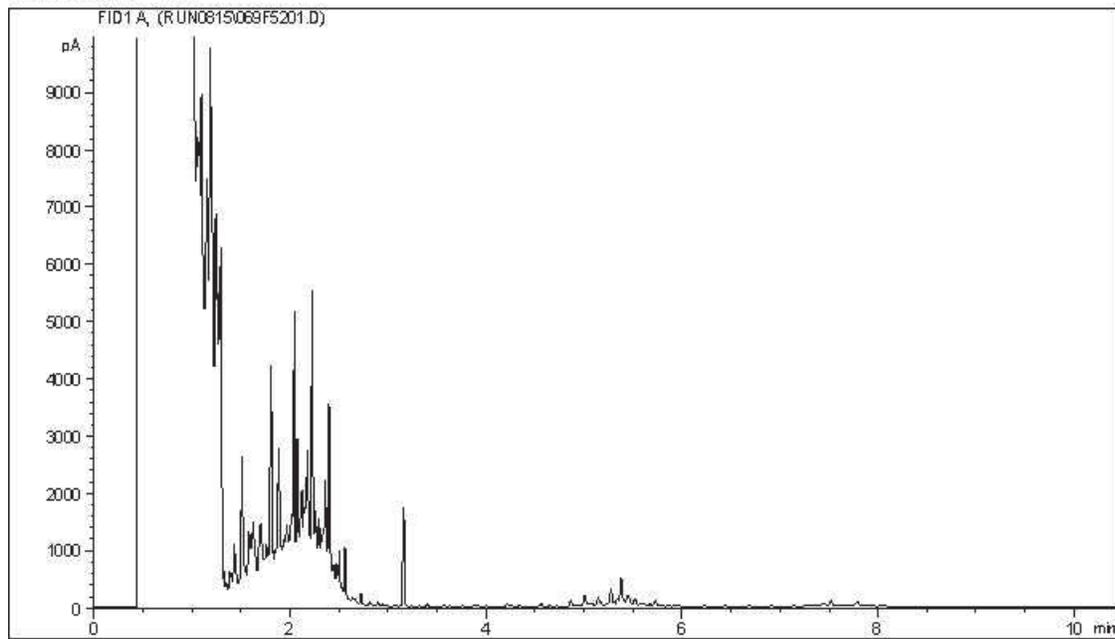
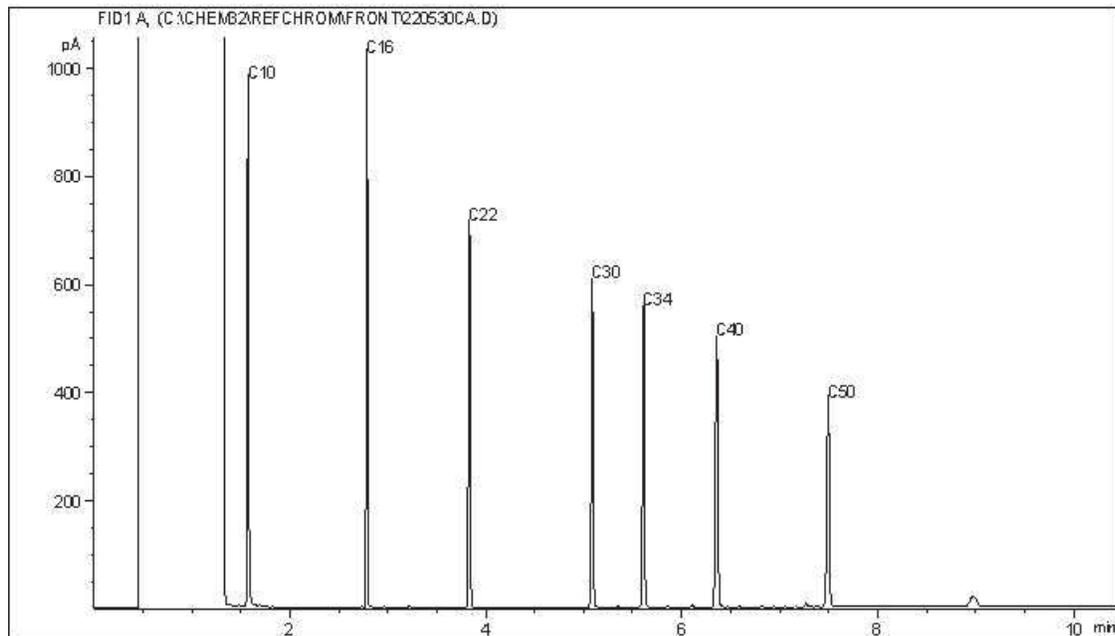


CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



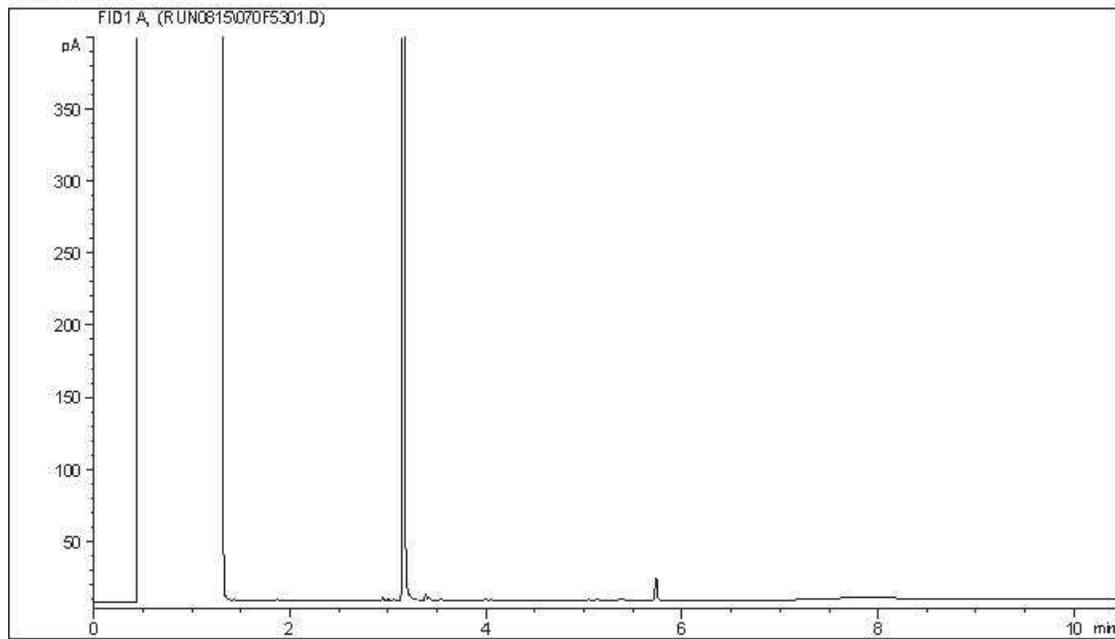
TYPICAL PRODUCT CARBON NUMBER RANGES

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

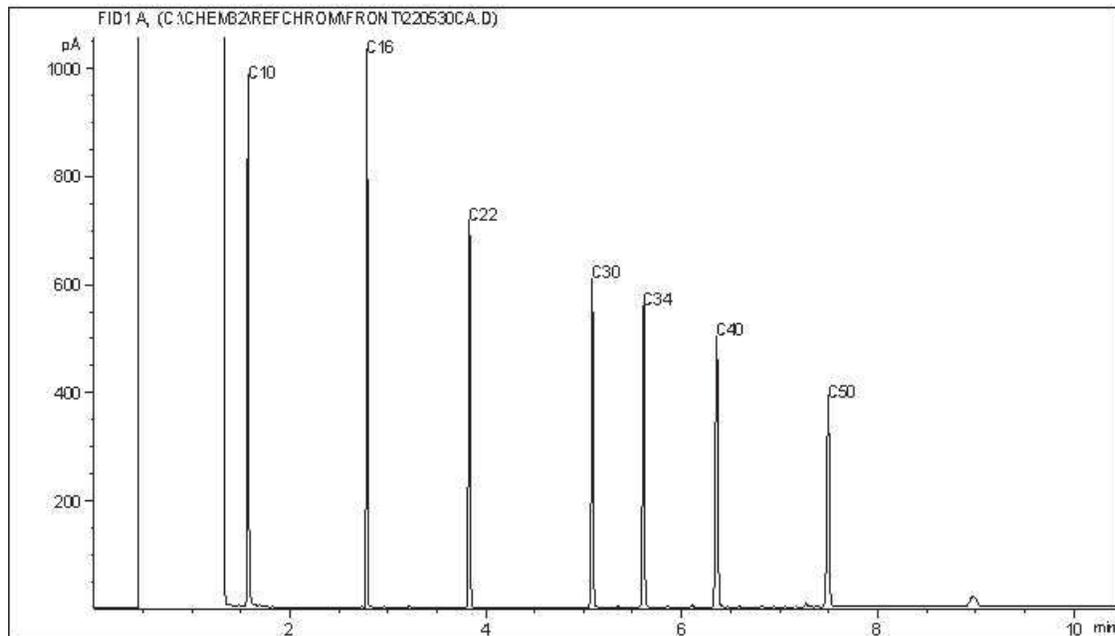
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



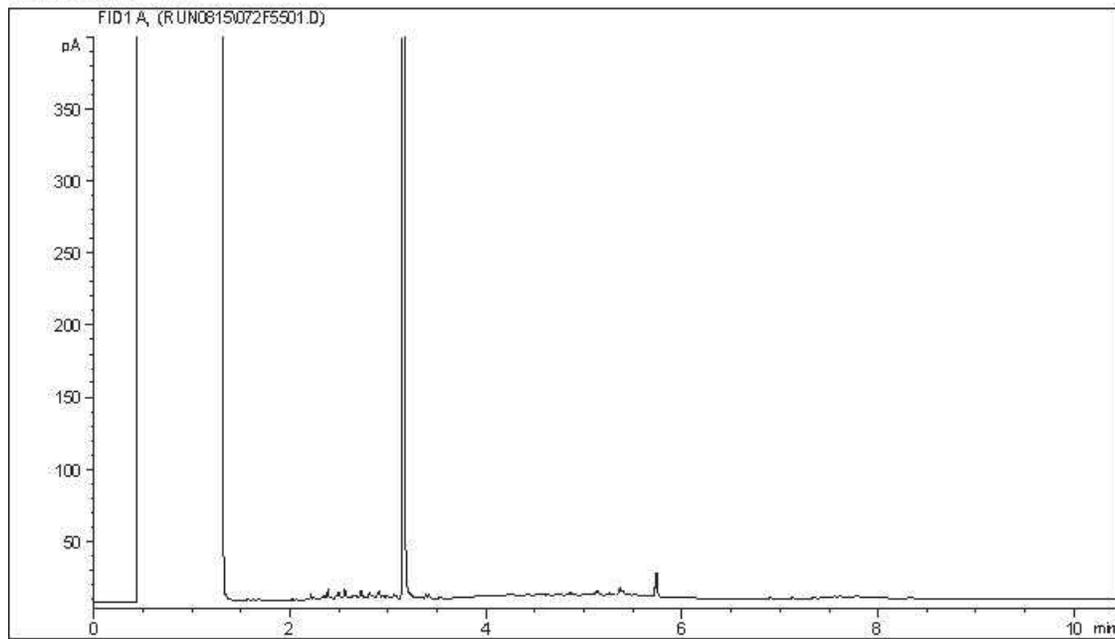
TYPICAL PRODUCT CARBON NUMBER RANGES

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

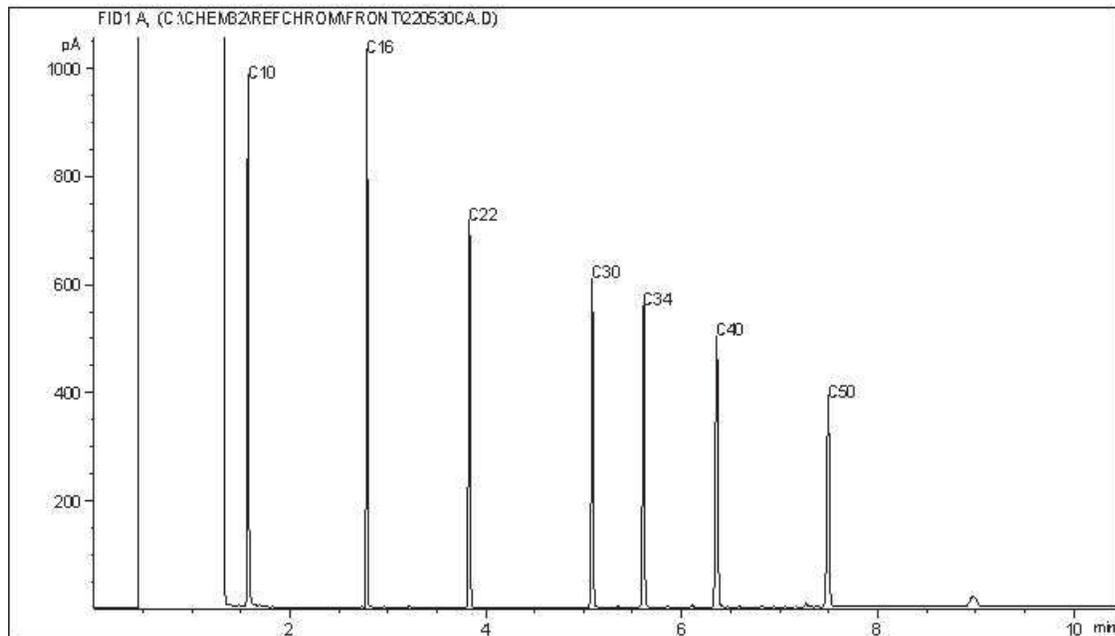
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



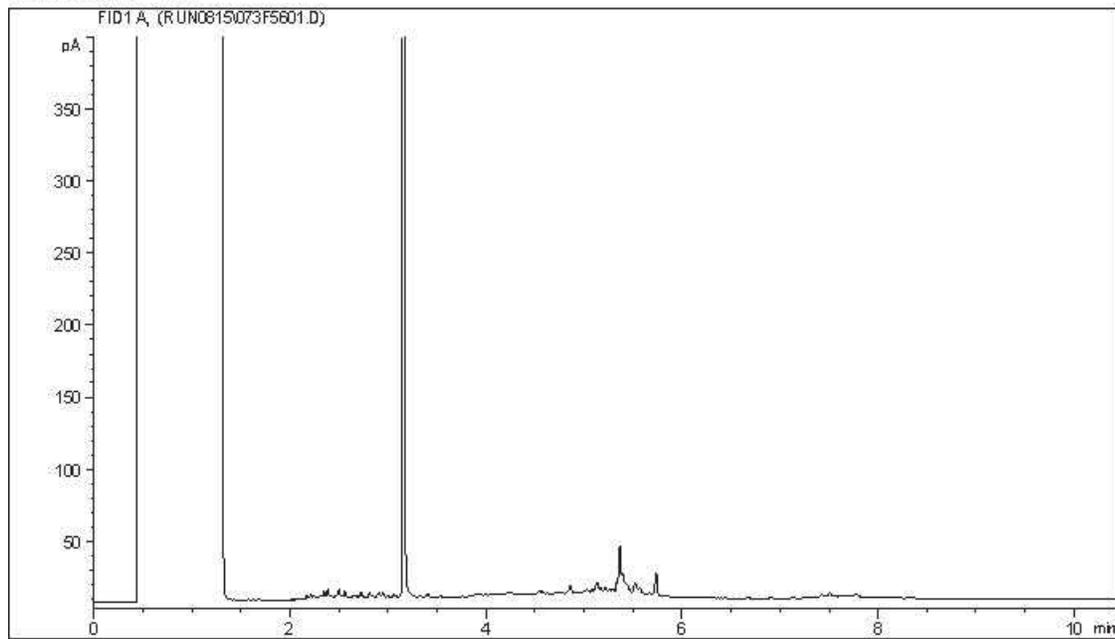
TYPICAL PRODUCT CARBON NUMBER RANGES

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

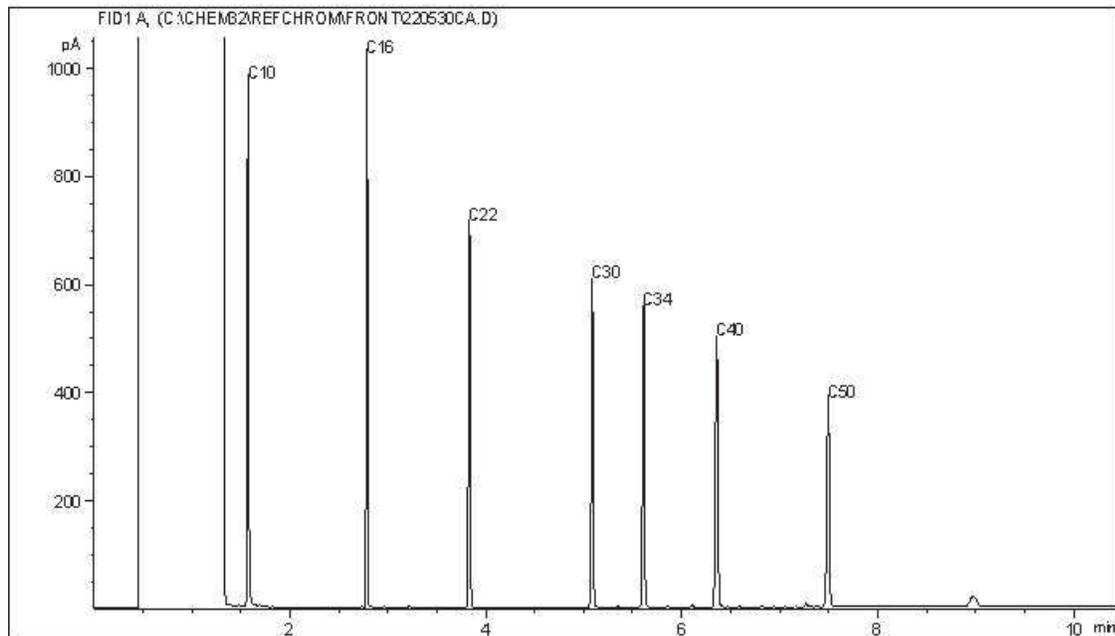
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



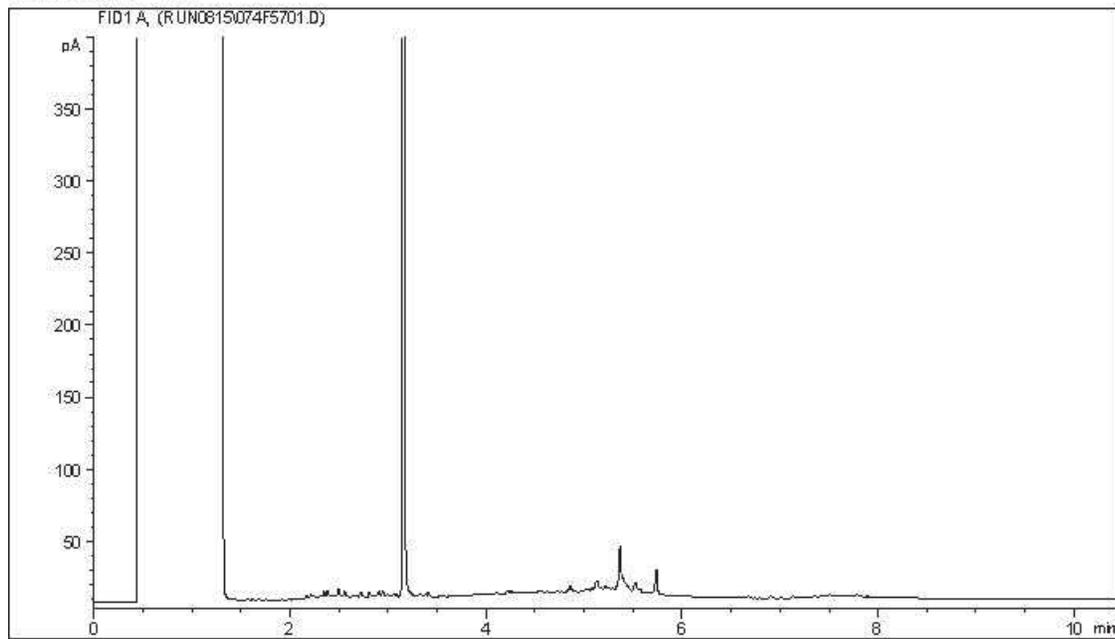
TYPICAL PRODUCT CARBON NUMBER RANGES

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

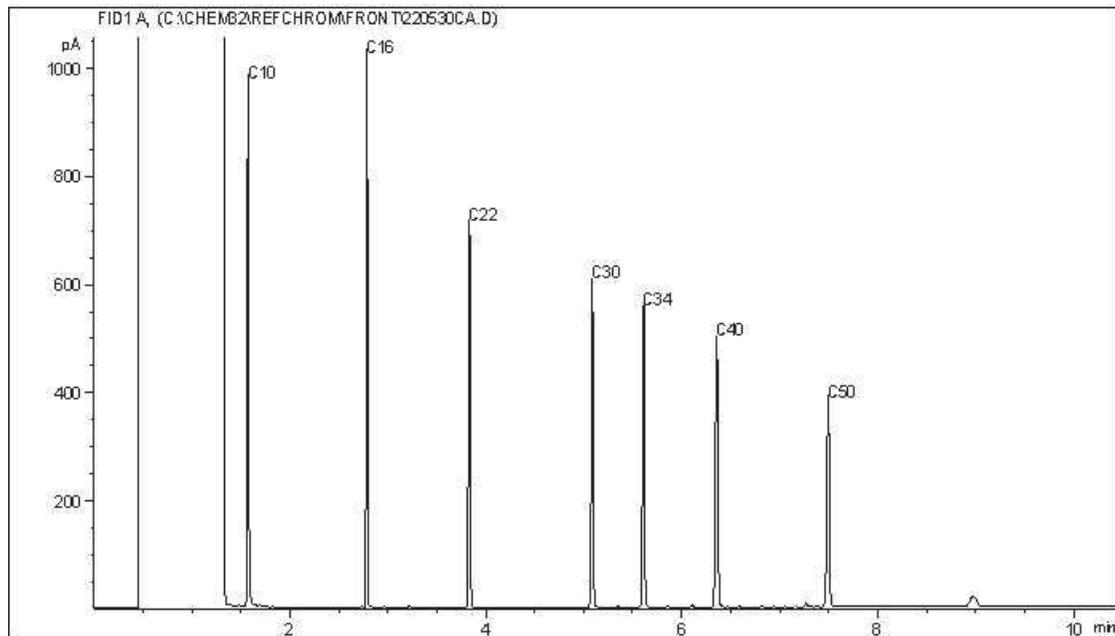
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



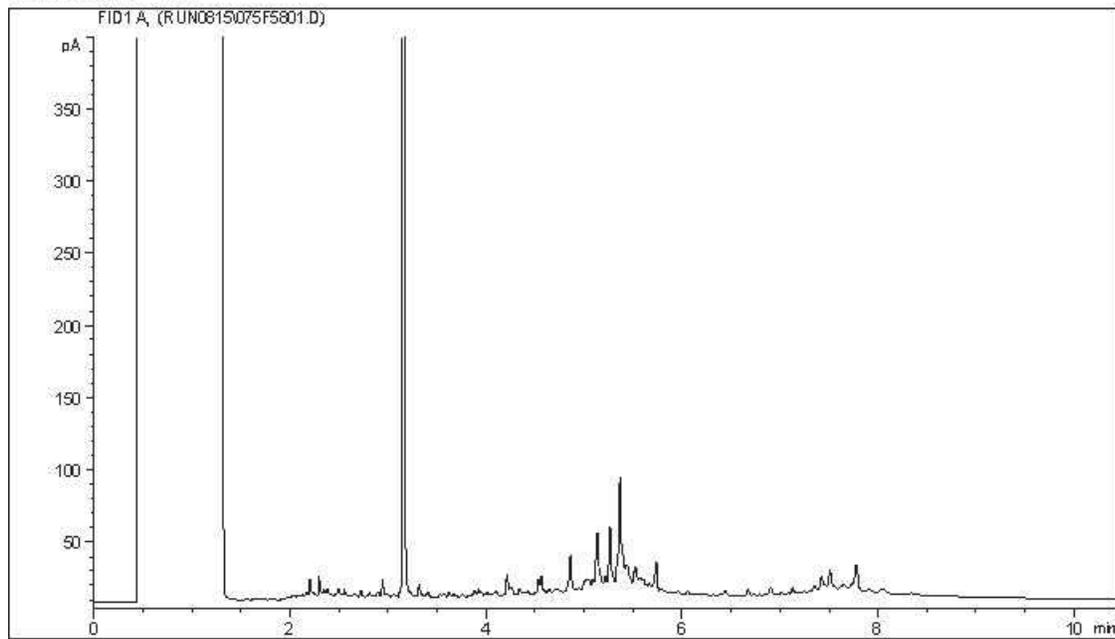
TYPICAL PRODUCT CARBON NUMBER RANGES

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

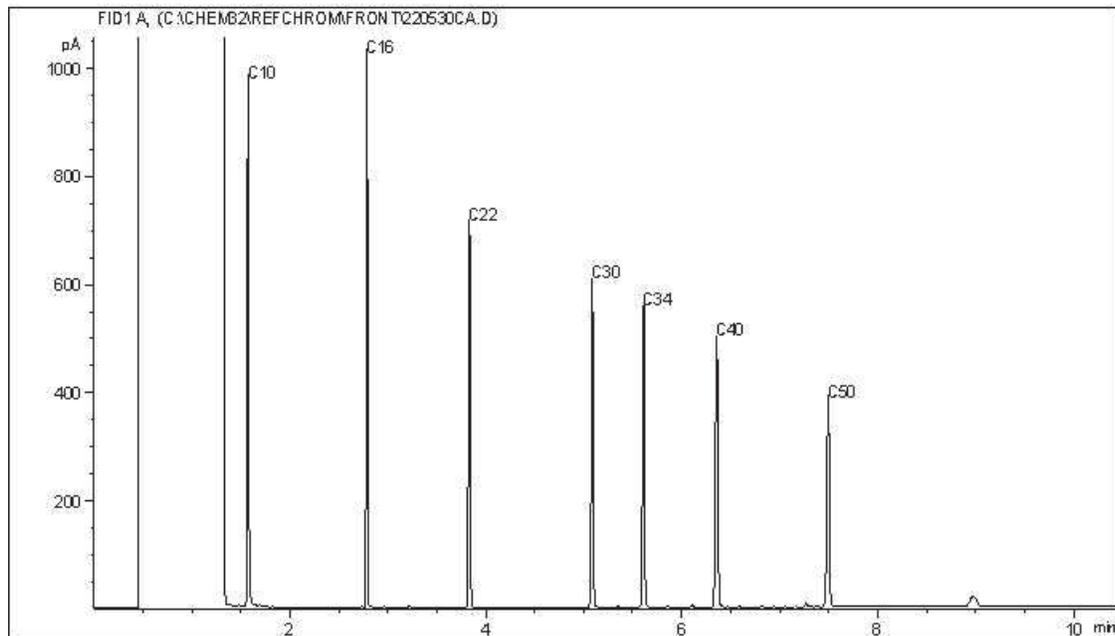
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) 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.



CLIENT NAME: BUREAU VERITAS CANADA (2019) INC
2021 - 41ST STREET NE
Calgary, AB T2E6P2
(403) 291-3077

ATTENTION TO: Cynny Hagen

PROJECT: C260028

AGAT WORK ORDER: 22C940464

SOIL ANALYSIS REVIEWED BY: Loan Nguyen, Senior Analyst

DATE REPORTED: Sep 06, 2022

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.



Certificate of Analysis

AGAT WORK ORDER: 22C940464

PROJECT: C260028

2910 12TH STREET NE
 CALGARY, ALBERTA
 CANADA T2E 7P7
 TEL (403)735-2005
 FAX (403)735-2771
<http://www.agatlabs.com>

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

Metals - Barium by Fusion ICP

DATE RECEIVED: 2022-09-01

DATE REPORTED: 2022-09-06

		AZM252-BH22-	AZM253-BH22-	AZM254-BH22-	AZM255-BH22-		
SAMPLE DESCRIPTION:		26-01	26-02	26-03	26-04		
SAMPLE TYPE:		Water	Water	Water	Water		
DATE SAMPLED:		2022-08-09 14:00	2022-08-09 14:00	2022-08-09 14:00	2022-08-09 14:00		
Parameter	Unit	G / S	RDL	4266872	4266874	4266875	4266876
True Barium by Fusion ICP	mg/kg	50	9590	3560	3190	4990	

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

4266872-4266876 Result is based on the dry weight of the sample.

Analysis performed at AGAT Calgary (unless marked by *)

Certified By:



Method Summary

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

AGAT WORK ORDER: 22C940464

PROJECT: C260028

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
True Barium by Fusion ICP	SOIL- 0620, INST- 0140	ASTM D4503.08	ICP/OES



AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Bureau Veritas

Courier: JAWO Prepaid Collect

Waybill# _____

Branch: EDM GP FN FM RD VAN LYD FSJ EST SASK Other: _____

If multiple sites were submitted at once: Yes No

Custody Seal Intact: Yes No NA

TAT: <24hr 24-48hr 48-72hr Reg Other _____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken: _____

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) NA Soil = ___ °C 2(Bottle/Jar) ___ + ___ + ___ = ___ °C

3 (Bottle/Jar) ___ + ___ + ___ = ___ °C 4 (Bottle/Jar) ___ + ___ + ___ = ___ °C

5 (Bottle/Jar) ___ + ___ + ___ = ___ °C 6 (Bottle/Jar) ___ + ___ + ___ = ___ °C

7 (Bottle/Jar) ___ + ___ + ___ = ___ °C 8 (Bottle/Jar) ___ + ___ + ___ = ___ °C

9 (Bottle/Jar) ___ + ___ + ___ = ___ °C 10 (Bottle/Jar) ___ + ___ + ___ = ___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 22 C940464

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial _____

General Comments: _____

* Subcontracted Analysis (See CPM)

WIN-CITY



JAZOO EXPRESS COURIER

www.jazooCourier.com

CLIENT USE ONLY			
Sender Name: Robert Mebrahtu	Receiver Name:	Sample Reception	Billed To: Bureau Veritas
Date: 2022/09/01	Delivery From: Bureau Veritas Calgary	Delivery To: AGAT-Calgary 2910 12th street NE Calgary, AB, T2E 7P7	
Total # Items: 2	Item Description: 1 Large Cooler, 1 Medium Cooler	envelope, sm/med/lg box, cooler, etc.	
Authorized Shipper Signature:		Job/PO/Reference #:	
DRIVER USE ONLY			
P/U Driver Name:	P/U Time: 11:50 am	D/O Time: 12:05 pm	Surcharge
# Items P/U:	# Of TDG	# Of Same Day	
# Of Overweight	Additional Info:		
Total # Items Dropped Off: 2	D/O Driver Name:		
Authorized Receiver Signature:			
HOTSHOT DETAILS			
Total Km:	Or Total Charge (\$):		
OFFICE USE ONLY			
Verified By:	Invoiced By:		
To schedule a pickup please contact dispatch at the city nearest you:			
Calgary 403-660-5504		Fort McMurray 587-645-6364	
Edmonton 780-903-3628		Grande Prairie 587-297-8406	
THANK YOU FOR SUPPORTING LOCAL AND CHOOSING JAZOO EXPRESS COURIER.			



CLIENT NAME: BUREAU VERITAS CANADA (2019) INC
2021 - 41ST STREET NE
Calgary, AB T2E6P2
(403) 291-3077

ATTENTION TO: Cynny Hagen

PROJECT: C260028

AGAT WORK ORDER: 22C940464

SOIL ANALYSIS REVIEWED BY: Loan Nguyen, Senior Analyst

DATE REPORTED: Sep 06, 2022

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.



Certificate of Analysis

AGAT WORK ORDER: 22C940464

PROJECT: C260028

2910 12TH STREET NE
 CALGARY, ALBERTA
 CANADA T2E 7P7
 TEL (403)735-2005
 FAX (403)735-2771
<http://www.agatlabs.com>

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

Metals - Barium by Fusion ICP

DATE RECEIVED: 2022-09-01

DATE REPORTED: 2022-09-06

				AZM252-BH22-	AZM253-BH22-	AZM254-BH22-	AZM255-BH22-
	SAMPLE DESCRIPTION:			26-01	26-02	26-03	26-04
	SAMPLE TYPE:			Water	Water	Water	Water
	DATE SAMPLED:			2022-08-09 14:00	2022-08-09 14:00	2022-08-09 14:00	2022-08-09 14:00
Parameter	Unit	G / S	RDL	4266872	4266874	4266875	4266876
True Barium by Fusion ICP	mg/kg		50	9590	3560	3190	4990

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

4266872-4266876 Result is based on the dry weight of the sample.

Analysis performed at AGAT Calgary (unless marked by *)

Certified By:



Method Summary

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

AGAT WORK ORDER: 22C940464

PROJECT: C260028

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
True Barium by Fusion ICP	SOIL- 0620, INST- 0140	ASTM D4503.08	ICP/OES



AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Bureau Veritas
 Courier: Jarvo Prepaid Collect
 Waybill# _____
 Branch: EDM GP FN FM RD VAN LYD FSJ EST SASK Other: _____
 If multiple sites were submitted at once: Yes No
 Custody Seal Intact: Yes No NA
 TAT: <24hr 24-48hr 48-72hr Reg Other _____
 Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No
 Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*
 Earliest Expiry: _____
 Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken: _____
 Legal Samples: Yes No
 International Samples: Yes No
 Tape Sealed: Yes No
 Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A if only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) NA Soil = ___ °C 2 (Bottle/Jar) ___ + ___ + ___ = ___ °C
 3 (Bottle/Jar) ___ + ___ + ___ = ___ °C 4 (Bottle/Jar) ___ + ___ + ___ = ___ °C
 5 (Bottle/Jar) ___ + ___ + ___ = ___ °C 6 (Bottle/Jar) ___ + ___ + ___ = ___ °C
 7 (Bottle/Jar) ___ + ___ + ___ = ___ °C 8 (Bottle/Jar) ___ + ___ + ___ = ___ °C
 9 (Bottle/Jar) ___ + ___ + ___ = ___ °C 10 (Bottle/Jar) ___ + ___ + ___ = ___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 22 C940464
 Samples Damaged: Yes No If YES why?
 No Bubble Wrap Frozen Courier
 Other: _____
 Account Project Manager: _____ have they been notified of the above issues: Yes No
 Whom spoken to: _____ Date/Time: _____
 CPM Initial _____
 General Comments: _____

* Subcontracted Analysis (See CPM)

WIN-CITY



JAZOO EXPRESS COURIER

www.jazooCourier.com

CLIENT USE ONLY			
Sender Name: Robert Mebrahtu	Receiver Name:	Sample Reception	Billed To: Bureau Veritas
Date: 2022/09/01	Delivery From: Bureau Veritas Calgary	Delivery To: AGAT-Calgary 2910 12th street NE Calgary, AB, T2E 7P7	
Total # Items: 2	Item Description: 1 Large Cooler, 1 Medium Cooler	envelope, sm/med/lg box, cooler, etc.	
Authorized Shipper Signature:		Job/PO/Reference #:	
DRIVER USE ONLY			
P/U Driver Name:	P/U Time: 11:50 am	D/O Time: 12:05 pm	Surcharge
# Items P/U:	# Of TDG	# Of Same Day	
# Of Overweight	Additional Info:		
Total # Items Dropped Off: 2	D/O Driver Name:	Authorized Receiver Signature:	
HOTSHOT DETAILS			
Total Km:	Or Total Charge (\$):		
OFFICE USE ONLY			
Verified By:	Invoiced By:		
To schedule a pickup please contact dispatch at the city nearest you:			
Calgary 403-660-5504	Fort McMurray 587-645-6364		
Edmonton 780-903-3628	Grande Prairie 587-297-8406		
THANK YOU FOR SUPPORTING LOCAL AND CHOOSING JAZOO EXPRESS COURIER.			

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 9, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C260028

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes
 Was proper chain of custody of the samples documented and kept? Yes
 Were sample temperatures acceptable when they reached lab?: Yes
 Were all samples analyzed and extracted within hold times?: Yes
 Has lab warranted all tests were in statistical control in CoA?: Yes
 Was sufficient sample provided for the requested analysis? Yes
 Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	X			Matrix spike recovery for vanadium (140% and 131%)
Method Blank Concentration	X			exceeded the acceptance criteria of (75-125%).
Laboratory Duplicate RPD	X			All remaining laboratory QC results are within acceptance criteria.
Matrix Spike Recovery		X		
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	All field QC samples are within alert limits.
Trip Blank Concentration			X	
Field Duplicate RPD	X			

Is data considered reliable (Yes/No/Suspect)?: Yes

If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 18, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAREWELL,NT
 Your C.O.C. #: 1 of 2, 2 of 2

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/08/23
 Report #: R3220499
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C260029

Received: 2022/08/12, 09:00

Sample Matrix: Soil
 # Samples Received: 20

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Barium on ICP using Fusion Extraction (1)	9	N/A	2022/08/19		
Elements by ICPMS - Soils (2)	11	2022/08/16	2022/08/17	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m

Remarks:

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

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

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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) This test was performed by Element Materials Tech Canada, 7217 Roper Rd. , Edmonton, AB, T6B 3J4

(2) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your C.O.C. #: 1 of 2, 2 of 2

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2022/08/23
Report #: R3220499
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C260029

Received: 2022/08/12, 09:00

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas
23 Aug 2022 16:47:48

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====

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



BUREAU
VERITAS

Bureau Veritas Job #: C260029
Report Date: 2022/08/23

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		AZM256	AZM257	AZM258	AZM259	AZM260	AZM270	
Sampling Date		2022/08/09 10:50	2022/08/09 10:52	2022/08/09 10:55	2022/08/09 10:58	2022/08/09 10:55	2022/08/09 11:05	
COC Number		1 of 2	2 of 2					
	UNITS	BH22-31-01	BH22-31-02	BH22-31-03	BH22-31-04	DUP I	BH22-30-01	QC Batch

Parameter								
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	A687495

Bureau Veritas ID		AZM271	AZM272	AZM273	
Sampling Date		2022/08/09 11:10	2022/08/09 11:15	2022/08/09 11:20	
COC Number		2 of 2	2 of 2	2 of 2	
	UNITS	BH22-30-02	BH22-30-03	BH22-30-04	QC Batch

Parameter					
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	A687495



ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		AZM261		AZM262		AZM263		AZM264			
Sampling Date		2022/08/09 10:00		2022/08/09 10:05		2022/08/09 10:10		2022/08/09 10:25			
COC Number		1 of 2		1 of 2		1 of 2		1 of 2			
	UNITS	BH22-36-01	QC Batch	BH22-36-02	RDL	BH22-36-03	RDL	QC Batch	BH22-38-01	RDL	QC Batch

Elements											
Total Chromium (Cr)	mg/kg	9.9	A682611	11	1.0	11	2.0	A683218	13	1.0	A682611
RDL = Reportable Detection Limit											

Bureau Veritas ID		AZM265	AZM266		AZM267	AZM268		AZM269		
Sampling Date		2022/08/09 10:30	2022/08/09 10:35		2022/08/09 09:30	2022/08/09 09:35		2022/08/09 09:35		
COC Number		1 of 2	1 of 2		1 of 2	2 of 2		2 of 2		
	UNITS	BH22-38-02	BH22-38-03	QC Batch	BH22-39-01	BH22-39-02	QC Batch	DUP H	RDL	QC Batch

Elements											
Total Chromium (Cr)	mg/kg	10	9.7	A683223	9.2	6.9	A683218	5.0	1.0	A683223	
RDL = Reportable Detection Limit											

Bureau Veritas ID		AZM274		AZM275		
Sampling Date		2022/08/09 10:15		2022/08/09 10:20		
COC Number		2 of 2		2 of 2		
	UNITS	BH22-37-01	QC Batch	BH22-37-02	RDL	QC Batch

Elements						
Total Chromium (Cr)	mg/kg	7.5	A683223	7.4	1.0	A682611
RDL = Reportable Detection Limit						



GENERAL COMMENTS

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

Package 1	2.7°C
-----------	-------

Version #3: Report reissued to include EDD file as per client request received 20220823

Sample AZM256 [BH22-31-01] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM257 [BH22-31-02] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM258 [BH22-31-03] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM259 [BH22-31-04] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM260 [DUP I] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM270 [BH22-30-01] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM271 [BH22-30-02] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM272 [BH22-30-03] : Please see attachment for Barium on ICP using Fusion Extraction results.

Sample AZM273 [BH22-30-04] : Please see attachment for Barium on ICP using Fusion Extraction results.

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL) Comments

Sample AZM263 [BH22-36-03] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C260029
Report Date: 2022/08/23

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A682611	MKJ	Matrix Spike	Total Chromium (Cr)	2022/08/17		113	%	75 - 125
A682611	MKJ	QC Standard	Total Chromium (Cr)	2022/08/17		113	%	59 - 141
A682611	MKJ	Spiked Blank	Total Chromium (Cr)	2022/08/17		97	%	80 - 120
A682611	MKJ	Method Blank	Total Chromium (Cr)	2022/08/17	<1.0		mg/kg	
A682611	MKJ	RPD	Total Chromium (Cr)	2022/08/17	1.9		%	30
A683218	MKJ	Matrix Spike	Total Chromium (Cr)	2022/08/17		98	%	75 - 125
A683218	MKJ	QC Standard	Total Chromium (Cr)	2022/08/17		104	%	59 - 141
A683218	MKJ	Spiked Blank	Total Chromium (Cr)	2022/08/17		98	%	80 - 120
A683218	MKJ	Method Blank	Total Chromium (Cr)	2022/08/17	<1.0		mg/kg	
A683218	MKJ	RPD	Total Chromium (Cr)	2022/08/17	1.4		%	30
A683223	KH2	Matrix Spike	Total Chromium (Cr)	2022/08/17		113	%	75 - 125
A683223	KH2	QC Standard	Total Chromium (Cr)	2022/08/17		78	%	59 - 141
A683223	KH2	Spiked Blank	Total Chromium (Cr)	2022/08/17		97	%	80 - 120
A683223	KH2	Method Blank	Total Chromium (Cr)	2022/08/17	<1.0		mg/kg	
A683223	KH2	RPD	Total Chromium (Cr)	2022/08/17	7.9		%	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.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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.



BUREAU
VERITAS

Bureau Veritas Job #: C260029
Report Date: 2022/08/23

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

Nadeem Cheema, Project Solutions Representative

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

Report Transmission Cover Page

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029 Project Name: Project Location: LSD: P.O.:	Lot ID: 1592221 Control Number: Date Received: Aug 15, 2022 Date Reported: Aug 18, 2022 Report Number: 2777694
Attn: Accounts Payable Sampled By: ML Company:	Proj. Acct. code:	

Contact	Company	Address
Accounts Payable	Bureau Veritas Canada (2019) Inc.	#500 1919 Minnesota Court Mississauga, ON L5N 0C9 Phone: (866) 611-1118 Fax: (905) 288-2169 Email: AP.865.INV.SUBMIT@bureauveritas.com

Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Invoice

Contact	Company	Address
Customer Solutions	Bureau Veritas Canada (2019) Inc.	4606 Canada Way Burnaby, BC V5G 1K5 Phone: (604) 734-7276 Fax: (604) 731-2386 Email: customersolutionswest@bvlab.com

Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	Legacy Crosstab in CSV	Test Report
Email - Single Deliverable	PDF	COA

Contact	Company	Address
Cynny Hagen	Bureau Veritas Canada (2019) Inc.	4606 Canada Way Burnaby, BC V5G 1K5 Phone: (604) 734-7276 Fax: (604) 731-2386 Email: cynny.hagen@bureauveritas.com

Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	PDF	COA

Notes To Clients:

The information contained on this and all other pages transmitted, is intended for the addressee only and is considered confidential. If the reader is not the intended recipient, you are hereby notified that any use, dissemination, distribution or copy of this transmission is strictly prohibited. If you receive this transmission by error, or if this transmission is not satisfactory, please notify us by telephone.

Analytical Report

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

Reference Number	1592221-1	1592221-2	1592221-3
Sample Date	Aug 09, 2022	Aug 09, 2022	Aug 09, 2022
Sample Time	10:50	10:52	10:55
Sample Location			
Sample Description	BH22-31-01 / AZM256	BH22-31-02 / AZM257	BH22-31-03 / AZM258
Matrix	Soil	Soil	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Barite Soil Analysis						
Barium	Fusion	mg/kg	780	630	580	40

Analytical Report

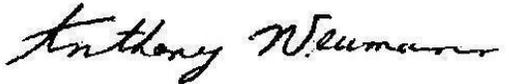
Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

	Reference Number	1592221-4	1592221-5	1592221-6	
	Sample Date	Aug 09, 2022	Aug 09, 2022	Aug 09, 2022	
	Sample Time	10:58	10:55	11:05	
	Sample Location				
	Sample Description	BH22-31-04 / AZM259	AZM260-Dup 1	BH22-30-01 / AZM270	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Barite Soil Analysis					
Barium	Fusion	mg/kg	580	680	2490
					40

Analytical Report

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

	Reference Number	1592221-7	1592221-8	1592221-9	
	Sample Date	Aug 09, 2022	Aug 09, 2022	Aug 09, 2022	
	Sample Time	11:10	11:50	11:20	
	Sample Location				
	Sample Description	BH22-30-02 / AZM271	BH22-30-03 / AZM272	BH22-30-04 / AZM273	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Barite Soil Analysis					
Barium	Fusion	mg/kg	1780	700	620
					40

Approved by: 

Anthony Neumann, MSc
General Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Barium (Fusion) in soil	ASTM	* Standard Practice for Dissolution of Solid Waste by Lithium Metaborate Fusion, 2008., D 4503-08 <i>* Reference Method Modified</i>	Aug 18, 2022	Element Edmonton - Roper Road

References

ASTM Annual Book of ASTM Standards

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

Report Transmission Cover Page

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029 Project Name: Project Location: LSD: P.O.:	Lot ID: 1592221 Control Number: Date Received: Aug 15, 2022 Date Reported: Aug 18, 2022 Report Number: 2777694
Attn: Accounts Payable Sampled By: ML Company:	Proj. Acct. code:	

Contact	Company	Address
Accounts Payable	Bureau Veritas Canada (2019) Inc.	#500 1919 Minnesota Court Mississauga, ON L5N 0C9 Phone: (866) 611-1118 Fax: (905) 288-2169 Email: AP.865.INV.SUBMIT@bureauveritas.com

Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Invoice

Contact	Company	Address
Customer Solutions	Bureau Veritas Canada (2019) Inc.	4606 Canada Way Burnaby, BC V5G 1K5 Phone: (604) 734-7276 Fax: (604) 731-2386 Email: customersolutionswest@bvlab.com

Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	Legacy Crosstab in CSV	Test Report
Email - Single Deliverable	PDF	COA

Contact	Company	Address
Cynny Hagen	Bureau Veritas Canada (2019) Inc.	4606 Canada Way Burnaby, BC V5G 1K5 Phone: (604) 734-7276 Fax: (604) 731-2386 Email: cynny.hagen@bureauveritas.com

Delivery	Format	Deliverables
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	PDF	COA

Notes To Clients:

The information contained on this and all other pages transmitted, is intended for the addressee only and is considered confidential. If the reader is not the intended recipient, you are hereby notified that any use, dissemination, distribution or copy of this transmission is strictly prohibited. If you receive this transmission by error, or if this transmission is not satisfactory, please notify us by telephone.

Analytical Report

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

	Reference Number	1592221-1	1592221-2	1592221-3
	Sample Date	Aug 09, 2022	Aug 09, 2022	Aug 09, 2022
	Sample Time	10:50	10:52	10:55
	Sample Location			
	Sample Description	BH22-31-01 / AZM256	BH22-31-02 / AZM257	BH22-31-03 / AZM258
	Matrix	Soil	Soil	Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Barite Soil Analysis						
Barium	Fusion	mg/kg	780	630	580	40

Analytical Report

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

	Reference Number	1592221-4	1592221-5	1592221-6	
	Sample Date	Aug 09, 2022	Aug 09, 2022	Aug 09, 2022	
	Sample Time	10:58	10:55	11:05	
	Sample Location				
	Sample Description	BH22-31-04 / AZM259	AZM260-Dup 1	BH22-30-01 / AZM270	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Barite Soil Analysis					
Barium	Fusion	mg/kg	580	680	2490
					40

Analytical Report

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

	Reference Number	1592221-7	1592221-8	1592221-9	
	Sample Date	Aug 09, 2022	Aug 09, 2022	Aug 09, 2022	
	Sample Time	11:10	11:50	11:20	
	Sample Location				
	Sample Description	BH22-30-02 / AZM271	BH22-30-03 / AZM272	BH22-30-04 / AZM273	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Barite Soil Analysis					
Barium	Fusion	mg/kg	1780	700	620
					40

Approved by:



 Anthony Neumann, MSc
 General Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Methodology and Notes

Bill To: Bureau Veritas Canada (2019) #500 1919 Minnesota Court Mississauga, ON, Canada L5N 0C9	Project ID: C260029	Lot ID: 1592221
Attn: Accounts Payable	Project Name:	Control Number:
Sampled By: ML	Project Location:	Date Received: Aug 15, 2022
Company:	LSD:	Date Reported: Aug 18, 2022
	P.O.:	Report Number: 2777694
	Proj. Acct. code:	

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Barium (Fusion) in soil	ASTM	* Standard Practice for Dissolution of Solid Waste by Lithium Metaborate Fusion, 2008., D 4503-08 <i>* Reference Method Modified</i>	Aug 18, 2022	Element Edmonton - Roper Road

References

ASTM Annual Book of ASTM Standards

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 9, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C260029

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes
 Was proper chain of custody of the samples documented and kept? Yes
 Were sample temperatures acceptable when they reached lab?: Yes
 Were all samples analyzed and extracted within hold times?: Yes
 Has lab warranted all tests were in statistical control in CoA?: Yes
 Was sufficient sample provided for the requested analysis? Yes
 Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery			X	All laboratory QC results are within acceptance criteria.
Method Blank Concentration	X			
Laboratory Duplicate RPD	X			
Matrix Spike Recovery	X			
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	All field QC samples are within alert limits.
Trip Blank Concentration			X	
Field Duplicate RPD	X			

Is data considered reliable (Yes/No/Suspect)?: Yes
 If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 23, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAREWELL,NT
 Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/09/06
 Report #: R3226629
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C260031

Received: 2022/08/12, 09:00

Sample Matrix: Soil
 # Samples Received: 9

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Boron (Hot Water Soluble)	9	2022/08/16	2022/08/16	AB SOP-00034 / AB SOP-00042	EPA 6010d R5 m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (2)	9	N/A	2022/08/16	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	9	N/A	2022/08/16		Auto Calc
Hexavalent Chromium (3)	5	2022/08/16	2022/08/16	AB SOP-00063	SM 23 3500-Cr B m
Hexavalent Chromium (3)	4	2022/08/17	2022/08/17	AB SOP-00063	SM 23 3500-Cr B m
Barium on ICP using Fusion Extraction (1)	1	N/A	2022/09/06		
CCME Hydrocarbons (F2-F4 in soil) (4)	1	2022/08/15	2022/08/15	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (4)	8	2022/08/15	2022/08/16	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils	9	2022/08/16	2022/08/17	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Moisture	9	N/A	2022/08/16	AB SOP-00002	CCME PHC-CWS m

Remarks:

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

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

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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

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

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



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2022/09/06
Report #: R3226629
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C260031

Received: 2022/08/12, 09:00

- (1) This test was performed by AGAT - Calgary, 2910 12th Street NE , Calgary, AB, T2E 7P7
- (2) No lab extraction date is given for F1BTX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
- (3) Some soil samples may react with the Cr(VI) spike reducing it to Cr(III). These samples are highly unlikely to contain native hexavalent chromium. Thus a failed spike recovery does not invalidate a negative result on the native sample.
- (4) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key



**AUTHORIZED REPORT
RAPPORT AUTORISÉ**

Bureau Veritas
06 Sep 2022 17:28:05

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====

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



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZM277	AZM278	AZM279	AZM280	AZM281	AZM282		
Sampling Date		2022/08/08 13:30	2022/08/08 13:30	2022/08/08 13:40	2022/08/08 13:45	2022/08/08 13:50	2022/08/08 13:00		
COC Number		1 of 1							
	UNITS	DUP E	BH22-20-04	BH22-20-03	BH22-20-02	BH22-20-01	BH22-18-01	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	41	100	300	14	94	18	10	A681077
F3 (C16-C34 Hydrocarbons)	mg/kg	81	130	670	<50	400	310	50	A681077
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	260	<50	160	140	50	A681077
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	N/A	A681077
Physical Properties									
Moisture	%	16	18	40	5.4	14	38	0.30	A681090
Volatiles									
Xylenes (Total)	mg/kg	<0.045	<0.045	<0.045	<0.045	0.16	<0.045	0.045	A679841
F1 (C6-C10) - BTEX	mg/kg	<10	<10	<10	<10	<10	<10	10	A679841
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.022	<0.0050	0.0050	A680852
Toluene	mg/kg	<0.050	<0.050	<0.050	<0.050	0.12	<0.050	0.050	A680852
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.026	<0.010	0.010	A680852
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.13	<0.040	0.040	A680852
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.032	<0.020	0.020	A680852
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	10	A680852
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	98	97	97	98	97	97	N/A	A680852
4-Bromofluorobenzene (sur.)	%	100	100	100	100	99	101	N/A	A680852
D10-o-Xylene (sur.)	%	101	102	99	105	83	86	N/A	A680852
D4-1,2-Dichloroethane (sur.)	%	103	102	103	103	102	104	N/A	A680852
O-TERPHENYL (sur.)	%	96	98	108	98	101	104	N/A	A681077
RDL = Reportable Detection Limit N/A = Not Applicable									



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZM283	AZM284	AZM284	AZM285		
Sampling Date		2022/08/08 13:10	2022/08/08 13:15	2022/08/08 13:15	2022/08/08 13:20		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	BH22-18-02	BH22-18-03	BH22-18-03 Lab-Dup	BH22-18-04	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	<10	<10	10	A681077
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	50	A681077
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	50	A681077
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	N/A	A681077
Physical Properties							
Moisture	%	20	15	N/A	17	0.30	A681090
Volatiles							
Xylenes (Total)	mg/kg	<0.045	<0.045	N/A	<0.045	0.045	A679841
F1 (C6-C10) - BTEX	mg/kg	<10	<10	N/A	<10	10	A679841
Field Preserved Volatiles							
Benzene	mg/kg	<0.0050	<0.0050	N/A	<0.0050	0.0050	A680852
Toluene	mg/kg	<0.050	<0.050	N/A	<0.050	0.050	A680852
Ethylbenzene	mg/kg	<0.010	0.025	N/A	<0.010	0.010	A680852
m & p-Xylene	mg/kg	<0.040	<0.040	N/A	<0.040	0.040	A680852
o-Xylene	mg/kg	<0.020	<0.020	N/A	<0.020	0.020	A680852
F1 (C6-C10)	mg/kg	<10	<10	N/A	<10	10	A680852
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	96	97	N/A	96	N/A	A680852
4-Bromofluorobenzene (sur.)	%	101	100	N/A	101	N/A	A680852
D10-o-Xylene (sur.)	%	108	107	N/A	103	N/A	A680852
D4-1,2-Dichloroethane (sur.)	%	105	104	N/A	106	N/A	A680852
O-TERPHENYL (sur.)	%	101	101	100	101	N/A	A681077
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZM277	AZM278	AZM279		AZM280		AZM281		
Sampling Date		2022/08/08 13:30	2022/08/08 13:30	2022/08/08 13:40		2022/08/08 13:45		2022/08/08 13:50		
COC Number		1 of 1	1 of 1	1 of 1		1 of 1		1 of 1		
	UNITS	DUP E	BH22-20-04	BH22-20-03	QC Batch	BH22-20-02	QC Batch	BH22-20-01	RDL	QC Batch

Elements										
Soluble (Hot water) Boron (B)	mg/kg	0.20	<0.10	0.31	A683007	0.23	A683007	0.65	0.10	A683000
Hex. Chromium (Cr 6+)	mg/kg	<0.080	<0.080	<0.080	A683972	<0.080	A682697	<0.080	0.080	A683972
Total Antimony (Sb)	mg/kg	<0.50	<0.50	<0.50	A682611	<0.50	A682611	1.9	0.50	A683223
Total Arsenic (As)	mg/kg	7.3	6.8	5.3	A682611	4.7	A682611	4.7	1.0	A683223
Total Barium (Ba)	mg/kg	360	140	120	A682611	380	A682611	2200	1.0	A683223
Total Beryllium (Be)	mg/kg	<0.40	<0.40	<0.40	A682611	<0.40	A682611	<0.40	0.40	A683223
Total Cadmium (Cd)	mg/kg	0.12	0.10	0.24	A682611	0.091	A682611	0.25	0.050	A683223
Total Chromium (Cr)	mg/kg	21	8.7	10	A682611	42	A682611	12	1.0	A683223
Total Cobalt (Co)	mg/kg	4.7	4.8	12	A682611	2.5	A682611	2.8	0.50	A683223
Total Copper (Cu)	mg/kg	7.9	5.6	9.6	A682611	6.3	A682611	56	1.0	A683223
Total Lead (Pb)	mg/kg	7.8	4.2	5.2	A682611	9.0	A682611	110	0.50	A683223
Total Mercury (Hg)	mg/kg	<0.050	<0.050	0.051	A682611	<0.050	A682611	<0.050	0.050	A683223
Total Molybdenum (Mo)	mg/kg	1.7	0.93	0.74	A682611	1.6	A682611	1.6	0.40	A683223
Total Nickel (Ni)	mg/kg	17	13	32	A682611	21	A682611	9.1	1.0	A683223
Total Selenium (Se)	mg/kg	<0.50	<0.50	0.86	A682611	<0.50	A682611	<0.50	0.50	A683223
Total Silver (Ag)	mg/kg	<0.20	<0.20	<0.20	A682611	<0.20	A682611	<0.20	0.20	A683223
Total Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	A682611	<0.10	A682611	<0.10	0.10	A683223
Total Tin (Sn)	mg/kg	<1.0	<1.0	<1.0	A682611	<1.0	A682611	1.5	1.0	A683223
Total Uranium (U)	mg/kg	0.69	0.51	2.3	A682611	0.29	A682611	0.37	0.20	A683223
Total Vanadium (V)	mg/kg	18	17	21	A682611	15	A682611	13	1.0	A683223
Total Zinc (Zn)	mg/kg	32	32	28	A682611	22	A682611	73	10	A683223

RDL = Reportable Detection Limit



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZM282	AZM282	AZM283		AZM284		AZM285		
Sampling Date		2022/08/08 13:00	2022/08/08 13:00	2022/08/08 13:10		2022/08/08 13:15		2022/08/08 13:20		
COC Number		1 of 1	1 of 1	1 of 1		1 of 1		1 of 1		
	UNITS	BH22-18-01	BH22-18-01 Lab-Dup	BH22-18-02	QC Batch	BH22-18-03	QC Batch	BH22-18-04	RDL	QC Batch

Elements										
Soluble (Hot water) Boron (B)	mg/kg	2.1	2.2	0.17	A683007	<0.10	A683000	<0.10	0.10	A683007
Hex. Chromium (Cr 6+)	mg/kg	<0.080	N/A	<0.080	A682697	<0.080	A682697	<0.080	0.080	A682697
Total Antimony (Sb)	mg/kg	<0.50	N/A	<0.50	A682611	<0.50	A683223	<0.50	0.50	A682611
Total Arsenic (As)	mg/kg	5.6	N/A	6.9	A682611	5.2	A683223	5.2	1.0	A682611
Total Barium (Ba)	mg/kg	300	N/A	130	A682611	89	A683223	76	1.0	A682611
Total Beryllium (Be)	mg/kg	<0.40	N/A	<0.40	A682611	<0.40	A683223	<0.40	0.40	A682611
Total Cadmium (Cd)	mg/kg	0.086	N/A	0.055	A682611	0.078	A683223	0.056	0.050	A682611
Total Chromium (Cr)	mg/kg	20	N/A	7.7	A682611	4.8	A683223	6.4	1.0	A682611
Total Cobalt (Co)	mg/kg	3.1	N/A	3.9	A682611	2.8	A683223	3.1	0.50	A682611
Total Copper (Cu)	mg/kg	6.0	N/A	2.8	A682611	2.7	A683223	3.2	1.0	A682611
Total Lead (Pb)	mg/kg	6.2	N/A	3.7	A682611	3.2	A683223	2.7	0.50	A682611
Total Mercury (Hg)	mg/kg	0.064	N/A	<0.050	A682611	<0.050	A683223	<0.050	0.050	A682611
Total Molybdenum (Mo)	mg/kg	1.4	N/A	0.54	A682611	0.54	A683223	0.57	0.40	A682611
Total Nickel (Ni)	mg/kg	12	N/A	8.4	A682611	7.0	A683223	8.5	1.0	A682611
Total Selenium (Se)	mg/kg	0.56	N/A	<0.50	A682611	<0.50	A683223	<0.50	0.50	A682611
Total Silver (Ag)	mg/kg	<0.20	N/A	<0.20	A682611	<0.20	A683223	<0.20	0.20	A682611
Total Thallium (Tl)	mg/kg	<0.10	N/A	<0.10	A682611	<0.10	A683223	<0.10	0.10	A682611
Total Tin (Sn)	mg/kg	<1.0	N/A	<1.0	A682611	<1.0	A683223	<1.0	1.0	A682611
Total Uranium (U)	mg/kg	0.52	N/A	0.26	A682611	0.26	A683223	0.29	0.20	A682611
Total Vanadium (V)	mg/kg	21	N/A	16	A682611	9.7	A683223	13	1.0	A682611
Total Zinc (Zn)	mg/kg	19	N/A	23	A682611	20	A683223	22	10	A682611

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



**BUREAU
VERITAS**

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		AZM281	
Sampling Date		2022/08/08 13:50	
COC Number		1 of 1	
	UNITS	BH22-20-01	QC Batch
Parameter			
Subcontract Parameter	N/A	ATTACHED	A705741



GENERAL COMMENTS

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

Package 1	4.0°C
-----------	-------

Version 2: Report reissued to include Chromatogram analysis on sample AZM279/BH22-20-03as per client request received 2022/08/18.

Version 3: Report reissued to include results for Barium - True Total on sample BH22-20-01/AZM281 as per client request received 2022/08/24.

Sample AZM281 [BH22-20-01] : Please see attachment for Barium on ICP using Fusion Extraction results.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A680852	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2022/08/16	91	%	50 - 140		
			4-Bromofluorobenzene (sur.)	2022/08/16	102	%	50 - 140		
			D10-o-Xylene (sur.)	2022/08/16	99	%	50 - 140		
			D4-1,2-Dichloroethane (sur.)	2022/08/16	102	%	50 - 140		
			Benzene	2022/08/16	91	%	50 - 140		
			Toluene	2022/08/16	86	%	50 - 140		
			Ethylbenzene	2022/08/16	89	%	50 - 140		
			m & p-Xylene	2022/08/16	89	%	50 - 140		
			o-Xylene	2022/08/16	92	%	50 - 140		
			F1 (C6-C10)	2022/08/16	91	%	60 - 140		
			A680852	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/08/16	93	%
4-Bromofluorobenzene (sur.)	2022/08/16	102				%	50 - 140		
D10-o-Xylene (sur.)	2022/08/16	94				%	50 - 140		
D4-1,2-Dichloroethane (sur.)	2022/08/16	114				%	50 - 140		
Benzene	2022/08/16	98				%	60 - 130		
Toluene	2022/08/16	90				%	60 - 130		
Ethylbenzene	2022/08/16	89				%	60 - 130		
m & p-Xylene	2022/08/16	89				%	60 - 130		
o-Xylene	2022/08/16	92				%	60 - 130		
F1 (C6-C10)	2022/08/16	106				%	60 - 140		
A680852	DO1	Method Blank				1,4-Difluorobenzene (sur.)	2022/08/16	96	%
			4-Bromofluorobenzene (sur.)	2022/08/16	101	%	50 - 140		
			D10-o-Xylene (sur.)	2022/08/16	85	%	50 - 140		
			D4-1,2-Dichloroethane (sur.)	2022/08/16	105	%	50 - 140		
			Benzene	2022/08/16	<0.0050		mg/kg		
			Toluene	2022/08/16	<0.050		mg/kg		
			Ethylbenzene	2022/08/16	<0.010		mg/kg		
			m & p-Xylene	2022/08/16	<0.040		mg/kg		
			o-Xylene	2022/08/16	<0.020		mg/kg		
			F1 (C6-C10)	2022/08/16	<10		mg/kg		
			A680852	DO1	RPD	Benzene	2022/08/16	NC	%
Toluene	2022/08/16	NC				%	50		
Ethylbenzene	2022/08/16	NC				%	50		
m & p-Xylene	2022/08/16	NC				%	50		
o-Xylene	2022/08/16	NC				%	50		
F1 (C6-C10)	2022/08/16	NC				%	30		
A681077	GG3	Matrix Spike [AZM284-02]	O-TERPHENYL (sur.)	2022/08/15	81	%	60 - 140		
			F2 (C10-C16 Hydrocarbons)	2022/08/15	77	%	60 - 140		
			F3 (C16-C34 Hydrocarbons)	2022/08/15	77	%	60 - 140		
			F4 (C34-C50 Hydrocarbons)	2022/08/15	72	%	60 - 140		
A681077	GG3	Spiked Blank	O-TERPHENYL (sur.)	2022/08/15	81	%	60 - 140		
			F2 (C10-C16 Hydrocarbons)	2022/08/15	78	%	60 - 140		
			F3 (C16-C34 Hydrocarbons)	2022/08/15	79	%	60 - 140		
			F4 (C34-C50 Hydrocarbons)	2022/08/15	74	%	60 - 140		
A681077	GG3	Method Blank	O-TERPHENYL (sur.)	2022/08/15	83	%	60 - 140		
			F2 (C10-C16 Hydrocarbons)	2022/08/15	<10		mg/kg		
			F3 (C16-C34 Hydrocarbons)	2022/08/15	<50		mg/kg		
			F4 (C34-C50 Hydrocarbons)	2022/08/15	<50		mg/kg		
A681077	GG3	RPD [AZM284-02]	F2 (C10-C16 Hydrocarbons)	2022/08/15	NC	%	40		
			F3 (C16-C34 Hydrocarbons)	2022/08/15	NC	%	40		
			F4 (C34-C50 Hydrocarbons)	2022/08/15	NC	%	40		



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	A681090	A1H	Method Blank	Moisture	2022/08/16	<0.30		%	
	A681090	A1H	RPD	Moisture	2022/08/16	2.1		%	20
	A682611	MKJ	Matrix Spike	Total Antimony (Sb)	2022/08/17		101	%	75 - 125
				Total Arsenic (As)	2022/08/17		97	%	75 - 125
				Total Barium (Ba)	2022/08/17		NC	%	75 - 125
				Total Beryllium (Be)	2022/08/17		96	%	75 - 125
				Total Cadmium (Cd)	2022/08/17		98	%	75 - 125
				Total Chromium (Cr)	2022/08/17		113	%	75 - 125
				Total Cobalt (Co)	2022/08/17		99	%	75 - 125
				Total Copper (Cu)	2022/08/17		100	%	75 - 125
				Total Lead (Pb)	2022/08/17		99	%	75 - 125
				Total Mercury (Hg)	2022/08/17		96	%	75 - 125
				Total Molybdenum (Mo)	2022/08/17		101	%	75 - 125
				Total Nickel (Ni)	2022/08/17		104	%	75 - 125
				Total Selenium (Se)	2022/08/17		100	%	75 - 125
				Total Silver (Ag)	2022/08/17		99	%	75 - 125
				Total Thallium (Tl)	2022/08/17		98	%	75 - 125
				Total Tin (Sn)	2022/08/17		102	%	75 - 125
				Total Uranium (U)	2022/08/17		95	%	75 - 125
				Total Vanadium (V)	2022/08/17		140 (1)	%	75 - 125
				Total Zinc (Zn)	2022/08/17		102	%	75 - 125
	A682611	MKJ	QC Standard	Total Antimony (Sb)	2022/08/17		109	%	15 - 182
				Total Arsenic (As)	2022/08/17		103	%	53 - 147
				Total Barium (Ba)	2022/08/17		103	%	80 - 119
				Total Cadmium (Cd)	2022/08/17		94	%	72 - 128
				Total Chromium (Cr)	2022/08/17		113	%	59 - 141
				Total Cobalt (Co)	2022/08/17		101	%	58 - 142
				Total Copper (Cu)	2022/08/17		103	%	83 - 117
				Total Lead (Pb)	2022/08/17		111	%	79 - 121
				Total Molybdenum (Mo)	2022/08/17		122	%	67 - 133
				Total Nickel (Ni)	2022/08/17		110	%	79 - 121
				Total Silver (Ag)	2022/08/17		89	%	47 - 153
				Total Tin (Sn)	2022/08/17		98	%	67 - 133
				Total Uranium (U)	2022/08/17		98	%	77 - 123
				Total Vanadium (V)	2022/08/17		111	%	79 - 121
				Total Zinc (Zn)	2022/08/17		103	%	79 - 121
	A682611	MKJ	Spiked Blank	Total Antimony (Sb)	2022/08/17		102	%	80 - 120
				Total Arsenic (As)	2022/08/17		95	%	80 - 120
				Total Barium (Ba)	2022/08/17		96	%	80 - 120
				Total Beryllium (Be)	2022/08/17		92	%	80 - 120
				Total Cadmium (Cd)	2022/08/17		95	%	80 - 120
				Total Chromium (Cr)	2022/08/17		97	%	80 - 120
				Total Cobalt (Co)	2022/08/17		97	%	80 - 120
				Total Copper (Cu)	2022/08/17		97	%	80 - 120
				Total Lead (Pb)	2022/08/17		97	%	80 - 120
				Total Mercury (Hg)	2022/08/17		100	%	80 - 120
				Total Molybdenum (Mo)	2022/08/17		96	%	80 - 120
				Total Nickel (Ni)	2022/08/17		96	%	80 - 120
				Total Selenium (Se)	2022/08/17		99	%	80 - 120
				Total Silver (Ag)	2022/08/17		96	%	80 - 120
				Total Thallium (Tl)	2022/08/17		97	%	80 - 120
				Total Tin (Sn)	2022/08/17		96	%	80 - 120



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits			
A682611	MKJ	Method Blank	Total Uranium (U)	2022/08/17		97	%	80 - 120			
			Total Vanadium (V)	2022/08/17		97	%	80 - 120			
			Total Zinc (Zn)	2022/08/17		97	%	80 - 120			
			Total Antimony (Sb)	2022/08/17	<0.50		mg/kg				
			Total Arsenic (As)	2022/08/17	<1.0		mg/kg				
			Total Barium (Ba)	2022/08/17	<1.0		mg/kg				
			Total Beryllium (Be)	2022/08/17	<0.40		mg/kg				
			Total Cadmium (Cd)	2022/08/17	<0.050		mg/kg				
			Total Chromium (Cr)	2022/08/17	<1.0		mg/kg				
			Total Cobalt (Co)	2022/08/17	<0.50		mg/kg				
			Total Copper (Cu)	2022/08/17	<1.0		mg/kg				
			Total Lead (Pb)	2022/08/17	<0.50		mg/kg				
			Total Mercury (Hg)	2022/08/17	<0.050		mg/kg				
			Total Molybdenum (Mo)	2022/08/17	<0.40		mg/kg				
			Total Nickel (Ni)	2022/08/17	<1.0		mg/kg				
			Total Selenium (Se)	2022/08/17	<0.50		mg/kg				
			Total Silver (Ag)	2022/08/17	<0.20		mg/kg				
			Total Thallium (Tl)	2022/08/17	<0.10		mg/kg				
			A682611	MKJ	RPD	Total Uranium (U)	2022/08/17	<0.20		mg/kg	
						Total Vanadium (V)	2022/08/17	<1.0		mg/kg	
A682697	FM0	Matrix Spike	Total Zinc (Zn)	2022/08/17	<10		mg/kg				
			Total Chromium (Cr)	2022/08/17	1.9	%	30				
A682697	FM0	Spiked Blank	Total Nickel (Ni)	2022/08/17	5.2	%	30				
			Hex. Chromium (Cr 6+)	2022/08/16		97	%	75 - 125			
A682697	FM0	Method Blank	Hex. Chromium (Cr 6+)	2022/08/16	<0.080		mg/kg				
			Hex. Chromium (Cr 6+)	2022/08/16	NC	%	35				
A683000	MPU	Matrix Spike	Soluble (Hot water) Boron (B)	2022/08/16		95	%	75 - 125			
			Soluble (Hot water) Boron (B)	2022/08/16		89	%	80 - 120			
A683000	MPU	Spiked Blank	Soluble (Hot water) Boron (B)	2022/08/16	<0.10		mg/kg				
			Soluble (Hot water) Boron (B)	2022/08/16	4.3	%	35				
A683000	MPU	Method Blank	Soluble (Hot water) Boron (B)	2022/08/16		91	%	75 - 125			
			Soluble (Hot water) Boron (B) [AZM282-01]	2022/08/16		94	%	80 - 120			
A683007	MPU	Matrix Spike	Soluble (Hot water) Boron (B)	2022/08/16	<0.10		mg/kg				
			Soluble (Hot water) Boron (B) [AZM282-01]	2022/08/16	6.8	%	35				
A683223	KH2	Matrix Spike	Total Chromium (Cr)	2022/08/17		104	%	75 - 125			
			Total Nickel (Ni)	2022/08/17		100	%	75 - 125			
			Total Selenium (Se)	2022/08/17		NC	%	75 - 125			
			Total Silver (Ag)	2022/08/17		105	%	75 - 125			
			Total Thallium (Tl)	2022/08/17		101	%	75 - 125			
			Total Antimony (Sb)	2022/08/17		101	%	75 - 125			
			Total Arsenic (As)	2022/08/17		103	%	75 - 125			
			Total Barium (Ba)	2022/08/17		101	%	75 - 125			
			Total Beryllium (Be)	2022/08/17		101	%	75 - 125			
			Total Cadmium (Cd)	2022/08/17		106	%	75 - 125			
			Total Cobalt (Co)	2022/08/17		106	%	75 - 125			
			Total Copper (Cu)	2022/08/17		100	%	75 - 125			
			Total Lead (Pb)	2022/08/17		104	%	75 - 125			
			Total Mercury (Hg)	2022/08/17		102	%	75 - 125			



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A683223	KH2	QC Standard	Total Tin (Sn)	2022/08/17		105	%	75 - 125
			Total Uranium (U)	2022/08/17		101	%	75 - 125
			Total Vanadium (V)	2022/08/17		131 (1)	%	75 - 125
			Total Zinc (Zn)	2022/08/17		113	%	75 - 125
			Total Antimony (Sb)	2022/08/17		96	%	15 - 182
			Total Arsenic (As)	2022/08/17		73	%	53 - 147
			Total Barium (Ba)	2022/08/17		89	%	80 - 119
			Total Cadmium (Cd)	2022/08/17		85	%	72 - 128
			Total Chromium (Cr)	2022/08/17		78	%	59 - 141
			Total Cobalt (Co)	2022/08/17		73	%	58 - 142
			Total Copper (Cu)	2022/08/17		101	%	83 - 117
			Total Lead (Pb)	2022/08/17		98	%	79 - 121
			Total Molybdenum (Mo)	2022/08/17		112	%	67 - 133
			Total Nickel (Ni)	2022/08/17		81	%	79 - 121
			Total Silver (Ag)	2022/08/17		80	%	47 - 153
			Total Tin (Sn)	2022/08/17		86	%	67 - 133
			A683223	KH2	Spiked Blank	Total Uranium (U)	2022/08/17	
Total Vanadium (V)	2022/08/17					79	%	79 - 121
Total Zinc (Zn)	2022/08/17					101	%	79 - 121
Total Antimony (Sb)	2022/08/17					101	%	80 - 120
Total Arsenic (As)	2022/08/17					94	%	80 - 120
Total Barium (Ba)	2022/08/17					97	%	80 - 120
Total Beryllium (Be)	2022/08/17					98	%	80 - 120
Total Cadmium (Cd)	2022/08/17					96	%	80 - 120
Total Chromium (Cr)	2022/08/17					97	%	80 - 120
Total Cobalt (Co)	2022/08/17					97	%	80 - 120
Total Copper (Cu)	2022/08/17					97	%	80 - 120
Total Lead (Pb)	2022/08/17					97	%	80 - 120
Total Mercury (Hg)	2022/08/17					102	%	80 - 120
Total Molybdenum (Mo)	2022/08/17					99	%	80 - 120
Total Nickel (Ni)	2022/08/17					96	%	80 - 120
Total Selenium (Se)	2022/08/17					96	%	80 - 120
Total Silver (Ag)	2022/08/17					98	%	80 - 120
Total Thallium (Tl)	2022/08/17		98	%	80 - 120			
Total Tin (Sn)	2022/08/17		97	%	80 - 120			
Total Uranium (U)	2022/08/17		98	%	80 - 120			
Total Vanadium (V)	2022/08/17		98	%	80 - 120			
Total Zinc (Zn)	2022/08/17		95	%	80 - 120			
A683223	KH2	Method Blank	Total Antimony (Sb)	2022/08/17	<0.50		mg/kg	
			Total Arsenic (As)	2022/08/17	<1.0		mg/kg	
			Total Barium (Ba)	2022/08/17	<1.0		mg/kg	
			Total Beryllium (Be)	2022/08/17	<0.40		mg/kg	
			Total Cadmium (Cd)	2022/08/17	<0.050		mg/kg	
			Total Chromium (Cr)	2022/08/17	<1.0		mg/kg	
			Total Cobalt (Co)	2022/08/17	<0.50		mg/kg	
			Total Copper (Cu)	2022/08/17	<1.0		mg/kg	
			Total Lead (Pb)	2022/08/17	<0.50		mg/kg	
			Total Mercury (Hg)	2022/08/17	<0.050		mg/kg	
			Total Molybdenum (Mo)	2022/08/17	<0.40		mg/kg	
			Total Nickel (Ni)	2022/08/17	<1.0		mg/kg	
			Total Selenium (Se)	2022/08/17	<0.50		mg/kg	
Total Silver (Ag)	2022/08/17	<0.20		mg/kg				



BUREAU
VERITAS

Bureau Veritas Job #: C260031
Report Date: 2022/09/06

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL,NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: ML

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A683223	KH2	RPD	Total Thallium (Tl)	2022/08/17	<0.10		mg/kg	
			Total Tin (Sn)	2022/08/17	<1.0		mg/kg	
			Total Uranium (U)	2022/08/17	<0.20		mg/kg	
			Total Vanadium (V)	2022/08/17	<1.0		mg/kg	
			Total Zinc (Zn)	2022/08/17	<10		mg/kg	
			Total Antimony (Sb)	2022/08/17	NC	%	30	
			Total Arsenic (As)	2022/08/17	10	%	30	
			Total Barium (Ba)	2022/08/17	14	%	35	
			Total Beryllium (Be)	2022/08/17	NC	%	30	
			Total Cadmium (Cd)	2022/08/17	0.64	%	30	
			Total Chromium (Cr)	2022/08/17	7.9	%	30	
			Total Cobalt (Co)	2022/08/17	7.9	%	30	
			Total Copper (Cu)	2022/08/17	5.9	%	30	
			Total Lead (Pb)	2022/08/17	3.3	%	35	
			Total Mercury (Hg)	2022/08/17	NC	%	35	
			Total Molybdenum (Mo)	2022/08/17	2.7	%	35	
			Total Nickel (Ni)	2022/08/17	4.8	%	30	
			Total Selenium (Se)	2022/08/17	NC	%	30	
			Total Silver (Ag)	2022/08/17	NC	%	35	
			Total Thallium (Tl)	2022/08/17	NC	%	30	
Total Tin (Sn)	2022/08/17	NC	%	35				
Total Uranium (U)	2022/08/17	5.0	%	30				
Total Vanadium (V)	2022/08/17	11	%	30				
Total Zinc (Zn)	2022/08/17	6.1	%	30				
A683972	FM0	Matrix Spike	Hex. Chromium (Cr 6+)	2022/08/17		107	%	75 - 125
A683972	FM0	Spiked Blank	Hex. Chromium (Cr 6+)	2022/08/17		101	%	80 - 120
A683972	FM0	Method Blank	Hex. Chromium (Cr 6+)	2022/08/17	<0.080		mg/kg	
A683972	FM0	RPD	Hex. Chromium (Cr 6+)	2022/08/17	NC		%	35

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.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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.



VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Chantal Vincent, Customer Solutions Representative

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

Sandy Yuan, M.Sc., QP, Scientific Specialist

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

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

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

636

CHAIN OF CUSTODY RECORD
ENV COC - 00013V3

Choose Location:
 Calgary, AB: 4000 19th St. NE T2E 6P8 Toll Free (800) 386-7247
 Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
 Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208



Invoice Information Invoice to (requires report) Report Information (if differs from invoice)

Company: Client #254, Golder Associates
 Contact Name: Aurelie Bellavance
 Street Address: 237 - 4 Ave SW Suite 3300
 City: Calgary Prov: AB Postal Code: [blank]

Company: Golder Associates
 Contact Name: Aurelie Bellavance
 Street Address: 22525414-100
 City: West-Channel, NT Postal Code: [blank]

Phone: 403-299-5600
 Email: aurelie.bellavance@bvwsp.com
 Copies: peter.tano@bvwsp.com

Quotation #: 22525414-100-104
 Project #: 22525414-1000
 Site #: T2P 4K3
 Site Location: Camp Farewell NA
 Province: WEST CHANNEL, NT
 Site Location: NT

LAB USE ONLY - PLACE STICKER HERE
 C260031

Regulatory Criteria

AT1 CCME Drinking Water - Canada Drinking Water - Manitoba
 Saskatchewan Drinking Water - Alberta Other: AMSRP

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

Sample Identification	Date Sampled			Time (24hr)		Matrix	Regulatory Criteria										Comments									
	YY	MM	DD	HH	MM		FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	PAHS	BTEX F1-F2	BARUM TRUE TOTAL	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total		Mercury - dissolved	Salinity &	Slieve (75 micron)	Texture (% sand, silt, clay)	Basic class II landfill	LIMITED SAMPLE	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	
1 DWP E	22	08	08	13	30	Soil	X						X								X	4			email report to: gld.sheppard@bvwsp.com gld.iol-equis@bvwsp.com Upload to Facility code 41259544	
2 BH 22-20-04	22	08	08	13	30	Soil	X						X								X	4			Received in Yellowknife By: J. Mercier 09:00 AUG 12 2022 Temp: 1/3	
3 BH 22-20-03	22	08	08	13	40	Soil	X						X								X	4				
4 BH 22-20-02	22	08	08	13	45	Soil	X						X								X	4				
5 BH 22-20-01	22	08	08	13	50	Soil	X						X								X	4				
6 BH 22-18-01	22	08	08	13	00	Soil	X						X								X	4				
7 BH 22-18-02	22	08	08	13	10	Soil	X						X								X	4				
8 BH 22-18-03	22	08	08	13	15	Soil	X						X								X	4				
9 BH 22-18-04	22	08	08	13	20	Soil	X						X								X	4				
10																										
11																										
12																										

LAB USE ONLY

Seal present: 5 4 9
 Seal intact: [blank]
 Cooling media present: [blank]

LAB USE ONLY
 Seal present: [blank]
 Seal intact: [blank]
 Cooling media present: [blank]

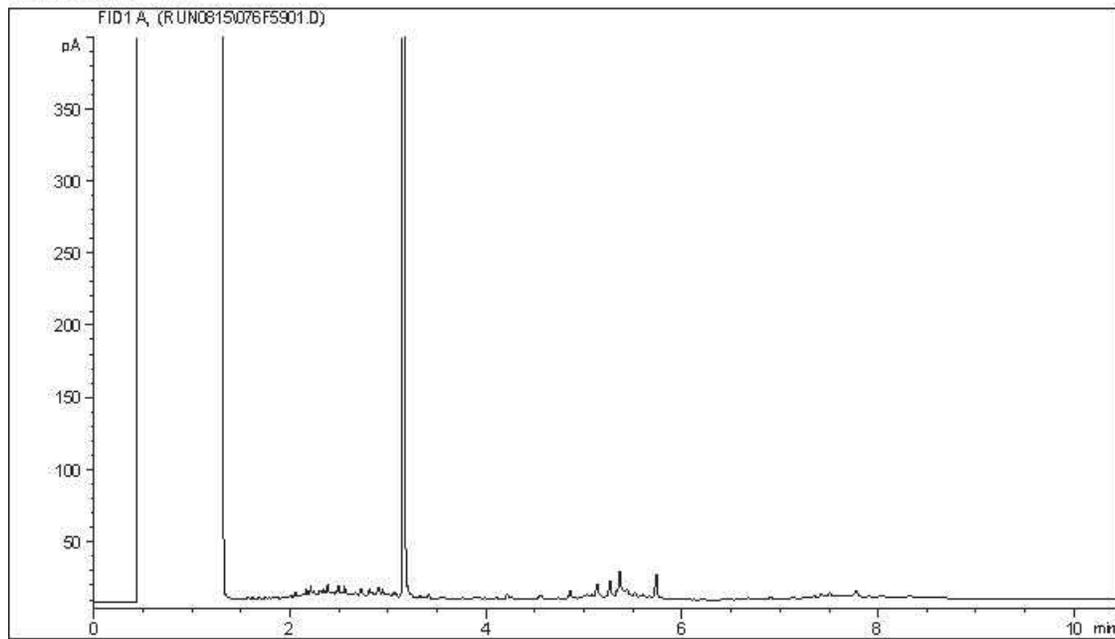
Temperature reading by: [blank]

Received by: (Signature/Print) Sarah Dolan 2022 08 13 15 03

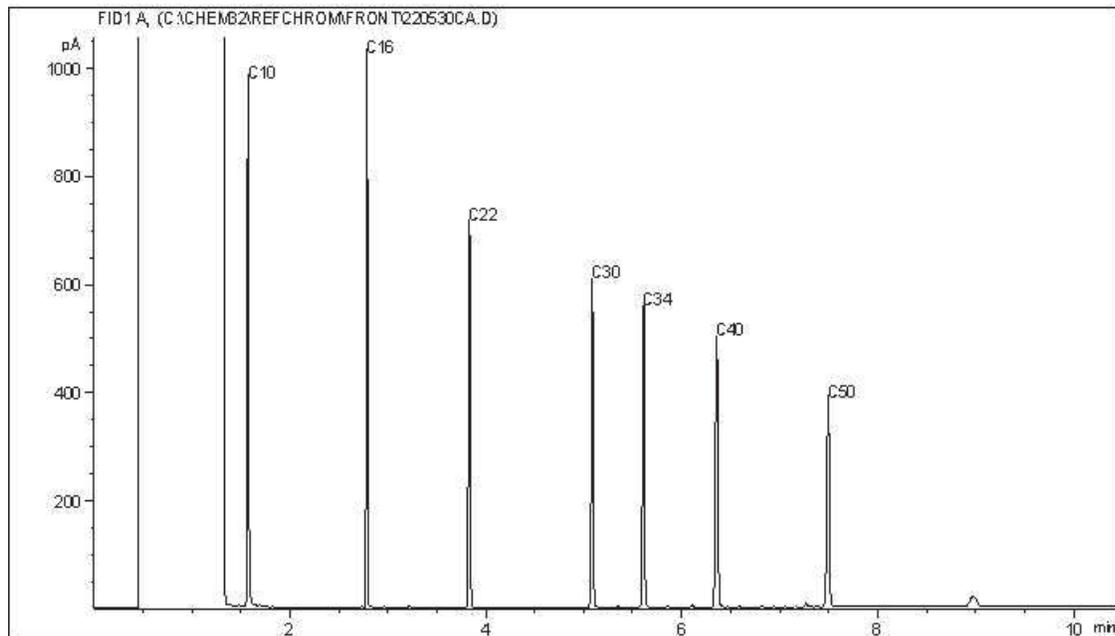
Special Instructions: [blank]

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



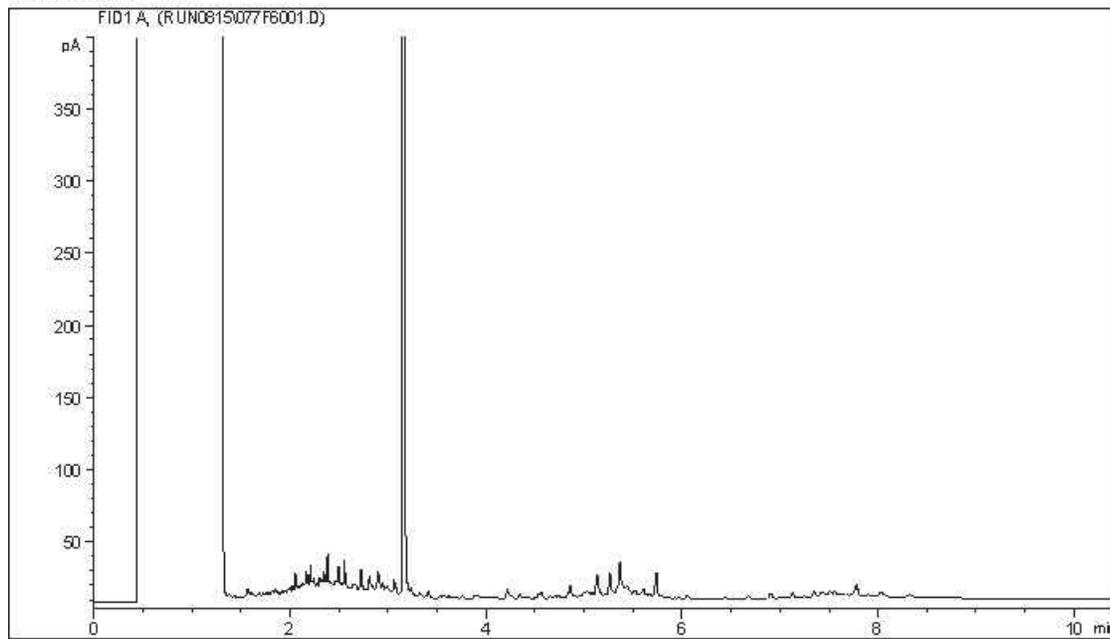
TYPICAL PRODUCT CARBON NUMBER RANGES

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

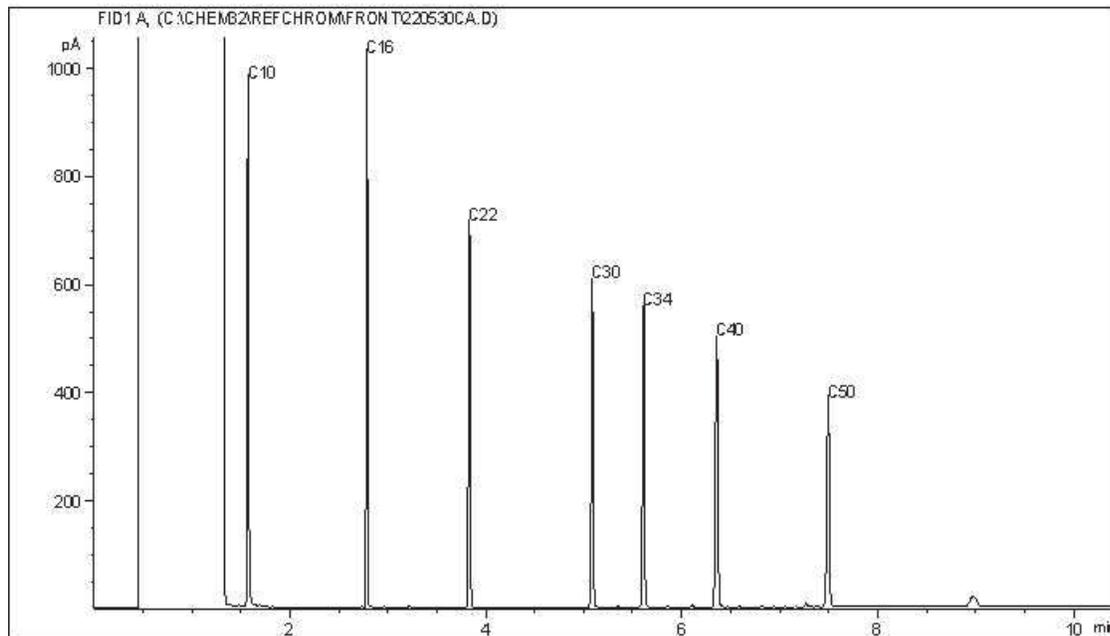
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



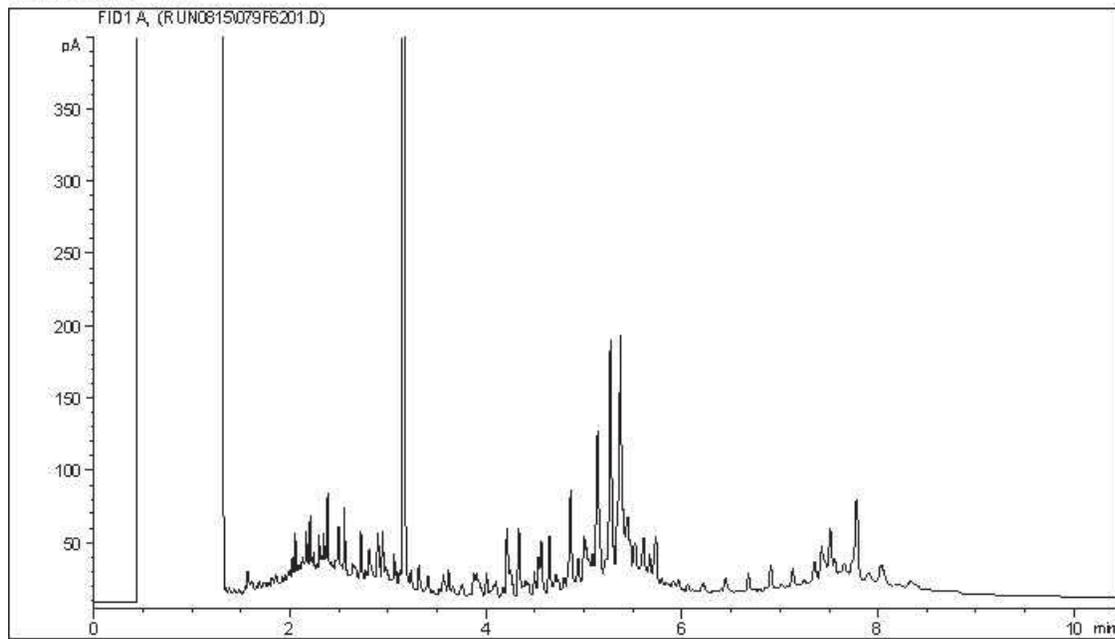
TYPICAL PRODUCT CARBON NUMBER RANGES

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

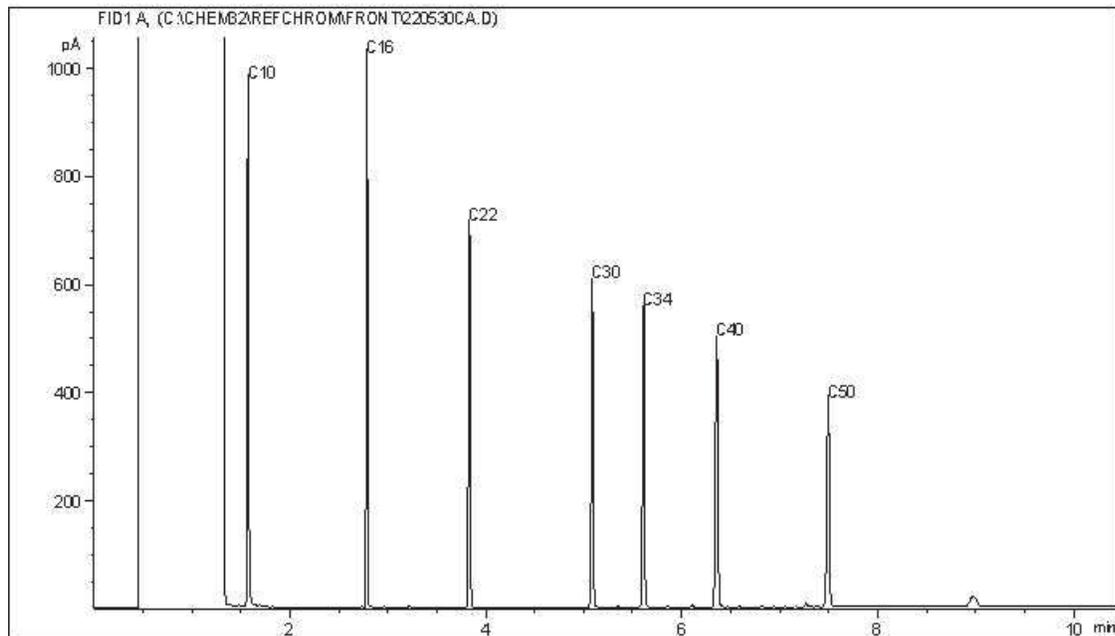
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



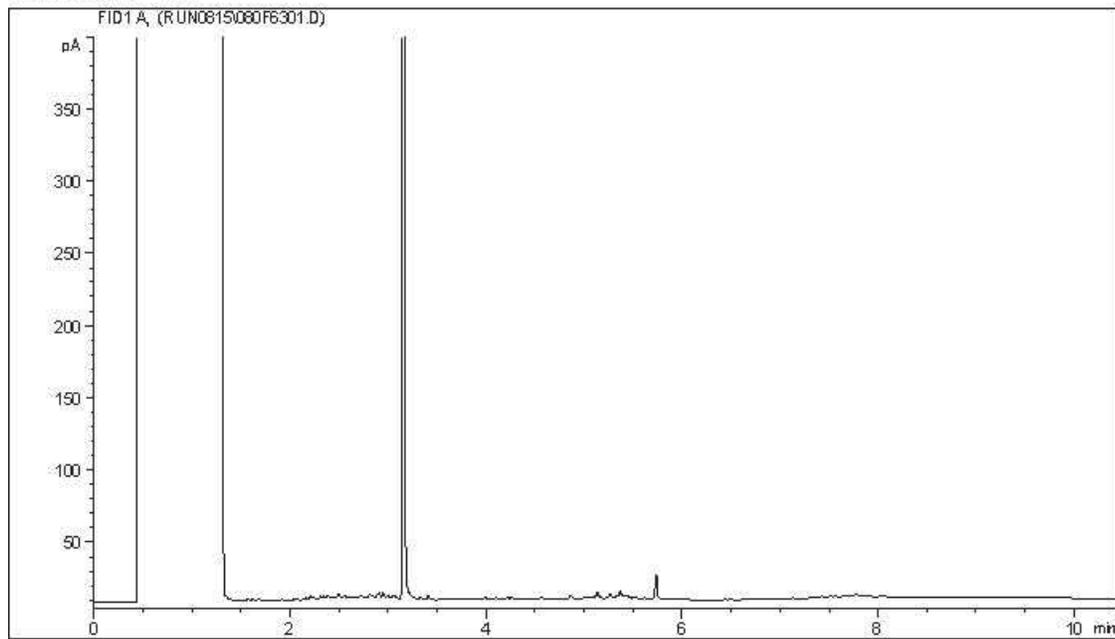
TYPICAL PRODUCT CARBON NUMBER RANGES

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

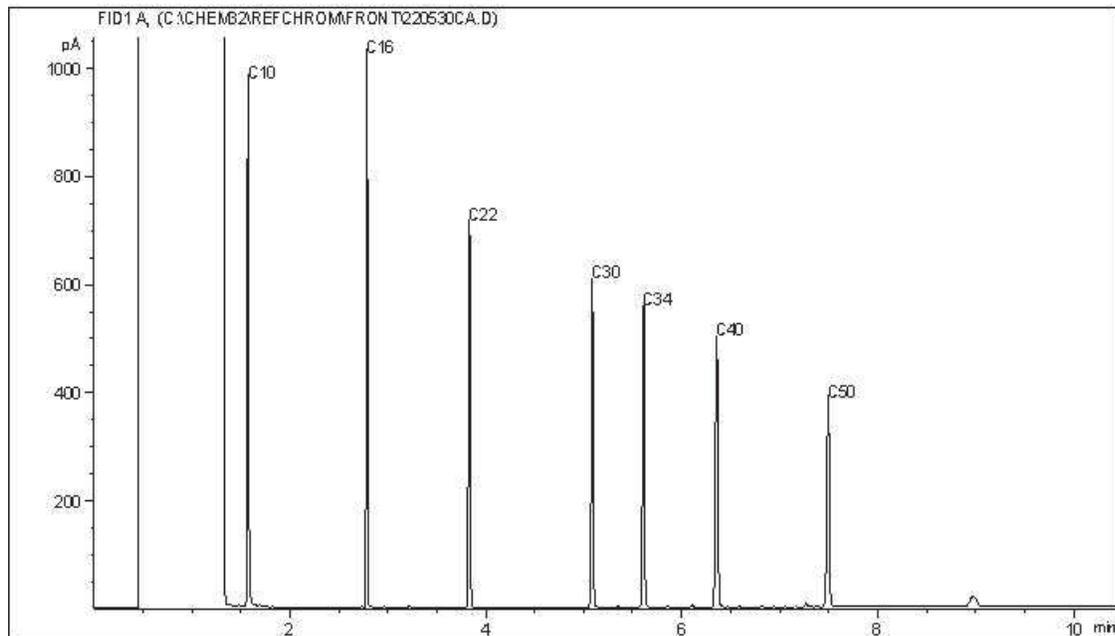
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



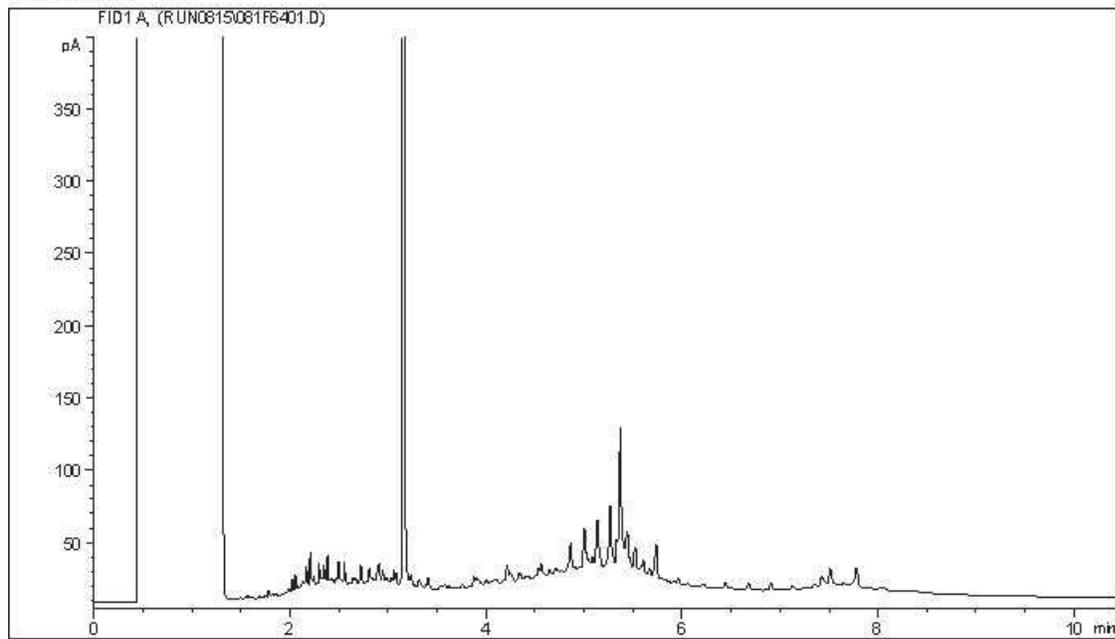
TYPICAL PRODUCT CARBON NUMBER RANGES

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

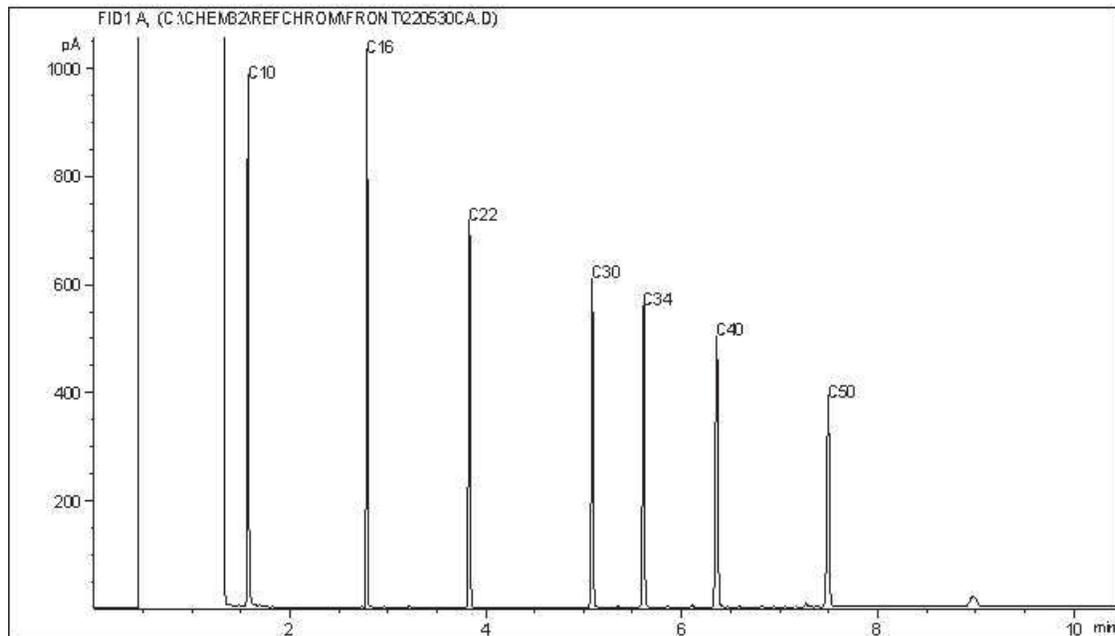
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



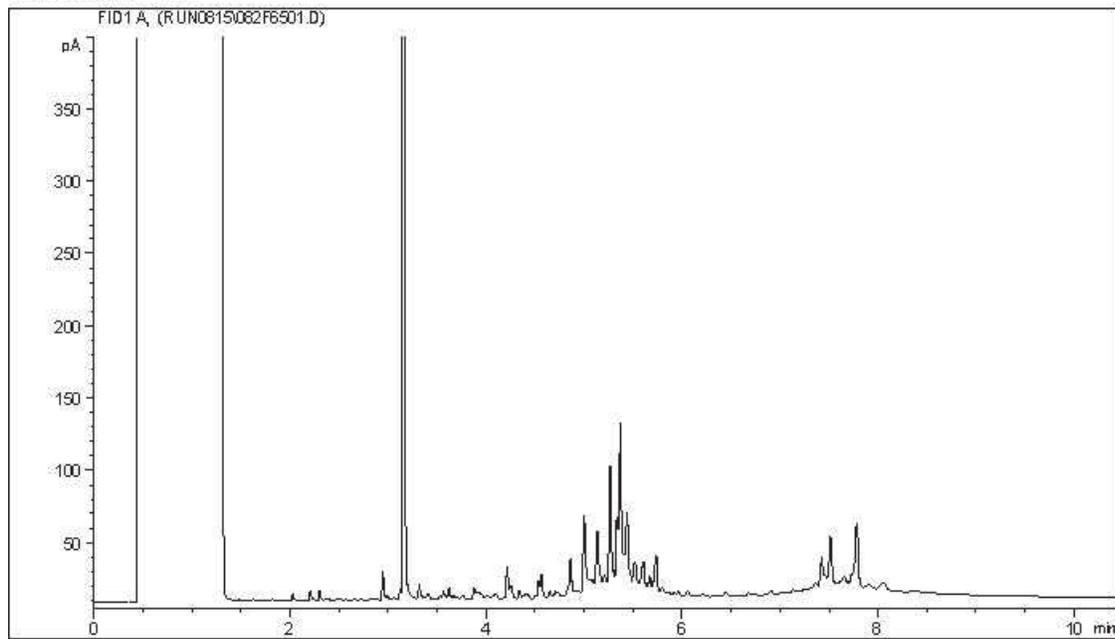
TYPICAL PRODUCT CARBON NUMBER RANGES

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

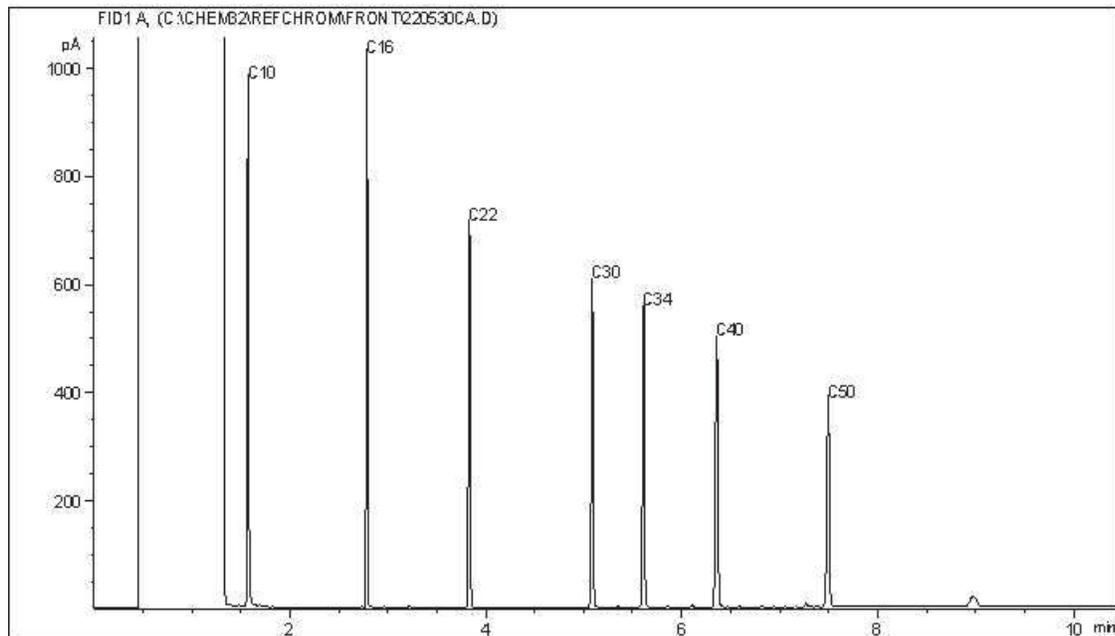
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



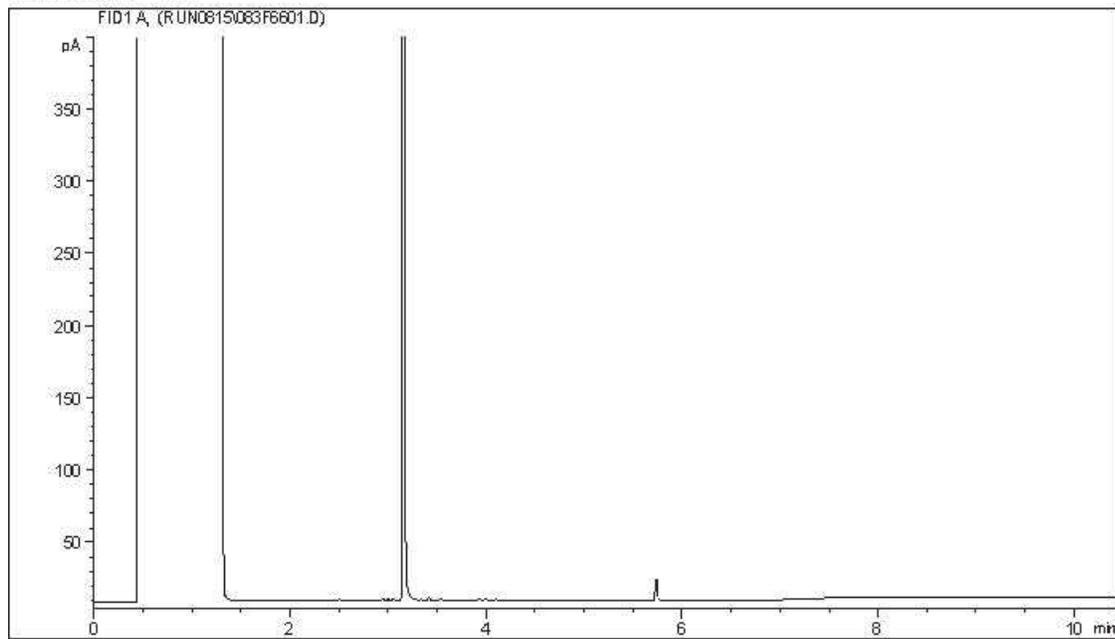
TYPICAL PRODUCT CARBON NUMBER RANGES

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

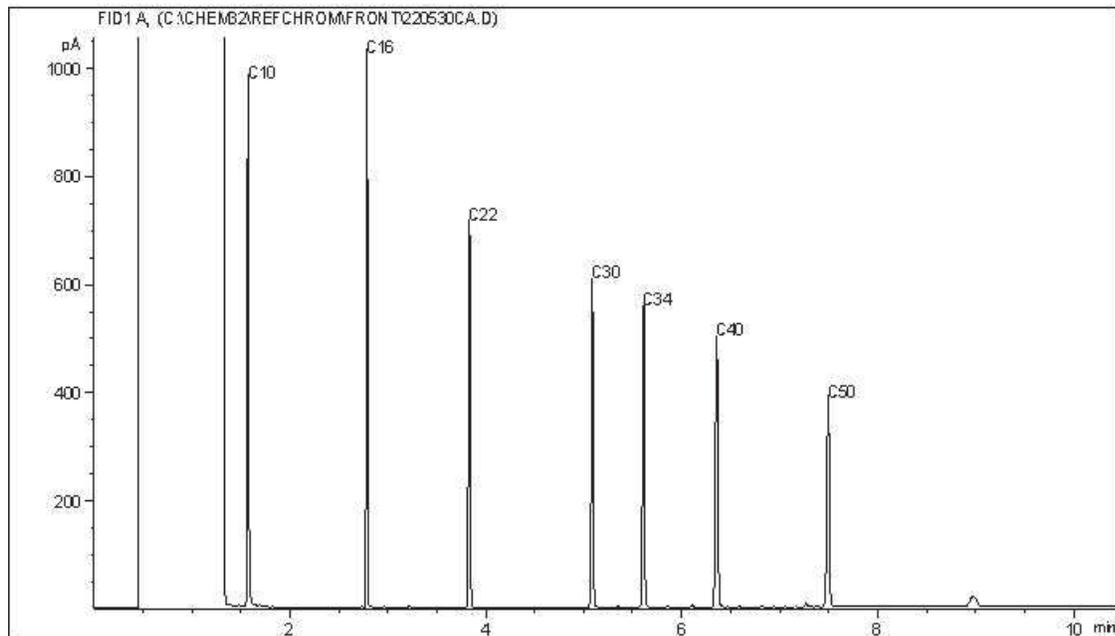
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



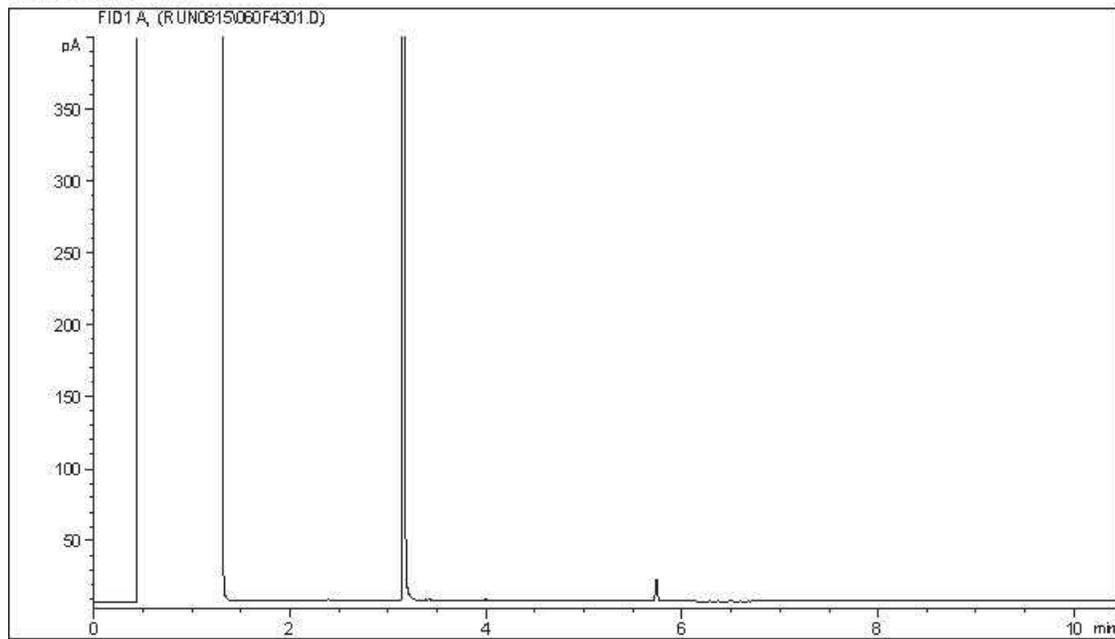
TYPICAL PRODUCT CARBON NUMBER RANGES

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

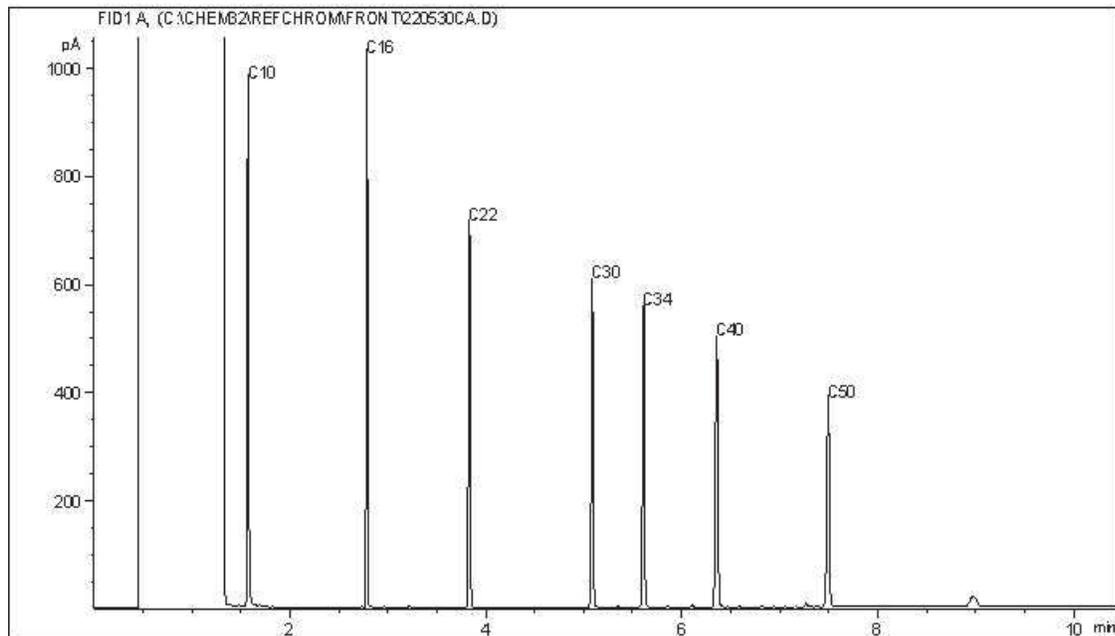
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



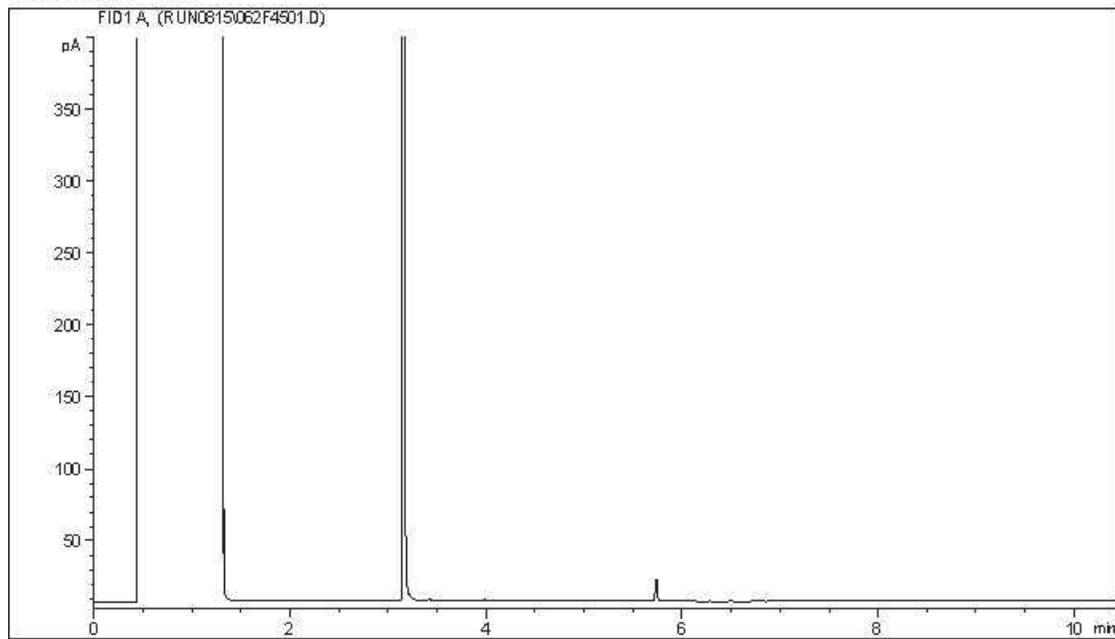
TYPICAL PRODUCT CARBON NUMBER RANGES

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

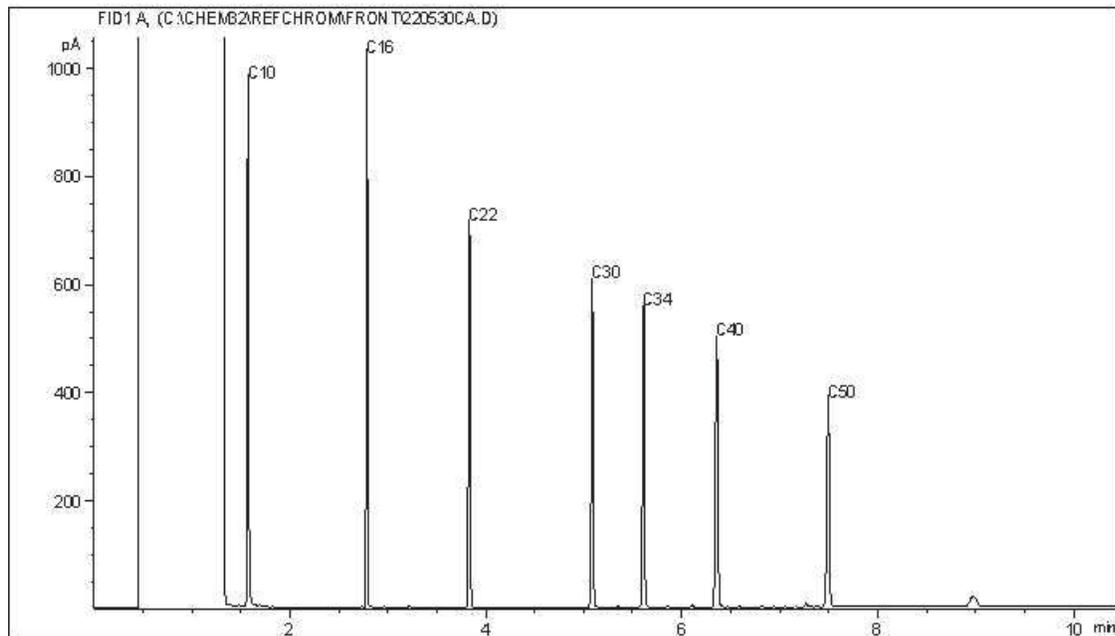
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC7



Carbon Range Distribution - Reference Chromatogram



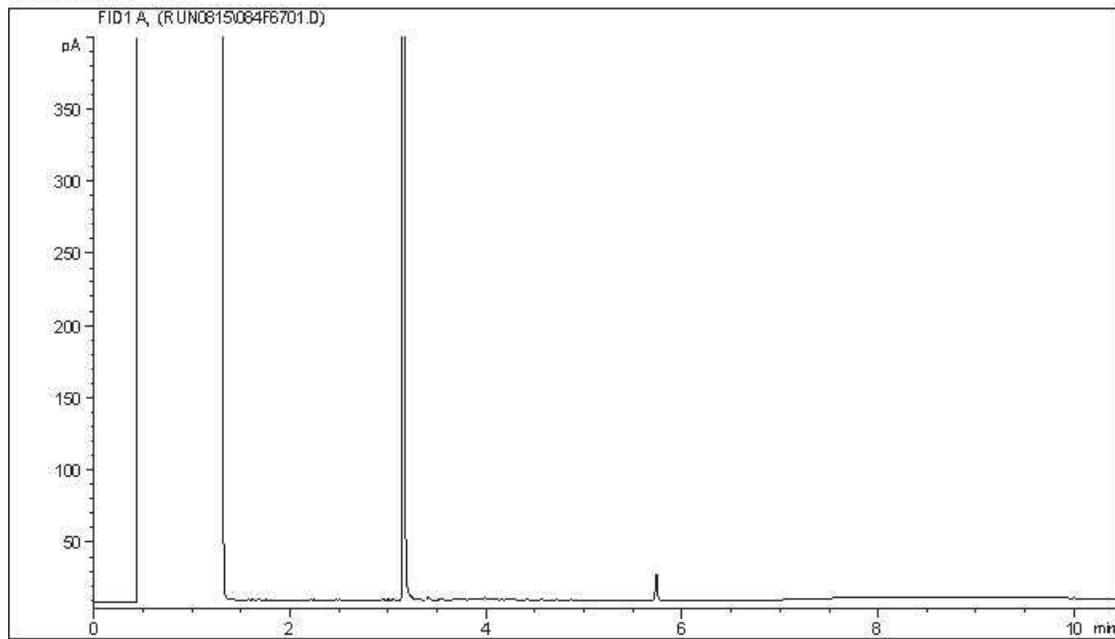
TYPICAL PRODUCT CARBON NUMBER RANGES

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

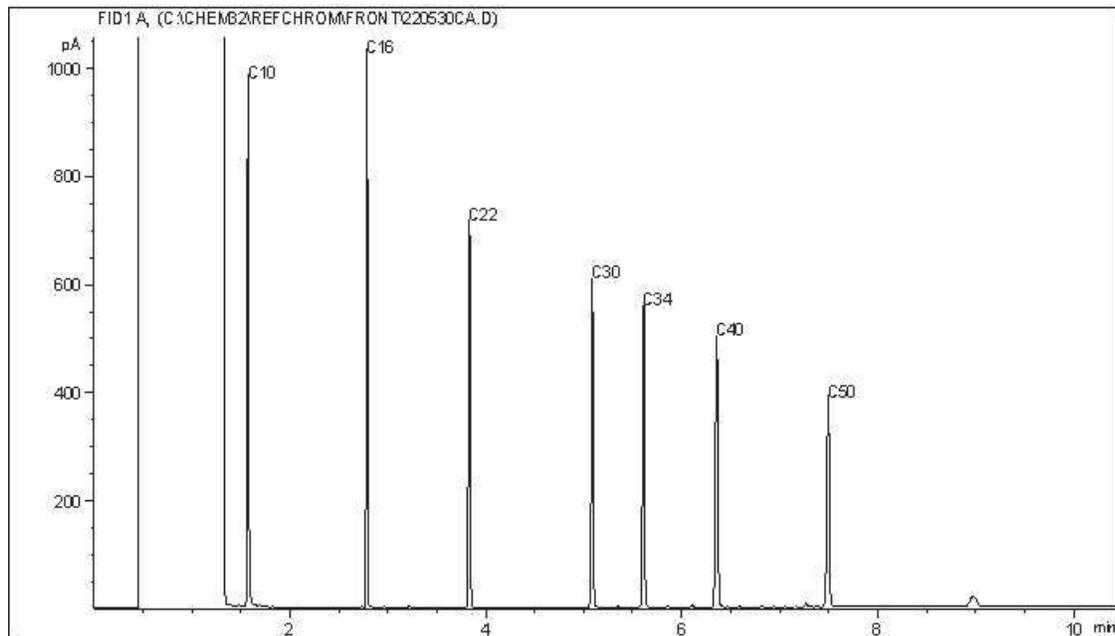
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) 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.



August 19, 2022

GOLDER ASSOCIATES LTD.

2800, 700 -2nd Street SW
CALGARY, AB, T2P 2W2

Attention: Aurelie Bellavance

**Re: Chromatogram Interpretation of CAMP FAREWELL, NT; Project 22525414-1000
Bureau Veritas Job No.: C260031**

Bureau Veritas was retained by Golder Associates Ltd. to provide hydrocarbon interpretations concerning the likely origin of hydrocarbons quantified within CCME fraction(s) F2, F3 and/or F4.

Analytical Method

Petroleum hydrocarbon analyses at Bureau Veritas are conducted in accordance with the analytical specifications required by the prescriptive and performance-based (where appropriate) elements of the CCME Tier I protocols for hydrocarbon determination¹ in soil samples.

Chromatogram Interpretation

A comprehensive qualitative assessment of the resultant gas chromatograms in the F2-F4 ranges was performed. The chromatograms were inspected for specific peak profiles that would indicate the possible origin of the hydrocarbons present in the sample. The presence and nature of specific aliphatic compounds (n-alkanes), the presence of characteristic unresolved complex mixtures (UCMs) or “humps” and the relative abundance (ratios) of specific compounds are reviewed as part of the evaluation.

¹ Canadian Council of Ministers of the Environment: “Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier I Method” 2001



Data Interpretation

Table 1. Qualitative Data Summary – Chromatogram Interpretation

Lab ID	Sample ID	Chromatogram Interpretation
AZM279	BH22-20-03	The CCME F2-F4 chromatographic peak profile is consistent with a mixture of biogenic organic material (e.g. peat), and a weathered middle distillate petroleum product (e.g. Diesel #1, Kerosene). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34, whereas middle distillate products are typically characterized by evenly distributed peaks between C10 and C24, representing the simple straight chain aliphatic compounds (n-alkanes). These peaks will decrease in height, relative to the unresolved complex mixture (UCM or “hump”) with increased weathering of the product material.

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

Sincerely,
Bureau Veritas Laboratories

Michael Sheppard, B.Sc., P.Bio., QP
Consulting Scientist
Environmental Services

Scott Cantwell, CET, B.Sc., P.Chem.
Director and General Manager – Western Canada
Environmental Services

Disclaimer

Hydrocarbon Resemblance

Characterization by way of visual evaluation of the sample chromatogram may not be conclusive and is only indicative of substances that may be present. The resemblance information must be regarded as approximate and qualitative.



CLIENT NAME: BUREAU VERITAS CANADA (2019) INC
2021 - 41ST STREET NE
Calgary, AB T2E6P2
(403) 291-3077

ATTENTION TO: Cynny Hagen

PROJECT: C260031

AGAT WORK ORDER: 22C940500

SOIL ANALYSIS REVIEWED BY: Loan Nguyen, Senior Analyst

DATE REPORTED: Sep 06, 2022

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.



Certificate of Analysis

AGAT WORK ORDER: 22C940500

PROJECT: C260031

2910 12TH STREET NE
 CALGARY, ALBERTA
 CANADA T2E 7P7
 TEL (403)735-2005
 FAX (403)735-2771
<http://www.agatlabs.com>

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

Metals - Barium by Fusion ICP				
DATE RECEIVED: 2022-09-01			DATE REPORTED: 2022-09-06	
AZM281-BH22-				
SAMPLE DESCRIPTION: 20-01				
SAMPLE TYPE: Soil				
DATE SAMPLED: 2022-08-08 13:50				
Parameter	Unit	G / S	RDL	4267029
True Barium by Fusion ICP	mg/kg		50	3010

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
 4267029 Result is based on the dry weight of the sample.
 Analysis performed at AGAT Calgary (unless marked by *)

Certified By: _____



Method Summary

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

AGAT WORK ORDER: 22C940500

PROJECT: C260031

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
True Barium by Fusion ICP	SOIL- 0620, INST- 0140	ASTM D4503.08	ICP/OES



AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Bureau Veritas

Courier: JALOO Prepaid Collect

Waybill# _____

Branch: EDM GP FN FM RD VAN LYD FSJ EST SASK Other: _____

If multiple sites were submitted at once: Yes No

Custody Seal Intact: Yes No NA

TAT: <24hr 24-48hr 48-72hr Reg Other _____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken: _____

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) NA Soil = ___ °C 2 (Bottle/Jar) ___ + ___ + ___ = ___ °C

3 (Bottle/Jar) ___ + ___ + ___ = ___ °C 4 (Bottle/Jar) ___ + ___ + ___ = ___ °C

5 (Bottle/Jar) ___ + ___ + ___ = ___ °C 6 (Bottle/Jar) ___ + ___ + ___ = ___ °C

7 (Bottle/Jar) ___ + ___ + ___ = ___ °C 8 (Bottle/Jar) ___ + ___ + ___ = ___ °C

9 (Bottle/Jar) ___ + ___ + ___ = ___ °C 10 (Bottle/Jar) ___ + ___ + ___ = ___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 22C940500

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial _____

General Comments: _____

* Subcontracted Analysis (See CPM)

WIN-CITY



JAZOO EXPRESS COURIER

www.jazooocourier.com

CLIENT USE ONLY

Sender Name:	Robert Mebrahtu	Receiver Name:	Bureau Reception	Billed To:	Bureau Veritas
Date:	2022/09/01	Delivery From:	Bureau Veritas Calgary		
Total # Items:	2	Delivery To:	AGAT-Calgary 2910 12th street NE Calgary, AB, T2E 7P7		
		Item Description:	1 Large Cooler, 1 Medium Cooler		
		envelope, sm/med/lg box, cooler, etc.			
Authorized Shipper Signature:		Job/PO/Reference #:			

DRIVER USE ONLY

P/U Driver Name:			P/U Time:	11:50 am	D/O Time:	12:05 pm
# Items P/U:	2					
# Of Overweight		# Of TDG		# Of Same Day		Surcharge

Additional Info:

Total # Items Dropped Off:	2	D/O Driver Name:	
Authorized Receiver Signature:			

HOTSHOT DETAILS

Total Km:		Or Total Charge (\$):	
OFFICE USE ONLY			
Verified By:		Invoiced By:	

To schedule a pickup please contact dispatch at the city nearest you:

Calgary 403-660-5504 Fort McMurray 587-645-6364
 Edmonton 780-903-3628 Grande Prairie 587-297-8406

THANK YOU FOR SUPPORTING LOCAL AND CHOOSING JAZOO EXPRESS COURIER.



CLIENT NAME: BUREAU VERITAS CANADA (2019) INC
2021 - 41ST STREET NE
Calgary, AB T2E6P2
(403) 291-3077

ATTENTION TO: Cynny Hagen

PROJECT: C260031

AGAT WORK ORDER: 22C940500

SOIL ANALYSIS REVIEWED BY: Loan Nguyen, Senior Analyst

DATE REPORTED: Sep 06, 2022

PAGES (INCLUDING COVER): 7

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 735-2005

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.



Certificate of Analysis

AGAT WORK ORDER: 22C940500

PROJECT: C260031

2910 12TH STREET NE
 CALGARY, ALBERTA
 CANADA T2E 7P7
 TEL (403)735-2005
 FAX (403)735-2771
<http://www.agatlabs.com>

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

Metals - Barium by Fusion ICP

DATE RECEIVED: 2022-09-01

DATE REPORTED: 2022-09-06

AZM281-BH22-

SAMPLE DESCRIPTION: 20-01

SAMPLE TYPE: Soil

DATE SAMPLED: 2022-08-08
 13:50

Parameter	Unit	G / S	RDL	4267029
True Barium by Fusion ICP	mg/kg		50	3010

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

4267029 Result is based on the dry weight of the sample.

Analysis performed at AGAT Calgary (unless marked by *)

Certified By:



Method Summary

CLIENT NAME: BUREAU VERITAS CANADA (2019) INC

AGAT WORK ORDER: 22C940500

PROJECT: C260031

ATTENTION TO: Cynny Hagen

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
True Barium by Fusion ICP	SOIL- 0620, INST- 0140	ASTM D4503.08	ICP/OES



AGAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM

RECEIVING BASICS - Shipping

Company/Consultant: Bureau Veritas

Courier: JALOO Prepaid Collect

Waybill# _____

Branch: EDM GP FN FM RD VAN LYD FSJ EST SASK Other: _____

If multiple sites were submitted at once: Yes No

Custody Seal Intact: Yes No NA

TAT: <24hr 24-48hr 48-72hr Reg Other _____

Cooler Quantity: 1

TIME SENSITIVE ISSUES - Shipping

ALREADY EXCEEDED HOLD TIME? Yes No

Inorganic Tests (Please Circle): Mibi , BOD , Nitrate/Nitrite , Turbidity , Color , Microtox , Ortho PO4 , Tedlar Bag , Residual Chlorine , Chlorophyll* , Chloroamines*

Earliest Expiry: _____

Hydrocarbons: Earliest Expiry _____

SAMPLE INTEGRITY - Shipping

Hazardous Samples: YES NO Precaution Taken: _____

Legal Samples: Yes No

International Samples: Yes No

Tape Sealed: Yes No

Coolant Used: Icepack Bagged Ice Free Ice Free Water None

Temperature (Bottles/Jars only) N/A only Soil Bags Received

FROZEN (Please Circle if samples received Frozen)

1 (Bottle/Jar) NA Soil = ___ °C 2 (Bottle/Jar) ___ + ___ + ___ = ___ °C

3 (Bottle/Jar) ___ + ___ + ___ = ___ °C 4 (Bottle/Jar) ___ + ___ + ___ = ___ °C

5 (Bottle/Jar) ___ + ___ + ___ = ___ °C 6 (Bottle/Jar) ___ + ___ + ___ = ___ °C

7 (Bottle/Jar) ___ + ___ + ___ = ___ °C 8 (Bottle/Jar) ___ + ___ + ___ = ___ °C

9 (Bottle/Jar) ___ + ___ + ___ = ___ °C 10 (Bottle/Jar) ___ + ___ + ___ = ___ °C

(If more than 10 coolers are received use another sheet of paper and attach)

LOGISTICS USE ONLY

Workorder No: 22C940500

Samples Damaged: Yes No If YES why?

No Bubble Wrap Frozen Courier

Other: _____

Account Project Manager: _____ have they been notified of the above issues: Yes No

Whom spoken to: _____ Date/Time: _____

CPM Initial _____

General Comments: _____

* Subcontracted Analysis (See CPM)

WIN-CITY



JAZOO EXPRESS COURIER

www.jazooocourier.com

CLIENT USE ONLY

Sender Name:	Robert Mebrahtu	Receiver Name:	Bureau Reception	Billed To:	Bureau Veritas
Date:	2022/09/01	Delivery From:	Bureau Veritas Calgary		
Total # Items:	2	Delivery To:	AGAT-Calgary 2910 12th street NE Calgary, AB, T2E 7P7		
		Item Description:	1 Large Cooler, 1 Medium Cooler		
		envelope, sm/med/lg box, cooler, etc.			
Authorized Shipper Signature:		Job/PO/Reference #:			

DRIVER USE ONLY

P/U Driver Name:			P/U Time:	11:50 am	D/O Time:	12:05 pm
# Items P/U:	2		# Of TDG		# Of Same Day	
# Of Overweight			Surcharge			

Additional Info:

Total # Items Dropped Off:	2	D/O Driver Name:	
Authorized Receiver Signature:			

HOTSHOT DETAILS

Total Km:		Or Total Charge (\$):	
OFFICE USE ONLY			
Verified By:		Invoiced By:	

To schedule a pickup please contact dispatch at the city nearest you:

Calgary 403-660-5504 Fort McMurray 587-645-6364
 Edmonton 780-903-3628 Grande Prairie 587-297-8406

THANK YOU FOR SUPPORTING LOCAL AND CHOOSING JAZOO EXPRESS COURIER.

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 8, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C260031

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes
 Was proper chain of custody of the samples documented and kept? Yes
 Were sample temperatures acceptable when they reached lab?: Yes
 Were all samples analyzed and extracted within hold times?: Yes
 Has lab warranted all tests were in statistical control in CoA?: Yes
 Was sufficient sample provided for the requested analysis? Yes
 Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	X			Matrix spike recovery for vanadium (140% and 131%)
Method Blank Concentration	X			exceeded the acceptance criteria of (75-125%).
Laboratory Duplicate RPD	X			All remaining laboratory QC results are within acceptance criteria.
Matrix Spike Recovery		X		
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	Samples BH22-20-04 and DUP E exceed the alert limits for barium (88%) and chromium (83%).
Trip Blank Concentration			X	
Field Duplicate RPD		X		

Is data considered reliable (Yes/No/Suspect)?: Yes
 If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 24, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAIRWELL
 Your C.O.C. #: 00013v3

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/08/25
 Report #: R3221467
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262019

Received: 2022/08/17, 12:45

Sample Matrix: Soil
 # Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Boron (Hot Water Soluble) (1)	4	2022/08/20	2022/08/20	AB SOP-00034 / AB SOP-00042	EPA 6010d R5 m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 2)	7	N/A	2022/08/19	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	7	N/A	2022/08/20		Auto Calc
Cation/EC Ratio (1)	4	N/A	2022/08/20		Auto Calc
Chloride (Soluble) (1)	1	2022/08/20	2022/08/20	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Chloride and Sulphate by IC (Soluble) (1)	3	2022/08/21	2022/08/21	AB SOP-00033 / AB SOP-00026	SM 23 4110 B m
Hexavalent Chromium (1, 3)	4	2022/08/19	2022/08/19	AB SOP-00063	SM 23 3500-Cr B m
Conductivity @25C (Soluble) (1)	4	2022/08/20	2022/08/20	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	7	2022/08/19	2022/08/19	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils (1)	4	2022/08/20	2022/08/20	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Sum of Cations, Anions (1)	4	N/A	2022/08/20		Auto Calc
Moisture (1)	7	N/A	2022/08/20	AB SOP-00002	CCME PHC-CWS m
Index of Additive Cancer Risk (1, 5)	4	N/A	2022/08/25		Auto Calc
Benzo[a]pyrene Equivalency (1)	4	N/A	2022/08/25		Auto Calc
PAH in Soil by GC/MS (1)	4	2022/08/24	2022/08/24	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
pH @25C (1:2 Calcium Chloride Extract) (1)	4	2022/08/20	2022/08/20	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
Sodium Adsorption Ratio (1)	4	N/A	2022/08/20		Auto Calc
Soluble Ions (1)	4	2022/08/20	2022/08/20	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Paste (1)	4	2022/08/20	2022/08/20	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Ions Calculation (1)	4	N/A	2022/08/20		Auto Calc
Theoretical Gypsum Requirement (1, 6)	4	N/A	2022/08/20		Auto Calc

Remarks:

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



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your C.O.C. #: 00013v3

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2022/08/25
Report #: R3221467
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262019

Received: 2022/08/17, 12:45

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

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
- (2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
- (3) Some soil samples may react with the Cr(VI) spike reducing it to Cr(III). These samples are highly unlikely to contain native hexavalent chromium. Thus a failed spike recovery does not invalidate a negative result on the native sample.
- (4) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
- (5) Index of Additive Cancer Risk, (C) denotes coarse, (F) denotes fine.
- (6) TGR calculation is based on a theoretical SAR of 4. Salt Contamination and Assessment and remediation guideline 2001 recommended SAR is ranging 4-8. TGR is reported in tonnes/ha.

Encryption Key



Bureau Veritas
25 Aug 2022 11:40:19

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

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



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY121	AZY121	AZY122	AZY122	AZY123	AZY124		
Sampling Date		2022/08/13 11:00	2022/08/13 11:00	2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:30		
COC Number		00013v3	00013v3	00013v3	00013v3	00013v3	00013v3		
	UNITS	MW22-23-01	MW22-23-01 Lab-Dup	MW22-23-02	MW22-23-02 Lab-Dup	DUP N	MW22-23-03	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	N/A	<10	<10	<10	23	10	A687729
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	N/A	100	100	87	260	50	A687729
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	N/A	<50	<50	<50	87	50	A687729
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	Yes	Yes	Yes	N/A	A687729
Physical Properties									
Moisture	%	13	N/A	21	N/A	17	35	0.30	A688093
Volatiles									
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	N/A	<0.045	<0.045	0.045	A687229
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	<10	N/A	<10	<10	10	A687229
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	N/A	<0.0050	<0.0050	0.0050	A687757
Toluene	mg/kg	<0.050	<0.050	<0.050	N/A	<0.050	<0.050	0.050	A687757
Ethylbenzene	mg/kg	<0.010	<0.010	<0.010	N/A	<0.010	<0.010	0.010	A687757
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	N/A	<0.040	<0.040	0.040	A687757
o-Xylene	mg/kg	<0.020	<0.020	<0.020	N/A	<0.020	<0.020	0.020	A687757
F1 (C6-C10)	mg/kg	<10	<10	<10	N/A	<10	<10	10	A687757
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	99	101	103	N/A	100	99	N/A	A687757
4-Bromofluorobenzene (sur.)	%	100	100	100	N/A	101	98	N/A	A687757
D10-o-Xylene (sur.)	%	113	104	112	N/A	103	105	N/A	A687757
D4-1,2-Dichloroethane (sur.)	%	104	107	110	N/A	107	104	N/A	A687757
O-TERPHENYL (sur.)	%	128	N/A	111	139	118	133	N/A	A687729
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY125	AZY125	AZY126	AZY127		
Sampling Date		2022/08/13 12:00	2022/08/13 12:00	2022/08/13 12:15	2022/08/13 12:30		
COC Number		00013v3	00013v3	00013v3	00013v3		
	UNITS	MW22-50-01	MW22-50-01 Lab-Dup	MW22-50-02	MW22-50-03	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/kg	22	N/A	<10	<10	10	A687729
F3 (C16-C34 Hydrocarbons)	mg/kg	900	N/A	74	110	50	A687729
F4 (C34-C50 Hydrocarbons)	mg/kg	290	N/A	<50	<50	50	A687729
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	Yes	N/A	A687729
Physical Properties							
Moisture	%	37	33	16	16	0.30	A688093
Volatiles							
Xylenes (Total)	mg/kg	<0.045	N/A	<0.045	<0.045	0.045	A687229
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	<10	<10	10	A687229
Field Preserved Volatiles							
Benzene	mg/kg	<0.0050	N/A	<0.0050	<0.0050	0.0050	A687757
Toluene	mg/kg	0.098	N/A	0.083	<0.050	0.050	A687757
Ethylbenzene	mg/kg	0.022	N/A	<0.010	<0.010	0.010	A687757
m & p-Xylene	mg/kg	<0.040	N/A	<0.040	<0.040	0.040	A687757
o-Xylene	mg/kg	<0.020	N/A	<0.020	<0.020	0.020	A687757
F1 (C6-C10)	mg/kg	<10	N/A	<10	<10	10	A687757
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	101	N/A	97	98	N/A	A687757
4-Bromofluorobenzene (sur.)	%	100	N/A	99	98	N/A	A687757
D10-o-Xylene (sur.)	%	108	N/A	110	100	N/A	A687757
D4-1,2-Dichloroethane (sur.)	%	110	N/A	104	105	N/A	A687757
O-TERPHENYL (sur.)	%	119	N/A	108	127	N/A	A687729
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

SOIL SALINITY 4 (SOIL)

Bureau Veritas ID		AZY121		AZY122	AZY123		AZY124		
Sampling Date		2022/08/13 11:00		2022/08/13 11:15	2022/08/13 11:15		2022/08/13 11:30		
COC Number		00013v3		00013v3	00013v3		00013v3		
	UNITS	MW22-23-01	RDL	MW22-23-02	DUP N	RDL	MW22-23-03	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	5.0	N/A	3.1	3.2	N/A	3.3	N/A	A686906
Cation Sum	meq/L	5.4	N/A	6.4	6.4	N/A	7.6	N/A	A686906
Cation/EC Ratio	N/A	9.9	0.10	9.4	9.2	0.10	9.5	0.10	A686905
Calculated Calcium (Ca)	mg/kg	16	0.57	19	19	0.49	37	0.75	A687232
Calculated Magnesium (Mg)	mg/kg	4.8	0.38	3.9	4.2	0.33	9.1	0.50	A687232
Calculated Sodium (Na)	mg/kg	19	0.95	17	17	0.82	24	1.3	A687232
Calculated Potassium (K)	mg/kg	2.3	0.49	2.8	2.8	0.43	6.0	0.65	A687232
Calculated Chloride (Cl)	mg/kg	16	3.8	13	13	1.6	26	2.5	A687232
Calculated Sulphate (SO4)	mg/kg	69	1.9	32	32	1.6	44	2.5	A687232
Soluble Parameters									
Soluble Chloride (Cl)	mg/L	44	10	N/A	N/A	N/A	N/A	N/A	A688403
Soluble Conductivity	dS/m	0.55	0.020	0.69	0.70	0.020	0.80	0.020	A688405
Soluble (CaCl2) pH	pH	7.63	N/A	7.57	7.64	N/A	7.62	N/A	A688203
Sodium Adsorption Ratio	N/A	1.7	0.10	1.6	1.6	0.10	1.3	0.10	A687227
Soluble Calcium (Ca)	mg/L	42	1.5	59	58	1.5	74	1.5	A688421
Soluble Magnesium (Mg)	mg/L	13	1.0	12	13	1.0	18	1.0	A688421
Soluble Sodium (Na)	mg/L	50	2.5	53	51	2.5	48	2.5	A688421
Soluble Potassium (K)	mg/L	6.2	1.3	8.6	8.6	1.3	12	1.3	A688421
Saturation %	%	38	N/A	33	33	N/A	50	N/A	A688202
Soluble Sulphate (SO4)	mg/L	180	5.0	N/A	N/A	N/A	N/A	N/A	A688421
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	<0.20	<0.20	0.20	<0.20	0.20	A686909
RDL = Reportable Detection Limit N/A = Not Applicable									



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZY121		AZY122	AZY122	AZY123		AZY124		
Sampling Date		2022/08/13 11:00		2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:15		2022/08/13 11:30		
COC Number		00013v3		00013v3	00013v3	00013v3		00013v3		
	UNITS	MW22-23-01	QC Batch	MW22-23-02	MW22-23-02 Lab-Dup	DUP N	QC Batch	MW22-23-03	RDL	QC Batch

Elements										
Soluble (Hot water) Boron (B)	mg/kg	<0.10	A688283	0.36	0.37	0.35	A688283	0.45	0.10	A688283
Hex. Chromium (Cr 6+)	mg/kg	<0.080	A688032	<0.080	<0.080	<0.080	A688035	<0.080	0.080	A688032
Total Antimony (Sb)	mg/kg	<0.50	A688249	<0.50	<0.50	<0.50	A688249	0.56	0.50	A688249
Total Arsenic (As)	mg/kg	6.9	A688249	6.0	5.9	6.5	A688249	7.5	1.0	A688249
Total Barium (Ba)	mg/kg	300	A688249	180	180	200	A688249	260	1.0	A688249
Total Beryllium (Be)	mg/kg	0.44	A688249	<0.40	<0.40	0.42	A688249	0.55	0.40	A688249
Total Cadmium (Cd)	mg/kg	0.38	A688249	0.25	0.24	0.30	A688249	0.46	0.050	A688249
Total Chromium (Cr)	mg/kg	17	A688249	12	13	13	A688249	19	1.0	A688249
Total Cobalt (Co)	mg/kg	7.9	A688249	5.9	5.9	6.5	A688249	8.7	0.50	A688249
Total Copper (Cu)	mg/kg	16	A688249	11	11	13	A688249	20	1.0	A688249
Total Lead (Pb)	mg/kg	8.2	A688249	6.0	5.9	6.7	A688249	9.5	0.50	A688249
Total Mercury (Hg)	mg/kg	<0.050	A688249	<0.050	<0.050	<0.050	A688249	<0.050	0.050	A688249
Total Molybdenum (Mo)	mg/kg	1.4	A688249	1.1	1.3	1.2	A688249	1.5	0.40	A688249
Total Nickel (Ni)	mg/kg	24	A688249	18	18	20	A688249	27	1.0	A688249
Total Selenium (Se)	mg/kg	0.57	A688249	<0.50	<0.50	<0.50	A688249	0.75	0.50	A688249
Total Silver (Ag)	mg/kg	<0.20	A688249	<0.20	<0.20	<0.20	A688249	<0.20	0.20	A688249
Total Thallium (Tl)	mg/kg	0.14	A688249	<0.10	<0.10	0.11	A688249	0.17	0.10	A688249
Total Tin (Sn)	mg/kg	<1.0	A688249	<1.0	<1.0	<1.0	A688249	<1.0	1.0	A688249
Total Uranium (U)	mg/kg	0.71	A688249	0.57	0.61	0.65	A688249	0.81	0.20	A688249
Total Vanadium (V)	mg/kg	26	A688249	20 (1)	21	23	A688249	31	1.0	A688249
Total Zinc (Zn)	mg/kg	76	A688249	53	53	60	A688249	89	10	A688249

RDL = Reportable Detection Limit
 Lab-Dup = Laboratory Initiated Duplicate
 (1) Matrix spike exceeds acceptance limits due to probable matrix interference.



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		AZY122	AZY122	AZY123	AZY124		
Sampling Date		2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:30		
COC Number		00013v3	00013v3	00013v3	00013v3		
	UNITS	MW22-23-02	MW22-23-02 Lab-Dup	DUP N	MW22-23-03	RDL	QC Batch
Soluble Parameters							
Soluble Chloride (Cl)	mg/L	40	38	40	52	5.0	A688566
Soluble Sulphate (SO4)	mg/L	96	93	98	88	5.0	A688566
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate							



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		AZY121	AZY122	AZY123	AZY124		
Sampling Date		2022/08/13 11:00	2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:30		
COC Number		00013v3	00013v3	00013v3	00013v3		
	UNITS	MW22-23-01	MW22-23-02	DUP N	MW22-23-03	RDL	QC Batch
Polycyclic Aromatics							
Index of Additive Cancer Risk (C)	N/A	<0.10	<0.10	<0.10	<0.10	0.10	A692086
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	<0.0071	<0.0071	0.0090	0.0071	A692087
Index of Additive Cancer Risk (F)	N/A	<0.10	<0.10	<0.10	<0.10	0.10	A692086
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	A692779
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	A692779
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
Benzo(b&j)fluoranthene	mg/kg	<0.0050	0.0061	<0.0050	0.024	0.0050	A692779
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.0081	<0.0050	0.034	0.0050	A692779
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
Benzo(e)pyrene	mg/kg	<0.0050	0.0067	<0.0050	0.030	0.0050	A692779
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	0.012	0.0050	A692779
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A692779
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	0.011	0.0050	A692779
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	0.0096	0.0050	A692779
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	0.0083	0.0050	A692779
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	0.025	0.0050	A692779
2-Methylnaphthalene	mg/kg	<0.0050	0.0063	<0.0050	0.037	0.0050	A692779
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	0.016	0.0050	A692779
Phenanthrene	mg/kg	<0.0050	0.0087	0.0063	0.039	0.0050	A692779
Perylene	mg/kg	0.0091	0.028	0.023	0.091	0.0050	A692779
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	0.018	0.0050	A692779
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	A692779
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	102	108	109	110	N/A	A692779
D8-ACENAPHTHYLENE (sur.)	%	97	101	103	108	N/A	A692779
D8-NAPHTHALENE (sur.)	%	91	91	92	97	N/A	A692779
RDL = Reportable Detection Limit N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		AZY121	AZY122	AZY123	AZY124		
Sampling Date		2022/08/13 11:00	2022/08/13 11:15	2022/08/13 11:15	2022/08/13 11:30		
COC Number		00013v3	00013v3	00013v3	00013v3		
	UNITS	MW22-23-01	MW22-23-02	DUP N	MW22-23-03	RDL	QC Batch
TERPHENYL-D14 (sur.)	%	137 (1)	123	126	123	N/A	A692779

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.



GENERAL COMMENTS

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

Package 1	7.0°C
-----------	-------

Version #3: Additional PAHs analysis and Chromatorgram review on sample AZY125 (MW22-50-01) have been added as per request from client 20220823

HYDROCARBON RESEMBLANCE

The reported hydrocarbon resemblance was obtained by visual comparison of the sample chromatogram with a library of reference product chromatograms. Since variables such as the degree and type of weathering and the presence of non-petrogenic hydrocarbons cannot be duplicated in reference spectra, the resemblance information must be regarded as approximate and qualitative and as such, Bureau Veritas Laboratories can assume no liability for any conclusions drawn from these data.

Sample AZY125 [MW22-50-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A687729	GG3	Matrix Spike [AZY122-02]	O-TERPHENYL (sur.)	2022/08/19		113	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/19		113	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/19		116	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/19		116	%	60 - 140
A687729	GG3	Spiked Blank	O-TERPHENYL (sur.)	2022/08/19		123	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/19		122	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/19		125	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/19		124	%	60 - 140
A687729	GG3	Method Blank	O-TERPHENYL (sur.)	2022/08/19		138	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/19	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2022/08/19	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2022/08/19	<50		mg/kg	
A687729	GG3	RPD [AZY122-02]	F2 (C10-C16 Hydrocarbons)	2022/08/19	NC		%	40
			F3 (C16-C34 Hydrocarbons)	2022/08/19	3.3		%	40
			F4 (C34-C50 Hydrocarbons)	2022/08/19	NC		%	40
A687757	DO1	Matrix Spike [AZY121-03]	1,4-Difluorobenzene (sur.)	2022/08/19		102	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/08/19		99	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/19		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/19		108	%	50 - 140
			Benzene	2022/08/19		110	%	50 - 140
			Toluene	2022/08/19		108	%	50 - 140
			Ethylbenzene	2022/08/19		106	%	50 - 140
			m & p-Xylene	2022/08/19		106	%	50 - 140
			o-Xylene	2022/08/19		100	%	50 - 140
			F1 (C6-C10)	2022/08/19		93	%	60 - 140
			A687757	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/08/19	
4-Bromofluorobenzene (sur.)	2022/08/19					100	%	50 - 140
D10-o-Xylene (sur.)	2022/08/19					94	%	50 - 140
D4-1,2-Dichloroethane (sur.)	2022/08/19					109	%	50 - 140
Benzene	2022/08/19					92	%	60 - 130
Toluene	2022/08/19					92	%	60 - 130
Ethylbenzene	2022/08/19					91	%	60 - 130
m & p-Xylene	2022/08/19					92	%	60 - 130
o-Xylene	2022/08/19					89	%	60 - 130
F1 (C6-C10)	2022/08/19					84	%	60 - 140
A687757	DO1	Method Blank				1,4-Difluorobenzene (sur.)	2022/08/19	
			4-Bromofluorobenzene (sur.)	2022/08/19		100	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/19		93	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/19		105	%	50 - 140
			Benzene	2022/08/19	<0.0050		mg/kg	
			Toluene	2022/08/19	<0.050		mg/kg	
			Ethylbenzene	2022/08/19	<0.010		mg/kg	
			m & p-Xylene	2022/08/19	<0.040		mg/kg	
			o-Xylene	2022/08/19	<0.020		mg/kg	
			F1 (C6-C10)	2022/08/19	<10		mg/kg	
			A687757	DO1	RPD [AZY121-03]	Benzene	2022/08/19	NC
Toluene	2022/08/19	NC					%	50
Ethylbenzene	2022/08/19	NC					%	50
m & p-Xylene	2022/08/19	NC					%	50
o-Xylene	2022/08/19	NC					%	50
F1 (C6-C10)	2022/08/19	NC					%	30
A688032	SKM	Matrix Spike	Hex. Chromium (Cr 6+)	2022/08/19		94	%	75 - 125



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A688032	SKM	Spiked Blank	Hex. Chromium (Cr 6+)	2022/08/19		102	%	80 - 120
A688032	SKM	Method Blank	Hex. Chromium (Cr 6+)	2022/08/19	<0.080		mg/kg	
A688032	SKM	RPD	Hex. Chromium (Cr 6+)	2022/08/19	NC		%	35
A688035	SKM	Matrix Spike [AZY122-01]	Hex. Chromium (Cr 6+)	2022/08/19		90	%	75 - 125
A688035	SKM	Spiked Blank	Hex. Chromium (Cr 6+)	2022/08/19		101	%	80 - 120
A688035	SKM	Method Blank	Hex. Chromium (Cr 6+)	2022/08/19	<0.080		mg/kg	
A688035	SKM	RPD [AZY122-01]	Hex. Chromium (Cr 6+)	2022/08/19	NC		%	35
A688093	A1H	Method Blank	Moisture	2022/08/20	<0.30		%	
A688093	A1H	RPD [AZY125-01]	Moisture	2022/08/20	8.9		%	20
A688202	BMH	QC Standard	Saturation %	2022/08/20		97	%	75 - 125
A688202	BMH	RPD	Saturation %	2022/08/20	10		%	12
A688203	AL7	QC Standard	Soluble (CaCl2) pH	2022/08/20		101	%	97 - 103
A688203	AL7	Spiked Blank	Soluble (CaCl2) pH	2022/08/20		100	%	97 - 103
A688203	AL7	RPD	Soluble (CaCl2) pH	2022/08/20	0.39		%	N/A
A688249	KGR	Matrix Spike [AZY122-01]	Total Antimony (Sb)	2022/08/20		106	%	75 - 125
			Total Arsenic (As)	2022/08/20		103	%	75 - 125
			Total Barium (Ba)	2022/08/20		NC	%	75 - 125
			Total Beryllium (Be)	2022/08/20		105	%	75 - 125
			Total Cadmium (Cd)	2022/08/20		104	%	75 - 125
			Total Chromium (Cr)	2022/08/20		121	%	75 - 125
			Total Cobalt (Co)	2022/08/20		101	%	75 - 125
			Total Copper (Cu)	2022/08/20		102	%	75 - 125
			Total Lead (Pb)	2022/08/20		102	%	75 - 125
			Total Mercury (Hg)	2022/08/20		104	%	75 - 125
			Total Molybdenum (Mo)	2022/08/20		106	%	75 - 125
			Total Nickel (Ni)	2022/08/20		103	%	75 - 125
			Total Selenium (Se)	2022/08/20		106	%	75 - 125
			Total Silver (Ag)	2022/08/20		105	%	75 - 125
			Total Thallium (Tl)	2022/08/20		101	%	75 - 125
			Total Tin (Sn)	2022/08/20		106	%	75 - 125
			Total Uranium (U)	2022/08/20		98	%	75 - 125
			Total Vanadium (V)	2022/08/20		155 (1)	%	75 - 125
			Total Zinc (Zn)	2022/08/20		NC	%	75 - 125
A688249	KGR	QC Standard	Total Antimony (Sb)	2022/08/20		130	%	15 - 182
			Total Arsenic (As)	2022/08/20		102	%	53 - 147
			Total Barium (Ba)	2022/08/20		100	%	80 - 119
			Total Cadmium (Cd)	2022/08/20		100	%	72 - 128
			Total Chromium (Cr)	2022/08/20		101	%	59 - 141
			Total Cobalt (Co)	2022/08/20		96	%	58 - 142
			Total Copper (Cu)	2022/08/20		105	%	83 - 117
			Total Lead (Pb)	2022/08/20		114	%	79 - 121
			Total Molybdenum (Mo)	2022/08/20		102	%	67 - 133
			Total Nickel (Ni)	2022/08/20		105	%	79 - 121
			Total Silver (Ag)	2022/08/20		85	%	47 - 153
			Total Tin (Sn)	2022/08/20		114	%	67 - 133
			Total Uranium (U)	2022/08/20		93	%	77 - 123
			Total Vanadium (V)	2022/08/20		103	%	79 - 121
			Total Zinc (Zn)	2022/08/20		105	%	79 - 121
A688249	KGR	Spiked Blank	Total Antimony (Sb)	2022/08/20		105	%	80 - 120
			Total Arsenic (As)	2022/08/20		96	%	80 - 120
			Total Barium (Ba)	2022/08/20		99	%	80 - 120
			Total Beryllium (Be)	2022/08/20		98	%	80 - 120



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Cadmium (Cd)	2022/08/20		99	%	80 - 120
			Total Chromium (Cr)	2022/08/20		98	%	80 - 120
			Total Cobalt (Co)	2022/08/20		97	%	80 - 120
			Total Copper (Cu)	2022/08/20		98	%	80 - 120
			Total Lead (Pb)	2022/08/20		98	%	80 - 120
			Total Mercury (Hg)	2022/08/20		107	%	80 - 120
			Total Molybdenum (Mo)	2022/08/20		100	%	80 - 120
			Total Nickel (Ni)	2022/08/20		97	%	80 - 120
			Total Selenium (Se)	2022/08/20		102	%	80 - 120
			Total Silver (Ag)	2022/08/20		99	%	80 - 120
			Total Thallium (Tl)	2022/08/20		98	%	80 - 120
			Total Tin (Sn)	2022/08/20		98	%	80 - 120
			Total Uranium (U)	2022/08/20		98	%	80 - 120
			Total Vanadium (V)	2022/08/20		98	%	80 - 120
			Total Zinc (Zn)	2022/08/20		97	%	80 - 120
A688249	KGR	Method Blank	Total Antimony (Sb)	2022/08/20	<0.50		mg/kg	
			Total Arsenic (As)	2022/08/20	<1.0		mg/kg	
			Total Barium (Ba)	2022/08/20	<1.0		mg/kg	
			Total Beryllium (Be)	2022/08/20	<0.40		mg/kg	
			Total Cadmium (Cd)	2022/08/20	<0.050		mg/kg	
			Total Chromium (Cr)	2022/08/20	<1.0		mg/kg	
			Total Cobalt (Co)	2022/08/20	<0.50		mg/kg	
			Total Copper (Cu)	2022/08/20	<1.0		mg/kg	
			Total Lead (Pb)	2022/08/20	<0.50		mg/kg	
			Total Mercury (Hg)	2022/08/20	<0.050		mg/kg	
			Total Molybdenum (Mo)	2022/08/20	<0.40		mg/kg	
			Total Nickel (Ni)	2022/08/20	<1.0		mg/kg	
			Total Selenium (Se)	2022/08/20	<0.50		mg/kg	
			Total Silver (Ag)	2022/08/20	<0.20		mg/kg	
			Total Thallium (Tl)	2022/08/20	<0.10		mg/kg	
			Total Tin (Sn)	2022/08/20	<1.0		mg/kg	
			Total Uranium (U)	2022/08/20	<0.20		mg/kg	
			Total Vanadium (V)	2022/08/20	<1.0		mg/kg	
			Total Zinc (Zn)	2022/08/20	<10		mg/kg	
A688249	KGR	RPD [AZY122-01]	Total Antimony (Sb)	2022/08/20	NC		%	30
			Total Arsenic (As)	2022/08/20	1.8		%	30
			Total Barium (Ba)	2022/08/20	0.097		%	35
			Total Beryllium (Be)	2022/08/20	NC		%	30
			Total Cadmium (Cd)	2022/08/20	3.9		%	30
			Total Chromium (Cr)	2022/08/20	3.7		%	30
			Total Cobalt (Co)	2022/08/20	0.33		%	30
			Total Copper (Cu)	2022/08/20	3.1		%	30
			Total Lead (Pb)	2022/08/20	0.42		%	35
			Total Mercury (Hg)	2022/08/20	NC		%	35
			Total Molybdenum (Mo)	2022/08/20	21		%	35
			Total Nickel (Ni)	2022/08/20	0.24		%	30
			Total Selenium (Se)	2022/08/20	NC		%	30
			Total Silver (Ag)	2022/08/20	NC		%	35
			Total Thallium (Tl)	2022/08/20	NC		%	30
			Total Tin (Sn)	2022/08/20	NC		%	35
			Total Uranium (U)	2022/08/20	6.6		%	30
			Total Vanadium (V)	2022/08/20	2.5		%	30



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Zinc (Zn)	2022/08/20	0.079		%	30
A688283	JAB	Matrix Spike [AZY122-01]	Soluble (Hot water) Boron (B)	2022/08/20		104	%	75 - 125
A688283	JAB	Spiked Blank	Soluble (Hot water) Boron (B)	2022/08/20		97	%	80 - 120
A688283	JAB	Method Blank	Soluble (Hot water) Boron (B)	2022/08/20	<0.10		mg/kg	
A688283	JAB	RPD [AZY122-01]	Soluble (Hot water) Boron (B)	2022/08/20	1.9		%	35
A688403	CTU	Matrix Spike	Soluble Chloride (Cl)	2022/08/20		110	%	75 - 125
A688403	CTU	QC Standard	Soluble Chloride (Cl)	2022/08/20		100	%	75 - 125
A688403	CTU	Spiked Blank	Soluble Chloride (Cl)	2022/08/20		109	%	80 - 120
A688403	CTU	Method Blank	Soluble Chloride (Cl)	2022/08/20	<10		mg/L	
A688403	CTU	RPD	Soluble Chloride (Cl)	2022/08/20	18		%	30
A688405	ZI	QC Standard	Soluble Conductivity	2022/08/20		99	%	75 - 125
A688405	ZI	Spiked Blank	Soluble Conductivity	2022/08/20		100	%	90 - 110
A688405	ZI	Method Blank	Soluble Conductivity	2022/08/20	<0.020		dS/m	
A688405	ZI	RPD	Soluble Conductivity	2022/08/20	11		%	20
A688421	JAB	Matrix Spike [AZY124-01]	Soluble Calcium (Ca)	2022/08/20		103	%	75 - 125
			Soluble Magnesium (Mg)	2022/08/20		105	%	75 - 125
			Soluble Sodium (Na)	2022/08/20		100	%	75 - 125
			Soluble Potassium (K)	2022/08/20		100	%	75 - 125
A688421	JAB	QC Standard	Soluble Calcium (Ca)	2022/08/20		101	%	75 - 125
			Soluble Magnesium (Mg)	2022/08/20		99	%	75 - 125
			Soluble Sodium (Na)	2022/08/20		99	%	75 - 125
			Soluble Potassium (K)	2022/08/20		113	%	75 - 125
			Soluble Sulphate (SO4)	2022/08/20		106	%	75 - 125
A688421	JAB	Spiked Blank	Soluble Calcium (Ca)	2022/08/20		104	%	80 - 120
			Soluble Magnesium (Mg)	2022/08/20		106	%	80 - 120
			Soluble Sodium (Na)	2022/08/20		103	%	80 - 120
			Soluble Potassium (K)	2022/08/20		102	%	80 - 120
A688421	JAB	Method Blank	Soluble Calcium (Ca)	2022/08/20	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/08/20	<1.0		mg/L	
			Soluble Sodium (Na)	2022/08/20	<2.5		mg/L	
			Soluble Potassium (K)	2022/08/20	<1.3		mg/L	
			Soluble Sulphate (SO4)	2022/08/20	<5.0		mg/L	
A688421	JAB	RPD	Soluble Calcium (Ca)	2022/08/20	9.1		%	30
			Soluble Magnesium (Mg)	2022/08/20	12		%	30
			Soluble Sodium (Na)	2022/08/20	15		%	30
			Soluble Potassium (K)	2022/08/20	3.9		%	30
			Soluble Sulphate (SO4)	2022/08/20	10		%	30
A688566	KDB	Matrix Spike [AZY122-01]	Soluble Chloride (Cl)	2022/08/21		106	%	75 - 125
			Soluble Sulphate (SO4)	2022/08/21		101	%	75 - 125
A688566	KDB	QC Standard	Soluble Chloride (Cl)	2022/08/21		93	%	75 - 125
			Soluble Sulphate (SO4)	2022/08/21		99	%	75 - 125
A688566	KDB	Spiked Blank	Soluble Chloride (Cl)	2022/08/21		100	%	80 - 120
			Soluble Sulphate (SO4)	2022/08/21		96	%	80 - 120
A688566	KDB	Method Blank	Soluble Chloride (Cl)	2022/08/21	<5.0		mg/L	
			Soluble Sulphate (SO4)	2022/08/21	<5.0		mg/L	
A688566	KDB	RPD [AZY122-01]	Soluble Chloride (Cl)	2022/08/21	4.2		%	30
			Soluble Sulphate (SO4)	2022/08/21	3.4		%	30
A692779	JU2	Matrix Spike	D10-ANTHRACENE (sur.)	2022/08/24		95	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/08/24		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/08/24		90	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/08/24		122	%	50 - 130
			Acenaphthene	2022/08/24		87	%	50 - 130



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acenaphthylene	2022/08/24		88	%	50 - 130
			Acridine	2022/08/24		51	%	50 - 130
			Anthracene	2022/08/24		93	%	50 - 130
			Benzo(a)anthracene	2022/08/24		110	%	50 - 130
			Benzo(b&j)fluoranthene	2022/08/24		105	%	50 - 130
			Benzo(k)fluoranthene	2022/08/24		98	%	50 - 130
			Benzo(g,h,i)perylene	2022/08/24		102	%	50 - 130
			Benzo(c)phenanthrene	2022/08/24		113	%	50 - 130
			Benzo(a)pyrene	2022/08/24		106	%	50 - 130
			Benzo(e)pyrene	2022/08/24		97	%	50 - 130
			Chrysene	2022/08/24		104	%	50 - 130
			Dibenz(a,h)anthracene	2022/08/24		102	%	50 - 130
			Fluoranthene	2022/08/24		96	%	50 - 130
			Fluorene	2022/08/24		95	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/08/24		104	%	50 - 130
			1-Methylnaphthalene	2022/08/24		69	%	50 - 130
			2-Methylnaphthalene	2022/08/24		89	%	50 - 130
			Naphthalene	2022/08/24		87	%	50 - 130
			Phenanthrene	2022/08/24		92	%	50 - 130
			Perylene	2022/08/24		83	%	50 - 130
			Pyrene	2022/08/24		93	%	50 - 130
			Quinoline	2022/08/24		77	%	50 - 130
A692779	JU2	Spiked Blank	D10-ANTHRACENE (sur.)	2022/08/24		95	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/08/24		91	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/08/24		93	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/08/24		130	%	50 - 130
			Acenaphthene	2022/08/24		92	%	50 - 130
			Acenaphthylene	2022/08/24		88	%	50 - 130
			Acridine	2022/08/24		72	%	50 - 130
			Anthracene	2022/08/24		99	%	50 - 130
			Benzo(a)anthracene	2022/08/24		118	%	50 - 130
			Benzo(b&j)fluoranthene	2022/08/24		110	%	50 - 130
			Benzo(k)fluoranthene	2022/08/24		117	%	50 - 130
			Benzo(g,h,i)perylene	2022/08/24		108	%	50 - 130
			Benzo(c)phenanthrene	2022/08/24		123	%	50 - 130
			Benzo(a)pyrene	2022/08/24		93	%	50 - 130
			Benzo(e)pyrene	2022/08/24		103	%	50 - 130
			Chrysene	2022/08/24		114	%	50 - 130
			Dibenz(a,h)anthracene	2022/08/24		109	%	50 - 130
			Fluoranthene	2022/08/24		99	%	50 - 130
			Fluorene	2022/08/24		98	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/08/24		98	%	50 - 130
			1-Methylnaphthalene	2022/08/24		79	%	50 - 130
			2-Methylnaphthalene	2022/08/24		104	%	50 - 130
			Naphthalene	2022/08/24		93	%	50 - 130
			Phenanthrene	2022/08/24		99	%	50 - 130
			Perylene	2022/08/24		90	%	50 - 130
			Pyrene	2022/08/24		99	%	50 - 130
			Quinoline	2022/08/24		91	%	50 - 130
A692779	JU2	Method Blank	D10-ANTHRACENE (sur.)	2022/08/24		106	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/08/24		96	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/08/24		95	%	50 - 130



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			TERPHENYL-D14 (sur.)	2022/08/24		138 (1)	%	50 - 130
			Acenaphthene	2022/08/24	<0.0050		mg/kg	
			Acenaphthylene	2022/08/24	<0.0050		mg/kg	
			Acridine	2022/08/24	<0.010		mg/kg	
			Anthracene	2022/08/24	<0.0040		mg/kg	
			Benzo(a)anthracene	2022/08/24	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2022/08/24	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2022/08/24	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2022/08/24	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2022/08/24	<0.0050		mg/kg	
			Benzo(a)pyrene	2022/08/24	<0.0050		mg/kg	
			Benzo(e)pyrene	2022/08/24	<0.0050		mg/kg	
			Chrysene	2022/08/24	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2022/08/24	<0.0050		mg/kg	
			Fluoranthene	2022/08/24	<0.0050		mg/kg	
			Fluorene	2022/08/24	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2022/08/24	<0.0050		mg/kg	
			1-Methylnaphthalene	2022/08/24	<0.0050		mg/kg	
			2-Methylnaphthalene	2022/08/24	<0.0050		mg/kg	
			Naphthalene	2022/08/24	<0.0050		mg/kg	
			Phenanthrene	2022/08/24	<0.0050		mg/kg	
			Perylene	2022/08/24	<0.0050		mg/kg	
			Pyrene	2022/08/24	<0.0050		mg/kg	
			Quinoline	2022/08/24	<0.010		mg/kg	
A692779	JU2	RPD	Acenaphthene	2022/08/24	23		%	50
			Acenaphthylene	2022/08/24	21		%	50
			Acridine	2022/08/24	19		%	50
			Anthracene	2022/08/24	NC		%	50
			Benzo(a)anthracene	2022/08/24	NC		%	50
			Benzo(b&j)fluoranthene	2022/08/24	NC		%	50
			Benzo(k)fluoranthene	2022/08/24	NC		%	50
			Benzo(g,h,i)perylene	2022/08/24	NC		%	50
			Benzo(c)phenanthrene	2022/08/24	NC		%	50
			Benzo(a)pyrene	2022/08/24	NC		%	50
			Benzo(e)pyrene	2022/08/24	NC		%	50
			Chrysene	2022/08/24	NC		%	50
			Dibenz(a,h)anthracene	2022/08/24	NC		%	50
			Fluoranthene	2022/08/24	NC		%	50
			Fluorene	2022/08/24	19		%	50
			Indeno(1,2,3-cd)pyrene	2022/08/24	NC		%	50
			1-Methylnaphthalene	2022/08/24	29		%	50
			2-Methylnaphthalene	2022/08/24	29		%	50
			Naphthalene	2022/08/24	15		%	50
			Phenanthrene	2022/08/24	21		%	50
			Perylene	2022/08/24	NC		%	50
			Pyrene	2022/08/24	NC		%	50



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Quinoline	2022/08/24	NC		%	50
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>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)</p> <p>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).</p> <p>(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.</p>									



BUREAU
VERITAS

Bureau Veritas Job #: C262019
Report Date: 2022/08/25

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

Gita Pokhrel, Laboratory Supervisor

Jingyuan Song, QP, Organics – Senior Analyst

Sandy Yuan, M.Sc., QP, Scientific Specialist



Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

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

CHAIN OF CUSTODY RECORD
ENV COC - 00013V3

Choose Location:
 Calgary, AB: 4000 19th St. NE, TZE 698 Toll Free (800) 386-7247
 Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
 Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

Invoice Information: Invoice to (requires report) Report information (if differs from invoice)

Company: Client #254, Golder Associates
 Contact Name: Aurelie Bellavance
 Street Address: 237 - 4 Ave SW Suite 3300
 City: Calgary Prov: AB Postal Code: [blank]

Company: Golder Associates
 Contact Name: Aurelie Bellavance
 Street Address: 237 - 4 Ave SW Suite 3300
 City: Calgary Prov: AB Postal Code: [blank]

Phone: 403-299-5600
 Email: aurelie.bellavance@wsp.com
 Copies: Peter Tan @ wsp.com

Project Information: Shell
 Quotation #: 22525414-100-104
 Project #: 22525414-1000
 Site #: NA
 Site Location: WEST-GHANNEE-NT
 Province: NT
 Sampled By: J. Pabed

Regulatory Criteria:
 AT1 CCME Drinking Water - Canada
 Saskatchewan Drinking Water - Alberta Other AMSRP

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

Sample Identification	Date Sampled			Time (24hr)			Matrix
	YY	MM	DD	HH	MM	SS	
1 Mw 22-23-01	2022	08	13	11	00		Soil
2 Mw 22-23-02				11	15		
3 Dup N				11	15		
4 Mw 22-23-03				11	30		
5 Mw 22-50-01				12	00		
6 Mw 22-50-02				12	15		
7 Mw 22-50-03				12	30		
8							
9							
10							
11							
12							

LAB USE ONLY

Seal present: ACTR
 Seal intact: [blank]
 Cooling media present: [blank]

Relinquished by: (Signature/Print) [Signature]
 Date: 2022 08 14 09 15

Received by: (Signature/Print) JASON BUC
 Date: 2022 08 18 15 10

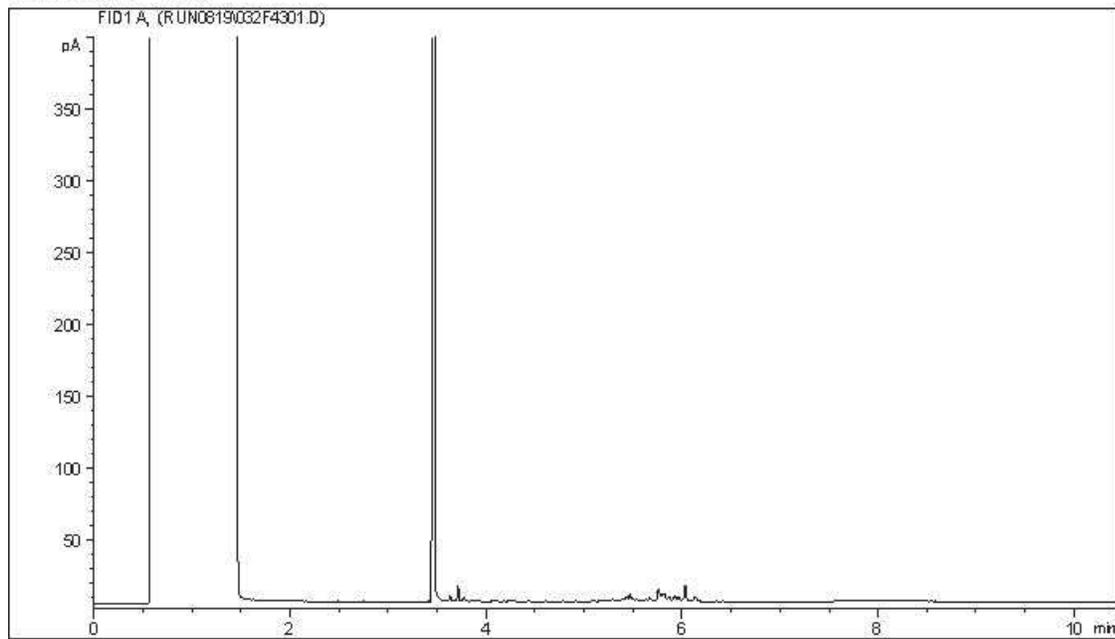
LAB USE ONLY
 Seal present: [blank]
 Seal intact: [blank]
 Cooling media present: [blank]

Temperature reading by: [blank]

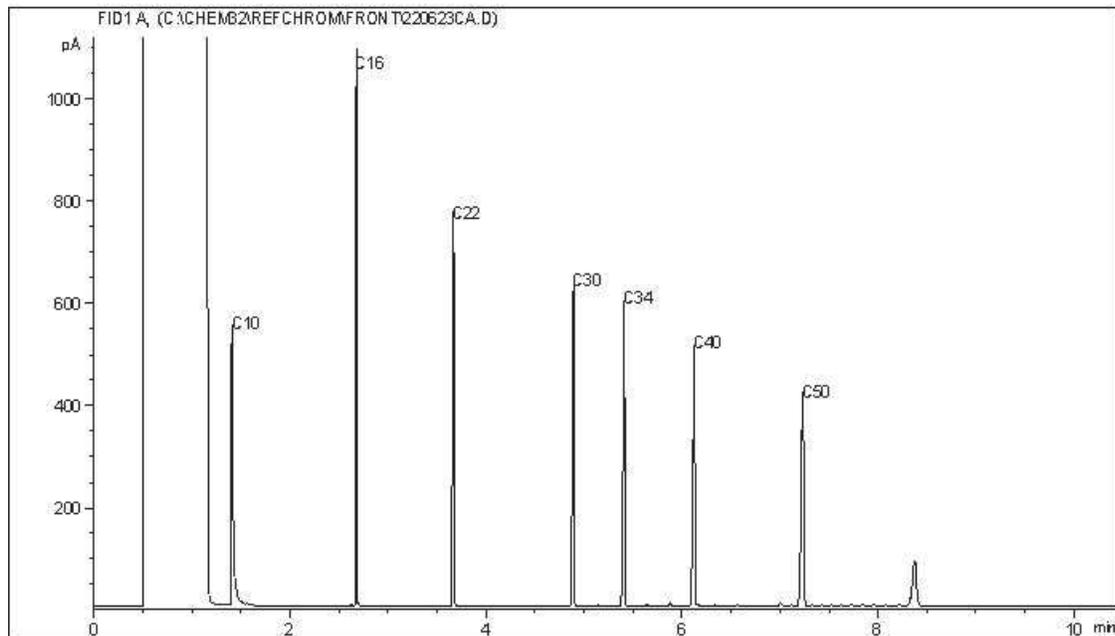
Special instructions: 2262019

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



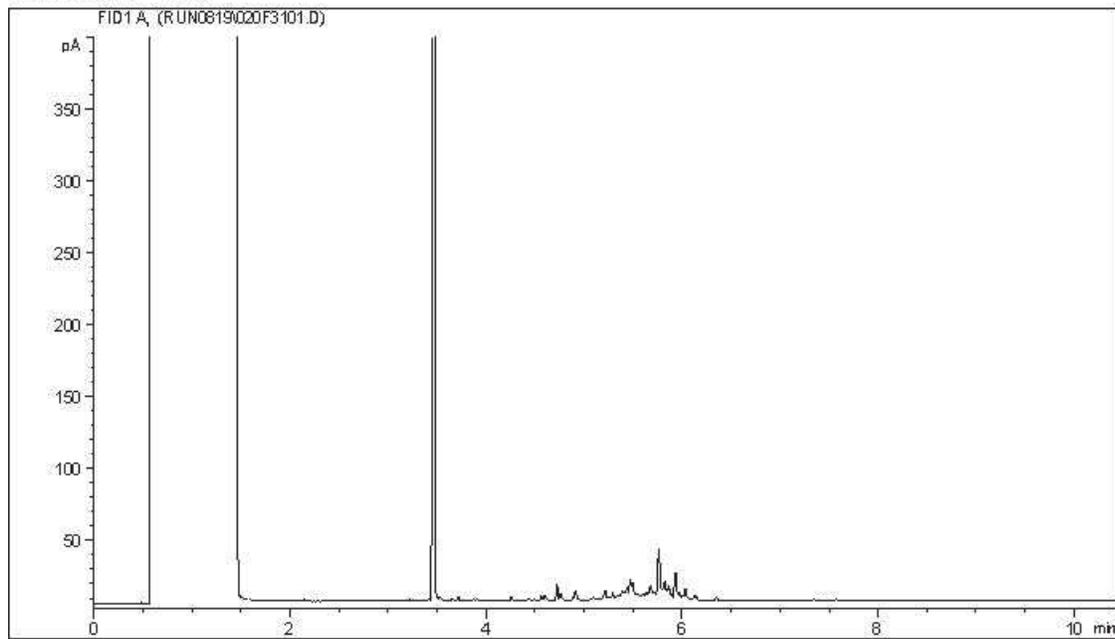
TYPICAL PRODUCT CARBON NUMBER RANGES

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

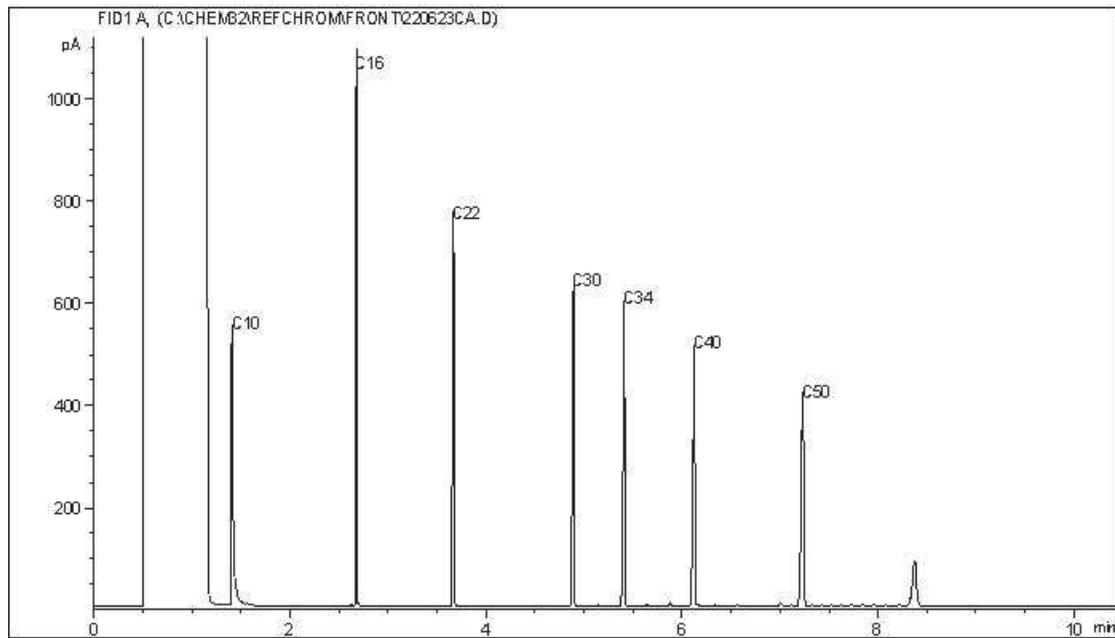
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



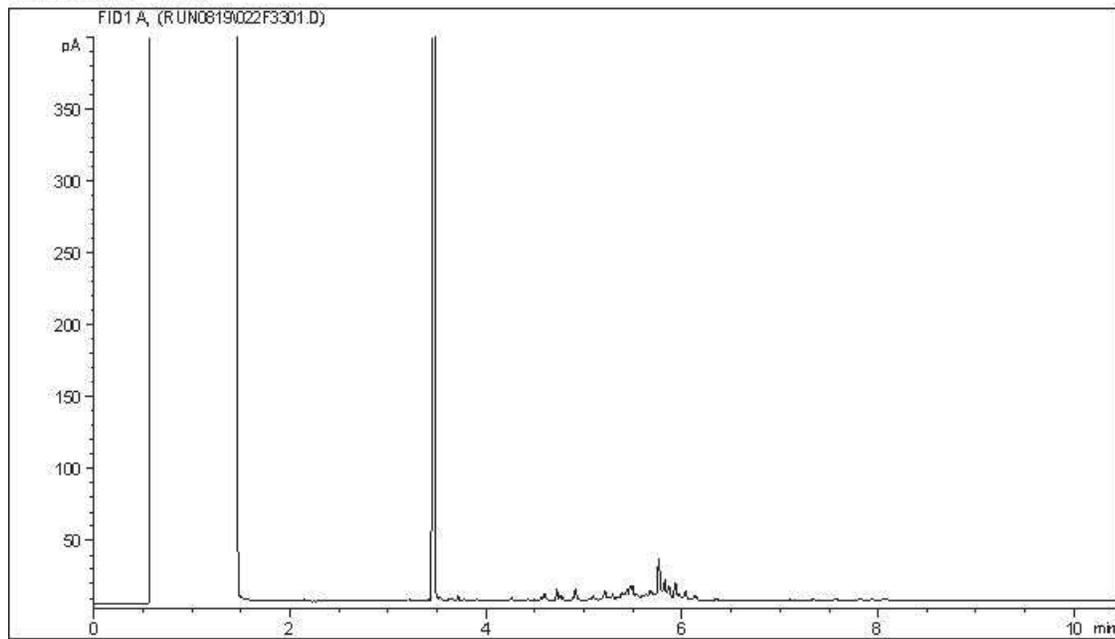
TYPICAL PRODUCT CARBON NUMBER RANGES

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

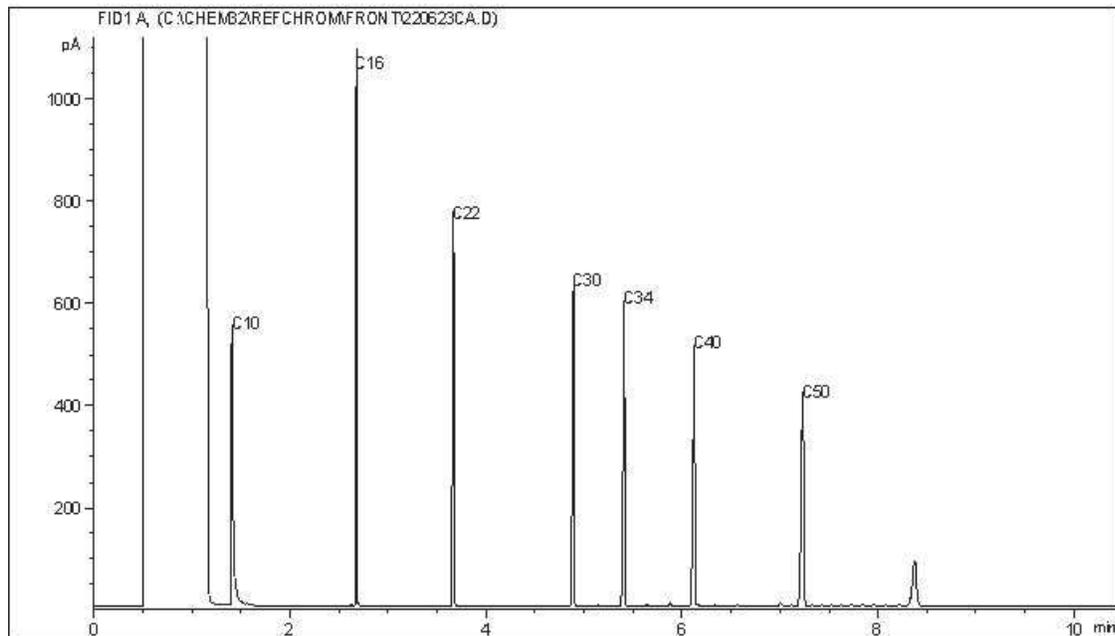
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



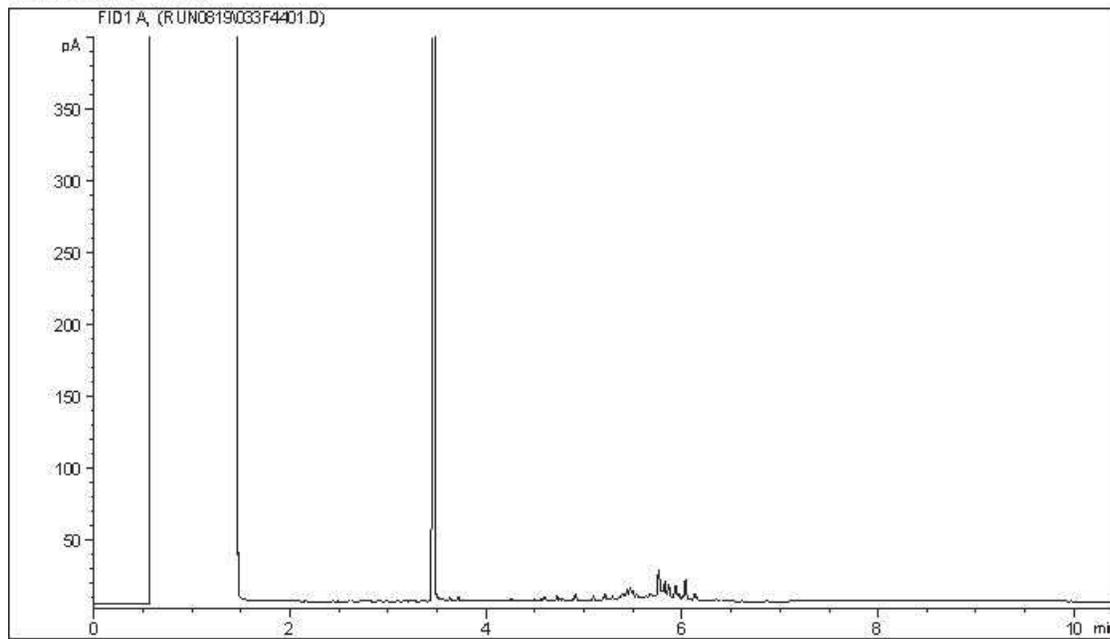
TYPICAL PRODUCT CARBON NUMBER RANGES

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

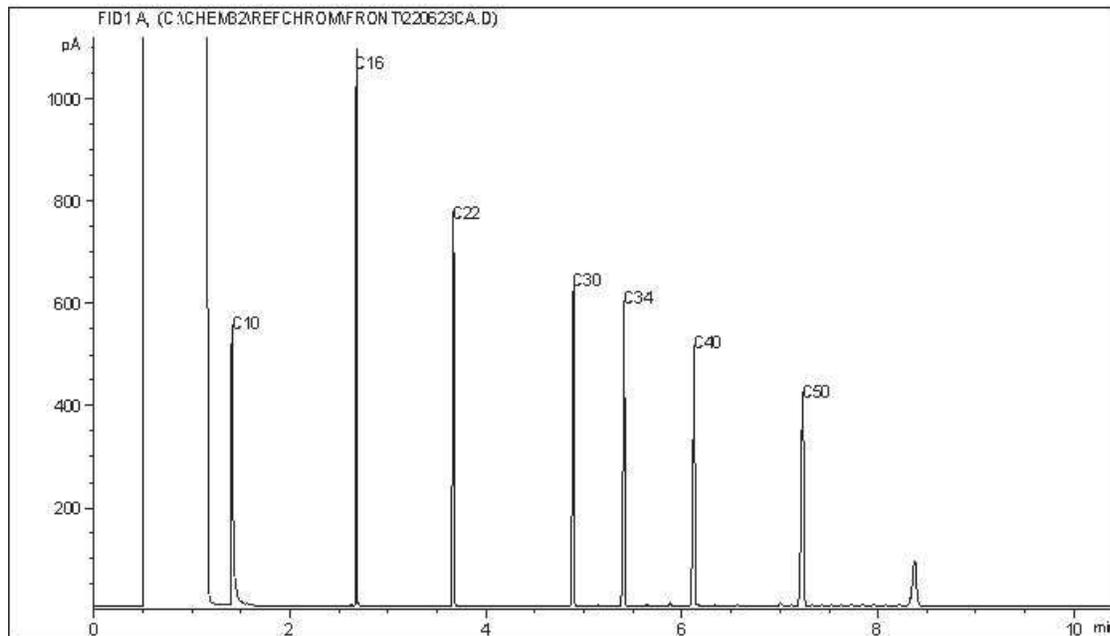
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



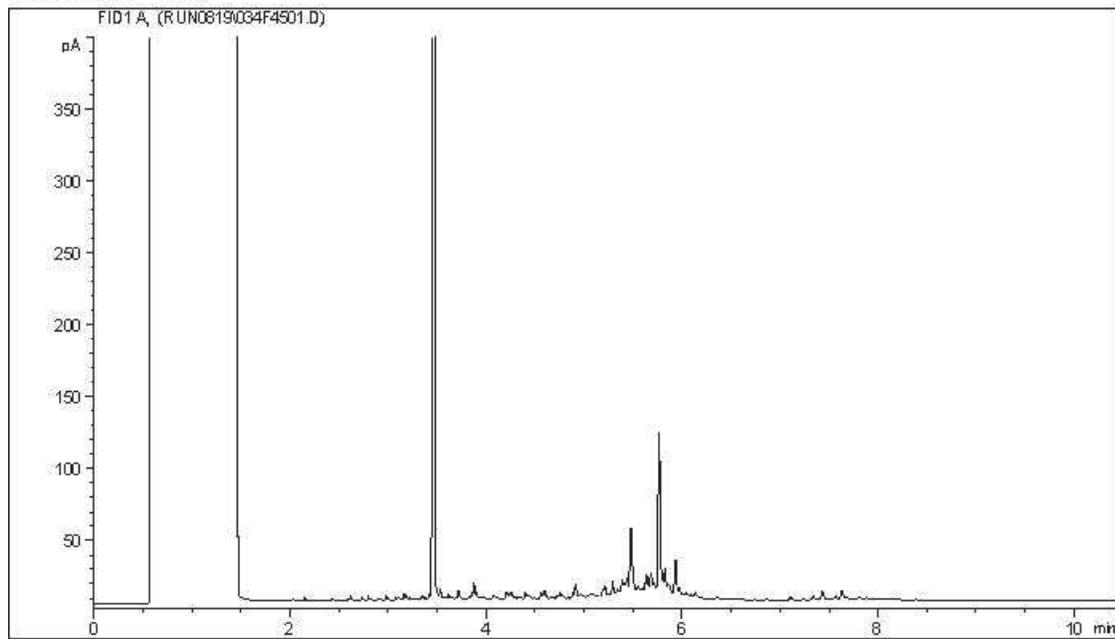
TYPICAL PRODUCT CARBON NUMBER RANGES

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

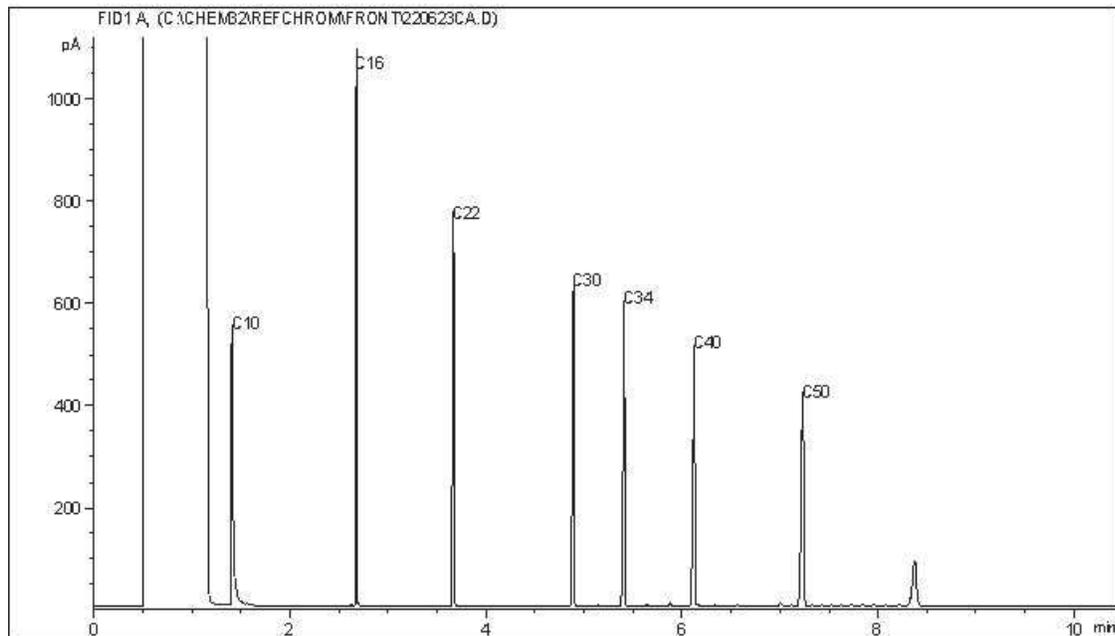
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



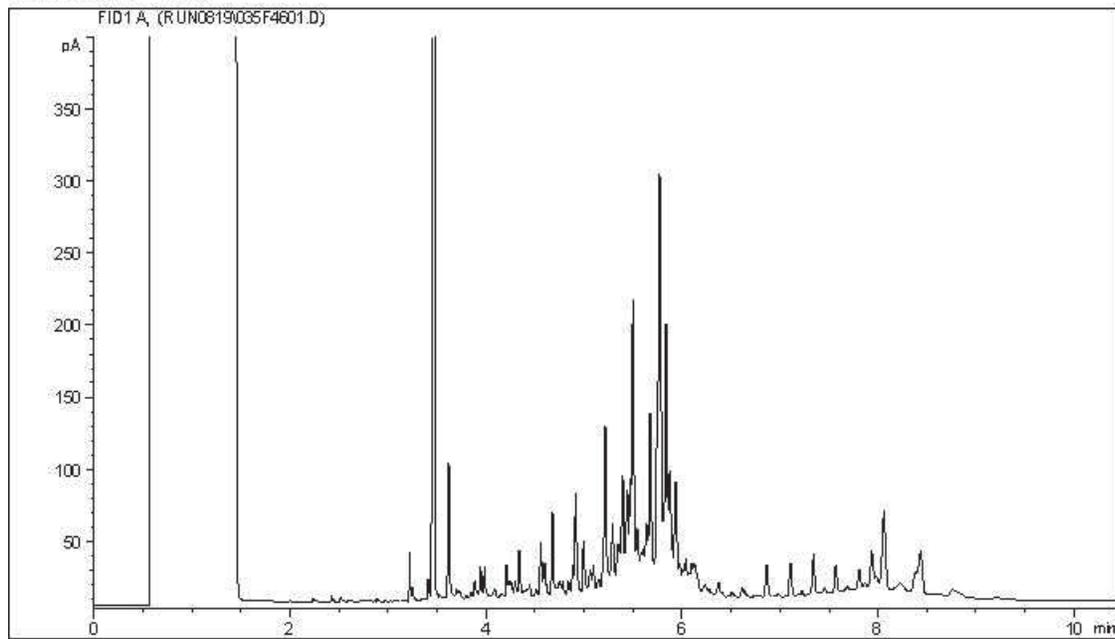
TYPICAL PRODUCT CARBON NUMBER RANGES

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

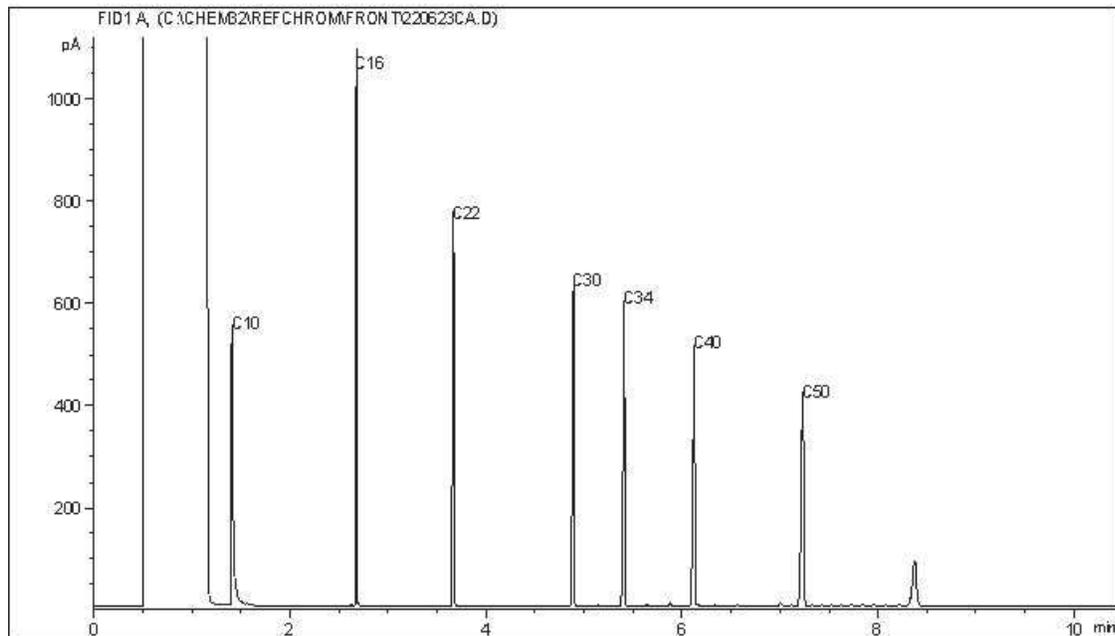
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



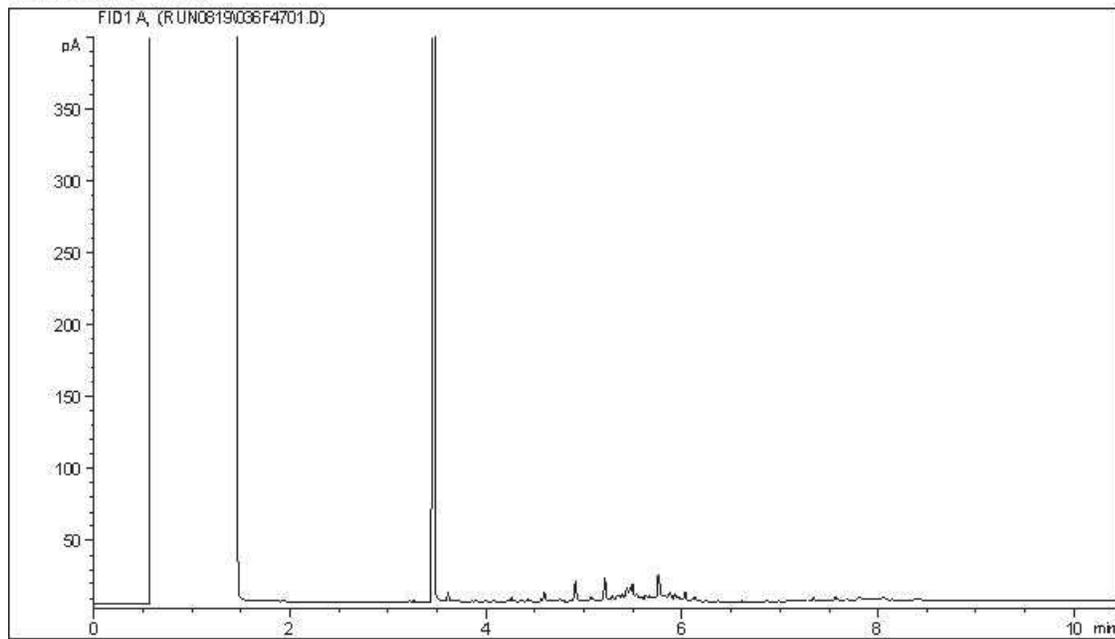
TYPICAL PRODUCT CARBON NUMBER RANGES

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

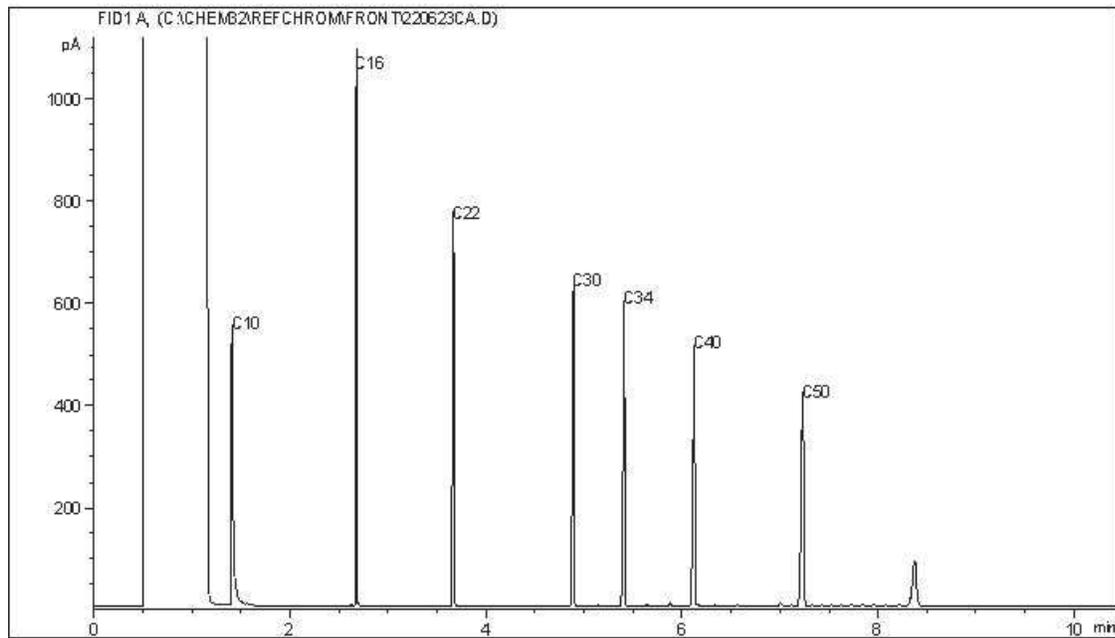
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



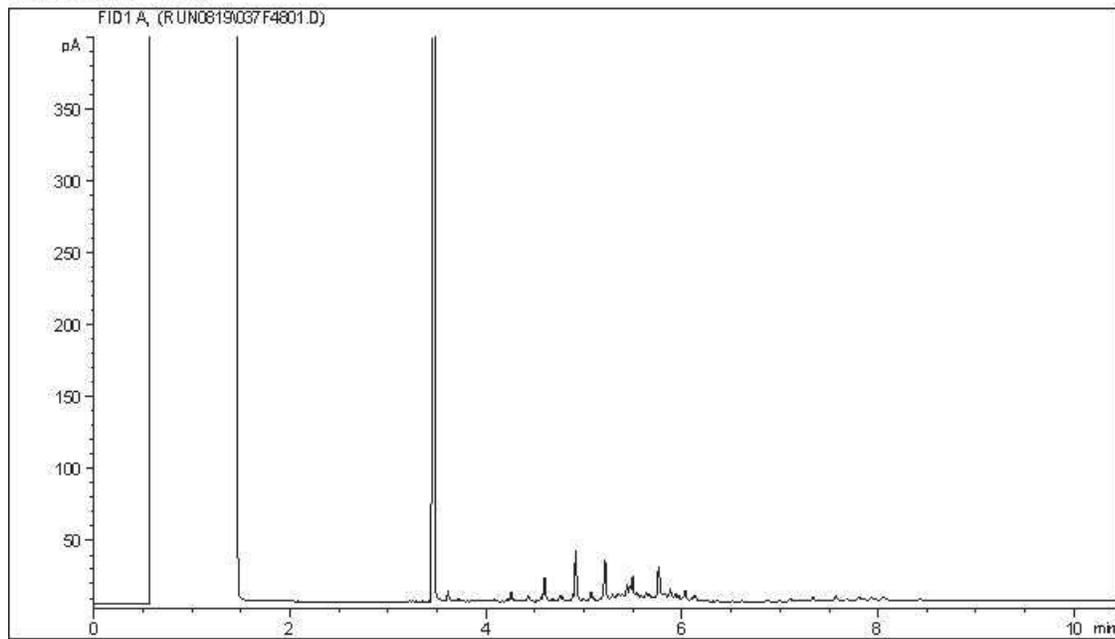
TYPICAL PRODUCT CARBON NUMBER RANGES

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

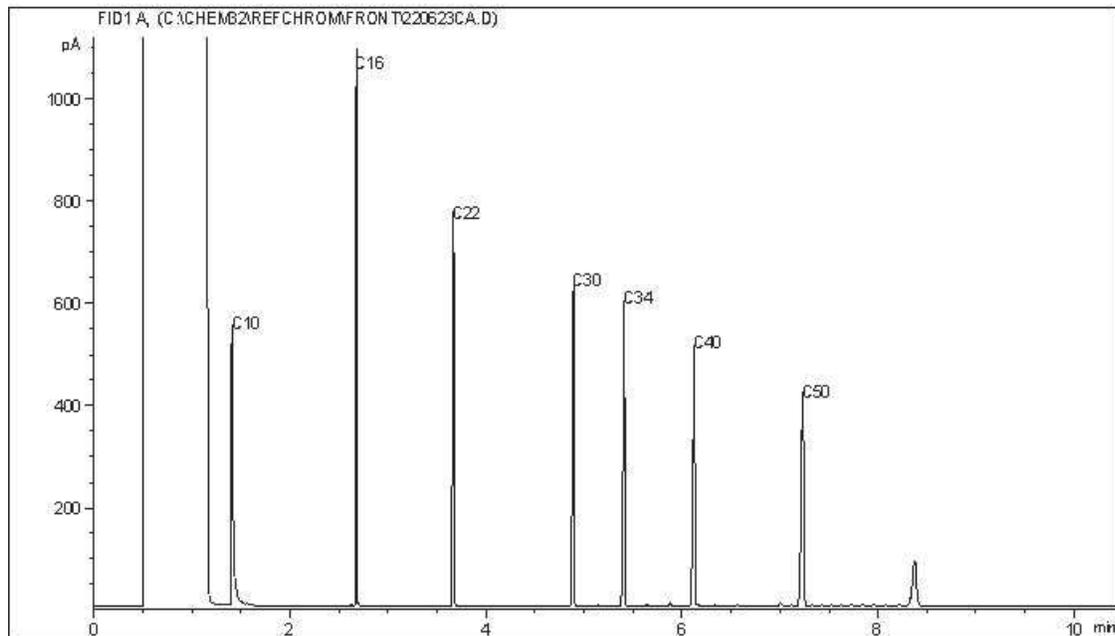
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) 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.

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 13, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C262019

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes
 Was proper chain of custody of the samples documented and kept? Yes
 Were sample temperatures acceptable when they reached lab?: Yes
 Were all samples analyzed and extracted within hold times?: Yes
 Has lab warranted all tests were in statistical control in CoA?: Yes
 Was sufficient sample provided for the requested analysis? Yes
 Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery		X		All remaining laboratory QC results are within acceptance criteria, please see QA/QC appendix.
Method Blank Concentration		X		
Laboratory Duplicate RPD	X			
Matrix Spike Recovery		X		
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	All field QC samples are within alert limits.
Trip Blank Concentration			X	
Field Duplicate RPD	X			

Is data considered reliable (Yes/No/Suspect)? Yes
 If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 29, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAIRWELL
 Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/10/12
 Report #: R3246787
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262020

Received: 2022/08/17, 12:45

Sample Matrix: Soil
 # Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Boron (Hot Water Soluble) (1)	10	2022/08/28	2022/08/29	AB SOP-00034 / AB SOP-00042	EPA 6010d R5 m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 3)	10	N/A	2022/08/19	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	10	N/A	2022/08/20		Auto Calc
Hexavalent Chromium (1, 4)	6	2022/08/26	2022/08/26	AB SOP-00063	SM 23 3500-Cr B m
Hexavalent Chromium (1, 4)	4	2022/08/29	2022/08/29	AB SOP-00063	SM 23 3500-Cr B m
Barium on ICP using Fusion Extraction (2)	1	N/A	2022/10/12		
CCME Hydrocarbons (F2-F4 in soil) (1, 5)	10	2022/08/19	2022/08/20	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils (1)	6	2022/08/26	2022/08/26	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Soils (1)	4	2022/08/26	2022/08/27	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Moisture (1)	2	N/A	2022/08/19	AB SOP-00002	CCME PHC-CWS m
Moisture (1)	8	N/A	2022/08/20	AB SOP-00002	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (1)	6	N/A	2022/08/20		Auto Calc
PAH in Soil by GC/MS (1)	6	2022/08/19	2022/08/20	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m

Remarks:

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

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

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



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2022/10/12
Report #: R3246787
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262020

Received: 2022/08/17, 12:45

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
- (2) This test was performed by Element Materials Tech Canada, 7217 Roper Rd. , Edmonton, AB, T6B 3J4
- (3) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
- (4) Some soil samples may react with the Cr(VI) spike reducing it to Cr(III). These samples are highly unlikely to contain native hexavalent chromium. Thus a failed spike recovery does not invalidate a negative result on the native sample.
- (5) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Cynny Hagen
Key Account Soecialist
12 Oct 2022 16:46:58

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====

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



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY128	AZY128		AZY129	AZY130	AZY131		
Sampling Date		2022/08/12 11:30	2022/08/12 11:30		2022/08/12 11:45	2022/08/12 12:00	2022/08/12 12:00		
COC Number		1 of 1	1 of 1		1 of 1	1 of 1	1 of 1		
	UNITS	MW22-22-01	MW22-22-01 Lab-Dup	QC Batch	MW22-22-02	MW22-22-03	DUP K	RDL	QC Batch

Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	19	N/A	A687951	24	91	31	10	A687951
F3 (C16-C34 Hydrocarbons)	mg/kg	100	N/A	A687951	100	130	84	50	A687951
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	N/A	A687951	<50	<50	<50	50	A687951
Reached Baseline at C50	mg/kg	Yes	N/A	A687951	Yes	Yes	Yes	N/A	A687951

Physical Properties									
Moisture	%	20	17	A688091	24	23	22	0.30	A688037

Volatiles									
Xylenes (Total)	mg/kg	<0.045	N/A	A686814	<0.045	<0.045	<0.045	0.045	A686814
F1 (C6-C10) - BTEX	mg/kg	<10	N/A	A686814	15	<10	<10	10	A686814

Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	N/A	A687757	0.15	2.3	1.7	0.0050	A687757
Toluene	mg/kg	<0.050	N/A	A687757	<0.050	<0.050	<0.050	0.050	A687757
Ethylbenzene	mg/kg	<0.010	N/A	A687757	0.19	0.022	<0.010	0.010	A687757
m & p-Xylene	mg/kg	<0.040	N/A	A687757	<0.040	<0.040	<0.040	0.040	A687757
o-Xylene	mg/kg	<0.020	N/A	A687757	<0.020	<0.020	<0.020	0.020	A687757
F1 (C6-C10)	mg/kg	<10	N/A	A687757	15	<10	<10	10	A687757

Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	100	N/A	A687757	100	99	103	N/A	A687757
4-Bromofluorobenzene (sur.)	%	101	N/A	A687757	100	101	98	N/A	A687757
D10-o-Xylene (sur.)	%	111	N/A	A687757	117	108	102	N/A	A687757
D4-1,2-Dichloroethane (sur.)	%	106	N/A	A687757	108	110	103	N/A	A687757
O-TERPHENYL (sur.)	%	132	N/A	A687951	117	134	116	N/A	A687951

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



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY132		AZY133			AZY134		
Sampling Date		2022/08/12 12:15		2022/08/12 12:30			2022/08/12 12:45		
COC Number		1 of 1		1 of 1			1 of 1		
	UNITS	MW22-22-04	QC Batch	MW22-22-05	RDL	QC Batch	BH22-21-01	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	A687951	17	10	A687951	19	10	A687951
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	A687951	74	50	A687951	380	50	A687951
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	A687951	<50	50	A687951	170	50	A687951
Reached Baseline at C50	mg/kg	Yes	A687951	Yes	N/A	A687951	Yes	N/A	A687951
Physical Properties									
Moisture	%	19	A688037	25	0.30	A688047	49	0.30	A688091
Volatiles									
Xylenes (Total)	mg/kg	<0.045	A687229	<0.045	0.045	A687229	<0.11	0.11	A686814
F1 (C6-C10) - BTEX	mg/kg	<10	A687229	<10	10	A687229	<24	24	A686814
Field Preserved Volatiles									
Benzene	mg/kg	<0.0050	A687757	<0.0050	0.0050	A687757	<0.012 (1)	0.012	A687757
Toluene	mg/kg	<0.050	A687757	<0.050	0.050	A687757	<0.12 (1)	0.12	A687757
Ethylbenzene	mg/kg	<0.010	A687757	<0.010	0.010	A687757	<0.024 (1)	0.024	A687757
m & p-Xylene	mg/kg	<0.040	A687757	<0.040	0.040	A687757	<0.095 (1)	0.095	A687757
o-Xylene	mg/kg	<0.020	A687757	<0.020	0.020	A687757	<0.048 (1)	0.048	A687757
F1 (C6-C10)	mg/kg	<10	A687757	<10	10	A687757	<24 (1)	24	A687757
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	104	A687757	104	N/A	A687757	103	N/A	A687757
4-Bromofluorobenzene (sur.)	%	99	A687757	99	N/A	A687757	97	N/A	A687757
D10-o-Xylene (sur.)	%	74	A687757	89	N/A	A687757	104	N/A	A687757
D4-1,2-Dichloroethane (sur.)	%	99	A687757	101	N/A	A687757	97	N/A	A687757
O-TERPHENYL (sur.)	%	123	A687951	108	N/A	A687951	124	N/A	A687951
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised based on sample weight used for analysis.									



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY135		AZY136		AZY137		
Sampling Date		2022/08/12 12:50		2022/08/12 13:15		2022/08/12 13:30		
COC Number		1 of 1		1 of 1		1 of 1		
	UNITS	BH22-21-02	QC Batch	BH22-21-03	QC Batch	BH22-21-04	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	15	A687951	<10	A687951	<10	10	A687951
F3 (C16-C34 Hydrocarbons)	mg/kg	180	A687951	<50	A687951	<50	50	A687951
F4 (C34-C50 Hydrocarbons)	mg/kg	72	A687951	<50	A687951	<50	50	A687951
Reached Baseline at C50	mg/kg	Yes	A687951	Yes	A687951	Yes	N/A	A687951
Physical Properties								
Moisture	%	25	A688037	12	A688047	17	0.30	A688091
Volatiles								
Xylenes (Total)	mg/kg	<0.045	A686814	<0.045	A686814	<0.045	0.045	A686814
F1 (C6-C10) - BTEX	mg/kg	<10	A686814	<10	A686814	<10	10	A686814
Field Preserved Volatiles								
Benzene	mg/kg	<0.0050	A687757	<0.0050	A687757	<0.0050	0.0050	A687757
Toluene	mg/kg	<0.050	A687757	<0.050	A687757	<0.050	0.050	A687757
Ethylbenzene	mg/kg	<0.010	A687757	<0.010	A687757	<0.010	0.010	A687757
m & p-Xylene	mg/kg	<0.040	A687757	<0.040	A687757	<0.040	0.040	A687757
o-Xylene	mg/kg	<0.020	A687757	<0.020	A687757	<0.020	0.020	A687757
F1 (C6-C10)	mg/kg	<10	A687757	<10	A687757	<10	10	A687757
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	103	A687757	105	A687757	104	N/A	A687757
4-Bromofluorobenzene (sur.)	%	97	A687757	98	A687757	97	N/A	A687757
D10-o-Xylene (sur.)	%	107	A687757	96	A687757	89	N/A	A687757
D4-1,2-Dichloroethane (sur.)	%	99	A687757	99	A687757	99	N/A	A687757
O-TERPHENYL (sur.)	%	117	A687951	118	A687951	106	N/A	A687951
RDL = Reportable Detection Limit N/A = Not Applicable								



**BUREAU
VERITAS**

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZY128	AZY129		AZY130		AZY131		
Sampling Date		2022/08/12 11:30	2022/08/12 11:45		2022/08/12 12:00		2022/08/12 12:00		
COC Number		1 of 1	1 of 1		1 of 1		1 of 1		
	UNITS	MW22-22-01	MW22-22-02	QC Batch	MW22-22-03	QC Batch	DUP K	RDL	QC Batch
Elements									
Soluble (Hot water) Boron (B)	mg/kg	0.12	0.17	A696714	0.13	A696714	0.18	0.10	A696714
Hex. Chromium (Cr 6+)	mg/kg	<0.080	<0.080	A697738	<0.080	A695906	<0.080	0.080	A695906
Total Antimony (Sb)	mg/kg	<0.50	0.55	A695284	<0.50	A696156	0.54	0.50	A695284
Total Arsenic (As)	mg/kg	7.2	7.6	A695284	8.0	A696156	8.1	1.0	A695284
Total Barium (Ba)	mg/kg	420	350	A695284	390	A696156	370	1.0	A695284
Total Beryllium (Be)	mg/kg	0.44	0.52	A695284	0.58	A696156	0.56	0.40	A695284
Total Cadmium (Cd)	mg/kg	0.36	0.46	A695284	0.51	A696156	0.50	0.050	A695284
Total Chromium (Cr)	mg/kg	93	32	A695284	17	A696156	17	1.0	A695284
Total Cobalt (Co)	mg/kg	8.2	8.5	A695284	8.7	A696156	8.9	0.50	A695284
Total Copper (Cu)	mg/kg	18	19	A695284	20	A696156	20	1.0	A695284
Total Lead (Pb)	mg/kg	9.9	11	A695284	9.9	A696156	10	0.50	A695284
Total Mercury (Hg)	mg/kg	0.061	0.060	A695284	0.053	A696156	0.054	0.050	A695284
Total Molybdenum (Mo)	mg/kg	3.3	1.9	A695284	1.6	A696156	1.7	0.40	A695284
Total Nickel (Ni)	mg/kg	57	32	A695284	26	A696156	27	1.0	A695284
Total Selenium (Se)	mg/kg	0.50	0.62	A695284	0.61	A696156	0.69	0.50	A695284
Total Silver (Ag)	mg/kg	<0.20	<0.20	A695284	<0.20	A696156	<0.20	0.20	A695284
Total Thallium (Tl)	mg/kg	0.13	0.16	A695284	0.16	A696156	0.16	0.10	A695284
Total Tin (Sn)	mg/kg	<1.0	<1.0	A695284	<1.0	A696156	<1.0	1.0	A695284
Total Uranium (U)	mg/kg	0.72	0.77	A695284	0.89	A696156	0.88	0.20	A695284
Total Vanadium (V)	mg/kg	26	28	A695284	29	A696156	29	1.0	A695284
Total Zinc (Zn)	mg/kg	66	82	A695284	95	A696156	89	10	A695284
RDL = Reportable Detection Limit									



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZY132	AZY133			AZY134			AZY135		
Sampling Date		2022/08/12 12:15	2022/08/12 12:30			2022/08/12 12:45			2022/08/12 12:50		
COC Number		1 of 1	1 of 1			1 of 1			1 of 1		
	UNITS	MW22-22-04	MW22-22-05	RDL	QC Batch	BH22-21-01	RDL	QC Batch	BH22-21-02	RDL	QC Batch

Elements											
Soluble (Hot water) Boron (B)	mg/kg	<0.10	0.24	0.10	A696714	1.7	0.10	A696714	<0.10	0.10	A696714
Hex. Chromium (Cr 6+)	mg/kg	<0.080	<0.080	0.080	A697738	<0.080	0.080	A695906	<0.080	0.080	A695457
Total Antimony (Sb)	mg/kg	<0.50	<0.50	0.50	A696156	<1.0	1.0	A695284	<0.50	0.50	A695284
Total Arsenic (As)	mg/kg	6.0	6.9	1.0	A696156	4.7	2.0	A695284	5.2	1.0	A695284
Total Barium (Ba)	mg/kg	220	330	1.0	A696156	1200	2.0	A695284	110	1.0	A695284
Total Beryllium (Be)	mg/kg	<0.40	0.51	0.40	A696156	<0.80	0.80	A695284	<0.40	0.40	A695284
Total Cadmium (Cd)	mg/kg	0.29	0.45	0.050	A696156	0.29	0.10	A695284	<0.050	0.050	A695284
Total Chromium (Cr)	mg/kg	13	21	1.0	A696156	8.8	2.0	A695284	6.4	1.0	A695284
Total Cobalt (Co)	mg/kg	6.3	8.3	0.50	A696156	4.3	1.0	A695284	2.3	0.50	A695284
Total Copper (Cu)	mg/kg	13	18	1.0	A696156	12	2.0	A695284	2.5	1.0	A695284
Total Lead (Pb)	mg/kg	6.5	8.7	0.50	A696156	13	1.0	A695284	4.2	0.50	A695284
Total Mercury (Hg)	mg/kg	<0.050	0.052	0.050	A696156	0.12	0.10	A695284	<0.050	0.050	A695284
Total Molybdenum (Mo)	mg/kg	1.2	1.5	0.40	A696156	1.5	0.80	A695284	0.65	0.40	A695284
Total Nickel (Ni)	mg/kg	19	25	1.0	A696156	12	2.0	A695284	6.4	1.0	A695284
Total Selenium (Se)	mg/kg	<0.50	0.57	0.50	A696156	<1.0	1.0	A695284	<0.50	0.50	A695284
Total Silver (Ag)	mg/kg	<0.20	<0.20	0.20	A696156	<0.40	0.40	A695284	<0.20	0.20	A695284
Total Thallium (Tl)	mg/kg	0.11	0.15	0.10	A696156	<0.20	0.20	A695284	<0.10	0.10	A695284
Total Tin (Sn)	mg/kg	<1.0	<1.0	1.0	A696156	<2.0	2.0	A695284	<1.0	1.0	A695284
Total Uranium (U)	mg/kg	0.60	0.82	0.20	A696156	0.77	0.40	A695284	0.23	0.20	A695284
Total Vanadium (V)	mg/kg	21	26	1.0	A696156	15	2.0	A695284	15	1.0	A695284
Total Zinc (Zn)	mg/kg	62	81	10	A696156	53	20	A695284	18	10	A695284

RDL = Reportable Detection Limit



CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZY136		AZY137		
Sampling Date		2022/08/12 13:15		2022/08/12 13:30		
COC Number		1 of 1		1 of 1		
	UNITS	BH22-21-03	QC Batch	BH22-21-04	RDL	QC Batch
Elements						
Soluble (Hot water) Boron (B)	mg/kg	<0.10	A696714	<0.10	0.10	A696714
Hex. Chromium (Cr 6+)	mg/kg	<0.080	A695906	<0.080	0.080	A695906
Total Antimony (Sb)	mg/kg	<0.50	A695284	<0.50	0.50	A696156
Total Arsenic (As)	mg/kg	6.0	A695284	5.3	1.0	A696156
Total Barium (Ba)	mg/kg	90	A695284	67	1.0	A696156
Total Beryllium (Be)	mg/kg	<0.40	A695284	<0.40	0.40	A696156
Total Cadmium (Cd)	mg/kg	0.099	A695284	0.084	0.050	A696156
Total Chromium (Cr)	mg/kg	6.1	A695284	6.1	1.0	A696156
Total Cobalt (Co)	mg/kg	3.9	A695284	3.7	0.50	A696156
Total Copper (Cu)	mg/kg	3.7	A695284	3.6	1.0	A696156
Total Lead (Pb)	mg/kg	3.8	A695284	3.1	0.50	A696156
Total Mercury (Hg)	mg/kg	<0.050	A695284	<0.050	0.050	A696156
Total Molybdenum (Mo)	mg/kg	0.57	A695284	0.51	0.40	A696156
Total Nickel (Ni)	mg/kg	10	A695284	10	1.0	A696156
Total Selenium (Se)	mg/kg	<0.50	A695284	<0.50	0.50	A696156
Total Silver (Ag)	mg/kg	<0.20	A695284	<0.20	0.20	A696156
Total Thallium (Tl)	mg/kg	<0.10	A695284	<0.10	0.10	A696156
Total Tin (Sn)	mg/kg	<1.0	A695284	<1.0	1.0	A696156
Total Uranium (U)	mg/kg	0.30	A695284	0.32	0.20	A696156
Total Vanadium (V)	mg/kg	11	A695284	12	1.0	A696156
Total Zinc (Zn)	mg/kg	26	A695284	27	10	A696156
RDL = Reportable Detection Limit						



**BUREAU
VERITAS**

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		AZY134	
Sampling Date		2022/08/12 12:45	
COC Number		1 of 1	
	UNITS	BH22-21-01	QC Batch
Parameter			
Subcontract Parameter	N/A	ATTACHED	A753619



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		AZY128	AZY129	AZY130	AZY131	AZY132	AZY133		
Sampling Date		2022/08/12 11:30	2022/08/12 11:45	2022/08/12 12:00	2022/08/12 12:00	2022/08/12 12:15	2022/08/12 12:30		
COC Number		1 of 1							
	UNITS	MW22-22-01	MW22-22-02	MW22-22-03	DUP K	MW22-22-04	MW22-22-05	RDL	QC Batch

Polycyclic Aromatics									
Acenaphthene	mg/kg	<0.0050	<0.0050	0.012	<0.0050	<0.0050	<0.0050	0.0050	A686416
B[a]P TPE Total Potency Equivalents	mg/kg	0.0080	0.012	0.0080	0.0080	<0.0071	0.0080	0.0071	A687230
Acenaphthylene	mg/kg	<0.0050	<0.0050	0.0072	<0.0050	<0.0050	<0.0050	0.0050	A686416
Acridine	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	A686416
Anthracene	mg/kg	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.0040	A686416
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A686416
Benzo(b&j)fluoranthene	mg/kg	0.018	0.021	0.020	0.018	<0.0050	0.018	0.0050	A686416
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A686416
Benzo(g,h,i)perylene	mg/kg	0.034	0.032	0.028	0.026	<0.0050	0.026	0.0050	A686416
Benzo(c)phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A686416
Benzo(a)pyrene	mg/kg	<0.0050	0.0066	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A686416
Benzo(e)pyrene	mg/kg	0.027	0.029	0.026	0.025	<0.0050	0.024	0.0050	A686416
Chrysene	mg/kg	0.011	0.011	0.010	0.012	<0.0050	0.013	0.0050	A686416
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A686416
Fluoranthene	mg/kg	0.0083	0.0090	0.0081	0.0082	<0.0050	0.0081	0.0050	A686416
Fluorene	mg/kg	<0.0050	<0.0050	0.021	0.0086	<0.0050	0.0076	0.0050	A686416
Indeno(1,2,3-cd)pyrene	mg/kg	0.0066	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A686416
1-Methylnaphthalene	mg/kg	0.023	0.031	0.88	0.22	<0.0050	0.025	0.0050	A686416
2-Methylnaphthalene	mg/kg	0.034	0.043	1.3	0.33	<0.0050	0.040	0.0050	A686416
Naphthalene	mg/kg	0.018	0.061	1.3	0.37	<0.0050	0.017	0.0050	A686416
Phenanthrene	mg/kg	0.028	0.042	0.038	0.036	<0.0050	0.039	0.0050	A686416
Perylene	mg/kg	0.051	0.075	0.067	0.069	<0.0050	0.070	0.0050	A686416
Pyrene	mg/kg	0.016	0.018	0.016	0.015	<0.0050	0.016	0.0050	A686416
Quinoline	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	A686416

Surrogate Recovery (%)									
D10-ANTHRACENE (sur.)	%	102	95	89	96	102	98	N/A	A686416
D8-ACENAPHTHYLENE (sur.)	%	94	86	83	92	96	93	N/A	A686416
D8-NAPHTHALENE (sur.)	%	100	86	83	90	93	90	N/A	A686416
TERPHENYL-D14 (sur.)	%	126	115	109	119	126	122	N/A	A686416

RDL = Reportable Detection Limit
N/A = Not Applicable



GENERAL COMMENTS

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

Package 1	5.3°C
-----------	-------

Version 2: Report reissued to include results for Metals as per client request received 2022/08/24.

Version 3: Report reissued to include results for Barium-True Total on sample BH22-21-01/AZY134 as per client request received 2022/09/23.

Sample AZY134 [BH22-21-01] : Please see attachment for Barium on ICP using Fusion Extraction results.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
A686416	SJ1	Matrix Spike	D10-ANTHRACENE (sur.)	2022/08/19	84	%	50 - 130			
			D8-ACENAPHTHYLENE (sur.)	2022/08/19	77	%	50 - 130			
			D8-NAPHTHALENE (sur.)	2022/08/19	76	%	50 - 130			
			TERPHENYL-D14 (sur.)	2022/08/19	98	%	50 - 130			
			Acenaphthene	2022/08/19	76	%	50 - 130			
			Acenaphthylene	2022/08/19	76	%	50 - 130			
			Acridine	2022/08/19	53	%	50 - 130			
			Anthracene	2022/08/19	74	%	50 - 130			
			Benzo(a)anthracene	2022/08/19	78	%	50 - 130			
			Benzo(b&j)fluoranthene	2022/08/19	73	%	50 - 130			
			Benzo(k)fluoranthene	2022/08/19	66	%	50 - 130			
			Benzo(g,h,i)perylene	2022/08/19	71	%	50 - 130			
			Benzo(c)phenanthrene	2022/08/19	80	%	50 - 130			
			Benzo(a)pyrene	2022/08/19	72	%	50 - 130			
			Benzo(e)pyrene	2022/08/19	67	%	50 - 130			
			Chrysene	2022/08/19	73	%	50 - 130			
			Dibenz(a,h)anthracene	2022/08/19	71	%	50 - 130			
			Fluoranthene	2022/08/19	74	%	50 - 130			
			Fluorene	2022/08/19	78	%	50 - 130			
			Indeno(1,2,3-cd)pyrene	2022/08/19	74	%	50 - 130			
			1-Methylnaphthalene	2022/08/19	62	%	50 - 130			
			2-Methylnaphthalene	2022/08/19	78	%	50 - 130			
			Naphthalene	2022/08/19	77	%	50 - 130			
			Phenanthrene	2022/08/19	72	%	50 - 130			
			Perylene	2022/08/19	62	%	50 - 130			
			Pyrene	2022/08/19	73	%	50 - 130			
			Quinoline	2022/08/19	91	%	50 - 130			
			A686416	SJ1	Spiked Blank	D10-ANTHRACENE (sur.)	2022/08/19	100	%	50 - 130
						D8-ACENAPHTHYLENE (sur.)	2022/08/19	82	%	50 - 130
						D8-NAPHTHALENE (sur.)	2022/08/19	83	%	50 - 130
TERPHENYL-D14 (sur.)	2022/08/19	121				%	50 - 130			
Acenaphthene	2022/08/19	84				%	50 - 130			
Acenaphthylene	2022/08/19	81				%	50 - 130			
Acridine	2022/08/19	60				%	50 - 130			
Anthracene	2022/08/19	87				%	50 - 130			
Benzo(a)anthracene	2022/08/19	92				%	50 - 130			
Benzo(b&j)fluoranthene	2022/08/19	89				%	50 - 130			
Benzo(k)fluoranthene	2022/08/19	91				%	50 - 130			
Benzo(g,h,i)perylene	2022/08/19	90				%	50 - 130			
Benzo(c)phenanthrene	2022/08/19	100				%	50 - 130			
Benzo(a)pyrene	2022/08/19	88				%	50 - 130			
Benzo(e)pyrene	2022/08/19	86				%	50 - 130			
Chrysene	2022/08/19	94				%	50 - 130			
Dibenz(a,h)anthracene	2022/08/19	87				%	50 - 130			
Fluoranthene	2022/08/19	87				%	50 - 130			
Fluorene	2022/08/19	83				%	50 - 130			
Indeno(1,2,3-cd)pyrene	2022/08/19	80				%	50 - 130			
1-Methylnaphthalene	2022/08/19	70	%	50 - 130						
2-Methylnaphthalene	2022/08/19	89	%	50 - 130						
Naphthalene	2022/08/19	85	%	50 - 130						
Phenanthrene	2022/08/19	86	%	50 - 130						
Perylene	2022/08/19	77	%	50 - 130						



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
A686416	SJ1	Method Blank	Pyrene	2022/08/19		86	%	50 - 130	
			Quinoline	2022/08/19		93	%	50 - 130	
			D10-ANTHRACENE (sur.)	2022/08/19		96	%	50 - 130	
			D8-ACENAPHTHYLENE (sur.)	2022/08/19		87	%	50 - 130	
			D8-NAPHTHALENE (sur.)	2022/08/19		88	%	50 - 130	
			TERPHENYL-D14 (sur.)	2022/08/19		127	%	50 - 130	
			Acenaphthene	2022/08/19	<0.0050		mg/kg		
			Acenaphthylene	2022/08/19	<0.0050		mg/kg		
			Acridine	2022/08/19	<0.010		mg/kg		
			Anthracene	2022/08/19	<0.0040		mg/kg		
			Benzo(a)anthracene	2022/08/19	<0.0050		mg/kg		
			Benzo(b&j)fluoranthene	2022/08/19	<0.0050		mg/kg		
			Benzo(k)fluoranthene	2022/08/19	<0.0050		mg/kg		
			Benzo(g,h,i)perylene	2022/08/19	<0.0050		mg/kg		
			Benzo(c)phenanthrene	2022/08/19	<0.0050		mg/kg		
			Benzo(a)pyrene	2022/08/19	<0.0050		mg/kg		
			Benzo(e)pyrene	2022/08/19	<0.0050		mg/kg		
			Chrysene	2022/08/19	<0.0050		mg/kg		
			Dibenz(a,h)anthracene	2022/08/19	<0.0050		mg/kg		
			Fluoranthene	2022/08/19	<0.0050		mg/kg		
			Fluorene	2022/08/19	<0.0050		mg/kg		
			Indeno(1,2,3-cd)pyrene	2022/08/19	<0.0050		mg/kg		
			1-Methylnaphthalene	2022/08/19	<0.0050		mg/kg		
			2-Methylnaphthalene	2022/08/19	<0.0050		mg/kg		
			Naphthalene	2022/08/19	<0.0050		mg/kg		
			Phenanthrene	2022/08/19	<0.0050		mg/kg		
			Perylene	2022/08/19	<0.0050		mg/kg		
Pyrene	2022/08/19	<0.0050		mg/kg					
Quinoline	2022/08/19	<0.010		mg/kg					
A686416	SJ1	RPD	Acenaphthene	2022/08/19	NC		%	50	
			Acenaphthylene	2022/08/19	NC		%	50	
			Acridine	2022/08/19	NC		%	50	
			Anthracene	2022/08/19	29		%	50	
			Benzo(a)anthracene	2022/08/19	25		%	50	
			Benzo(b&j)fluoranthene	2022/08/19	16		%	50	
			Benzo(k)fluoranthene	2022/08/19	NC		%	50	
			Benzo(g,h,i)perylene	2022/08/19	12		%	50	
			Benzo(c)phenanthrene	2022/08/19	NC		%	50	
			Benzo(a)pyrene	2022/08/19	24		%	50	
			Benzo(e)pyrene	2022/08/19	10		%	50	
			Chrysene	2022/08/19	8.6		%	50	
			Dibenz(a,h)anthracene	2022/08/19	NC		%	50	
			Fluoranthene	2022/08/19	40		%	50	
			Fluorene	2022/08/19	21		%	50	
			Indeno(1,2,3-cd)pyrene	2022/08/19	32		%	50	
			1-Methylnaphthalene	2022/08/19	54 (1)		%	50	
			2-Methylnaphthalene	2022/08/19	61 (1)		%	50	
			Naphthalene	2022/08/19	51 (1)		%	50	
			Phenanthrene	2022/08/19	39		%	50	
Perylene	2022/08/19	3.7		%	50				
Pyrene	2022/08/19	34		%	50				
Quinoline	2022/08/19	NC		%	50				



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits		
A687757	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2022/08/19		102	%	50 - 140			
			4-Bromofluorobenzene (sur.)	2022/08/19		99	%	50 - 140			
			D10-o-Xylene (sur.)	2022/08/19		106	%	50 - 140			
			D4-1,2-Dichloroethane (sur.)	2022/08/19		108	%	50 - 140			
			Benzene	2022/08/19		110	%	50 - 140			
			Toluene	2022/08/19		108	%	50 - 140			
			Ethylbenzene	2022/08/19		106	%	50 - 140			
			m & p-Xylene	2022/08/19		106	%	50 - 140			
			o-Xylene	2022/08/19		100	%	50 - 140			
			F1 (C6-C10)	2022/08/19		93	%	60 - 140			
			A687757	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/08/19		103	%	50 - 140
						4-Bromofluorobenzene (sur.)	2022/08/19		100	%	50 - 140
						D10-o-Xylene (sur.)	2022/08/19		94	%	50 - 140
D4-1,2-Dichloroethane (sur.)	2022/08/19					109	%	50 - 140			
Benzene	2022/08/19					92	%	60 - 130			
Toluene	2022/08/19					92	%	60 - 130			
Ethylbenzene	2022/08/19					91	%	60 - 130			
m & p-Xylene	2022/08/19					92	%	60 - 130			
o-Xylene	2022/08/19					89	%	60 - 130			
F1 (C6-C10)	2022/08/19					84	%	60 - 140			
A687757	DO1	Method Blank				1,4-Difluorobenzene (sur.)	2022/08/19		99	%	50 - 140
						4-Bromofluorobenzene (sur.)	2022/08/19		100	%	50 - 140
						D10-o-Xylene (sur.)	2022/08/19		93	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/19		105	%	50 - 140			
			Benzene	2022/08/19	<0.0050		mg/kg				
			Toluene	2022/08/19	<0.050		mg/kg				
			Ethylbenzene	2022/08/19	<0.010		mg/kg				
			m & p-Xylene	2022/08/19	<0.040		mg/kg				
			o-Xylene	2022/08/19	<0.020		mg/kg				
			F1 (C6-C10)	2022/08/19	<10		mg/kg				
			A687757	DO1	RPD	Benzene	2022/08/19	NC		%	50
						Toluene	2022/08/19	NC		%	50
						Ethylbenzene	2022/08/19	NC		%	50
m & p-Xylene	2022/08/19	NC					%	50			
o-Xylene	2022/08/19	NC					%	50			
F1 (C6-C10)	2022/08/19	NC					%	30			
A687951	CAU	Matrix Spike	O-TERPHENYL (sur.)	2022/08/20		114	%	60 - 140			
			F2 (C10-C16 Hydrocarbons)	2022/08/20		78	%	60 - 140			
			F3 (C16-C34 Hydrocarbons)	2022/08/20		NC	%	60 - 140			
			F4 (C34-C50 Hydrocarbons)	2022/08/20		68	%	60 - 140			
			A687951	CAU	Spiked Blank	O-TERPHENYL (sur.)	2022/08/20		112	%	60 - 140
F2 (C10-C16 Hydrocarbons)	2022/08/20					106	%	60 - 140			
F3 (C16-C34 Hydrocarbons)	2022/08/20					111	%	60 - 140			
F4 (C34-C50 Hydrocarbons)	2022/08/20					108	%	60 - 140			
A687951	CAU	Method Blank	O-TERPHENYL (sur.)	2022/08/20		116	%	60 - 140			
			F2 (C10-C16 Hydrocarbons)	2022/08/20	<10		mg/kg				
			F3 (C16-C34 Hydrocarbons)	2022/08/20	<50		mg/kg				
			F4 (C34-C50 Hydrocarbons)	2022/08/20	<50		mg/kg				
A687951	CAU	RPD	F2 (C10-C16 Hydrocarbons)	2022/08/20	30		%	40			
			F3 (C16-C34 Hydrocarbons)	2022/08/20	42 (1)		%	40			
			F4 (C34-C50 Hydrocarbons)	2022/08/20	26		%	40			
A688037	A1H	Method Blank	Moisture	2022/08/20	<0.30		%				



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	A688037	A1H	RPD	Moisture	2022/08/20	8.9		%	20
	A688047	ETS	Method Blank	Moisture	2022/08/19	<0.30		%	
	A688047	ETS	RPD	Moisture	2022/08/19	8.1		%	20
	A688091	A1H	Method Blank	Moisture	2022/08/20	<0.30		%	
	A688091	A1H	RPD [AZY128-02]	Moisture	2022/08/20	16		%	20
	A695284	MKJ	Matrix Spike	Total Antimony (Sb)	2022/08/26		94	%	75 - 125
				Total Arsenic (As)	2022/08/26		88	%	75 - 125
				Total Barium (Ba)	2022/08/26		NC	%	75 - 125
				Total Beryllium (Be)	2022/08/26		100	%	75 - 125
				Total Cadmium (Cd)	2022/08/26		95	%	75 - 125
				Total Chromium (Cr)	2022/08/26		105	%	75 - 125
				Total Cobalt (Co)	2022/08/26		91	%	75 - 125
				Total Copper (Cu)	2022/08/26		90	%	75 - 125
				Total Lead (Pb)	2022/08/26		96	%	75 - 125
				Total Mercury (Hg)	2022/08/26		90	%	75 - 125
				Total Molybdenum (Mo)	2022/08/26		99	%	75 - 125
				Total Nickel (Ni)	2022/08/26		93	%	75 - 125
				Total Selenium (Se)	2022/08/26		90	%	75 - 125
				Total Silver (Ag)	2022/08/26		98	%	75 - 125
				Total Thallium (Tl)	2022/08/26		96	%	75 - 125
				Total Tin (Sn)	2022/08/26		98	%	75 - 125
				Total Uranium (U)	2022/08/26		92	%	75 - 125
				Total Vanadium (V)	2022/08/26		119	%	75 - 125
				Total Zinc (Zn)	2022/08/26		90	%	75 - 125
	A695284	MKJ	QC Standard	Total Antimony (Sb)	2022/08/26		108	%	15 - 182
				Total Arsenic (As)	2022/08/26		94	%	53 - 147
				Total Barium (Ba)	2022/08/26		93	%	80 - 119
				Total Cadmium (Cd)	2022/08/26		92	%	72 - 128
				Total Chromium (Cr)	2022/08/26		84	%	59 - 141
				Total Cobalt (Co)	2022/08/26		89	%	58 - 142
				Total Copper (Cu)	2022/08/26		98	%	83 - 117
				Total Lead (Pb)	2022/08/26		107	%	79 - 121
				Total Molybdenum (Mo)	2022/08/26		93	%	67 - 133
				Total Nickel (Ni)	2022/08/26		96	%	79 - 121
				Total Silver (Ag)	2022/08/26		91	%	47 - 153
				Total Tin (Sn)	2022/08/26		101	%	67 - 133
				Total Uranium (U)	2022/08/26		85	%	77 - 123
				Total Vanadium (V)	2022/08/26		90	%	79 - 121
				Total Zinc (Zn)	2022/08/26		93	%	79 - 121
	A695284	MKJ	Spiked Blank	Total Antimony (Sb)	2022/08/26		96	%	80 - 120
				Total Arsenic (As)	2022/08/26		86	%	80 - 120
				Total Barium (Ba)	2022/08/26		91	%	80 - 120
				Total Beryllium (Be)	2022/08/26		94	%	80 - 120
				Total Cadmium (Cd)	2022/08/26		91	%	80 - 120
				Total Chromium (Cr)	2022/08/26		88	%	80 - 120
				Total Cobalt (Co)	2022/08/26		90	%	80 - 120
				Total Copper (Cu)	2022/08/26		90	%	80 - 120
				Total Lead (Pb)	2022/08/26		94	%	80 - 120
				Total Mercury (Hg)	2022/08/26		94	%	80 - 120
				Total Molybdenum (Mo)	2022/08/26		94	%	80 - 120
				Total Nickel (Ni)	2022/08/26		88	%	80 - 120
				Total Selenium (Se)	2022/08/26		88	%	80 - 120



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Silver (Ag)	2022/08/26		94	%	80 - 120
			Total Thallium (Tl)	2022/08/26		95	%	80 - 120
			Total Tin (Sn)	2022/08/26		94	%	80 - 120
			Total Uranium (U)	2022/08/26		94	%	80 - 120
			Total Vanadium (V)	2022/08/26		88	%	80 - 120
			Total Zinc (Zn)	2022/08/26		86	%	80 - 120
A695284	MKJ	Method Blank	Total Antimony (Sb)	2022/08/26	<0.50		mg/kg	
			Total Arsenic (As)	2022/08/26	<1.0		mg/kg	
			Total Barium (Ba)	2022/08/26	<1.0		mg/kg	
			Total Beryllium (Be)	2022/08/26	<0.40		mg/kg	
			Total Cadmium (Cd)	2022/08/26	<0.050		mg/kg	
			Total Chromium (Cr)	2022/08/26	<1.0		mg/kg	
			Total Cobalt (Co)	2022/08/26	<0.50		mg/kg	
			Total Copper (Cu)	2022/08/26	<1.0		mg/kg	
			Total Lead (Pb)	2022/08/26	<0.50		mg/kg	
			Total Mercury (Hg)	2022/08/26	<0.050		mg/kg	
			Total Molybdenum (Mo)	2022/08/26	<0.40		mg/kg	
			Total Nickel (Ni)	2022/08/26	<1.0		mg/kg	
			Total Selenium (Se)	2022/08/26	<0.50		mg/kg	
			Total Silver (Ag)	2022/08/26	<0.20		mg/kg	
			Total Thallium (Tl)	2022/08/26	<0.10		mg/kg	
			Total Tin (Sn)	2022/08/26	<1.0		mg/kg	
			Total Uranium (U)	2022/08/26	<0.20		mg/kg	
			Total Vanadium (V)	2022/08/26	<1.0		mg/kg	
			Total Zinc (Zn)	2022/08/26	<10		mg/kg	
A695284	MKJ	RPD	Total Antimony (Sb)	2022/08/26	12		%	30
			Total Arsenic (As)	2022/08/26	7.2		%	30
			Total Barium (Ba)	2022/08/26	5.1		%	35
			Total Beryllium (Be)	2022/08/26	12		%	30
			Total Cadmium (Cd)	2022/08/26	NC		%	30
			Total Chromium (Cr)	2022/08/26	12		%	30
			Total Cobalt (Co)	2022/08/26	2.3		%	30
			Total Copper (Cu)	2022/08/26	11		%	30
			Total Lead (Pb)	2022/08/26	5.3		%	35
			Total Mercury (Hg)	2022/08/26	NC		%	35
			Total Molybdenum (Mo)	2022/08/26	6.9		%	35
			Total Nickel (Ni)	2022/08/26	2.1		%	30
			Total Selenium (Se)	2022/08/26	15		%	30
			Total Silver (Ag)	2022/08/26	NC		%	35
			Total Thallium (Tl)	2022/08/26	2.3		%	30
			Total Tin (Sn)	2022/08/26	NC		%	35
			Total Uranium (U)	2022/08/26	15		%	30
			Total Vanadium (V)	2022/08/26	8.2		%	30
			Total Zinc (Zn)	2022/08/26	7.2		%	30
A695457	FM0	Matrix Spike	Hex. Chromium (Cr 6+)	2022/08/26		96	%	75 - 125
A695457	FM0	Spiked Blank	Hex. Chromium (Cr 6+)	2022/08/26		99	%	80 - 120
A695457	FM0	Method Blank	Hex. Chromium (Cr 6+)	2022/08/26	<0.080		mg/kg	
A695457	FM0	RPD	Hex. Chromium (Cr 6+)	2022/08/26	NC		%	35
A695906	FM0	Matrix Spike	Hex. Chromium (Cr 6+)	2022/08/26		92	%	75 - 125
A695906	FM0	Spiked Blank	Hex. Chromium (Cr 6+)	2022/08/26		102	%	80 - 120
A695906	FM0	Method Blank	Hex. Chromium (Cr 6+)	2022/08/26	<0.080		mg/kg	
A695906	FM0	RPD	Hex. Chromium (Cr 6+)	2022/08/26	NC		%	35



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC											
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits			
A696156	MKJ	Matrix Spike	Total Antimony (Sb)	2022/08/27		90	%	75 - 125			
			Total Arsenic (As)	2022/08/27		85	%	75 - 125			
			Total Barium (Ba)	2022/08/27		NC	%	75 - 125			
			Total Beryllium (Be)	2022/08/27		102	%	75 - 125			
			Total Cadmium (Cd)	2022/08/27		94	%	75 - 125			
			Total Chromium (Cr)	2022/08/27		117	%	75 - 125			
			Total Cobalt (Co)	2022/08/27		92	%	75 - 125			
			Total Copper (Cu)	2022/08/27		92	%	75 - 125			
			Total Lead (Pb)	2022/08/27		115	%	75 - 125			
			Total Mercury (Hg)	2022/08/27		94	%	75 - 125			
			Total Molybdenum (Mo)	2022/08/27		97	%	75 - 125			
			Total Nickel (Ni)	2022/08/27		93	%	75 - 125			
			Total Selenium (Se)	2022/08/27		89	%	75 - 125			
			Total Silver (Ag)	2022/08/27		97	%	75 - 125			
			Total Thallium (Tl)	2022/08/27		95	%	75 - 125			
			Total Tin (Sn)	2022/08/27		98	%	75 - 125			
			Total Uranium (U)	2022/08/27		88	%	75 - 125			
			Total Vanadium (V)	2022/08/27		129 (1)	%	75 - 125			
			A696156	MKJ	QC Standard	Total Zinc (Zn)	2022/08/27		100	%	75 - 125
						Total Antimony (Sb)	2022/08/27		111	%	15 - 182
Total Arsenic (As)	2022/08/27					100	%	53 - 147			
Total Barium (Ba)	2022/08/27					100	%	80 - 119			
Total Cadmium (Cd)	2022/08/27					103	%	72 - 128			
Total Chromium (Cr)	2022/08/27					100	%	59 - 141			
Total Cobalt (Co)	2022/08/27					99	%	58 - 142			
Total Copper (Cu)	2022/08/27					103	%	83 - 117			
Total Lead (Pb)	2022/08/27					112	%	79 - 121			
Total Molybdenum (Mo)	2022/08/27					102	%	67 - 133			
Total Nickel (Ni)	2022/08/27					104	%	79 - 121			
Total Silver (Ag)	2022/08/27					129	%	47 - 153			
Total Tin (Sn)	2022/08/27					105	%	67 - 133			
Total Uranium (U)	2022/08/27					91	%	77 - 123			
Total Vanadium (V)	2022/08/27		103	%	79 - 121						
A696156	MKJ	Spiked Blank	Total Zinc (Zn)	2022/08/27		100	%	79 - 121			
			Total Antimony (Sb)	2022/08/28		96	%	80 - 120			
			Total Arsenic (As)	2022/08/28		92	%	80 - 120			
			Total Barium (Ba)	2022/08/28		94	%	80 - 120			
			Total Beryllium (Be)	2022/08/28		102	%	80 - 120			
			Total Cadmium (Cd)	2022/08/28		94	%	80 - 120			
			Total Chromium (Cr)	2022/08/28		95	%	80 - 120			
			Total Cobalt (Co)	2022/08/28		95	%	80 - 120			
			Total Copper (Cu)	2022/08/28		96	%	80 - 120			
			Total Lead (Pb)	2022/08/28		97	%	80 - 120			
			Total Mercury (Hg)	2022/08/28		109	%	80 - 120			
			Total Molybdenum (Mo)	2022/08/28		98	%	80 - 120			
			Total Nickel (Ni)	2022/08/28		93	%	80 - 120			
			Total Selenium (Se)	2022/08/28		92	%	80 - 120			
Total Silver (Ag)	2022/08/28		98	%	80 - 120						
Total Thallium (Tl)	2022/08/28		98	%	80 - 120						
Total Tin (Sn)	2022/08/28		98	%	80 - 120						
Total Uranium (U)	2022/08/28		96	%	80 - 120						
Total Vanadium (V)	2022/08/28		94	%	80 - 120						



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A696156	MKJ	Method Blank	Total Zinc (Zn)	2022/08/28		91	%	80 - 120
			Total Antimony (Sb)	2022/08/28	<0.50		mg/kg	
			Total Arsenic (As)	2022/08/28	<1.0		mg/kg	
			Total Barium (Ba)	2022/08/28	<1.0		mg/kg	
			Total Beryllium (Be)	2022/08/28	<0.40		mg/kg	
			Total Cadmium (Cd)	2022/08/28	<0.050		mg/kg	
			Total Chromium (Cr)	2022/08/28	<1.0		mg/kg	
			Total Cobalt (Co)	2022/08/28	<0.50		mg/kg	
			Total Copper (Cu)	2022/08/28	<1.0		mg/kg	
			Total Lead (Pb)	2022/08/28	<0.50		mg/kg	
			Total Mercury (Hg)	2022/08/28	<0.050		mg/kg	
			Total Molybdenum (Mo)	2022/08/28	<0.40		mg/kg	
			Total Nickel (Ni)	2022/08/28	<1.0		mg/kg	
			Total Selenium (Se)	2022/08/28	<0.50		mg/kg	
			Total Silver (Ag)	2022/08/28	<0.20		mg/kg	
			Total Thallium (Tl)	2022/08/28	<0.10		mg/kg	
			Total Tin (Sn)	2022/08/28	<1.0		mg/kg	
			Total Uranium (U)	2022/08/28	<0.20		mg/kg	
Total Vanadium (V)	2022/08/28	<1.0		mg/kg				
Total Zinc (Zn)	2022/08/28	<10		mg/kg				
A696156	MKJ	RPD	Total Antimony (Sb)	2022/08/27	NC		%	30
			Total Arsenic (As)	2022/08/27	14		%	30
			Total Barium (Ba)	2022/08/27	14		%	35
			Total Beryllium (Be)	2022/08/27	7.8		%	30
			Total Cadmium (Cd)	2022/08/27	1.5		%	30
			Total Chromium (Cr)	2022/08/27	13		%	30
			Total Cobalt (Co)	2022/08/27	9.2		%	30
			Total Copper (Cu)	2022/08/27	11		%	30
			Total Lead (Pb)	2022/08/27	13		%	35
			Total Mercury (Hg)	2022/08/27	3.6		%	35
			Total Molybdenum (Mo)	2022/08/27	3.5		%	35
			Total Nickel (Ni)	2022/08/27	13		%	30
			Total Selenium (Se)	2022/08/27	NC		%	30
			Total Silver (Ag)	2022/08/27	NC		%	35
			Total Thallium (Tl)	2022/08/27	14		%	30
			Total Tin (Sn)	2022/08/27	NC		%	35
			Total Uranium (U)	2022/08/27	11		%	30
			Total Vanadium (V)	2022/08/27	1.6		%	30
Total Zinc (Zn)	2022/08/27	11		%	30			
A696714	PC5	Matrix Spike	Soluble (Hot water) Boron (B)	2022/08/29		107	%	75 - 125
A696714	PC5	Spiked Blank	Soluble (Hot water) Boron (B)	2022/08/29		101	%	80 - 120
A696714	PC5	Method Blank	Soluble (Hot water) Boron (B)	2022/08/29	<0.10		mg/kg	
A696714	PC5	RPD	Soluble (Hot water) Boron (B)	2022/08/29	14		%	35
A697738	SKM	Matrix Spike	Hex. Chromium (Cr 6+)	2022/08/29		90	%	75 - 125
A697738	SKM	Spiked Blank	Hex. Chromium (Cr 6+)	2022/08/29		100	%	80 - 120
A697738	SKM	Method Blank	Hex. Chromium (Cr 6+)	2022/08/29	<0.080		mg/kg	



BUREAU
VERITAS

Bureau Veritas Job #: C262020
Report Date: 2022/10/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC									
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
A697738	SKM	RPD	Hex. Chromium (Cr 6+)	2022/08/29	NC		%	35	
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>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)</p> <p>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).</p> <p>(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.</p>									



VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Chantal Vincent, Customer Solutions Representative

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

Gita Pokhrel, Laboratory Supervisor

Sandy Yuan, M.Sc., QP, Scientific Specialist

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

CHAIN OF CUSTODY RECORD
ENV COC - 00013V3

Choose Location:
 Calgary, AB: 4000 19th St. NE, T2E 6P8 Toll Free (800) 386-7247
 Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
 Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208



Invoice to (requires report) **Report Information (if differs from invoice)**

Company: Client #254, Golder Associates
Contact Name: 237 - 4 Ave SW Suite 3300
Address: Calgary, AB, Postal Code: [blank]
City: Calgary, Prov: AB, Postal Code: [blank]
Phone: [blank]
Email: Canada Account Payable
Copies: [blank]

Company: Golder Associates
Contact Name: Aurelie Bellavance
Address: Calgary, AB, Postal Code: [blank]
City: Calgary, Prov: AB, Postal Code: [blank]
Phone: 403-299-5600
Email: aurelie.bellavance@wsp.com
Copies: Peter, Tan for w's p.coin

Project Information
Quotation #: Shell
P.O. # / AFE#: 22525414-100-1104
Project #: 22525414-1000
Site #: NA
Site Location: WEST-CHARMEL, NT
Province: NT
Sampled by: Sheaphiel / S Pascal

Regulatory Criteria

AT1 CCME Drinking Water - Canada Drinking Water - Manitoba
 Saskatchewan Drinking Water - Alberta Other **AMSRP**

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

Sample Identification	Date Sampled			Time (24hr)			Matrix
	YY	MM	DD	HH	MM	SS	
1 MW 22-22-01	2022	08	12	11	30		Soil
2 MW 22-22-02				11	45		
3 MW 22-22-03				12	00		
4 Deep K				12	00		
5 MW 22-22-04				12	15		
6 MW 22-22-05				12	30		
7 BH 22-21-01				12	45		
8 BH 22-21-02				12	50		
9 BH 22-21-03				13	15		
10 BH 22-21-04				13	30		
11							
12							

UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVMA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY.

LAB USE ONLY

Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Temperature reading by: [blank] °C

Received by: (Signature/Print) **ACTR**

Received by: (Signature/Print) **JASON SIK**

Date: 2022 05 14 09 15

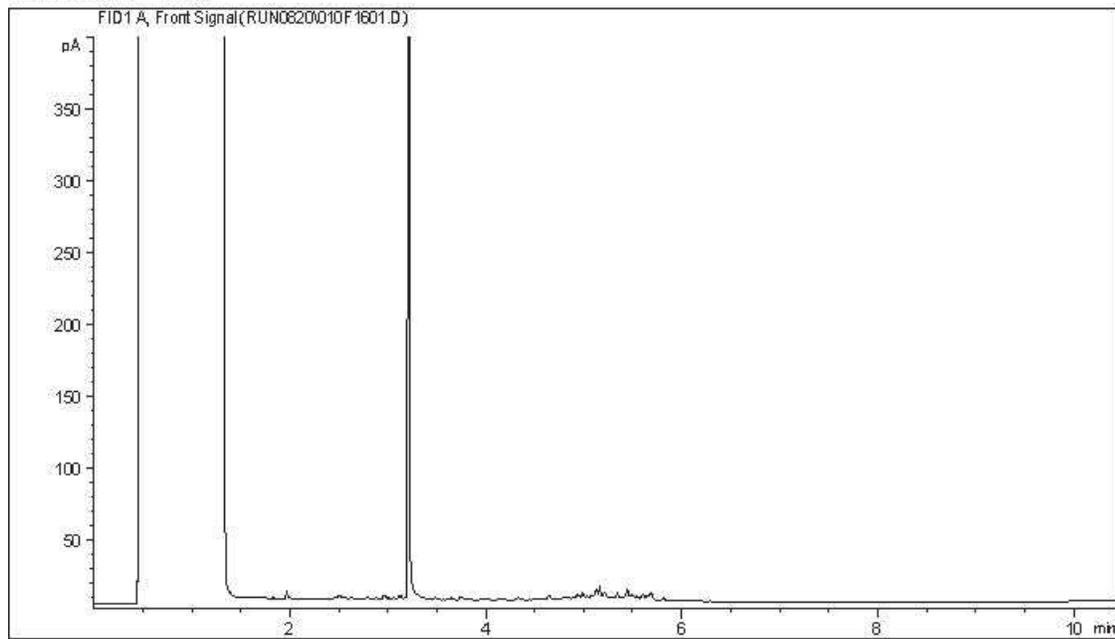
Date: 2022 08 18 15 10

Time: HH MM

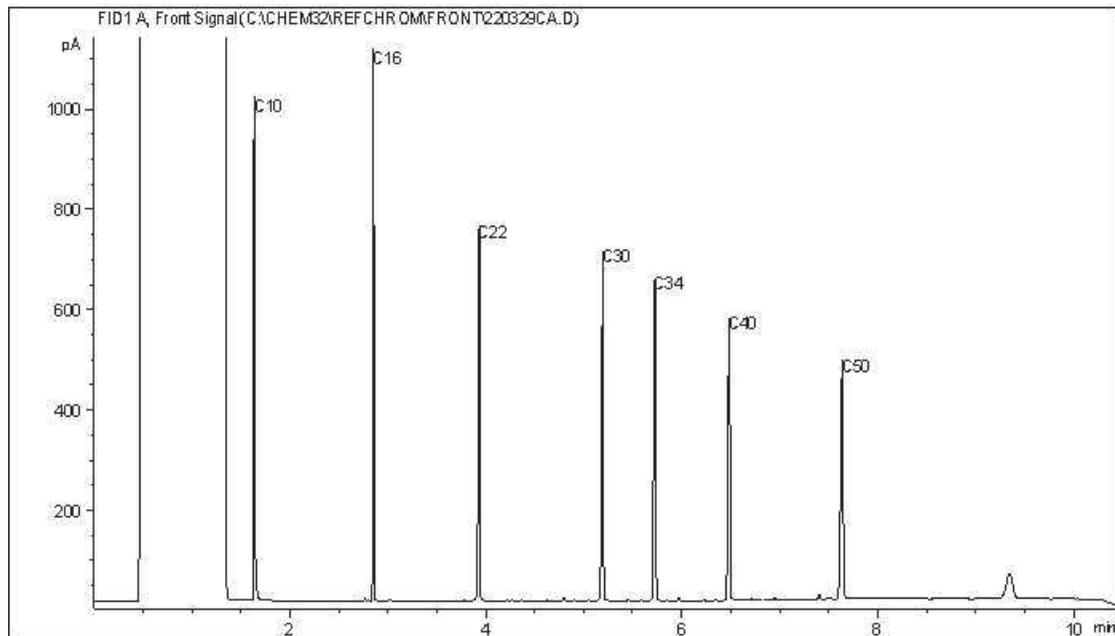
Special Instructions: **C262020**

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



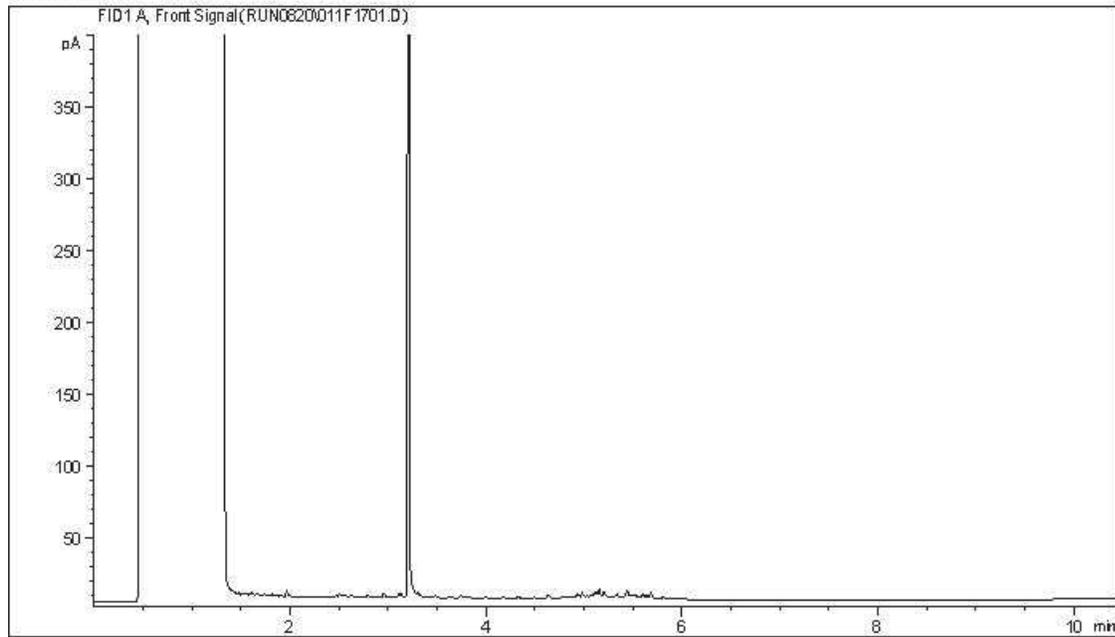
TYPICAL PRODUCT CARBON NUMBER RANGES

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

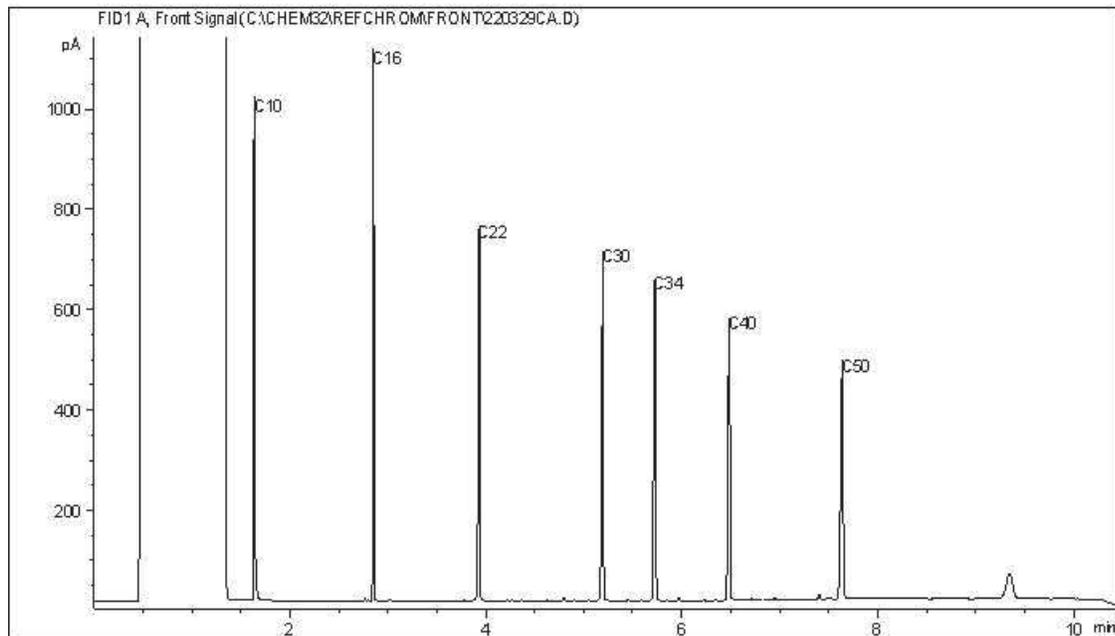
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



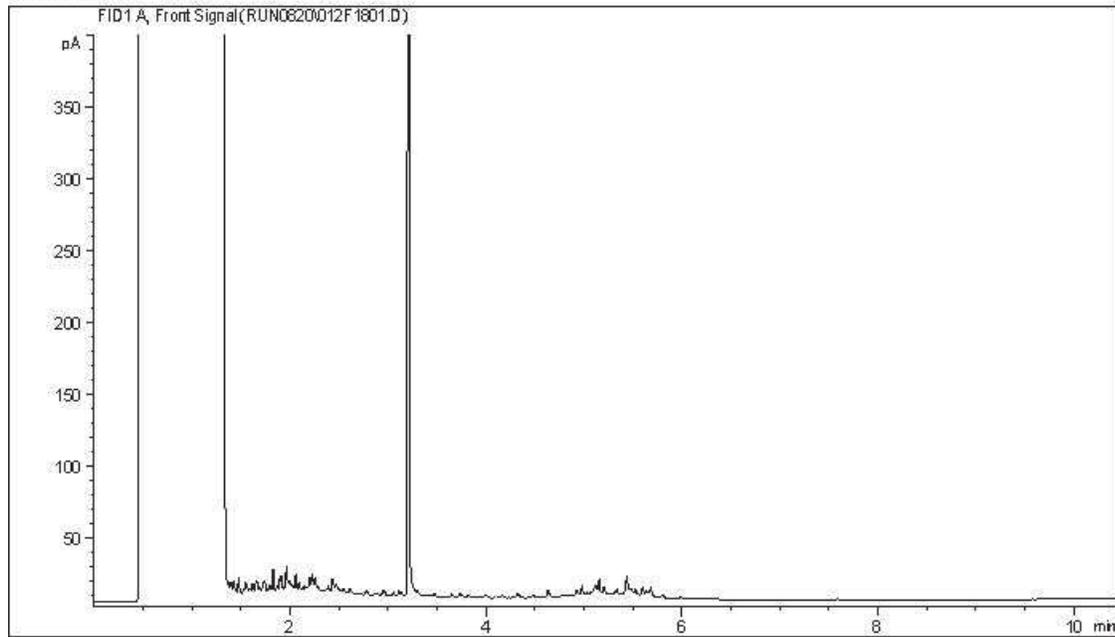
TYPICAL PRODUCT CARBON NUMBER RANGES

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

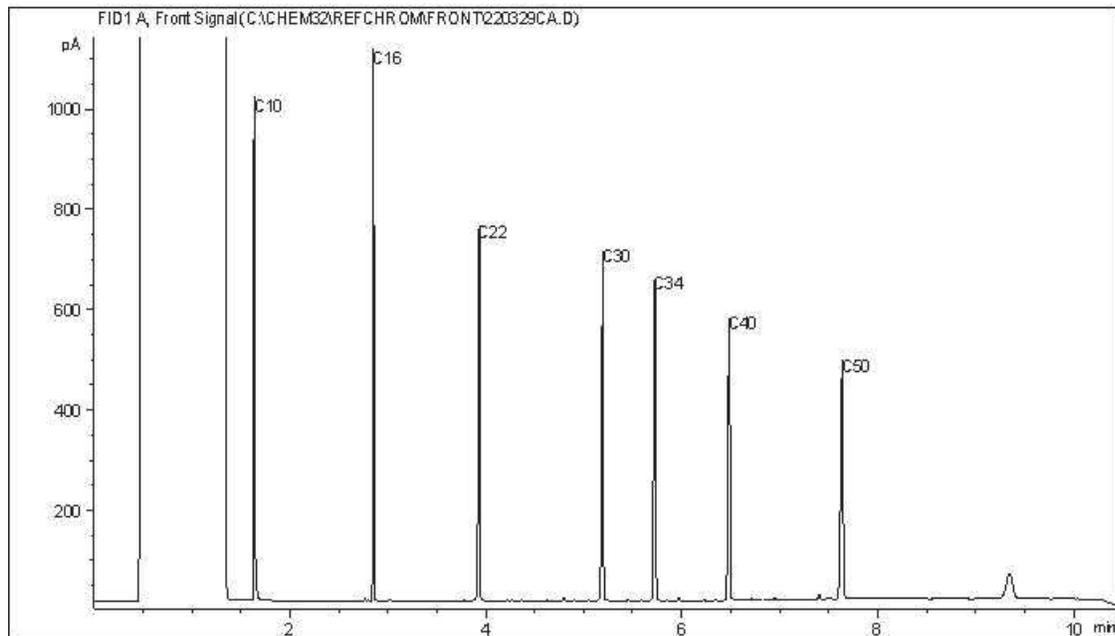
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



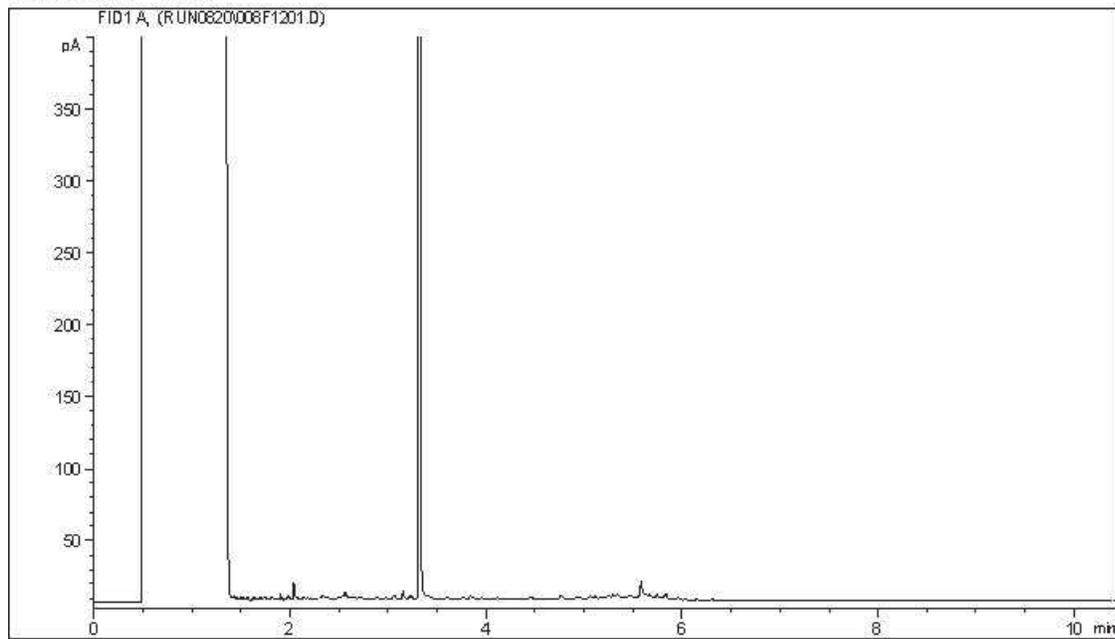
TYPICAL PRODUCT CARBON NUMBER RANGES

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

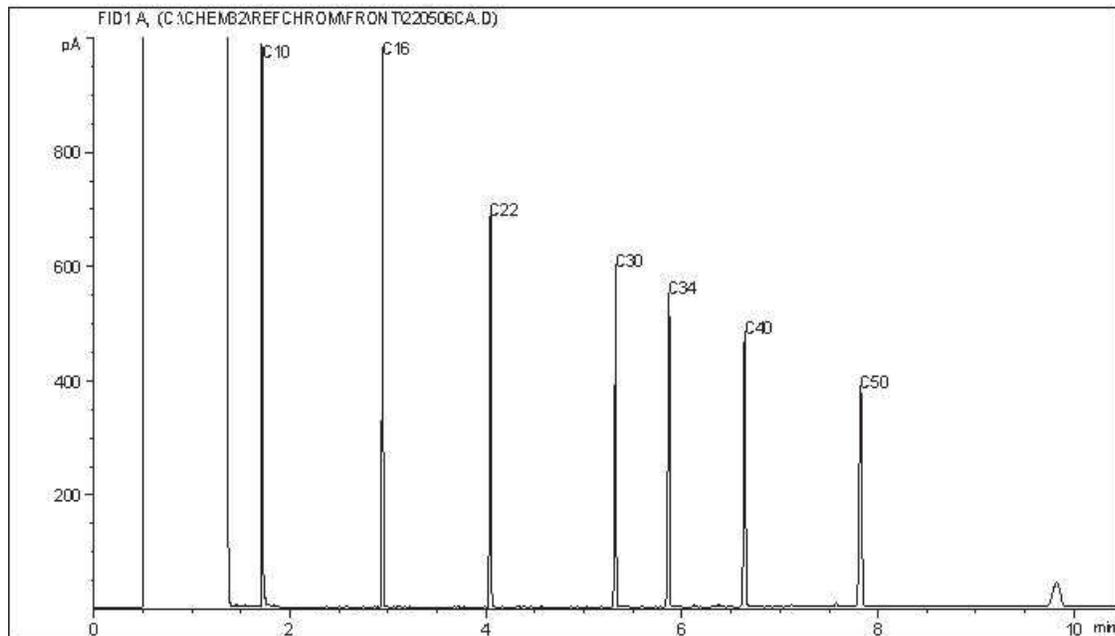
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



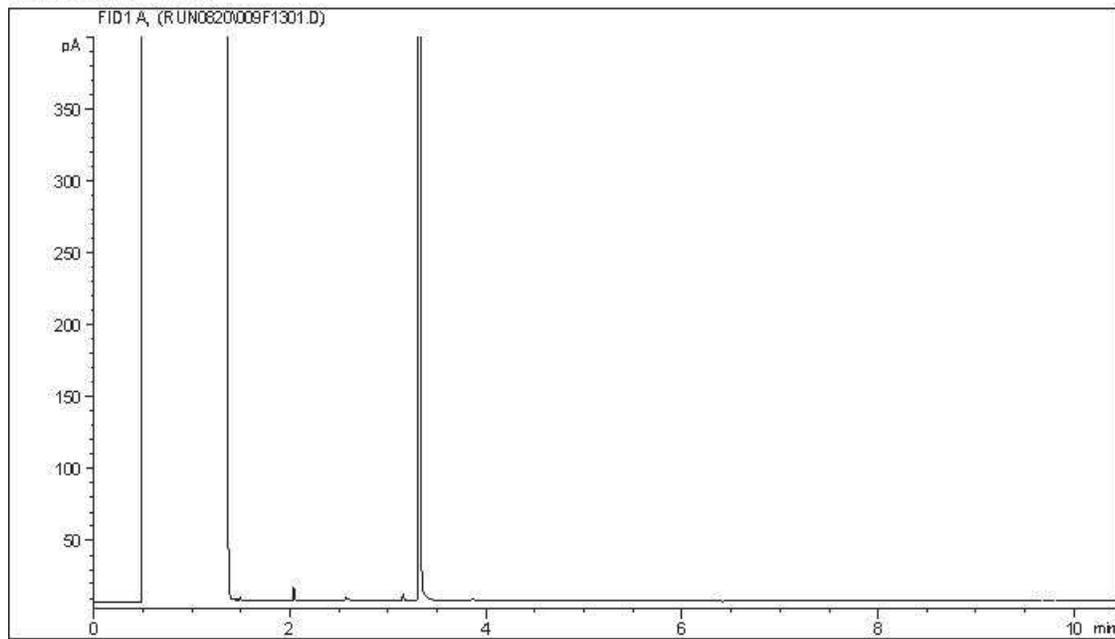
TYPICAL PRODUCT CARBON NUMBER RANGES

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

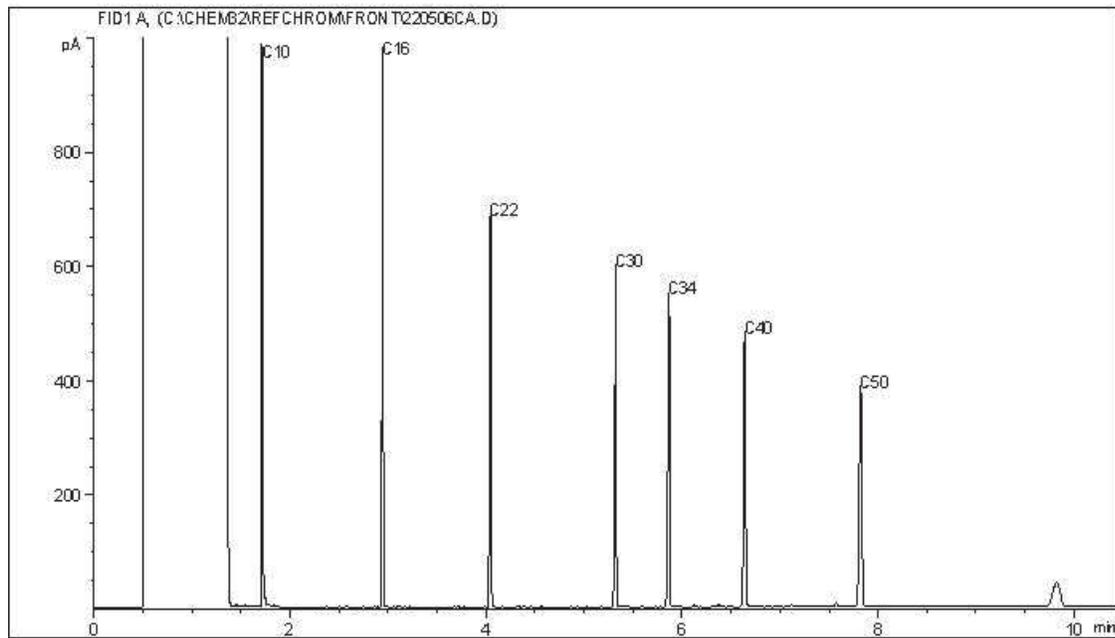
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



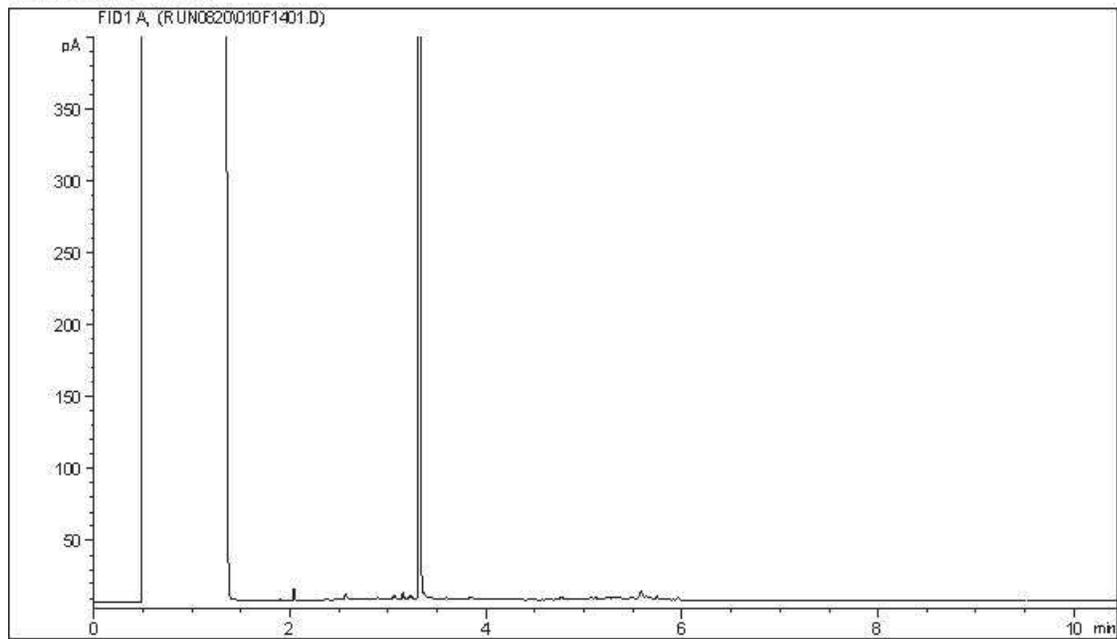
TYPICAL PRODUCT CARBON NUMBER RANGES

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

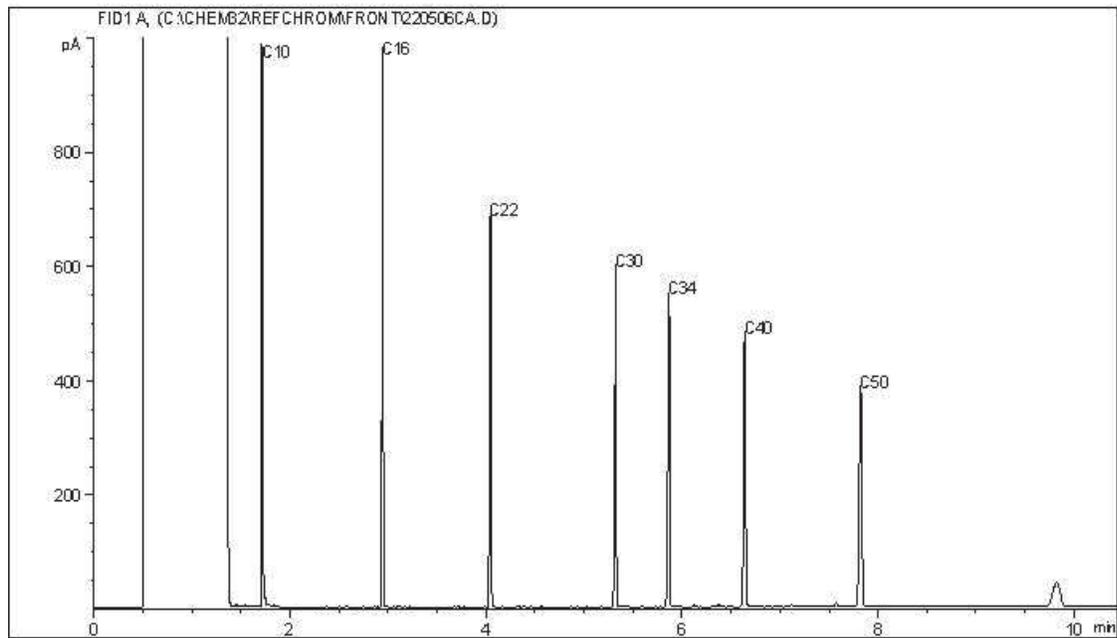
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



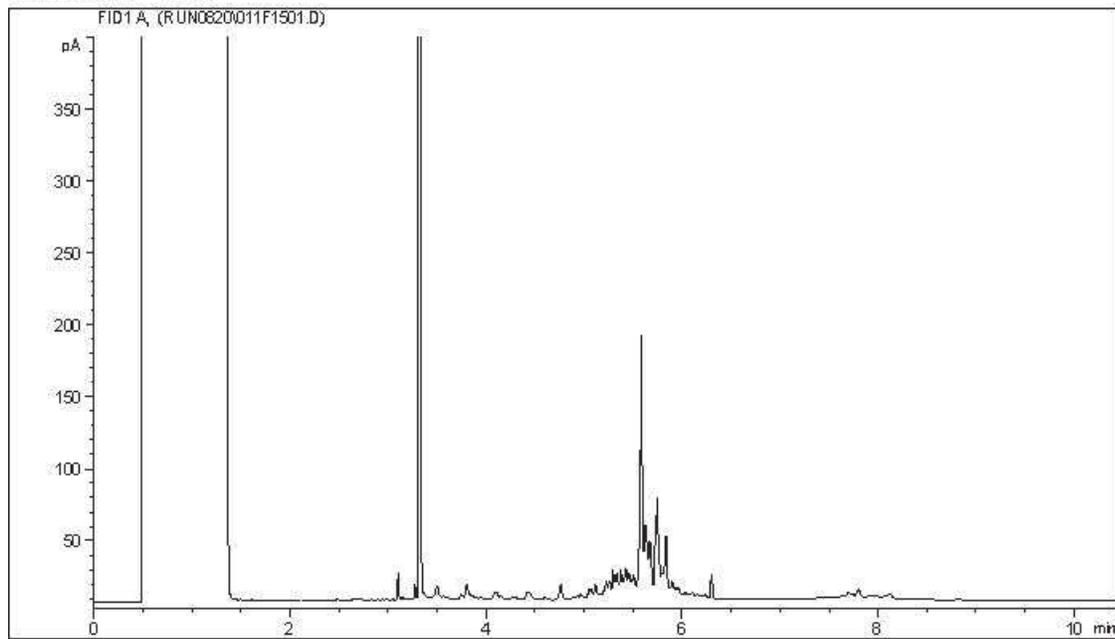
TYPICAL PRODUCT CARBON NUMBER RANGES

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

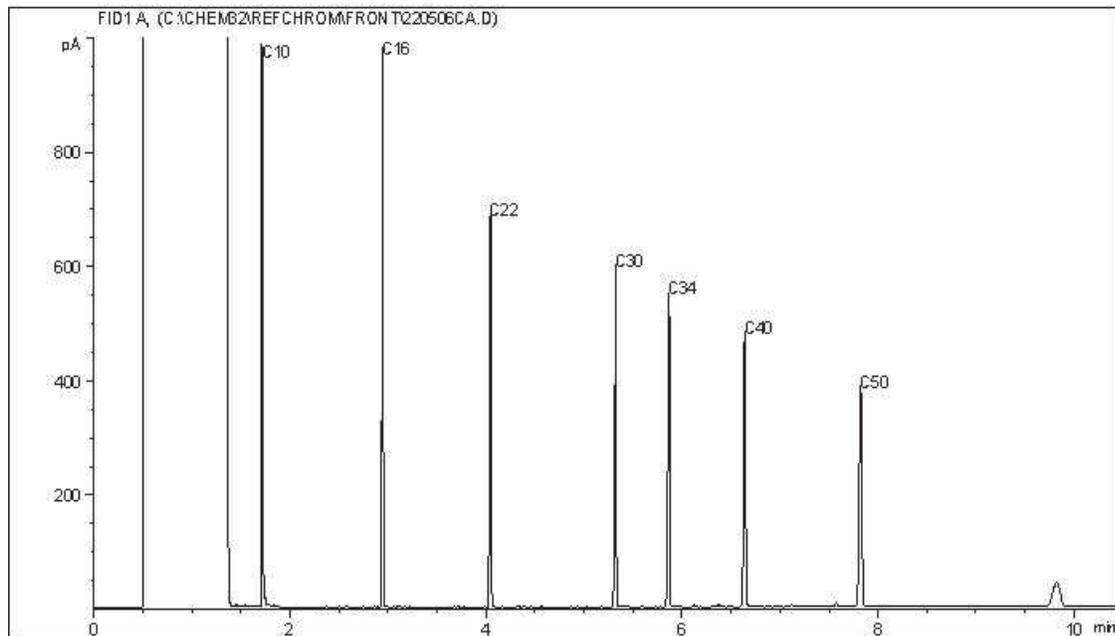
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



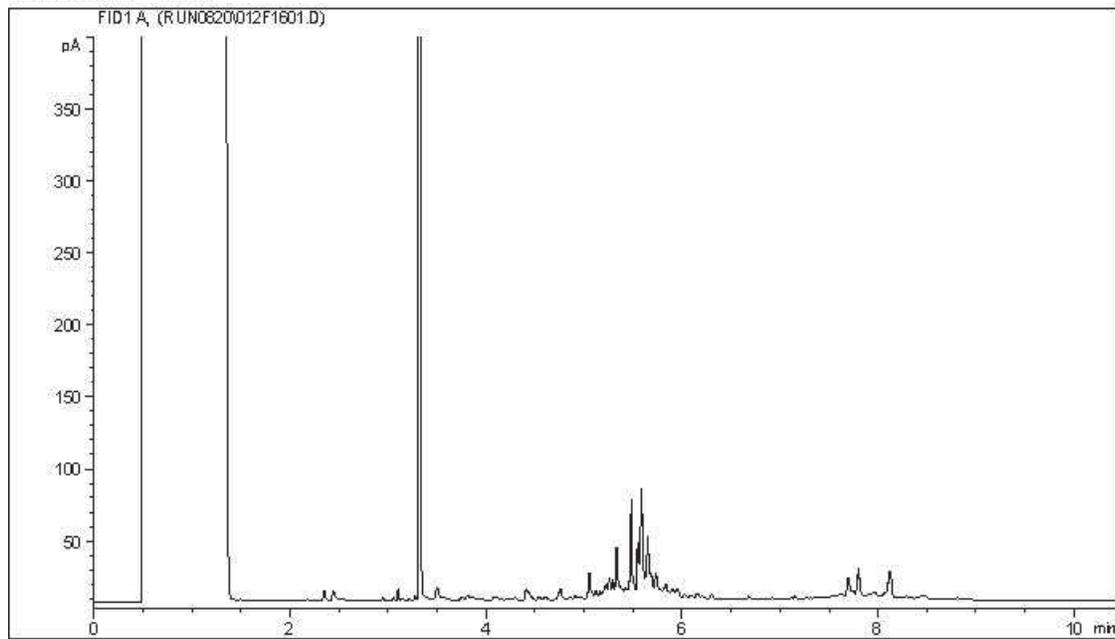
TYPICAL PRODUCT CARBON NUMBER RANGES

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

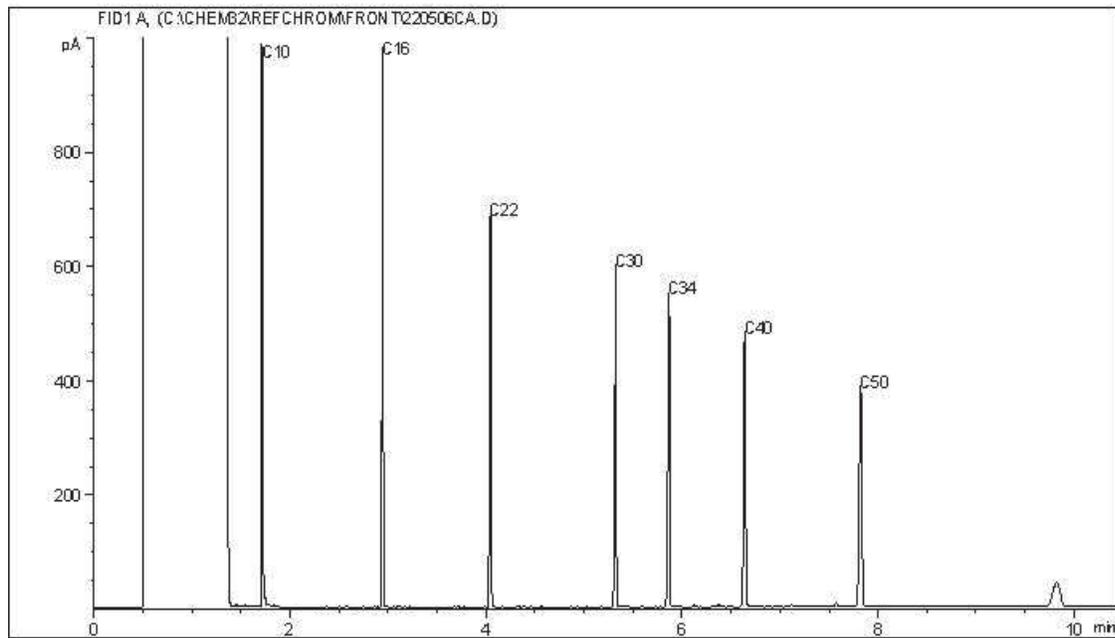
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



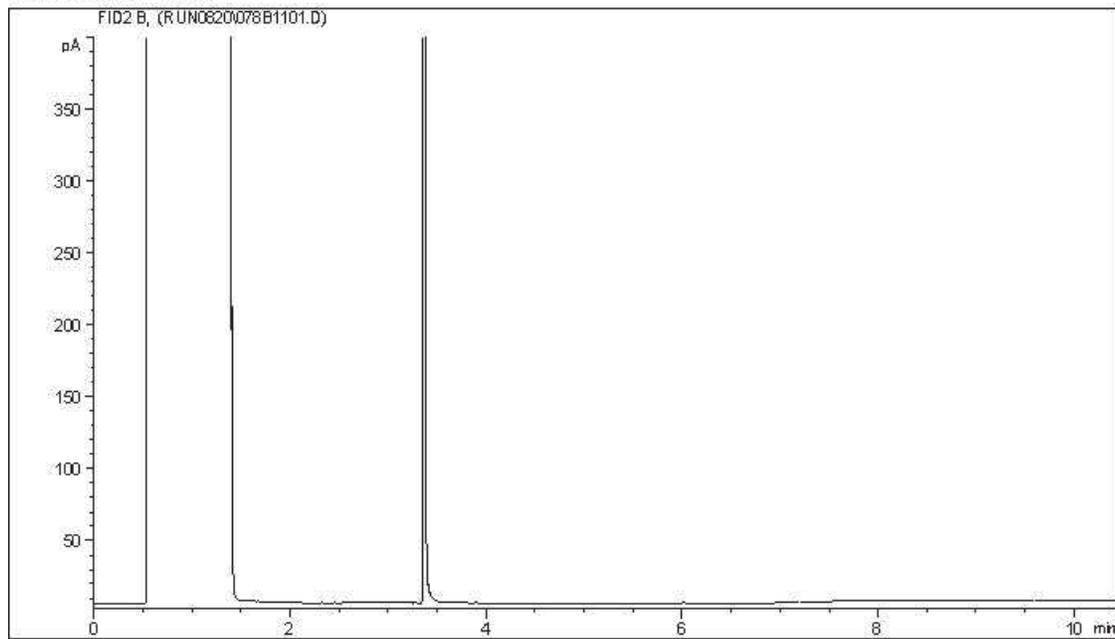
TYPICAL PRODUCT CARBON NUMBER RANGES

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

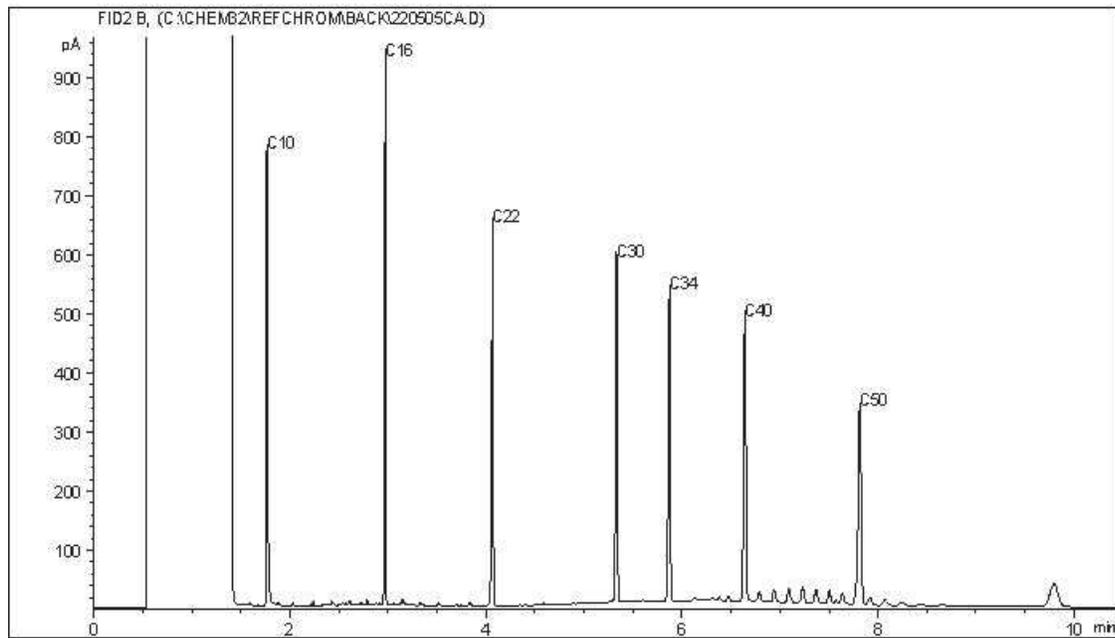
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



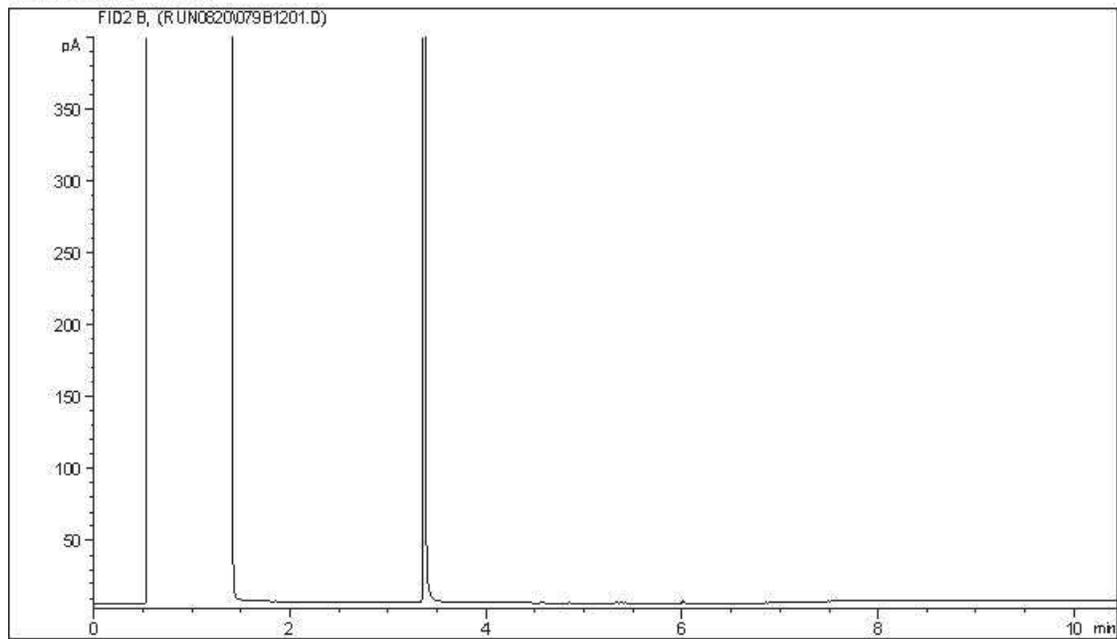
TYPICAL PRODUCT CARBON NUMBER RANGES

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

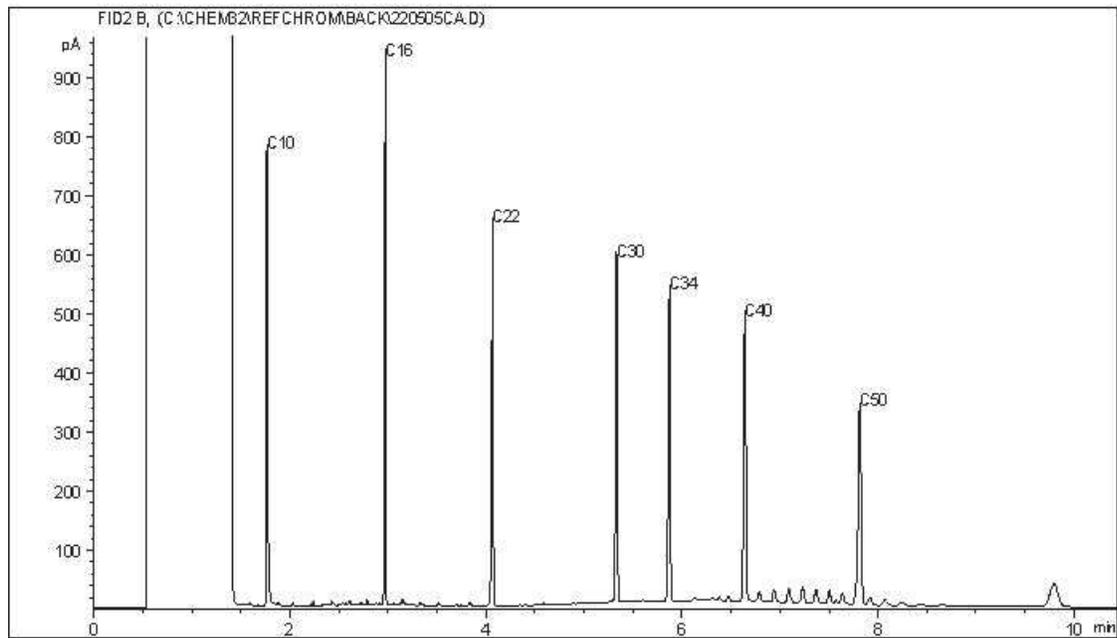
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



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.

Report Transmission Cover Page

Bill To: Bureau Veritas Canada (2019) 4606 Canada Way Burnaby, BC, Canada V5G 1K5	Project ID: C262020 Project Name: Project Location: LSD: P.O.:	Lot ID: 1602767 Control Number: Date Received: Sep 29, 2022 Date Reported: Oct 11, 2022 Report Number: 2793127
Attn: Cynny Hagen Sampled By: JP Company:	Proj. Acct. code:	

Contact	Company	Address
Accounts Payable	Bureau Veritas Canada (2019) Inc.	#500 1919 Minnesota Court Mississauga, ON L5N 0C9 Phone: (866) 611-1118 Fax: (905) 288-2169 Email: AP.865.INV.SUBMIT@bureauveritas.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Deliverables	PDF	COC / Invoice
Customer Solutions	Bureau Veritas Canada (2019) Inc.	4606 Canada Way Burnaby, BC V5G 1K5 Phone: (604) 734-7276 Fax: (604) 731-2386 Email: customersolutionswest@bvlab.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	Legacy Crosstab in CSV	Test Report
Email - Single Deliverable	PDF	COA
Cynny Hagen	Bureau Veritas Canada (2019) Inc.	4606 Canada Way Burnaby, BC V5G 1K5 Phone: (604) 734-7276 Fax: (604) 731-2386 Email: cynny.hagen@bureauveritas.com
<u>Delivery</u>	<u>Format</u>	<u>Deliverables</u>
Email - Merge Deliverables	PDF	COC / Test Report
Email - Single Deliverable	PDF	COA

Notes To Clients:

The information contained on this and all other pages transmitted, is intended for the addressee only and is considered confidential. If the reader is not the intended recipient, you are hereby notified that any use, dissemination, distribution or copy of this transmission is strictly prohibited. If you receive this transmission by error, or if this transmission is not satisfactory, please notify us by telephone.

Analytical Report

Bill To: Bureau Veritas Canada (2019) 4606 Canada Way Burnaby, BC, Canada V5G 1K5	Project ID: C262020 Project Name: Project Location: LSD: P.O.:	Lot ID: 1602767 Control Number: Date Received: Sep 29, 2022 Date Reported: Oct 11, 2022 Report Number: 2793127
Attn: Cynny Hagen Sampled By: JP Company:	Proj. Acct. code:	

Reference Number 1602767-1
Sample Date Aug 12, 2022
Sample Time 12:45
Sample Location
Sample Description AZY134-BH22-21-01

Matrix Soil

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Barite Soil Analysis					
Barium	Fusion	mg/kg	1130		40

Approved by: 
Benjamin Morris, B.Sc
Operations Manager

Methodology and Notes

Bill To: Bureau Veritas Canada (2019) 4606 Canada Way Burnaby, BC, Canada V5G 1K5	Project ID: C262020	Lot ID: 1602767
Attn: Cynny Hagen	Project Name:	Control Number:
Sampled By: JP	Project Location:	Date Received: Sep 29, 2022
Company:	LSD:	Date Reported: Oct 11, 2022
	P.O.:	Report Number: 2793127
	Proj. Acct. code:	

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Barium (Fusion) in soil	ASTM	* Standard Practice for Dissolution of Solid Waste by Lithium Metaborate Fusion, 2008., D 4503-08 <i>* Reference Method Modified</i>	Oct 8, 2022	Element Edmonton - Roper Road

References

ASTM Annual Book of ASTM Standards

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



Sent To: Element Materials Tech Canada
 7217 Roper Rd.
 Edmonton, AB, T6B 3J4
 Tel: (780) 438-5522

CHAIN OF CUSTODY RECORD FOR SUBCONTRACTED WORK

COC # C262020-EEXO-01-01

REPORT INFORMATION								ANALYSIS REQUESTED								ADDITIONAL SAMPLE INFORMATION
Company: Bureau Veritas								Barium on ICP using Fusion Extraction								
Address: 4000 19st N.E, Calgary, Alberta, T2E 6P8																
Contact Name: Cynny Hagen																
Email: Cynny.HAGEN@bureauveritas.com, Customersolutionswest@bureauveritas.com																
Phone: (403) 735-2273																
Lab Project #: C262020																
#	SAMPLE ID	MATRIX	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	SAMPLER INITIALS	# CONT.										
1	AZY134-BH22-21-01	SOIL	2022/08/12	12:45	JP	1	X									
2																
3																
4																
5																
6																
7																
8																
9																
10																
REGULATORY CRITERIA								SPECIAL INSTRUCTIONS								TURNAROUND TIME
								Please inform Bureau Veritas immediately, ... • You are not accredited for the requested test(s) • The hold time is approaching for the requested test(s). **Please return a copy of this form with the report.**								<input type="checkbox"/> Rush Required 2022/10/07 Date Required <i>Please inform us if rush charges will be incurred.</i>
COOLER ID:				COOLER ID:				COOLER ID:								
Custody Seal Present	YES	NO	Temp: (°C)	Custody Seal Present	YES	NO	Temp: (°C)	Custody Seal Present	YES	NO	Temp: (°C)					
Custody Seal Intact				Custody Seal Intact				Custody Seal Intact			12.5					
Cooling Media Present				Cooling Media Present				Cooling Media Present								
RELINQUISHED BY: (SIGN & PRINT)				DATE: (YYYY/MM/DD)		TIME: (HH:MM)		RECEIVED BY: (SIGN & PRINT)				DATE: (YYYY/MM/DD)		TIME: (HH:MM)		
1. <i>Nick Batty</i> Nick Batty				2022/04/28		20:00		1. <i>[Signature]</i>				2022/09/29		5:14		
2.								2.								

Lot: 1602767 COC



SEP 29 AM 5:46

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 12, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C262020

Was the Cooler Received at the lab under a sealed and intact custody seal?	<u>Yes</u>
Was proper chain of custody of the samples documented and kept?	<u>Yes</u>
Were sample temperatures acceptable when they reached lab?:	<u>Yes</u>
Were all samples analyzed and extracted within hold times?:	<u>Yes</u>
Has lab warranted all tests were in statistical control in CoA?:	<u>Yes</u>
Was sufficient sample provided for the requested analysis?	<u>Yes</u>
Has lab warranted all samples were analyzed with limited headspace present?:	<u>Yes</u>

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	X			All remaining laboratory QC results are within acceptance criteria, please see QA/QC appendix.
Method Blank Concentration	X			
Laboratory Duplicate RPD		X		
Matrix Spike Recovery		X		
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	Samples MW22-22-03 and DUP K exceed the alert limits for 1-methylnaphthalene (120%), 2-methylnaphthalene (119%) and naphthalene (111%).
Trip Blank Concentration			X	
Field Duplicate RPD		X		

Is data considered reliable (Yes/No/Suspect)?:

Suspect

If answer is "No" or "Suspect", describe and provide rationale: Please see QA/QC appendix for details

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 22, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAIRWELL
 Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2023/01/12
 Report #: R3287446
 Version: 7 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262029

Received: 2022/08/17, 12:45

Sample Matrix: Soil
 # Samples Received: 12

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 3)	12	N/A	2022/08/20	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	12	N/A	2022/08/20		Auto Calc
Toluene (13C/12C) CSIA (2)	2	N/A	2022/10/19		
Toluene (13C/12C) CSIA (1)	1	N/A	2023/01/10		See Attachment
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	2	2022/08/19	2022/08/19	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	9	2022/08/19	2022/08/20	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	1	2022/08/20	2022/08/20	AB SOP-00036	CCME PHC-CWS m
CCME Hydrocarbons (F4G in soil) (1, 4)	3	2022/08/19	2022/08/22	AB SOP-00036 AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons (F4G in soil) (1, 4)	2	2022/09/20	2022/08/22	AB SOP-00036 AB SOP-00040	CCME PHC-CWS m
Moisture (1)	4	N/A	2022/08/19	AB SOP-00002	CCME PHC-CWS m
Moisture (1)	8	N/A	2022/08/20	AB SOP-00002	CCME PHC-CWS m

Remarks:

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

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

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2023/01/12
Report #: R3287446
Version: 7 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262029

Received: 2022/08/17, 12:45

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

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

- (1) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
- (2) This test was performed by Microbial insights c/o EBPI, 735 Griffith Court , Burlington, ON, L7L 5R9
- (3) No lab extraction date is given for F1BTX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
- (4) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Brody Andersen
Program Specialist-Emergency Spill
Response
12 Jan 2023 14:39:07

Please direct all questions regarding this Certificate of Analysis to:
Cynny Hagen, Key Account Soecialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.



AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY173	AZY173		AZY174			AZY175		
Sampling Date		2022/08/13 08:00	2022/08/13 08:00		2022/08/13 08:15			2022/08/13 08:30		
COC Number		1 of 1	1 of 1		1 of 1			1 of 1		
	UNITS	MW 22-09-01	MW 22-09-01 Lab-Dup	RDL	MW 22-09-02	RDL	QC Batch	MW 22-09-03	RDL	QC Batch

Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	180 (1)	130	22	120	10	A687951	15	10	A687729
F3 (C16-C34 Hydrocarbons)	mg/kg	2300 (2)	1500 (3)	110	1500	50	A687951	170	50	A687729
F4 (C34-C50 Hydrocarbons)	mg/kg	690 (1)	530	110	410	50	A687951	<50	50	A687729
Reached Baseline at C50	mg/kg	No	No	N/A	No	N/A	A687951	Yes	N/A	A687729
Physical Properties										
Moisture	%	55	N/A	0.30	43	0.30	A688093	19	0.30	A688093
Volatiles										
Xylenes (Total)	mg/kg	<0.13	N/A	0.13	<0.13	0.13	A686814	<0.045	0.045	A686814
F1 (C6-C10) - BTEX	mg/kg	<24	N/A	24	<24	24	A686814	<10	10	A686814
Field Preserved Volatiles										
Benzene	mg/kg	<0.015 (4)	N/A	0.015	<0.014 (4)	0.014	A687767	<0.0050	0.0050	A687767
Toluene	mg/kg	0.85 (4)	N/A	0.15	1.3 (4)	0.14	A687767	<0.050	0.050	A687767
Ethylbenzene	mg/kg	<0.030 (4)	N/A	0.030	<0.028 (4)	0.028	A687767	<0.010	0.010	A687767
m & p-Xylene	mg/kg	<0.12 (4)	N/A	0.12	<0.11 (4)	0.11	A687767	<0.040	0.040	A687767
o-Xylene	mg/kg	<0.059 (4)	N/A	0.059	<0.056 (4)	0.056	A687767	<0.020	0.020	A687767
F1 (C6-C10)	mg/kg	<24 (5)	N/A	24	<24 (5)	24	A687767	<10	10	A687767
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	96	N/A	N/A	97	N/A	A687767	96	N/A	A687767
4-Bromofluorobenzene (sur.)	%	110	N/A	N/A	109	N/A	A687767	111	N/A	A687767
D10-o-Xylene (sur.)	%	87	N/A	N/A	92	N/A	A687767	96	N/A	A687767
D4-1,2-Dichloroethane (sur.)	%	88	N/A	N/A	94	N/A	A687767	92	N/A	A687767

RDL = Reportable Detection Limit
 Lab-Dup = Laboratory Initiated Duplicate
 N/A = Not Applicable
 (1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
 (2) Detection limits raised due to high moisture content, sample contains => 50% moisture.
 Duplicate exceeds acceptance criteria due to sample non homogeneity.
 (3) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
 (4) Detection limits raised based on sample weight used for analysis.
 (5) Detection limits raised based on MDL and sample weight used for analysis.



AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY173	AZY173		AZY174			AZY175		
Sampling Date		2022/08/13 08:00	2022/08/13 08:00		2022/08/13 08:15			2022/08/13 08:30		
COC Number		1 of 1	1 of 1		1 of 1			1 of 1		
	UNITS	MW 22-09-01	MW 22-09-01 Lab-Dup	RDL	MW 22-09-02	RDL	QC Batch	MW 22-09-03	RDL	QC Batch
O-TERPHENYL (sur.)	%	126	101	N/A	97	N/A	A687951	110	N/A	A687729

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



BUREAU
VERITAS

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY176			AZY177			AZY178			AZY179		
Sampling Date		2022/08/13 08:45			2022/08/13 08:45			2022/08/13 09:00			2022/08/13 09:15		
COC Number		1 of 1			1 of 1			1 of 1			1 of 1		
	UNITS	BH22-49-01	RDL	QC Batch	DUP M	RDL	BH22-49-02	RDL	QC Batch	BH22-49-03	RDL	QC Batch	

Ext. Pet. Hydrocarbon												
F2 (C10-C16 Hydrocarbons)	mg/kg	930 (1)	28	A687951	190 (1)	29	21	10	A687729	<10	10	A687951
F3 (C16-C34 Hydrocarbons)	mg/kg	8700 (1)	140	A687951	2800 (1)	140	660	50	A687729	<50	50	A687951
F4 (C34-C50 Hydrocarbons)	mg/kg	2700 (1)	140	A687951	1100 (1)	140	230	50	A687729	<50	50	A687951
Reached Baseline at C50	mg/kg	No	N/A	A687951	No	N/A	Yes	N/A	A687729	Yes	N/A	A687951

Physical Properties												
Moisture	%	64	0.30	A688093	65	0.30	40	0.30	A688047	19	0.30	A688093

Volatiles												
Xylenes (Total)	mg/kg	<0.21	0.21	A686814	1.2	0.20	<0.098	0.098	A686814	<0.045	0.045	A686814
F1 (C6-C10) - BTEX	mg/kg	<24	24	A686814	<44	44	<22	22	A686814	<10	10	A686814

Field Preserved Volatiles												
Benzene	mg/kg	<0.023 (2)	0.023	A687767	0.060 (2)	0.022	0.012 (2)	0.011	A687767	0.010	0.0050	A687767
Toluene	mg/kg	0.36 (2)	0.23	A687767	48 (2)	0.22	8.2 (2)	0.11	A687767	0.088	0.050	A687767
Ethylbenzene	mg/kg	<0.047 (2)	0.047	A687767	0.27 (2)	0.044	<0.022 (2)	0.022	A687767	<0.010	0.010	A687767
m & p-Xylene	mg/kg	<0.19 (2)	0.19	A687767	0.87 (2)	0.18	<0.088 (2)	0.088	A687767	<0.040	0.040	A687767
o-Xylene	mg/kg	<0.093 (2)	0.093	A687767	0.30 (2)	0.088	<0.044 (2)	0.044	A687767	<0.020	0.020	A687767
F1 (C6-C10)	mg/kg	<24 (3)	24	A687767	67 (2)	44	<22 (2)	22	A687767	<10	10	A687767

Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	98	N/A	A687767	97	N/A	96	N/A	A687767	98	N/A	A687767
4-Bromofluorobenzene (sur.)	%	108	N/A	A687767	109	N/A	107	N/A	A687767	109	N/A	A687767
D10-o-Xylene (sur.)	%	92	N/A	A687767	94	N/A	98	N/A	A687767	96	N/A	A687767
D4-1,2-Dichloroethane (sur.)	%	94	N/A	A687767	94	N/A	94	N/A	A687767	93	N/A	A687767
O-TERPHENYL (sur.)	%	108	N/A	A687951	140	N/A	117	N/A	A687729	109	N/A	A687951

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits raised based on sample weight used for analysis.
(3) Detection limits raised based on MDL and sample weight used for analysis.



BUREAU
VERITAS

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY180	AZY181			AZY182			AZY183		
Sampling Date		2022/08/13 09:30	2022/08/13 09:45			2022/08/13 10:00			2022/08/13 10:15		
COC Number		1 of 1	1 of 1			1 of 1			1 of 1		
	UNITS	BH22-11-01	BH22-11-02	RDL	QC Batch	BH22-47-01	RDL	QC Batch	BH22-10-01	RDL	QC Batch

Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/kg	6400	13	10	A687951	380 (1)	48	A687729	76 (1)	26	A687729
F3 (C16-C34 Hydrocarbons)	mg/kg	520	<50	50	A687951	8300 (1)	240	A687729	780 (1)	130	A687729
F4 (C34-C50 Hydrocarbons)	mg/kg	140	<50	50	A687951	3200 (1)	240	A687729	380 (1)	130	A687729
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	A687951	No	N/A	A687729	Yes	N/A	A687729

Physical Properties											
Moisture	%	10	20	0.30	A688093	79	0.30	A688047	62	0.30	A688091

Volatiles											
Xylenes (Total)	mg/kg	0.12	0.47	0.045	A686814	<0.51	0.51	A686814	<0.37	0.37	A686814
F1 (C6-C10) - BTEX	mg/kg	110	86	10	A686814	<30	30	A686814	<24	24	A686814

Field Preserved Volatiles											
Benzene	mg/kg	<0.0050	0.024	0.0050	A687767	<0.057 (2)	0.057	A687767	<0.041 (2)	0.041	A687767
Toluene	mg/kg	<0.050	<0.050	0.050	A687767	13 (2)	0.57	A687767	<0.080 (3)	0.080	A687767
Ethylbenzene	mg/kg	0.016	0.12	0.010	A687767	<0.040 (3)	0.040	A687767	<0.030 (3)	0.030	A687767
m & p-Xylene	mg/kg	0.054	0.39	0.040	A687767	<0.45 (2)	0.45	A687767	<0.33 (2)	0.33	A687767
o-Xylene	mg/kg	0.063	0.082	0.020	A687767	<0.23 (2)	0.23	A687767	<0.16 (2)	0.16	A687767
F1 (C6-C10)	mg/kg	110	87	10	A687767	<30 (3)	30	A687767	<24 (3)	24	A687767

Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	99	96	N/A	A687767	95	N/A	A687767	94	N/A	A687767
4-Bromofluorobenzene (sur.)	%	109	108	N/A	A687767	112	N/A	A687767	110	N/A	A687767
D10-o-Xylene (sur.)	%	108	83	N/A	A687767	87	N/A	A687767	91	N/A	A687767
D4-1,2-Dichloroethane (sur.)	%	96	95	N/A	A687767	95	N/A	A687767	95	N/A	A687767
O-TERPHENYL (sur.)	%	84	107	N/A	A687951	123	N/A	A687729	111	N/A	A687729

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits raised based on sample weight used for analysis.
(3) Detection limits raised based on MDL and sample weight used for analysis.



AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY184		
Sampling Date		2022/08/13 10:30		
COC Number		1 of 1		
	UNITS	BH22-48-01	RDL	QC Batch

Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/kg	140 (1)	39	A687729
F3 (C16-C34 Hydrocarbons)	mg/kg	2300 (1)	190	A687729
F4 (C34-C50 Hydrocarbons)	mg/kg	990 (1)	190	A687729
Reached Baseline at C50	mg/kg	Yes	N/A	A687729

Physical Properties				
Moisture	%	74	0.30	A688047

Volatiles				
Xylenes (Total)	mg/kg	<0.24	0.24	A686814
F1 (C6-C10) - BTEX	mg/kg	<24	24	A686814

Field Preserved Volatiles				
Benzene	mg/kg	<0.026 (2)	0.026	A687767
Toluene	mg/kg	<0.080 (3)	0.080	A687767
Ethylbenzene	mg/kg	<0.030 (3)	0.030	A687767
m & p-Xylene	mg/kg	<0.21 (2)	0.21	A687767
o-Xylene	mg/kg	<0.11 (2)	0.11	A687767
F1 (C6-C10)	mg/kg	<24 (3)	24	A687767

Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	98	N/A	A687767
4-Bromofluorobenzene (sur.)	%	109	N/A	A687767
D10-o-Xylene (sur.)	%	94	N/A	A687767
D4-1,2-Dichloroethane (sur.)	%	95	N/A	A687767
O-TERPHENYL (sur.)	%	136	N/A	A687729

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.
(2) Detection limits raised based on sample weight used for analysis.
(3) Detection limits raised based on MDL and sample weight used for analysis.



**BUREAU
VERITAS**

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		AZY173	AZY174		AZY178	
Sampling Date		2022/08/13 08:00	2022/08/13 08:15		2022/08/13 09:00	
COC Number		1 of 1	1 of 1		1 of 1	
	UNITS	MW 22-09-01	MW 22-09-02	QC Batch	BH22-49-02	QC Batch
Parameter						
Subcontract Parameter	N/A	SEE ATTACH	SEE ATTACH	A763373	ATTACHED	A849901



**BUREAU
VERITAS**

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

PETROLEUM HYDROCARBONS (CCME)

Bureau Veritas ID		AZY173	AZY173		AZY174		AZY176	AZY177		
Sampling Date		2022/08/13 08:00	2022/08/13 08:00		2022/08/13 08:15		2022/08/13 08:45	2022/08/13 08:45		
COC Number		1 of 1	1 of 1		1 of 1		1 of 1	1 of 1		
	UNITS	MW 22-09-01	MW 22-09-01 Lab-Dup	RDL	MW 22-09-02	RDL	BH22-49-01	DUP M	RDL	QC Batch

Ext. Pet. Hydrocarbon										
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	6500 (1)	5300 (1)	1100	4800	500	16000 (1)	5000 (1)	1400	A689459
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate (1) Detection limits raised due to high moisture content.										

Bureau Veritas ID		AZY182		
Sampling Date		2022/08/13 10:00		
COC Number		1 of 1		
	UNITS	BH22-47-01	RDL	QC Batch

Ext. Pet. Hydrocarbon				
F4G-SG (Heavy Hydrocarbons-Grav.)	mg/kg	13000 (1)	2400	A689459
RDL = Reportable Detection Limit (1) Detection limits raised due to high moisture content.				



GENERAL COMMENTS

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

Package 1	7.7°C
Package 2	4.3°C
Package 3	7.3°C
Package 4	4.7°C
Package 5	4.7°C
Package 6	3.0°C
Package 7	2.3°C

Change Request: Report to include results on below samples as per client request received 2022/09/20.

BH22-49-02/AZY178 - Chromatogram and Biotoluene review

BH22-11-01/AZY180 - Chromatogram review

Version #7:Toluene Stage 3 Assessment has been done on sample AZY178 as per client request on 20221117. Updated report is attached to this job.

Version #6:Toluene Stage 3 Assessment has been done on sample AZY173 (MW22-09-01) & AZY174 (MW22-09-02) as per client request on 2022097. Report is attached to this job.

Version #5: Additional Toluene assessmetn has been done on sample AZY173 (MW22-09--01) & AZY174 (MW22-09-02) as per request from client 20220831

Version #4: Additional Chromatogram review has been done on sample AZY173 (MW22-09-01), AZY174 (MW22-09-02) and AZY184 (BH22-48-01) as per request from client 20220829

Version #3: Additional Chromatogram review has been done on sample AZY183 (BH22-10-01) as per request from client 20220823

HYDROCARBON RESEMBLANCE

The reported hydrocarbon resemblance was obtained by visual comparison of the sample chromatogram with a library of reference product chromatograms. Since variables such as the degree and type of weathering and the presence of non-petrogenic hydrocarbons cannot be duplicated in reference spectra, the resemblance information must be regarded as approximate and qualitative and as such, Bureau Veritas Laboratories can assume no liability for any conclusions drawn from these data.

Sample AZY173 [MW 22-09-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY174 [MW 22-09-02] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY178 [BH22-49-02] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY180 [BH22-11-01] : The CCME F2-F4 chromatographic peak profile is consistent with a light distillate petroleum product (e.g. Gasoline, Mineral spirits, Stoddard solvent). These are typically characterized by a cluster of peaks between C10 and C16, representing a variety of straight-chain, branched-chain and cyclic hydrocarbons. These peaks will decrease in height, relative to the unresolved complex mixture (UCM or "hump") with increased weathering of the product material.

Chromatogram also indicates a minor contribution of biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain



BUREAU
VERITAS

Bureau Veritas Job #: C262029

Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.

Client Project #: 22525414-1000

Site Location: CAMP FAIRWELL

Your P.O. #: 22525414-1100-1104

Sampler Initials: JM

peak patterns spanning the C18 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34.

Sample AZY183 [BH22-10-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY184 [BH22-48-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A687729	GG3	Matrix Spike	O-TERPHENYL (sur.)	2022/08/19		113	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/19		113	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/19		116	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/19		116	%	60 - 140
A687729	GG3	Spiked Blank	O-TERPHENYL (sur.)	2022/08/19		123	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/19		122	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/19		125	%	60 - 140
A687729	GG3	Method Blank	F4 (C34-C50 Hydrocarbons)	2022/08/19		124	%	60 - 140
			O-TERPHENYL (sur.)	2022/08/19		138	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/19	<10		mg/kg	
A687729	GG3	RPD	F3 (C16-C34 Hydrocarbons)	2022/08/19	<50			mg/kg
			F4 (C34-C50 Hydrocarbons)	2022/08/19	<50			mg/kg
			F2 (C10-C16 Hydrocarbons)	2022/08/19	NC		%	40
A687729	GG3	RPD	F3 (C16-C34 Hydrocarbons)	2022/08/19	3.3		%	40
			F4 (C34-C50 Hydrocarbons)	2022/08/19	NC		%	40
			F2 (C10-C16 Hydrocarbons)	2022/08/19	NC		%	40
A687767	DO1	Matrix Spike	1,4-Difluorobenzene (sur.)	2022/08/20		94	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/08/20		111	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/20		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/20		91	%	50 - 140
			Benzene	2022/08/20		88	%	50 - 140
			Toluene	2022/08/20		90	%	50 - 140
			Ethylbenzene	2022/08/20		91	%	50 - 140
			m & p-Xylene	2022/08/20		94	%	50 - 140
			o-Xylene	2022/08/20		92	%	50 - 140
			F1 (C6-C10)	2022/08/20		99	%	60 - 140
A687767	DO1	Spiked Blank	1,4-Difluorobenzene (sur.)	2022/08/20		89	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/08/20		107	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/20		112	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/20		90	%	50 - 140
			Benzene	2022/08/20		109	%	60 - 130
			Toluene	2022/08/20		106	%	60 - 130
			Ethylbenzene	2022/08/20		108	%	60 - 130
			m & p-Xylene	2022/08/20		111	%	60 - 130
			o-Xylene	2022/08/20		109	%	60 - 130
			F1 (C6-C10)	2022/08/20		88	%	60 - 140
A687767	DO1	Method Blank	1,4-Difluorobenzene (sur.)	2022/08/20		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/08/20		110	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/20		87	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/20		96	%	50 - 140
			Benzene	2022/08/20	<0.0050			mg/kg
			Toluene	2022/08/20	<0.050			mg/kg
			Ethylbenzene	2022/08/20	<0.015 (1)			mg/kg
			m & p-Xylene	2022/08/20	<0.045 (1)			mg/kg
			o-Xylene	2022/08/20	<0.025 (1)			mg/kg
			F1 (C6-C10)	2022/08/20	<10			mg/kg
A687767	DO1	RPD	Benzene	2022/08/20	14		%	50
			Toluene	2022/08/20	NC		%	50
			Ethylbenzene	2022/08/20	24		%	50
			m & p-Xylene	2022/08/20	NC		%	50
			o-Xylene	2022/08/20	NC		%	50
A687951	CAU	Matrix Spike [AZY173-01]	F1 (C6-C10)	2022/08/20	NC		%	30
			O-TERPHENYL (sur.)	2022/08/20		114	%	60 - 140



BUREAU
VERITAS

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A687951	CAU	Spiked Blank	F2 (C10-C16 Hydrocarbons)	2022/08/20		78	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/20		NC	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/20		68	%	60 - 140
			O-TERPHENYL (sur.)	2022/08/20		112	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/20		106	%	60 - 140
A687951	CAU	Method Blank	F3 (C16-C34 Hydrocarbons)	2022/08/20		111	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/20		108	%	60 - 140
			O-TERPHENYL (sur.)	2022/08/20		116	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/20	<10		mg/kg	
A687951	CAU	RPD [AZY173-01]	F3 (C16-C34 Hydrocarbons)	2022/08/20	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2022/08/20	<50		mg/kg	
			F2 (C10-C16 Hydrocarbons)	2022/08/20	30	%	40	
			F3 (C16-C34 Hydrocarbons)	2022/08/20	42 (2)	%	40	
A688047	ETS	Method Blank	F4 (C34-C50 Hydrocarbons)	2022/08/20	26	%	40	
			Moisture	2022/08/19	<0.30	%		
			Moisture	2022/08/19	8.1	%	20	
A688091	A1H	Method Blank	Moisture	2022/08/20	<0.30	%		
A688091	A1H	RPD	Moisture	2022/08/20	16	%	20	
A688093	A1H	Method Blank	Moisture	2022/08/20	<0.30	%		
A688093	A1H	RPD	Moisture	2022/08/20	8.9	%	20	
A689459	JB9	Spiked Blank	F4G-SG (Heavy Hydrocarbons-Grav.)	2022/08/22		109	%	60 - 140
A689459	JB9	Method Blank	F4G-SG (Heavy Hydrocarbons-Grav.)	2022/08/22	<500		mg/kg	
A689459	JB9	RPD [AZY173-01]	F4G-SG (Heavy Hydrocarbons-Grav.)	2022/08/22	22 (3)		%	40

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

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

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

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

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

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

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

(1) Detection limit raised due to interferent.

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

(3) Detection limits raised due to high moisture content.



BUREAU
VERITAS

Bureau Veritas Job #: C262029
Report Date: 2023/01/12

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: JM

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cynny Hagen, Key Account Specialist

Gita Pokhrel, Laboratory Supervisor

Nadeem Cheema, Project Solutions Representative

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

918

MCAZ



ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

COOLER OBSERVATIONS:												BY JOB#:					
Page	of	CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3	CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	PRESENT	/	/	689					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/	544					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/	787					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/	536					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/	545					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/	234					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/	331					PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							
Page	of	INTACT	/	/						ICE PRESENT							
Page	of	ICE PRESENT								CUSTODY SEAL	YES	NO	COOLER ID	TEMP	1	2	3
Page	of	CUSTODY SEAL	/	/						PRESENT							

RECEIVED BY (SIGN & PRINT) JASON BIL DATE (YYYY/MM/DD) 2022/08/18 TIME (HH:MM) 7:30

1510

CHAIN OF CUSTODY RECORD
ENV COC - 00013V3

Choose Location:
 Calgary, AB: 4000 19th St. NE, TZE 698 Toll Free (800) 386-7247
 Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
 Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

Invoice Information Invoice to (requires report) **Report Information** (if differs from invoice)

Company: Client #254, Golder Associates
 Contact Name: Aurelie Bellavance
 Street: 237 - 4 Ave SW Suite 3300
 City: Calgary Prov: AB Postal Code: T2P 4K3
 Phone: 403-299-5600
 Email: aurelie.bellavance@wsp.com
 Copies: Peter.Tan@wsp.com

Company: Golder Associates
 Contact Name: Aurelie Bellavance
 Street: 22525414-3000
 City: West-Channahel, NT
 Site Location: NA
 Province: NT
 Sampled By: J. Macphail

Regulatory Criteria

AT1 CCME Drinking Water - Canada
 Saskatchewan Drinking Water - Alberta

Drinking Water - Manitoba
 Other A GMSRP

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

Sample Identification	Date Sampled			Time (24hr)			Matrix
	YY	MM	DD	HH	MM	SS	
1 MW 22-09-01	2022	08	13	08	00	00	S&I
2 MW 22-09-02				08	15		
3 MW 22-09-03				08	30		
4 BH 22-09-01				08	45		
5 Dup M				08	45		
6 BH 22-09-02				09	00		
7 BH 22-09-03				09	15		
8 BH 22-11-01				09	30		
9 BH 22-11-02				09	45		
10 BH 22-09-01				10	00		
11 BH 22-10-01				10	15		
12 BH 22-08-01				10	30		

LAB USE ONLY

Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

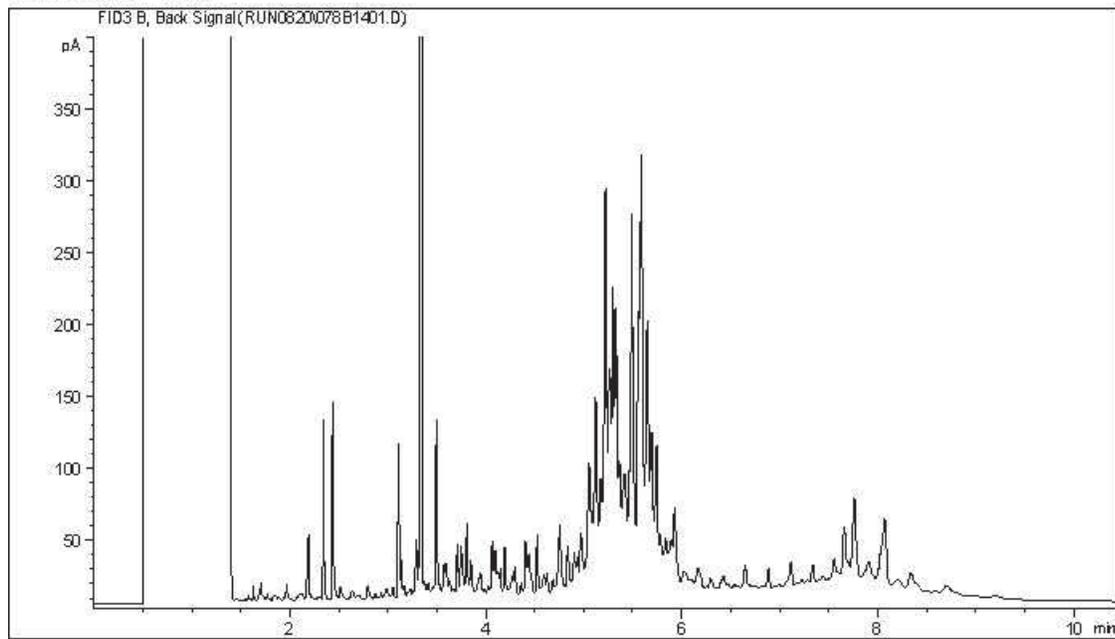
Temperature reading by: _____ °C

Received by: (Signature/Print) *J. Macphail* Date: 2022-08-14 09:15
 Received by: (Signature/Print) *J. Macphail* Date: 2022-08-18 15:10

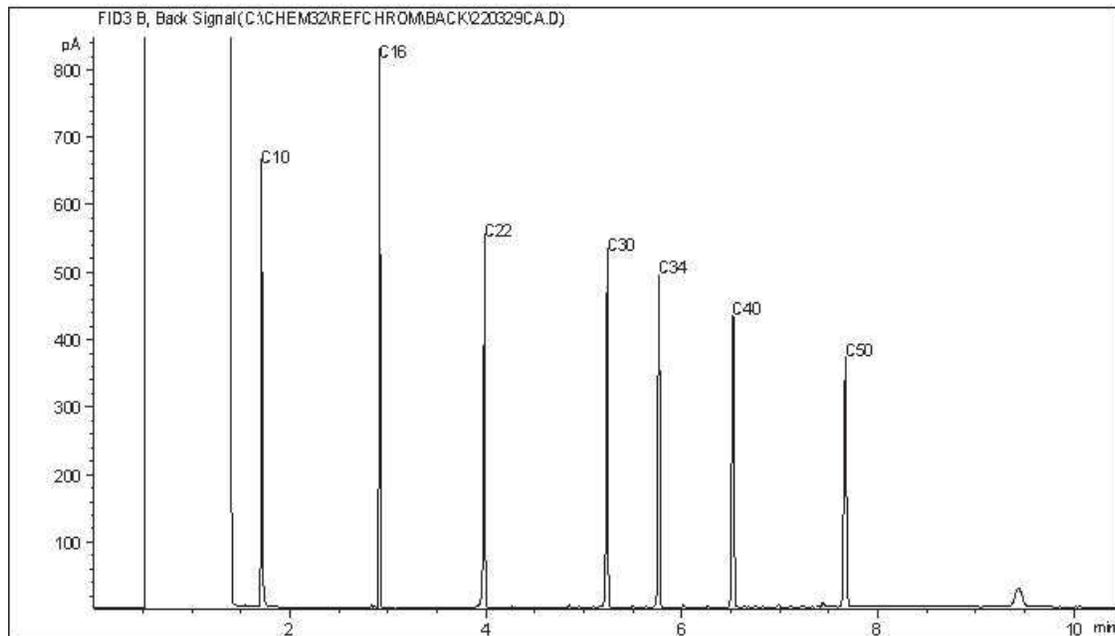
Special Instructions: 0262029

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



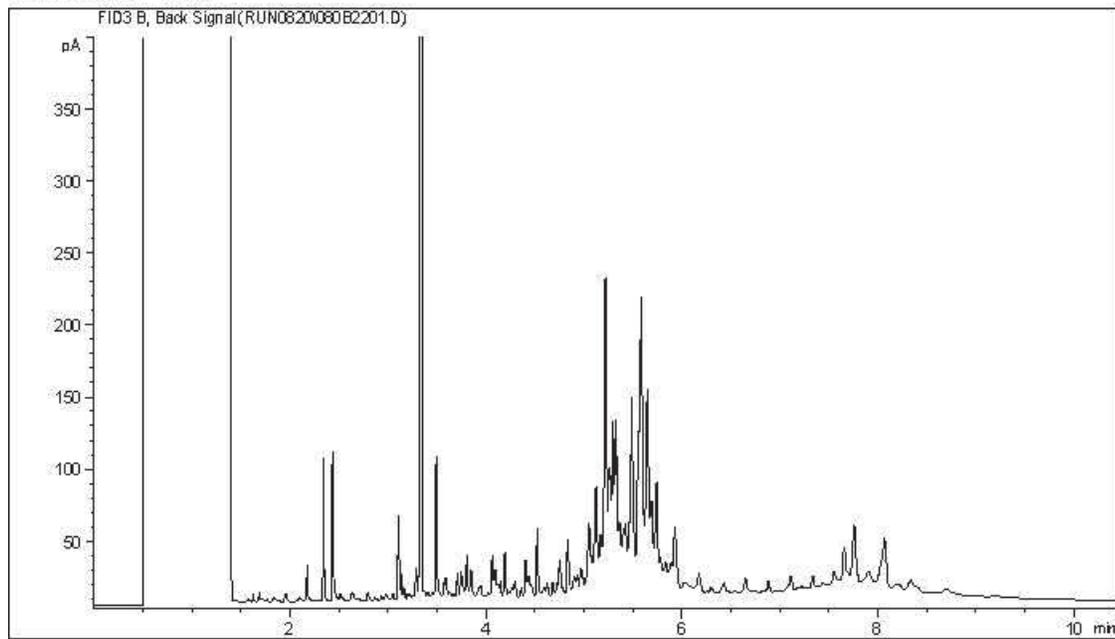
TYPICAL PRODUCT CARBON NUMBER RANGES

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

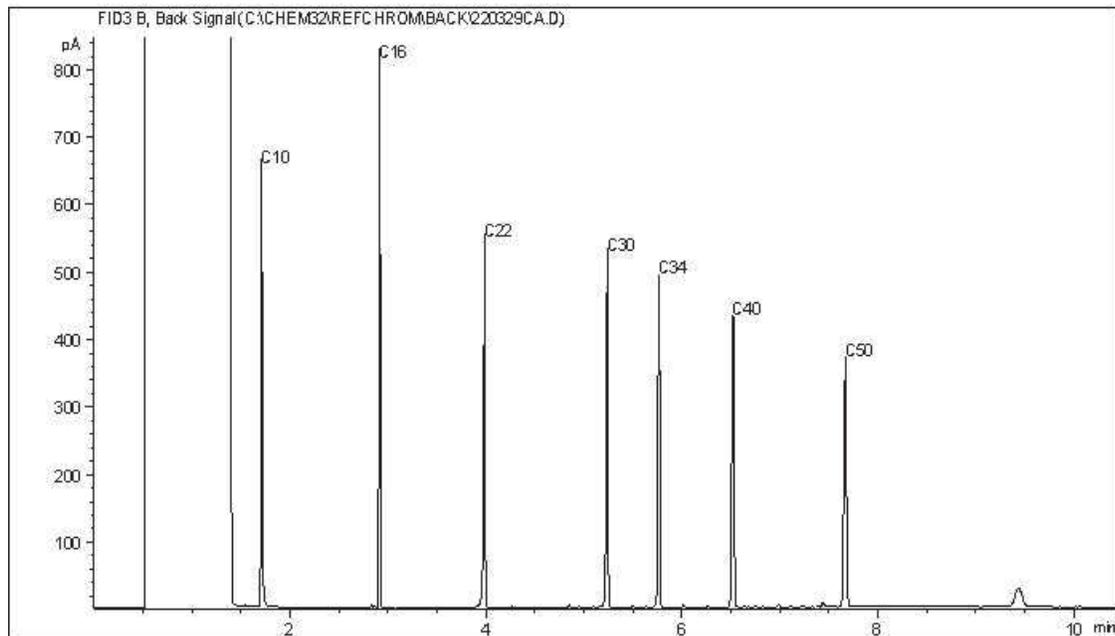
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



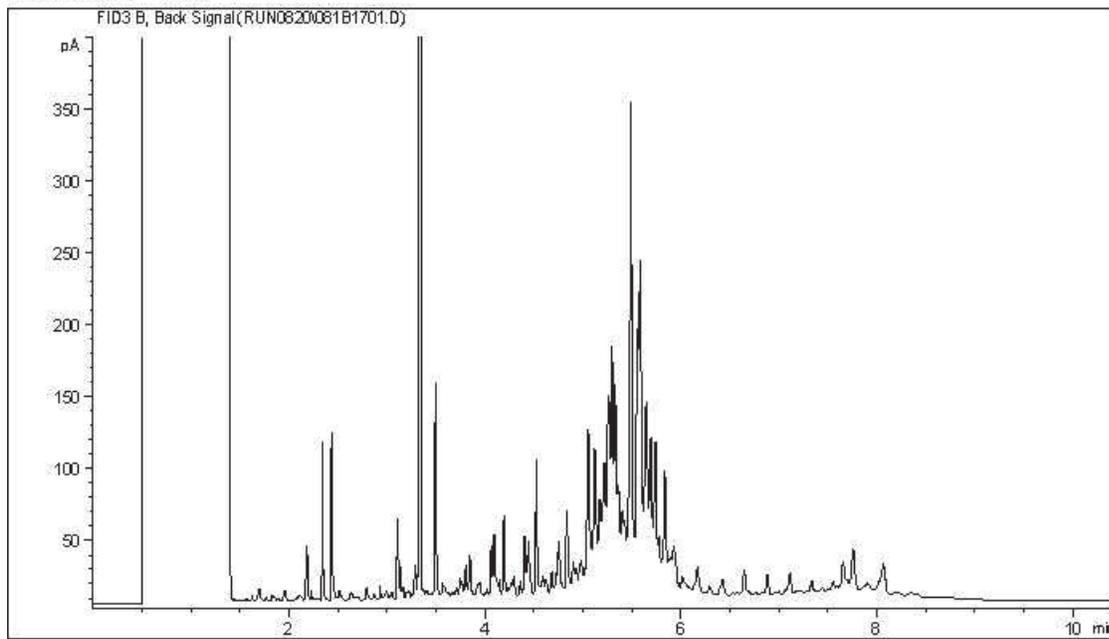
TYPICAL PRODUCT CARBON NUMBER RANGES

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

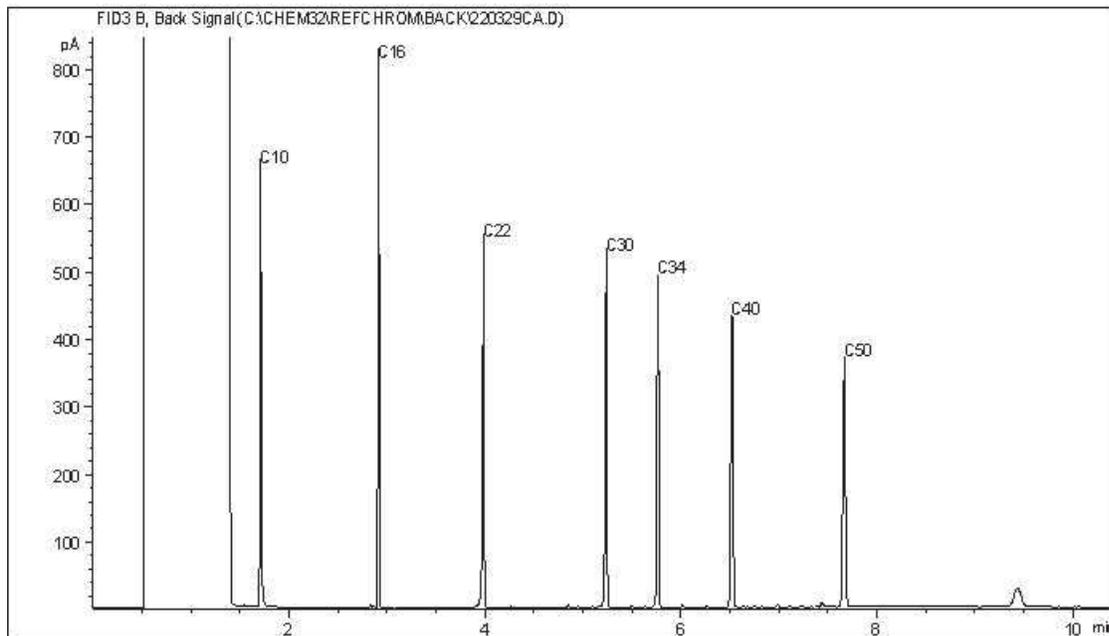
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



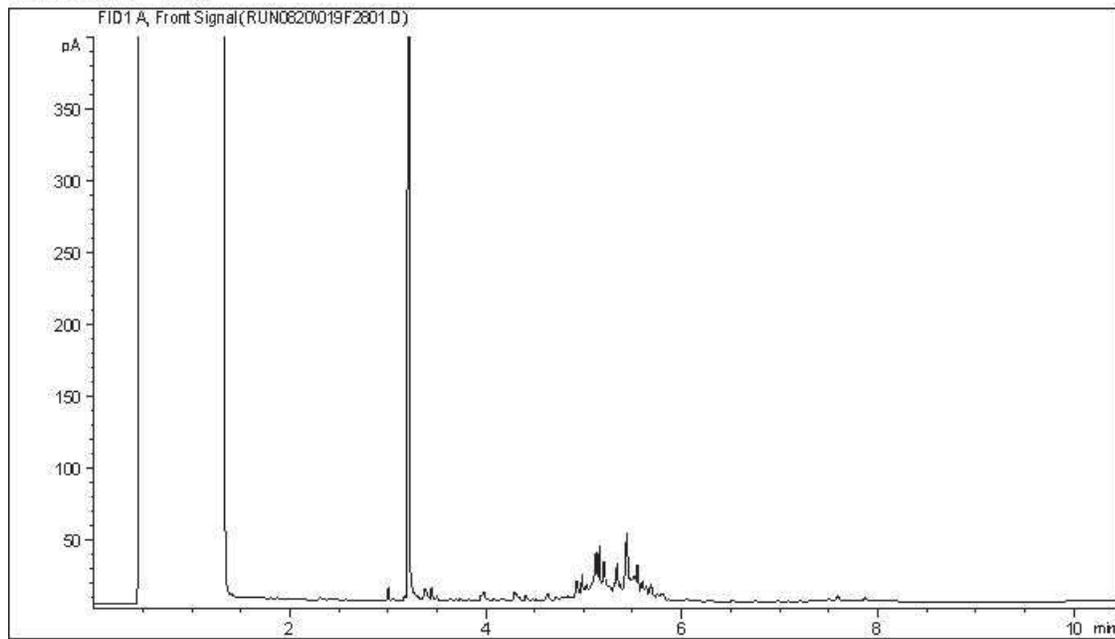
TYPICAL PRODUCT CARBON NUMBER RANGES

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

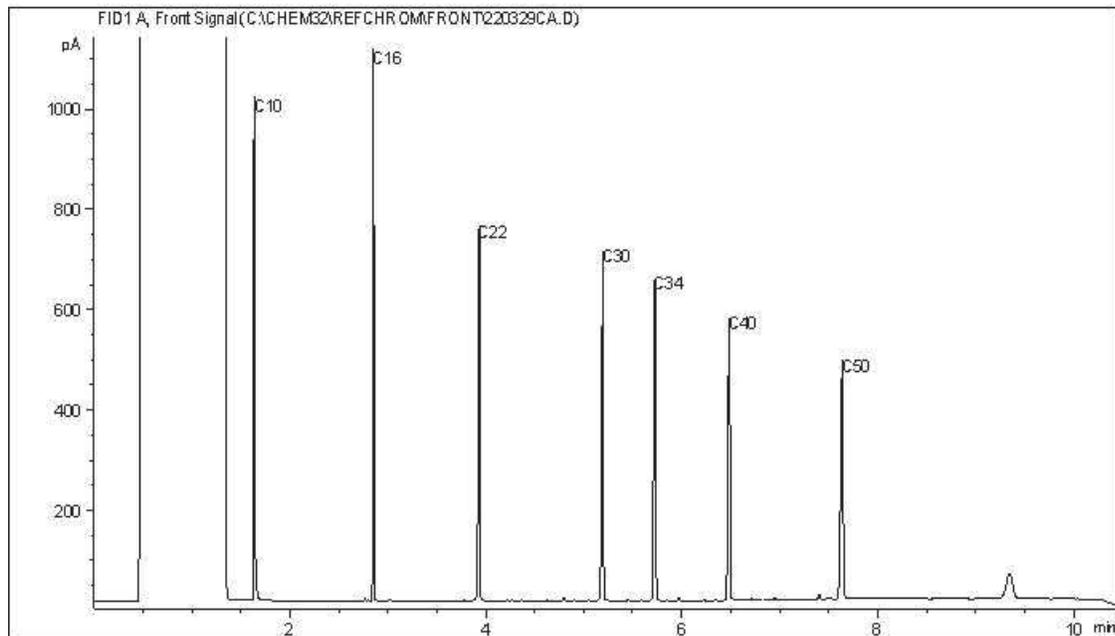
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



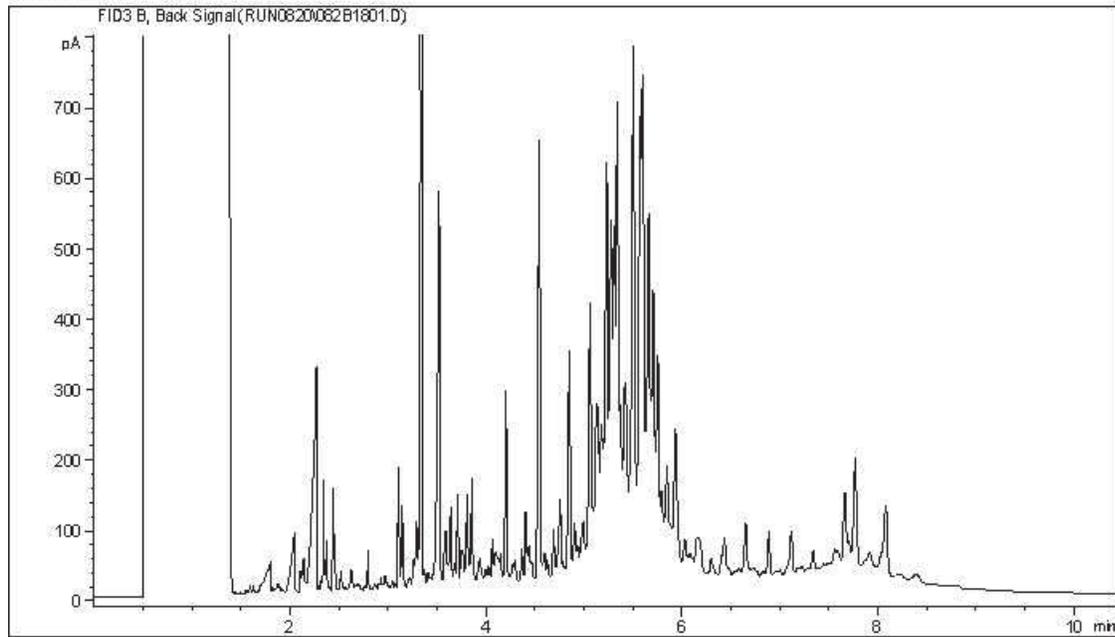
TYPICAL PRODUCT CARBON NUMBER RANGES

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

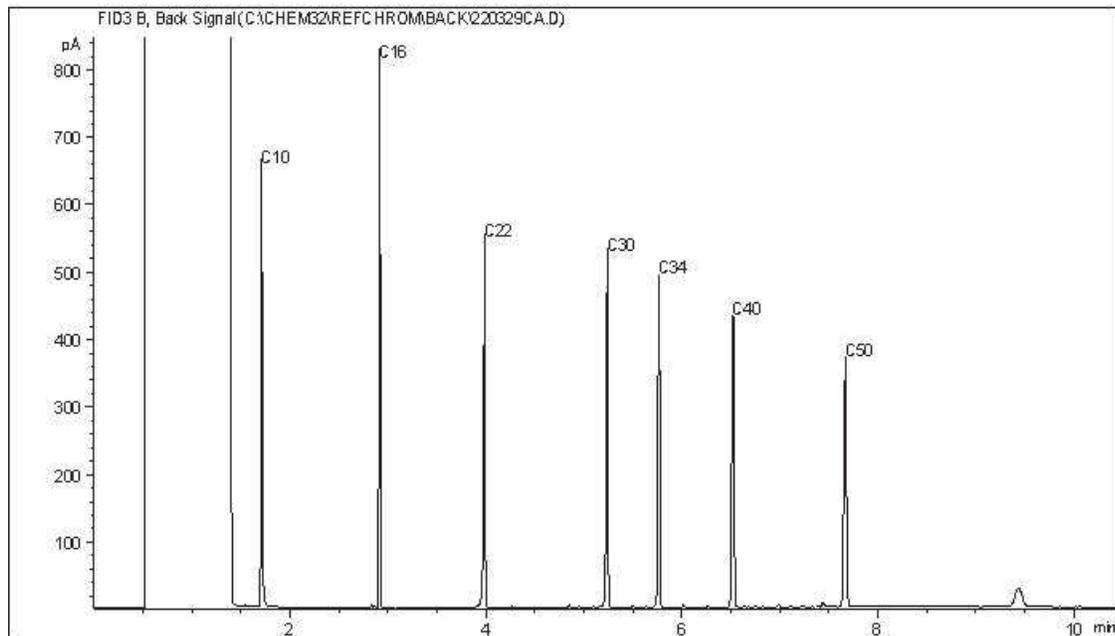
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC13



Carbon Range Distribution - Reference Chromatogram



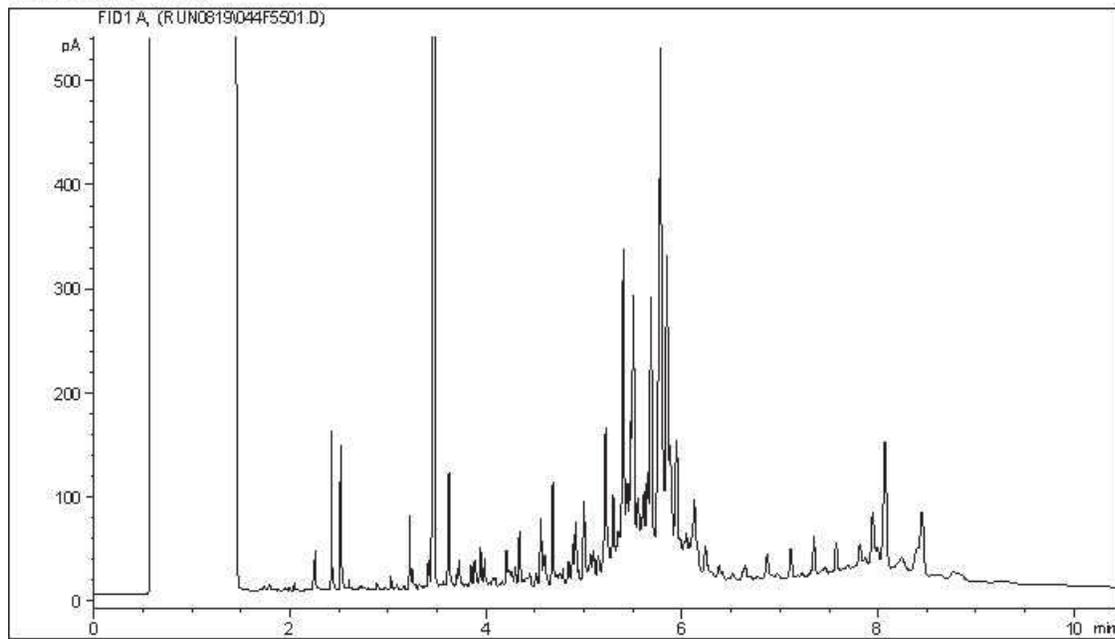
TYPICAL PRODUCT CARBON NUMBER RANGES

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

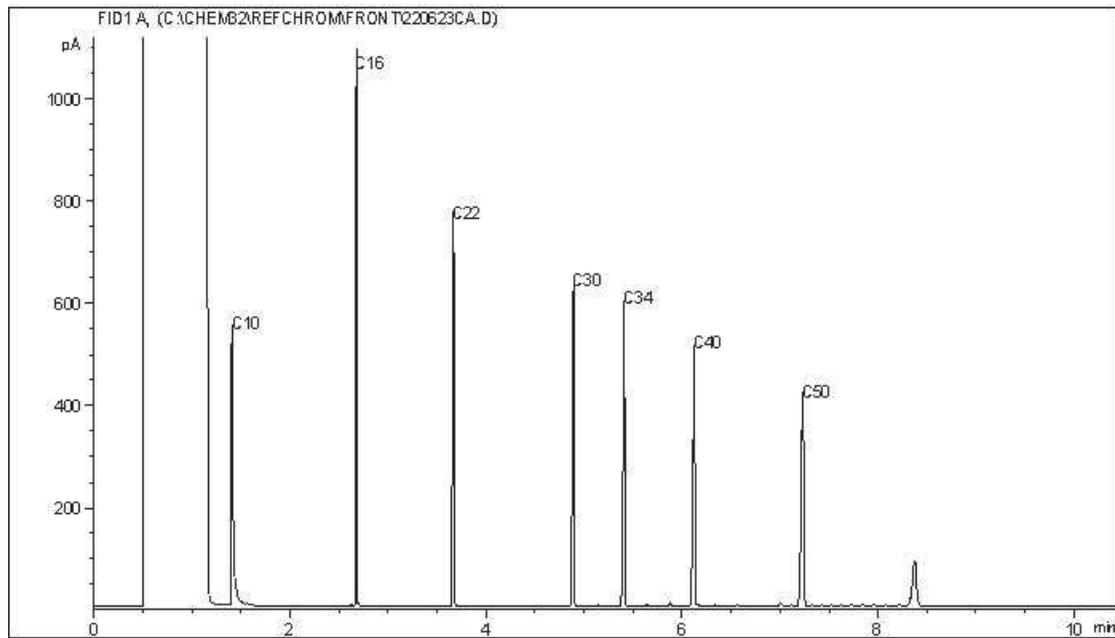
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



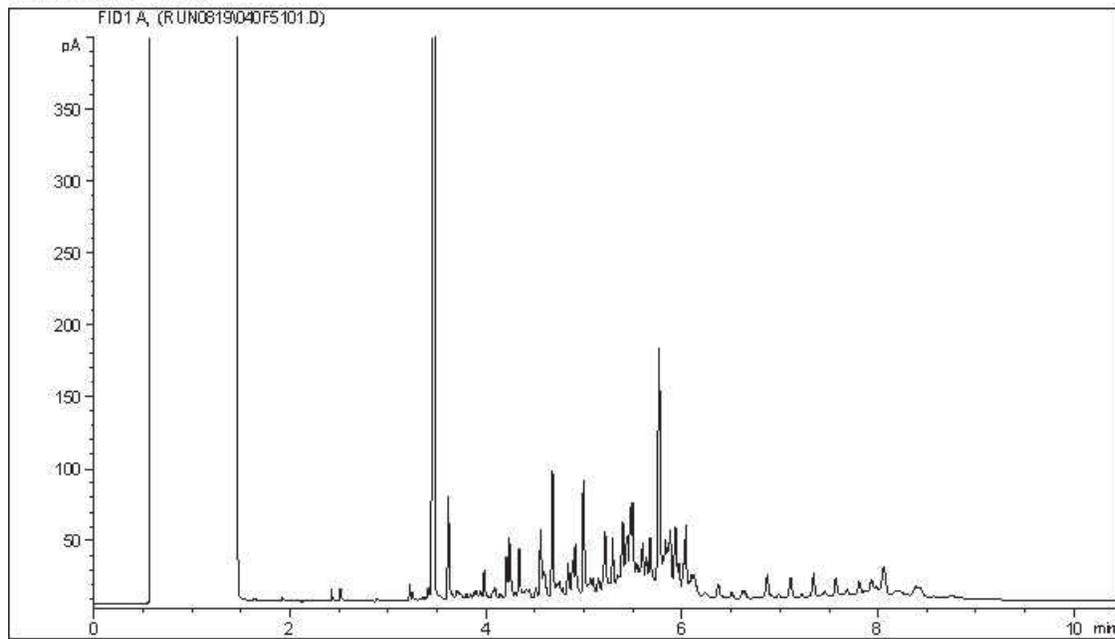
TYPICAL PRODUCT CARBON NUMBER RANGES

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

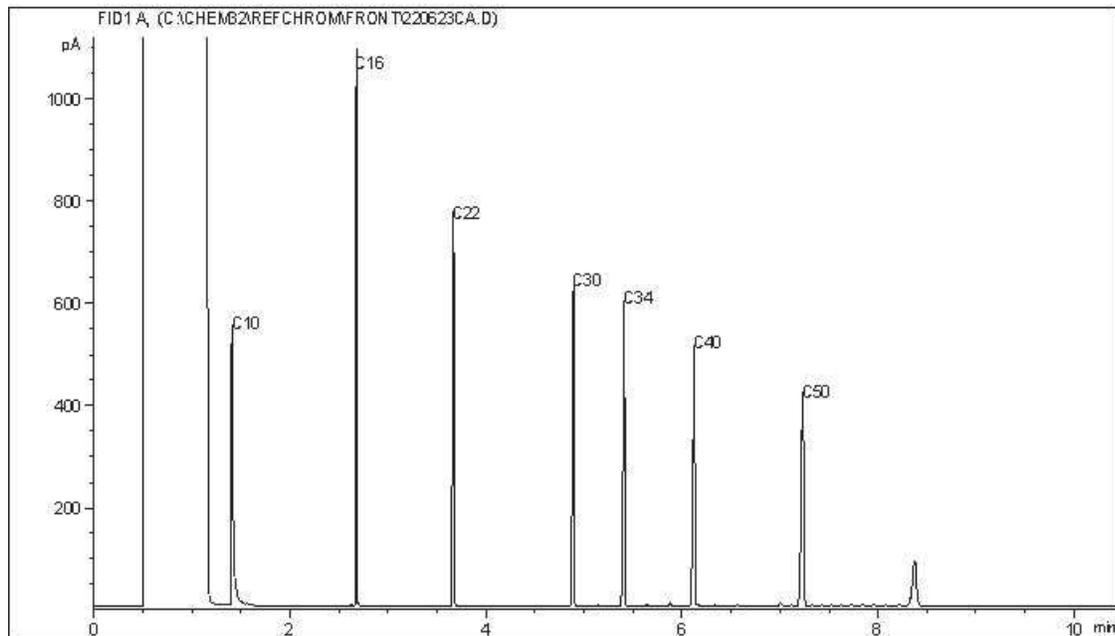
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



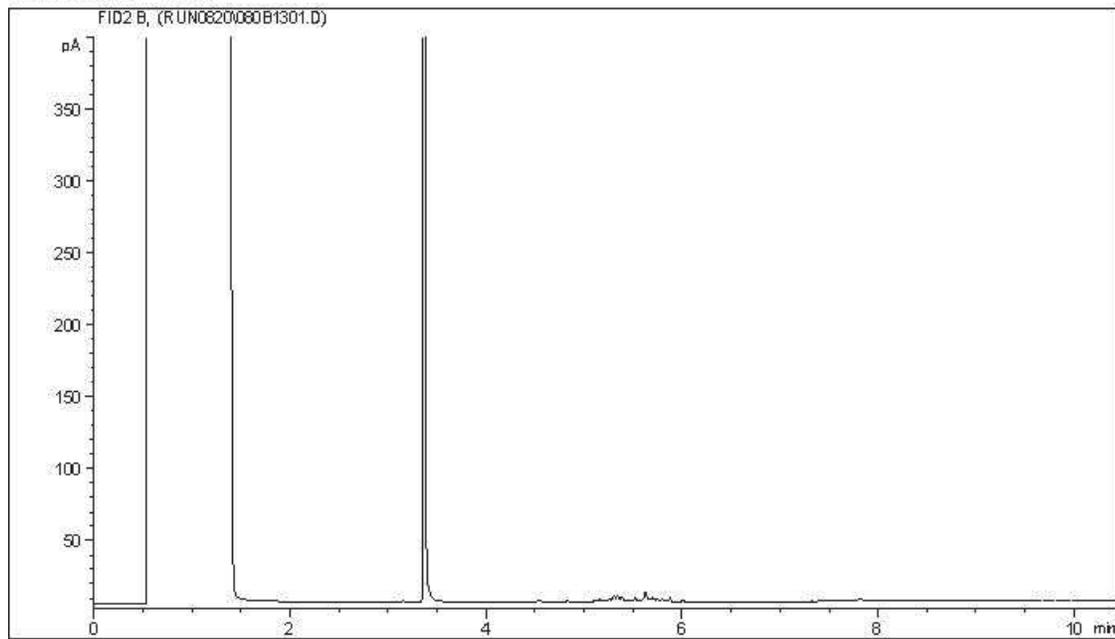
TYPICAL PRODUCT CARBON NUMBER RANGES

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

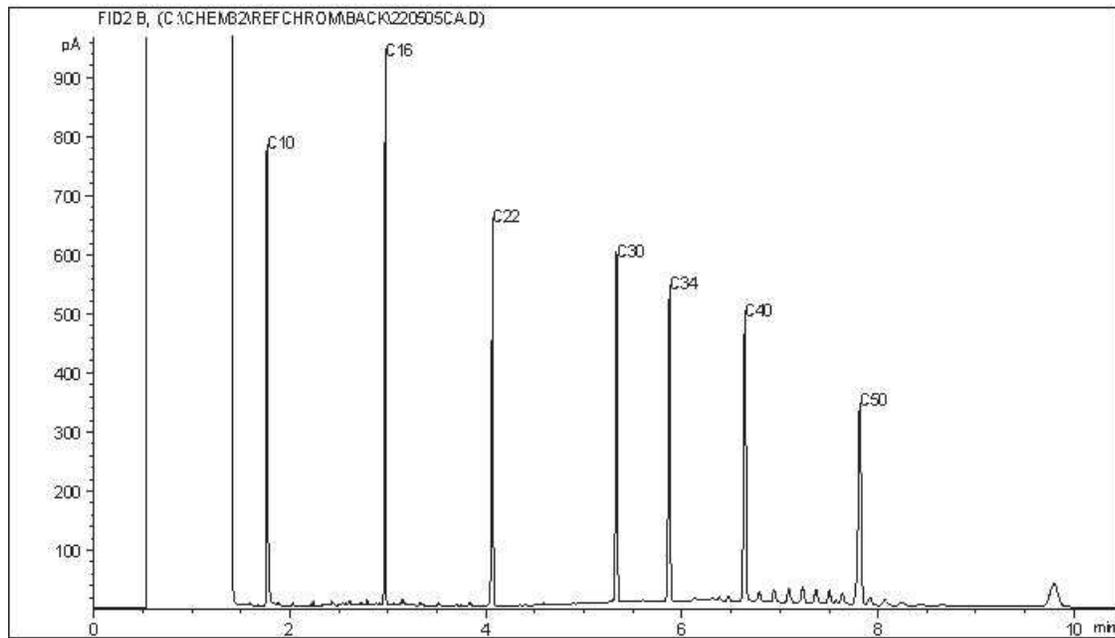
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



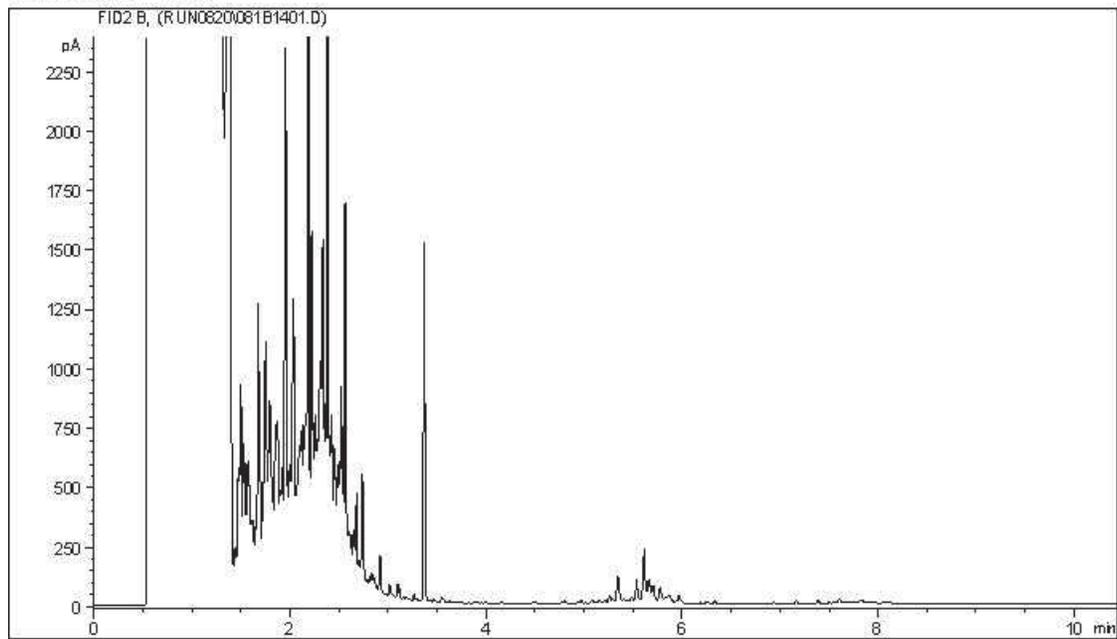
TYPICAL PRODUCT CARBON NUMBER RANGES

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

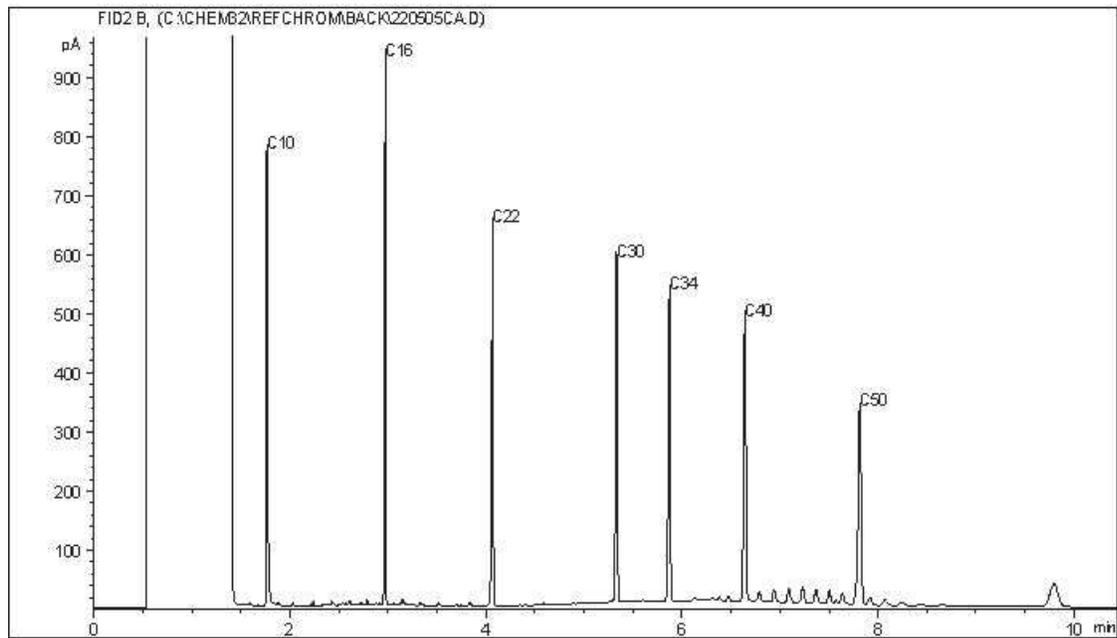
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



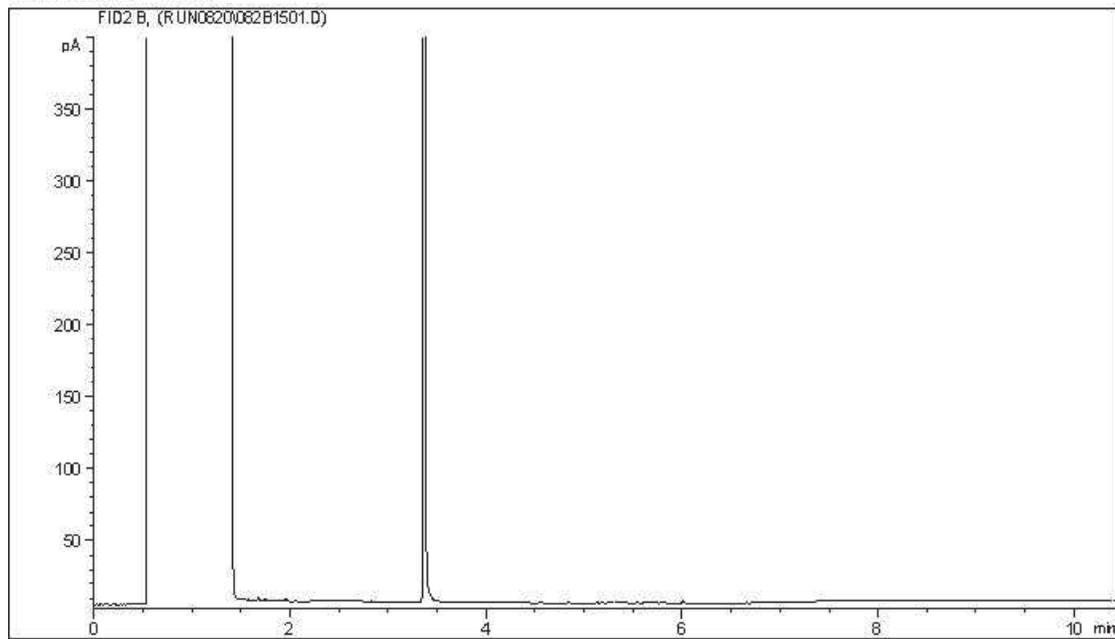
TYPICAL PRODUCT CARBON NUMBER RANGES

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

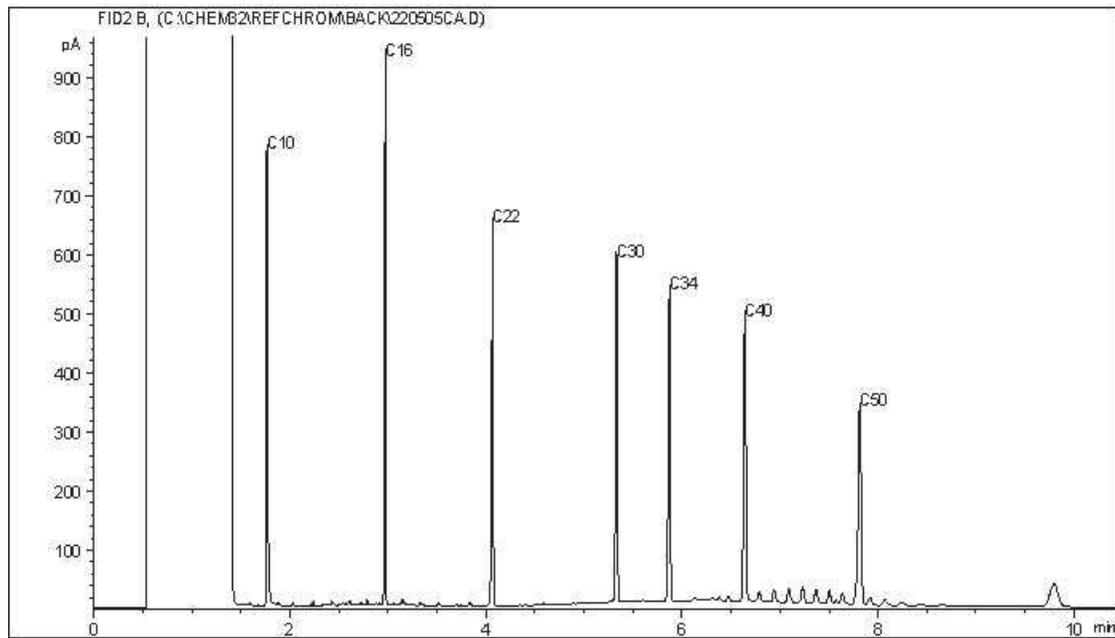
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



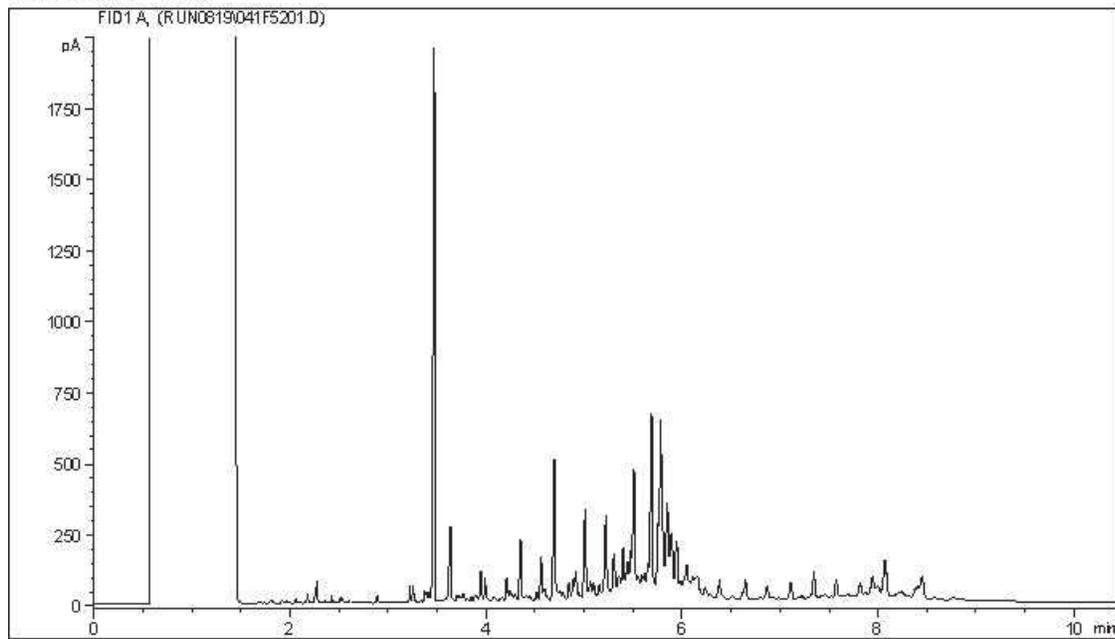
TYPICAL PRODUCT CARBON NUMBER RANGES

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

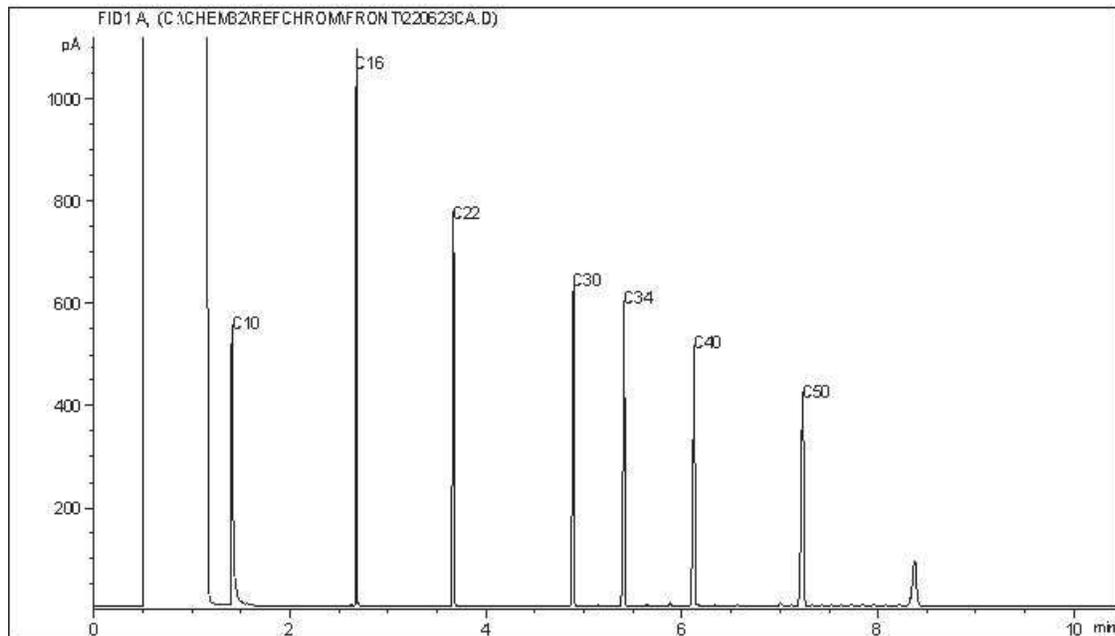
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



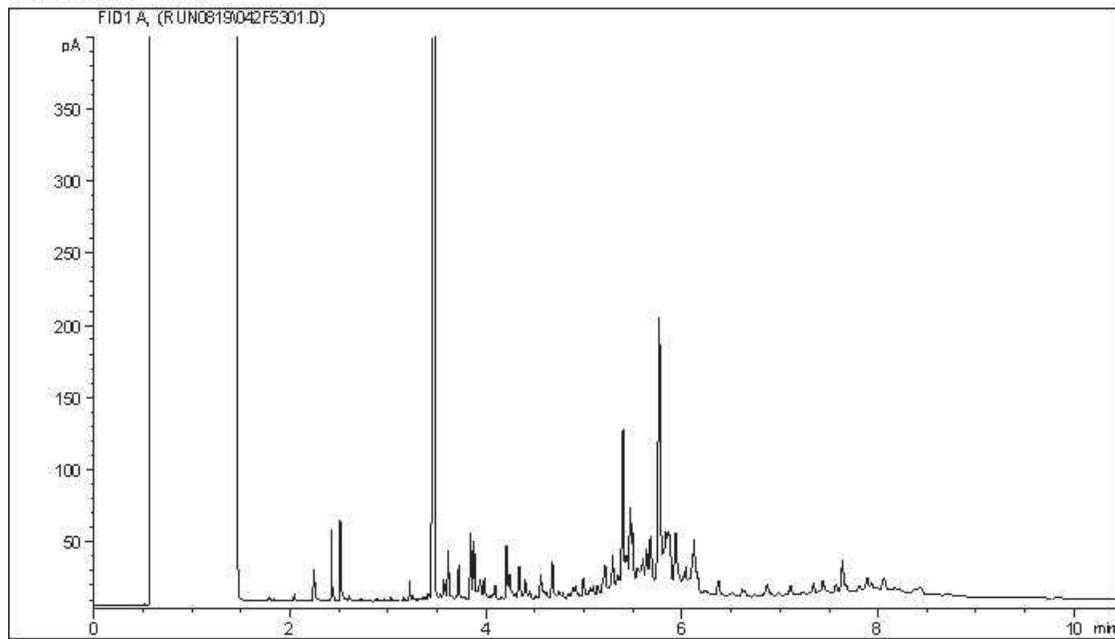
TYPICAL PRODUCT CARBON NUMBER RANGES

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

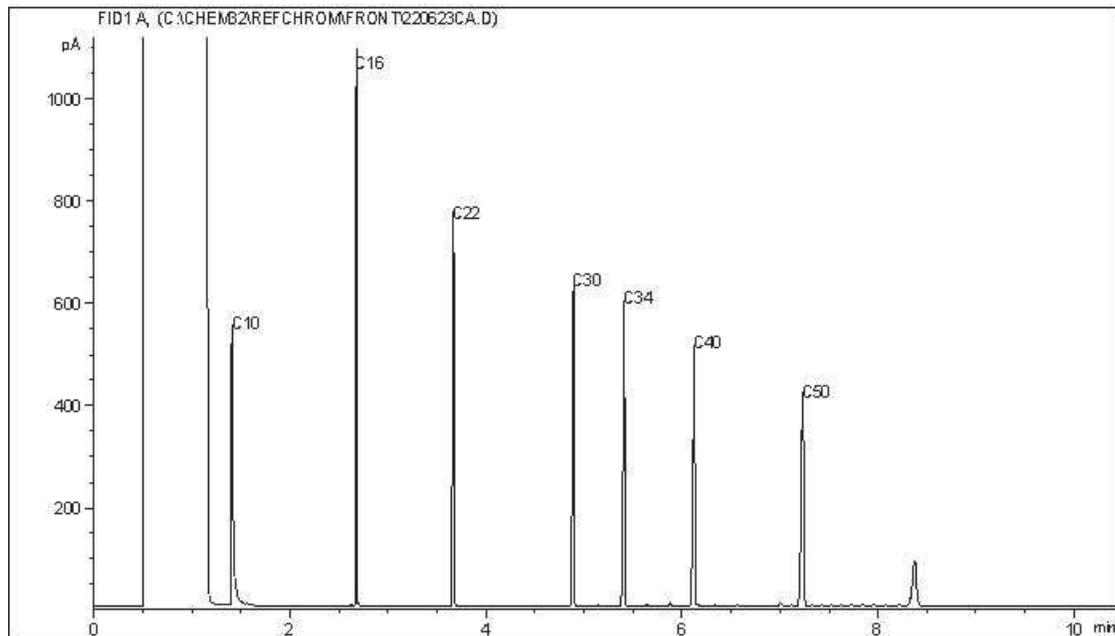
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC12



Carbon Range Distribution - Reference Chromatogram



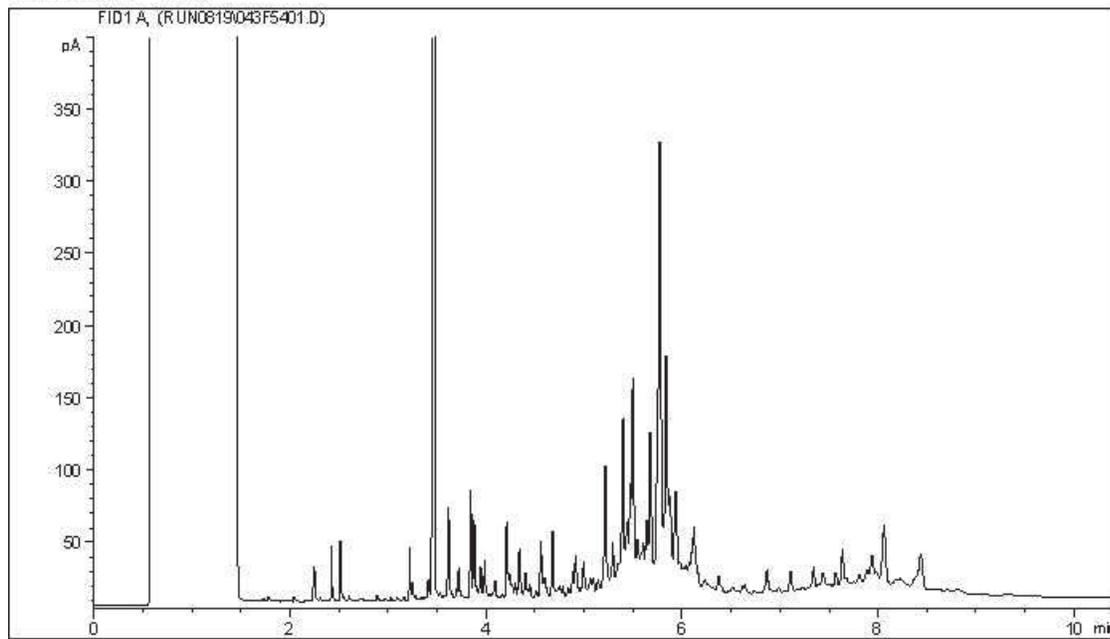
TYPICAL PRODUCT CARBON NUMBER RANGES

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

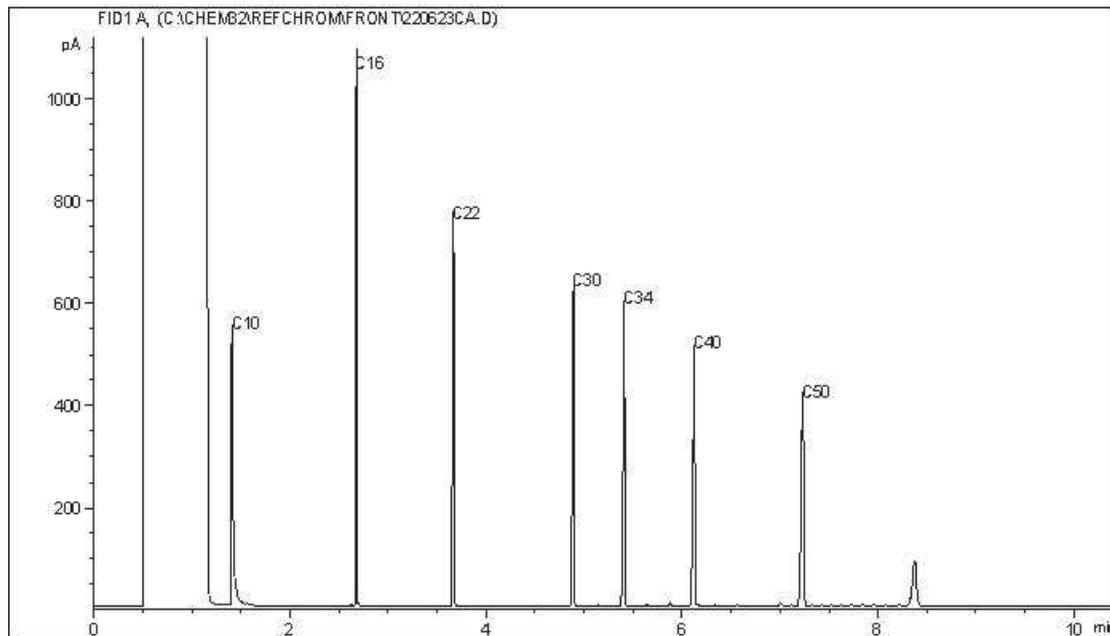
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) 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.

Cynny Hagen

From: MacLean, Colleen <Colleen_MacLean@golder.com>
Sent: Wednesday, September 7, 2022 11:48 AM
To: Cynny Hagen
Cc: Bellavance, Aurelie
Subject: Stage 3 toluene isotope assessment request - Camp Farewell - project: 22525414-1000, PO 22525414-1100-1104

Be careful with this message: it is coming from an external sender

Do not open attachments nor click on links, unless you are sure that the content is safe

Hello,

Could you please complete a stage 3 toluene isotope assessment for the samples below?

Job	Sample ID	Sample name
C262029	AZY173	MW22-09-01
	AZY174	MW22-09-02

Thanks very much,

Colleen MacLean, *She/her*
Environmental Technologist, B.A., Dipl. EVT.

T: +1 403 299 5600

D: +1 403 299 5667



237 – 4 Avenue SW, Suite 3300, Calgary, Alberta T2P 4K3, Canada
wsp.com | golder.com

WSP and Golder have joined together to form the premier environmental consultancy in the industry. Together we are 14,000 strong, Future Ready®, and delivering innovative solutions to our clients around the globe.

This email transmission is confidential and may contain proprietary information for the exclusive use of the intended recipient. Any use, distribution or copying of this transmission, other than by the intended recipient, is strictly prohibited. If you are not the intended recipient, please notify the sender and delete all copies. Electronic media is susceptible to unauthorized modification, deterioration, and incompatibility. Accordingly, the electronic media version of any work product may not be relied upon.



September 2, 2022

GOLDER ASSOCIATES LTD.

2800, 700 -2nd Street SW
CALGARY, AB, T2P 2W2

Attention: Aurelie Bellavance

**Re: Biogenic Toluene Assessment of Camp Farewell, NT; Project 22525414-1000
Bureau Veritas Job No.: C262029**

Bureau Veritas Environmental & Specialty Services Laboratories (BV Labs) was retained by Golder Associated Ltd. to provide an interpretation concerning the likely origin of toluene quantified within CCME Fraction 1 (nC6-nC10).

Analytical Method

Petroleum hydrocarbon analyses at BV Labs are conducted in accordance with the analytical specifications required by the prescriptive and performance-based (where appropriate) elements of the CCME Tier I protocols for hydrocarbon determination¹ in soil samples.

Biogenic Toluene

The sample extract is analyzed by volatile organic compound (VOC) analysis in selected ion monitoring (SIM) mode to determine the origin of the quantified toluene. The presence of specific marker compounds, both biogenic and petrogenic, along with a series of associated parameters are reviewed as part of this evaluation. Diagnostic parameters of primary interest and the ranges typically associated with biogenic toluene samples are listed below²:

- Moisture: typically $\geq 70\%$
- Absence of an Unresolved Complex Mixture (UCM) within CCME Fractions F2 or F3.
- Presence of a "Biogenic Cluster" within CCME Fraction 3 (F3Bc); specifically F3B, nC32-nC34
- Presence of biogenic monoterpene compound(s)³
- Toluene ratio (T_{ratio}): Ratio between Toluene and sum of all BTEX compounds; typically >0.7
- Cymene ratio (C_{ratio}): Ratio between p-Cymene and the sum of all three isomers; typically >0.8
- Additional diagnostic parameters may be included in the assessment if deemed beneficial (examples include: Carbon Preference Index (CPI), isoprenoid ratios, BIC, etc.)

¹ Canadian Council of Ministers of the Environment: "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier I Method" 2001

² Bureau Veritas Laboratories Canada: threshold values derived internally (assessment of long-term data set)

³ Target compounds: α/β -Pinene, Camphene, (+)-3-Carene, α -Terpinene, Limonene, o/m/p-Cymene, γ -Terpinene and α -Terpinolene (list may be amended from time-to-time without notice)



Data Interpretation

Table 1. Data Summary – Biogenic Toluene Evaluation

Lab ID	Sample ID	Diagnostic Parameters ⁴						Conclusion ⁵
		Moist	UCM	F3B _c	Mono	T _{ratio}	C _{ratio}	
AZY173	MW 22-09-01	M	No	Yes	No	1.0	NC	Inconclusive (neither)
AZY174	MW 22-09-02	M	No	Yes	No	1.0	NC	Inconclusive (neither)

NC: Unable to Calculate (absence of Cymene isomers)

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

Sincerely,

Bureau Veritas Environmental & Specialty Services Laboratories



Michael Sheppard, B.Sc., P.Bio, QP
Consulting Scientist
Environmental Services

Scott Cantwell, CET, B.Sc., P.Chem.
Director and General Manager – Western Canada
Environmental Services

Disclaimer

Biogenic Toluene

A detailed assessment of Selective Ion Monitoring (SIM) GC-MS, and associated project data was completed to provide further information relating to the biogenic and/or petrogenic origin of compounds or fractions quantified as part of the CCME Tier I protocol. All statements must be regarded as approximate and qualitative.

⁴ Diagnostic Parameters

Moist: Moisture; H ($\geq 70\%$), M ($< 70\%$ & $\geq 20\%$), L ($< 20\%$)

UCM: Presence/Position of Unresolved Complex Mixture

F3B_c: Presence of a biogenic cluster within F3B

Mono: Biogenic monoterpenes (excluding cymenes)

T_{ratio}: Toluene Ratio (T/ Σ BTEX)

C_{ratio}: Cymene Ratio (p-Cymene/ Σ Cymene isomers)

⁵ Conclusions

Biogenic Toluene: Quantified toluene likely of biogenic origin

Petrogenic Toluene: Quantified toluene likely of petrogenic origin

Inconclusive (both): Presence of both biogenic and petrogenic diagnostic parameters (CSIA recommended)

Inconclusive (neither): Insufficient evidence to support Biogenic or Petrogenic origin (CSIA recommended)



September 27, 2022

GOLDER ASSOCIATES LTD.

2800, 700 -2nd Street SW
CALGARY, AB, T2P 2W2

Attention: Aurelie Bellavance

**Re: Biogenic Toluene Assessment of Camp Farewell; Project 22525414-1000
Bureau Veritas Job No.: C262029**

Bureau Veritas Environmental & Specialty Services Laboratories (BV Labs) was retained by Golder Associated Ltd. to provide an interpretation concerning the likely origin of toluene quantified within CCME Fraction 1 (nC6-nC10).

Analytical Method

Petroleum hydrocarbon analyses at BV Labs are conducted in accordance with the analytical specifications required by the prescriptive and performance-based (where appropriate) elements of the CCME Tier I protocols for hydrocarbon determination¹ in soil samples.

Biogenic Toluene

The sample extract is analyzed by volatile organic compound (VOC) analysis in selected ion monitoring (SIM) mode to determine the origin of the quantified toluene. The presence of specific marker compounds, both biogenic and petrogenic, along with a series of associated parameters are reviewed as part of this evaluation. Diagnostic parameters of primary interest and the ranges typically associated with biogenic toluene samples are listed below²:

- Moisture: typically $\geq 70\%$
- Absence of an Unresolved Complex Mixture (UCM) within CCME Fractions F2 or F3.
- Presence of a "Biogenic Cluster" within CCME Fraction 3 (F3Bc); specifically F3B, nC32-nC34
- Presence of biogenic monoterpene compound(s)³
- Toluene ratio (T_{ratio}): Ratio between Toluene and sum of all BTEX compounds; typically >0.7
- Cymene ratio (C_{ratio}): Ratio between p-Cymene and the sum of all three isomers; typically >0.8
- Additional diagnostic parameters may be included in the assessment if deemed beneficial (examples include: Carbon Preference Index (CPI), isoprenoid ratios, BIC, etc.)

¹ Canadian Council of Ministers of the Environment: "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier I Method" 2001

² Bureau Veritas Laboratories Canada: threshold values derived internally (assessment of long-term data set)

³ Target compounds: α/β -Pinene, Camphene, (+)-3-Carene, α -Terpinene, Limonene, o/m/p-Cymene, γ -Terpinene and α -Terpinolene (list may be amended from time-to-time without notice)



Data Interpretation

Table 1. Data Summary – Biogenic Toluene Evaluation

Lab ID	Sample ID	Diagnostic Parameters ⁴						Conclusion ⁵
		Moist	UCM	F3B _c	Mono	T _{ratio}	C _{ratio}	
AZY178	BH22-49-02	M	No	Yes	No	1.0	NC	Inconclusive (neither)

NC: Unable to Calculate (absence of Cymene isomers)

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

Sincerely,

Bureau Veritas Environmental & Specialty Services Laboratories



Michael Sheppard, B.Sc., P.Bio, QP
Consulting Scientist
Environmental Services

Scott Cantwell, CET, B.Sc., P.Chem.
Director and General Manager – Western Canada
Environmental Services

Disclaimer

Biogenic Toluene

A detailed assessment of Selective Ion Monitoring (SIM) GC-MS, and associated project data was completed to provide further information relating to the biogenic and/or petrogenic origin of compounds or fractions quantified as part of the CCME Tier I protocol. All statements must be regarded as approximate and qualitative.

⁴ Diagnostic Parameters

Moist: Moisture; H ($\geq 70\%$), M ($< 70\%$ & $\geq 20\%$), L ($< 20\%$)

UCM: Presence/Position of Unresolved Complex Mixture

F3B_c: Presence of a biogenic cluster within F3B

Mono: Biogenic monoterpenes (excluding cymenes)

T_{ratio}: Toluene Ratio (T/ Σ BTEX)

C_{ratio}: Cymene Ratio (p-Cymene/ Σ Cymene isomers)

⁵ Conclusions

Biogenic Toluene: Quantified toluene likely of biogenic origin

Petrogenic Toluene: Quantified toluene likely of petrogenic origin

Inconclusive (both): Presence of both biogenic and petrogenic diagnostic parameters (CSIA recommended)

Inconclusive (neither): Insufficient evidence to support Biogenic or Petrogenic origin (CSIA recommended)

Client: Cynny Hagen
Bureau Veritas
2021 – 41 Avenue NE
Calgary, AB T2E 6P2
Canada

Phone: 4037352273

Fax:

Identifier: 005TJ

Date Rec: 10/03/2022

Report Date: 10/19/2022

Client Project #: 22525414-1100-1104

Client Project Name: 22525414-100, Camp Farewell, NT

Purchase Order #: C262029

Test results provided for: CSIA

Reviewed By:



NOTICE: This report is intended only for the addressee shown above and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this in error, please notify Microbial Insights, Inc. immediately. The data and other information in this report represent only the sample(s) analyzed and are rendered upon condition that it is not to be reproduced without approval from Microbial Insights, Inc. Thank you for your cooperation.

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CSIA**Client:** Bureau Veritas**MI Project Number:** 005TJ

Project: 22525414-100, Camp Farewell, NT

Date Received: 10/03/2022

Sample Information

Client Sample ID:	AZY173 (MW22-09-01)	AZY174 (MW22-09-02)
Sample Date:	09/13/2022	09/13/2022
Analyst/Reviewer:	SB/MW	SB/MW

Carbon**Units**

¹³ C/ ¹² C Toluene (‰)	δ ¹³ C, VPDB (‰)	-29.0 (J)	-31.3
--	-----------------------------	-----------	-------

Legend:

NA= Not Analyzed NS=Not Sampled J= Estimated concentration below PQL but above LQL ND= Not Detected

Quality Assurance/Quality Control Data

Samples Received 10/3/2022

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control (% Std. Dev.)*	Blank
¹³ C/ ¹² C Toluene (‰)	10/03/2022	10/14/2022	14.2 °C	0.1	Pass

* $\delta^{13}\text{C}$ positive control values are within $\pm 0.5\text{‰}$ of true value.



10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Identifier: 005TJ

Date Rec: 10/03/2022

Report Date: 10/19/2022

Client Project #: 22525414-1100-1104

Client Project Name: 22525414-100, Camp Farewell, NT

Purchase Order #: C262029

Comments: An in-house screening method was used to estimate VOC concentrations. Please note that the precision of toluene in sample AZY174 (MW 22-09-02) was +/- 0.9 which is outside of the acceptance range (+/- 0.5).



October 21, 2022

GOLDER ASSOCIATES LTD.

2800, 700 -2nd Street SW
CALGARY, AB, T2P 2W2

Attention: Aurelie Bellavance

**Re: Biogenic Toluene Assessment of Camp Farewell, NT; Project 22525414-1000
Bureau Veritas Job No.: C262029**

Bureau Veritas Environmental & Specialty Services Laboratories (BV Labs) was retained by Golder Associated Ltd. to provide an interpretation concerning the likely origin of toluene quantified within CCME Fraction 1 (nC6-nC10).

Analytical Method

Petroleum hydrocarbon analyses at BV Labs are conducted in accordance with the analytical specifications required by the prescriptive and performance-based elements of the CCME Tier I protocols for hydrocarbon determination¹ in soil samples. Compound Specific Isotope Analyses (CSIA) are conducted by Microbial Insights Inc. utilizing Isotope Ratio Mass Spectroscopy (IRMS).

Biogenic Toluene

The biogenic toluene evaluation involved the analysis of two extracts. A methanol extract was analyzed by GC/MS in selected ion monitoring (SIM) mode for specific diagnostic volatile organic compounds (VOCs). A second sample aliquot extracted in organic-free deionized water was submitted for CSIA. The CSIA was selected to provide an additional line of evidence concerning which of two origins the sample's toluene is deemed most likely (biogenic or petrogenic).

The diagnostic parameters of primary interest and the ranges typically associated with biogenic toluene samples listed below²:

- Moisture: typically $\geq 70\%$
- Absence of an Unresolved Complex Mixture (UCM) within CCME Fractions F2 or F3.
- Presence of a "Biogenic Cluster" within CCME Fraction 3 (F3Bc); specifically F3B, nC32-nC34
- Presence of biogenic monoterpene compound(s)³
- Toluene ratio (T_{ratio}): Ratio between Toluene and sum of all BTEX compounds; typically > 0.7
- Cymene ratio (C_{ratio}): Ratio between p-Cymene and the sum of all three isomers; typically > 0.8
- Additional diagnostic parameters may be included in the assessment if deemed beneficial (examples include: Carbon Preference Index (CPI), isoprenoid ratios, BIC, etc.)
- Toluene Compound Specific Isotope Analysis (CSIA): $\delta^{13}C < -30\text{‰}$

¹ Canadian Council of Ministers of the Environment: "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier I Method" 2001

² Bureau Veritas Laboratories Canada: threshold values derived internally (assessment of long-term data set)

³ Target compounds: α/β -Pinene, Camphene, (+)-3-Carene, α -Terpinene, Limonene, o/m/p-Cymene, γ -Terpinene and α -Terpinolene (list may be amended from time-to-time without notice)



Data Interpretation

Table 1. Data Summary – Biogenic Toluene Evaluation

Lab ID	Sample ID	Diagnostic Parameters ⁴							Conclusion ⁵
		Moist	UCM	F3B _c	Mono	T _{ratio}	C _{ratio}	CSIA (±)	
AZY173	MW 22-09-01	M	No	Yes	No	1.0	NC	-31.3 ±0.9	Biogenic Toluene
AZY174	MW 22-09-02	M	No	Yes	No	1.0	NC	-29.0	Inconclusive (neither)

NC: Unable to Calculate

‡ AZY173: Analytical precision exceeded the acceptance range of the analysis (±0.5).

AZY174: Value based on estimated concentration. Concentrations below Practical Quantitation Limit (PQL), but above Lower Quantifiable Limit (LQL). Precision estimation unavailable.

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

Sincerely,

Bureau Veritas Environmental & Specialty Services Laboratories



Michael Sheppard, B.Sc., P.Bio, QP
Consulting Scientist
Environmental Services

Scott Cantwell, CET, B.Sc., P.Chem.
Director and General Manager – Western Canada
Environmental Services

Disclaimer

Biogenic Toluene

A detailed assessment of Selective Ion Monitoring (SIM) GC-MS, and associated project data was completed to provide further information relating to the biogenic and/or petrogenic origin of compounds or fractions quantified as part of the CCME Tier I protocol. All statements must be regarded as approximate and qualitative.

⁴ Diagnostic Parameters

Moist: Moisture; H (≥70%), M (<70 & ≥20%), L (<20%)

UCM: Presence/Position of Unresolved Complex Mixture

F3B_c: Presence of a biogenic cluster within F3B

CSIA: Biogenic Toluene δ13C < -30‰; Petrogenic Toluene δ13C between -29.5‰ and -27.5‰

Reported value sourced from Microbial Insights Inc. report 005TJ; dated 2022/10/19

Mono: Biogenic monoterpenes (excluding cymenes)

T_{ratio}: Toluene Ratio (T/ΣBTEX)

C_{ratio}: Cymene Ratio (p-Cymene/ΣCymene isomers)

⁵ Conclusions

Biogenic Toluene: Quantified toluene likely of biogenic origin

Petrogenic Toluene: Quantified toluene likely of petrogenic origin

Inconclusive (both): Presence of both biogenic and petrogenic diagnostic parameters

Inconclusive (neither): Insufficient evidence to support Biogenic or Petrogenic origin



January 12, 2023

GOLDER ASSOCIATES LTD.

2800, 700 -2nd Street SW
CALGARY, AB, T2P 2W2

Attention: Aurelie Bellavance

**Re: Biogenic Toluene Assessment of Camp Farewell; Project 22525414-1000
Bureau Veritas Job No.: C262029**

Bureau Veritas Environmental & Specialty Services Laboratories (BV Labs) was retained by Golder Associated Ltd. to provide an interpretation concerning the likely origin of toluene quantified within CCME Fraction 1 (nC6-nC10).

Analytical Method

Petroleum hydrocarbon analyses at BV Labs are conducted in accordance with the analytical specifications required by the prescriptive and performance-based elements of the CCME Tier I protocols for hydrocarbon determination¹ in soil samples. Compound Specific Isotope Analyses (CSIA) are conducted by Microbial Insights Inc. utilizing Isotope Ratio Mass Spectroscopy (IRMS).

Biogenic Toluene

The biogenic toluene evaluation involved the analysis of two extracts. A methanol extract was analyzed by GC/MS in selected ion monitoring (SIM) mode for specific diagnostic volatile organic compounds (VOCs). A second sample aliquot extracted in organic-free deionized water was submitted for CSIA. The CSIA was selected to provide an additional line of evidence concerning which of two origins the sample's toluene is deemed most likely (biogenic or petrogenic).

The diagnostic parameters of primary interest and the ranges typically associated with biogenic toluene samples listed below²:

- Moisture: typically $\geq 70\%$
- Absence of an Unresolved Complex Mixture (UCM) within CCME Fractions F2 or F3.
- Presence of a "Biogenic Cluster" within CCME Fraction 3 (F3Bc); specifically F3B, nC32-nC34
- Presence of biogenic monoterpene compound(s)³
- Toluene ratio (T_{ratio}): Ratio between Toluene and sum of all BTEX compounds; typically > 0.7
- Cymene ratio (C_{ratio}): Ratio between p-Cymene and the sum of all three isomers; typically > 0.8
- Additional diagnostic parameters may be included in the assessment if deemed beneficial (examples include: Carbon Preference Index (CPI), isoprenoid ratios, BIC, etc.)
- Toluene Compound Specific Isotope Analysis (CSIA): $\delta^{13}C < -30\%$

¹ Canadian Council of Ministers of the Environment: "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier I Method" 2001

² Bureau Veritas Laboratories Canada: threshold values derived internally (assessment of long-term data set)

³ Target compounds: α/β -Pinene, Camphene, (+)-3-Carene, α -Terpinene, Limonene, o/m/p-Cymene, γ -Terpinene and α -Terpinolene (list may be amended from time-to-time without notice)



Data Interpretation

Table 1. Data Summary – Biogenic Toluene Evaluation

Lab ID	Sample ID	Diagnostic Parameters ⁴							Conclusion ⁵
		Moist	UCM	F3B _c	Mono	T _{ratio}	C _{ratio}	CSIA	
AZY178	BH22-49-02	M	No	Yes	No	1.0	NC	-29.8	Inconclusive (neither)

NC: Unable to Calculate (absence of Cymene isomers)

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

Sincerely,

Bureau Veritas Environmental & Specialty Services Laboratories



Michael Sheppard, B.Sc., P.Bio, QP
Consulting Scientist
Environmental Services

Scott Cantwell, CET, B.Sc., P.Chem.
Director and General Manager – Western Canada
Environmental Services

Disclaimer

Biogenic Toluene

A detailed assessment of Selective Ion Monitoring (SIM) GC-MS, and associated project data was completed to provide further information relating to the biogenic and/or petrogenic origin of compounds or fractions quantified as part of the CCME Tier I protocol. All statements must be regarded as approximate and qualitative.

⁴ Diagnostic Parameters

Moist: Moisture; H ($\geq 70\%$), M (< 70 & $\geq 20\%$), L ($< 20\%$)
 UCM: Presence/Position of Unresolved Complex Mixture
 F3B_c: Presence of a biogenic cluster within F3B
 CSIA: Biogenic Toluene $\delta 13C < -30\text{‰}$; Petrogenic Toluene $\delta 13C$ between -29.5‰ and -27.5‰
 Reported value sourced from Microbial Insights Inc. report 105TK; dated 2023/01/10

Mono: Biogenic monoterpenes (excluding cymenes)
 T_{ratio}: Toluene Ratio (T/ Σ BTEX)
 C_{ratio}: Cymene Ratio (p-Cymene/ Σ Cymene isomers)

⁵ Conclusions

Biogenic Toluene: Quantified toluene likely of biogenic origin
 Petrogenic Toluene: Quantified toluene likely of petrogenic origin
 Inconclusive (both): Presence of both biogenic and petrogenic diagnostic parameters
 Inconclusive (neither): Insufficient evidence to support Biogenic or Petrogenic origin

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 13, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C262029

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes
 Was proper chain of custody of the samples documented and kept? Yes
 Were sample temperatures acceptable when they reached lab?: Yes
 Were all samples analyzed and extracted within hold times?: Yes
 Has lab warranted all tests were in statistical control in CoA?: Yes
 Was sufficient sample provided for the requested analysis? Yes
 Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	X			Laboratory duplicate RPD for F3 (42%) exceeded the acceptance criteria of (40%).
Method Blank Concentration	X			
Laboratory Duplicate RPD		X		All remaining laboratory QC results are within acceptance criteria.
Matrix Spike Recovery	X			
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	Samples BH22-49-01 and DUP M exceed the alert limits for F2 (132%), F3 (103%) and F4 (84%).
Trip Blank Concentration			X	
Field Duplicate RPD		X		

Is data considered reliable (Yes/No/Suspect)?: Yes
 If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 29, 2022



Your P.O. #: 22525414-1000-1104
 Your Project #: 22525414-1000
 Site Location: CAMPFUR WELL
 Your C.O.C. #: 1 of 2, 2 OF 2

Attention: AURELIE BELLAVANCE

GOLDER ASSOCIATES LTD
 CALGARY - NATIONAL CONTRACT
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/09/15
 Report #: R3233080
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262079

Received: 2022/08/17, 12:45

Sample Matrix: Soil
 # Samples Received: 14

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Boron (Hot Water Soluble) (1)	2	2022/08/22	2022/08/24	AB SOP-00034 / AB SOP-00042	EPA 6010d R5 m
BTEX/F1 by HS GC/MS/FID (MeOH extract) (1, 2)	14	N/A	2022/08/22	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	14	N/A	2022/08/23		Auto Calc
Cation/EC Ratio (1)	2	N/A	2022/08/24		Auto Calc
Chloride (Soluble) (1)	2	2022/08/24	2022/08/24	AB SOP-00033 / AB SOP-00020	SM 23-4500-Cl-E m
Hexavalent Chromium (1, 3)	2	2022/08/22	2022/08/22	AB SOP-00063	SM 23 3500-Cr B m
Conductivity @25C (Soluble) (1)	2	2022/08/24	2022/08/24	AB SOP-00033 / AB SOP-00004	SM 23 2510 B m
CCME Hydrocarbons (F2-F4 in soil) (1, 4)	14	2022/08/23	2022/08/23	AB SOP-00036	CCME PHC-CWS m
Elements by ICPMS - Soils (1)	2	2022/08/21	2022/08/21	AB SOP-00001 / AB SOP-00043	EPA 6020b R2 m
Sum of Cations, Anions (1)	2	N/A	2022/08/24		Auto Calc
Moisture (1)	14	N/A	2022/08/23	AB SOP-00002	CCME PHC-CWS m
Benzo[a]pyrene Equivalency (1)	2	N/A	2022/08/23		Auto Calc
PAH in Soil by GC/MS (1)	2	2022/08/22	2022/08/23	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
pH @25C (1:2 Calcium Chloride Extract) (1)	2	2022/08/21	2022/08/21	AB SOP-00033 / AB SOP-00006	SM 23 4500 H+B m
Sodium Adsorption Ratio (1)	2	N/A	2022/08/24		Auto Calc
Soluble Ions (1)	2	2022/08/24	2022/08/24	AB SOP-00033 / AB SOP-00042	EPA 6010d R5 m
Soluble Paste (1)	2	2022/08/24	2022/08/24	AB SOP-00033	Carter 2nd ed 15.2 m
Soluble Ions Calculation (1)	2	N/A	2022/08/21		Auto Calc
Theoretical Gypsum Requirement (1, 5)	2	N/A	2022/08/24		Auto Calc

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession



Your P.O. #: 22525414-1000-1104
 Your Project #: 22525414-1000
 Site Location: CAMPFUR WELL
 Your C.O.C. #: 1 of 2, 2 OF 2

Attention: AURELIE BELLAVANCE

GOLDER ASSOCIATES LTD
 CALGARY - NATIONAL CONTRACT
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/09/15
 Report #: R3233080
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C262079

Received: 2022/08/17, 12:45

using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
- (2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
- (3) Some soil samples may react with the Cr(VI) spike reducing it to Cr(III). These samples are highly unlikely to contain native hexavalent chromium. Thus a failed spike recovery does not invalidate a negative result on the native sample.
- (4) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Validation of Performance-Based Alternative Methods September 2003. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
- (5) TGR calculation is based on a theoretical SAR of 4. Salt Contamination and Assessment and remediation guideline 2001 recommended SAR is ranging 4-8. TGR is reported in tonnes/ha.

Encryption Key



Bureau Veritas
 15 Sep 2022 16:18:12

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
 Cynny Hagen, Key Account Specialist
 Email: Cynny.HAGEN@bureauveritas.com
 Phone# (403)735-2273

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



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY347	AZY347		AZY348		AZY349		AZY350		
Sampling Date		2022/08/12 08:00	2022/08/12 08:00		2022/08/12 08:15		2022/08/12 08:30		2022/08/12 08:45		
COC Number		1 of 2	1 of 2		1 of 2		1 of 2		1 of 2		
	UNITS	BH22-14-01	BH22-14-01 Lab-Dup	RDL	BH22-14-02	RDL	BH22-14-03	RDL	MW22-13-01	RDL	QC Batch

Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/kg	24 (1)	N/A	22	45 (1)	27	39	10	34 (1)	29	A690209
F3 (C16-C34 Hydrocarbons)	mg/kg	700 (1)	N/A	110	2000 (1)	140	440	50	850 (1)	150	A690209
F4 (C34-C50 Hydrocarbons)	mg/kg	190 (1)	N/A	110	810 (1)	140	190	50	350 (1)	150	A690209
Reached Baseline at C50	mg/kg	Yes	N/A	N/A	Yes	N/A	Yes	N/A	Yes	N/A	A690209

Physical Properties											
Moisture	%	54	N/A	0.30	63	0.30	30	0.30	66	0.30	A690290

Volatiles											
Xylenes (Total)	mg/kg	<0.22	N/A	0.22	<0.14	0.14	<0.045	0.045	<0.21	0.21	A687849
F1 (C6-C10) - BTEX	mg/kg	<36	N/A	36	<22	22	<10	10	<35	35	A687849

Field Preserved Volatiles											
Benzene	mg/kg	<0.023 (2)	<0.023	0.023	<0.014 (2)	0.014	<0.0050	0.0050	<0.023 (2)	0.023	A689486
Toluene	mg/kg	<0.089 (2)	<0.089	0.089	3.9 (3)	0.15	0.66	0.050	<0.087 (2)	0.087	A689486
Ethylbenzene	mg/kg	<0.035 (2)	<0.035	0.035	<0.022 (2)	0.022	<0.010	0.010	<0.034 (2)	0.034	A689486
m & p-Xylene	mg/kg	<0.20 (3)	<0.20	0.20	<0.12 (3)	0.12	<0.040	0.040	<0.19 (3)	0.19	A689486
o-Xylene	mg/kg	<0.098 (3)	<0.098	0.098	<0.060 (3)	0.060	<0.020	0.020	<0.095 (3)	0.095	A689486
F1 (C6-C10)	mg/kg	<36 (2)	<36	36	<22 (2)	22	<10	10	<35 (2)	35	A689486

Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	95	100	N/A	95	N/A	96	N/A	95	N/A	A689486
4-Bromofluorobenzene (sur.)	%	102	100	N/A	102	N/A	102	N/A	102	N/A	A689486
D10-o-Xylene (sur.)	%	97	93	N/A	114	N/A	102	N/A	110	N/A	A689486
D4-1,2-Dichloroethane (sur.)	%	106	103	N/A	106	N/A	107	N/A	108	N/A	A689486
O-TERPHENYL (sur.)	%	99	N/A	N/A	94	N/A	103	N/A	99	N/A	A690209

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.

(2) Detection limit reported based on MDL and sample weight used for analysis.

(3) Detection limits raised based on sample weight used for analysis.



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY351	AZY351		AZY352		AZY353	AZY354		
Sampling Date		2022/08/12 08:50	2022/08/12 08:50		2022/08/12 09:15		2022/08/12 09:30	2022/08/12 09:45		
COC Number		1 of 2	1 of 2		1 of 2		1 of 2	1 of 2		
	UNITS	MW22-13-02	MW22-13-02 Lab-Dup	RDL	BH22-15-01	RDL	BH22-15-02	BH22-15-03	RDL	QC Batch

Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	140 (1)	N/A	58	54 (1)	26	<10	<10	10	A690209
F3 (C16-C34 Hydrocarbons)	mg/kg	2800 (1)	N/A	290	740 (1)	130	51	<50	50	A690209
F4 (C34-C50 Hydrocarbons)	mg/kg	1000 (1)	N/A	290	270 (1)	130	<50	<50	50	A690209
Reached Baseline at C50	mg/kg	Yes	N/A	N/A	Yes	N/A	Yes	Yes	N/A	A690209

Physical Properties										
Moisture	%	83	83	0.30	61	0.30	15	17	0.30	A690290

Volatiles										
Xylenes (Total)	mg/kg	<0.41	N/A	0.41	<0.24	0.24	<0.045	<0.045	0.045	A687849
F1 (C6-C10) - BTEX	mg/kg	<68	N/A	68	<40	40	<10	<10	10	A687849

Field Preserved Volatiles										
Benzene	mg/kg	<0.044 (2)	N/A	0.044	<0.026 (2)	0.026	<0.0050	<0.0050	0.0050	A689486
Toluene	mg/kg	3.7 (3)	N/A	0.46	<0.098 (2)	0.098	<0.050	<0.050	0.050	A689486
Ethylbenzene	mg/kg	<0.066 (2)	N/A	0.066	<0.039 (2)	0.039	<0.010	<0.010	0.010	A689486
m & p-Xylene	mg/kg	<0.37 (3)	N/A	0.37	<0.22 (3)	0.22	<0.040	<0.040	0.040	A689486
o-Xylene	mg/kg	<0.18 (3)	N/A	0.18	<0.11 (3)	0.11	<0.020	<0.020	0.020	A689486
F1 (C6-C10)	mg/kg	<68 (2)	N/A	68	<40 (2)	40	<10	<10	10	A689486

Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95	N/A	N/A	95	N/A	94	96	N/A	A689486
4-Bromofluorobenzene (sur.)	%	103	N/A	N/A	102	N/A	102	102	N/A	A689486
D10-o-Xylene (sur.)	%	110	N/A	N/A	114	N/A	121	117	N/A	A689486
D4-1,2-Dichloroethane (sur.)	%	106	N/A	N/A	107	N/A	110	106	N/A	A689486
O-TERPHENYL (sur.)	%	99	N/A	N/A	96	N/A	100	98	N/A	A690209

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

(1) Detection limits raised due to high moisture content, sample contains => 50% moisture.

(2) Detection limit reported based on MDL and sample weight used for analysis.

(3) Detection limits raised based on sample weight used for analysis.



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY355		AZY356		AZY357		AZY358		
Sampling Date		2022/08/12 09:45		2022/08/12 10:00		2022/08/12 10:15		2022/08/12 10:30		
COC Number		1 of 2		1 of 2		1 of 2		1 of 2		
	UNITS	DUPL	RDL	MW-22-16-01	RDL	MW22-16-02	RDL	BH22-12-01	RDL	QC Batch
Ext. Pet. Hydrocarbon										
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	11	10	<10	10	<55 (1)	55	A690209
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	310	50	<50	50	1600 (1)	270	A690209
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	80	50	<50	50	430 (1)	270	A690209
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	Yes	N/A	Yes	N/A	A690209
Physical Properties										
Moisture	%	16	0.30	44	0.30	11	0.30	82	0.30	A690290
Volatiles										
Xylenes (Total)	mg/kg	<0.045	0.045	<0.12	0.12	<0.045	0.045	<0.37	0.37	A687849
F1 (C6-C10) - BTEX	mg/kg	<10	10	<21	21	<10	10	<61	61	A687849
Field Preserved Volatiles										
Benzene	mg/kg	<0.0050	0.0050	<0.013 (2)	0.013	<0.0050	0.0050	<0.039 (2)	0.039	A689486
Toluene	mg/kg	<0.050	0.050	<0.051 (2)	0.051	<0.050	0.050	9.9 (3)	0.41	A689486
Ethylbenzene	mg/kg	<0.010	0.010	<0.020 (2)	0.020	<0.010	0.010	<0.059 (2)	0.059	A689486
m & p-Xylene	mg/kg	<0.040	0.040	<0.11 (3)	0.11	<0.040	0.040	<0.33 (3)	0.33	A689486
o-Xylene	mg/kg	<0.020	0.020	<0.056 (3)	0.056	<0.020	0.020	<0.16 (3)	0.16	A689486
F1 (C6-C10)	mg/kg	<10	10	<21 (2)	21	<10	10	<61 (2)	61	A689486
Surrogate Recovery (%)										
1,4-Difluorobenzene (sur.)	%	95	N/A	96	N/A	96	N/A	96	N/A	A689486
4-Bromofluorobenzene (sur.)	%	102	N/A	101	N/A	102	N/A	102	N/A	A689486
D10-o-Xylene (sur.)	%	112	N/A	98	N/A	109	N/A	107	N/A	A689486
D4-1,2-Dichloroethane (sur.)	%	106	N/A	107	N/A	107	N/A	108	N/A	A689486
O-TERPHENYL (sur.)	%	105	N/A	108	N/A	103	N/A	93	N/A	A690209
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to high moisture content, sample contains => 50% moisture. (2) Detection limit reported based on MDL and sample weight used for analysis. (3) Detection limits raised based on sample weight used for analysis.										



AT1 BTEX AND F1-F4 IN SOIL (VIALS)

Bureau Veritas ID		AZY383		AZY385		
Sampling Date		2022/08/12 10:30		2022/08/12 10:30		
COC Number		2 OF 2		2 OF 2		
	UNITS	BH22-12-02	RDL	BH22-12-03	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/kg	<60 (1)	60	<10	10	A690209
F3 (C16-C34 Hydrocarbons)	mg/kg	330 (1)	300	64	50	A690209
F4 (C34-C50 Hydrocarbons)	mg/kg	<300 (1)	300	<50	50	A690209
Reached Baseline at C50	mg/kg	Yes	N/A	Yes	N/A	A690209
Physical Properties						
Moisture	%	83	0.30	23	0.30	A690290
Volatiles						
Xylenes (Total)	mg/kg	<0.40	0.40	<0.093	0.093	A687849
F1 (C6-C10) - BTEX	mg/kg	<66	66	<21	21	A687849
Field Preserved Volatiles						
Benzene	mg/kg	<0.042 (2)	0.042	<0.010 (2)	0.010	A689486
Toluene	mg/kg	3.7 (3)	0.44	<0.10 (3)	0.10	A689486
Ethylbenzene	mg/kg	<0.064 (2)	0.064	<0.015 (2)	0.015	A689486
m & p-Xylene	mg/kg	<0.36 (3)	0.36	<0.084 (3)	0.084	A689486
o-Xylene	mg/kg	<0.18 (3)	0.18	<0.042 (3)	0.042	A689486
F1 (C6-C10)	mg/kg	<66 (2)	66	<21 (3)	21	A689486
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	95	N/A	96	N/A	A689486
4-Bromofluorobenzene (sur.)	%	102	N/A	102	N/A	A689486
D10-o-Xylene (sur.)	%	114	N/A	106	N/A	A689486
D4-1,2-Dichloroethane (sur.)	%	107	N/A	106	N/A	A689486
O-TERPHENYL (sur.)	%	104	N/A	104	N/A	A690209
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to high moisture content, sample contains => 50% moisture. (2) Detection limit reported based on MDL and sample weight used for analysis. (3) Detection limits raised based on sample weight used for analysis.						



SOIL SALINITY 4 (SOIL)

Bureau Veritas ID		AZY350		AZY351		
Sampling Date		2022/08/12 08:45		2022/08/12 08:50		
COC Number		1 of 2		1 of 2		
	UNITS	MW22-13-01	RDL	MW22-13-02	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	1.3	N/A	0.98	N/A	A687815
Cation Sum	meq/L	4.8	N/A	3.1	N/A	A687815
Cation/EC Ratio	N/A	9.3	0.10	12	0.10	A687813
Calculated Calcium (Ca)	mg/kg	200	6.9	48	3.6	A687858
Calculated Magnesium (Mg)	mg/kg	62	4.6	20	2.4	A687858
Calculated Sodium (Na)	mg/kg	140	11	76	6.0	A687858
Calculated Potassium (K)	mg/kg	28	6.0	4.9	3.1	A687858
Calculated Chloride (Cl)	mg/kg	100	46	50	24	A687858
Calculated Sulphate (SO4)	mg/kg	150	23	46	12	A687858
Soluble Parameters						
Soluble Chloride (Cl)	mg/L	22	10	21	10	A692392
Soluble Conductivity	dS/m	0.52	0.020	0.26	0.020	A692710
Soluble (CaCl2) pH	pH	4.73 (1)	N/A	4.87 (1)	N/A	A688560
Sodium Adsorption Ratio	N/A	1.0	0.10	1.5	0.10	A687856
Soluble Calcium (Ca)	mg/L	45	1.5	20	1.5	A692713
Soluble Magnesium (Mg)	mg/L	14	1.0	8.3	1.0	A692713
Soluble Sodium (Na)	mg/L	30	2.5	32	2.5	A692713
Soluble Potassium (K)	mg/L	6.1	1.3	2.0	1.3	A692713
Saturation %	%	460	N/A	240	N/A	A690241
Soluble Sulphate (SO4)	mg/L	32	5.0	19	5.0	A692713
Theoretical Gypsum Requirement	tonnes/ha	<0.20	0.20	<0.20	0.20	A687817
RDL = Reportable Detection Limit N/A = Not Applicable (1) pH was done on a 10:1 Calcium Chloride to soil ratio due to the matrix of the sample.						



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

CCME REGULATED METALS - SOILS (SOIL)

Bureau Veritas ID		AZY350		AZY351		
Sampling Date		2022/08/12 08:45		2022/08/12 08:50		
COC Number		1 of 2		1 of 2		
	UNITS	MW22-13-01	RDL	MW22-13-02	RDL	QC Batch
Elements						
Soluble (Hot water) Boron (B)	mg/kg	1.2	0.10	0.29	0.10	A689874
Hex. Chromium (Cr 6+)	mg/kg	<0.23 (1)	0.23	<0.47 (1)	0.47	A689719
Total Antimony (Sb)	mg/kg	<1.0	1.0	<1.0	1.0	A688596
Total Arsenic (As)	mg/kg	2.3	2.0	<2.0	2.0	A688596
Total Barium (Ba)	mg/kg	190	2.0	160	2.0	A688596
Total Beryllium (Be)	mg/kg	<0.80	0.80	<0.80	0.80	A688596
Total Cadmium (Cd)	mg/kg	0.28	0.10	0.16	0.10	A688596
Total Chromium (Cr)	mg/kg	11	2.0	12	2.0	A688596
Total Cobalt (Co)	mg/kg	2.7	1.0	1.8	1.0	A688596
Total Copper (Cu)	mg/kg	5.7	2.0	3.7	2.0	A688596
Total Lead (Pb)	mg/kg	2.2	1.0	3.0	1.0	A688596
Total Mercury (Hg)	mg/kg	<0.10	0.10	<0.10	0.10	A688596
Total Molybdenum (Mo)	mg/kg	2.7	0.80	1.9	0.80	A688596
Total Nickel (Ni)	mg/kg	8.4	2.0	8.5	2.0	A688596
Total Selenium (Se)	mg/kg	1.1	1.0	<1.0	1.0	A688596
Total Silver (Ag)	mg/kg	<0.40	0.40	<0.40	0.40	A688596
Total Thallium (Tl)	mg/kg	<0.20	0.20	<0.20	0.20	A688596
Total Tin (Sn)	mg/kg	<2.0	2.0	<2.0	2.0	A688596
Total Uranium (U)	mg/kg	0.60	0.40	0.97	0.40	A688596
Total Vanadium (V)	mg/kg	8.9	2.0	7.0	2.0	A688596
Total Zinc (Zn)	mg/kg	<20	20	<20	20	A688596
RDL = Reportable Detection Limit						
(1) Detection limits raised due to high moisture content, samples contain => 50% moisture.						



SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		AZY350			AZY351		
Sampling Date		2022/08/12 08:45			2022/08/12 08:50		
COC Number		1 of 2			1 of 2		
	UNITS	MW22-13-01	RDL	QC Batch	MW22-13-02	RDL	QC Batch
Polycyclic Aromatics							
Acenaphthene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
B[a]P TPE Total Potency Equivalents	mg/kg	0.040	0.019	A687230	<0.038	0.038	A687907
Acenaphthylene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Acridine	mg/kg	0.11 (1)	0.026	A689763	0.19 (1)	0.053	A689763
Anthracene	mg/kg	<0.010 (1)	0.010	A689763	<0.021 (1)	0.021	A689763
Benzo(a)anthracene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Benzo(b&j)fluoranthene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Benzo(k)fluoranthene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Benzo(g,h,i)perylene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Benzo(c)phenanthrene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Benzo(a)pyrene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Benzo(e)pyrene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Chrysene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Dibenz(a,h)anthracene	mg/kg	0.031 (2)	0.013	A689763	<0.027 (1)	0.027	A689763
Fluoranthene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Fluorene	mg/kg	<0.013 (1)	0.013	A689763	0.070 (1)	0.027	A689763
Indeno(1,2,3-cd)pyrene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
1-Methylnaphthalene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
2-Methylnaphthalene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Naphthalene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Phenanthrene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Perylene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Pyrene	mg/kg	<0.013 (1)	0.013	A689763	<0.027 (1)	0.027	A689763
Quinoline	mg/kg	<0.026 (1)	0.026	A689763	<0.053 (1)	0.053	A689763
Surrogate Recovery (%)							
D10-ANTHRACENE (sur.)	%	120	N/A	A689763	105	N/A	A689763
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to high moisture content, sample contains => 50% moisture. (2) Qualifying ion outside of acceptance criteria. Results are tentatively identified and potentially biased high. In addition, detection limits raised due to high moisture content, sample contains => 50% moisture.							



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		AZY350			AZY351		
Sampling Date		2022/08/12 08:45			2022/08/12 08:50		
COC Number		1 of 2			1 of 2		
	UNITS	MW22-13-01	RDL	QC Batch	MW22-13-02	RDL	QC Batch
D8-ACENAPHTHYLENE (sur.)	%	114	N/A	A689763	94	N/A	A689763
D8-NAPHTHALENE (sur.)	%	110	N/A	A689763	94	N/A	A689763
TERPHENYL-D14 (sur.)	%	113	N/A	A689763	107	N/A	A689763
RDL = Reportable Detection Limit N/A = Not Applicable							



GENERAL COMMENTS

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

Package 1	7.0°C
-----------	-------

Version #2: Report reissued to include Shell DQR email address as per COC.

Version 3: Report reissued to amend client sample IDs, and to include Biotoluene analyses and Chromatogram review on below samples as per client request received 2022/09/07.

Sample ID:

- BH22-13-01 to MW22-13-01
- BH22-13-02 to MW22-13-02

Chromatogram review:

- BH22-12-01
- BH22-12-02
- MW22-13-01
- MW22-13-02
- BH22-14-01
- BH22-14-02
- BH22-14-03
- BH22-15-01

Biotoluene analysis:

- MW22-13-02
- BH22-12-01
- BH22-12-02
- BH22-14-02

HYDROCARBON RESEMBLANCE

The reported hydrocarbon resemblance was obtained by visual comparison of the sample chromatogram with a library of reference product chromatograms. Since variables such as the degree and type of weathering and the presence of non-petrogenic hydrocarbons cannot be duplicated in reference spectra, the resemblance information must be regarded as approximate and qualitative and as such, Bureau Veritas Laboratories can assume no liability for any conclusions drawn from these data.

Sample AZY347 [BH22-14-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY348 [BH22-14-02] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY349 [BH22-14-03] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY350 [MW22-13-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY351 [MW22-13-02] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY352 [BH22-15-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY358 [BH22-12-01] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

Sample AZY383 [BH22-12-02] : The CCME F2-F4 chromatographic peak profile is consistent with biogenic organic material (e.g. peat). Chromatograms of biogenic organic material may contain peak patterns spanning the C10 to C50 range, but they are most commonly characterized by a profile of unevenly distributed sharp peaks between C28 and C34. The impacts are not consistent with a petroleum product or crude oil.

CCME REGULATED METALS - SOILS (SOIL) Comments

Sample AZY350 [MW22-13-01] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.

Sample AZY351 [MW22-13-02] Elements by ICPMS - Soils: Detection limits raised due to sample matrix.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	A688560	STB	QC Standard	Soluble (CaCl2) pH	2022/08/21		100	%	97 - 103
	A688560	STB	Spiked Blank	Soluble (CaCl2) pH	2022/08/21		100	%	97 - 103
	A688560	STB	RPD	Soluble (CaCl2) pH	2022/08/21	0.11		%	N/A
	A688596	KGR	Matrix Spike	Total Antimony (Sb)	2022/08/21		101	%	75 - 125
				Total Arsenic (As)	2022/08/21		96	%	75 - 125
				Total Barium (Ba)	2022/08/21		NC	%	75 - 125
				Total Beryllium (Be)	2022/08/21		106	%	75 - 125
				Total Cadmium (Cd)	2022/08/21		99	%	75 - 125
				Total Chromium (Cr)	2022/08/21		106	%	75 - 125
				Total Cobalt (Co)	2022/08/21		99	%	75 - 125
				Total Copper (Cu)	2022/08/21		97	%	75 - 125
				Total Lead (Pb)	2022/08/21		98	%	75 - 125
				Total Mercury (Hg)	2022/08/21		96	%	75 - 125
				Total Molybdenum (Mo)	2022/08/21		104	%	75 - 125
				Total Nickel (Ni)	2022/08/21		94	%	75 - 125
				Total Selenium (Se)	2022/08/21		100	%	75 - 125
				Total Silver (Ag)	2022/08/21		101	%	75 - 125
				Total Thallium (Tl)	2022/08/21		100	%	75 - 125
				Total Tin (Sn)	2022/08/21		103	%	75 - 125
				Total Uranium (U)	2022/08/21		97	%	75 - 125
				Total Vanadium (V)	2022/08/21		123	%	75 - 125
				Total Zinc (Zn)	2022/08/21		99	%	75 - 125
	A688596	KGR	QC Standard	Total Antimony (Sb)	2022/08/21		112	%	15 - 182
				Total Arsenic (As)	2022/08/21		105	%	53 - 147
				Total Barium (Ba)	2022/08/21		101	%	80 - 119
				Total Cadmium (Cd)	2022/08/21		119	%	72 - 128
				Total Chromium (Cr)	2022/08/21		96	%	59 - 141
				Total Cobalt (Co)	2022/08/21		100	%	58 - 142
				Total Copper (Cu)	2022/08/21		106	%	83 - 117
				Total Lead (Pb)	2022/08/21		113	%	79 - 121
				Total Molybdenum (Mo)	2022/08/21		105	%	67 - 133
				Total Nickel (Ni)	2022/08/21		108	%	79 - 121
				Total Silver (Ag)	2022/08/21		93	%	47 - 153
				Total Tin (Sn)	2022/08/21		100	%	67 - 133
				Total Uranium (U)	2022/08/21		86	%	77 - 123
				Total Vanadium (V)	2022/08/21		102	%	79 - 121
				Total Zinc (Zn)	2022/08/21		103	%	79 - 121
	A688596	KGR	Spiked Blank	Total Antimony (Sb)	2022/08/21		104	%	80 - 120
				Total Arsenic (As)	2022/08/21		96	%	80 - 120
				Total Barium (Ba)	2022/08/21		99	%	80 - 120
				Total Beryllium (Be)	2022/08/21		98	%	80 - 120
				Total Cadmium (Cd)	2022/08/21		96	%	80 - 120
				Total Chromium (Cr)	2022/08/21		100	%	80 - 120
				Total Cobalt (Co)	2022/08/21		101	%	80 - 120
				Total Copper (Cu)	2022/08/21		100	%	80 - 120
				Total Lead (Pb)	2022/08/21		100	%	80 - 120
				Total Mercury (Hg)	2022/08/21		100	%	80 - 120
				Total Molybdenum (Mo)	2022/08/21		99	%	80 - 120
				Total Nickel (Ni)	2022/08/21		100	%	80 - 120
				Total Selenium (Se)	2022/08/21		101	%	80 - 120
				Total Silver (Ag)	2022/08/21		98	%	80 - 120
				Total Thallium (Tl)	2022/08/21		99	%	80 - 120



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits			
A688596	KGR	Method Blank	Total Tin (Sn)	2022/08/21		98	%	80 - 120			
			Total Uranium (U)	2022/08/21		99	%	80 - 120			
			Total Vanadium (V)	2022/08/21		100	%	80 - 120			
			Total Zinc (Zn)	2022/08/21		97	%	80 - 120			
			Total Antimony (Sb)	2022/08/21	<0.50		mg/kg				
			Total Arsenic (As)	2022/08/21	<1.0		mg/kg				
			Total Barium (Ba)	2022/08/21	<1.0		mg/kg				
			Total Beryllium (Be)	2022/08/21	<0.40		mg/kg				
			Total Cadmium (Cd)	2022/08/21	<0.050		mg/kg				
			Total Chromium (Cr)	2022/08/21	<1.0		mg/kg				
			Total Cobalt (Co)	2022/08/21	<0.50		mg/kg				
			Total Copper (Cu)	2022/08/21	<1.0		mg/kg				
			Total Lead (Pb)	2022/08/21	<0.50		mg/kg				
			Total Mercury (Hg)	2022/08/21	<0.050		mg/kg				
			Total Molybdenum (Mo)	2022/08/21	<0.40		mg/kg				
			Total Nickel (Ni)	2022/08/21	<1.0		mg/kg				
			Total Selenium (Se)	2022/08/21	<0.50		mg/kg				
			Total Silver (Ag)	2022/08/21	<0.20		mg/kg				
			A688596	KGR	RPD	Total Thallium (Tl)	2022/08/21	<0.10		mg/kg	
						Total Tin (Sn)	2022/08/21	<1.0		mg/kg	
Total Uranium (U)	2022/08/21	<0.20					mg/kg				
Total Vanadium (V)	2022/08/21	<1.0					mg/kg				
Total Zinc (Zn)	2022/08/21	<10					mg/kg				
Total Antimony (Sb)	2022/08/21	NC				%	30				
Total Arsenic (As)	2022/08/21	15				%	30				
Total Barium (Ba)	2022/08/21	23				%	35				
Total Beryllium (Be)	2022/08/21	6.2				%	30				
Total Cadmium (Cd)	2022/08/21	8.6				%	30				
Total Chromium (Cr)	2022/08/21	3.3				%	30				
Total Cobalt (Co)	2022/08/21	17				%	30				
Total Copper (Cu)	2022/08/21	1.6				%	30				
Total Lead (Pb)	2022/08/21	4.2				%	35				
Total Molybdenum (Mo)	2022/08/21	6.4				%	35				
Total Nickel (Ni)	2022/08/21	20				%	30				
Total Selenium (Se)	2022/08/21	NC				%	30				
Total Silver (Ag)	2022/08/21	NC				%	35				
Total Thallium (Tl)	2022/08/21	10				%	30				
A689486	WPK	Matrix Spike [AZY347-02]				Total Tin (Sn)	2022/08/21	NC	%	35	
			Total Uranium (U)	2022/08/21	3.9	%	30				
			Total Vanadium (V)	2022/08/21	0.029	%	30				
			Total Zinc (Zn)	2022/08/21	0.19	%	30				
			1,4-Difluorobenzene (sur.)	2022/08/22		91	%	50 - 140			
			4-Bromofluorobenzene (sur.)	2022/08/22		104	%	50 - 140			
			D10-o-Xylene (sur.)	2022/08/22		100	%	50 - 140			
			D4-1,2-Dichloroethane (sur.)	2022/08/22		104	%	50 - 140			
			Benzene	2022/08/22		94	%	50 - 140			
			Toluene	2022/08/22		89	%	50 - 140			
			Ethylbenzene	2022/08/22		94	%	50 - 140			
			m & p-Xylene	2022/08/22		95	%	50 - 140			
A689486	WPK	Spiked Blank	o-Xylene	2022/08/22		97	%	50 - 140			
			F1 (C6-C10)	2022/08/22		101	%	60 - 140			
			1,4-Difluorobenzene (sur.)	2022/08/22		94	%	50 - 140			



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A689486	WPK	Method Blank	4-Bromofluorobenzene (sur.)	2022/08/22		104	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/22		118	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/22		105	%	50 - 140
			Benzene	2022/08/22		122	%	60 - 130
			Toluene	2022/08/22		116	%	60 - 130
			Ethylbenzene	2022/08/22		119	%	60 - 130
			m & p-Xylene	2022/08/22		118	%	60 - 130
			o-Xylene	2022/08/22		120	%	60 - 130
			F1 (C6-C10)	2022/08/22		126	%	60 - 140
			1,4-Difluorobenzene (sur.)	2022/08/22		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2022/08/22		102	%	50 - 140
			D10-o-Xylene (sur.)	2022/08/22		112	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2022/08/22		105	%	50 - 140
			A689486	WPK	RPD [AZY347-02]	Benzene	2022/08/22	<0.0050
Toluene	2022/08/22	<0.050					mg/kg	
Ethylbenzene	2022/08/22	<0.010					mg/kg	
m & p-Xylene	2022/08/22	<0.040					mg/kg	
o-Xylene	2022/08/22	<0.020					mg/kg	
F1 (C6-C10)	2022/08/22	<10					mg/kg	
Benzene	2022/08/22	NC					%	50
Toluene	2022/08/22	NC					%	50
Ethylbenzene	2022/08/22	NC					%	50
m & p-Xylene	2022/08/22	NC					%	50
A689719	SKM	Matrix Spike	Hex. Chromium (Cr 6+)	2022/08/22		86	%	75 - 125
			Hex. Chromium (Cr 6+)	2022/08/22		97	%	80 - 120
A689719	SKM	Method Blank	Hex. Chromium (Cr 6+)	2022/08/22	<0.080		mg/kg	
A689719	SKM	RPD	Hex. Chromium (Cr 6+)	2022/08/22	NC		%	35
A689763	JU2	Matrix Spike	D10-ANTHRACENE (sur.)	2022/08/22		104	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/08/22		94	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/08/22		93	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/08/22		110	%	50 - 130
			Acenaphthene	2022/08/22		97	%	50 - 130
			Acenaphthylene	2022/08/22		96	%	50 - 130
			Acridine	2022/08/22		75	%	50 - 130
			Anthracene	2022/08/22		94	%	50 - 130
			Benzo(a)anthracene	2022/08/22		95	%	50 - 130
			Benzo(b&j)fluoranthene	2022/08/22		91	%	50 - 130
			Benzo(k)fluoranthene	2022/08/22		92	%	50 - 130
			Benzo(g,h,i)perylene	2022/08/22		101	%	50 - 130
			Benzo(c)phenanthrene	2022/08/22		94	%	50 - 130
			Benzo(a)pyrene	2022/08/22		102	%	50 - 130
			Benzo(e)pyrene	2022/08/22		85	%	50 - 130
			Chrysene	2022/08/22		92	%	50 - 130
			Dibenz(a,h)anthracene	2022/08/22		98	%	50 - 130
			Fluoranthene	2022/08/22		96	%	50 - 130
			Fluorene	2022/08/22		98	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/08/22		108	%	50 - 130
			1-Methylnaphthalene	2022/08/22		81	%	50 - 130
2-Methylnaphthalene	2022/08/22		103	%	50 - 130			
Naphthalene	2022/08/22		98	%	50 - 130			



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A689763	JU2	Spiked Blank	Phenanthrene	2022/08/22		96	%	50 - 130
			Perylene	2022/08/22		89	%	50 - 130
			Pyrene	2022/08/22		94	%	50 - 130
			Quinoline	2022/08/22		90	%	50 - 130
			D10-ANTHRACENE (sur.)	2022/08/22		105	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/08/22		95	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/08/22		96	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/08/22		130	%	50 - 130
			Acenaphthene	2022/08/22		97	%	50 - 130
			Acenaphthylene	2022/08/22		94	%	50 - 130
			Acridine	2022/08/22		64	%	50 - 130
			Anthracene	2022/08/22		91	%	50 - 130
			Benzo(a)anthracene	2022/08/22		104	%	50 - 130
			Benzo(b&j)fluoranthene	2022/08/22		99	%	50 - 130
			Benzo(k)fluoranthene	2022/08/22		115	%	50 - 130
			Benzo(g,h,i)perylene	2022/08/22		106	%	50 - 130
			Benzo(c)phenanthrene	2022/08/22		112	%	50 - 130
			Benzo(a)pyrene	2022/08/22		94	%	50 - 130
			Benzo(e)pyrene	2022/08/22		97	%	50 - 130
			Chrysene	2022/08/22		109	%	50 - 130
			Dibenz(a,h)anthracene	2022/08/22		103	%	50 - 130
			Fluoranthene	2022/08/22		94	%	50 - 130
			Fluorene	2022/08/22		96	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2022/08/22		97	%	50 - 130
1-Methylnaphthalene	2022/08/22		81	%	50 - 130			
2-Methylnaphthalene	2022/08/22		102	%	50 - 130			
Naphthalene	2022/08/22		99	%	50 - 130			
Phenanthrene	2022/08/22		91	%	50 - 130			
Perylene	2022/08/22		90	%	50 - 130			
Pyrene	2022/08/22		93	%	50 - 130			
Quinoline	2022/08/22		91	%	50 - 130			
A689763	JU2	Method Blank	D10-ANTHRACENE (sur.)	2022/08/22		97	%	50 - 130
			D8-ACENAPHTHYLENE (sur.)	2022/08/22		89	%	50 - 130
			D8-NAPHTHALENE (sur.)	2022/08/22		91	%	50 - 130
			TERPHENYL-D14 (sur.)	2022/08/22		127	%	50 - 130
			Acenaphthene	2022/08/22	<0.0050		mg/kg	
			Acenaphthylene	2022/08/22	<0.0050		mg/kg	
			Acridine	2022/08/22	<0.010		mg/kg	
			Anthracene	2022/08/22	<0.0040		mg/kg	
			Benzo(a)anthracene	2022/08/22	<0.0050		mg/kg	
			Benzo(b&j)fluoranthene	2022/08/22	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2022/08/22	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2022/08/22	<0.0050		mg/kg	
			Benzo(c)phenanthrene	2022/08/22	<0.0050		mg/kg	
			Benzo(a)pyrene	2022/08/22	<0.0050		mg/kg	
			Benzo(e)pyrene	2022/08/22	<0.0050		mg/kg	
			Chrysene	2022/08/22	<0.0050		mg/kg	
Dibenz(a,h)anthracene	2022/08/22	<0.0050		mg/kg				
Fluoranthene	2022/08/22	<0.0050		mg/kg				
Fluorene	2022/08/22	<0.0050		mg/kg				
Indeno(1,2,3-cd)pyrene	2022/08/22	<0.0050		mg/kg				
1-Methylnaphthalene	2022/08/22	<0.0050		mg/kg				



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A689763	JU2	RPD	2-Methylnaphthalene	2022/08/22	<0.0050		mg/kg	
			Naphthalene	2022/08/22	<0.0050		mg/kg	
			Phenanthrene	2022/08/22	<0.0050		mg/kg	
			Perylene	2022/08/22	<0.0050		mg/kg	
			Pyrene	2022/08/22	<0.0050		mg/kg	
			Quinoline	2022/08/22	<0.010		mg/kg	
			Acenaphthene	2022/08/22	NC		%	50
			Acenaphthylene	2022/08/22	NC		%	50
			Acridine	2022/08/22	NC		%	50
			Anthracene	2022/08/22	NC		%	50
			Benzo(a)anthracene	2022/08/22	NC		%	50
			Benzo(b&j)fluoranthene	2022/08/22	34		%	50
			Benzo(k)fluoranthene	2022/08/22	NC		%	50
			Benzo(g,h,i)perylene	2022/08/22	15		%	50
			Benzo(c)phenanthrene	2022/08/22	NC		%	50
			Benzo(a)pyrene	2022/08/22	NC		%	50
			Benzo(e)pyrene	2022/08/22	13		%	50
			Chrysene	2022/08/22	NC		%	50
			Dibenz(a,h)anthracene	2022/08/22	NC		%	50
			Fluoranthene	2022/08/22	NC		%	50
			Fluorene	2022/08/22	NC		%	50
Indeno(1,2,3-cd)pyrene	2022/08/22	21		%	50			
1-Methylnaphthalene	2022/08/22	NC		%	50			
2-Methylnaphthalene	2022/08/22	NC		%	50			
Naphthalene	2022/08/22	NC		%	50			
Phenanthrene	2022/08/22	NC		%	50			
Perylene	2022/08/22	11		%	50			
Pyrene	2022/08/22	11		%	50			
Quinoline	2022/08/22	NC		%	50			
A689874	MPU	Matrix Spike	Soluble (Hot water) Boron (B)	2022/08/24		91	%	75 - 125
A689874	MPU	Spiked Blank	Soluble (Hot water) Boron (B)	2022/08/24		98	%	80 - 120
A689874	MPU	Method Blank	Soluble (Hot water) Boron (B)	2022/08/24	<0.10		mg/kg	
A689874	MPU	RPD	Soluble (Hot water) Boron (B)	2022/08/24	17		%	35
A690209	GG3	Matrix Spike	O-TERPHENYL (sur.)	2022/08/23		90	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/23		82	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/23		89	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/23		87	%	60 - 140
A690209	GG3	Spiked Blank	O-TERPHENYL (sur.)	2022/08/23		107	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/23		86	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2022/08/23		94	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2022/08/23		92	%	60 - 140
A690209	GG3	Method Blank	O-TERPHENYL (sur.)	2022/08/23		101	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2022/08/23	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2022/08/23	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2022/08/23	<50		mg/kg	
A690209	GG3	RPD	F2 (C10-C16 Hydrocarbons)	2022/08/23	2.3		%	40
			F3 (C16-C34 Hydrocarbons)	2022/08/23	0.67		%	40
			F4 (C34-C50 Hydrocarbons)	2022/08/23	NC		%	40
			Saturation %	2022/08/23		98	%	75 - 125
A690241	JKV	QC Standard	Saturation %	2022/08/23	2.0		%	12
A690290	A1H	Method Blank	Moisture	2022/08/23	<0.30		%	
A690290	A1H	RPD [AZY351-01]	Moisture	2022/08/23	0.24		%	20



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A692392	AFI	Matrix Spike	Soluble Chloride (Cl)	2022/08/24		107	%	75 - 125
A692392	AFI	QC Standard	Soluble Chloride (Cl)	2022/08/24		96	%	75 - 125
A692392	AFI	Spiked Blank	Soluble Chloride (Cl)	2022/08/24		106	%	80 - 120
A692392	AFI	Method Blank	Soluble Chloride (Cl)	2022/08/24	<10		mg/L	
A692392	AFI	RPD	Soluble Chloride (Cl)	2022/08/24	NC		%	30
A692710	EH2	QC Standard	Soluble Conductivity	2022/08/24		101	%	75 - 125
A692710	EH2	Spiked Blank	Soluble Conductivity	2022/08/24		98	%	90 - 110
A692710	EH2	Method Blank	Soluble Conductivity	2022/08/24	<0.020		dS/m	
A692710	EH2	RPD	Soluble Conductivity	2022/08/24	5.5		%	20
A692713	MB5	Matrix Spike	Soluble Calcium (Ca)	2022/08/24		94	%	75 - 125
			Soluble Magnesium (Mg)	2022/08/24		101	%	75 - 125
			Soluble Sodium (Na)	2022/08/24		91	%	75 - 125
			Soluble Potassium (K)	2022/08/24		98	%	75 - 125
A692713	MB5	QC Standard	Soluble Calcium (Ca)	2022/08/24		102	%	75 - 125
			Soluble Magnesium (Mg)	2022/08/24		107	%	75 - 125
			Soluble Sodium (Na)	2022/08/24		97	%	75 - 125
			Soluble Potassium (K)	2022/08/24		85	%	75 - 125
			Soluble Sulphate (SO4)	2022/08/24		103	%	75 - 125
A692713	MB5	Spiked Blank	Soluble Calcium (Ca)	2022/08/24		95	%	80 - 120
			Soluble Magnesium (Mg)	2022/08/24		103	%	80 - 120
			Soluble Sodium (Na)	2022/08/24		94	%	80 - 120
			Soluble Potassium (K)	2022/08/24		98	%	80 - 120
A692713	MB5	Method Blank	Soluble Calcium (Ca)	2022/08/24	<1.5		mg/L	
			Soluble Magnesium (Mg)	2022/08/24	<1.0		mg/L	
			Soluble Sodium (Na)	2022/08/24	<2.5		mg/L	
			Soluble Potassium (K)	2022/08/24	<1.3		mg/L	
			Soluble Sulphate (SO4)	2022/08/24	<5.0		mg/L	
A692713	MB5	RPD	Soluble Calcium (Ca)	2022/08/25	66 (1)		%	30
			Soluble Magnesium (Mg)	2022/08/25	NC		%	30
			Soluble Sodium (Na)	2022/08/25	3.9		%	30
			Soluble Potassium (K)	2022/08/25	NC		%	30
			Soluble Sulphate (SO4)	2022/08/25	NC		%	30

N/A = Not Applicable

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.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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.



BUREAU
VERITAS

Bureau Veritas Job #: C262079
Report Date: 2022/09/15

GOLDER ASSOCIATES LTD
Client Project #: 22525414-1000
Site Location: CAMPFUR WELL
Your P.O. #: 22525414-1000-1104
Sampler Initials: JP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

Gita Pokhrel, Laboratory Supervisor

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

Jingyuan Song, QP, Organics – Senior Analyst

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist



Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

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

Choose Location:
 Calgary, AB: 4000 19th St. NE, TZE 698 Toll Free (800) 386-7247
 Edmonton, AB: 9331-48 St. T6B 2R4 Toll Free (800) 386-7247
 Winnipeg, MB: D-675 Berry St. R3H 1A7 Toll Free (866) 800-6208

Invoice Information
 Invoice to (requires report) Report Information (if differs from invoice)

Company: Client #254, Golder Associates
 Contact Name: Aurelie Bellavance
 Street Address: 237 - 4 Ave SW Suite 3300
 City: Calgary, AB, Postal Code: T2P 4K3

Company: Golder Associates
 Shell
 Quotation #: 22525414-100-104
 P.O. # / AFE#: 22525414-100-104
 Project #: 22525414-1000
 Site #: Camp Eut. Mcell NA
 Site Location: WESTCHESTER, NT

Canada Account Payable
 Email: aurelie.bellavance@golder.com
 Copies: Peter Tan @ wja.com

Regulatory Criteria
 AT1 CCME Drinking Water - Canada Drinking Water - Manitoba
 Saskatchewan Drinking Water - Alberta Other

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

Sample Identification	Date Sampled			Time (24hr)			Matrix	LAB FILTERED	LAB PRESERVED	LAB FILTRATION REQUIRED	PAHS	BTEX FL-F2	BARIUM TRUE TOTAL	Routine water	Regulated metals - total	Regulated metals - dissolved	Mercury - total	Mercury - dissolved	Salinity 4	Texture (% sand, silt, clay)	Basic class II landfill	LIMITED SAMPLE	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	Comments		
	YY	MM	DD	HH	MM	SS																					
1 BH22-14-01	2022	08	12	08	00	00	Soil	X			X																
2 BH22-14-02								X			X																
3 BH22-14-03								X			X																
4 MW22-13-01								X			X																
5 MW22-13-02								X			X																
6 BH22-15-01								X			X																
7 BH22-15-02								X			X																
8 BH22-15-03								X			X																
9 Dupl								X			X																
10 MW22-16-01								X			X																
11 MW22-16-02								X			X																
12 BH22-12-01								X			X																

LAB USE ONLY

Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Temperature reading by: °C

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Received by: Signature/Print
 Relinquished by: Signature/Print

Date: YY MM DD HH MM
 2022 08 14 09 15

Received by: Jason Bil
 Relinquished by: Jason Bil

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Temperature reading by: °C

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Received by: Signature/Print
 Relinquished by: Signature/Print

Date: YY MM DD HH MM
 2022 08 18 15 10

Received by: Jason Bil
 Relinquished by: Jason Bil

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Temperature reading by: °C

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Received by: Signature/Print
 Relinquished by: Signature/Print

Date: YY MM DD HH MM
 2022 08 18 15 10

Received by: Jason Bil
 Relinquished by: Jason Bil

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

Temperature reading by: °C

LAB USE ONLY
 Seal present: Yes No
 Seal intact: Yes No
 Cooling media present: Yes No

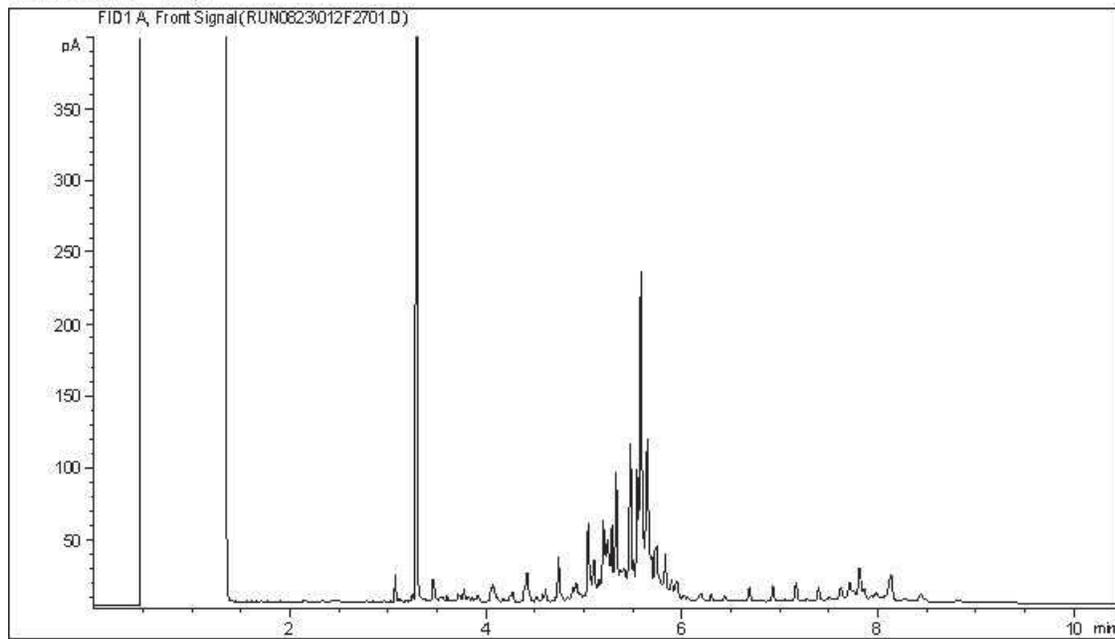
Received by: Signature/Print
 Relinquished by: Signature/Print

Date: YY MM DD HH MM
 2022 08 18 15 10

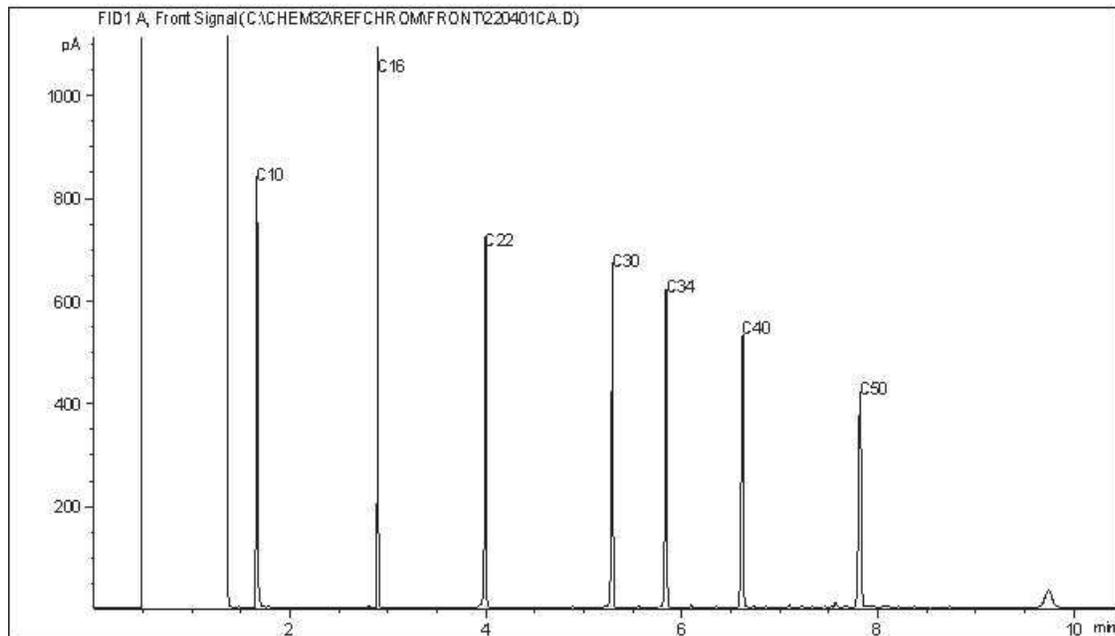
Received by: Jason Bil
 Relinquished by: Jason Bil

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC20



Carbon Range Distribution - Reference Chromatogram



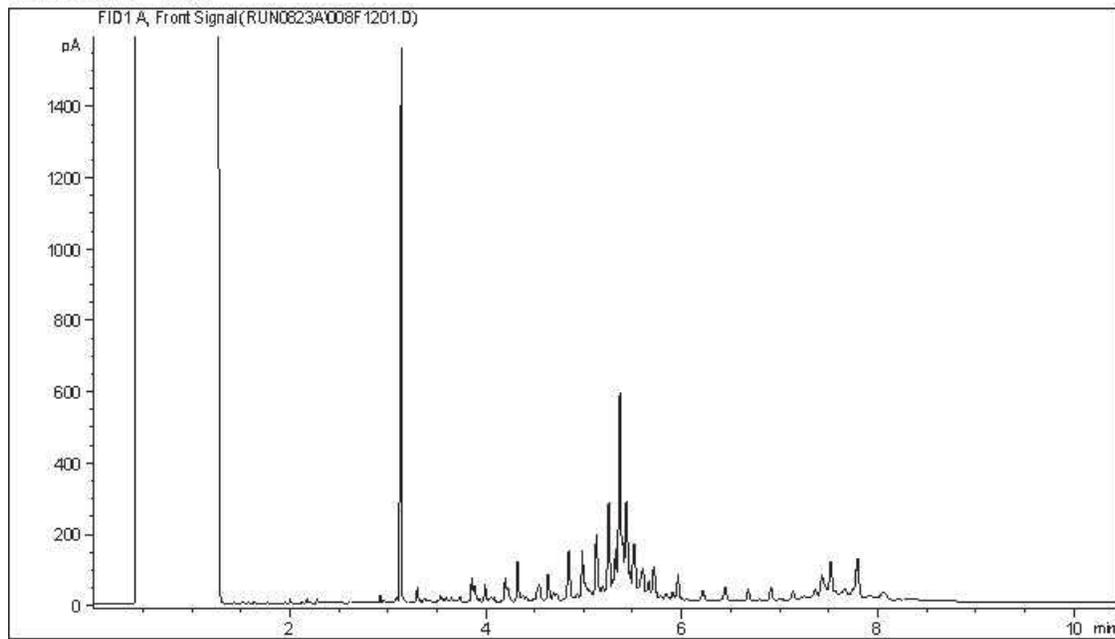
TYPICAL PRODUCT CARBON NUMBER RANGES

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

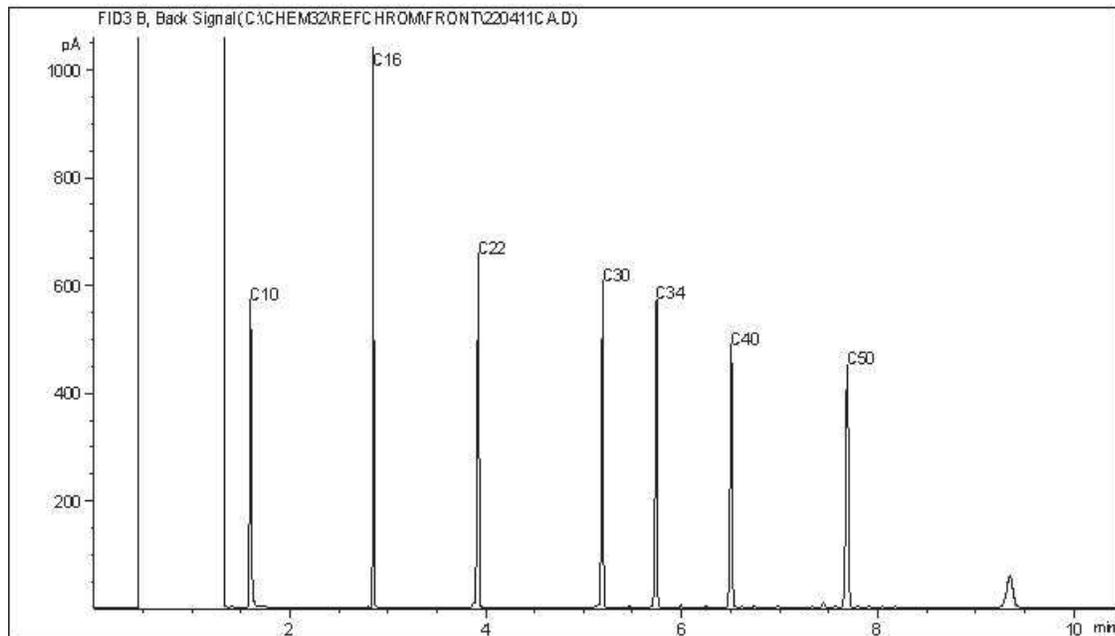
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



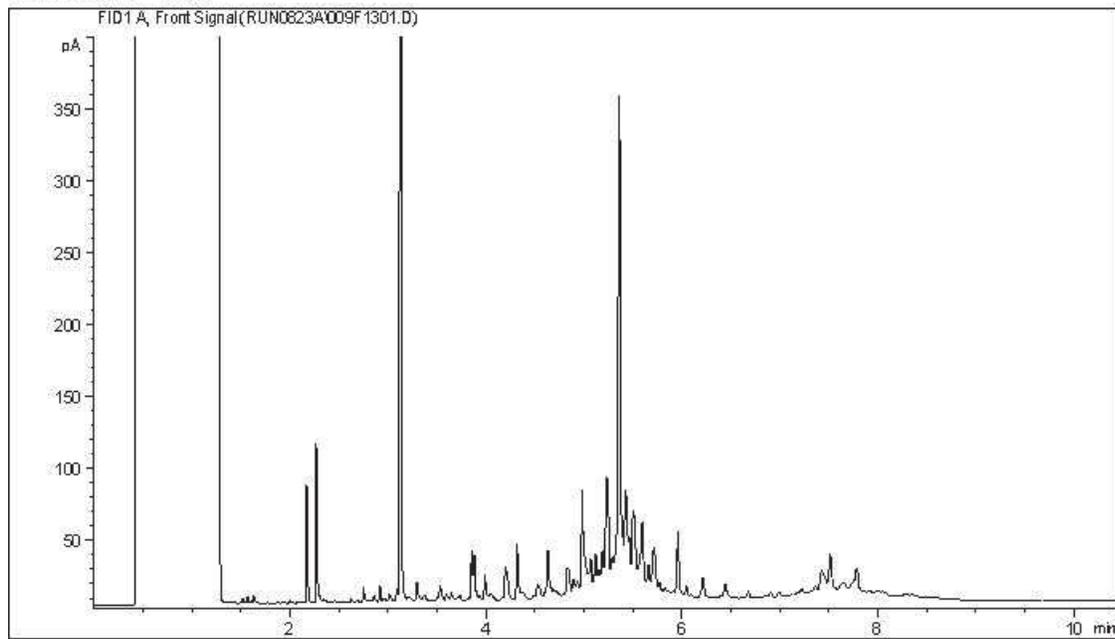
TYPICAL PRODUCT CARBON NUMBER RANGES

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

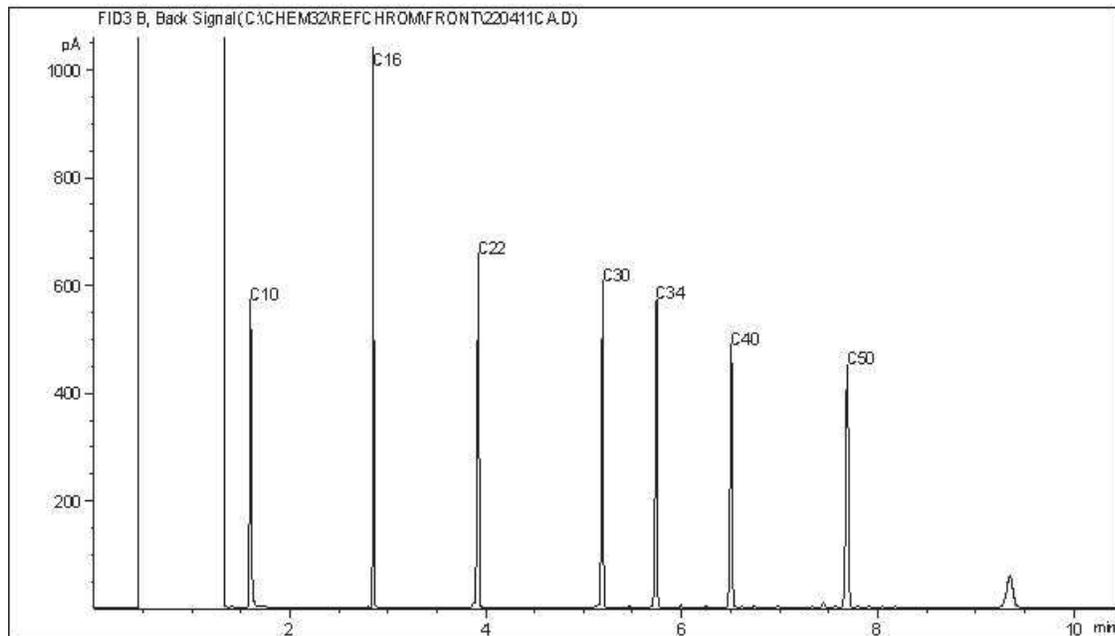
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



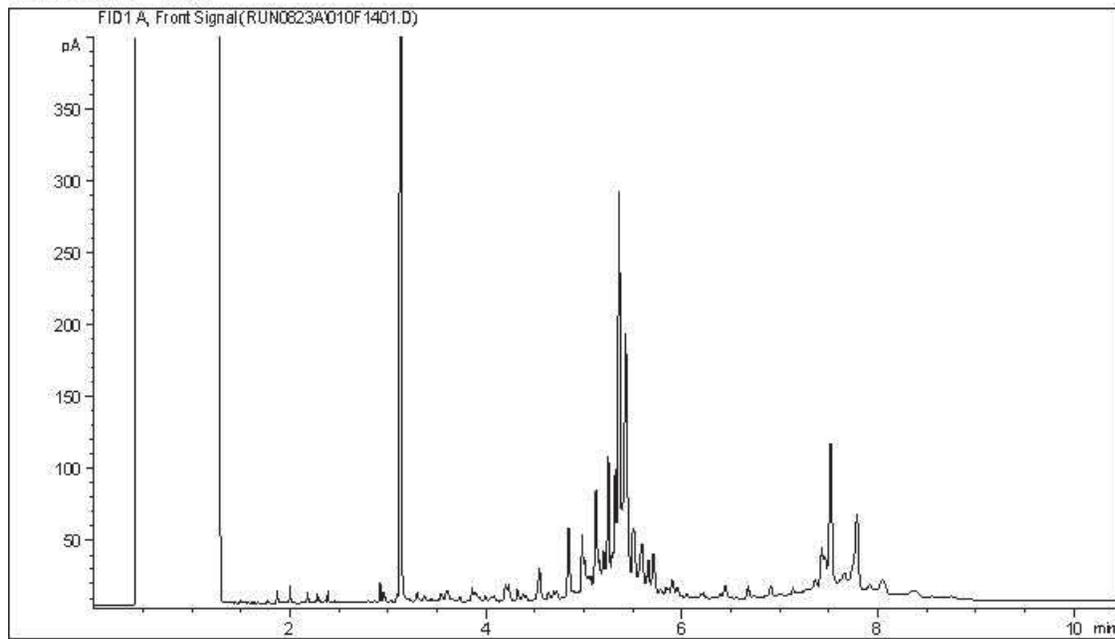
TYPICAL PRODUCT CARBON NUMBER RANGES

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

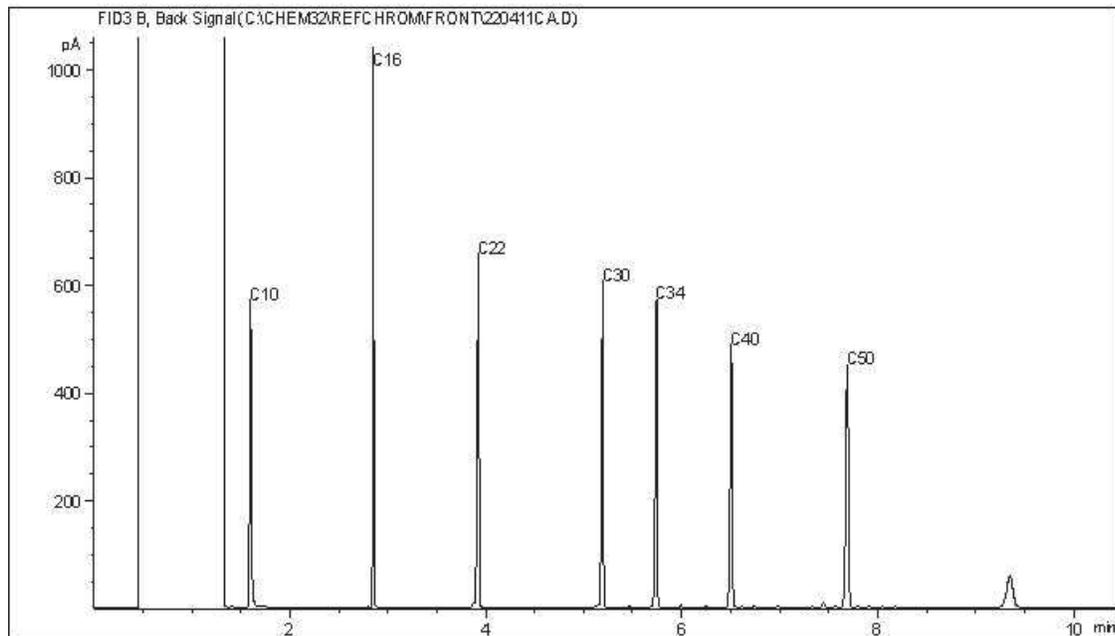
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



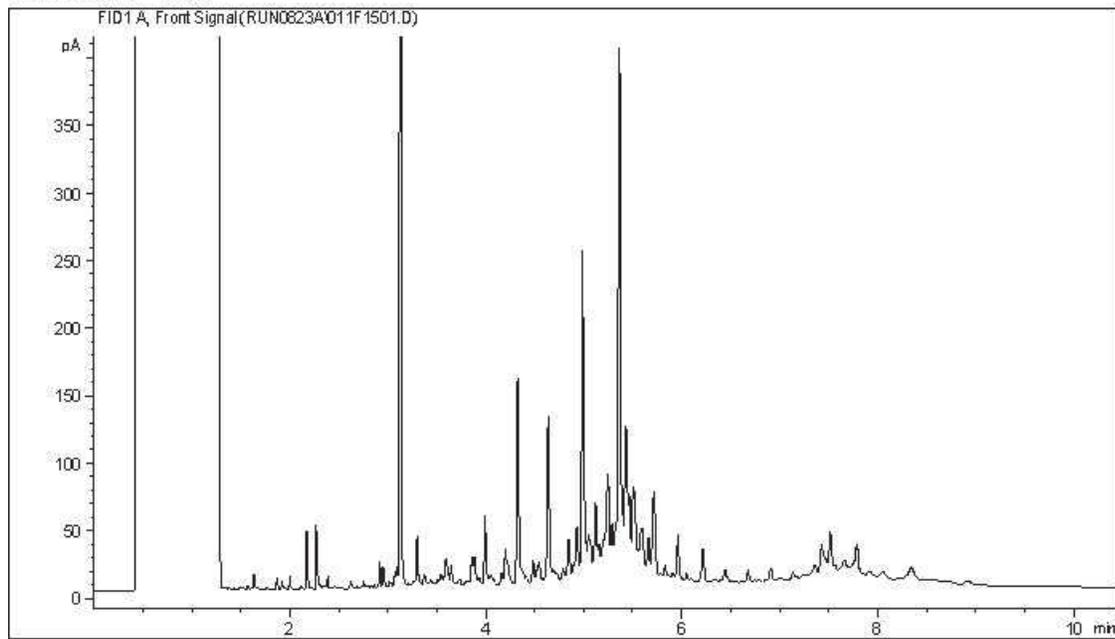
TYPICAL PRODUCT CARBON NUMBER RANGES

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

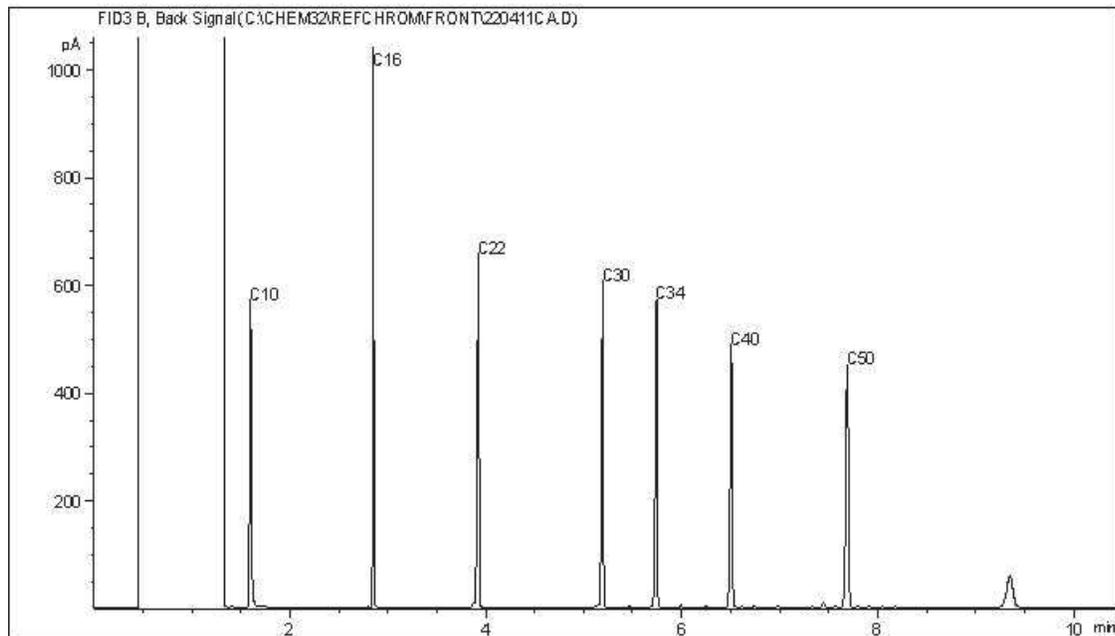
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



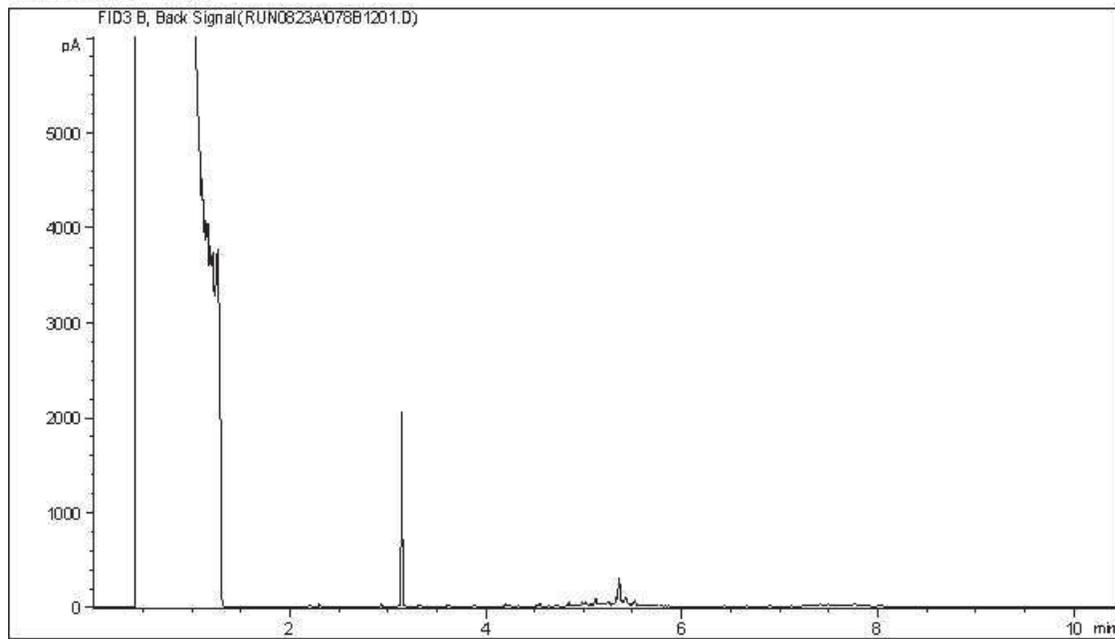
TYPICAL PRODUCT CARBON NUMBER RANGES

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

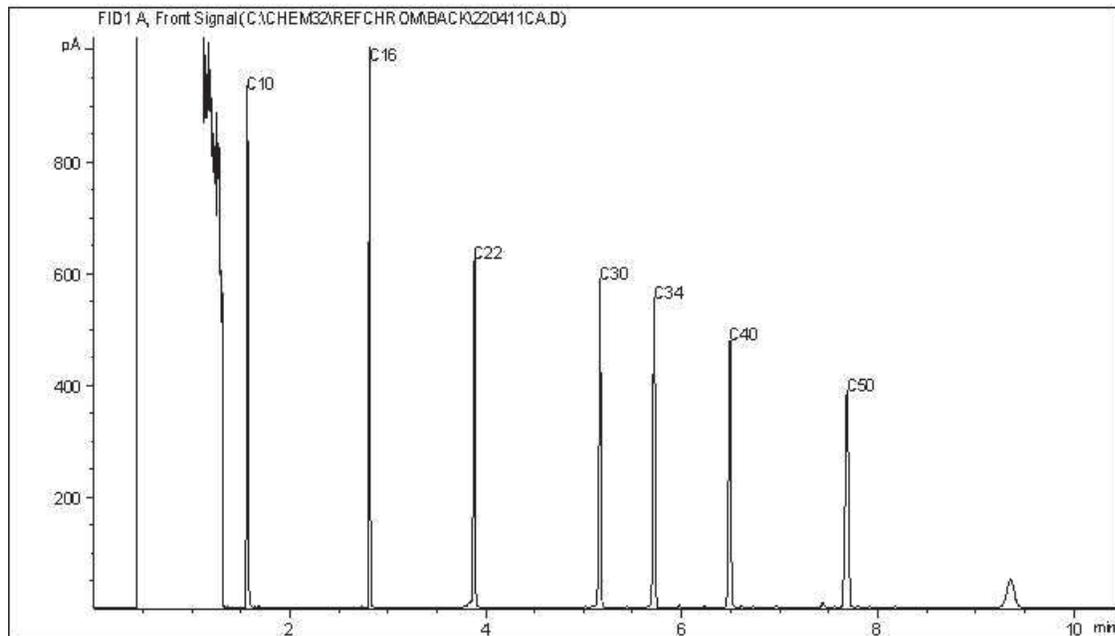
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



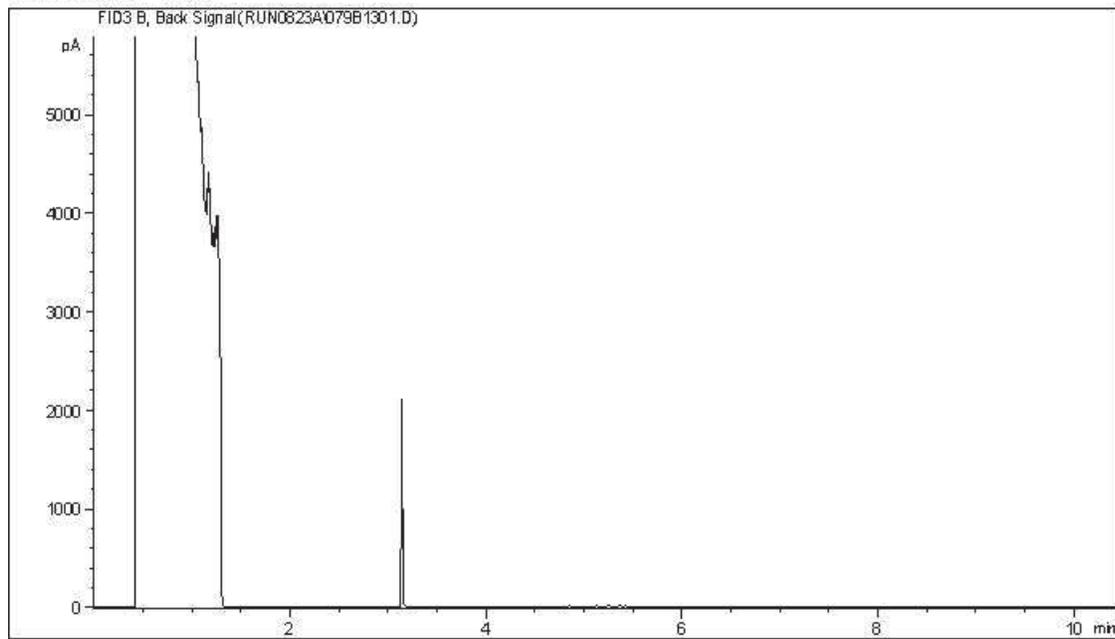
TYPICAL PRODUCT CARBON NUMBER RANGES

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

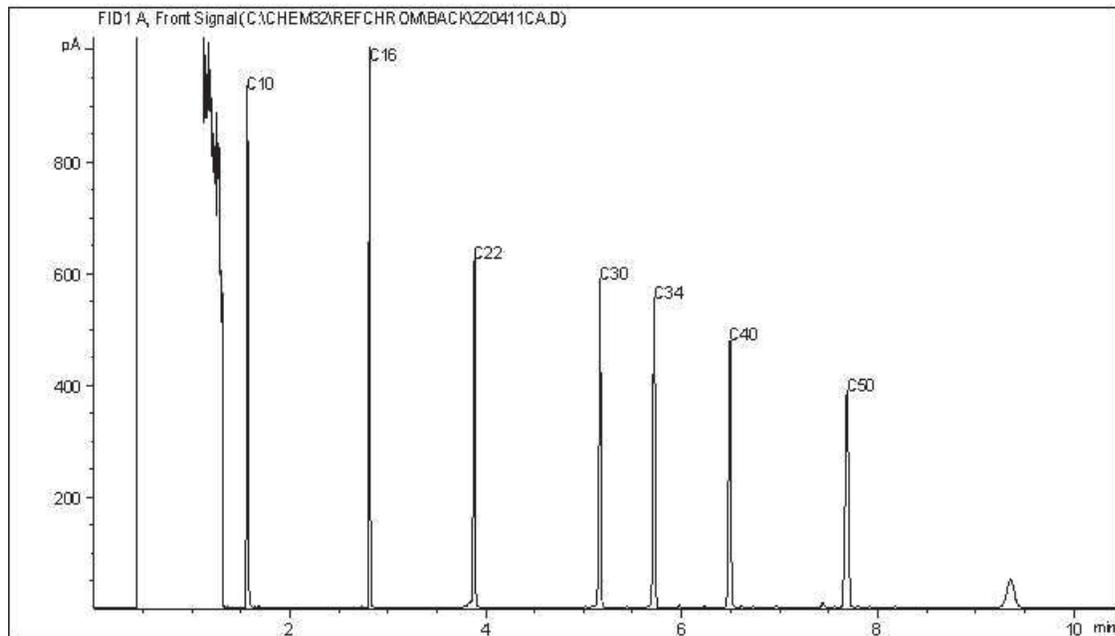
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



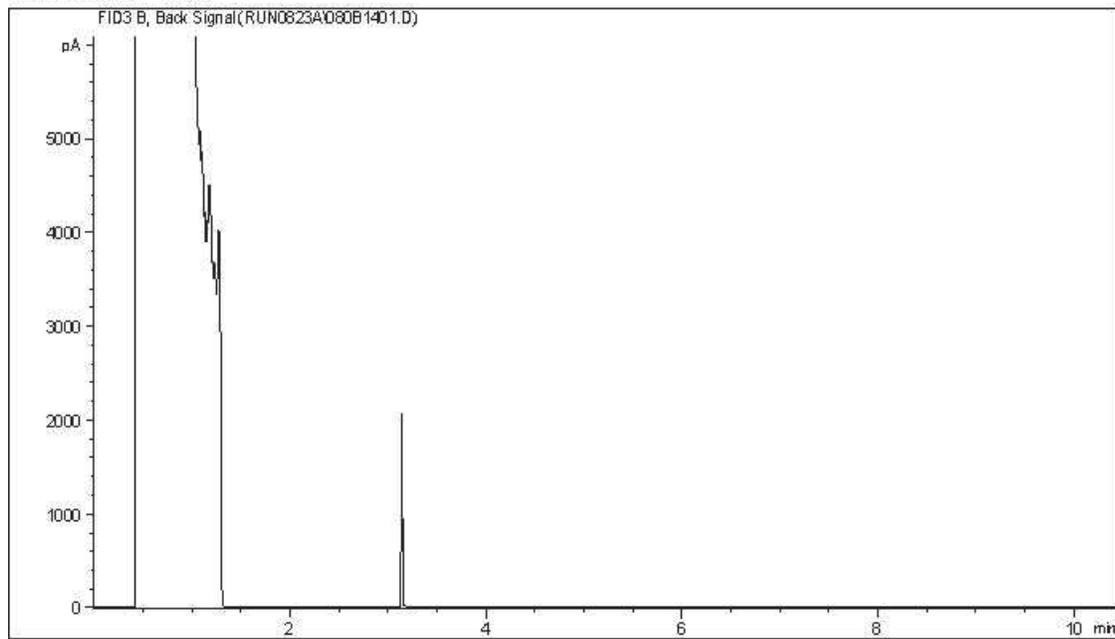
TYPICAL PRODUCT CARBON NUMBER RANGES

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

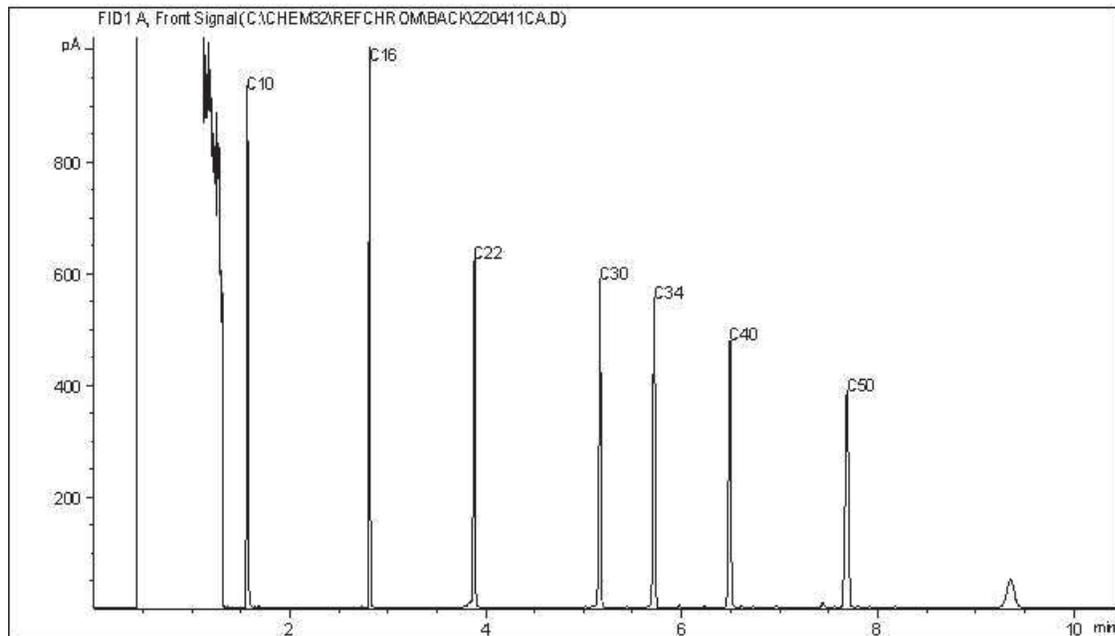
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



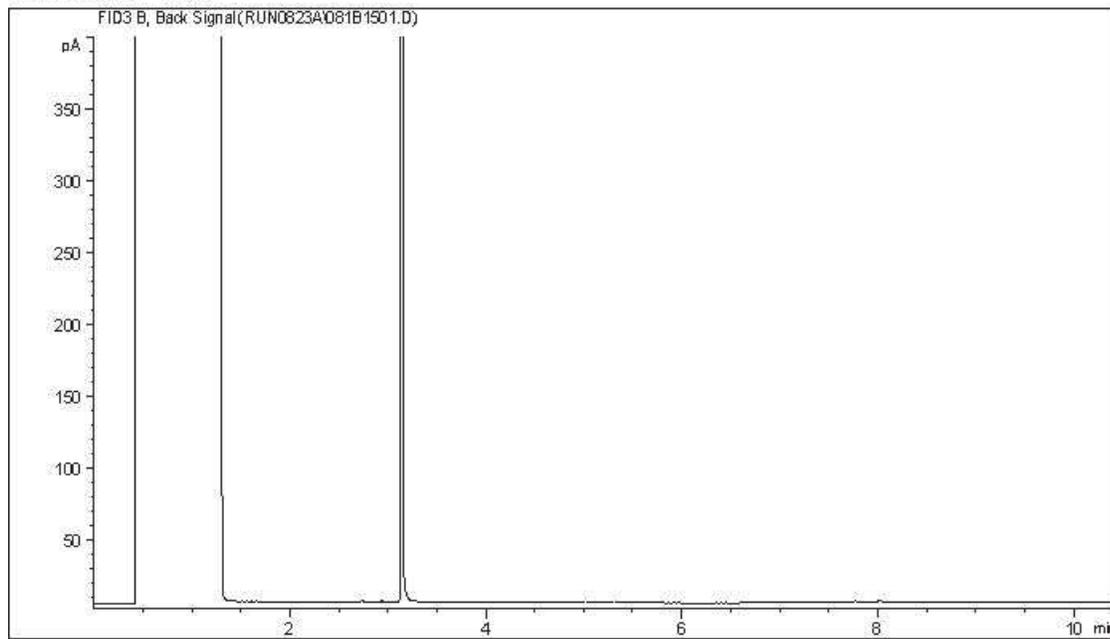
TYPICAL PRODUCT CARBON NUMBER RANGES

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

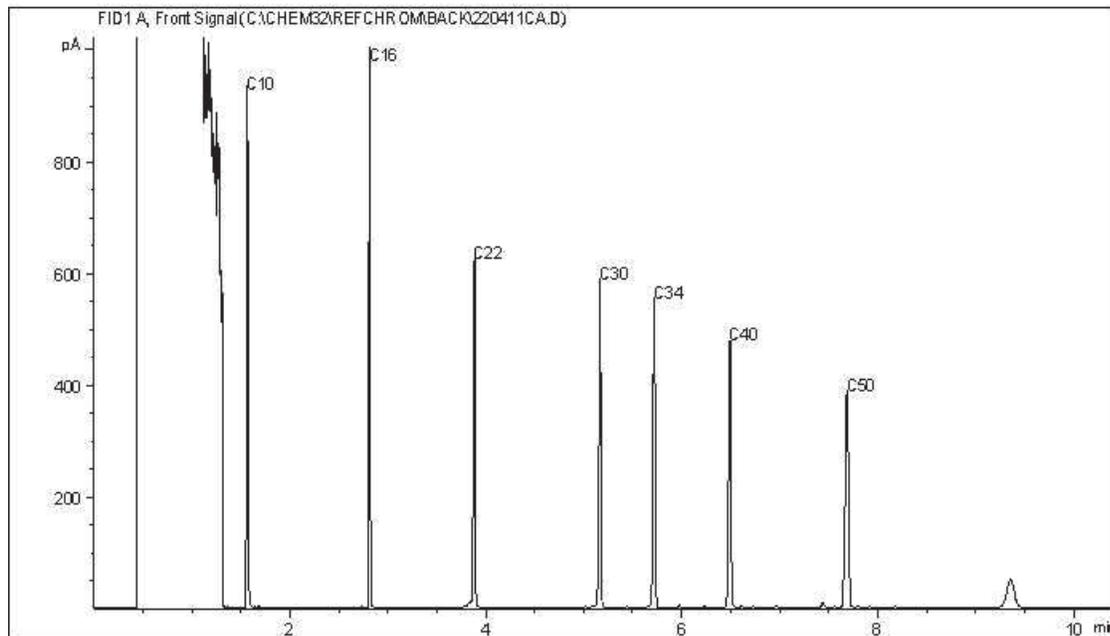
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC19



Carbon Range Distribution - Reference Chromatogram



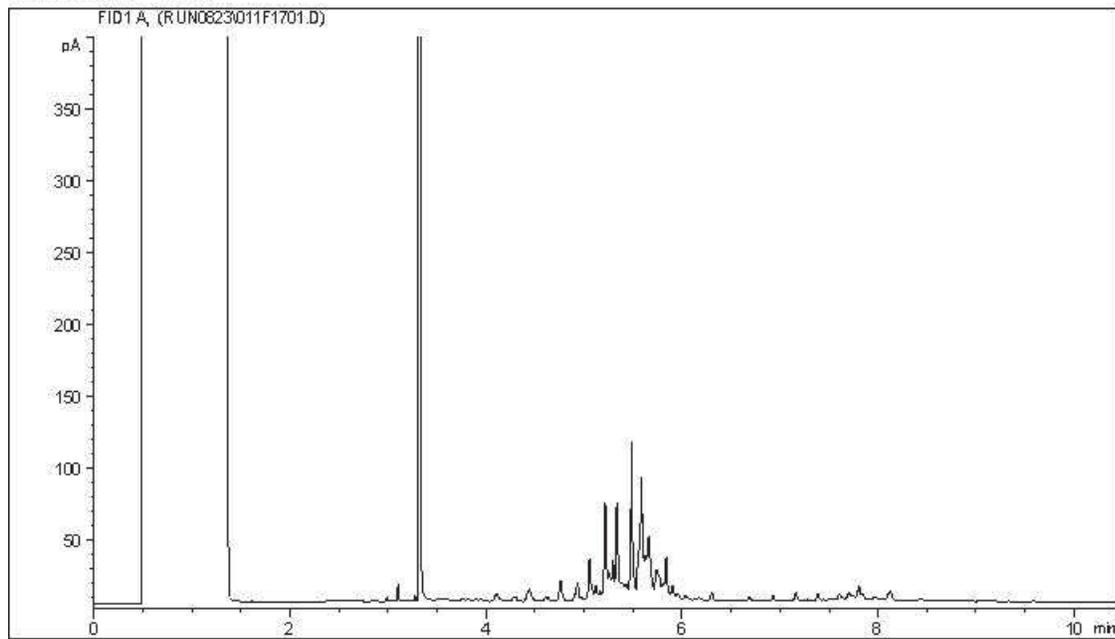
TYPICAL PRODUCT CARBON NUMBER RANGES

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

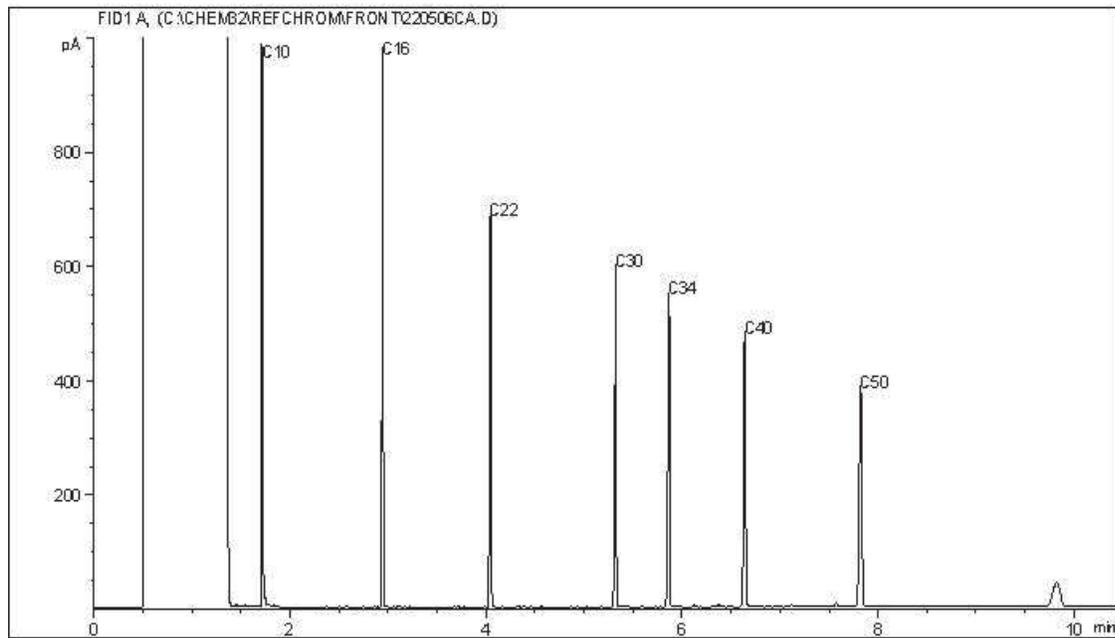
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



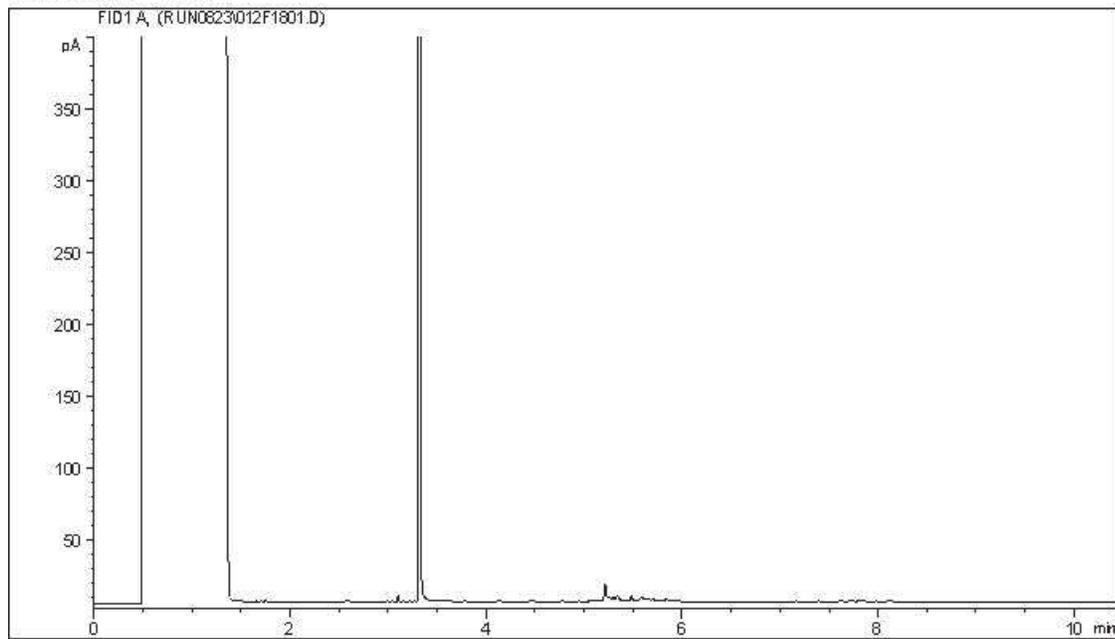
TYPICAL PRODUCT CARBON NUMBER RANGES

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

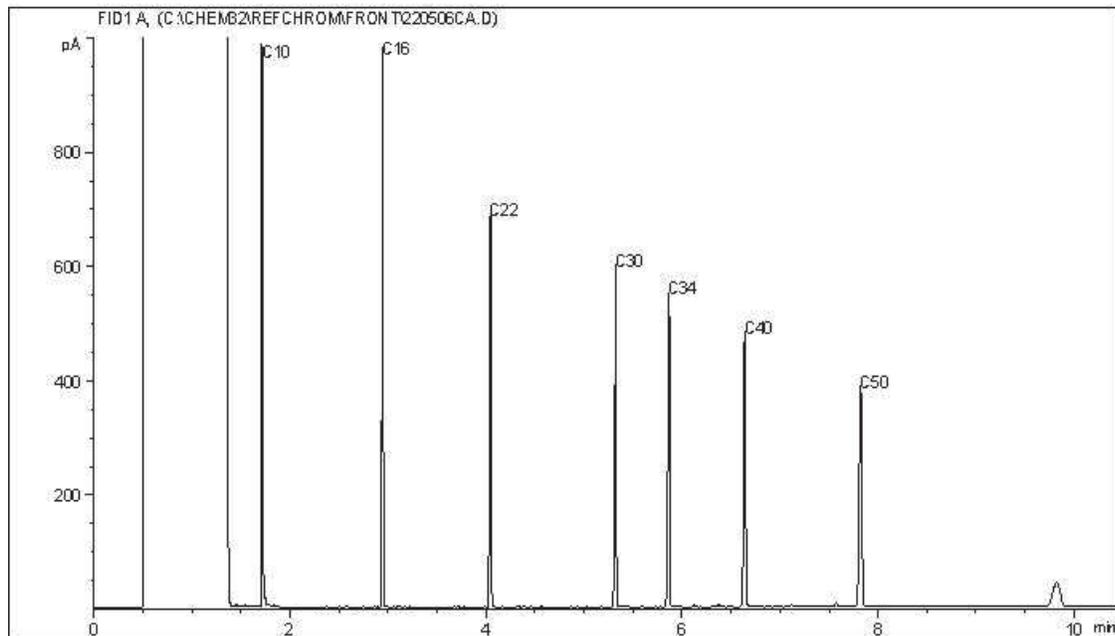
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



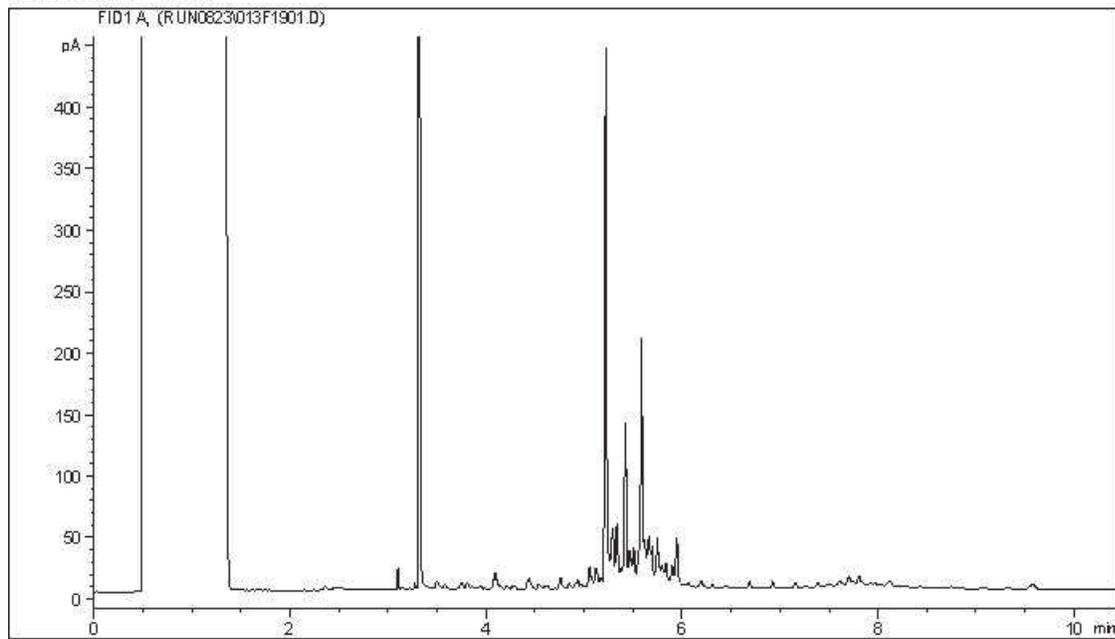
TYPICAL PRODUCT CARBON NUMBER RANGES

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

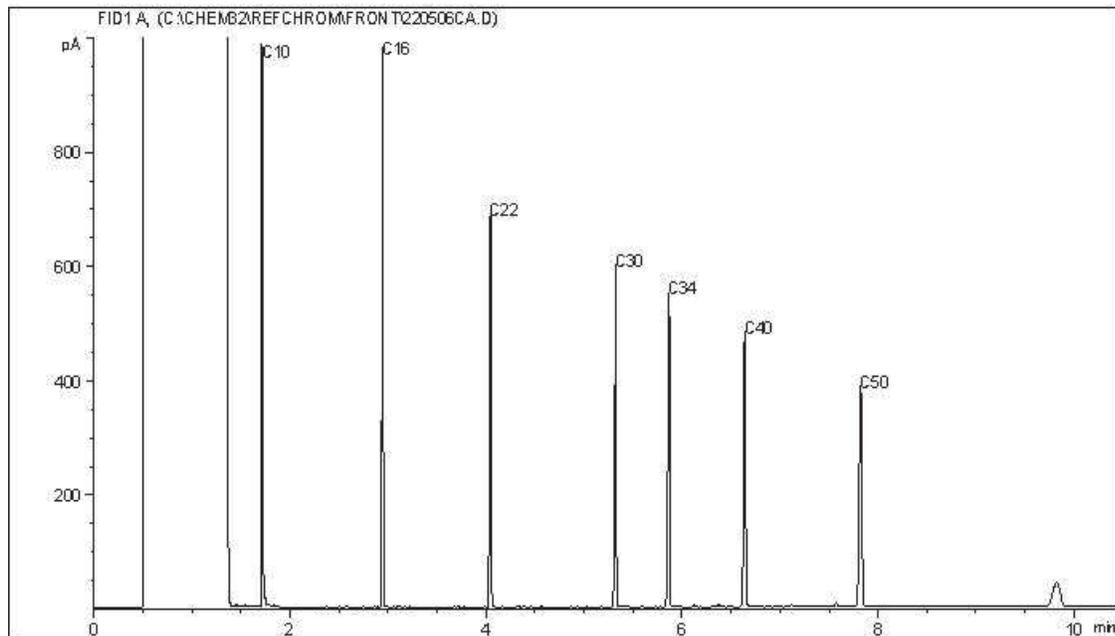
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



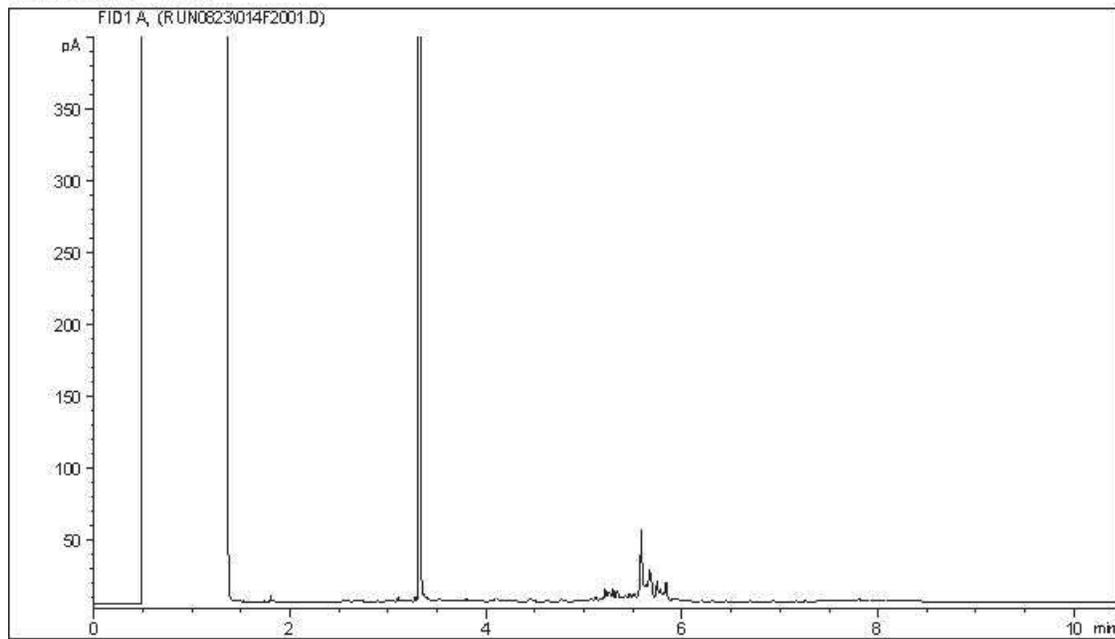
TYPICAL PRODUCT CARBON NUMBER RANGES

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

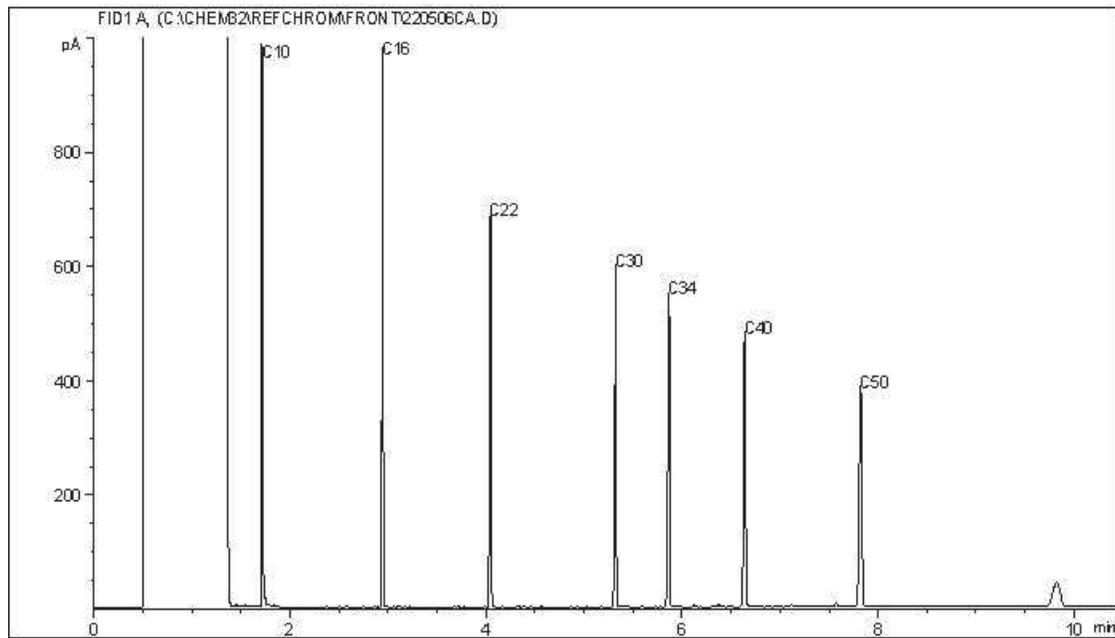
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



Carbon Range Distribution - Reference Chromatogram



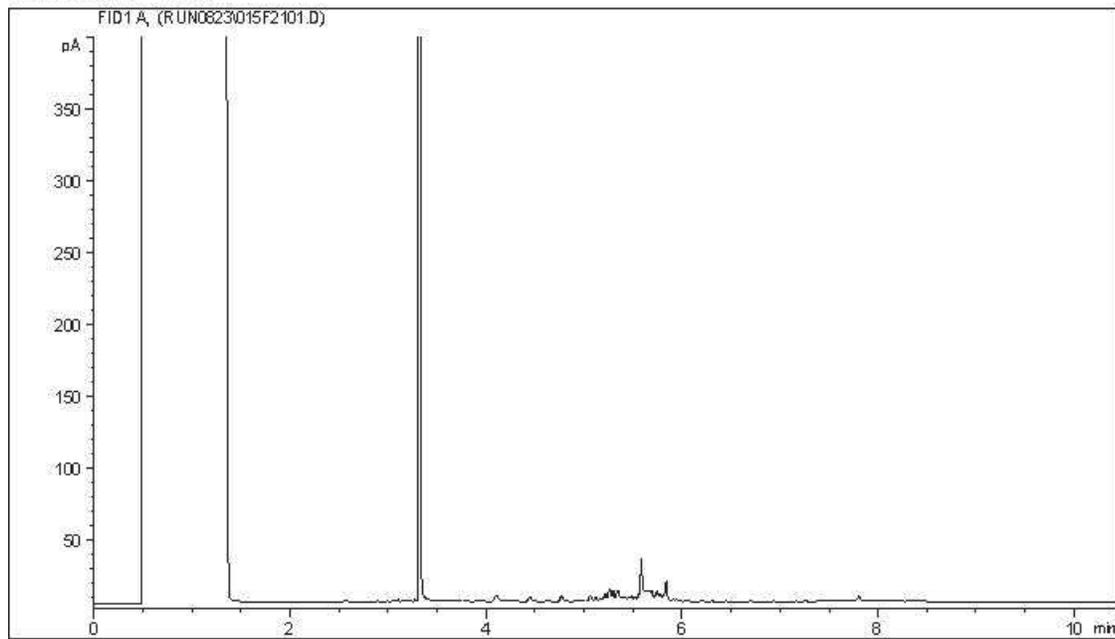
TYPICAL PRODUCT CARBON NUMBER RANGES

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

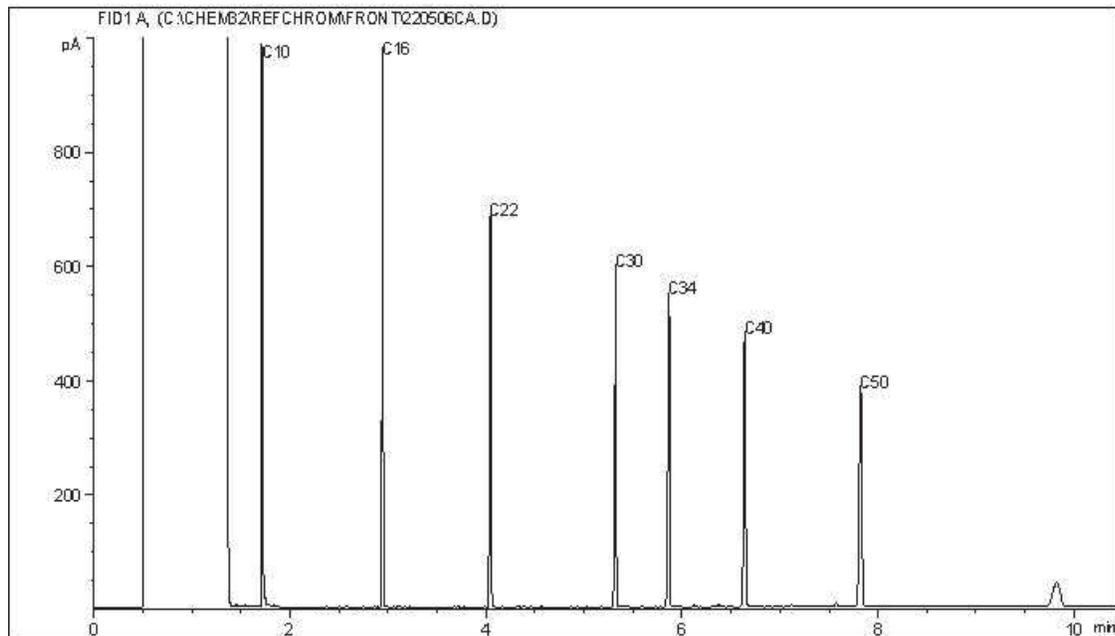
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: GC21



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.



September 14, 2022

GOLDER ASSOCIATES LTD.

2800, 700 -2nd Street SW
CALGARY, AB, T2P 2W2

Attention: Aurelie Bellavance

**Re: Biogenic Toluene Assessment of Camp Farewell, NT; Project 22525414-1000
Bureau Veritas Job No.: C262079**

Bureau Veritas Environmental & Specialty Services Laboratories (BV Labs) was retained by Golder Associated Ltd. to provide an interpretation concerning the likely origin of toluene quantified within CCME Fraction 1 (nC6-nC10).

Analytical Method

Petroleum hydrocarbon analyses at BV Labs are conducted in accordance with the analytical specifications required by the prescriptive and performance-based (where appropriate) elements of the CCME Tier I protocols for hydrocarbon determination¹ in soil samples.

Biogenic Toluene

The sample extract is analyzed by volatile organic compound (VOC) analysis in selected ion monitoring (SIM) mode to determine the origin of the quantified toluene. The presence of specific marker compounds, both biogenic and petrogenic, along with a series of associated parameters are reviewed as part of this evaluation. Diagnostic parameters of primary interest and the ranges typically associated with biogenic toluene samples are listed below²:

- Moisture: typically $\geq 70\%$
- Absence of an Unresolved Complex Mixture (UCM) within CCME Fractions F2 or F3.
- Presence of a "Biogenic Cluster" within CCME Fraction 3 (F3Bc); specifically F3B, nC32-nC34
- Presence of biogenic monoterpene compound(s)³
- Toluene ratio (T_{ratio}): Ratio between Toluene and sum of all BTEX compounds; typically >0.7
- Cymene ratio (C_{ratio}): Ratio between p-Cymene and the sum of all three isomers; typically >0.8
- Additional diagnostic parameters may be included in the assessment if deemed beneficial (examples include: Carbon Preference Index (CPI), isoprenoid ratios, BIC, etc.)

¹ Canadian Council of Ministers of the Environment: "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil – Tier I Method" 2001

² Bureau Veritas Laboratories Canada: threshold values derived internally (assessment of long-term data set)

³ Target compounds: α/β -Pinene, Camphene, (+)-3-Carene, α -Terpinene, Limonene, o/m/p-Cymene, γ -Terpinene and α -Terpinolene (list may be amended from time-to-time without notice)



Data Interpretation

Table 1. Data Summary – Biogenic Toluene Evaluation

Lab ID	Sample ID	Diagnostic Parameters ⁴						Conclusion ⁵
		Moist	UCM	F3B _c	Mono	T _{ratio}	C _{ratio}	
AZY348	BH22-14-02	M	No	Yes	No	1.0	NC	Inconclusive (neither)
AZY351	MW22-13-02	H	No	Yes	No	1.0	NC	Inconclusive (neither)
AZY358	BH22-12-01	H	No	Yes	No	1.0	NC	Inconclusive (neither)
AZY383	BH22-12-02	H	No	Yes	No	1.0	NC	Inconclusive (neither)

NC: Unable to Calculate (absence of Cymene isomers)

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

Sincerely,

Bureau Veritas Environmental & Specialty Services Laboratories



Michael Sheppard, B.Sc., P.Bio, QP
Consulting Scientist
Environmental Services

Scott Cantwell, CET, B.Sc., P.Chem.
Director and General Manager – Western Canada
Environmental Services

Disclaimer

Biogenic Toluene

A detailed assessment of Selective Ion Monitoring (SIM) GC-MS, and associated project data was completed to provide further information relating to the biogenic and/or petrogenic origin of compounds or fractions quantified as part of the CCME Tier I protocol. All statements must be regarded as approximate and qualitative.

⁴ Diagnostic Parameters

Moist: Moisture; H (≥70%), M (<70 & ≥20%), L (<20%)

UCM: Presence/Position of Unresolved Complex Mixture

F3B_c: Presence of a biogenic cluster within F3B

Mono: Biogenic monoterpenes (excluding cymenes)

T_{ratio}: Toluene Ratio (T/ΣBTEX)

C_{ratio}: Cymene Ratio (p-Cymene/ΣCymene isomers)

⁵ Conclusions

Biogenic Toluene: Quantified toluene likely of biogenic origin

Petrogenic Toluene: Quantified toluene likely of petrogenic origin

Inconclusive (both): Presence of both biogenic and petrogenic diagnostic parameters (CSIA recommended)

Inconclusive (neither): Insufficient evidence to support Biogenic or Petrogenic origin (CSIA recommended)

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 12, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Edmonton

Lab Submission Number: C262079

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes

Was proper chain of custody of the samples documented and kept? Yes

Were sample temperatures acceptable when they reached lab?: Yes

Were all samples analyzed and extracted within hold times?: Yes

Has lab warranted all tests were in statistical control in CoA?: Yes

Was sufficient sample provided for the requested analysis? Yes

Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery	X			Laboratory duplicate RPD for soluble calcium (66%)
Method Blank Concentration	X			exceed the acceptance criteria (30%).
Laboratory Duplicate RPD		X		All remaining laboratory QC results are within
Matrix Spike Recovery	X			acceptance criteria.
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	All field QC samples are within
Trip Blank Concentration			X	alert limits.
Field Duplicate RPD	X			

Is data considered reliable (Yes/No/Suspect)?: Yes

If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: September 19, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAIRWELL, NT
 Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/08/24
 Report #: R3221131
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C262125

Received: 2022/08/17, 12:45

Sample Matrix: Water
 # Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Cadmium - low level CCME (Total)	2	N/A	2022/08/24		Auto Calc
Carbon (DOC) -Lab Filtered (1)	2	N/A	2022/08/24	AB SOP-00087	MMCW 119 1996 m
Elements by ICP - Total	2	2022/08/24	2022/08/24	AB SOP-00014 / AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS - Total	2	2022/08/24	2022/08/24	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m

Remarks:

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

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

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2022/08/24
Report #: R3221131
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C262125

Received: 2022/08/17, 12:45

Encryption Key



Bureau Veritas
24 Aug 2022 16:43:15

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

REGULATED METALS (CCME/AT1) - TOTAL

Bureau Veritas ID		AZY559	AZY560		
Sampling Date		2022/08/14 10:45	2022/08/14 14:00		
COC Number		1 of 1	1 of 1		
	UNITS	SW22-01	SW22-02	RDL	QC Batch
Elements					
Total Cadmium (Cd)	mg/L	0.000046	<0.000020	0.000020	A691151
Total Aluminum (Al)	mg/L	0.90	0.035	0.0030	A691953
Total Antimony (Sb)	mg/L	<0.00060	<0.00060	0.00060	A691953
Total Arsenic (As)	mg/L	0.0014	0.00047	0.00020	A691953
Total Barium (Ba)	mg/L	0.12	0.11	0.010	A691954
Total Beryllium (Be)	mg/L	<0.0010	<0.0010	0.0010	A691953
Total Boron (B)	mg/L	<0.020	<0.020	0.020	A691954
Total Calcium (Ca)	mg/L	43	29	0.30	A691954
Total Chromium (Cr)	mg/L	0.0014	<0.0010	0.0010	A691953
Total Cobalt (Co)	mg/L	0.00083	<0.00030	0.00030	A691953
Total Copper (Cu)	mg/L	0.0056	<0.0010	0.0010	A691953
Total Iron (Fe)	mg/L	2.4	0.16	0.060	A691954
Total Lead (Pb)	mg/L	0.0013	<0.00020	0.00020	A691953
Total Lithium (Li)	mg/L	<0.020	<0.020	0.020	A691954
Total Magnesium (Mg)	mg/L	11	7.9	0.20	A691954
Total Manganese (Mn)	mg/L	0.046	0.024	0.0040	A691954
Total Molybdenum (Mo)	mg/L	0.0014	0.00061	0.00020	A691953
Total Nickel (Ni)	mg/L	0.0036	0.00087	0.00050	A691953
Total Phosphorus (P)	mg/L	<0.10	<0.10	0.10	A691954
Total Potassium (K)	mg/L	1.8	1.0	0.30	A691954
Total Selenium (Se)	mg/L	0.00045	<0.00020	0.00020	A691953
Total Silicon (Si)	mg/L	7.4	0.54	0.17	A691954
Total Silver (Ag)	mg/L	<0.00010	<0.00010	0.00010	A691953
Total Sodium (Na)	mg/L	7.5	11	0.50	A691954
Total Strontium (Sr)	mg/L	0.22	0.11	0.020	A691954
Total Sulphur (S)	mg/L	16	3.5	0.20	A691954
Total Thallium (Tl)	mg/L	<0.00020	<0.00020	0.00020	A691953
Total Tin (Sn)	mg/L	0.0015	<0.0010	0.0010	A691953
Total Titanium (Ti)	mg/L	0.012	0.0011	0.0010	A691953
Total Uranium (U)	mg/L	0.00091	0.00020	0.00010	A691953
Total Vanadium (V)	mg/L	0.0033	<0.0010	0.0010	A691953
RDL = Reportable Detection Limit					



**BUREAU
VERITAS**

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

REGULATED METALS (CCME/AT1) - TOTAL

Bureau Veritas ID		AZY559	AZY560		
Sampling Date		2022/08/14 10:45	2022/08/14 14:00		
COC Number		1 of 1	1 of 1		
	UNITS	SW22-01	SW22-02	RDL	QC Batch
Total Zinc (Zn)	mg/L	0.068	<0.0030	0.0030	A691953
RDL = Reportable Detection Limit					



**BUREAU
VERITAS**

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		AZY559	AZY560		
Sampling Date		2022/08/14 10:45	2022/08/14 14:00		
COC Number		1 of 1	1 of 1		
	UNITS	SW22-01	SW22-02	RDL	QC Batch
Lab Filtered Inorganics					
Dissolved Organic Carbon (C)	mg/L	7.2 (1)	8.8 (1)	0.50	A691572
RDL = Reportable Detection Limit					
(1) Sample filtered and preserved past method specified hold time					



**BUREAU
VERITAS**

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

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.



BUREAU
VERITAS

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

QUALITY ASSURANCE REPORT

QA/QC								
Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A691572	MDO	Matrix Spike	Dissolved Organic Carbon (C)	2022/08/24		114	%	80 - 120
A691572	MDO	Spiked Blank	Dissolved Organic Carbon (C)	2022/08/24		109	%	80 - 120
A691572	MDO	Method Blank	Dissolved Organic Carbon (C)	2022/08/24	<0.50		mg/L	
A691572	MDO	RPD	Dissolved Organic Carbon (C)	2022/08/24	9.3		%	20
A691953	RY3	Matrix Spike	Total Aluminum (Al)	2022/08/24		108	%	80 - 120
			Total Antimony (Sb)	2022/08/24		103	%	80 - 120
			Total Arsenic (As)	2022/08/24		96	%	80 - 120
			Total Beryllium (Be)	2022/08/24		101	%	80 - 120
			Total Chromium (Cr)	2022/08/24		96	%	80 - 120
			Total Cobalt (Co)	2022/08/24		98	%	80 - 120
			Total Copper (Cu)	2022/08/24		97	%	80 - 120
			Total Lead (Pb)	2022/08/24		101	%	80 - 120
			Total Molybdenum (Mo)	2022/08/24		101	%	80 - 120
			Total Nickel (Ni)	2022/08/24		96	%	80 - 120
			Total Selenium (Se)	2022/08/24		101	%	80 - 120
			Total Silver (Ag)	2022/08/24		100	%	80 - 120
			Total Thallium (Tl)	2022/08/24		98	%	80 - 120
			Total Tin (Sn)	2022/08/24		102	%	80 - 120
			Total Titanium (Ti)	2022/08/24		101	%	80 - 120
			Total Uranium (U)	2022/08/24		105	%	80 - 120
			Total Vanadium (V)	2022/08/24		101	%	80 - 120
			Total Zinc (Zn)	2022/08/24		100	%	80 - 120
A691953	RY3	Spiked Blank	Total Aluminum (Al)	2022/08/24		102	%	80 - 120
			Total Antimony (Sb)	2022/08/24		107	%	80 - 120
			Total Arsenic (As)	2022/08/24		100	%	80 - 120
			Total Beryllium (Be)	2022/08/24		105	%	80 - 120
			Total Chromium (Cr)	2022/08/24		102	%	80 - 120
			Total Cobalt (Co)	2022/08/24		102	%	80 - 120
			Total Copper (Cu)	2022/08/24		102	%	80 - 120
			Total Lead (Pb)	2022/08/24		105	%	80 - 120
			Total Molybdenum (Mo)	2022/08/24		105	%	80 - 120
			Total Nickel (Ni)	2022/08/24		102	%	80 - 120
			Total Selenium (Se)	2022/08/24		107	%	80 - 120
			Total Silver (Ag)	2022/08/24		106	%	80 - 120
			Total Thallium (Tl)	2022/08/24		102	%	80 - 120
			Total Tin (Sn)	2022/08/24		105	%	80 - 120
			Total Titanium (Ti)	2022/08/24		101	%	80 - 120
			Total Uranium (U)	2022/08/24		107	%	80 - 120
			Total Vanadium (V)	2022/08/24		104	%	80 - 120
			Total Zinc (Zn)	2022/08/24		103	%	80 - 120
A691953	RY3	Method Blank	Total Aluminum (Al)	2022/08/24	<0.0030		mg/L	
			Total Antimony (Sb)	2022/08/24	<0.00060		mg/L	
			Total Arsenic (As)	2022/08/24	<0.00020		mg/L	
			Total Beryllium (Be)	2022/08/24	<0.0010		mg/L	
			Total Chromium (Cr)	2022/08/24	<0.0010		mg/L	
			Total Cobalt (Co)	2022/08/24	<0.00030		mg/L	
			Total Copper (Cu)	2022/08/24	<0.0010		mg/L	
			Total Lead (Pb)	2022/08/24	<0.00020		mg/L	
			Total Molybdenum (Mo)	2022/08/24	<0.00020		mg/L	
			Total Nickel (Ni)	2022/08/24	<0.00050		mg/L	
			Total Selenium (Se)	2022/08/24	<0.00020		mg/L	
			Total Silver (Ag)	2022/08/24	<0.00010		mg/L	



BUREAU
VERITAS

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A691953	RY3	RPD	Total Thallium (Tl)	2022/08/24	<0.00020		mg/L	
			Total Tin (Sn)	2022/08/24	<0.0010		mg/L	
			Total Titanium (Ti)	2022/08/24	<0.0010		mg/L	
			Total Uranium (U)	2022/08/24	<0.00010		mg/L	
			Total Vanadium (V)	2022/08/24	<0.0010		mg/L	
			Total Zinc (Zn)	2022/08/24	<0.0030		mg/L	
			Total Aluminum (Al)	2022/08/24	14	%	20	
			Total Antimony (Sb)	2022/08/24	NC	%	20	
			Total Arsenic (As)	2022/08/24	NC	%	20	
			Total Beryllium (Be)	2022/08/24	NC	%	20	
			Total Chromium (Cr)	2022/08/24	NC	%	20	
			Total Cobalt (Co)	2022/08/24	NC	%	20	
			Total Copper (Cu)	2022/08/24	2.3	%	20	
			Total Lead (Pb)	2022/08/24	NC	%	20	
			Total Molybdenum (Mo)	2022/08/24	4.2	%	20	
			Total Nickel (Ni)	2022/08/24	4.5	%	20	
			Total Selenium (Se)	2022/08/24	1.3	%	20	
			Total Silver (Ag)	2022/08/24	NC	%	20	
			Total Thallium (Tl)	2022/08/24	NC	%	20	
			A691954	PC5	Matrix Spike	Total Tin (Sn)	2022/08/24	NC
Total Titanium (Ti)	2022/08/24	NC					%	20
Total Uranium (U)	2022/08/24	0.45				%	20	
Total Vanadium (V)	2022/08/24	NC					%	20
Total Zinc (Zn)	2022/08/24	5.7				%	20	
Total Barium (Ba)	2022/08/24					99	%	80 - 120
Total Boron (B)	2022/08/24					96	%	80 - 120
Total Calcium (Ca)	2022/08/24					102	%	80 - 120
Total Iron (Fe)	2022/08/24					101	%	80 - 120
Total Lithium (Li)	2022/08/24					102	%	80 - 120
Total Magnesium (Mg)	2022/08/24					104	%	80 - 120
Total Manganese (Mn)	2022/08/24					100	%	80 - 120
Total Phosphorus (P)	2022/08/24					102	%	80 - 120
A691954	PC5	Spiked Blank	Total Potassium (K)	2022/08/24		104	%	80 - 120
			Total Silicon (Si)	2022/08/24		100	%	80 - 120
			Total Sodium (Na)	2022/08/24		NC	%	80 - 120
			Total Strontium (Sr)	2022/08/24		95	%	80 - 120
			Total Sulphur (S)	2022/08/24		NC	%	80 - 120
			Total Barium (Ba)	2022/08/24		104	%	80 - 120
			Total Boron (B)	2022/08/24		98	%	80 - 120
			Total Calcium (Ca)	2022/08/24		103	%	80 - 120
			Total Iron (Fe)	2022/08/24		111	%	80 - 120
			Total Lithium (Li)	2022/08/24		105	%	80 - 120
			Total Magnesium (Mg)	2022/08/24		107	%	80 - 120
			Total Manganese (Mn)	2022/08/24		110	%	80 - 120
			Total Phosphorus (P)	2022/08/24		102	%	80 - 120
A691954	PC5	Method Blank	Total Potassium (K)	2022/08/24		105	%	80 - 120
			Total Silicon (Si)	2022/08/24		103	%	80 - 120
			Total Sodium (Na)	2022/08/24		104	%	80 - 120
			Total Strontium (Sr)	2022/08/24		99	%	80 - 120
			Total Sulphur (S)	2022/08/24		99	%	80 - 120
			Total Barium (Ba)	2022/08/24	<0.010		mg/L	
			Total Boron (B)	2022/08/24	<0.020		mg/L	



BUREAU
VERITAS

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A691954	PC5	RPD	Total Calcium (Ca)	2022/08/24	<0.30		mg/L	
			Total Iron (Fe)	2022/08/24	<0.060		mg/L	
			Total Lithium (Li)	2022/08/24	<0.020		mg/L	
			Total Magnesium (Mg)	2022/08/24	<0.20		mg/L	
			Total Manganese (Mn)	2022/08/24	<0.0040		mg/L	
			Total Phosphorus (P)	2022/08/24	<0.10		mg/L	
			Total Potassium (K)	2022/08/24	<0.30		mg/L	
			Total Silicon (Si)	2022/08/24	<0.17		mg/L	
			Total Sodium (Na)	2022/08/24	<0.50		mg/L	
			Total Strontium (Sr)	2022/08/24	<0.020		mg/L	
			Total Sulphur (S)	2022/08/24	<0.20		mg/L	
			Total Barium (Ba)	2022/08/24	1.7		%	20
			Total Boron (B)	2022/08/24	NC		%	20
			Total Calcium (Ca)	2022/08/24	1.5		%	20
			Total Iron (Fe)	2022/08/24	NC		%	20
			Total Lithium (Li)	2022/08/24	NC		%	20
			Total Magnesium (Mg)	2022/08/24	1.8		%	20
			Total Manganese (Mn)	2022/08/24	NC		%	20
			Total Phosphorus (P)	2022/08/24	NC		%	20
			Total Potassium (K)	2022/08/24	1.7		%	20
			Total Silicon (Si)	2022/08/24	1.4		%	20
			Total Sodium (Na)	2022/08/24	2.3		%	20
			Total Strontium (Sr)	2022/08/24	2.3		%	20
			Total Sulphur (S)	2022/08/24	1.4		%	20

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

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

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

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

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).



**BUREAU
VERITAS**

Bureau Veritas Job #: C262125
Report Date: 2022/08/24

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAIRWELL, NT
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in black ink, appearing to read "Suwan", written over a horizontal line.

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

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

CHAIN OF CUSTODY RECORD
ENV COC - 00013V3

Choose Location:
 Calgary, AB: 4000 19th St. NE, T2E 6P8 Toll Free (800) 386-7247
 Edmonton, AB: 9331-48 St. 16B 2R4 Toll Free (800) 386-7247
 Winnipeg, MB: D-675 Berry St. R3H JX7 Toll Free (866) 800-6208

Invoice information Invoice to (requires report) Report information (if differs from Invoice)

Company: Client #254, Golder Associates
 Contact Name: 237 - 4 Ave SW Suite 3300
 Street Address: 237 - 4 Ave SW Suite 3300
 City: Calgary Prov: AB Postal Code: T2P 4K3

Company: Golder Associates
 Contact Name: Aurelie Bellavance
 Street Address: 22525414-100
 City: Calgary AB Postal Code: T2P 4K3

Phone: 403-299-5600
 Email: aurelie.bellavance@wsp.com
 Copies: Rebecca Tan @ wsp.com

Project Information
 Quotation #: Shell
 P.O. #/AFE#: 22525414-100-104
 Project #: 22525414-1000
 Site #: NA
 Site Location: Camp
 Province: WEST-GHANNET, NT
 Rush Confirmation #: NT

Regulatory Criteria

AT1 CCME Drinking Water - Canada Drinking Water - Manitoba
 Saskatchewan Drinking Water - Alberta Other

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

Sample Identification	Date Sampled			Time (24hr)			Matrix
	YY	MM	DD	HH	MM	MM	
SW22-01	22	08	14	10	45		Surface water
SW22-02	22	08	14	14	00		Surface water

Sample ID	Date		LIMITED SAMPLE	# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE	Regular Turnaround Time (TAT)		Rush Turnaround Time (TAT)		Comments
	YY	MM				DD	YY	MM	DD	
1	22	08	X	2		5 to 7 Day	<input checked="" type="checkbox"/>	10 Day	<input type="checkbox"/>	AA email Report to: old.shelltdor@wsp.com
2	22	08	X	2		Same Day	<input type="checkbox"/>	1 Day	<input type="checkbox"/>	add id - eqvis@wsp.com update to facility code 41281544
3						2 Day	<input type="checkbox"/>	3 Day	<input type="checkbox"/>	
4						4 Day	<input type="checkbox"/>			
5										
6										
7										
8										
9										
10										
11										
12										

LAB USE ONLY

Seal present: Seal intact: Cooling media present:

Seal present: Seal intact: Cooling media present:

Temperature reading by: °C

Received by: (Signature/Print) Jason Bil
 Date: 22 08 18 15 10
 Time: HH MM

Special instructions: 2125

GOLDER DATA QUALITY REVIEW CHECKLIST

Site Location: Camp Farewell, NT

Sampling Date: August 14, 2022

Golder Project Number: 22525414-1000

Laboratory: Bureau Veritas Calgary

Lab Submission Number: C262125

Was the Cooler Received at the lab under a sealed and intact custody seal? Yes
 Was proper chain of custody of the samples documented and kept? Yes
 Were sample temperatures acceptable when they reached lab?: Yes
 Were all samples analyzed and extracted within hold times?: Yes
 Has lab warranted all tests were in statistical control in CoA?: Yes
 Was sufficient sample provided for the requested analysis? Yes
 Has lab warranted all samples were analyzed with limited headspace present?: Yes

Are All Laboratory QC Within Acceptance Criteria (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Surrogate Recovery			X	All laboratory QC results are within acceptance criteria.
Method Blank Concentration	X			
Laboratory Duplicate RPD	X			
Matrix Spike Recovery	X			
Blank Spike Recovery	X			

Are All Field QC Samples Within Alert Limits (Yes, No, Not Applicable)?

	Yes	No	NA	Comments
Field Blank Concentration			X	No field QC samples were collected.
Trip Blank Concentration			X	
Field Duplicate RPD			X	

Is data considered reliable (Yes/No/Suspect)?: Yes
 If answer is "No" or "Suspect", describe and provide rationale:

Data Reviewed by (Print): Anita Colbert

Data Reviewed by (Signature): Anita Colbert

Date: August 25, 2022



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAREWELL
 Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/08/30
 Report #: R3224001
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C264060

Received: 2022/08/22, 10:15

Sample Matrix: Ground Water
 # Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity @25C (pp, total), CO3,HCO3,OH (1)	2	N/A	2022/08/26	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID (1)	2	N/A	2022/08/29	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	2	N/A	2022/08/29		Auto Calc
Chloride/Sulphate by Auto Colourimetry (1)	2	N/A	2022/08/27	AB SOP-00020	SM23-4500-Cl/SO4-E m
Carbon (DOC) (1, 2)	1	N/A	2022/08/26	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C (1)	2	N/A	2022/08/26	AB SOP-00005	SM 23 2510 B m
CCME Hydrocarbons (F2-F4 in water) (1, 3)	1	2022/08/27	2022/08/27	AB SOP-00037	CCME PHC-CWS m
CCME Hydrocarbons (F2-F4 in water) (1, 3)	1	2022/08/27	2022/08/28	AB SOP-00037	CCME PHC-CWS m
Hardness (1)	2	N/A	2022/08/27		Auto Calc
Elements by ICP-Dissolved-Lab Filtered (1, 4)	2	N/A	2022/08/27	AB SOP-00042	EPA 6010d R5 m
Ion Balance (1)	2	N/A	2022/08/27		Auto Calc
Nitrate and Nitrite (1)	2	N/A	2022/08/27		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water (1)	1	N/A	2022/08/26	AB SOP-00091	SM 23 4500 NO3m
NO2 (N); NO2 (N) + NO3 (N) in Water (1)	1	N/A	2022/08/27	AB SOP-00091	SM 23 4500 NO3m
Nitrate (as N) (1)	2	2022/08/25	2022/08/27		Auto Calc
Benzo[a]pyrene Equivalency (1, 5)	2	N/A	2022/08/28		Auto Calc
PAH in Water by GC/MS (1)	2	2022/08/27	2022/08/28	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m
pH @25°C (1, 6)	2	N/A	2022/08/26	AB SOP-00005	SM 23 4500-H+B m
Total Dissolved Solids (Calculated) (1)	2	N/A	2022/08/27		Auto Calc

Sample Matrix: Surface Water
 # Samples Received: 2

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
BTEX/F1 in Water by HS GC/MS/FID (1)	1	N/A	2022/08/29	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	1	N/A	2022/08/29		Auto Calc
Cadmium - low level CCME (Total) (1)	1	N/A	2022/08/30		Auto Calc
Carbon (DOC) (1, 2)	1	N/A	2022/08/26	AB SOP-00087	MMCW 119 1996 m
CCME Hydrocarbons (F2-F4 in water) (1, 3)	1	2022/08/27	2022/08/27	AB SOP-00037	CCME PHC-CWS m
Elements by ICP - Total (1)	1	2022/08/29	2022/08/30	AB SOP-00014 / AB SOP-00042	EPA 6010d R5 m



Your P.O. #: 22525414-1100-1104
 Your Project #: 22525414-1000
 Site Location: CAMP FAREWELL
 Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
 2800, 700 -2nd Street SW
 CALGARY, AB
 CANADA T2P 2W2

Report Date: 2022/08/30
 Report #: R3224001
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C264060

Received: 2022/08/22, 10:15

Sample Matrix: Surface Water
 # Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICPMS - Total (1)	1	2022/08/29	2022/08/30	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m
Benzo[a]pyrene Equivalency (1, 5)	1	N/A	2022/08/28		Auto Calc
PAH in Water by GC/MS (1)	1	2022/08/27	2022/08/28	AB SOP-00037 / AB SOP-00003	EPA 3510C/8270E m

Remarks:

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

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

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

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

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. 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) This test was performed by Bureau Veritas Calgary, 4000 - 19 St. , Calgary, AB, T2E 6P8
- (2) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
- (3) Silica gel clean up employed.
- (4) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
- (5) 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.
- (6) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.



Your P.O. #: 22525414-1100-1104
Your Project #: 22525414-1000
Site Location: CAMP FAREWELL
Your C.O.C. #: 1 of 1

Attention: Aurelie Bellavance

GOLDER ASSOCIATES LTD.
2800, 700 -2nd Street SW
CALGARY, AB
CANADA T2P 2W2

Report Date: 2022/08/30
Report #: R3224001
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C264060

Received: 2022/08/22, 10:15

Encryption Key



Bureau Veritas
30 Aug 2022 16:17:27

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cynny Hagen, Key Account Specialist
Email: Cynny.HAGEN@bureauveritas.com
Phone# (403)735-2273

=====
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



BUREAU
VERITAS

Bureau Veritas Job #: C264060
Report Date: 2022/08/30

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

AT1 BTEX AND F1-F4 IN WATER (GROUND WATER)

Bureau Veritas ID		BAK847	BAK847	BAK848	BAK848		
Sampling Date		2022/08/16 17:00	2022/08/16 17:00	2022/08/16 17:20	2022/08/16 17:20		
COC Number		1 of 1	1 of 1	1 of 1	1 of 1		
	UNITS	P19-06	P19-06 Lab-Dup	P19-05	P19-05 Lab-Dup	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	0.32	0.34	0.10	A695924
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	N/A	0.13	0.12	0.10	A695924
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	N/A	<0.20	<0.20	0.20	A695924
Volatiles							
Benzene	mg/L	0.0077	0.0073	<0.00040	N/A	0.00040	A697055
Toluene	mg/L	<0.00040	<0.00040	<0.00040	N/A	0.00040	A697055
Ethylbenzene	mg/L	0.0015	0.0014	0.00073	N/A	0.00040	A697055
m & p-Xylene	mg/L	0.0022	0.0020	0.0011	N/A	0.00080	A697055
o-Xylene	mg/L	0.0033	0.0031	0.00053	N/A	0.00040	A697055
Xylenes (Total)	mg/L	0.0055	N/A	0.0016	N/A	0.00089	A694487
F1 (C6-C10) - BTEX	mg/L	0.24	N/A	<0.10	N/A	0.10	A694487
F1 (C6-C10)	mg/L	0.25	0.25	<0.10	N/A	0.10	A697055
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	89	90	89	N/A	N/A	A697055
4-Bromofluorobenzene (sur.)	%	107	106	108	N/A	N/A	A697055
D4-1,2-Dichloroethane (sur.)	%	83	83	81	N/A	N/A	A697055
O-TERPHENYL (sur.)	%	97	N/A	98	98	N/A	A695924
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BUREAU
VERITAS

Bureau Veritas Job #: C264060
Report Date: 2022/08/30

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

AT1 BTEX AND F1-F4 IN WATER (SURFACE WATER)

Bureau Veritas ID		BAK849		
Sampling Date		2022/08/15 15:00		
COC Number		1 of 1		
	UNITS	SW22-02	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	A695924
F3 (C16-C34 Hydrocarbons)	mg/L	<0.10	0.10	A695924
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	0.20	A695924
Volatiles				
Benzene	mg/L	<0.00040	0.00040	A697055
Toluene	mg/L	<0.00040	0.00040	A697055
Ethylbenzene	mg/L	<0.00040	0.00040	A697055
m & p-Xylene	mg/L	<0.00080	0.00080	A697055
o-Xylene	mg/L	<0.00040	0.00040	A697055
Xylenes (Total)	mg/L	<0.00089	0.00089	A694487
F1 (C6-C10) - BTEX	mg/L	<0.10	0.10	A694487
F1 (C6-C10)	mg/L	<0.10	0.10	A697055
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99	N/A	A697055
4-Bromofluorobenzene (sur.)	%	108	N/A	A697055
D4-1,2-Dichloroethane (sur.)	%	99	N/A	A697055
O-TERPHENYL (sur.)	%	99	N/A	A695924
RDL = Reportable Detection Limit N/A = Not Applicable				



BUREAU
VERITAS

Bureau Veritas Job #: C264060
Report Date: 2022/08/30

GOLDER ASSOCIATES LTD.
Client Project #: 22525414-1000
Site Location: CAMP FAREWELL
Your P.O. #: 22525414-1100-1104
Sampler Initials: RO

ROUTINE WATER -LAB FILTERED (GROUND WATER)

Bureau Veritas ID		BAK847		BAK848		
Sampling Date		2022/08/16 17:00		2022/08/16 17:20		
COC Number		1 of 1		1 of 1		
	UNITS	P19-06	RDL	P19-05	RDL	QC Batch
Calculated Parameters						
Hardness (CaCO ₃)	mg/L	580	0.50	410	0.50	A694947
Ion Balance (% Difference)	%	6.2	N/A	2.4	N/A	A694856
Nitrate (N)	mg/L	<0.050	0.050	<0.010	0.010	A694939
Nitrate (NO ₃)	mg/L	<0.22	0.22	<0.044	0.044	A694700
Nitrite (NO ₂)	mg/L	<0.16	0.16	<0.033	0.033	A694700
Calculated Total Dissolved Solids	mg/L	660	10	580	10	A694861
Misc. Inorganics						
Conductivity	uS/cm	1200	2.0	1000	2.0	A695956
pH	pH	6.79	N/A	7.13	N/A	A695955
Anions						
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	1.0	<1.0	1.0	A695949
Alkalinity (Total as CaCO ₃)	mg/L	560	1.0	380	1.0	A695949
Bicarbonate (HCO ₃)	mg/L	680	1.0	470	1.0	A695949
Carbonate (CO ₃)	mg/L	<1.0	1.0	<1.0	1.0	A695949
Hydroxide (OH)	mg/L	<1.0	1.0	<1.0	1.0	A695949
Chloride (Cl)	mg/L	64	1.0	56	1.0	A696310
Sulphate (SO ₄)	mg/L	<1.0	1.0	64	1.0	A696310
Nutrients						
Nitrite (N)	mg/L	<0.050 (1)	0.050	<0.010	0.010	A696225
Nitrate plus Nitrite (N)	mg/L	<0.050 (1)	0.050	<0.010	0.010	A696225
Lab Filtered Elements						
Dissolved Calcium (Ca)	mg/L	120	3.0	110	0.30	A696338
Dissolved Iron (Fe)	mg/L	24	0.60	4.4	0.060	A696338
Dissolved Magnesium (Mg)	mg/L	71	2.0	31	0.20	A696338
Dissolved Manganese (Mn)	mg/L	1.8	0.040	1.4	0.0040	A696338
Dissolved Potassium (K)	mg/L	4.1	3.0	46	0.30	A696338
Dissolved Sodium (Na)	mg/L	46	5.0	36	0.50	A696338
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to matrix interference.						