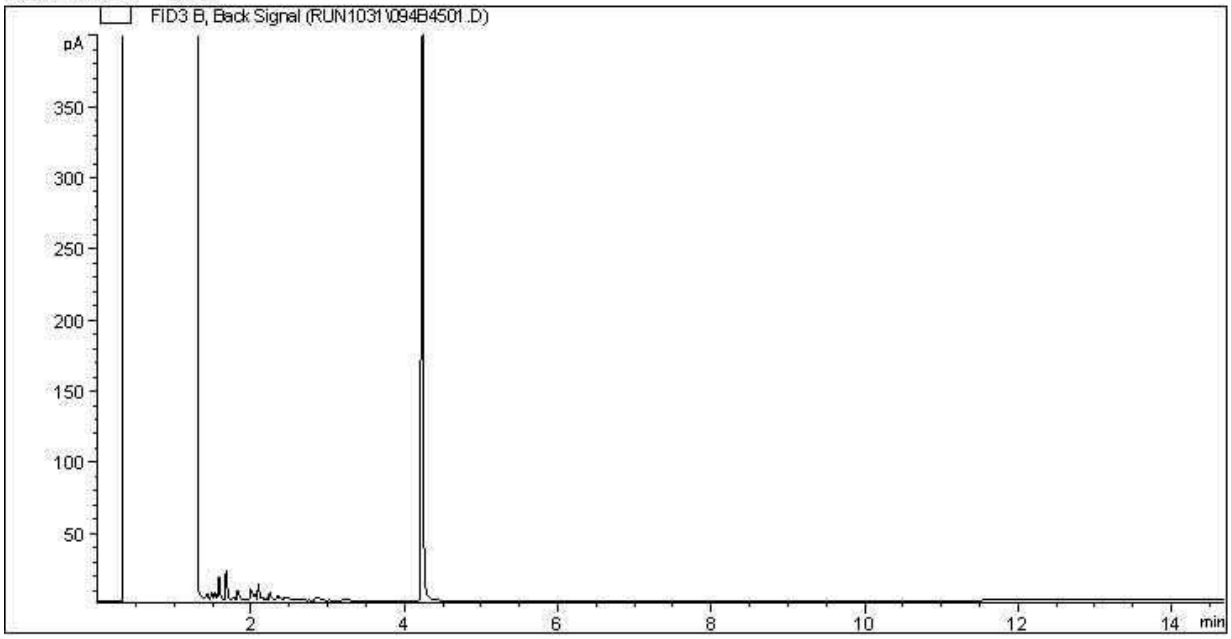
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894790
Report Date: 2018/11/13
Maxxam Sample: UQ8402

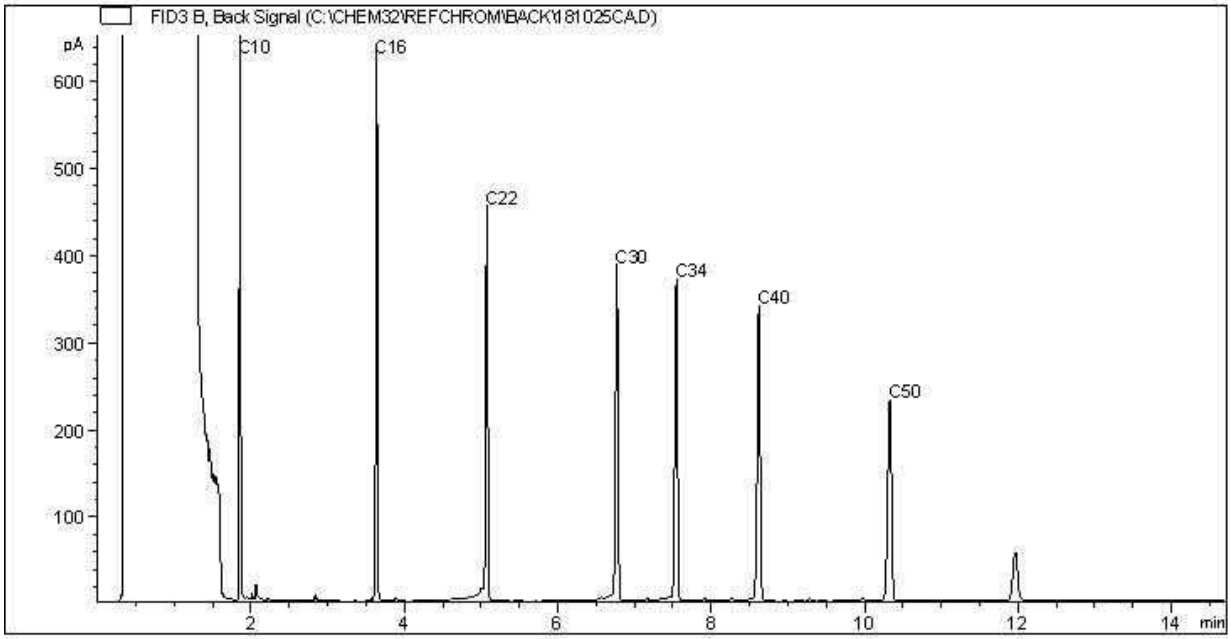
CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Client ID: 9915

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

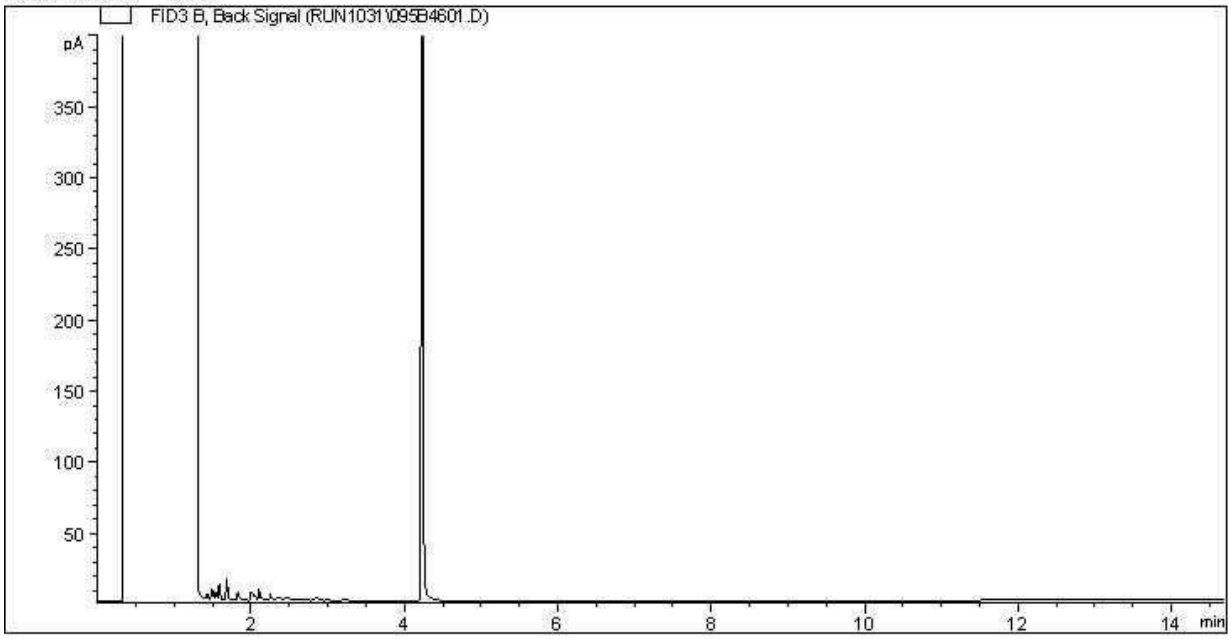
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894790
Report Date: 2018/11/13
Maxxam Sample: UQ8403

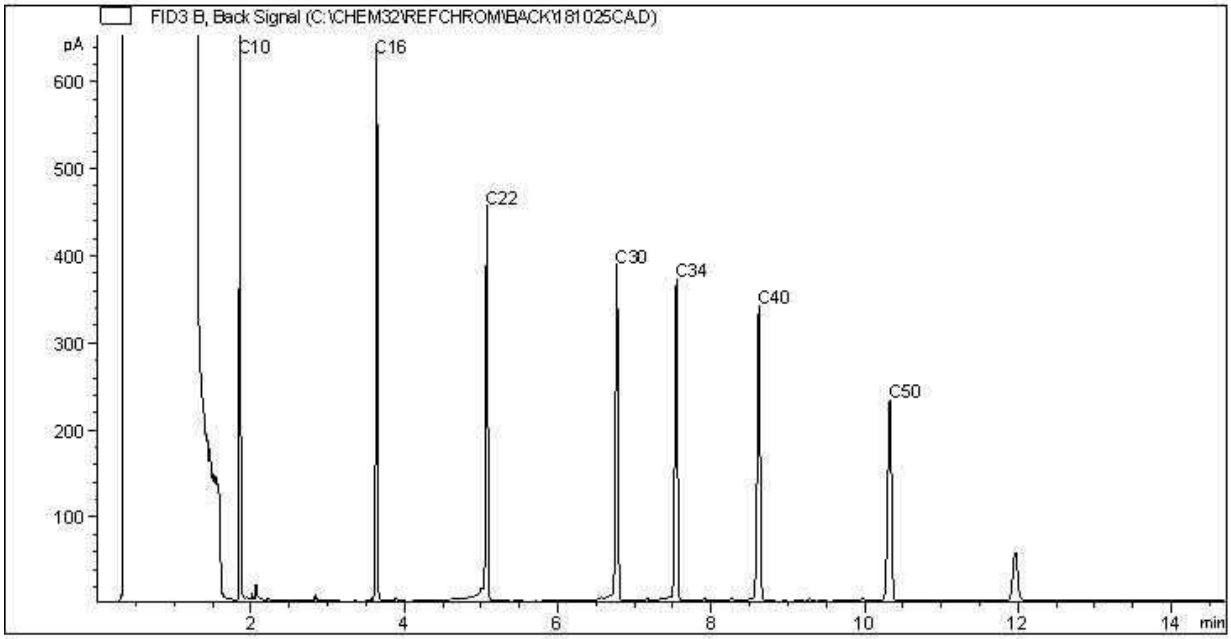
CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Client ID: 1915B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

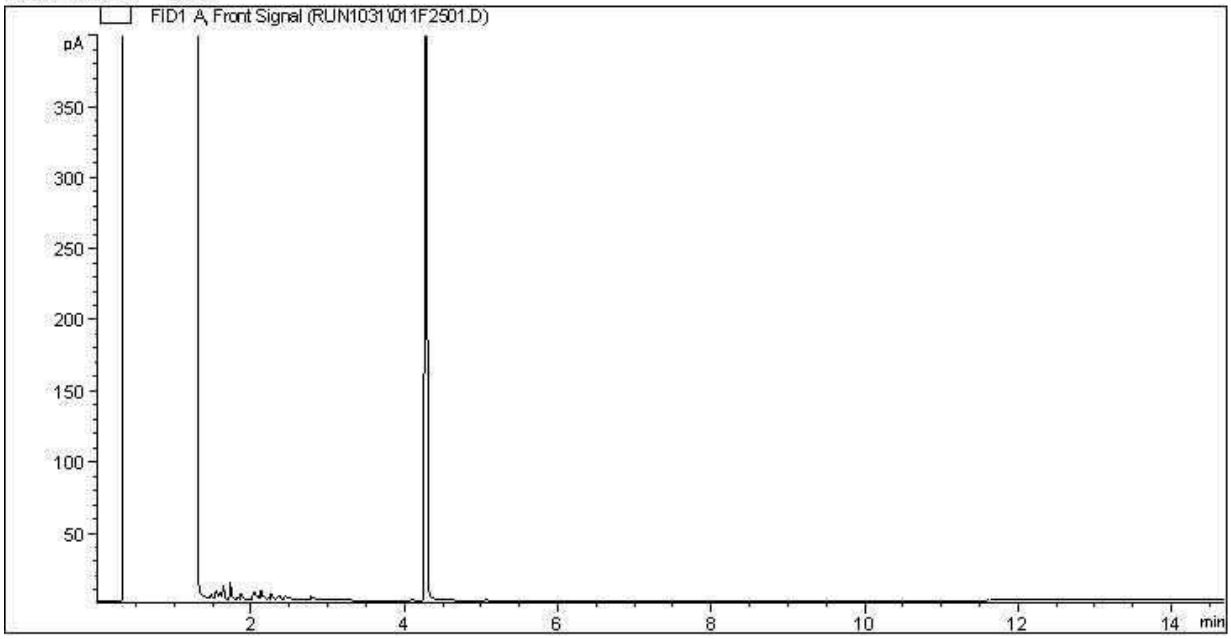
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894790
Report Date: 2018/11/13
Maxxam Sample: UQ8404

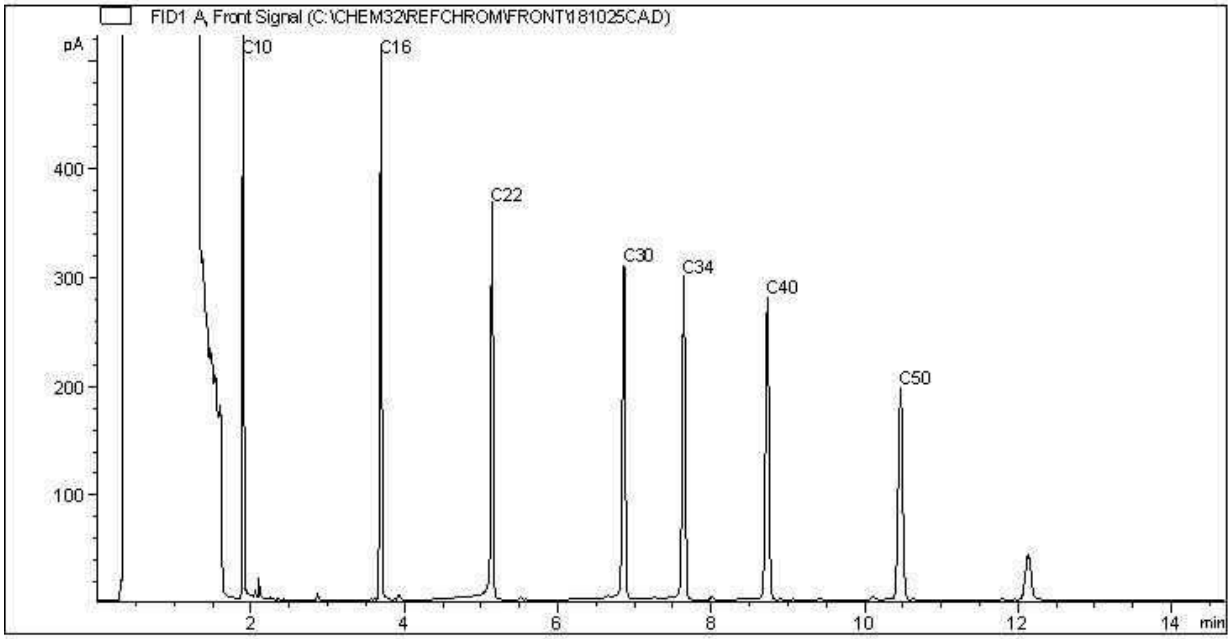
CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Client ID: 9915B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

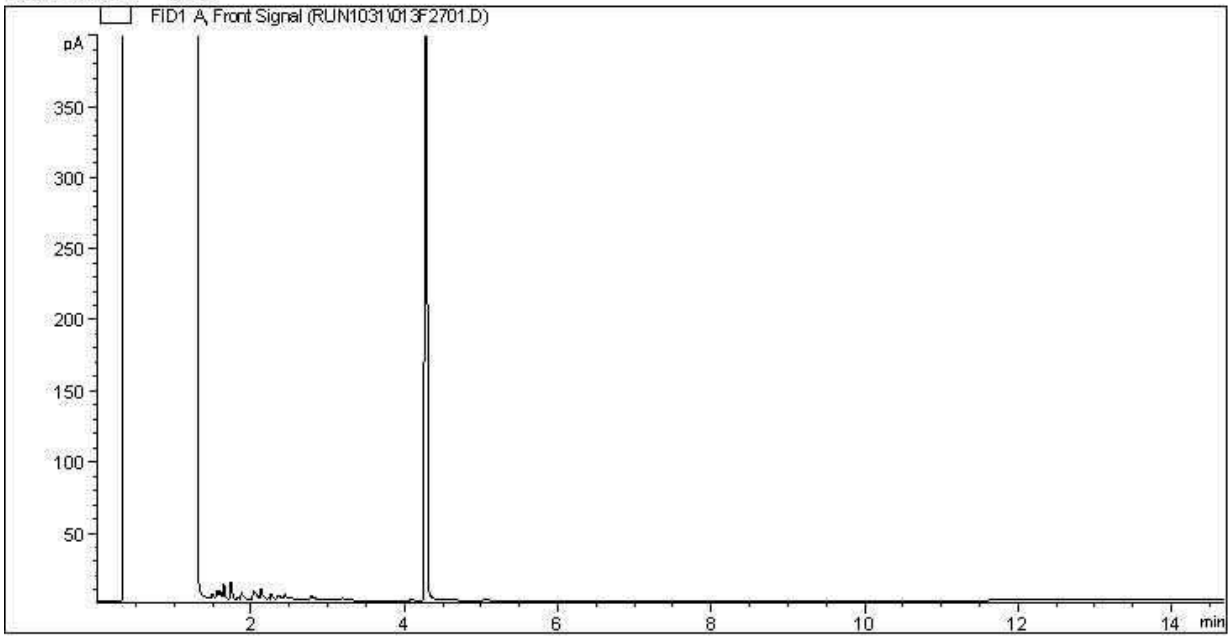
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B894790
Report Date: 2018/11/13
Maxxam Sample: UQ8404 Lab-Dup

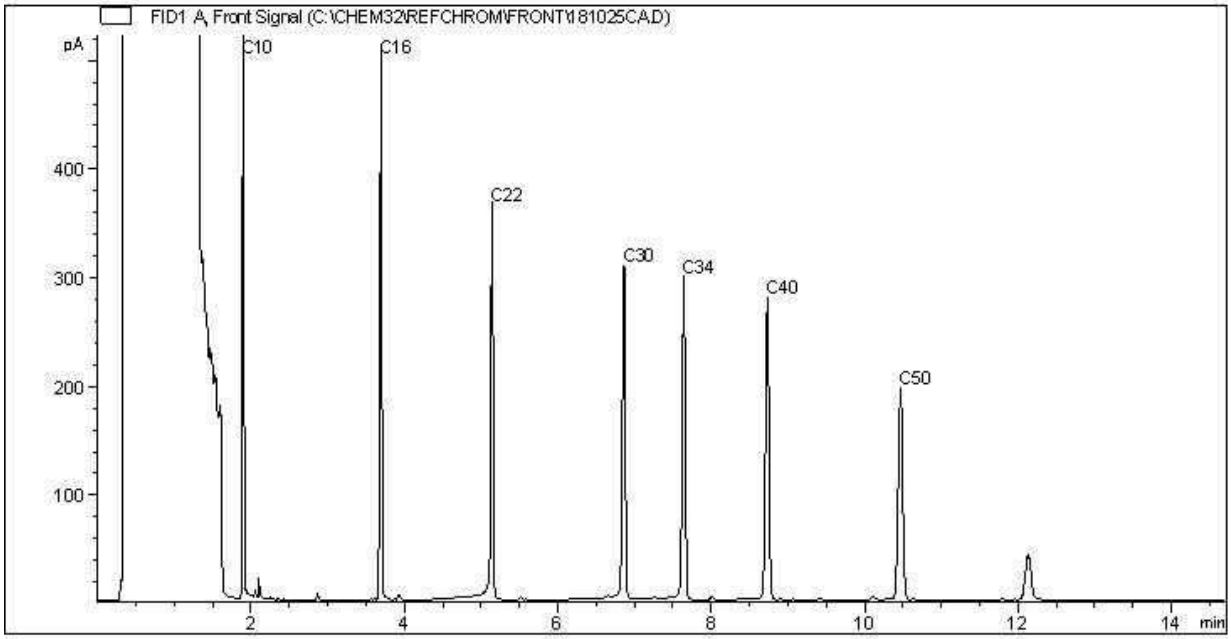
CLIFTON ASSOCIATES LTD.
Client Project #: CG24301.1 E32
Client ID: 9915B

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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.

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: CG2430.1 E32
Your C.O.C. #: m045957, m014187

Attention: STEPHEN DABADIE

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

Report Date: 2018/11/15
Report #: R2650898
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B898309
Received: 2018/11/07, 15:50

Sample Matrix: Water
Samples Received: 13

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS/FID	10	N/A	2018/11/09	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/11/14	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2018/11/15	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	12	N/A	2018/11/15	AB SOP-00039	Auto Calc
CCME Hydrocarbons in Water (F2; C10-C16) (1)	8	2018/11/08	2018/11/13	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1)	4	2018/11/08	2018/11/14	AB SOP-00037 AB SOP-00040	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (2)	5	N/A	2018/11/15	AB SOP-00003	Auto Calc
PAH in Water by GC/MS	5	2018/11/13	2018/11/14	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
Total Trihalomethanes Calculation	13	N/A	2018/11/14	AB SOP-00056	Auto Calc
VOCs in Water by HS GC/MS (Std List)	7	N/A	2018/11/13	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List)	6	N/A	2018/11/14	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.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: CG2430.1 E32
Your C.O.C. #: m045957, m014187

Attention: STEPHEN DABADIE

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

Report Date: 2018/11/15
Report #: R2650898
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B898309
Received: 2018/11/07, 15:50

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.

(1) Silica gel clean up employed.
(2) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.

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

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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.

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		US8651	US8651	US8652	US8653	US8654		
Sampling Date		2018/11/07 14:50	2018/11/07 14:50	2018/11/07 15:20	2018/11/07 14:30	2018/11/07 13:00		
COC Number		m045957	m045957	m045957	m045957	m045957		
	UNITS	**1901**	**1901 Lab-Dup**	**1902**	**1903**	**1904**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	<0.10	<0.10	0.10	9220704
Volatiles								
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.25	0.00040	9220121
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00085	0.00040	9220121
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.0017	0.00040	9220121
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.0013	0.00080	9220121
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00058	0.00040	9220121
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	<0.00089	0.0018	0.00089	9220088
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	<0.10	0.26	0.10	9220088
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.52	0.10	9220121
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	106	107	106	107	111	N/A	9220121
4-Bromofluorobenzene (sur.)	%	92	92	92	92	91	N/A	9220121
D4-1,2-Dichloroethane (sur.)	%	86	86	87	85	85	N/A	9220121
O-TERPHENYL (sur.)	%	91	N/A	92	90	92	N/A	9220704

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		US8655		US8656	US8657	US8658		US8659		
Sampling Date		2018/11/07 13:15		2018/11/07 15:00	2018/11/07 15:05	2018/11/07 14:40		2018/11/07 13:15		
COC Number		m045957		m045957	m045957	m045957		m045957		
	UNITS	**1905**	**RDL**	**1957**	**1958**	**1959**	**RDL**	**9905**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/L	2.8	0.10	<0.10	<0.10	<0.10	0.10	2.5	0.10	9220704
Volatiles										
Benzene	mg/L	0.037	0.00040	<0.00040	<0.00040	<0.00040	0.00040	0.037	0.00040	9220121
Toluene	mg/L	0.0018	0.00040	<0.00040	<0.00040	<0.00040	0.00040	0.0017	0.00040	9220121
Ethylbenzene	mg/L	0.35	0.00040	<0.00040	<0.00040	<0.00040	0.00040	0.36	0.00040	9220121
m & p-Xylene	mg/L	2.5 (1)	0.0040	<0.00080	<0.00080	<0.00080	0.00080	2.7 (1)	0.0040	9220121
o-Xylene	mg/L	0.26	0.00040	<0.00040	<0.00040	<0.00040	0.00040	0.27	0.00040	9220121
Xylenes (Total)	mg/L	2.7	0.0040	<0.00089	<0.00089	<0.00089	0.00089	2.9	0.0040	9220088
F1 (C6-C10) - BTEX	mg/L	4.6	0.10	<0.10	<0.10	<0.10	0.10	5.0	0.10	9220088
F1 (C6-C10)	mg/L	7.7	0.10	<0.10	<0.10	<0.10	0.10	8.4	0.10	9220121
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	106	N/A	108	108	108	N/A	107	N/A	9220121
4-Bromofluorobenzene (sur.)	%	95	N/A	92	91	92	N/A	95	N/A	9220121
D4-1,2-Dichloroethane (sur.)	%	92	N/A	85	85	85	N/A	86	N/A	9220121
O-TERPHENYL (sur.)	%	99	N/A	92	91	96	N/A	93	N/A	9220704

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		US8665	US8666	US8667		
Sampling Date		2018/11/07 13:30	2018/11/07 13:50	2018/11/07 14:15		
COC Number		m014187	m014187	m014187		
	UNITS	**1983A**	**1984**	**1985**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	9220704
Volatiles						
Benzene	mg/L	<0.00040	0.0022	<0.00040	0.00040	9220121
Toluene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9220121
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9220121
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	0.00080	9220121
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	0.00040	9220121
Xylenes (Total)	mg/L	<0.00089	<0.00089	<0.00089	0.00089	9220088
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	0.10	9220088
F1 (C6-C10)	mg/L	<0.10	<0.10	<0.10	0.10	9220121
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	106	108	108	N/A	9220121
4-Bromofluorobenzene (sur.)	%	92	91	92	N/A	9220121
D4-1,2-Dichloroethane (sur.)	%	87	83	85	N/A	9220121
O-TERPHENYL (sur.)	%	90	90	93	N/A	9220704

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8655	US8659		US8665	US8666		
Sampling Date		2018/11/07 13:15	2018/11/07 13:15		2018/11/07 13:30	2018/11/07 13:50		
COC Number		m045957	m045957		m014187	m014187		
	UNITS	**1905**	**9905**	**RDL**	**1983A**	**1984**	**RDL**	**QC Batch**
Polycyclic Aromatics								
Benzo[a]pyrene equivalency	mg/L	0.000010	0.000010	0.000010	0.000010	<0.000010	0.000010	9220095
Acenaphthene	mg/L	0.00049	0.00046	0.00010	<0.00010	<0.00010	0.00010	9220700
Acenaphthylene	mg/L	0.00011	0.00011	0.00010	<0.00010	<0.00010	0.00010	9220700
Acridine	mg/L	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	0.000050	9220700
Anthracene	mg/L	0.000077	0.000085	0.000010	<0.000010	<0.000010	0.000010	9220700
Benzo(a)anthracene	mg/L	<0.0000085	<0.0000085	0.0000085	<0.0000085	<0.0000085	0.0000085	9220700
Benzo(b&j)fluoranthene	mg/L	0.0000098	0.000011	0.0000085	0.000011	<0.0000085	0.0000085	9220700
Benzo(k)fluoranthene	mg/L	<0.0000085	<0.0000085	0.0000085	<0.0000085	<0.0000085	0.0000085	9220700
Benzo(g,h,i)perylene	mg/L	<0.0000085	<0.0000085	0.0000085	0.0000095	<0.0000085	0.0000085	9220700
Benzo(c)phenanthrene	mg/L	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	0.000050	9220700
Benzo(a)pyrene	mg/L	<0.0000075	<0.0000075	0.0000075	<0.0000075	<0.0000075	0.0000075	9220700
Benzo[e]pyrene	mg/L	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	0.000050	9220700
Chrysene	mg/L	0.000011	0.000012	0.0000085	<0.0000085	<0.0000085	0.0000085	9220700
Dibenz(a,h)anthracene	mg/L	<0.0000075	<0.0000075	0.0000075	<0.0000075	<0.0000075	0.0000075	9220700
Fluoranthene	mg/L	0.00014	0.00016	0.000010	0.000016	<0.000010	0.000010	9220700
Fluorene	mg/L	0.00040	0.00041	0.000050	<0.000050	<0.000050	0.000050	9220700
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	<0.0000085	0.0000085	<0.0000085	<0.0000085	0.0000085	9220700
1-Methylnaphthalene	mg/L	0.050	0.051	0.00010	<0.00010	<0.00010	0.00010	9220700
2-Methylnaphthalene	mg/L	0.085 (1)	0.084 (1)	0.0010	<0.00010	<0.00010	0.00010	9220700
Naphthalene	mg/L	0.18 (1)	0.18 (1)	0.0010	<0.00010	<0.00010	0.00010	9220700
Phenanthrene	mg/L	0.00044	0.00044	0.000050	<0.000050	<0.000050	0.000050	9220700
Perylene	mg/L	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	0.000050	9220700
Pyrene	mg/L	0.00015	0.00017	0.000020	0.000060	<0.000020	0.000020	9220700
Quinoline	mg/L	0.00053	0.00055	0.00020	<0.00020	<0.00020	0.00020	9220700
Surrogate Recovery (%)								
D10-ANTHRACENE (sur.)	%	97	99	N/A	94	97	N/A	9220700
D8-ACENAPHTHYLENE (sur.)	%	90	92	N/A	81	90	N/A	9220700
D8-NAPHTHALENE (sur.)	%	66	69	N/A	53	81	N/A	9220700
TERPHENYL-D14 (sur.)	%	100	103	N/A	94	104	N/A	9220700

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8667		
Sampling Date		2018/11/07 14:15		
COC Number		m014187		
	UNITS	**1985**	**RDL**	**QC Batch**
Polycyclic Aromatics				
Benzo[a]pyrene equivalency	mg/L	<0.000010	0.000010	9220095
Acenaphthene	mg/L	<0.00010	0.00010	9220700
Acenaphthylene	mg/L	<0.00010	0.00010	9220700
Acridine	mg/L	<0.000050	0.000050	9220700
Anthracene	mg/L	<0.000010	0.000010	9220700
Benzo(a)anthracene	mg/L	<0.0000085	0.0000085	9220700
Benzo(b&j)fluoranthene	mg/L	<0.0000085	0.0000085	9220700
Benzo(k)fluoranthene	mg/L	<0.0000085	0.0000085	9220700
Benzo(g,h,i)perylene	mg/L	<0.0000085	0.0000085	9220700
Benzo(c)phenanthrene	mg/L	<0.000050	0.000050	9220700
Benzo(a)pyrene	mg/L	<0.0000075	0.0000075	9220700
Benzo[e]pyrene	mg/L	<0.000050	0.000050	9220700
Chrysene	mg/L	<0.0000085	0.0000085	9220700
Dibenz(a,h)anthracene	mg/L	<0.0000075	0.0000075	9220700
Fluoranthene	mg/L	<0.000010	0.000010	9220700
Fluorene	mg/L	<0.000050	0.000050	9220700
Indeno(1,2,3-cd)pyrene	mg/L	<0.0000085	0.0000085	9220700
1-Methylnaphthalene	mg/L	<0.00010	0.00010	9220700
2-Methylnaphthalene	mg/L	<0.00010	0.00010	9220700
Naphthalene	mg/L	<0.00010	0.00010	9220700
Phenanthrene	mg/L	<0.000050	0.000050	9220700
Perylene	mg/L	<0.000050	0.000050	9220700
Pyrene	mg/L	<0.000020	0.000020	9220700
Quinoline	mg/L	<0.00020	0.00020	9220700
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	87	N/A	9220700
D8-ACENAPHTHYLENE (sur.)	%	90	N/A	9220700
D8-NAPHTHALENE (sur.)	%	81	N/A	9220700
TERPHENYL-D14 (sur.)	%	109	N/A	9220700

RDL = Reportable Detection Limit
N/A = Not Applicable

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8650	US8650	US8651	US8652	US8653		
Sampling Date		2018/11/07	2018/11/07	2018/11/07 14:50	2018/11/07 15:20	2018/11/07 14:30		
COC Number		m045957	m045957	m045957	m045957	m045957		
	UNITS	**TRIP BLANK 14**	**TRIP BLANK 14 Lab-Dup**	**1901**	**1902**	**1903**	**RDL**	**QC Batch**
Volatiles								
Total Trihalomethanes	mg/L	<0.0013	N/A	<0.0013	<0.0013	<0.0013	0.0013	9220100
Benzene	mg/L	<0.00040	<0.00040	N/A	N/A	N/A	0.00040	9220123
Bromodichloromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Bromoform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Bromomethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9220123
Carbon tetrachloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Chlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Chlorodibromomethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9220123
Chloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9220123
Chloroform	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Chloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9220123
1,2-dibromoethane	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	9220123
1,2-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,3-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,4-dichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,1-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,2-dichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,1-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
cis-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
trans-1,2-dichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Dichloromethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9220123
1,2-dichloropropane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
cis-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
trans-1,3-dichloropropene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Ethylbenzene	mg/L	<0.00040	<0.00040	N/A	N/A	N/A	0.00040	9220123
Methyl methacrylate	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Styrene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,1,2-tetrachloroethane	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9220123
1,1,2,2-tetrachloroethane	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	9220123

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8650	US8650	US8651	US8652	US8653		
Sampling Date		2018/11/07	2018/11/07	2018/11/07 14:50	2018/11/07 15:20	2018/11/07 14:30		
COC Number		m045957	m045957	m045957	m045957	m045957		
	UNITS	**TRIP BLANK 14**	**TRIP BLANK 14 Lab-Dup**	**1901**	**1902**	**1903**	**RDL**	**QC Batch**
Tetrachloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Toluene	mg/L	<0.00040	<0.00040	N/A	N/A	N/A	0.00040	9220123
1,2,3-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9220123
1,2,4-trichlorobenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	9220123
1,3,5-trichlorobenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,1-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,2-trichloroethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Trichloroethene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Trichlorofluoromethane	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,2,4-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
1,3,5-trimethylbenzene	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Vinyl chloride	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	9220123
Xylenes (Total)	mg/L	<0.00080	<0.00080	N/A	N/A	N/A	0.00080	9220123
m & p-Xylene	mg/L	<0.00080	<0.00080	N/A	N/A	N/A	0.00080	9220123
o-Xylene	mg/L	<0.00040	<0.00040	N/A	N/A	N/A	0.00040	9220123
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	102	102	100	101	N/A	9220123
4-Bromofluorobenzene (sur.)	%	94	95	94	93	95	N/A	9220123
D4-1,2-Dichloroethane (sur.)	%	104	100	98	98	95	N/A	9220123

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8654		US8655		US8656	US8657		
Sampling Date		2018/11/07 13:00		2018/11/07 13:15		2018/11/07 15:00	2018/11/07 15:05		
COC Number		m045957		m045957		m045957	m045957		
	UNITS	**1904**	**RDL**	**1905**	**RDL**	**1957**	**1958**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	0.0013	<0.0013	0.0013	<0.0013	<0.0013	0.0013	9220100
Bromodichloromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Bromoform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Bromomethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9220123
Carbon tetrachloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Chlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Chlorodibromomethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
Chloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
Chloroform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Chloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9220123
1,2-dibromoethane	mg/L	<0.00020	0.00020	<0.00034 (1)	0.00034	<0.00020	<0.00020	0.00020	9220123
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1-dichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,2-dichloroethane	mg/L	0.0017	0.00050	0.058	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Dichloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9220123
1,2-dichloropropane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Methyl methacrylate	mg/L	<0.0020 (1)	0.0020	<0.0070 (1)	0.0070	<0.00050	<0.00050	0.00050	9220123
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Styrene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	0.0037 (2)	0.0020	<0.0020	<0.0020	0.0020	9220123
Tetrachloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.
(2) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8654		US8655		US8656	US8657		
Sampling Date		2018/11/07 13:00		2018/11/07 13:15		2018/11/07 15:00	2018/11/07 15:05		
COC Number		m045957		m045957		m045957	m045957		
	UNITS	**1904**	**RDL**	**1905**	**RDL**	**1957**	**1958**	**RDL**	**QC Batch**
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,2-trichloroethane	mg/L	<0.0010 (1)	0.0010	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Trichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Trichlorofluoromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	1.6 (2)	0.0025	<0.00050	<0.00050	0.00050	9220123
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	0.47	0.00050	<0.00050	<0.00050	0.00050	9220123
Vinyl chloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	102	N/A	101	N/A	102	101	N/A	9220123
4-Bromofluorobenzene (sur.)	%	93	N/A	96	N/A	94	94	N/A	9220123
D4-1,2-Dichloroethane (sur.)	%	117	N/A	109	N/A	95	95	N/A	9220123

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
(2) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8658		US8659		US8665	US8666		
Sampling Date		2018/11/07 14:40		2018/11/07 13:15		2018/11/07 13:30	2018/11/07 13:50		
COC Number		m045957		m045957		m014187	m014187		
	UNITS	**1959**	**RDL**	**9905**	**RDL**	**1983A**	**1984**	**RDL**	**QC Batch**
Volatiles									
Total Trihalomethanes	mg/L	<0.0013	0.0013	<0.0013	0.0013	<0.0013	<0.0013	0.0013	9220100
Bromodichloromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Bromoform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Bromomethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9220123
Carbon tetrachloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Chlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Chlorodibromomethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
Chloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
Chloroform	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Chloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9220123
1,2-dibromoethane	mg/L	<0.00020	0.00020	<0.00033 (1)	0.00033	<0.00020	<0.00020	0.00020	9220123
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1-dichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,2-dichloroethane	mg/L	<0.00050	0.00050	0.059	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Dichloromethane	mg/L	<0.0020	0.0020	<0.0020	0.0020	<0.0020	<0.0020	0.0020	9220123
1,2-dichloropropane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Methyl methacrylate	mg/L	<0.00050	0.00050	<0.0070 (1)	0.0070	<0.00050	<0.00050	0.00050	9220123
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Styrene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	0.0042 (2)	0.0020	<0.0020	<0.0020	0.0020	9220123
Tetrachloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123

RDL = Reportable Detection Limit
(1) Detection limits raised due to matrix interference.
(2) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high.

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8658		US8659		US8665	US8666		
Sampling Date		2018/11/07 14:40		2018/11/07 13:15		2018/11/07 13:30	2018/11/07 13:50		
COC Number		m045957		m045957		m014187	m014187		
	UNITS	**1959**	**RDL**	**9905**	**RDL**	**1983A**	**1984**	**RDL**	**QC Batch**
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9220123
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Trichloroethene	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Trichlorofluoromethane	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	1.6 (1)	0.0025	<0.00050	<0.00050	0.00050	9220123
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	0.47	0.00050	<0.00050	<0.00050	0.00050	9220123
Vinyl chloride	mg/L	<0.00050	0.00050	<0.00050	0.00050	<0.00050	<0.00050	0.00050	9220123
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	101	N/A	101	N/A	101	101	N/A	9220123
4-Bromofluorobenzene (sur.)	%	95	N/A	96	N/A	94	94	N/A	9220123
D4-1,2-Dichloroethane (sur.)	%	99	N/A	113	N/A	105	100	N/A	9220123

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8667		
Sampling Date		2018/11/07 14:15		
COC Number		m014187		
	UNITS	**1985**	**RDL**	**QC Batch**
Volatiles				
Total Trihalomethanes	mg/L	<0.0013	0.0013	9220100
Bromodichloromethane	mg/L	<0.00050	0.00050	9220123
Bromoform	mg/L	<0.00050	0.00050	9220123
Bromomethane	mg/L	<0.0020	0.0020	9220123
Carbon tetrachloride	mg/L	<0.00050	0.00050	9220123
Chlorobenzene	mg/L	<0.00050	0.00050	9220123
Chlorodibromomethane	mg/L	<0.0010	0.0010	9220123
Chloroethane	mg/L	<0.0010	0.0010	9220123
Chloroform	mg/L	<0.00050	0.00050	9220123
Chloromethane	mg/L	<0.0020	0.0020	9220123
1,2-dibromoethane	mg/L	<0.00020	0.00020	9220123
1,2-dichlorobenzene	mg/L	<0.00050	0.00050	9220123
1,3-dichlorobenzene	mg/L	<0.00050	0.00050	9220123
1,4-dichlorobenzene	mg/L	<0.00050	0.00050	9220123
1,1-dichloroethane	mg/L	<0.00050	0.00050	9220123
1,2-dichloroethane	mg/L	<0.00050	0.00050	9220123
1,1-dichloroethene	mg/L	<0.00050	0.00050	9220123
cis-1,2-dichloroethene	mg/L	<0.00050	0.00050	9220123
trans-1,2-dichloroethene	mg/L	<0.00050	0.00050	9220123
Dichloromethane	mg/L	<0.0020	0.0020	9220123
1,2-dichloropropane	mg/L	<0.00050	0.00050	9220123
cis-1,3-dichloropropene	mg/L	<0.00050	0.00050	9220123
trans-1,3-dichloropropene	mg/L	<0.00050	0.00050	9220123
Methyl methacrylate	mg/L	<0.00050	0.00050	9220123
Methyl-tert-butylether (MTBE)	mg/L	<0.00050	0.00050	9220123
Styrene	mg/L	<0.00050	0.00050	9220123
1,1,1,2-tetrachloroethane	mg/L	<0.0010	0.0010	9220123
1,1,2,2-tetrachloroethane	mg/L	<0.0020	0.0020	9220123
Tetrachloroethene	mg/L	<0.00050	0.00050	9220123
1,2,3-trichlorobenzene	mg/L	<0.0010	0.0010	9220123
1,2,4-trichlorobenzene	mg/L	<0.0010	0.0010	9220123
RDL = Reportable Detection Limit				

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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		US8667		
Sampling Date		2018/11/07 14:15		
COC Number		m014187		
	UNITS	**1985**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	mg/L	<0.00050	0.00050	9220123
1,1,1-trichloroethane	mg/L	<0.00050	0.00050	9220123
1,1,2-trichloroethane	mg/L	<0.00050	0.00050	9220123
Trichloroethene	mg/L	<0.00050	0.00050	9220123
Trichlorofluoromethane	mg/L	<0.00050	0.00050	9220123
1,2,4-trimethylbenzene	mg/L	<0.00050	0.00050	9220123
1,3,5-trimethylbenzene	mg/L	<0.00050	0.00050	9220123
Vinyl chloride	mg/L	<0.00050	0.00050	9220123
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	101	N/A	9220123
4-Bromofluorobenzene (sur.)	%	95	N/A	9220123
D4-1,2-Dichloroethane (sur.)	%	106	N/A	9220123

RDL = Reportable Detection Limit
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	0.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9220121	RSU	Matrix Spike [US8651-02]	1,4-Difluorobenzene (sur.)	2018/11/09		108	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/09		93	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/09		95	%	50 - 140
			Benzene	2018/11/09		95	%	50 - 140
			Toluene	2018/11/09		95	%	50 - 140
			Ethylbenzene	2018/11/09		100	%	50 - 140
			m & p-Xylene	2018/11/09		100	%	50 - 140
			o-Xylene	2018/11/09		96	%	50 - 140
			F1 (C6-C10)	2018/11/09		84	%	60 - 140
9220121	RSU	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/11/09		109	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/09		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/09		94	%	50 - 140
			Benzene	2018/11/09		90	%	60 - 130
			Toluene	2018/11/09		91	%	60 - 130
			Ethylbenzene	2018/11/09		96	%	60 - 130
			m & p-Xylene	2018/11/09		96	%	60 - 130
			o-Xylene	2018/11/09		92	%	60 - 130
			F1 (C6-C10)	2018/11/09		94	%	60 - 140
9220121	RSU	Method Blank	1,4-Difluorobenzene (sur.)	2018/11/13		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/13		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/13		95	%	50 - 140
			Benzene	2018/11/13	<0.00040		mg/L	
			Toluene	2018/11/13	<0.00040		mg/L	
			Ethylbenzene	2018/11/13	<0.00040		mg/L	
			m & p-Xylene	2018/11/13	<0.00080		mg/L	
			o-Xylene	2018/11/13	<0.00040		mg/L	
			F1 (C6-C10)	2018/11/13	<0.10		mg/L	
9220121	RSU	RPD [US8651-02]	Benzene	2018/11/09	NC		%	30
			Toluene	2018/11/09	NC		%	30
			Ethylbenzene	2018/11/09	NC		%	30
			m & p-Xylene	2018/11/09	NC		%	30
			o-Xylene	2018/11/09	NC		%	30
			F1 (C6-C10)	2018/11/09	NC		%	30
9220123	MZ	Matrix Spike [US8651-02]	1,4-Difluorobenzene (sur.)	2018/11/13		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/13		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/13		96	%	50 - 140
			Benzene	2018/11/13		96	%	50 - 140
			Bromodichloromethane	2018/11/13		113	%	50 - 140
			Bromoform	2018/11/13		109	%	50 - 140
			Bromomethane	2018/11/13		96	%	50 - 140
			Carbon tetrachloride	2018/11/13		107	%	50 - 140
			Chlorobenzene	2018/11/13		108	%	50 - 140
			Chlorodibromomethane	2018/11/13		112	%	50 - 140
			Chloroethane	2018/11/13		89	%	50 - 140
			Chloroform	2018/11/13		105	%	50 - 140
			Chloromethane	2018/11/13		93	%	50 - 140
			1,2-dibromoethane	2018/11/13		107	%	50 - 140
			1,2-dichlorobenzene	2018/11/13		108	%	50 - 140
			1,3-dichlorobenzene	2018/11/13		107	%	50 - 140
			1,4-dichlorobenzene	2018/11/13		106	%	50 - 140
			1,1-dichloroethane	2018/11/13		102	%	50 - 140
			1,2-dichloroethane	2018/11/13		105	%	50 - 140
			1,1-dichloroethene	2018/11/13		98	%	50 - 140
			cis-1,2-dichloroethene	2018/11/13		105	%	50 - 140

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,2-dichloroethene	2018/11/13		95	%	50 - 140
			Dichloromethane	2018/11/13		95	%	50 - 140
			1,2-dichloropropane	2018/11/13		109	%	50 - 140
			cis-1,3-dichloropropene	2018/11/13		121	%	50 - 140
			trans-1,3-dichloropropene	2018/11/13		124	%	50 - 140
			Ethylbenzene	2018/11/13		99	%	50 - 140
			Methyl methacrylate	2018/11/13		111	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/11/13		104	%	50 - 140
			Styrene	2018/11/13		110	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/11/13		107	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/11/13		110	%	50 - 140
			Tetrachloroethene	2018/11/13		99	%	50 - 140
			Toluene	2018/11/13		100	%	50 - 140
			1,2,3-trichlorobenzene	2018/11/13		107	%	50 - 140
			1,2,4-trichlorobenzene	2018/11/13		107	%	50 - 140
			1,3,5-trichlorobenzene	2018/11/13		106	%	50 - 140
			1,1,1-trichloroethane	2018/11/13		104	%	50 - 140
			1,1,2-trichloroethane	2018/11/13		112	%	50 - 140
			Trichloroethene	2018/11/13		112	%	50 - 140
			Trichlorofluoromethane	2018/11/13		100	%	50 - 140
			1,2,4-trimethylbenzene	2018/11/13		104	%	50 - 140
			1,3,5-trimethylbenzene	2018/11/13		105	%	50 - 140
			Vinyl chloride	2018/11/13		95	%	50 - 140
			m & p-Xylene	2018/11/13		101	%	50 - 140
			o-Xylene	2018/11/13		99	%	50 - 140
9220123	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/11/13		103	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/13		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/13		93	%	50 - 140
			Benzene	2018/11/13		87	%	60 - 130
			Bromodichloromethane	2018/11/13		103	%	60 - 130
			Bromoform	2018/11/13		98	%	60 - 130
			Bromomethane	2018/11/13		87	%	60 - 130
			Carbon tetrachloride	2018/11/13		99	%	60 - 130
			Chlorobenzene	2018/11/13		97	%	60 - 130
			Chlorodibromomethane	2018/11/13		102	%	60 - 130
			Chloroethane	2018/11/13		81	%	60 - 130
			Chloroform	2018/11/13		95	%	60 - 130
			Chloromethane	2018/11/13		86	%	60 - 130
			1,2-dibromoethane	2018/11/13		95	%	60 - 130
			1,2-dichlorobenzene	2018/11/13		100	%	60 - 130
			1,3-dichlorobenzene	2018/11/13		99	%	60 - 130
			1,4-dichlorobenzene	2018/11/13		97	%	60 - 130
			1,1-dichloroethane	2018/11/13		93	%	60 - 130
			1,2-dichloroethane	2018/11/13		94	%	60 - 130
			1,1-dichloroethene	2018/11/13		89	%	60 - 130
			cis-1,2-dichloroethene	2018/11/13		95	%	60 - 130
			trans-1,2-dichloroethene	2018/11/13		86	%	60 - 130
			Dichloromethane	2018/11/13		85	%	60 - 130
			1,2-dichloropropane	2018/11/13		97	%	60 - 130
			cis-1,3-dichloropropene	2018/11/13		109	%	60 - 130
			trans-1,3-dichloropropene	2018/11/13		117	%	60 - 130
			Ethylbenzene	2018/11/13		92	%	60 - 130
			Methyl methacrylate	2018/11/13		97	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/11/13		94	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Styrene	2018/11/13		101	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/11/13		96	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/11/13		98	%	60 - 130
			Tetrachloroethene	2018/11/13		91	%	60 - 130
			Toluene	2018/11/13		92	%	60 - 130
			1,2,3-trichlorobenzene	2018/11/13		96	%	60 - 130
			1,2,4-trichlorobenzene	2018/11/13		96	%	60 - 130
			1,3,5-trichlorobenzene	2018/11/13		96	%	60 - 130
			1,1,1-trichloroethane	2018/11/13		101	%	60 - 130
			1,1,2-trichloroethane	2018/11/13		100	%	60 - 130
			Trichloroethene	2018/11/13		102	%	60 - 130
			Trichlorofluoromethane	2018/11/13		93	%	60 - 130
			1,2,4-trimethylbenzene	2018/11/13		96	%	60 - 130
			1,3,5-trimethylbenzene	2018/11/13		100	%	60 - 130
			Vinyl chloride	2018/11/13		85	%	60 - 130
			m & p-Xylene	2018/11/13		92	%	60 - 130
			o-Xylene	2018/11/13		90	%	60 - 130
9220123	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2018/11/13		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/11/13		94	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/11/13		99	%	50 - 140
			Benzene	2018/11/13	<0.00040		mg/L	
			Bromodichloromethane	2018/11/13	<0.00050		mg/L	
			Bromoform	2018/11/13	<0.00050		mg/L	
			Bromomethane	2018/11/13	<0.0020		mg/L	
			Carbon tetrachloride	2018/11/13	<0.00050		mg/L	
			Chlorobenzene	2018/11/13	<0.00050		mg/L	
			Chlorodibromomethane	2018/11/13	<0.0010		mg/L	
			Chloroethane	2018/11/13	<0.0010		mg/L	
			Chloroform	2018/11/13	<0.00050		mg/L	
			Chloromethane	2018/11/13	<0.0020		mg/L	
			1,2-dibromoethane	2018/11/13	<0.00020		mg/L	
			1,2-dichlorobenzene	2018/11/13	<0.00050		mg/L	
			1,3-dichlorobenzene	2018/11/13	<0.00050		mg/L	
			1,4-dichlorobenzene	2018/11/13	<0.00050		mg/L	
			1,1-dichloroethane	2018/11/13	<0.00050		mg/L	
			1,2-dichloroethane	2018/11/13	<0.00050		mg/L	
			1,1-dichloroethene	2018/11/13	<0.00050		mg/L	
			cis-1,2-dichloroethene	2018/11/13	<0.00050		mg/L	
			trans-1,2-dichloroethene	2018/11/13	<0.00050		mg/L	
			Dichloromethane	2018/11/13	<0.0020		mg/L	
			1,2-dichloropropane	2018/11/13	<0.00050		mg/L	
			cis-1,3-dichloropropene	2018/11/13	<0.00050		mg/L	
			trans-1,3-dichloropropene	2018/11/13	<0.00050		mg/L	
			Ethylbenzene	2018/11/13	<0.00040		mg/L	
			Methyl methacrylate	2018/11/13	<0.00050		mg/L	
			Methyl-tert-butylether (MTBE)	2018/11/13	<0.00050		mg/L	
			Styrene	2018/11/13	<0.00050		mg/L	
			1,1,1,2-tetrachloroethane	2018/11/13	<0.0010		mg/L	
			1,1,2,2-tetrachloroethane	2018/11/13	<0.0020		mg/L	
			Tetrachloroethene	2018/11/13	<0.00050		mg/L	
			Toluene	2018/11/13	<0.00040		mg/L	
			1,2,3-trichlorobenzene	2018/11/13	<0.0010		mg/L	
			1,2,4-trichlorobenzene	2018/11/13	<0.0010		mg/L	
			1,3,5-trichlorobenzene	2018/11/13	<0.00050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,1,1-trichloroethane	2018/11/13	<0.00050		mg/L	
			1,1,2-trichloroethane	2018/11/13	<0.00050		mg/L	
			Trichloroethene	2018/11/13	<0.00050		mg/L	
			Trichlorofluoromethane	2018/11/13	<0.00050		mg/L	
			1,2,4-trimethylbenzene	2018/11/13	<0.00050		mg/L	
			1,3,5-trimethylbenzene	2018/11/13	<0.00050		mg/L	
			Vinyl chloride	2018/11/13	<0.00050		mg/L	
			Xylenes (Total)	2018/11/13	<0.00080		mg/L	
			m & p-Xylene	2018/11/13	<0.00080		mg/L	
			o-Xylene	2018/11/13	<0.00040		mg/L	
9220123	MZ	RPD [US8650-01]	Benzene	2018/11/13	NC		%	30
			Bromodichloromethane	2018/11/13	NC		%	30
			Bromoform	2018/11/13	NC		%	30
			Bromomethane	2018/11/13	NC		%	30
			Carbon tetrachloride	2018/11/13	NC		%	30
			Chlorobenzene	2018/11/13	NC		%	30
			Chlorodibromomethane	2018/11/13	NC		%	30
			Chloroethane	2018/11/13	NC		%	30
			Chloroform	2018/11/13	NC		%	30
			Chloromethane	2018/11/13	NC		%	30
			1,2-dibromoethane	2018/11/13	NC		%	30
			1,2-dichlorobenzene	2018/11/13	NC		%	30
			1,3-dichlorobenzene	2018/11/13	NC		%	30
			1,4-dichlorobenzene	2018/11/13	NC		%	30
			1,1-dichloroethane	2018/11/13	NC		%	30
			1,2-dichloroethane	2018/11/13	NC		%	30
			1,1-dichloroethene	2018/11/13	NC		%	30
			cis-1,2-dichloroethene	2018/11/13	NC		%	30
			trans-1,2-dichloroethene	2018/11/13	NC		%	30
			Dichloromethane	2018/11/13	NC		%	30
			1,2-dichloropropane	2018/11/13	NC		%	30
			cis-1,3-dichloropropene	2018/11/13	NC		%	30
			trans-1,3-dichloropropene	2018/11/13	NC		%	30
			Ethylbenzene	2018/11/13	NC		%	30
			Methyl methacrylate	2018/11/13	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/11/13	NC		%	30
			Styrene	2018/11/13	NC		%	30
			1,1,1,2-tetrachloroethane	2018/11/13	NC		%	30
			1,1,2,2-tetrachloroethane	2018/11/13	NC		%	30
			Tetrachloroethene	2018/11/13	NC		%	30
			Toluene	2018/11/13	NC		%	30
			1,2,3-trichlorobenzene	2018/11/13	NC		%	30
			1,2,4-trichlorobenzene	2018/11/13	NC		%	30
			1,3,5-trichlorobenzene	2018/11/13	NC		%	30
			1,1,1-trichloroethane	2018/11/13	NC		%	30
			1,1,2-trichloroethane	2018/11/13	NC		%	30
			Trichloroethene	2018/11/13	NC		%	30
			Trichlorofluoromethane	2018/11/13	NC		%	30
			1,2,4-trimethylbenzene	2018/11/13	NC		%	30
			1,3,5-trimethylbenzene	2018/11/13	NC		%	30
			Vinyl chloride	2018/11/13	NC		%	30
			Xylenes (Total)	2018/11/13	NC		%	30
			m & p-Xylene	2018/11/13	NC		%	30
			o-Xylene	2018/11/13	NC		%	30

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9220700	SJ1	Matrix Spike	D10-ANTHRACENE (sur.)	2018/11/14		110	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/14		109	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/14		96	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/14		118	%	50 - 130
			Acenaphthene	2018/11/14		112	%	50 - 130
			Acenaphthylene	2018/11/14		126	%	50 - 130
			Acridine	2018/11/14		98	%	50 - 130
			Anthracene	2018/11/14		91	%	50 - 130
			Benzo(a)anthracene	2018/11/14		92	%	50 - 130
			Benzo(b&j)fluoranthene	2018/11/14		90	%	50 - 130
			Benzo(k)fluoranthene	2018/11/14		87	%	50 - 130
			Benzo(g,h,i)perylene	2018/11/14		83	%	50 - 130
			Benzo(c)phenanthrene	2018/11/14		88	%	50 - 130
			Benzo(a)pyrene	2018/11/14		89	%	50 - 130
			Benzo[e]pyrene	2018/11/14		84	%	50 - 130
			Chrysene	2018/11/14		88	%	50 - 130
			Dibenz(a,h)anthracene	2018/11/14		80	%	50 - 130
			Fluoranthene	2018/11/14		96	%	50 - 130
			Fluorene	2018/11/14		109	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/11/14		65	%	50 - 130
			1-Methylnaphthalene	2018/11/14		121	%	50 - 130
			2-Methylnaphthalene	2018/11/14		117	%	50 - 130
			Naphthalene	2018/11/14		123	%	50 - 130
			Phenanthrene	2018/11/14		101	%	50 - 130
			Perylene	2018/11/14		75	%	50 - 130
			Pyrene	2018/11/14		91	%	50 - 130
			Quinoline	2018/11/14		117	%	50 - 130
9220700	SJ1	Spiked Blank	D10-ANTHRACENE (sur.)	2018/11/14		81	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/14		73	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/14		55	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/14		85	%	50 - 130
			Acenaphthene	2018/11/14		85	%	50 - 130
			Acenaphthylene	2018/11/14		89	%	50 - 130
			Acridine	2018/11/14		76	%	50 - 130
			Anthracene	2018/11/14		82	%	50 - 130
			Benzo(a)anthracene	2018/11/14		102	%	50 - 130
			Benzo(b&j)fluoranthene	2018/11/14		101	%	50 - 130
			Benzo(k)fluoranthene	2018/11/14		98	%	50 - 130
			Benzo(g,h,i)perylene	2018/11/14		96	%	50 - 130
			Benzo(c)phenanthrene	2018/11/14		94	%	50 - 130
			Benzo(a)pyrene	2018/11/14		101	%	50 - 130
			Benzo[e]pyrene	2018/11/14		94	%	50 - 130
			Chrysene	2018/11/14		97	%	50 - 130
			Dibenz(a,h)anthracene	2018/11/14		94	%	50 - 130
			Fluoranthene	2018/11/14		96	%	50 - 130
			Fluorene	2018/11/14		86	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2018/11/14		76	%	50 - 130
			1-Methylnaphthalene	2018/11/14		88	%	50 - 130
			2-Methylnaphthalene	2018/11/14		86	%	50 - 130
			Naphthalene	2018/11/14		86	%	50 - 130
			Phenanthrene	2018/11/14		88	%	50 - 130
			Perylene	2018/11/14		84	%	50 - 130
			Pyrene	2018/11/14		93	%	50 - 130
			Quinoline	2018/11/14		113	%	50 - 130

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9220700	SJ1	Method Blank	D10-ANTHRACENE (sur.)	2018/11/14		86	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2018/11/14		78	%	50 - 130
			D8-NAPHTHALENE (sur.)	2018/11/14		63	%	50 - 130
			TERPHENYL-D14 (sur.)	2018/11/14		93	%	50 - 130
			Acenaphthene	2018/11/14	<0.00010		mg/L	
			Acenaphthylene	2018/11/14	<0.00010		mg/L	
			Acridine	2018/11/14	<0.000050		mg/L	
			Anthracene	2018/11/14	<0.000010		mg/L	
			Benzo(a)anthracene	2018/11/14	<0.0000085		mg/L	
			Benzo(b&j)fluoranthene	2018/11/14	<0.0000085		mg/L	
			Benzo(k)fluoranthene	2018/11/14	<0.0000085		mg/L	
			Benzo(g,h,i)perylene	2018/11/14	<0.0000085		mg/L	
			Benzo(c)phenanthrene	2018/11/14	<0.000050		mg/L	
			Benzo(a)pyrene	2018/11/14	<0.0000075		mg/L	
			Benzo[e]pyrene	2018/11/14	<0.000050		mg/L	
			Chrysene	2018/11/14	<0.0000085		mg/L	
			Dibenz(a,h)anthracene	2018/11/14	<0.0000075		mg/L	
			Fluoranthene	2018/11/14	<0.000010		mg/L	
			Fluorene	2018/11/14	<0.000050		mg/L	
			Indeno(1,2,3-cd)pyrene	2018/11/14	<0.0000085		mg/L	
			1-Methylnaphthalene	2018/11/14	<0.00010		mg/L	
			2-Methylnaphthalene	2018/11/14	<0.00010		mg/L	
			Naphthalene	2018/11/14	<0.00010		mg/L	
			Phenanthrene	2018/11/14	<0.000050		mg/L	
			Perylene	2018/11/14	<0.000050		mg/L	
			Pyrene	2018/11/14	<0.000020		mg/L	
			Quinoline	2018/11/14	<0.00020		mg/L	
9220700	SJ1	RPD	Acenaphthene	2018/11/14	NC		%	30
			Acenaphthylene	2018/11/14	NC		%	30
			Acridine	2018/11/14	NC		%	30
			Anthracene	2018/11/14	NC		%	30
			Benzo(a)anthracene	2018/11/14	NC		%	30
			Benzo(b&j)fluoranthene	2018/11/14	NC		%	30
			Benzo(k)fluoranthene	2018/11/14	NC		%	30
			Benzo(g,h,i)perylene	2018/11/14	NC		%	30
			Benzo(c)phenanthrene	2018/11/14	NC		%	30
			Benzo(a)pyrene	2018/11/14	NC		%	30
			Benzo[e]pyrene	2018/11/14	NC		%	30
			Chrysene	2018/11/14	NC		%	30
			Dibenz(a,h)anthracene	2018/11/14	NC		%	30
			Fluoranthene	2018/11/14	12		%	30
			Fluorene	2018/11/14	NC		%	30
			Indeno(1,2,3-cd)pyrene	2018/11/14	NC		%	30
			1-Methylnaphthalene	2018/11/14	NC		%	30
			2-Methylnaphthalene	2018/11/14	NC		%	30
			Naphthalene	2018/11/14	NC		%	30
			Phenanthrene	2018/11/14	NC		%	30
			Perylene	2018/11/14	NC		%	30
			Pyrene	2018/11/14	19		%	30
			Quinoline	2018/11/14	NC		%	30
9220704	MHF	Matrix Spike [US8651-01]	O-TERPHENYL (sur.)	2018/11/13		102	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/11/13		110	%	60 - 140
9220704	MHF	Spiked Blank	O-TERPHENYL (sur.)	2018/11/13		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/11/13		97	%	60 - 140

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9220704	MHF	Method Blank	O-TERPHENYL (sur.)	2018/11/13		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/11/13	<0.10		mg/L	
9220704	MHF	RPD	F2 (C10-C16 Hydrocarbons)	2018/11/13	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).

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Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

NOTIFICATION LOG

No Reportable Regulation Exceedences Noted.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B898309
Report Date: 2018/11/15

CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Sampler Initials: AUS

VALIDATION SIGNATURE PAGE

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

Dennis Ngondu, B.Sc., P.Chem., QP, Supervisor, Organics

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

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

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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Edmonton: 9331-48 St. T6B 2R4, Toll Free (800) 386-7247
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CHAIN OF CUSTODY RECORD

242
M045957

Page 1 of 2

Invoice Information		Report Information (if differs from invoice)		Project Information		Turnaround Time (TAT) Required
Company:	Clifton Associates	Company:		Quotation #:		☑ 5 - 7 Days Regular (Most analyses)
Contact Name:	Stephen d'Abadie	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	2222 - 30 Ave. NE Calgary. AB. T2E 7K9	Address:		Project #:	CG2430.1 E32	Rush TAT (Surcharges will be applied) ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3-4 Days
Phone:	403 - 263 - 2556	Phone:		Site Location:		
Email:	stephen_dabadie@clifton.ca			Site #:		Date Required:
Copies:	terryn_kwyk@clifton.ca			Sampled By:	Austin/ Gavin	Rush Confirmation #:

Laboratory Use Only

	YES	NO	Cooler ID			
Seal Present			Temp	2	-1	1
Seal Intact		✓				
Cooling Media	✓					
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						
	YES	NO	Cooler ID			
Seal Present			Temp			
Seal Intact						
Cooling Media						

Depot Reception

Analysis Requested

Regulatory Criteria: ☑ AT1 ☐ CCME ☐ Drinking Water ☐ DSO (Drilling Waste) ☐ Saskatchewan ☐ Other:

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	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
1	Trip Blank 14		2018.11.7		W	2	✓											
2	1901		↓	14:50	GW	6	✓	✓										
3	1902			15:20	↓	6	✓	✓										
4	1903			14:30		6	✓	✓										
5	1904			13:00		6	✓	✓										
6	1905			13:15		7	✓	✓									✓	
7	1957			15:00		6	✓	✓										
8	1958			15:05		6	✓	✓										
9	1959		↓	14:40	↓	6	✓	✓										
10	9905		2018.11.7	13:15	GW	7	✓	✓									✓	
	Please indicate Filtered, Preserved or Both (F, P, F/P)						P	P									P	

Special Instructions

Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Austin Mei	2018.11.7	15:50	[signature]	2018/11/07	15:50	B898309

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 acknowledgement and acceptance of our terms which are available for viewing at www.maxxam.ca/terms

AB FCD-00331/7

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Edmonton: 9331-48 St. T6B 2R4. Toll Free (800) 386-7247
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CHAIN OF CUSTODY RECORD

M 014187

Report Information

Company: Clifton Associates
Contact: Stephen d'Abadie
Phone: 403-263-2556
Email: stephen_dabadie@clifton.ca
Sampled by: terryn_kuzyk@clifton.ca

Comments

Same as CoC: 045957

Project/LSD: CG24301 E32

Special Instructions

Analysis Requested

	Sample Identification	Depth (Unit)	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	# of containers	BTEX F1 ☐ VOC ☑	BTEX F1-F2	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
11	1983A		2018.11.7	13:30	GW	8	✓	✓									✓								
12	1984		2018.11.7	13:50	GW	8	✓	✓									✓								
13	1985		2018.11.7	14:15	GW	8	✓	✓									✓								
14																									
15																									
16																									
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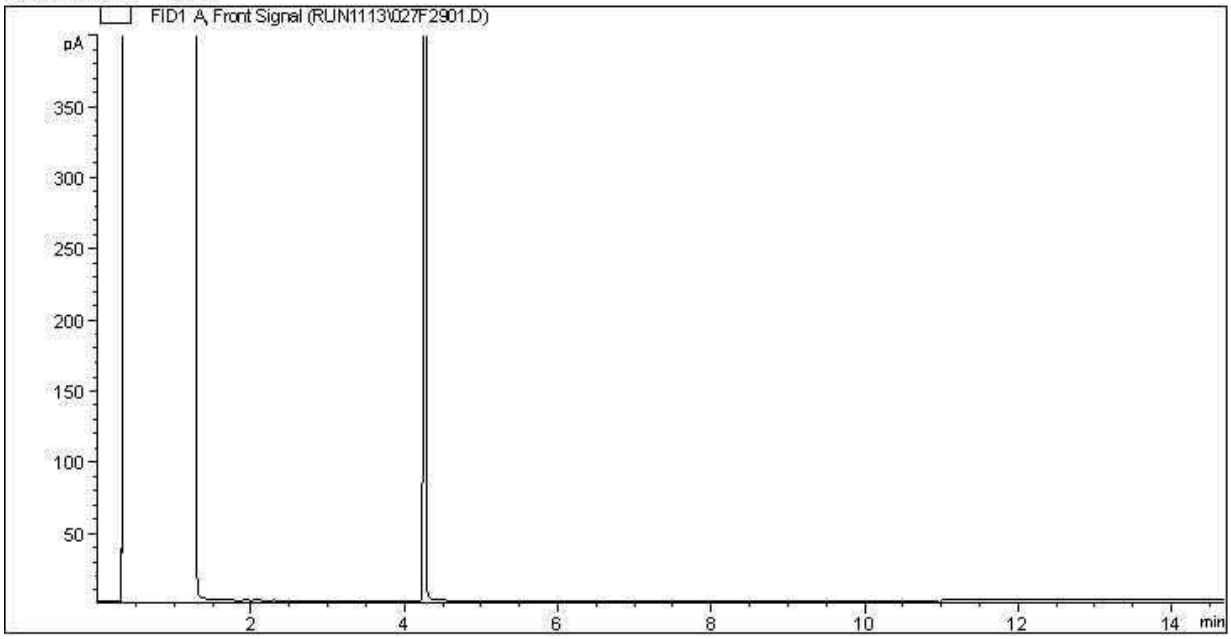
28																									
29																									
30																									
	Please indicate Filtered, Preserved or Both (F, P, F/P) →						P	P									P								

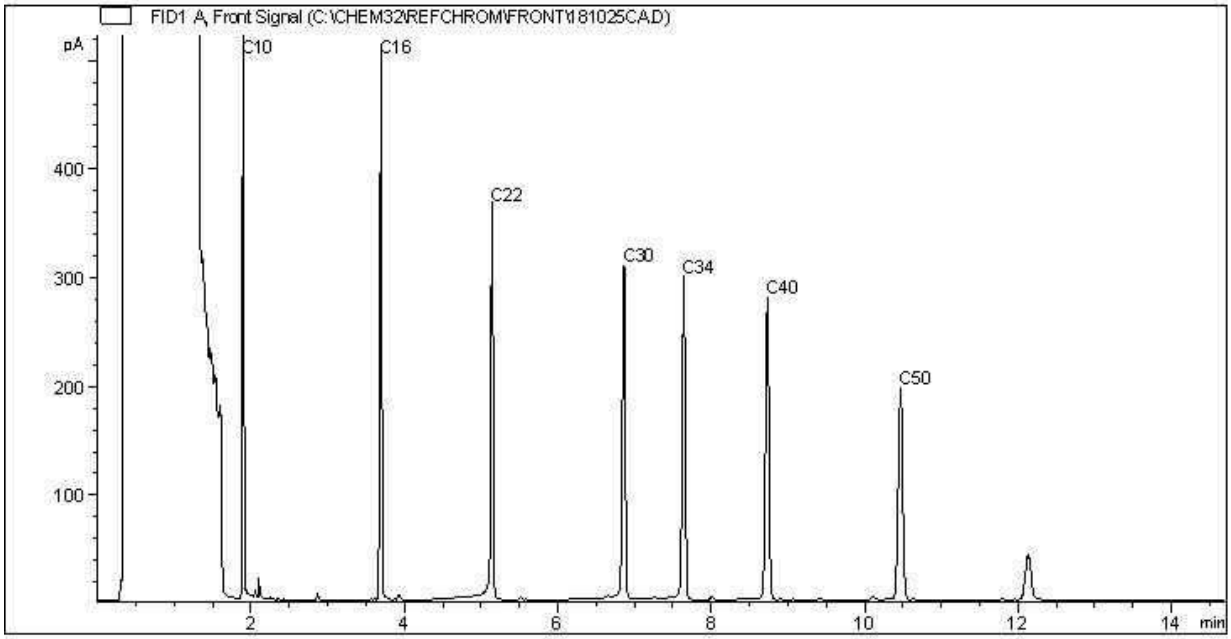
Relinquished by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Received by: (Signature/ Print)	DATE (YYYY/MM/DD)	Time (HH:MM)	Maxxam Job #
Austin Mei	2018.11.7	15:50	[illegible]	2018/11/07	15:50	B898309

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

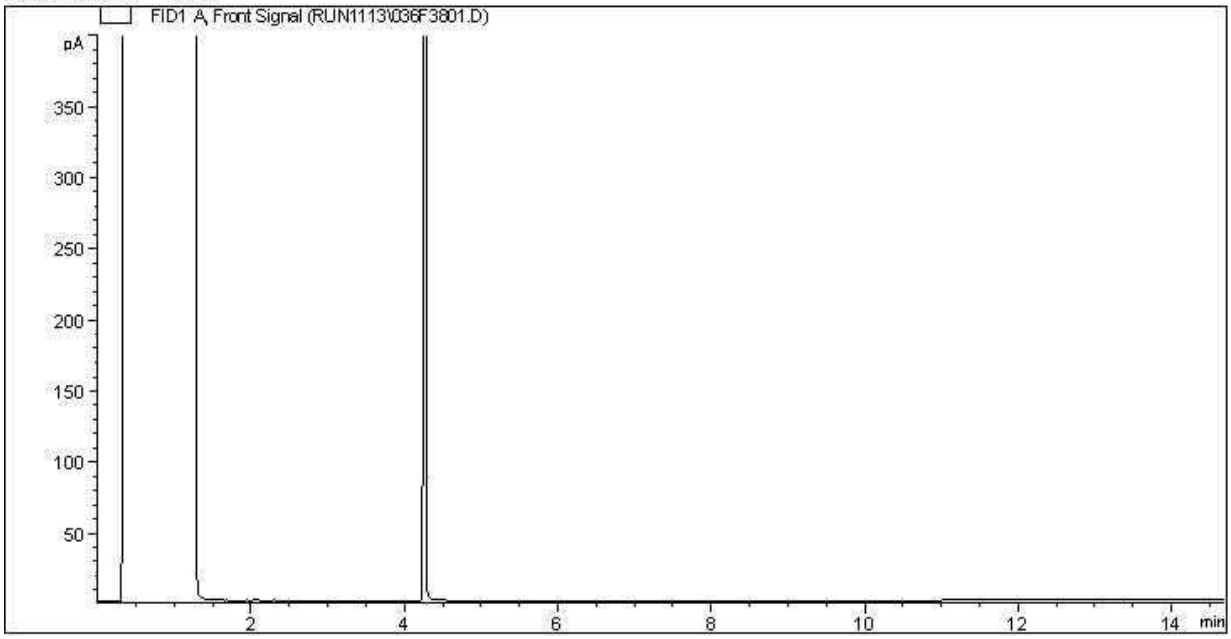
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8652

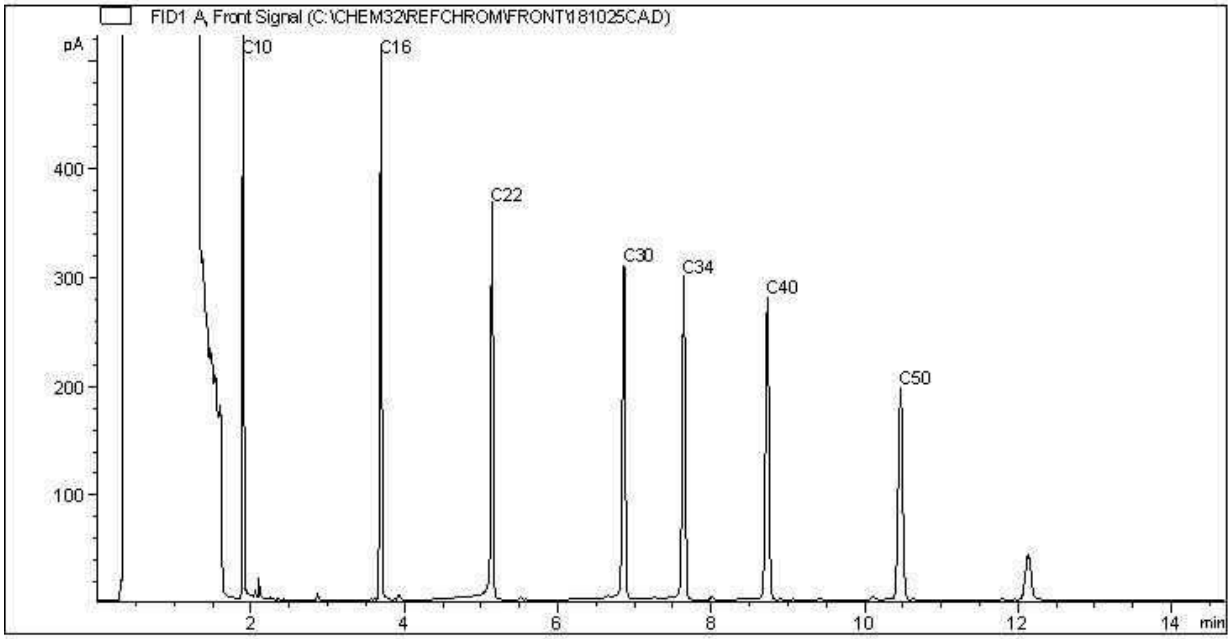
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1902

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

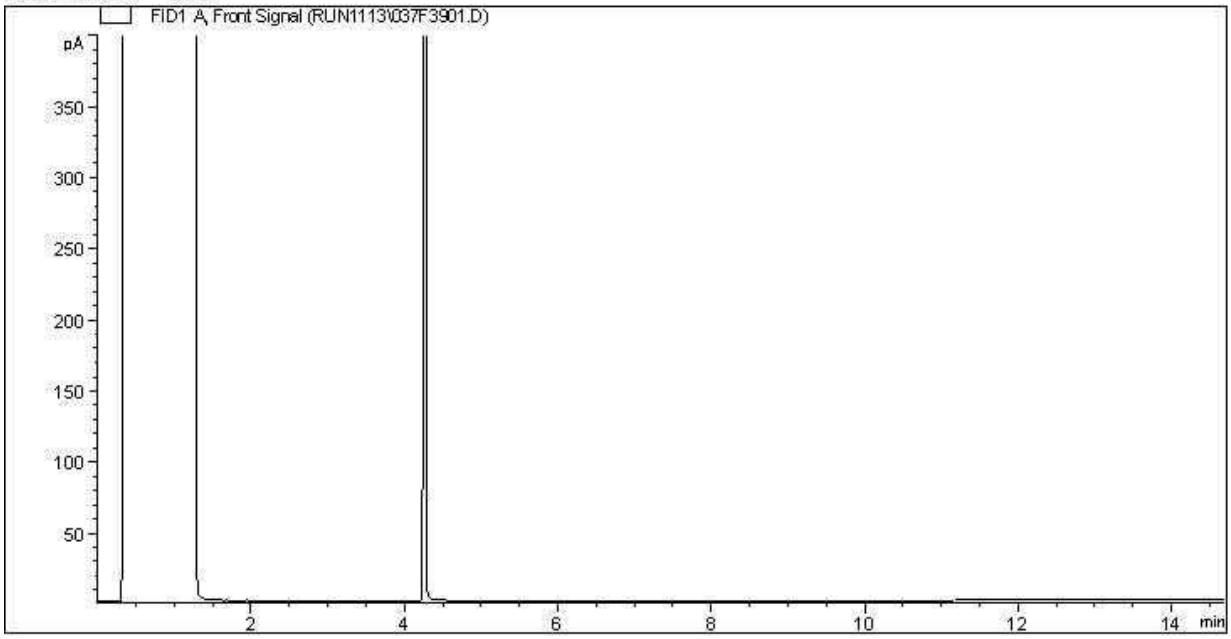
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8653

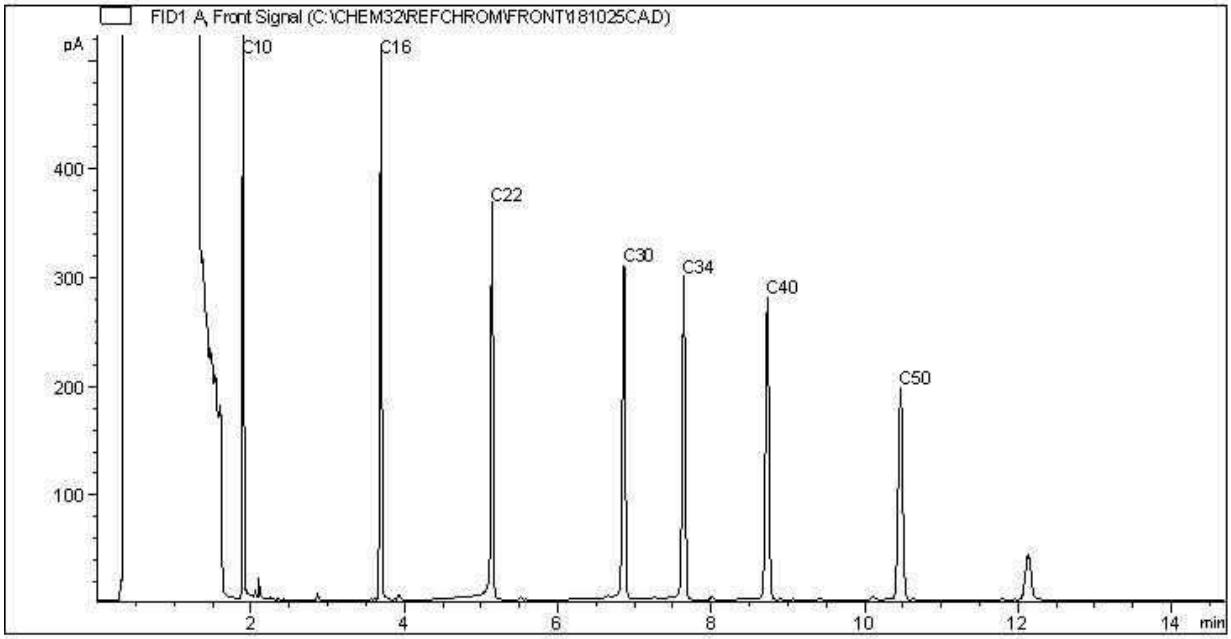
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1903

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



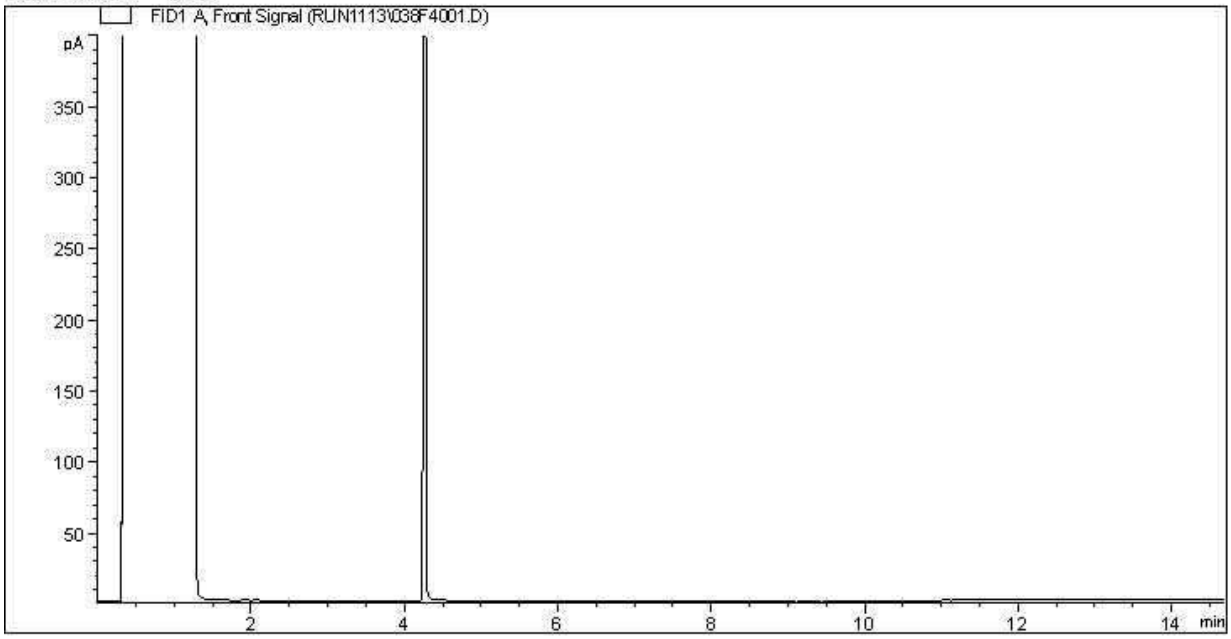
TYPICAL PRODUCT CARBON NUMBER RANGES

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

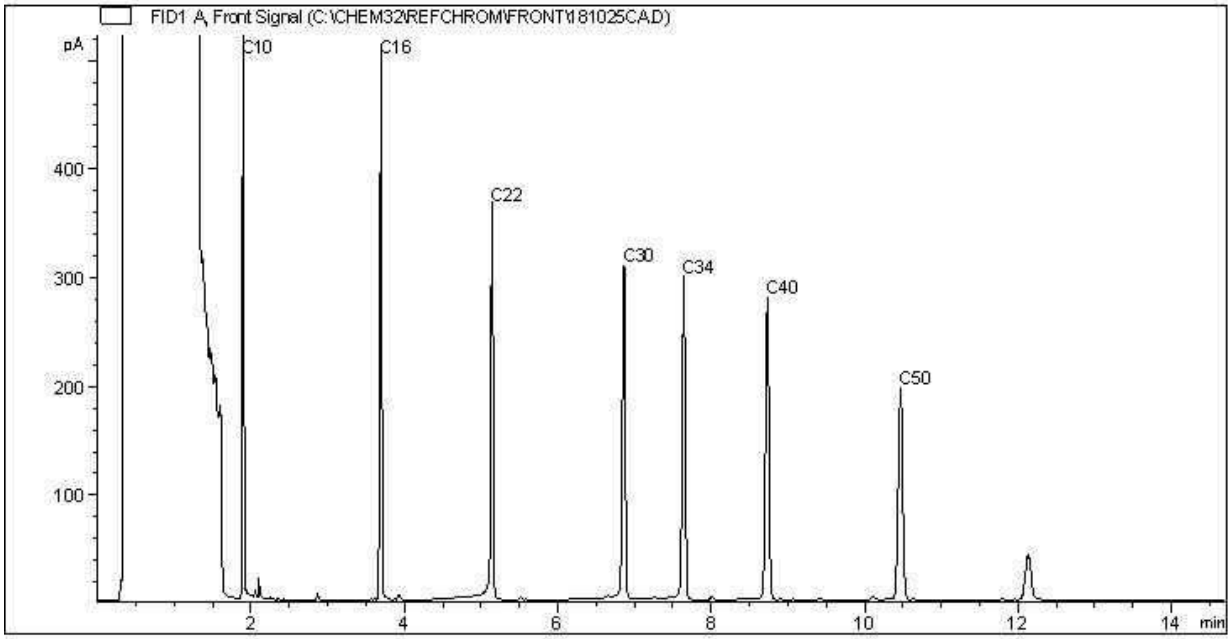
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



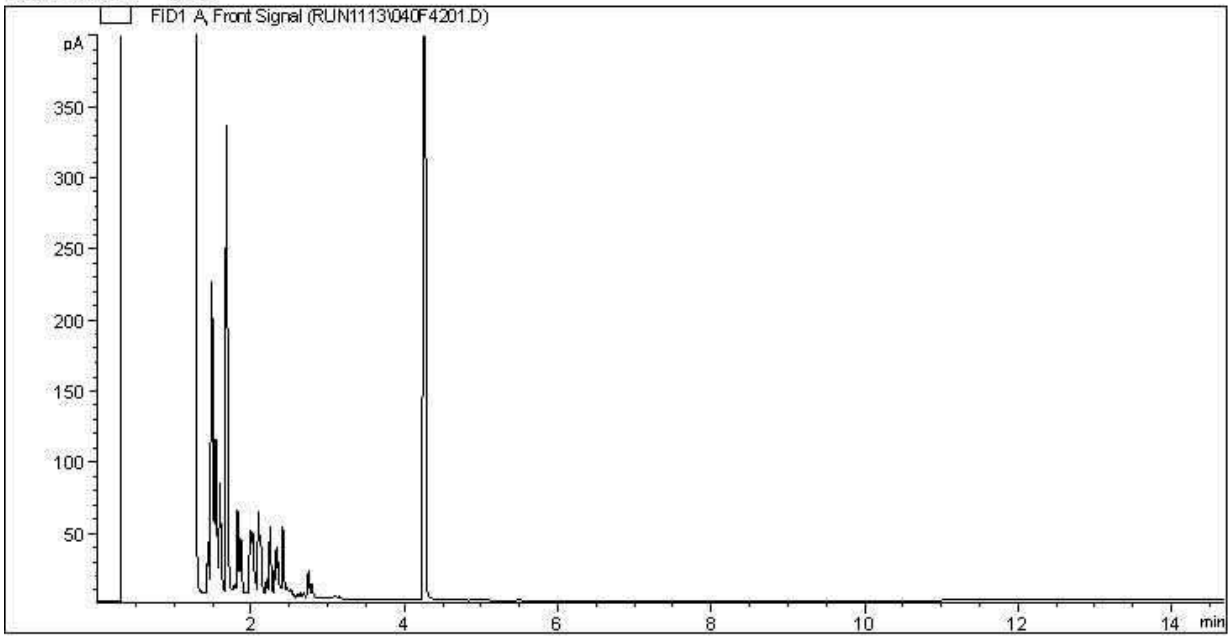
TYPICAL PRODUCT CARBON NUMBER RANGES

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

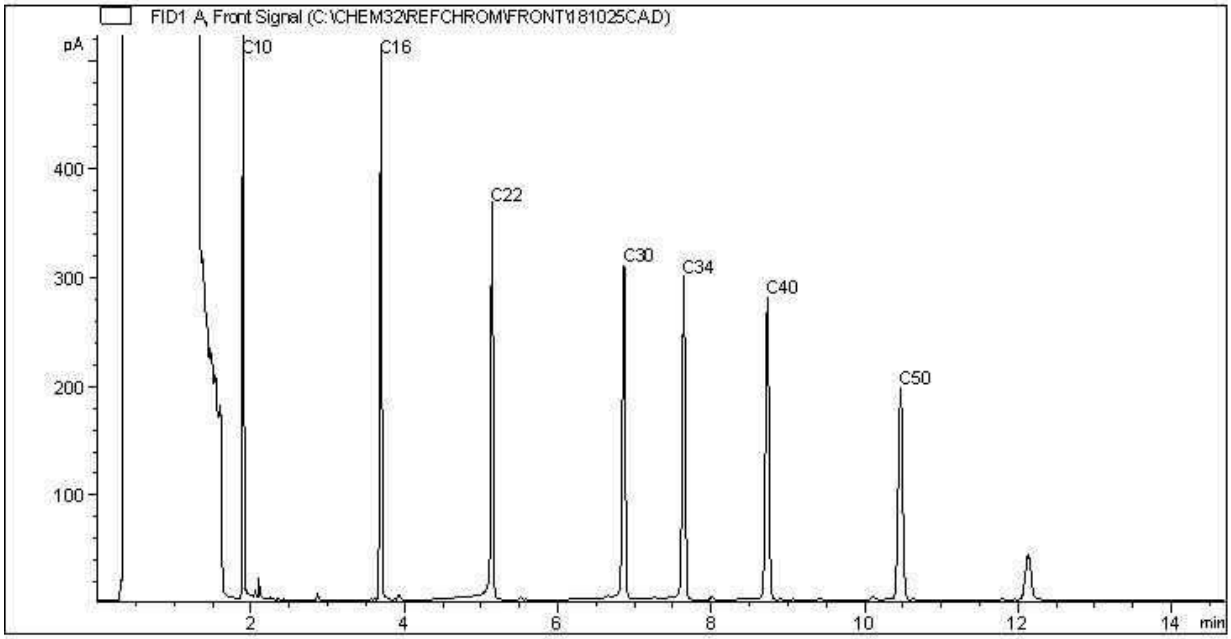
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

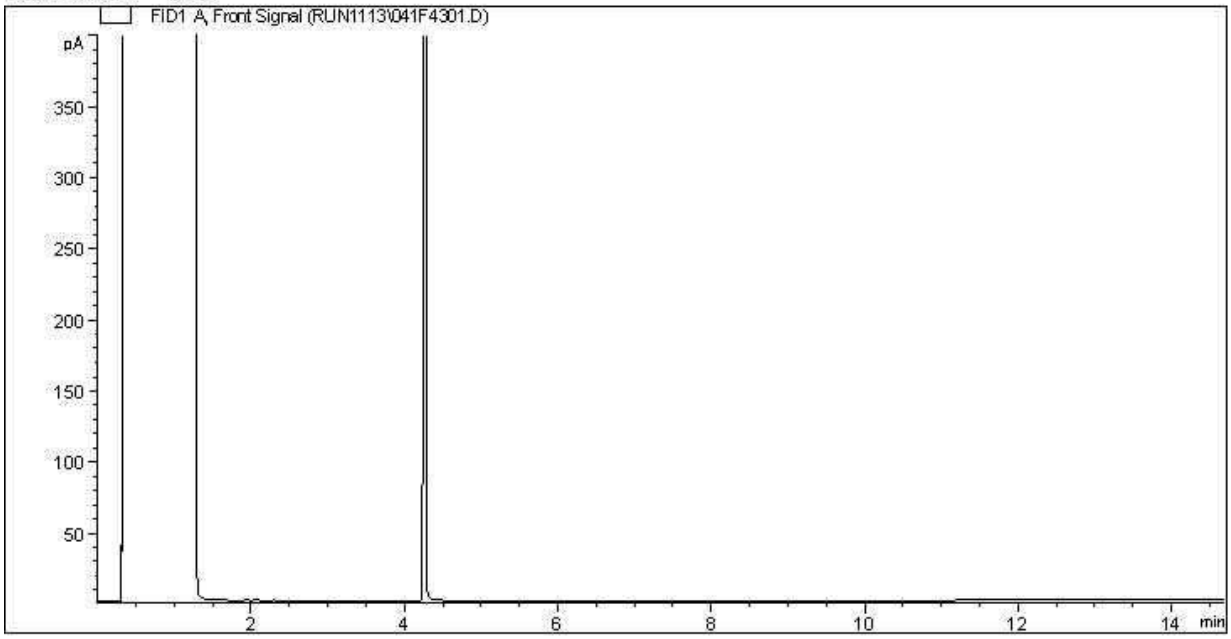
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8656

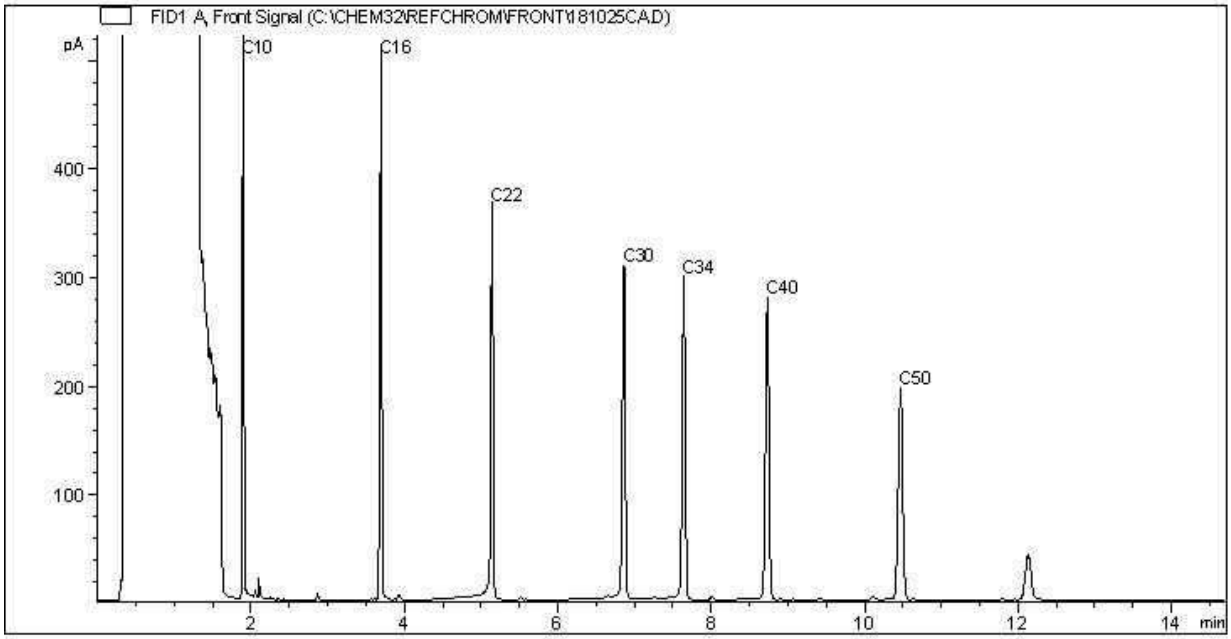
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1957

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

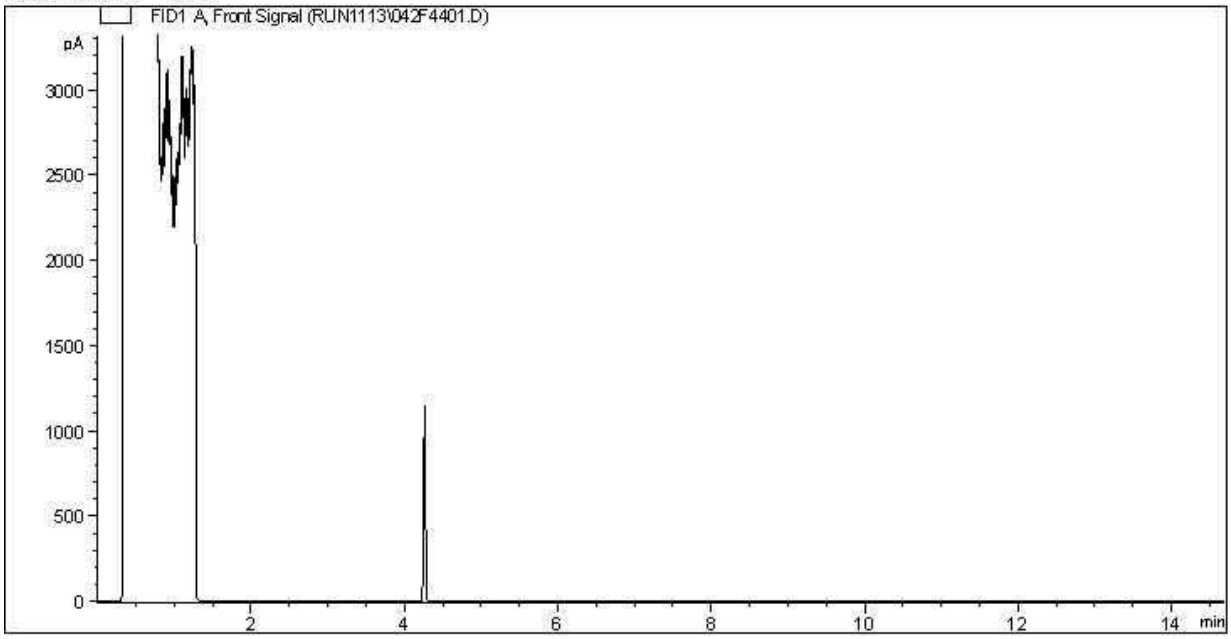
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8657

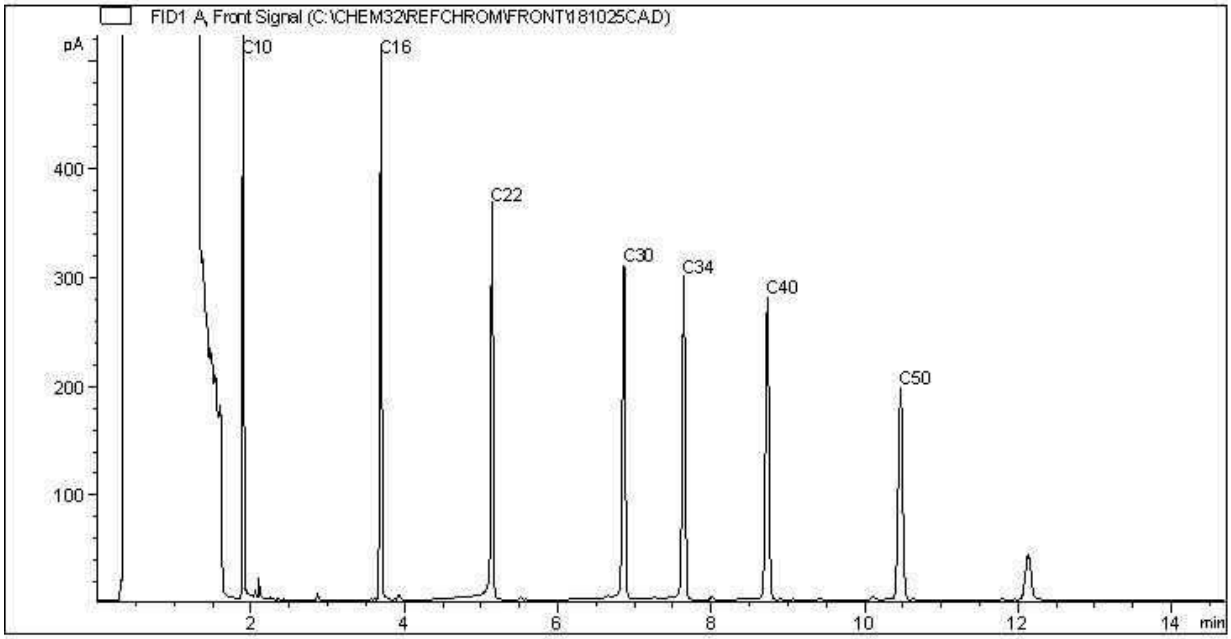
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1958

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

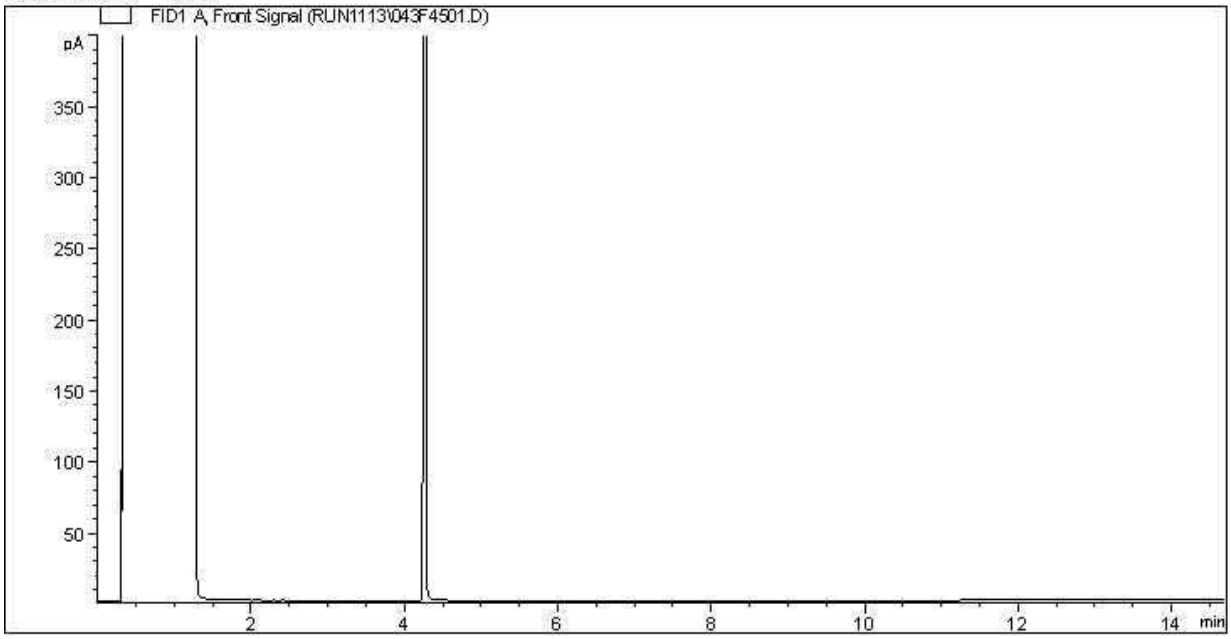
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8658

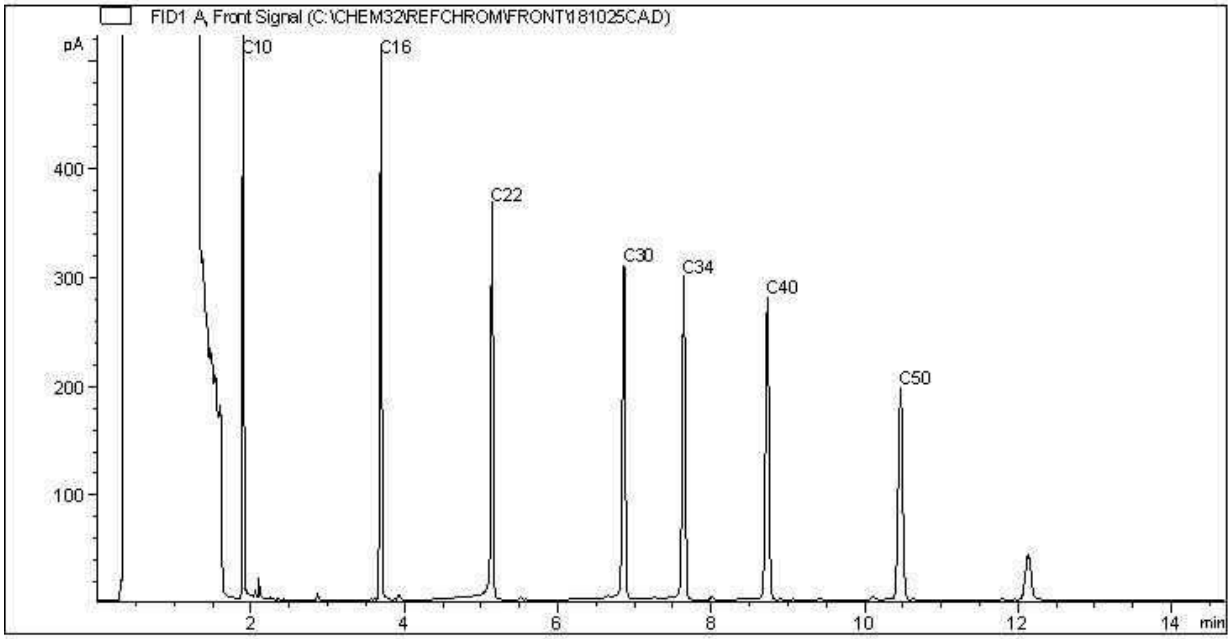
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1959

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

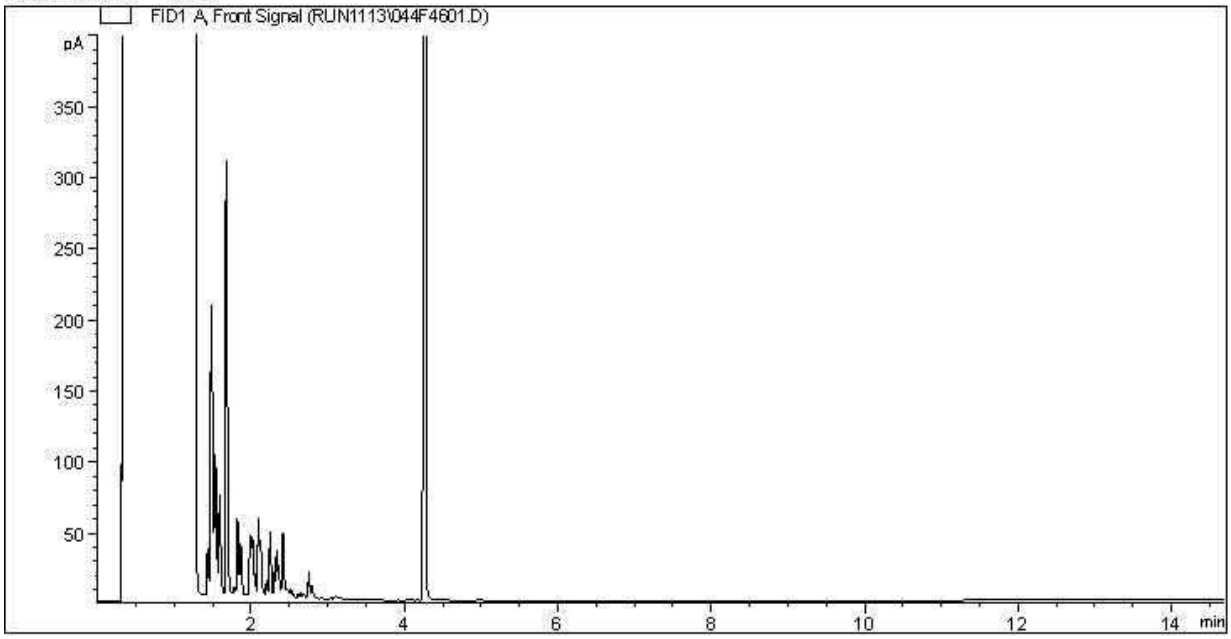
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8659

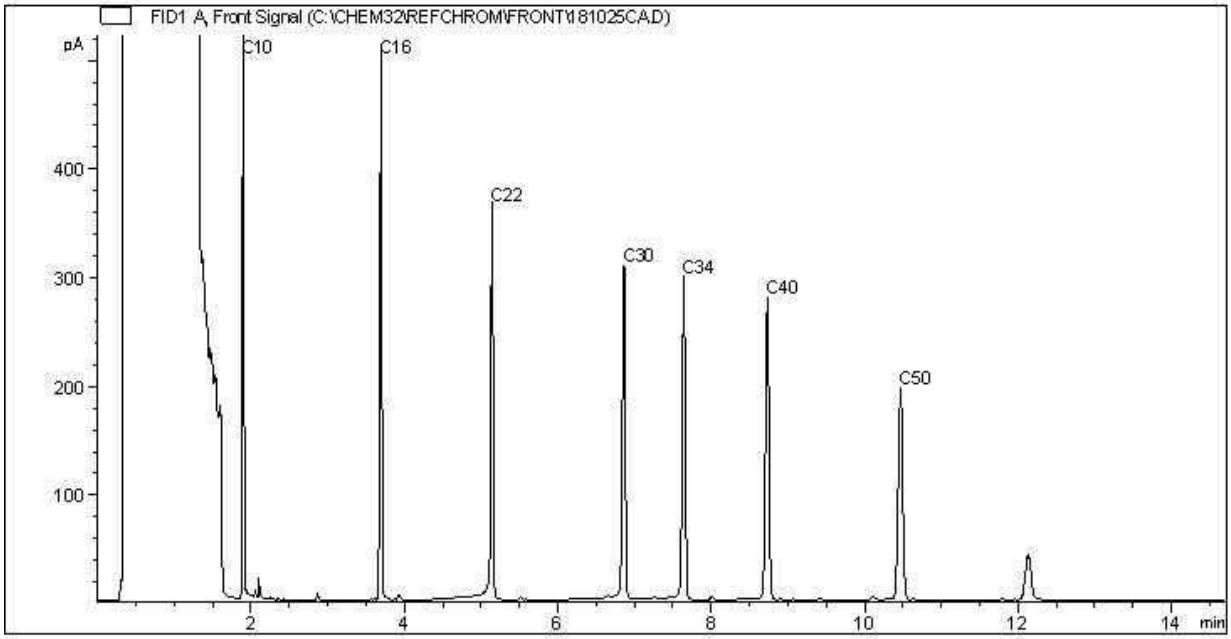
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 9905

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

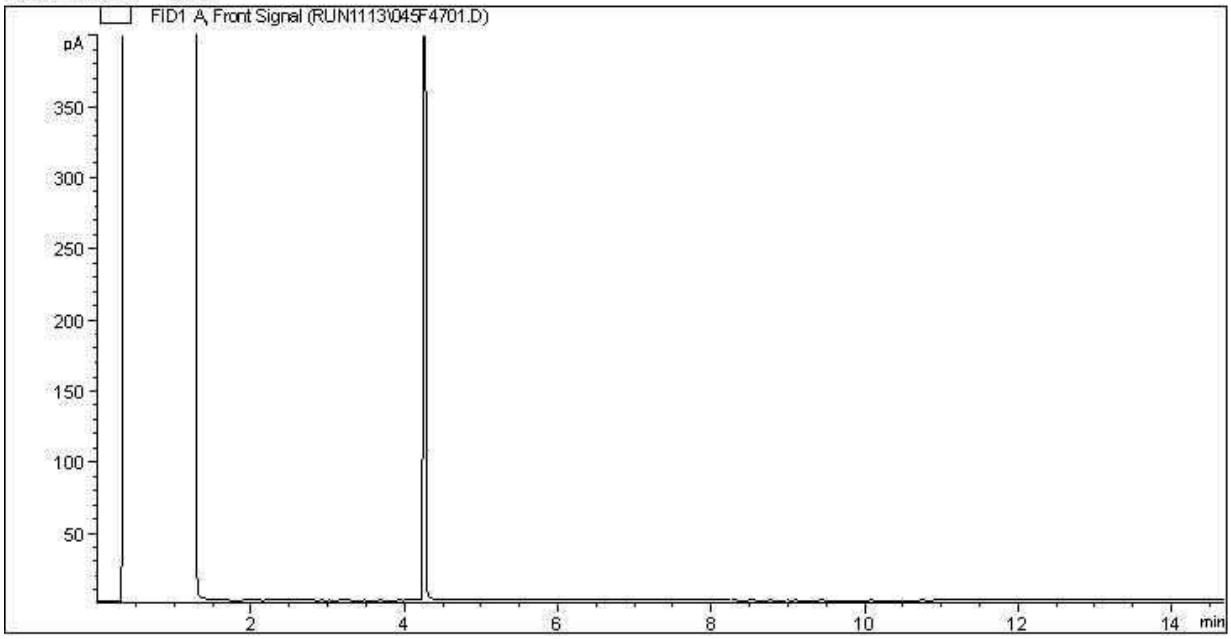
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8665

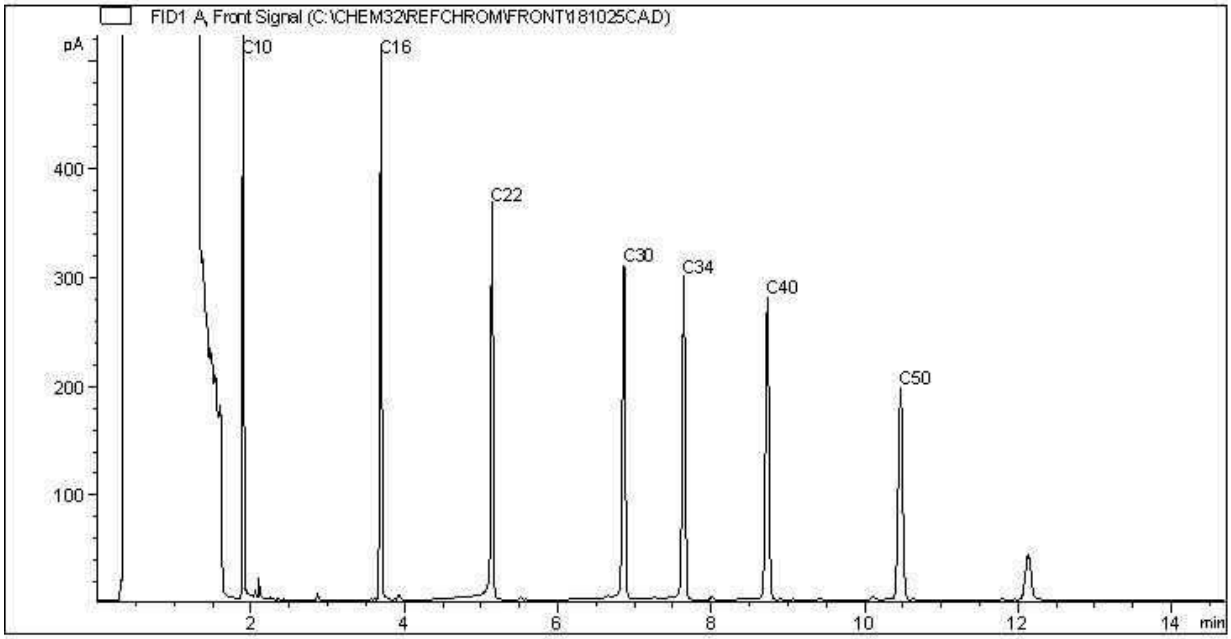
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1983A

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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+

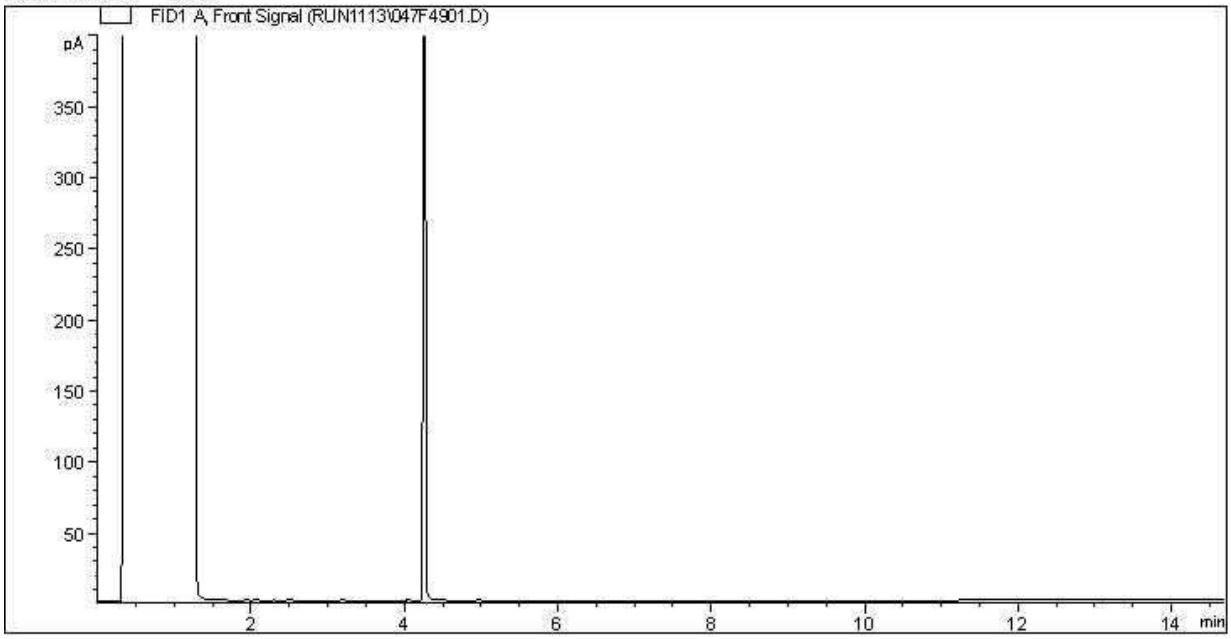
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Maxxam Job #: B898309
Report Date: 2018/11/15
Maxxam Sample: US8666

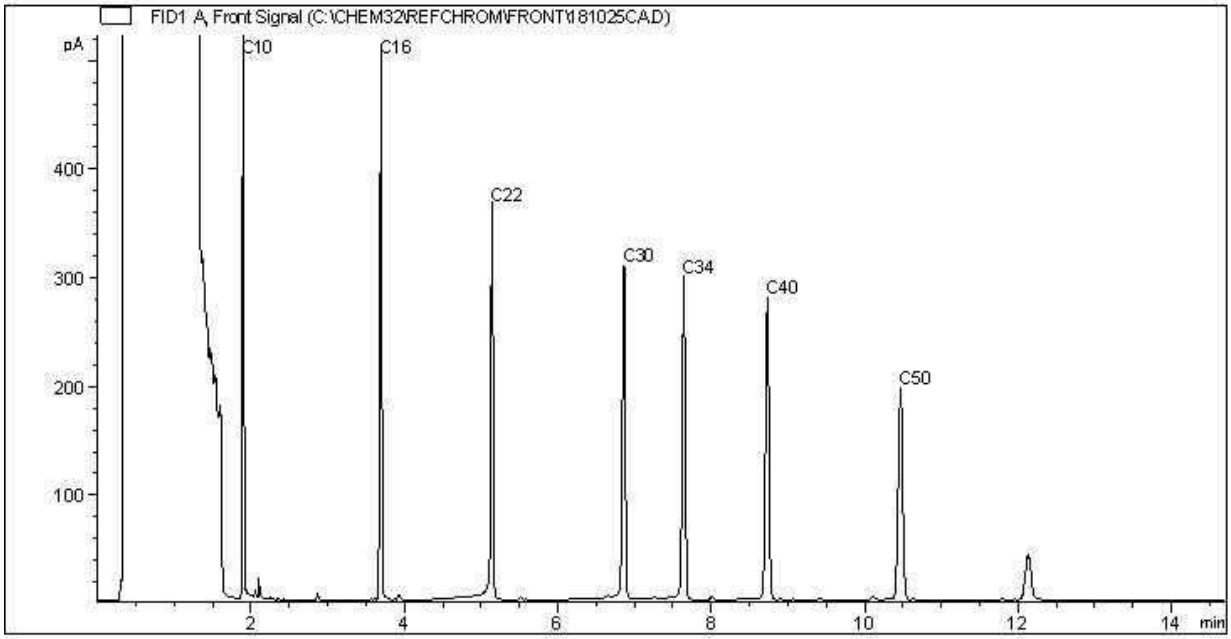
CLIFTON ASSOCIATES LTD.
Client Project #: CG2430.1 E32
Client ID: 1984

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



Carbon Range Distribution - Reference Chromatogram



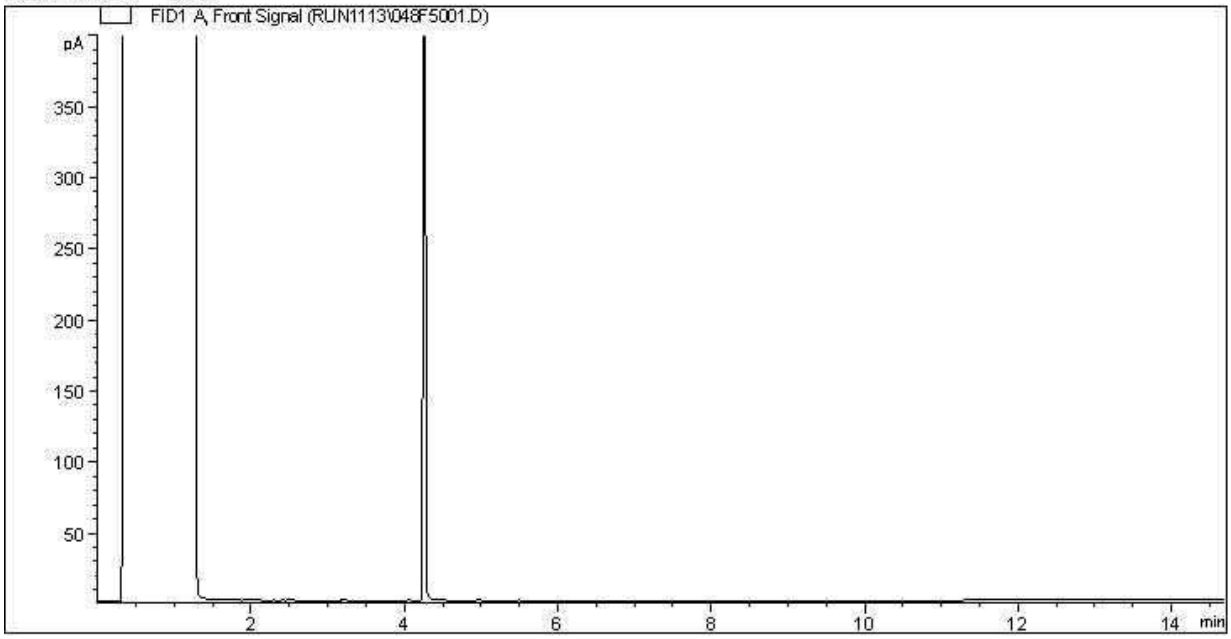
TYPICAL PRODUCT CARBON NUMBER RANGES

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

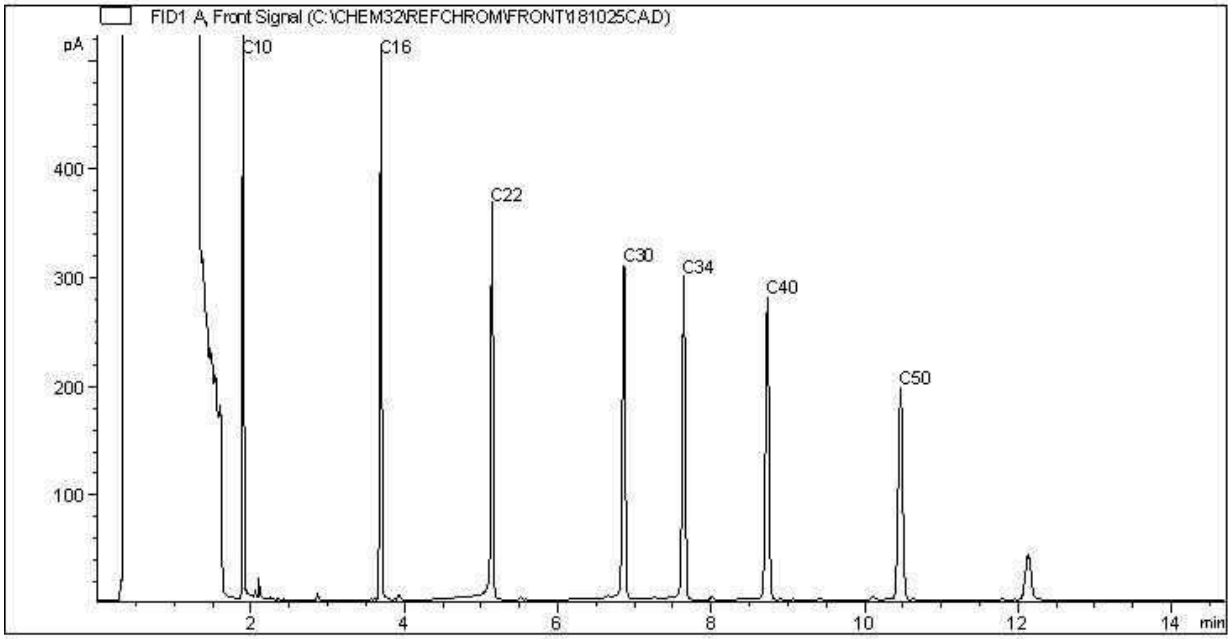
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: GC15



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.

Appendix C
Spring 2018 Soil Vapour Monitoring Report

Clifton

4 May 2018 CG2430.1E08/E10

Sears Canada Inc.
Soil Vapour Monitoring Report
Summer 2017 and Spring 2018

Hounsfield Heights and North Hill Mall
Calgary, Alberta

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1.0 Introduction

Clifton Associates Ltd. (Clifton) is pleased to present this Soil Vapour Monitoring Report Summer 2017 and Spring 2018 (Report) prepared for the account of Sears Canada Inc. to the stakeholders. The Report describes in detail the methodology of soil vapour sample collection, Quality Assurance/Quality Control (QA/QC) implementation and interpretation of soil vapour sampling results in the Hounsfield Heights community and North Hill Mall area within the City of Calgary (the Site) conducted by Clifton during summer 2017, and spring 2018, respectively.

The presented document is partially based on the previous environmental work completed for Sears in both the Mall area and the Hounsfield Heights area by Clifton and by Intrinsik Environmental Sciences Inc. (Intrinsik). Therefore, the presented document should be read and understood in conjunction with the following reports:

- Clifton Associates Ltd.: *Sears Canada Inc., Revised Soil Vapour Monitoring Program (Update Fall 2016), Hounsfield Heights and North Hill Mall, Calgary, Alberta,* 20 October 2016 (Revised SVMP);
- Clifton Associates Ltd.: *Sears Canada Inc., Soil Vapour Monitoring Points Installation Report, Hounsfield Heights and North Hill Mall, Calgary, Alberta,* 20 October 2016 (Installation Report);
- Clifton Associates Ltd.: *Subsurface Investigation-Mall Area and Hounsfield Heights,* 22 January 2016 (2016 SI);
- Clifton Associates Ltd.: *Updated Site Management Plan (2014), Hounsfield Heights-Briar Hill Community, Calgary, Alberta,* April 2014 (2014 Updated SMP);
- Intrinsik Environmental Sciences Inc.: *Draft Report-Human Health and Ecological Risk Assessment for the Hounsfield Heights Community and North Hill Mall Areas, Calgary, Alberta,* December 2015 (2015 HHERA); and
- Intrinsik Environmental Sciences Inc.: *Final Report-Development of Soil Vapour Quality Guidelines*, 31 August 2016.

The presented Report follows guidance, protocols, scientific rationale and best practices as outlined in the following documents:

- Alberta Environment and Parks: *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, 2016 (2016 AEP Tier 1 Guidelines);
- Alberta Environment and Parks: *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, 2016 (2016 AEP Tier 2 Guidelines);
- Canadian Council of Ministers of the Environment: *A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapors*, 2014 (2014 CCME Protocol);
- British Columbia Ministry of Environment: *Technical Guidance on Contaminated Sites 4,* version 1, September 2010 (BC TG-4);

- Golder Associates Ltd.: *Guidance on Site Characterization for Evaluation of Soil Vapour Intrusion into Buildings,* Submitted to the British Columbia Ministry of Environment by Science Advisory Board for Contaminated Sites in British Columbia, May 2011 (2011 Golder Guidance);
- Health Canada: *Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites*, September 2010 (2010 HC); and
- Johnson, P.C., & R. Ettinger: *Heuristic Model for predicting the Intrusion Rate of Contaminant Vapours into Buildings*, 1991(J&E Model).

2.0 Project Background

Since 1998, site investigations have revealed the presence of PHCs in the subsurface soils and groundwater beneath City of Calgary properties in the Hounsfield Heights community in Calgary, Alberta. The source of the PHCs is suspected to be a former gasoline station on the property owned by Sears located at the North Hill Shopping Centre as stipulated in the 2014 Updated SMP. Evidence suggests that gasoline may have leaked from underground fuel storage tanks prior to their removal in the mid-1990s when the gasoline station was decommissioned.

In 2006, Intrinsik (operating as Cantox Environmental at the time of the report) completed a risk assessment of the Hounsfield Heights community (Cantox 2006). The purpose of the assessment was to identify the potential health risks to people residing in the Hounsfield Heights community, as well as to ecological receptors that frequent the area, from the PHC-impacted subsurface soils and groundwater. Concentrations of various petroleum hydrocarbon constituents (*e.g.,* benzene, toluene, ethyl benzene, xylenes-BTEX) and PHCs fractions (*e.g.,* F1 and F2) measured in the soils and groundwater beneath the City-owned properties (e.g. parks, roads, and alleyways) were compared to the corresponding generic (Tier 1) guidelines from Alberta Environment and Sustainable Resource Development (Alberta ESRD, formerly Alberta Environment) for the protection of human health, safety, and the environment. In addition, site-specific (Tier 3) risk management guidelines were developed for selected petroleum hydrocarbons (*i.e*., benzene and the F1 PHC fraction). Overall, assessment results indicated that the potential for adverse effects to human health and ecological receptors was low. However, some uncertainties were identified surrounding the on-site impacts (i.e., Mall Area), presence of liquid petroleum hydrocarbons (LPH) off-site (Hounsfield Heights area), and an expanding dissolved phase plume off-site. These uncertainties were addressed through the implementation of remediation and monitoring programs.

Since 2006, a summary of the remediation and monitoring programs is as follows (2014 Updated SMP):

- Between 2006 and 2007, remedial excavation of the impacted soils in the Mall area was completed;
- Groundwater monitoring has continued within the Hounsfield Heights and Mall area at specific monitoring wells through a groundwater sampling program on an approximate bi-annual basis; and
- A dual-phase vapour extraction (DPVE) system was installed in 2008 to remove LPH in the Hounsfield Heights area. The system began running full time in 2011.

On 20 July 2012, Alberta ESRD requested that Sears update its Site Management Plan for the Mall and Hounsfield Heights area and address the following points:

- Fully delineate the dissolved plume south of 11th Avenue NW;
- Sample the groundwater adjacent to where it discharges to the surface in the southern portion of Zone 3 (south of 11th Avenue NW) and evaluate it for risk to ecological receptors;
- Delineate the soil gas/vapour plume at the Site;
- Assess potential risks from indoor air infiltration of petroleum hydrocarbon vapours in areas where the vapour inhalation pathway exceeds guidelines, and in areas where it has been determined that elevated soil gas/vapours are present;
- Establish a soil gas monitoring program on properties that may be at risk from indoor air infiltration. Compare current needs with those previously identified in the Clifton April 5, 2007 response to Alberta Environment regarding the soil vapour monitoring;
- Implement additional remediation techniques to deal with the expanding dissolved phase plume. As previously discussed, this could include enhanced bioremediation. Monitored natural attenuation is not appropriate while LPH is being removed and the dissolved plume is not stable. Multiple remediation approaches are needed to address the petroleum hydrocarbon impacts;
- Review the groundwater monitoring and sampling program to ensure adequate coverage based on current conditions and trends; and
- Apply the 2014 AEP Tier 1 Guidelines to monitoring well locations along 11th Avenue NW and include these wells in the groundwater monitoring and sampling program.

In order to address these requirements, Clifton abandoned groundwater monitoring wells not meeting requirements in 2014, in preparation for a future environmental monitoring program. The next step (fall 2014-spring 2015) included the installation of 70 new groundwater monitoring wells coupled with a soil sampling program focused on better understanding of the soil stratigraphy south of 11th Avenue NW. In addition, the 2015 Subsurface Investigation included four rounds of the groundwater sampling in the Mall and Hounsfield Heights areas, as well as limited (five residences) indoor air quality monitoring.

Indoor air sampling locations were determined based on historically (i.e. before 2015 Site Investigation) measured benzene concentrations in groundwater monitoring wells that were above guidelines for the protection of the vapour inhalation exposure pathway as defined by the 2014 AEP Tier 1 Guidelines. One round of the indoor air sampling was conducted at the following residential properties in 2015:

- 1601 11th Avenue NW;
- 1604 11th Avenue NW;
- 1605 11th Avenue NW;
- 1609 11th Avenue NW; and
- 1301 15th Street NW.

In addition, the indoor air sampling also included one sub-slab soil gas sample from the residence located at 1609 11th Avenue NW. For collected data and description of the sampling methodology refer to 2015 HHREA, Table D-1. These data were not included as part of the identification of Chemicals of Potential Concern (CoPCs), but were used as part of additional lines of evidence in Risk Characterization for 2015 HHREA completed by Intrinsik.

The 2015 HHREA included detailed investigation of the vapour inhalation pathway for human receptors present at the Site for both soil and groundwater and compared the results against the Residential/Parkland Land Use Guidelines (Hounsfield Heights area) and Commercial Land Use Guidelines (North Hill Mall area) as defined by AEP Tier 1 and 2 Guidelines. The following CoPCs in soil at the Site were identified for vapour inhalation pathway:

Table 2.1 – Constituents identified as CoPCs by 2015 HHREA in soil for vapour inhalation pathway and human receptors at the Site[1]

Constituent in Soil	Hounsfield Heights Area (Residential/Parkland Land Use)	North Hill Mall Area (Commercial Land Use)
Benzene	YES	YES
Toluene	NO	NO
Ethylbenzene	NO	NO
Xylenes	YES	NO
F1-BTEX (C_6—C_{10})	YES	NO
F2 (C_{10}-C_{16})	YES	NO
Naphthalene	YES	NO

[1] Please note that other constituents in soils may be present at the Site in concentrations exceeding different exposure pathways for human and ecological receptors as defined by the 2016 AEP Tier 1 Guidelines, and are not part of the objectives of this SVMP.

Volatile Organic Compounds (VOCs)		
1,2 Dichloroethane (1,2-DCA)	YES	YES

The following COPCs in groundwater at the Site were identified for vapour inhalation pathway:

Table 2.2 – Constituents identified as CoPCs by 2015 HHREA in groundwater for vapour inhalation pathway and human receptors at the Site[2]

Constituent in Groundwater	Hounsfield Heights Area (Residential/Parkland Land Use)	North Hill Mall Area (Commercial Land Use)
Petroleum Hydrocarbons		
Benzene	YES	NO
Toluene	NO	NO
Ethylbenzene	NO	NO
Xylenes	YES	NO
F1-BTEX (C_6—C_{10})	YES	NO
F2 (C_{10}-C_{16})	NO	NO
Polycyclic Aromatic Hydrocarbons (PAHs)		
Naphthalene	NO	NO
Volatile Organic Compounds (VOCs)		
1,2 Dichloroethane (1,2-DCA)	YES	NO

Based upon the results of 2015 Subsurface Investigation, Intrinsik prepared and submitted to the regulator an updated HHREA for the Site in December 2015. The 2015 HHREA recommended implementing a soil

[2] Please note that other constituents in groundwater may be present at the Site in concentrations exceeding different exposure pathways for human and ecological receptors as defined by the 2016 AEP Tier 1 Guidelines, and are not part of the objectives of this SVMP.

vapour monitoring program for assessing vapour inhalation and possible infiltration into indoor air, which should meet the following guiding principles:

- The program should provide broader spatial measurement of soil-gas concentrations in the Hounsfield Heights Area. Soil vapour monitoring locations should take into consideration the PHC levels present in groundwater throughout the community and the Site-specific geology;
- The program should include the installation of vapour monitoring points that collect soil-gas at multiple depth intervals. Ideally, three collection intervals would be installed with the lowest interval located above the groundwater and the upper interval located 2 to 3 metres below ground surface. The middle interval would be evenly spaced between the upper and lower interval. This would allow calculation of site-specific attenuation coefficients, which includes natural diffusion and biodegradation; and
- The vapour monitoring points should be located in areas that would not restrict access (e.g., public areas) to allow for repeated sampling at fixed time intervals throughout the year.

In order to address regulator's requirements and recommendations contained in the 2015 HHREA regarding the soil vapour delineation at the Site and assessment of potential presence of an active vapour intrusion pathway, Clifton prepared and submitted Revised SVMP on 20 October 2016. The following sections of this Report describe implementation of the methods outlined in the Revised SVMP.

3.0 Site Overview

The Site consists of two distinctive portions separated by 13th Avenue NW - the Hounsfield Heights area and the North Hill Mall (Mall) area:

- The Hounsfield Heights area is bound by: the southern edge of the LRT line to the north; 14th Street NW to the east; 10th Avenue SW (extending west to 17A Street NW) to the south; and, 17A Street NW to the west. The area is zoned as residential, as it primarily consists of single detached dwellings with basements. There are three areas of the Site that are zoned as Special Purpose: Hounsfield Heights Park; a parcel of land along 10th Avenue SW between 16th Street NW and 16th A Street NW; and, the area between the LRT line and 13th Avenue NW.
- The Mall area is bound by: 16th Avenue NW to the north; 14th Street NW to the east; the northern edge of the LRT line to the south; and, to the west by the western edge of the North Hill Centre property and a line extending south to the northern edge of the LRT line.

Capitol Hill, a residential area, is located to the north of the Site. To the east is SAIT Polytechnic and the Alberta College of Art + Design. Hillhurst and Briar Hill, both residential areas, are found south and west of the Site, respectively. The Site layout and land use are shown in Appendix A, Figures 1 and 2.

The Site topography is characterized by a gently south-sloping river valley plateau on the northern portion of the Site, and a more moderately sloping valley wall towards the southeast portion. The Site varies in

elevation from approximately 1,094 m above sea level in the northwestern corner along 13th Avenue NW, to approximately 1,068 m above sea level in the southeastern corner, north of the intersection of 15th Street NW and 10th Avenue NW.

4.0 Objective and Scope of Work

The principle objective of the executed Soil Vapour Monitoring Program (SVMP) was to evaluate potential risk to human health from inhalation of subsurface vapours in indoor air in both residential and commercial structures present at the Site. To address this objective, Clifton carried out the following Scope of Work within the SVMP:

- Collected representative soil vapour samples from areas identified by 2015 SI as having CoPCs concentrations in groundwater or soil exceeding the 2016 AEP Tier 1 Guidelines for vapour inhalation exposure pathway;
- Sampled nested soil vapour monitoring points at locations representing changing stratigraphy of the Site to provide representative data for evaluation of the Site-specific vertical soil vapour migration and biodegradation;
- Sampled soil vapour monitoring locations constituting lateral transects to facilitate lateral delineation of the soil vapour plume extent at the Site;
- Conducted sub-slab soil vapour sampling and indoor air quality monitoring at the residential property located at 11th Avenue NW;
- Forwarded collected soil vapour and air samples to Maxxam Analytics Inc. under Chain-of -Custody protocols for laboratory analyses of COPCs;
- Implemented QA/QC procedures to assure quality and defensibility of the collected data;
- Compared CoPCs concentrations in soil vapour from soil vapour monitoring points against the Site-specific soil vapour quality guidelines developed based on the 2014 CCME Protocol by Intrinsik; and
- Compared CoPCs concentrations in soil vapour from soil vapour monitoring points against trigger threshold values for additional investigation set as 90% of guidelines.

5.0 Sampling Methodology

The following sections provide a description of the soil vapour, sub-slab soil vapour and indoor air sampling methodologies. Where applicable, activities were completed as per *Compendium of Methods for the Determination of Compounds in Ambient Air, Second Edition, Compendium Method TO-15, Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GCMS).* EPA/625/R96/01b, 1999.

The laboratory analytical and quality assurance/quality control (QA/QC) programs are also described in the following section.

5.1 Soil Vapour Monitoring Points

In order to achieve required resolution of the laboratory detection limits for investigated constituents (especially 1,2 – DCA), and to extend validity of collected samples, Clifton used as soil vapour sampling media 1.4L Summa™ canisters, which were proofed and cleaned by the laboratory as per the United States Environmental Protection Agency (USEPA) reference method TO-14A. The sampling train included: an orifice equipped flow controller calibrated for a sampling rate of 70 mL/min; and, a length of the dedicated PTFE tubing with stainless steel fitting to connect to a valve at the top of the soil vapour monitoring point.

Before any sampling event, Clifton completed a seal integrity check of the monitoring point using helium tracer. All monitoring points meeting seal integrity criteria were subsequently purged by the SKC PGX-R8 vacuum pump calibrated for a flow rate of 70 mL/min for 20 minutes. Purging vacuum rate thus did not exceeded 10” (254 mm) of water column in order to avoid excessive moisture influx to the radius of influence.

The soil vapour sampling also included: measuring the initial and final Summa™ canister vacuum levels by standalone vacuum gauge; recording the start and finish time of the sampling; monitoring point identifier check; and weather observations, especially barometric pressure at the time of sampling and precipitation. The stainless-steel valve installed at the top of a soil vapour monitoring point were kept in a closed position, except when purging and sampling. Layout of the soil vapour monitoring points installed at the Site is shown in Appendix A, Figure 3.

5.2 Sub-Slab Soil Vapour Monitoring Points

Before sampling event, Clifton completed a seal integrity check of the sub-slab monitoring point using helium tracer. A monitoring point meeting seal integrity criteria was subsequently purged by the vacuum for at least three probe volumes. Purging vacuum rate did not exceeded 10” of water column in order to avoid excessive moisture influx to the radius of influence.

Subsequently, a length of new PTFE tubing connected to a 1.4L Summa™ canister was attached to stainless steel fitting and soil vapour sample was collected. After recording final vacuum, sampling time and other field observations, Summa™ canister was marked by a unique ID and submitted to Maxxam Analytics Inc. under the Chain-Of-Custody protocol. The sub-slab sampling point was secured by re-attaching a tamper-proof stainless top cap until the next sampling event.

5.3 Indoor Air Quality Sampling

Indoor air quality sampling was carried out concurrently with sub-slab soil vapour sampling within the same building to assure consistency of data. Clifton collected indoor air samples using a Summa™ canister (6-Liter capacity) equipped with a critical orifice flow-regulation device sized to allow an air sample to be collected over a 24-hour sampling period. Air sampling canister was deployed at a representative indoor sampling location, based on the results of the preliminary building visit findings, and away from any forced air influence emanating from HVAC, vents, or heaters in the breathing zone, which is characterized at a

level height of approximately 1.5 m. Final sampling locations were also selected based on the results of the field screening by a photoionization detector (PID) calibrated to the non-methane VOC standard , and an evaluation of the air flow/pressure gradients/stack effects in the building by digital micro-manometer, which might be caused by any HVAC systems, drafts around doors and windows, exhaust fans etc.

The stakeholders were asked for their cooperation in obtaining representative indoor air samples by refraining from activities that might affect planned indoor air sampling, such as: painting, heavy cleaning, and indoor storage of chemicals in the period ideally up to seventy-two-hours before the sampling.

5.4 Quality Assurance/Quality Control (QA/QC)

A comprehensive QA/QC program was implemented to insure that the sampling and analyses follow established protocols and provide defendable, representative results. The program included all aspects of data collection from the field to the laboratory.

The field QA/QC consisted of the following components:

- Labelling air sampling containers with the specific sample number to ensure adequate identification;
- Using laboratory-prepared batch-proofed and cleaned air sampling containers cleaned as per USEPA TO-14A reference method;
- Conducting an integrity 15-minutes shut-in vacuum test on sampling trains;
- Conducting helium tracer competent seal integrity testing;
- Collecting field duplicates and evaluating Relative Percent Difference (RPD) ratio;
- Measuring initial and final vacuum levels by the independent, standalone gauge to ensure sample validity;
- Conducting weather observations;
- Forwarding collected samples under the Chain-of -Custody protocols to Maxxam Analytics Inc.; and
- Reviewing the laboratory quality assurance data.

Field duplicates were collected simultaneously with the primary sample, using stainless steel splitter at a rate of approximately one duplicate per ten samples, per a sampling event. Primary and duplicate analytical results above the detection limit were compared using the following equation:

$$RPD\ (\%) = [abs(x_1-x_2)/(x_1+x_2)/2] * 100$$

Where: x_1, x_2 are the parameter concentrations for the primary and duplicate samples, respectively. USEPA TO-15 method recommends the RPD to be below 25%.

5.5 Analytical Suite and Methods

Clifton selected to use soil vapour analytical methods compatible with performance-based reference method USEPA TO-15 based on the gas chromatography and mass spectrometry (GC/MS). All COPCs for

vapour inhalation pathway as identified by the 2015 HHREA were investigated. Therefore, the proposed analytical suite included the following:

- PHCs fraction F1[3];
- PHCs fraction F2[4];
- BTEX (benzene, toluene, ethylbenzene, xylenes);
- Naphthalene;
- 1,2 Dichloroethane (1,2-DCA); and
- Fixed Gases (O_2, N_2, CO_2, CH_4)[5]

Clifton used Maxxam Analytics Inc. (Maxxam) as a provider of the laboratory services for this SVMP. Maxxam is accredited under ISO/IEC 17025-2005, the Canadian Association for Laboratory Accreditation (CALA), EPA Good Laboratory Practices (GLP) as well as under the National Environmental Laboratory Accreditation Program (NELAP).

6.0 Sampling Results

6.1 Selection of Assessment Criteria

The selection of the assessment criteria outlines the rationale for selecting applicable exposure pathways and indicates which guidelines should apply at the investigated Site. This evaluation is based on guidance presented in the documents further referenced in the text.

As for the indoor air quality samples (Appendix B, Table 1, and Appendix C, Table 1, respectively), the analytical data were compared to the generic air quality criteria for human toxicity based on risk-based tolerable concentrations (TC), reference concentrations (RfC), or Reference Units (RU) for carcinogens as stated in the 2016 AEP Tier 1 Guidelines, Table C-7.

Sub-slab soil vapour sample analytical results (Appendix B, Table 2, and Appendix C, Table 2, respectively), were compared to Soil Vapour Quality Guidelines (SVQG) protective of indoor air quality for residential buildings for samples collected from a depth of <100 cm and fine-textured soils as presented in the following document developed based on the 2014 CCME Protocol:

- Intrinsik Environmental Sciences Inc.: *Final Report-Development of Soil Vapour Quality Guidelines*, 31 August 2016.

The owners of the residential properties located at 1318 and 1312 16th Street NW, declared a presence of the crawl spaces with earthen floors during the “door-to-door” survey at the Site. Clifton contacted these

[3] Expressed in form of the constituting aliphatic and aromatic sub-fractions.
[4] Expressed in form of the constituting aliphatic and aromatic sub-fractions.
[5] Applicable for soil vapour samples collected from sub-slab and nested monitoring points.

owners with an offer of an indoor air quality monitoring and sub-slab soil vapour monitoring point installation for their property. Both owners declined the offer, therefore Clifton used the following conservative approach to estimate indoor air quality in these structures based on the Revised SVMP, Section 6.1:

- An external soil vapour monitoring point located in the shortest distance from the property was used for a rough estimate of indoor air quality. No allowance was made for either lateral or vertical biodegradation of soil vapour regardless of the soil vapour monitoring point installation depth, i.e., recorded concentrations of CoPCs in soil vapour were directly projected within the property and compared against SVQG for depth of 0 m bgs (Appendices B and C, Tables 3 and 4).

Soil vapour sampling analytical results were generally compared to SVQG for fine-textured soils and protective of indoor air quality for a residential building (Appendices B and C, Tables 7-15 B), or a commercial building (Appendices B and C, Table 16) based on the installation depth. 2014 CCME Protocol assumes that at least 1 m of clean soil is present immediately beneath the building as a condition for validity of the provided SVQG derivation model. Considering shallow groundwater in a portion of the Site to the south of 11th Avenue NW and default basement depth 2.44 m bgs (2016 Alberta Tier 1), this assumption may not be met for soil vapour monitoring points listed in Appendices B and C, Tables 5 and 6. Analytical results for these monitoring points were thus compared to SVQG based on the default attenuation factors.

In addition, AEP approved on a trial basis increased monitoring frequency triggers for soil vapour and sub-slab soil vapour monitoring points at the Site. These trigger values were set at 90% of a pertaining SVQG for CoPC. Comparison of analytical results to the trigger values is shown in Appendices B and C, Tables 2 and 5-16.

6.2 Sampling Results – Summer 2017 Monitoring Event

External Soil Vapour Monitoring Points

Clifton carried out soil monitoring event at the Site from 11 July 2017 to 21 July 2017. A total of 42 soil vapour samples was collected at external, nested and delineation monitoring points in summer 2017 at the Site and analysed for CoPCs concentrations. There were no exceedances for the investigated CoPCs compared either to the pertaining SVQG protective of indoor air quality or to the increased monitoring frequency trigger values. Based on analytical results for soil vapour at the Site, vapour migration from groundwater or soil at the Site was not an active exposure pathway of concern for indoor vapour inhalation at the time of investigation.

Distribution of the investigated CoPCs in soil vapour at the Site based on the analytical results for the summer 2017 is shown in Appendix A. Analytical Results Tables for these soil vapour monitoring points are presented in Appendix B, Tables 5-16.

Soil vapour monitoring points SV 39 and SV 34 were not sampled during this monitoring event. The reason was an excess of moisture present in the sampling train after vacuum application precluding collection of a representative sample.

Estimates of Indoor Air Quality

A rough estimate of indoor air quality for properties with reported unusual features is based on the soil vapour samples collected from the nearest soil vapour monitoring points. Sample ID SV19/379 was therefore used for the property located at 1312 16th Street NW, and sample ID SV15/233 for the civic address 1316 16th Street NW. Albeit these monitoring points have installation depth 5.5 and 6.0 m bgs, respectively, no allowance was made for vertical or horizontal biodegradation to add a level of conservativism to the estimate. Analytical results for both samples were compared to SVQG based on default attenuation factors. No exceedances for CoPCs criteria protective of indoor air quality were recorded, thus an active vapour intrusion pathway into these structures (if present) should not pose health risk for the occupants.

Analytical Results Tables for these soil vapour monitoring points are presented in Appendix B, Tables 3 and 4.

Sub-Slab Soil Vapour Sample

One sub-slab soil vapour sample (Sample ID 51/1761) was collected from the residential property located at 11th Avenue NW on 13 September 2017. The concentrations of measured sub-slab soil vapour constituents were below pertaining SVQG. This suggests that indoor air vapour infiltration from migration of vapour concentrations from groundwater was not active, below levels of concern or mitigated by biodegradation in the vadose zone beneath the structure.

In addition to the analyses of CoPCs, the sub-slab soil vapour sample was analyzed for fixed gases (i.e., oxygen, nitrogen, carbon oxides and methane) as an indicator of biodegradation potential. Petroleum hydrocarbons (PHCs) usually biodegrade under both anaerobic and aerobic conditions, with aerobic degradation occurring more rapidly. The Pennsylvania Department of Environmental Protection[6] defines an acceptable soil material as having greater than 2% oxygen for purposes of PHCs degradation. Oxygen content of the sample was measured to be 22.5% v/v[7]. The measured sub-slab soil vapour concentrations of PHCs constituents were very low compared to SVQG, below detection limits with an exception of Aliphatic $>C_{10} – C_{12}$ subfraction, suggesting that soil vapour infiltration into the residential structure is minimal.

Analytical Results Table for sub-slab soil vapour monitoring is presented in Appendix B, Table 2.

[6] Pennsylvania Department of Environmental Protection: *Land Recycling Program Technical Guidance for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2*. 2015.

[7] Indication of biodegradation via oxygen content is not applicable for non-petroleum CoPCs at the Site.

Indoor Air Quality Sample

Indoor air quality sample (Sample ID 50/257) representing 24 hours period was collected on 14 September 2017 from the residential property located on 11th Avenue NW. Sample was collected concurrently with sub-slab soil vapour sample at the same property. Analytical Results Table for indoor air quality monitoring is presented in Appendix B, Table 1. Analytical results show exceedance of 1,2-DCA concentration in indoor air within the property with recorded concentration of 0.70 µg/m^3 . All other investigated CoPCs in indoor air were below the applicable guidelines.

Neither sub-slab soil vapour monitoring results, nor external soil vapour monitoring data provide a line of evidence for elevated concentration of 1,2-DCA being directly related to the known contamination plume present at the Site. Therefore, elevated reading for 1,2-DCA was likely caused by other potential sources within this residential property.

6.3 QA/QC Results – Summer 2017 Monitoring Event

Four field duplicates (Sample IDs SV91, SV95, SV99 and SV92) were collected and analyzed for CoPCs during sampling as a part of QA/QC program. These duplicates were compared against primary samples and RPD values were calculated. USEPA TO-15 method recommends the RPD difference to be below 25%. Summary of field duplicates analytical results and the RPD calculations are presented in Appendix C, Table 2.

The RPD value for Aliphatic > C_{12}-C_{16} sub-fraction, samples SV15 and SV95, was calculated to be 44.6%, i.e., exceeding the recommended threshold of 25%. RPD threshold for other duplicates and investigated constituents were below recommended threshold.

Prior to the sampling, soil vapour monitoring points were tested for seal integrity by helium tracer gas method. Test results are summarized in Appendix C, Tables 1 A-1 D. The threshold limit applied was at least 95% differential between initial and final concentration of He in the shroud. All soil vapour monitoring points passed these integrity criteria.

6.4 Sampling Results – Spring 2018 Monitoring Event

External Soil Vapour Monitoring Points

Clifton carried out soil monitoring event at the Site at 28 March 2018 and from 3 April 2018 to 14 April 2018. A total of 43 soil vapour samples was collected at external, nested and delineation monitoring points in spring 2018 at the Site and analysed for CoPCs concentrations. There were no exceedances for the investigated CoPCs compared either to the pertaining SVQG protective of indoor air quality or to the increased monitoring frequency trigger values. Based on analytical results for soil vapour at the Site, vapour migration from groundwater or soil at the Site was not an active exposure pathway of concern for indoor vapour inhalation at the time of investigation.

Distribution of the investigated CoPCs in soil vapour at the Site based on the analytical results for the spring 2018 is shown in Appendix A. Analytical Results Tables for these soil vapour monitoring points are presented in Appendix C, Tables 5-16.

Soil vapour monitoring point SV 36 was not sampled during this monitoring event. The reason was temporary inaccessibility of this monitoring point caused by adjacent construction work.

Estimates of Indoor Air Quality

A rough estimate of indoor air quality for properties with reported unusual features is based on the soil vapour samples collected from the nearest soil vapour monitoring points. Sample ID 19/1408 was therefore used for the property located at 1312 16th Street NW, and sample ID 15/3003 for the civic address 1316 16th Street NW. Albeit these monitoring points have installation depth 5.5 and 6.0 m bgs, respectively, no allowance was made for vertical or horizontal biodegradation to add a level of conservativism to the estimate. Analytical results for both samples were compared to SVQG based on default attenuation factors. No exceedances for CoPCs criteria protective of indoor air quality were recorded, thus an active vapour intrusion pathway into these structures (if present) should not pose health risk for the occupants. Analytical Results Tables for these soil vapour monitoring points are presented in Appendix C, Tables 3 and 4.

Sub-Slab Soil Vapour Sample

One sub-slab soil vapour sample (Sample ID 51/1275) was collected from the residential property located at 11th Avenue NW on 18 April 2018. The concentrations of measured sub-slab soil vapour constituents were below pertaining SVQG. This suggests that indoor air vapour infiltration from migration of vapour concentrations from groundwater was not active, below levels of concern or mitigated by biodegradation in the vadose zone beneath the structure.

In addition to the analyses of CoPCs, the sub-slab soil vapour sample was analyzed for fixed gases (i.e., oxygen, nitrogen, carbon oxides and methane) as an indicator of biodegradation potential. Petroleum hydrocarbons (PHCs) usually biodegrade under both anaerobic and aerobic conditions, with aerobic degradation occurring more rapidly. The Pennsylvania Department of Environmental Protection[8] defines an acceptable soil material as having greater than 2% oxygen for purposes of PHCs degradation. Oxygen content of the sample was measured to be 22.5% v/v[9]. The measured sub-slab soil vapour concentrations of PHCs constituents were very low compared to SVQG, below detection limits with an exception of Aliphatic $>C_{10} – C_{12}$ subfraction, suggesting that soil vapour infiltration into the residential structure is minimal.

Analytical Results Table for sub-slab soil vapour monitoring is presented in Appendix C, Table 2.

[8] Pennsylvania Department of Environmental Protection: *Land Recycling Program Technical Guidance for Vapor Intrusion into Buildings from Groundwater and Soil under Act 2*. 2015.

[9] Indication of biodegradation via oxygen content is not applicable for non-petroleum CoPCs at the Site.

Indoor Air Quality Sample

Indoor air quality sample (Sample ID 50/7847) representing 24 hours period was collected on 19 April 2018 from the residential property located on 11th Avenue NW. Sample was collected concurrently with sub-slab soil vapour sample at the same property. Analytical Results Table for indoor air quality monitoring is presented in Appendix C, Table 1. Concentrations of the investigated CoPCs in indoor air were below the applicable guidelines.

Analytical results for 1,2-DCA concentration in indoor air were presented with laboratory detection limit of 0.65 µg/m^3. The applicable guideline for this constituent is 0.40 µg/m^3. Therefore, sampling results for 1,2-DCA during this monitoring event should be considered inconclusive, since detection limit was higher than the applicable guideline.

Increased detection limit used by laboratory for 1,2-DCA was caused by need for a de-pressurization of the Summa canister prior to the analysis. Time constrains related to this monitoring event prevented Clifton from any attempt to re-sample indoor air at this residence.

6.5 QA/QC Results – Spring 2018 Monitoring Event

Four field duplicates (Sample IDs 91, 98, 925 and 916) were collected and analyzed for CoPCs during sampling as a part of QA/QC program. These duplicates were compared against primary samples and RPD values were calculated. USEPA TO-15 method recommends the RPD difference to be below 25%. Summary of field duplicates analytical results and the RPD calculations are presented in Appendix C, Table 2.

The RPD values for Aliphatic > C_{12}-C_{16} sub-fraction, samples 8 and 98, and 25 and 925, were calculated to be 25.2% and 55.6%, respectively, i.e., exceeding the recommended threshold of 25%. RPD threshold for other duplicates and investigated constituents were below recommended threshold.

Prior to the sampling, soil vapour monitoring points were tested for seal integrity by helium tracer gas method. Test results are summarized in Appendix C, Tables 1 A-1 D. The threshold limit applied was at least 95% differential between initial and final concentration of He in the shroud. All soil vapour monitoring points passed these integrity criteria.

6.6 Meteorological Conditions

As ambient meteorological conditions, especially precipitation and barometric pressure, might affect soil vapour sampling, Clifton conducted limited meteorological observations during sampling, which are summarized in the following tables:

Table 6.1 – Summary of Meteorological Conditions – Monitoring Event Summer 2017[10]

Date	Average Wind Speed (km/h)	Average Wind Direction	Average Barometric Pressure (kPa)	Precipitation (mm)
11 July 2017	4	NWN	101.34	0.0
12 July 2017	11	S	101.90	0.0
13 July 2017	6	N	101.39	0.0
14 July 2017	9	SW	102.23	0.7
15 July 2017	13	WSW	101.75	0.0
16 July 2017	15	N	100.77	1.1
17 July 2017	6	N	101.81	0.0
18 July 2017	15	S	102.03	0.0
19 July 2017	9	SW	101.75	0.0
20 July 2017	6	S	101.22	0.5
21 July 2017	19	W	101.29	0.0

Table 6.2 – Summary of Meteorological Conditions – Monitoring Event Spring 2018[11]

Date	Average Wind Speed (km/h)	Average Wind Direction	Average Barometric Pressure (kPa)	Precipitation (mm)
3 April 2018	4	S	102.22	0.0
4 April 2018	9	SW	101.82	3.4

[10] Based on the Environment Canada data.
[11] Based on the Environment Canada data.

5 April 2018	20	N	103.22	2.6
6 April 2018	26	ESE	103.22	0.2
7 April 2018	17	ESE	101.81	trace
8 April 2018	9	N	101.35	trace
9 April 2018	4	N	102.27	0.0
10 April 2018	4	N	101.71	0.0
11 April 2018	19	NW	100.91	0.0
12 April 2018	22	SE	100.96	0.0
13 April 2018	11	S	102.02	0.0

As neither major precipitation event (> 5 mm in 24 hour period) nor major changes of barometric pressure were observed during sampling period, in Clifton's opinion, meteorological conditions did not significantly affected recorded soil vapour data.

7.0 Discussion of Results and Recommendations

The soil vapour analytical laboratory results collected in the summer 2017 and spring 2018 showed that the indoor air quality within the investigated residential and commercial structures at the Site are within the Site-specific SVQG protective of indoor air quality criteria. Therefore, it is unlikely that indoor air presents an immediate health risk for the occupants of the structures present at the Site.

Future steps in soil vapour monitoring at the Site should sufficiently address expected temporal fluctuations in soil vapour concentrations caused by seasonal water table fluctuation, as well as changing temperature of soil and groundwater and saturation levels in soils at the Site. Clifton therefore recommends the following:

- The next sampling event should be ideally completed during late fall 2018 when heating season commenced to take into account lower levels of biodegradation and possible stack effects, as well as limited air exchange in the buildings at the Site under these conditions;

- CoPCs concentration guidelines regarding delineation of soil vapour plume extent at the Site were not set, therefore soil vapour data and groundwater results should be superimposed for two correlated sampling events to determine if there are any trends or areas of potential concern;
- To provide additional line of evidence regarding 1,2 – DCA concentrations in indoor air at 11 Avenue NW, Clifton recommends to include at least two adjacent properties for indoor air monitoring for the next monitoring event. Indoor air samples should be therefore collected from three adjacent properties located at 11 Avenue NW at the same time period; and
- It is recommended to continue the soil vapour monitoring program at the Site for at least two more monitoring events, if not instructed differently by the regulator.

8.0 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 that 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.

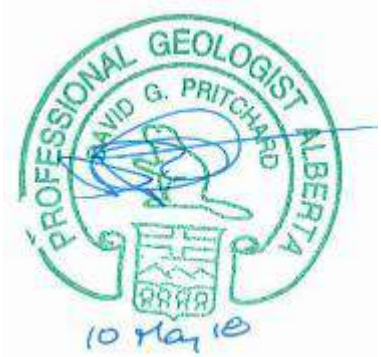
This report has been prepared in accordance with generally accepted engineering practice common to the local area. No other warranty, expressed or implied is made.

This report focuses exclusively at indoor air quality in the investigated buildings. No conclusions should be made based on this report in regards to any concentrations of substances in other areas of the Site. Other Contaminants of Concern may be present at the Site in areas that were not investigated. Clifton Associates Ltd. accepts no responsibility for any deficiencies or inaccuracies in the information provided in this report that are the direct result of intentional or unintentional misrepresentations, errors or omissions of the persons interviewed, or information reviewed.

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.

Yours truly,
Clifton Associates Ltd.



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Environmental Engineer

David G. Pritchard, PGeol
Director, Environmental Services

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

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Clifton Associates Ltd.: *Sears Canada Inc., Soil Vapour Monitoring Points Installation Report, Hounsfield Heights and North Hill Mall, Calgary, Alberta*, 20 October 2016.

Appendix A

Clifton Associates
Figures

Clifton Associates

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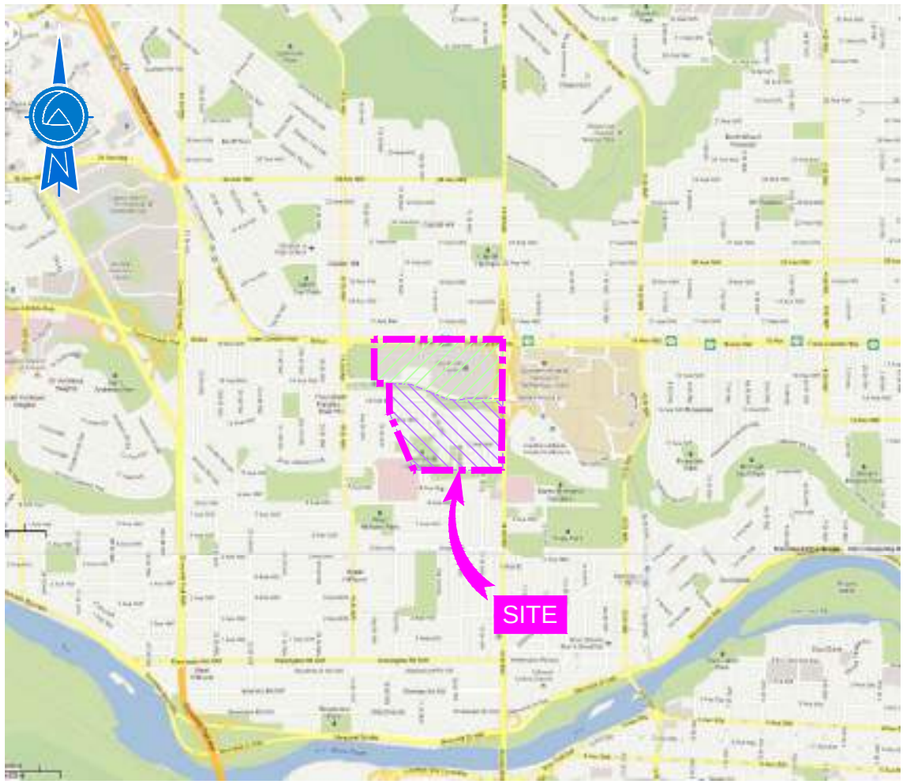

GENERAL SITE LOCATION

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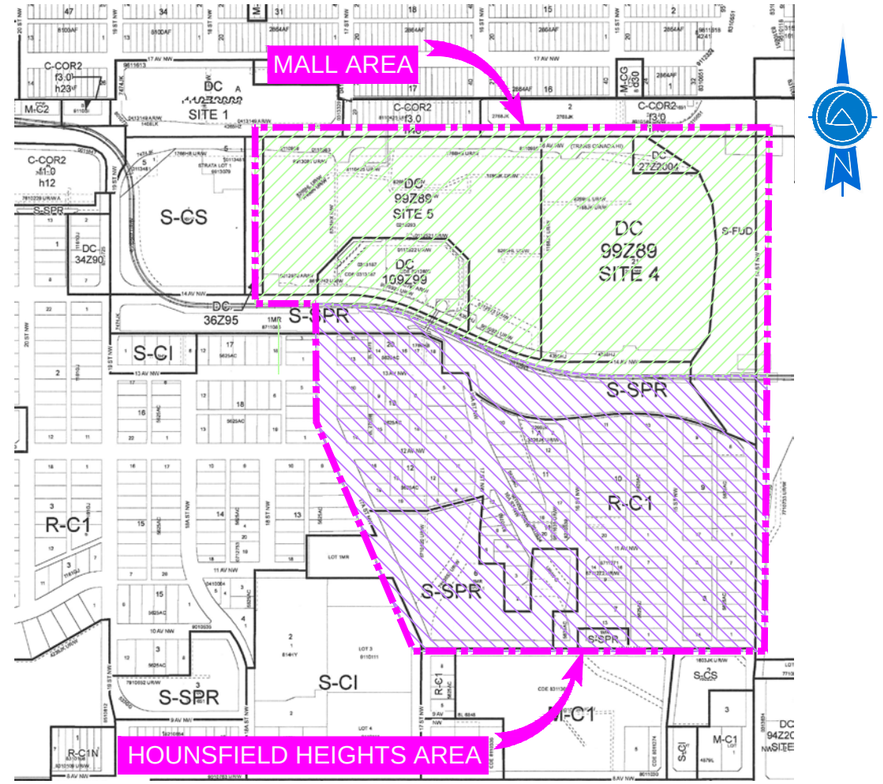

SURROUNDING LAND USE

SCALE 1:7,500

0 100 200 300 m

LEGEND:

SITE BOUNDARY

MALL AREA

HOUNSFIELD HEIGHTS AREA

CITY OF CALGARY BY-LAW ZONING

LAND USE DISTRICTS:

RESIDENTIAL - CONTEXTUAL ONE DWELLING DISTRICT	R-C1
MULTI-RESIDENTIAL - CONTEXTUAL LOW-PROFILE DISTRICT	MC-1
MULTI-RESIDENTIAL - CONTEXTUAL GRADE-ORIENTED DISTRICT	MC-G
COMMERCIAL - CORRIDOR 2 DISTRICT	C-COR2
SPECIAL PURPOSE - SCHOOL, PARK, AND COMMUNITY RESERVE DISTRICT	S-SPR
SPECIAL PURPOSE - COMMUNITY INSTITUTION DISTRICT	S-CI
SPECIAL PURPOSE - COMMUNITY SERVICE DISTRICT	S-CS
SPECIAL PURPOSE - FUTURE URBAN DEVELOPMENT DISTRICT	S-FUD
DIRECT CONTROL DISTRICT	DC

NOTES:

1. CITY OF CALGARY ROAD MAP PROVIDED BY CANADIAN CARTOGRAPHICS CORPORATION, 2012.
2. LAND USE MAP PROVIDED BY THE CITY OF CALGARY.

ENGINEER: Clifton Associates

CLIENT: SEARS Canada Inc.

PROJECT: SOIL VAPOUR MONITORING REPORT
SUMMER 2017 AND SPRING 2018
HOUNSFIELD HEIGHTS AND NORTH HILL MALL
CALGARY, ALBERTA

TITLE: SITE LOCATION AND SURROUNDING LAND USE

DESIGNED	SCALE: AS SHOWN	DATE: 2018-05-03
DRAWN: RD/MNG/SIB	PROJECT NO.: CG2430.1 E08/E10	FIG. 1
CHECKED	FILE NO.: CG2430.1-E08_E10 Fig 1.dwg	

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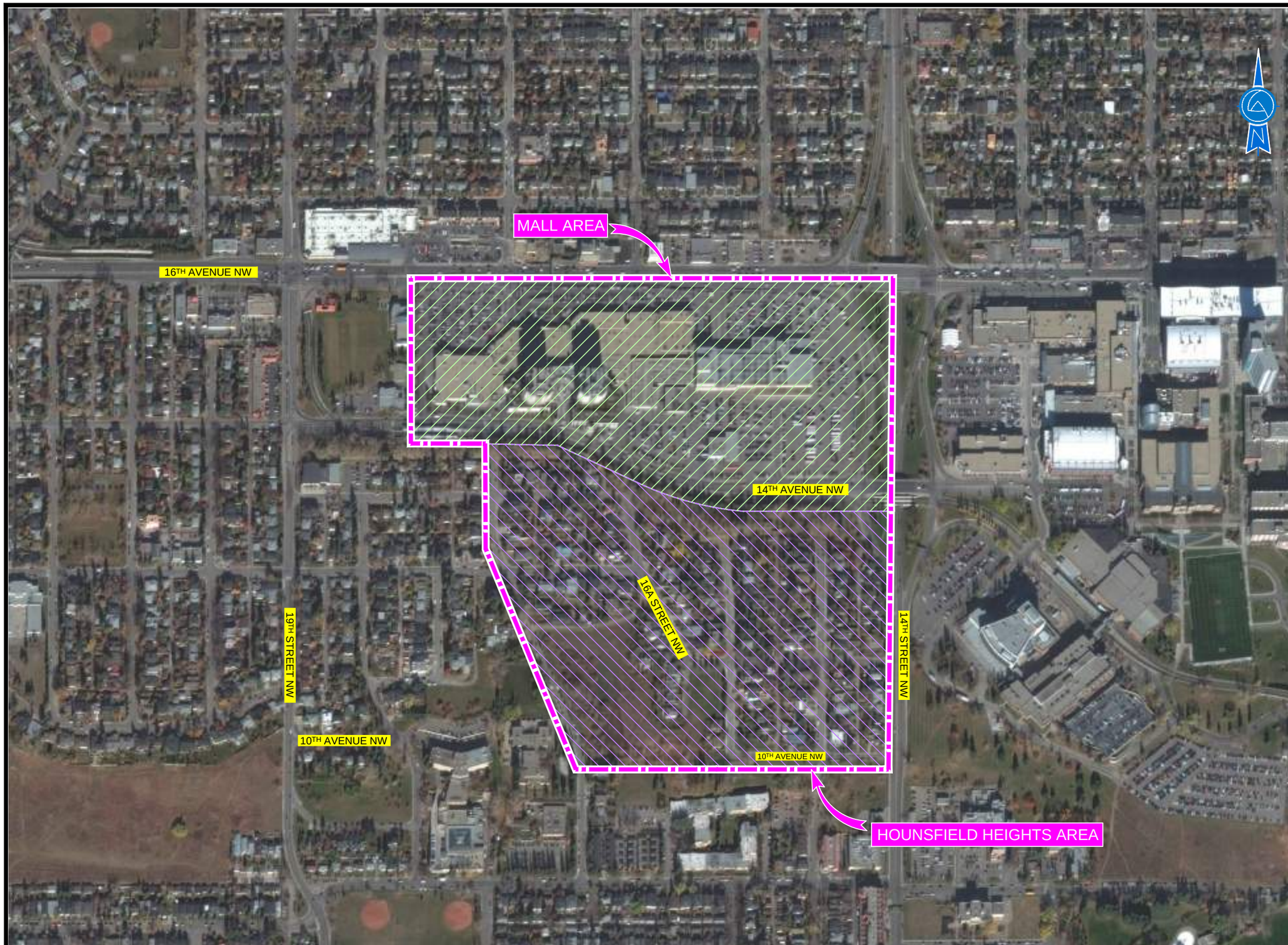

LEGEND:

SITE BOUNDARY

MALL AREA

HOUNSFIELD HEIGHTS AREA

NOTES:

1. AERIAL PHOTOGRAPH PROVIDED BY GOOGLE EARTH PRO. AIR PHOTO DATE: OCT 23, 2015.

0 50 100 150 200 250m

ENGINEER: Clifton Associates

CLIENT: SEARS Canada Inc.

PROJECT: SOIL VAPOUR MONITORING REPORT
SUMMER 2017 AND SPRING 2018
HOUNSFIELD HEIGHTS AND NORTH HILL MALL
CALGARY, ALBERTA

TITLE: SITE AND SURROUNDING PROPERTIES

DESIGNED	SCALE 1:5000	DATE 2018-05-03
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CHECKED	FILE NO. CG2430.1-E08_E10 Fig 2.dwg	

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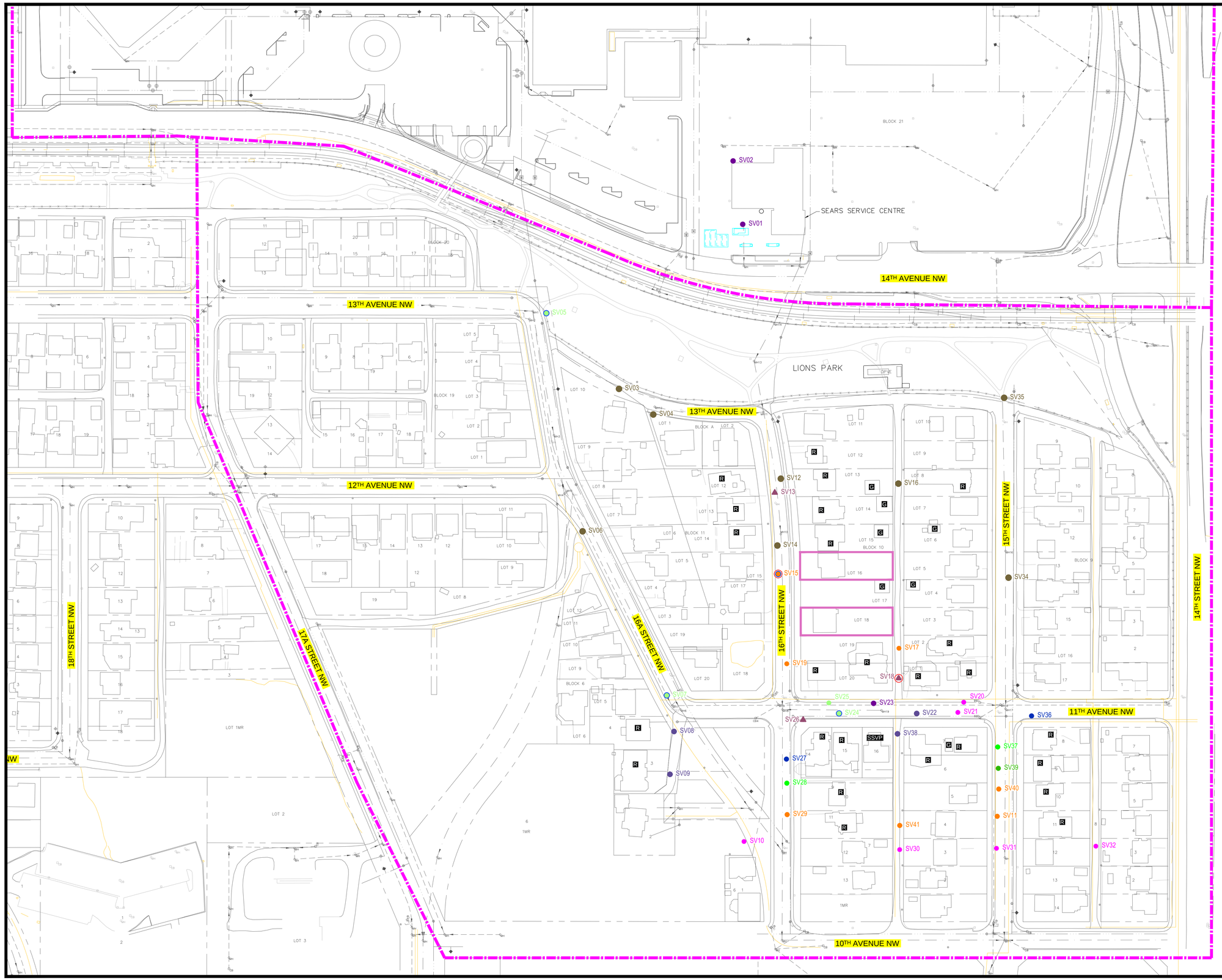

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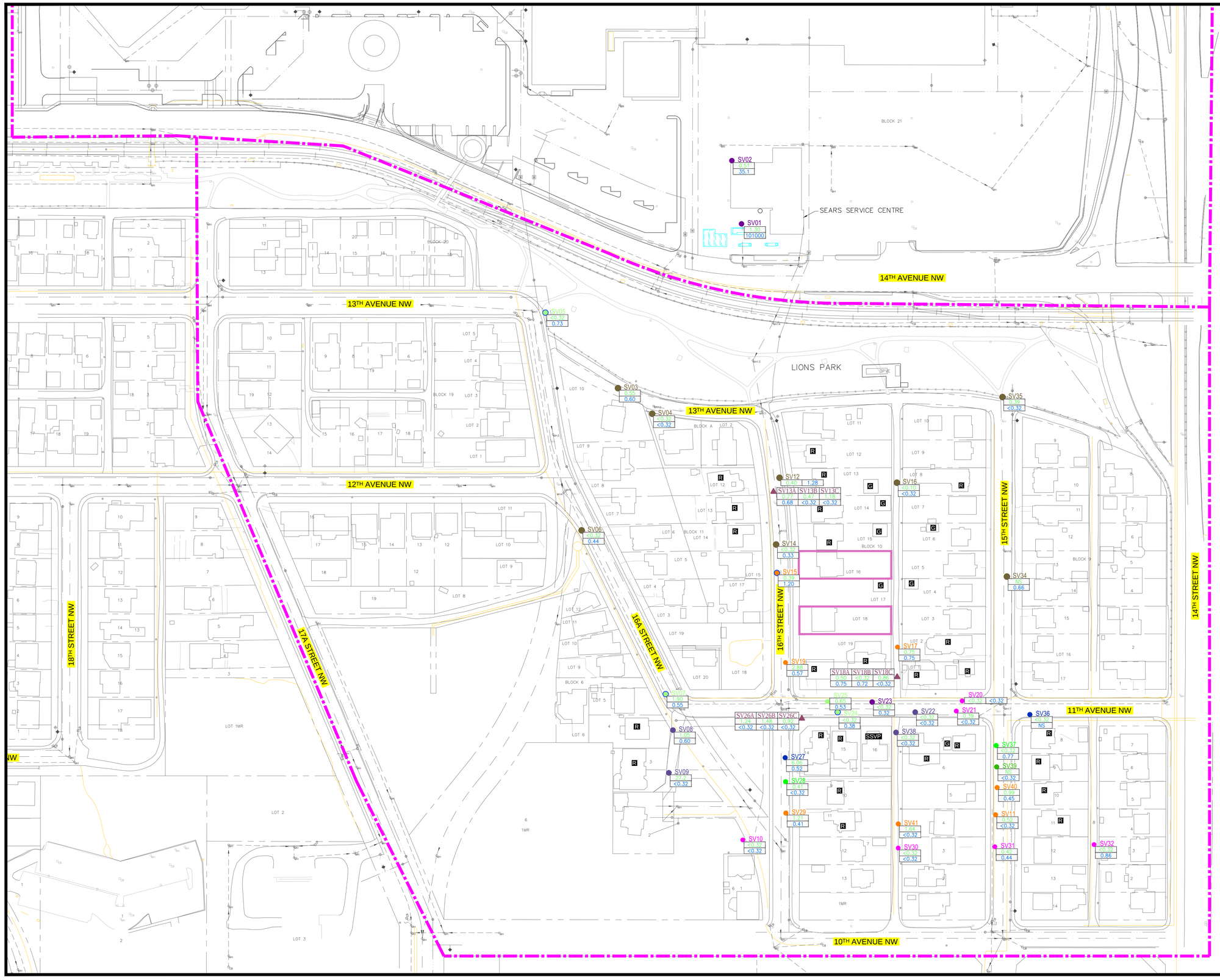

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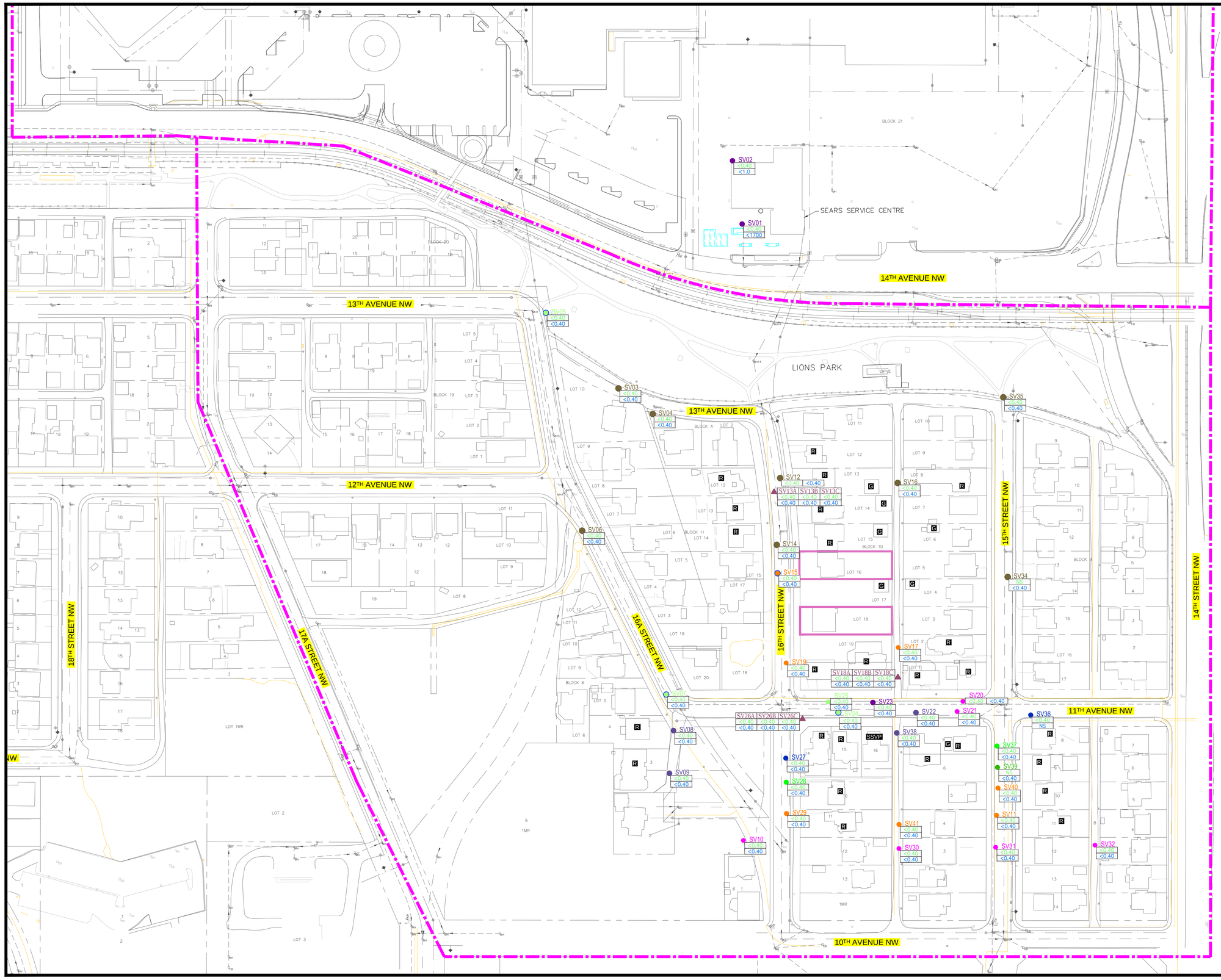

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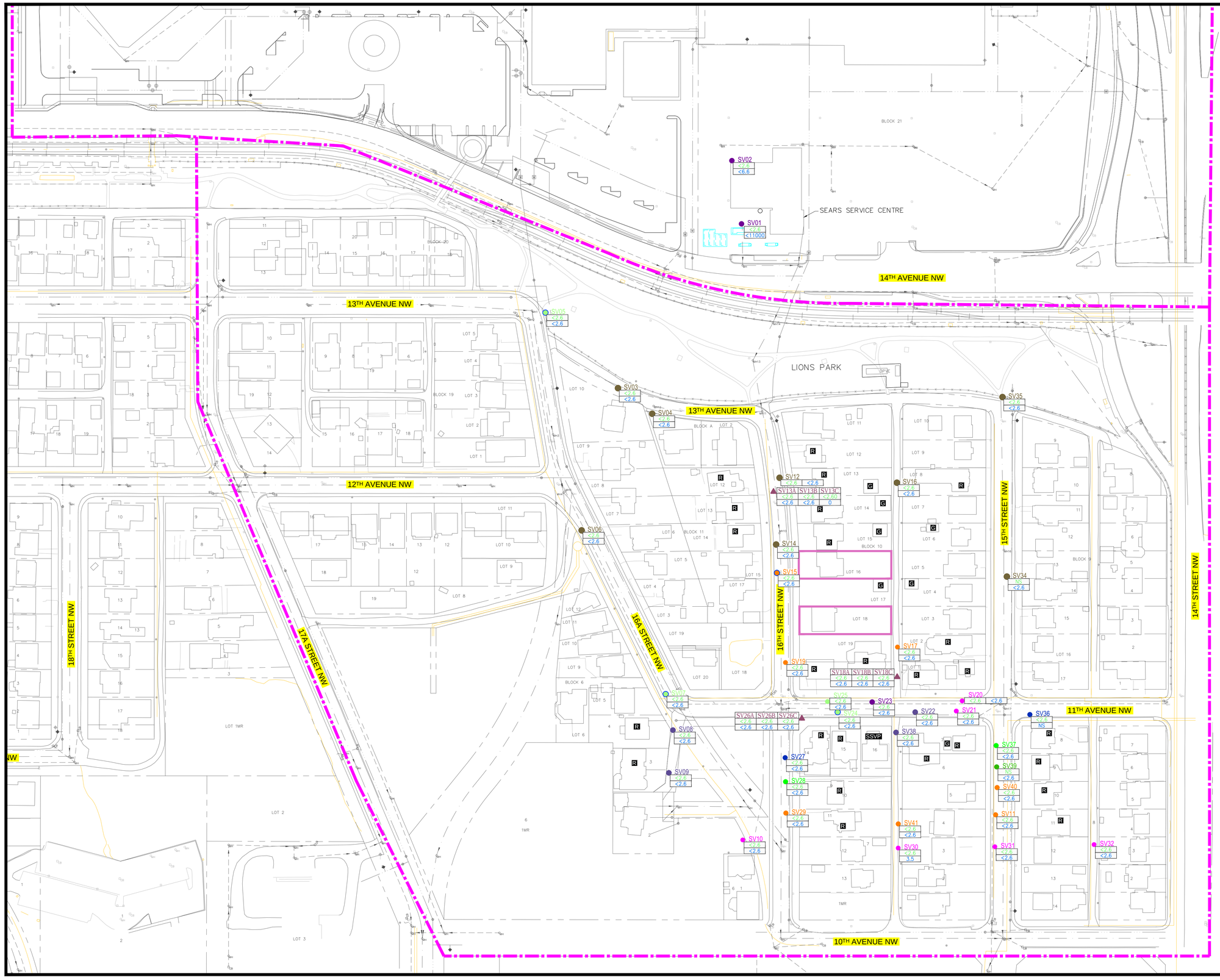

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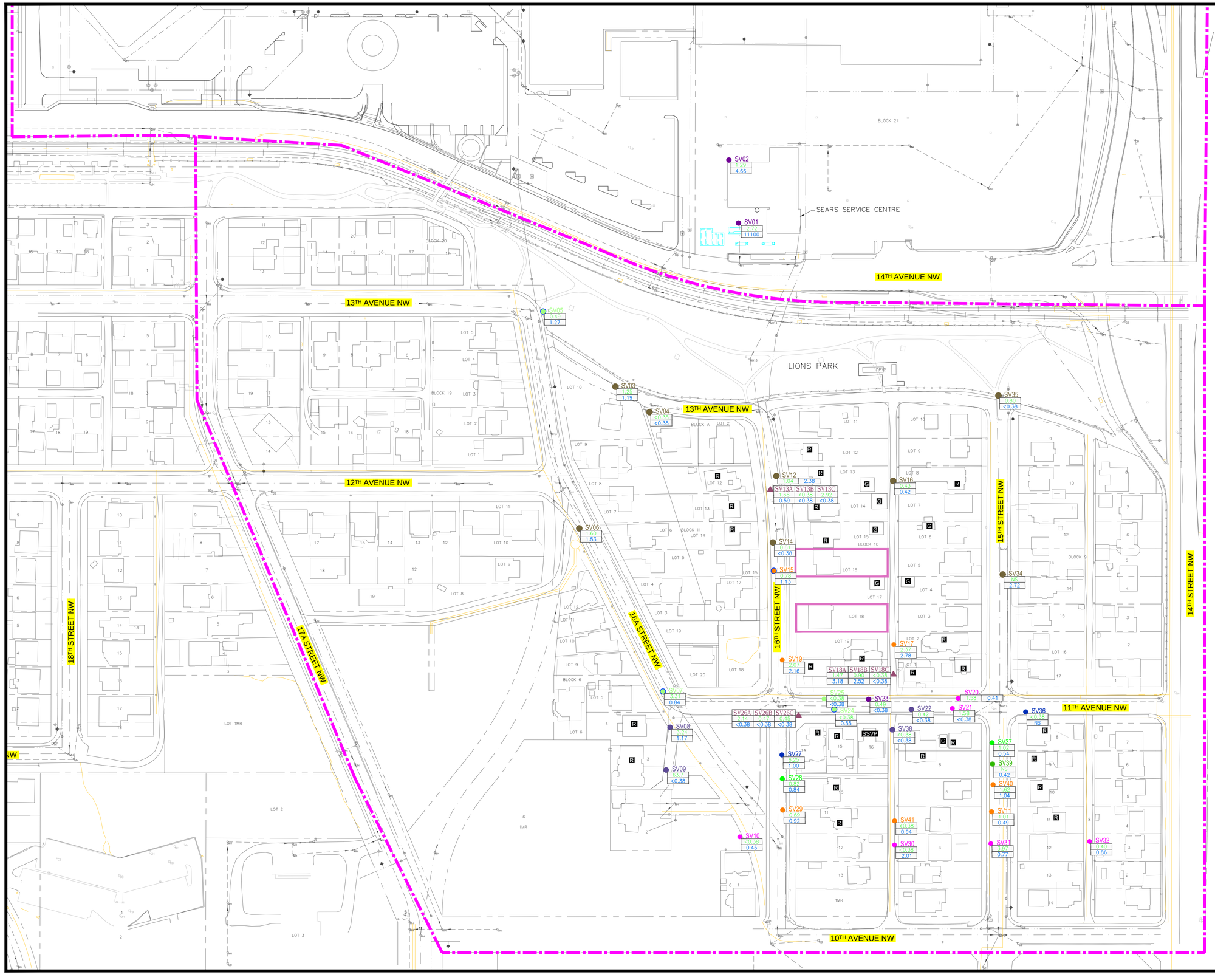
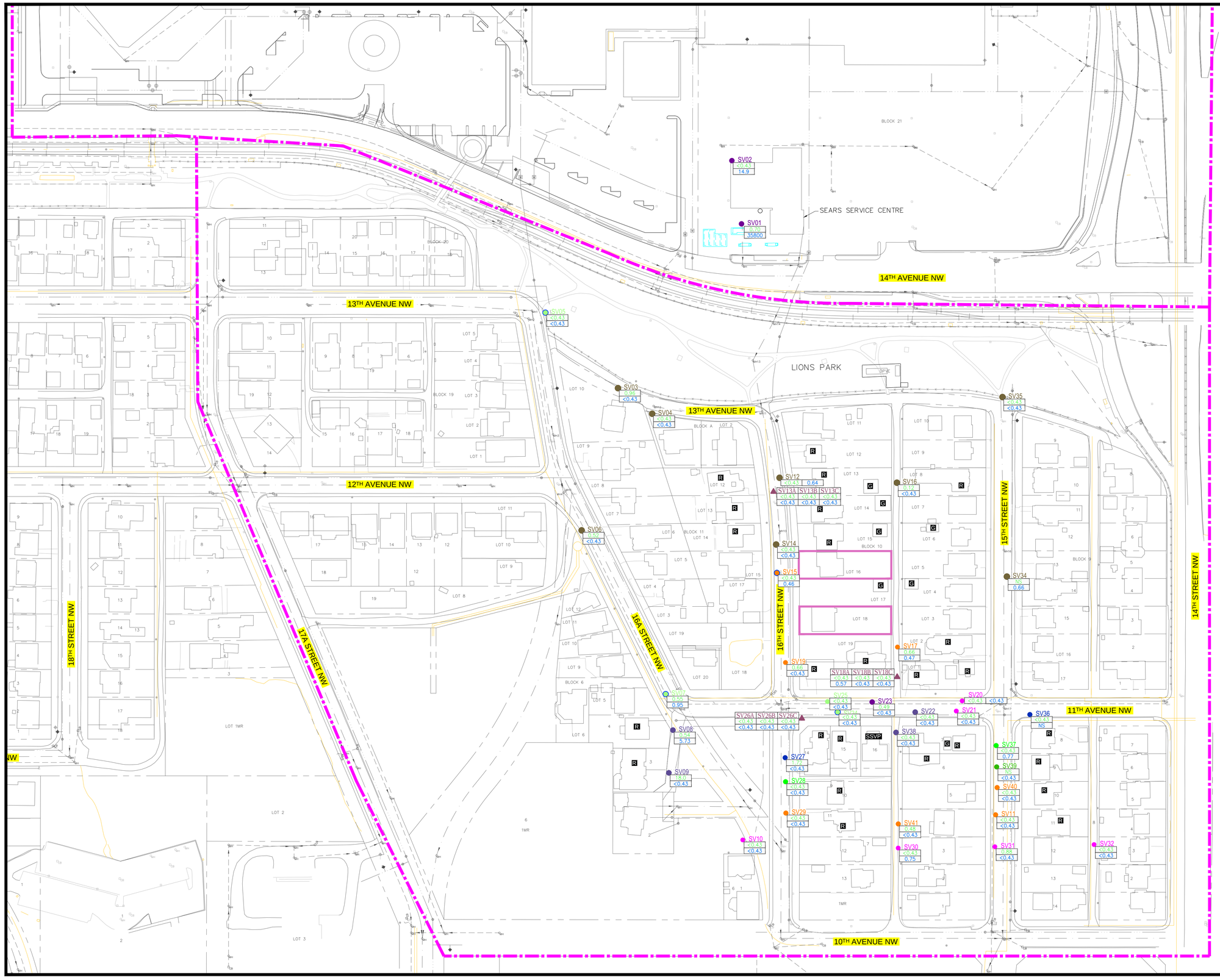


SEARS Canada Inc.



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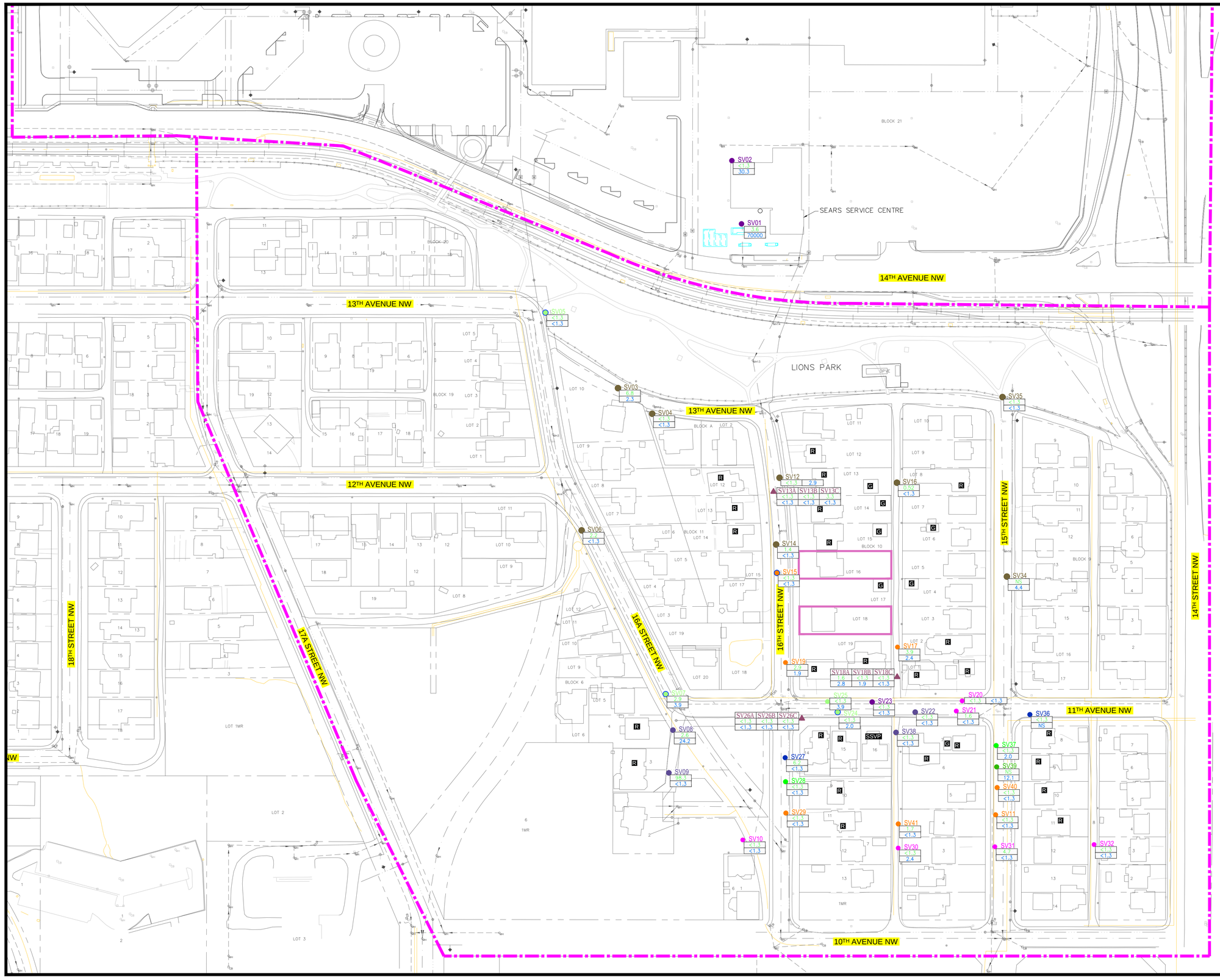

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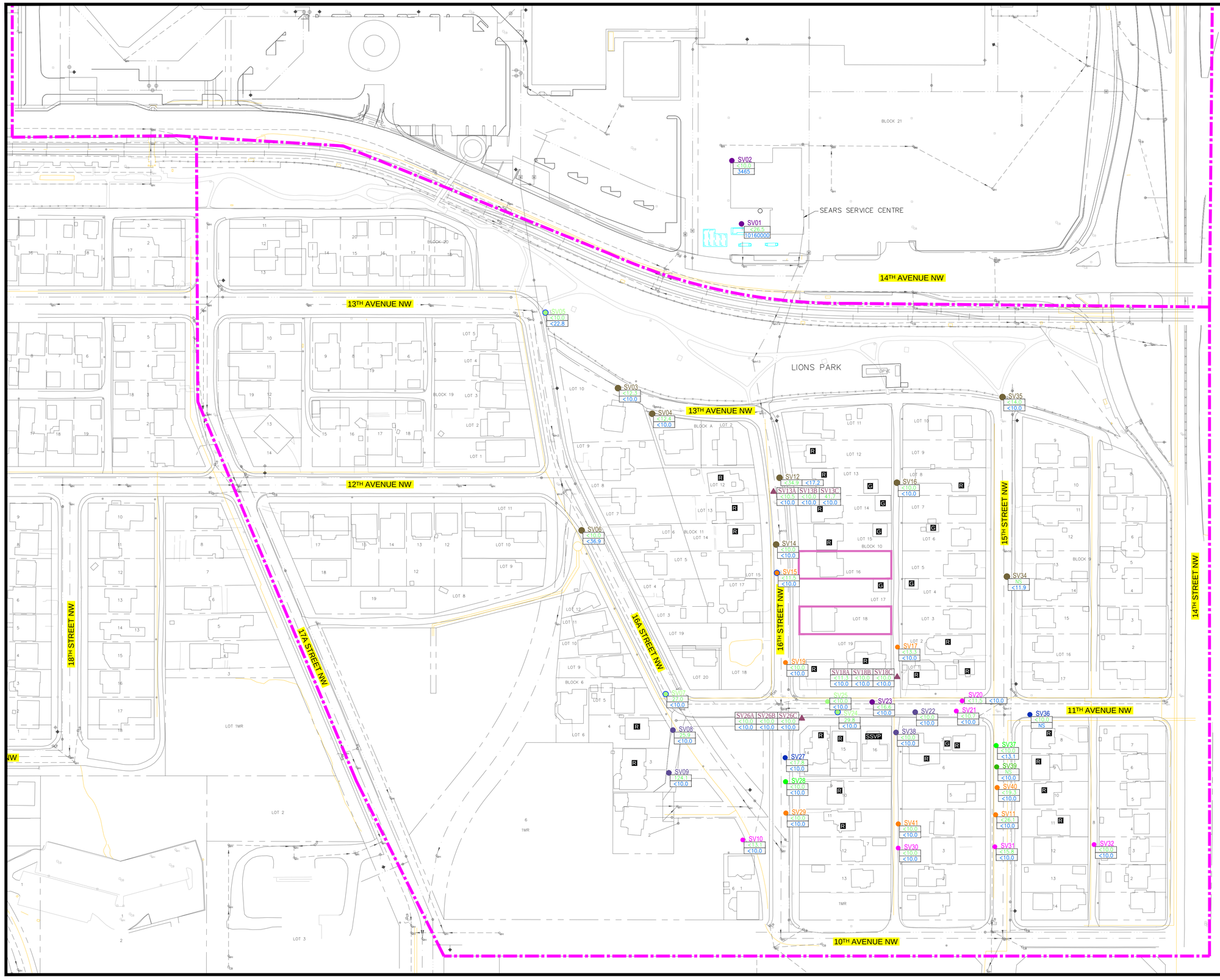

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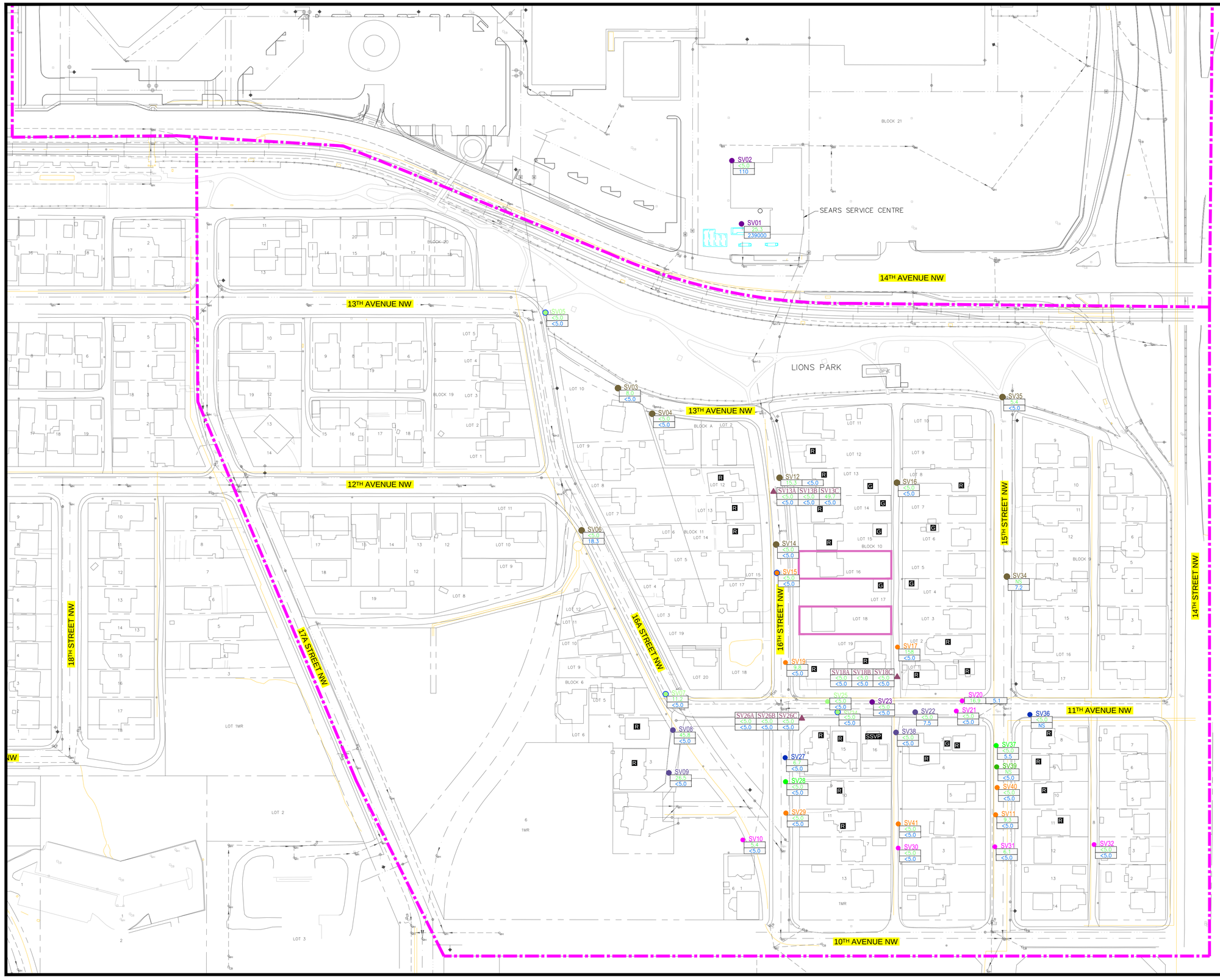
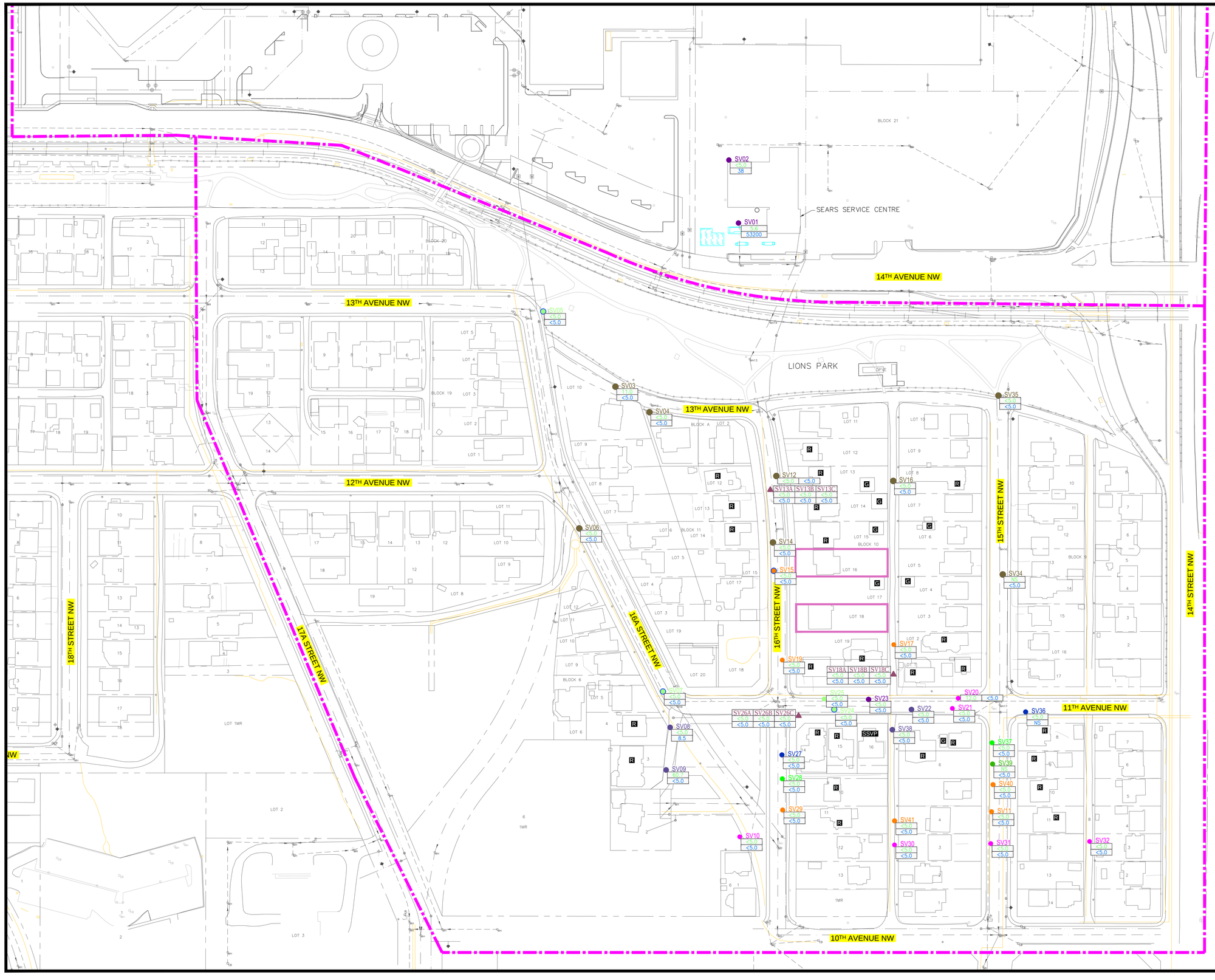
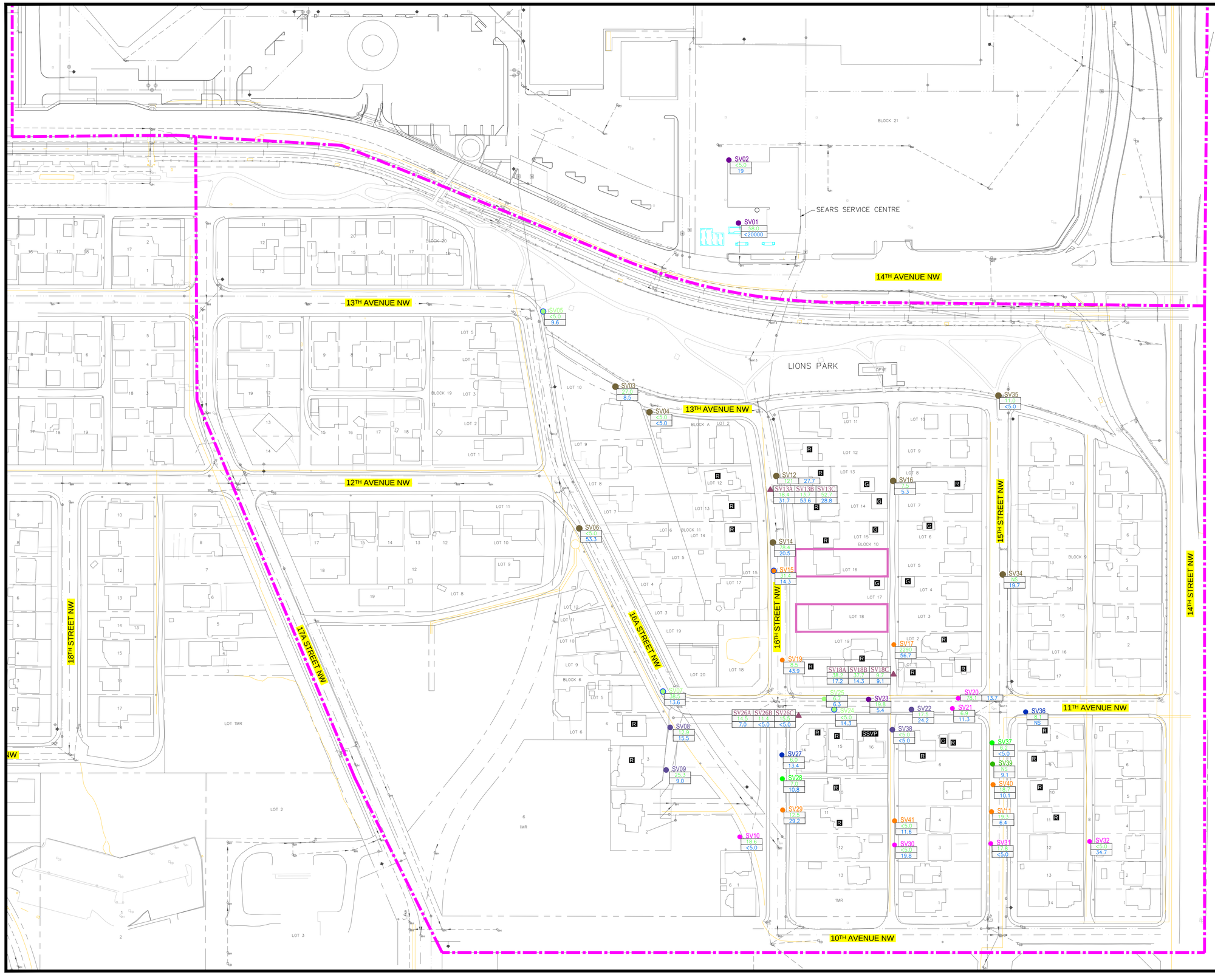


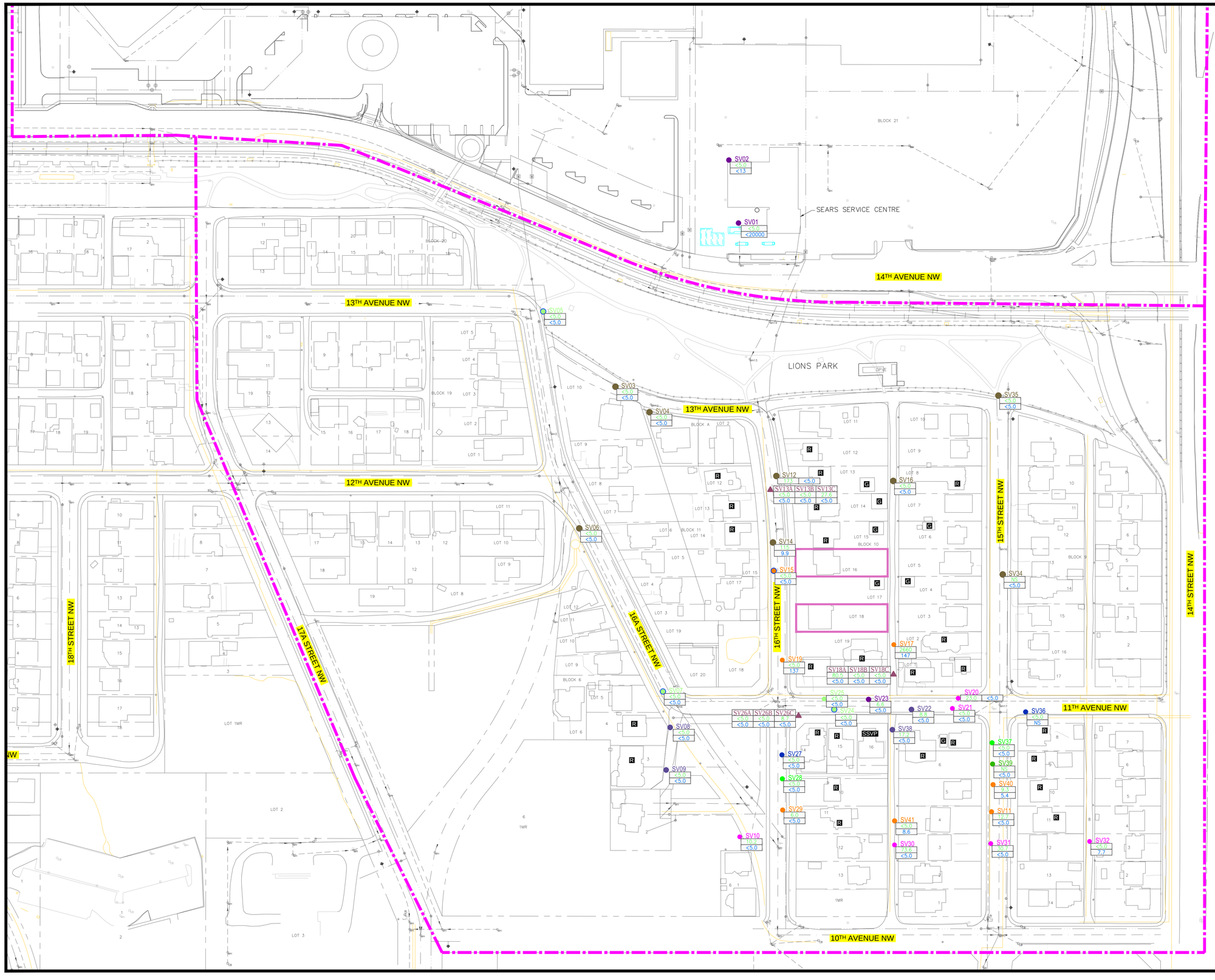
SEARS Canada Inc.



SEARS Canada Inc.



SEARS Canada Inc.



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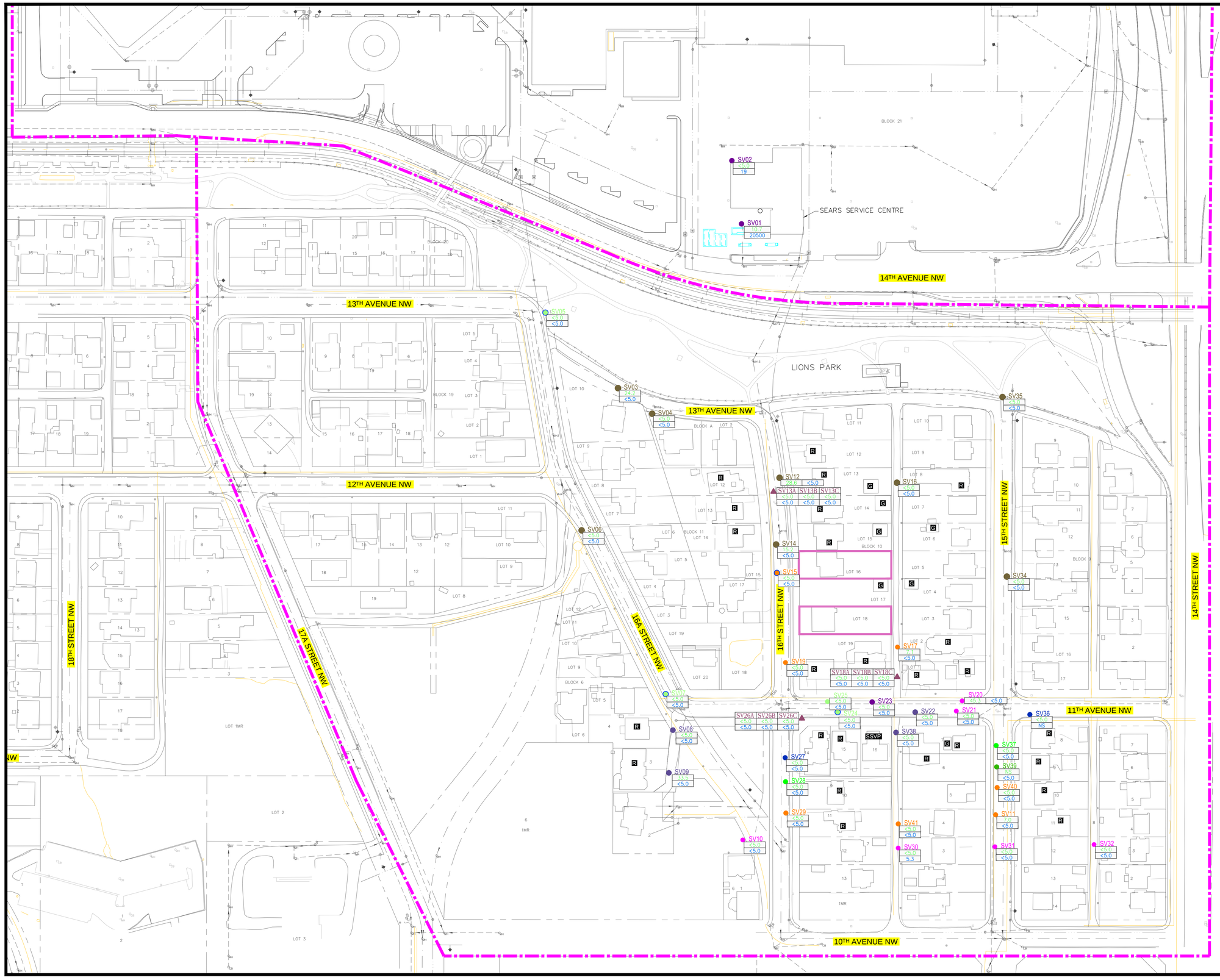
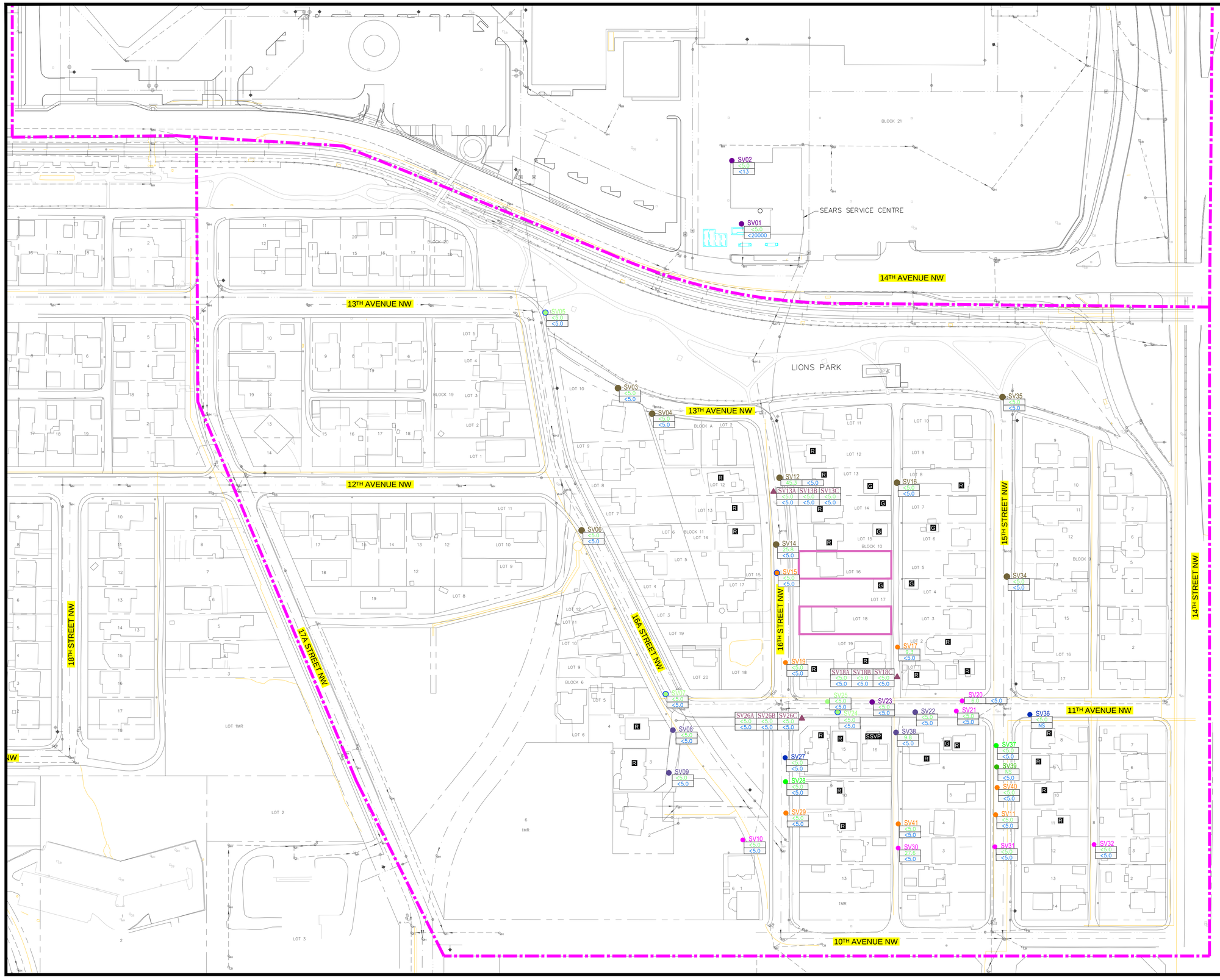


SEARS Canada Inc.



SEARS Canada Inc.

Appendix B

Clifton Associates
Analytical Results Tables
Summer 2017

Clifton Associates

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Table 1- Summary of Indoor Air Quality Laboratory Analysis
Chemicals of Potential Concern in Indoor Air
Residental Property at 11th Avenue NW, Calgary, Alberta

Sample ID	50/257	Guideline[1]
Sampling Date	14-Sep-17	
Parameter		
Benzene	1.82	3 [3]
Toluene	10.9	3880 [3]
Ethylbenzene	1.52	1000 [3]
Xylenes	7.2	180 [3]
Aliphatic >C5-C6	<5.0	700 [3]
Aliphatic >C6-C8	12.3	NG
Aliphatic C6-C8[2]	<17.3	18400 [4]
Aliphatic >C8-C10	6.4	1000 [4]
Aromatic >C8-C10	7.9	200 [4]
Aliphatic >C10-C12	13.0	1000 [4]
Aliphatic >C12-C16	<5.0	1000 [4]
Aromatic >C10-C12	7.3	200 [4]
Aromatic >C12-C16	<5.0	200 [4]
1,2-Dichloroethane (1,2-DCA)	**0.70**	0.4

Notes:

1 Human toxicity RfC, TC or UR-based generic air quality criteria-2016 AEP Tier 1 Guidelines
2 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions
3 Value based on 2008 CCME Guidelines.
4 Value based on 2010 Health Canada Guidelines.
Bold Indicates that the concentration exceeds guideline
NG No applicable guideline
All results are expressed as µg/m^3 unless otherwise noted.
Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 2- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Sub-Slab Soil Vapour
Residental Property at 11th Avenue NW, Calgary, Alberta

Sample ID	51/1761	Guideline[1]	Guideline[2]
Sampling Date	13-Sep-17		
Parameter			
Benzene	<0.32	3.0E+02	2.7E+02
Toluene	0.59	1.9E+05	1.7E+05
Ethylbenzene	<0.43	5.0E+04	4.5E+04
Xylenes	<1.3	8.9E+03	8.0E+03
Aliphatic C6-C8[3]	<12.2	9.2E+05	8.2E+05
Aliphatic C8-C10	<5.0	4.8E+04	4.3E+04
Aromatic C8-C10	<5.0	8.1E+03	7.3E+03
Aliphatic >C10-C12	13.8	5.0E+04	4.5E+04
Aliphatic >C12-C16	<5.0	5.0E+04	4.5E+04
Aromatic >C10-C12	<5.0	1.0E+04	9.0E+03
Aromatic >C12-C16	<5.0	1.0E+04	9.0E+03
Naphtalene	<2.6	1.0E+02	9.3E+01
1,2-Dichloroethane (1,2-DCA)	<0.40	4.0E+01	3.6E+01
Oxygen (% v/v)	22.5	NG	NG
Nitrogen (% v/v)	76.7	NG	NG
Methane (% v/v)	<0.2	NG	NG
Carbon Dioxide (% v/v)	0.8	NG	NG

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth < 100 cm, Intrinsik 31/8/2016

2 Inreased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 3- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Estimate of Indoor Air Quality for Residential Property at 1312 16th Street NW, Calgary, Alberta

Sample ID	SV19/379	Guideline[1]
Sampling Date	17-Jul-17	
Parameter		
Benzene	2.9	3.0E+02
Toluene	2.1	1.9E+05
Ethylbenzene	0.7	5.0E+04
Xylenes	2.9	8.9E+03
Aliphatic C6-C8[2]	<10.0	9.2E+05
Aliphatic C8-C10	9.8	4.8E+04
Aromatic C8_C10	<5.0	8.1E+03
Aliphatic >C10-C12	8.5	5.0E+04
Aliphatic >C12-C16	<5.0	5.0E+04
Aromatic >C10-C12	<5.0	1.0E+04
Aromatic >C12-C16	<5.0	1.0E+04
Naphtalene	<2.6	1.0E+02
1,2-Dichloroethane (1,2-DCA)	<0.40	4.0E+01

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth < 100 cm, Intrinsik 31/8/2016

2 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 4- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Estimate of Indoor Air Quality for Residential Property at 1316 16th Street NW, Calgary, Alberta

Sample ID	SV15/233	Guideline[1]
Sampling Date	14-Jul-17	
Parameter		
Benzene	0.4	3.0E+02
Toluene	0.8	1.9E+05
Ethylbenzene	<0.43	5.0E+04
Xylenes	<1.3	8.9E+03
Aliphatic C6-C8[2]	<11.5	9.2E+05
Aliphatic C8-C10	<5.0	4.8E+04
Aromatic C8_C10	<5.0	8.1E+03
Aliphatic >C10-C12	31.4	5.0E+04
Aliphatic >C12-C16	<5.0	5.0E+04
Aromatic >C10-C12	<5.0	1.0E+04
Aromatic >C12-C16	<5.0	1.0E+04
Naphtalene	<2.6	1.0E+02
1,2-Dichloroethane (1,2-DCA)	<0.40	4.0E+01

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth < 100 cm, Intrinsik 31/8/2016

2 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 5- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 1.0 m bgs

Sample ID	SV30/1754	SV10/2477	SV32/358	SV31/395	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	1.0	1.0	1.0	1.0		
Sampling Date	21-Jul-17	17-Jul-17	21-Jul-17	19-Jul-17		
Parameter						
Benzene	<0.32	<0.32	<0.32	0.42	3.0E+02	2.7E+02
Toluene	<0.38	<0.38	0.40	3.97	1.9E+05	1.7E+05
Ethylbenzene	<0.43	<0.43	<0.43	0.88	5.0E+04	4.5E+04
Xylenes	<1.3	<1.3	<1.3	4.7	8.9E+03	8.0E+03
Aliphatic C6-C8[3]	<10.0	<13.1	<10.0	<15.8	9.2E+05	8.2E+05
Aliphatic C8-C10	<5.0	5.4	<5.0	6.1	4.8E+04	4.3E+04
Aromatic C8-C10	<5.0	<5.0	<5.0	<5.0	8.1E+03	7.3E+03
Aliphatic >C10-C12	<5.0	18.6	<5.0	17.8	5.0E+04	4.5E+04
Aliphatic >C12-C16	73.6	10.2	<5.0	30.7	5.0E+04	4.5E+04
Aromatic >C10-C12	<5.0	<5.0	<5.0	<5.0	1.0E+04	9.0E+03
Aromatic >C12-C16	27.6	<5.0	<5.0	<5.0	1.0E+04	9.0E+03
Naphtalene	<2.6	<2.6	<2.6	<2.6	1.0E+02	9.3E+01
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	<0.40	4.0E+01	3.6E+01

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth < 100 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 6- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 1.5 m bgs

Sample ID	SV11/2582	SV40/386	SV29/2468	SV41/334	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	1.5	1.5	1.5	1.5		
Sampling Date	19-Jul-17	19-Jul-17	17-Jul-17	21-Jul-17		
Parameter						
Benzene	0.52	0.99	1.21	1.64	3.0E+02	2.7E+02
Toluene	1.01	1.62	0.69	<0.38	1.9E+05	1.7E+05
Ethylbenzene	<0.43	<0.43	<0.43	0.48	5.0E+04	4.5E+04
Xylenes	<1.3	<1.3	<1.3	1.7	8.9E+03	8.0E+03
Aliphatic C6-C8[3]	<26.1	<19.3	<10.0	<10.0	9.2E+05	8.2E+05
Aliphatic C8-C10	9.3	<5.0	<5.0	<5.0	4.8E+04	4.3E+04
Aromatic C8_C10	<5.0	<5.0	<5.0	<5.0	8.1E+03	7.3E+03
Aliphatic >C10-C12	19.3	18.7	12.5	<5.0	5.0E+04	4.5E+04
Aliphatic >C12-C16	12.7	9.3	6.0	<5.0	5.0E+04	4.5E+04
Aromatic >C10-C12	7.0	<5.0	<5.0	<5.0	1.0E+04	9.0E+03
Aromatic >C12-C16	<5.0	<5.0	<5.0	<5.0	1.0E+04	9.0E+03
Naphtalene	<2.6	<2.6	<2.6	<2.6	1.0E+02	9.3E+01
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	<0.40	4.0E+01	3.6E+01

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth < 100 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 7- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 2.0 m bgs

Sample ID	SV26C/415	SV18C/284	SV39	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	2.0	2.0	2.0		
Sampling Date	17-Jul-17	18-Jul-17	17-Jul-17		
Parameter					
Benzene	0.92	0.86	NS	1.6E+05	1.4E+05
Toluene	0.45	<0.38	NS	9.8E+07	8.8E+07
Ethylbenzene	<0.43	<0.43	NS	2.7E+07	2.4E+07
Xylenes	<1.3	<1.3	NS	4.7E+06	4.3E+06
Aliphatic C6-C8[3]	<10.0	<10.0	NS	5.3E+08	4.8E+08
Aliphatic C8-C10	<5.0	<5.0	NS	2.8E+07	2.5E+07
Aromatic C8_C10	<5.0	<5.0	NS	4.7E+06	4.2E+06
Aliphatic >C10-C12	15.5	9.7	NS	2.9E+07	2.6E+07
Aliphatic >C12-C16	8.7	<5.0	NS	2.9E+07	2.6E+07
Aromatic >C10-C12	<5.0	<5.0	NS	5.8E+06	5.2E+06
Aromatic >C12-C16	<5.0	<5.0	NS	5.8E+06	5.2E+06
Naphtalene	<2.6	<2.6	NS	5.7E+03	5.2E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	NS	1.9E+03	1.7E+03
Oxygen (% v/v)	22.7	18.8		NG	NG
Nitrogen (% v/v)	77.0	80.8		NG	NG
Methane (% v/v)	<0.3	<0.2		NG	NG
Carbon Dioxide (% v/v)	0.3	0.4		NG	NG

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 200 cm, Intrinsik 31/8/2016
2 Increased monitoring frequency trigger values
3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions
Bold Indicates that the concentration exceeds guideline
\- Analysis not completed
NG No applicable guideline
NS Not sampled. See report for details
All results are expressed as µg/m^3 unless otherwise noted.
Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 8- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 2.5 m bgs

Sample ID	SV13C/272	SV37/347	SV28/1464	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	2.5	2.5	2.5		
Sampling Date	14-Jul-17	19-Jul-17	17-Jul-17		
Parameter					
Benzene	1.18	<0.32	0.41	1.6E+05	1.5E+05
Toluene	2.92	1.02	0.82	1.0E+08	9.2E+07
Ethylbenzene	<0.43	<0.43	<0.43	2.8E+07	2.5E+07
Xylenes	3.3	<1.3	<1.3	4.9E+06	4.4E+06
Aliphatic C6-C8[3]	41.7	<10.0	<10.0	5.6E+08	5.1E+08
Aliphatic C8-C10	49.7	<5.0	<5.0	2.9E+07	2.7E+07
Aromatic C8_C10	<5.0	<5.0	<5.0	5.0E+06	4.5E+06
Aliphatic >C10-C12	52.7	6.2	7.0	3.1E+07	2.8E+07
Aliphatic >C12-C16	27.6	<5.0	<5.0	3.1E+07	2.8E+07
Aromatic >C10-C12	<5.0	<5.0	<5.0	6.1E+06	5.5E+06
Aromatic >C12-C16	<5.0	<5.0	<5.0	6.1E+06	5.5E+06
Naphtalene	<2.6	<2.6	<2.6	6.0E+03	5.4E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	2.0E+03	1.8E+03
Oxygen (% v/v)	21.9			NG	NG
Nitrogen (% v/v)	76.3			NG	NG
Methane (% v/v)	<0.2			NG	NG
Carbon Dioxide (% v/v)	1.8			NG	NG

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 250 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

\- Analysis not completed

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 9- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 3.0 m bgs

Sample ID	SV36/337	SV27/2398	SV18B/1529	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	3.0	3.0	3.0		
Sampling Date	19-Jul-17	17-Jul-17	20-Jul-17		
Parameter					
Benzene	<0.32	6.06	<0.32	1.6E+05	1.4E+05
Toluene	<0.38	6.25	0.90	9.8E+07	8.8E+07
Ethylbenzene	<0.43	1.72	<0.43	2.7E+07	2.4E+07
Xylenes	<1.3	6.2	<1.3	4.7E+06	4.3E+06
Aliphatic C6-C8[3]	<10.0	<17.8	<10.0	5.3E+08	4.8E+08
Aliphatic C8-C10	<5.0	6.7	<5.0	2.8E+07	2.5E+07
Aromatic C8_C10	<5.0	<5.0	<5.0	4.7E+06	4.2E+06
Aliphatic >C10-C12	8.1	6.0	37.7	2.9E+07	2.6E+07
Aliphatic >C12-C16	<5.0	<5.0	<5.0	2.9E+07	2.6E+07
Aromatic >C10-C12	<5.0	<5.0	<5.0	5.8E+06	5.2E+06
Aromatic >C12-C16	<5.0	<5.0	<5.0	5.8E+06	5.2E+06
Naphtalene	<2.6	<2.6	<2.6	5.7E+03	5.2E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	1.9E+03	1.7E+03
Oxygen (% v/v)	-	-	22.5	NG	NG
Nitrogen (% v/v)	-	-	77.4	NG	NG
Methane (% v/v)	-	-	<0.2	NG	NG
Carbon Dioxide (% v/v)	-	-	<0.2	NG	NG

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 300 cm, Intrinsik 31/8/2016

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

2 Increased monitoring frequency trigger values

Bold Indicates that the concentration exceeds guideline

\- Analysis not completed

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 10- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 3.5 m bgs

Sample ID	SV21/1897	SV20/2505	SV26B/2523	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	3.5	3.5	3.5		
Sampling Date	21-Jul-17	21-Jul-17	17-Jul-17		
Parameter					
Benzene	0.39	<0.32	1.48	1.8E+05	1.6E+05
Toluene	1.16	1.58	0.47	1.1E+08	9.8E+07
Ethylbenzene	<0.43	<0.43	<0.43	3.0E+07	2.7E+07
Xylenes	1.6	<1.3	<1.3	5.3E+06	4.8E+06
Aliphatic C6-C8[3]	<10.7	<11.5	<10.0	6.2E+08	5.6E+08
Aliphatic C8-C10	<5.0	16.9	<5.0	3.3E+07	2.9E+07
Aromatic C8_C10	<5.0	12.0	<5.0	5.5E+06	5.0E+06
Aliphatic >C10-C12	6.9	78.1	11.4	3.4E+07	3.1E+07
Aliphatic >C12-C16	<5.0	23.0	<5.0	3.4E+07	3.1E+07
Aromatic >C10-C12	<5.0	45.3	<5.0	6.8E+06	6.1E+06
Aromatic >C12-C16	<5.0	6.0	<5.0	6.8E+06	6.1E+06
Naphtalene	<2.6	<2.6	<2.6	6.6E+03	5.9E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	2.1E+03	1.9E+03
Oxygen (% v/v)	-	-	22.5	N/A	N/A
Nitrogen (% v/v)	-	-	76.4	N/A	N/A
Methane (% v/v)	-	-	<0.2	N/A	N/A
Carbon Dioxide (% v/v)	-	-	1.1	N/A	N/A

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 350 cm, Intrinsik 31/8/2016

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

2 Increased monitoring frequency trigger values

Bold Indicates that the concentration exceeds guideline

\- Analysis not completed

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 11- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 4.0 m bgs

Sample ID	SV08 / 1241	SV09/1512	SV38/1370	SV13B/200	SV15/233	SV18A/1405	SV22/2521	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Sampling Date	25-Jul-17	13-Jul-17	21-Jul-17	14-Jul-17	14-Jul-17	20-Jul-17	18-Jul-17		
Parameter									
Benzene	1.05	27.2	<0.32	0.47	0.39	0.50	<0.32	1.8E+05	1.6E+05
Toluene	3.24	63.7	<0.38	0.60	0.78	1.47	0.42	1.1E+08	1.0E+08
Ethylbenzene	0.54	18.0	<0.43	<0.43	<0.43	<0.43	<0.43	3.1E+07	2.8E+07
Xylenes	2.6	98.3	<1.3	<1.3	<1.3	1.6	<1.3	5.5E+06	4.9E+06
Aliphatic C6-C8[3]	25.9	124.1	<10.0	<10.0	<11.5	<11.3	<10.0	6.5E+08	5.9E+08
Aliphatic C8-C10	45.8	26.5	<5.0	<5.0	<5.0	<5.0	<5.0	3.4E+07	3.1E+07
Aromatic C8_C10	<5.0	60.7	<5.0	<5.0	<5.0	<5.0	<5.0	5.8E+06	5.2E+06
Aliphatic >C10-C12	12.9	25.3	<5.0	13.7	31.4	38.2	17.5	3.6E+07	3.2E+07
Aliphatic >C12-C16	<5.0	<5.0	17.2	<5.0	<5.0	80.5	8.8	3.6E+07	3.2E+07
Aromatic >C10-C12	<5.0	33.5	<5.0	<5.0	<5.0	<5.0	<5.0	7.1E+06	6.4E+06
Aromatic >C12-C16	<5.0	<5.0	9.8	<5.0	<5.0	<5.0	<5.0	7.1E+06	6.4E+06
Naphtalene	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	6.9E+03	6.2E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	2.2E+03	1.9E+03
Oxygen (% v/v)				21.3		21.5		N/A	N/A
Nitrogen (% v/v)				76.6		78.4		N/A	N/A
Methane (% v/v)				<0.2		<0.2		N/A	N/A
Carbon Dioxide (% v/v)				2.1		<0.2		N/A	N/A

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 400 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

\- Analysis not completed

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 12- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 4.5 m bgs

Sample ID	SV23/2526	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	4.5		
Sampling Date	18-Jul-17		
Parameter			
Benzene	<0.32	1.9E+05	1.7E+05
Toluene	0.49	1.2E+08	1.0E+08
Ethylbenzene	0.49	3.2E+07	2.9E+07
Xylenes	<1.3	5.7E+06	5.1E+06
Aliphatic C6-C8[3]	<16.6	6.8E+08	6.1E+08
Aliphatic C8-C10	<5.0	3.6E+07	3.2E+07
Aromatic C8_C10	<5.0	6.1E+06	5.4E+06
Aliphatic >C10-C12	19.8	3.7E+07	3.4E+07
Aliphatic >C12-C16	6.6	3.7E+07	3.4E+07
Aromatic >C10-C12	<5.0	7.4E+06	6.7E+06
Aromatic >C12-C16	<5.0	7.4E+06	6.7E+06
Naphtalene	<2.6	7.2E+03	6.5E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	2.2E+03	2.0E+03

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 450 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 13- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 5.0 m bgs

Sample ID	SV26A/338	SV24/237	SV05/1486	SV25/2549	SV07/363	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	5.0	5.0	5.0	5.0	5.0		
Sampling Date	17-Jul-17	18-Jul-17	12-Jul-17	18-Jul-17	13-Jul-17		
Parameter							
Benzene	1.24	<0.32	<0.32	0.65	1.90	1.9E+05	1.7E+05
Toluene	2.14	<0.38	0.49	<0.38	3.31	1.2E+08	1.1E+08
Ethylbenzene	<0.43	<0.43	<0.43	<0.43	0.55	3.3E+07	3.0E+07
Xylenes	<1.3	<1.3	<1.3	<1.3	2.9	5.9E+06	5.3E+06
Aliphatic C6-C8[3]	<10.0	29.8	<10.0	<10.0	27.0	7.1E+08	6.4E+08
Aliphatic C8-C10	<5.0	<5.0	<5.0	<5.0	11.2	3.7E+07	3.4E+07
Aromatic C8_C10	<5.0	<5.0	<5.0	<5.0	<5.0	6.3E+06	5.7E+06
Aliphatic >C10-C12	14.5	<5.0	<5.0	6.7	38.5	3.9E+07	3.5E+07
Aliphatic >C12-C16	<5.0	<5.0	<5.0	<5.0	<5.0	3.9E+07	3.5E+07
Aromatic >C10-C12	<5.0	<5.0	<5.0	<5.0	<5.0	7.8E+06	7.0E+06
Aromatic >C12-C16	<5.0	<5.0	<5.0	<5.0	<5.0	7.8E+06	7.0E+06
Naphtalene	<2.6	<2.6	<2.6	<2.6	<2.6	7.5E+03	6.7E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	<0.40	<0.40	2.3E+03	2.1E+03
Oxygen (% v/v)	21.8					NG	NG
Nitrogen (% v/v)	76.4					NG	NG
Methane (% v/v)	<0.2					NG	NG
Carbon Dioxide (% v/v)	1.8					NG	NG

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 500 cm, Intrinsik 31/8/2016
2 Increased monitoring frequency trigger values
3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions
2 Increased monitoring frequency trigger values
Bold Indicates that the concentration exceeds guideline
- Analysis not completed
NG No applicable guideline
All results are expressed as µg/m^3 unless otherwise noted.
Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 14- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 5.5 m bgs

Sample ID	SV17/2463	SV19/379	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	5.5	5.5		
Sampling Date	20-Jul-17	17-Jul-17		
Parameter				
Benzene	0.75	2.88	2.0E+05	1.8E+05
Toluene	2.37	2.07	1.2E+08	1.1E+08
Ethylbenzene	0.66	0.66	3.4E+07	3.1E+07
Xylenes	3.9	2.9	6.1E+06	5.5E+06
Aliphatic C6-C8[3]	<13.3	<10.0	7.4E+08	6.7E+08
Aliphatic C8-C10	158	9.8	3.9E+07	3.5E+07
Aromatic C8_C10	<5.0	<5.0	6.6E+06	5.9E+06
Aliphatic >C10-C12	2290	8.5	4.1E+07	3.6E+07
Aliphatic >C12-C16	2660	<5.0	4.1E+07	3.6E+07
Aromatic >C10-C12	7.1	<5.0	8.1E+06	7.3E+06
Aromatic >C12-C16	9.3	<5.0	8.1E+06	7.3E+06
Naphtalene	<2.6	<2.6	7.7E+03	7.0E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	2.3E+03	2.1E+03

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 550 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 15A- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 6.0 m bgs

Sample ID	SV13A/1536	SV06/1289	SV16/1481	SV04/2501	SV34	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	6.0	6.0	6.0	6.0	6.0		
Sampling Date	14-Jul-17	12-Jul-17	20-Jul-17	12-Jul-17	12-Jul-17		
Parameter							
Benzene	0.77	<0.32	<0.10	<0.32	NS	2.0E+05	1.8E+05
Toluene	1.66	1.60	0.43	<0.38	NS	1.3E+08	1.1E+08
Ethylbenzene	<0.43	0.52	0.12	<0.43	NS	3.5E+07	3.2E+07
Xylenes	<1.3	2.2	0.52	<1.3	NS	6.2E+06	5.6E+06
Aliphatic C6-C8[3]	<10.5	<10.0	<10.0	<12.4	NS	7.7E+08	6.9E+08
Aliphatic C8-C10	<5.0	<5.0	<5.0	<5.0	NS	4.1E+07	3.6E+07
Aromatic C8_C10	<5.0	<5.0	<5.0	<5.0	NS	6.9E+06	6.2E+06
Aliphatic >C10-C12	18.4	<5.0	7.5	<5.0	NS	4.2E+07	3.8E+07
Aliphatic >C12-C16	<5.0	<5.0	<5.0	<5.0	NS	4.2E+07	3.8E+07
Aromatic >C10-C12	<5.0	<5.0	<5.0	<5.0	NS	8.4E+06	7.6E+06
Aromatic >C12-C16	<5.0	<5.0	<5.0	<5.0	NS	8.4E+06	7.6E+06
Naphtalene	<2.6	<2.6	<2.6	<2.6	NS	8.0E+03	7.2E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	<0.40	NS	2.4E+03	2.2E+03
Oxygen (% v/v)	23.0					N/A	N/A
Nitrogen (% v/v)	77.0					N/A	N/A
Methane (% v/v)	<0.2					N/A	N/A
Carbon Dioxide (% v/v)	<0.2					N/A	N/A

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 600 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

\- Analysis not completed

NG No applicable guideline

NS Not sampled. See report for details

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 15B- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Residential Buildings-Installation Depth 6.0 m bgs

Sample ID	SV03/2570	SV35/1325	SV12/1432	SV14/1783	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	6.0	6.0	6.0	6.0		
Sampling Date	12-Jul-17	13-Jul-17	14-Jul-17	14-Jul-17		
Parameter						
Benzene	0.55	0.39	0.40	<0.32	2.0E+05	1.8E+05
Toluene	1.25	0.80	1.04	0.61	1.3E+08	1.1E+08
Ethylbenzene	0.96	<0.43	<0.43	<0.43	3.5E+07	3.2E+07
Xylenes	6.8	<1.3	<1.3	1.4	6.2E+06	5.6E+06
Aliphatic C6-C8[3]	<12.3	<14.0	<34.9	<10.0	7.7E+08	6.9E+08
Aliphatic C8-C10	8.0	5.4	15.3	<5.0	4.1E+07	3.6E+07
Aromatic C8_C10	11.0	<5.0	<5.0	<5.0	6.9E+06	6.2E+06
Aliphatic >C10-C12	27.0	11.0	121	78.4	4.2E+07	3.8E+07
Aliphatic >C12-C16	<5.0	<5.0	173	115	4.2E+07	3.8E+07
Aromatic >C10-C12	24.2	<5.0	28.6	15.2	8.4E+06	7.6E+06
Aromatic >C12-C16	<5.0	<5.0	45.3	25.8	8.4E+06	7.6E+06
Naphtalene	<2.6	<2.6	<2.6	<2.6	8.0E+03	7.2E+03
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	<0.40	<0.40	2.4E+03	2.2E+03

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a residential building on fine-textured soil, depth 600 cm, Intrinsik 31/8/2016

2 Increased monitoring frequency trigger values

3 Aliphatic C6-C8 values calculated by summing Aliphatic >C5-C6 and Aliphatic >C6-C8 fractions

Bold Indicates that the concentration exceeds guideline

NG No applicable guideline

All results are expressed as µg/m^3 unless otherwise noted.

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta

Table 16- Summary of Soil Vapour Laboratory Analysis
Chemicals of Potential Concern in Soil Vapour
Soil Vapour Samples-Commercial Buildings-Installation Depth 4.5 m bgs

Sample ID	SV01/1479	SV02/267	Guideline[1]	Guideline[2]
Installation Depth (m bgs)	4.5	4.5		
Sampling Date	12-Jul-17	25-Jul-17		
Parameter				
Benzene	1.30	0.51	1,900,000	1,710,000
Toluene	2.72	1.29	NGR	NGR
Ethylbenzene	0.70	<0.43	NGR	NGR
Xylenes	3.6	<1.3	NGR	NGR
Aliphatic C6-C8[3]	<26.5	<10.0	NGR	NGR
Aliphatic C8-C10	25.3	<5.0	NGR	NGR
Aromatic C8_C10	5.6	<5.0	NGR	NGR
Aliphatic >C10-C12	58.0	<5.0	NGR	NGR
Aliphatic >C12-C16	<5.0	<5.0	NGR	NGR
Aromatic >C10-C12	10.7	<5.0	NGR	NGR
Aromatic >C12-C16	<5.0	<5.0	NGR	NGR
Naphtalene	<2.60	<2.60	75,000	67,500
1,2-Dichloroethane (1,2-DCA)	<0.40	<0.40	23,000	20,700

Notes:

1 Soil vapour quality guidelines protective of indoor air quality for a commercial building on fine-textured soil, depth 450 cm, Intrinsik 31/8/2016

2 Trigger thresholds for additional investigation

3 Increased monitoring frequency trigger values

Bold Indicates that the concentration exceeds guideline

NGR No guideline required, as calculated guideline value results in a vapour concentration greater than the maximum possible vapour concentration for that chemical, assuming no NAPL is present. Maximum vapour concentration calculated according to Health Canada (2010) guidance.

All results are expressed as µg/m^3 unless otherwise noted

Testing was conducted by Maxxam Analytics Inc.

Clifton Associates

Job No.	CG2430.1E08
Client	Sears Canada Inc.
Project	SVMP, Summer 2017
Location	Calgary, Alberta