

Appendix B: 2019 Contaminated Soil Investigation

Memo

To:	Peter Kuhn, Blue Star Gold Corp.	Client:	Blue Star Gold Corp.
From:	Arlene Stearman, PGeo	Project No:	1CB041.000
Cc:		Date:	March 12, 2020
Subject:	Results of 2019 Contaminated Soil Investigation at Ulu Gold Project		

1 Introduction

The Ulu Gold project is located on Inuit-owned land in the Kitikmeot Region, Nunavut, within the Hood River watershed. It is located 150 km north of the Lupin mine (Figure 1). This memo documents the results of the 2019 contaminated soil investigation of areas where petroleum hydrocarbon (PHC) products were known to be handled historically to determine the extent and chemical characteristics of impacts to the surrounding ground.

2 Background

The mineral claims holding the Ulu deposit were initially staked in 1988. Portal excavation at the Ulu site commenced in 1996 to confirm resource calculations and mining design for mill feed to the Lupin Mine. Equipment to construct the camp and develop the mine was mobilized to site via a winter road from the Lupin mine in 1996. Camp 3 was built at the esker sand quarry to facilitate construction of the airstrip, road and underground exploration site. It included tent accommodations, a garage and a fuel tank farm. Camp 3 was reclaimed in 2018/2019. Underground development of the ramp ceased in August 1997 at the 155 m level. The existing facilities at the Ulu underground exploration site consist of a 20-man camp with sleeping and dining quarters, a 22 m by 37 m vehicle repair shop, fuel containment areas (tanks removed in 2018) for bulk diesel and day tank storage, core storage area, core shack, and fuel staging area.

The previous operators investigated the PHC contamination at the Camp 3 fuel tank farm and collected remediation confirmation samples across the base of the area that was excavated (Stantec 2018). Sixteen remediation confirmation samples and one quality assurance/quality control sample were submitted for analytical testing (Stantec 2018). Approximately 1,220 m³ of PHC impacted soil was transported to the Ulu tank farm and deposited into the area that had previously held the fuel tanks. No samples were submitted for analytical testing to characterize the contaminated soil excavated or the soil in the areas of concern at the Ulu underground exploration site. Based on visual observations and experience gained during the excavation of contaminated soil at the Camp 3 tank farm it was estimated that 3,042 m³ of PHC impacted soil was present at the Ulu underground exploration site (Stantec 2019).

3 Soil Quality Objectives

The soil analytical results were compared with the Government of Nunavut's *Environmental Guideline for Contaminated Site Remediation* (2009) Tier 2 guidelines for coarse-grained soil and wildland land use.

A three-tiered approach for the assessment and remediation of contaminated sites has been established by the Canadian Council of Ministers of the Environment (CCME) and adopted by the Government of Nunavut. Generic guidelines represent the first tier, while a second tier allows limited modification of the guidelines to establish site-specific remedial objectives. The third tier uses risk assessment procedures to establish remediation objectives at contaminated sites on a site-specific basis. The first-tier guidelines represent generic recommendations that are based on a conservative application of the most current scientific information without consideration of possible site-specific, special considerations. The second-tier approach is utilized in situations where site conditions, land use, receptors or exposure pathways differ from those assumed in the development of the first-tier criteria. The site-specific exposure pathways used to determine Tier 2 remediation objectives for the Ulu Gold Project are soil ingestion, soil contact, nutrient cycling and management limits.

Remediation criteria are presented in the context of four types of land use: agricultural, residential/parkland, commercial and industrial. The Government of Nunavut refers to residential/parkland as wildland. The criteria are considered generally protective of human and environmental health for the 'normal' activities associated with each land use. Parkland/wildland is land on which the primary activity is related to the productive capability of the land. This includes lands that provides habitat for transitory wildlife and birds.

The parkland land use (PL) standards and guidelines for petroleum hydrocarbons are set out in the following references:

- Canada Wide Standards for Petroleum Hydrocarbons in Soil (PHC CWS), CCME April 2008 (CCME 2008); and
- Canadian Environmental Quality Guidelines (CEQG), CCME 1999, with updates to 2018 (CCME 2018).

In the PHC CWS petroleum hydrocarbons are subdivided according to specified ranges of equivalent carbon number:

- PHC CWS fraction F1 encompasses the range of equivalent carbon number from C6 to C10. Constituents of fraction F1 include the volatile fraction of most hydrocarbons mixtures (including gasoline) such as benzene, ethylbenzene, toluene and xylene (BETX). The aromatic compounds BETX are assessed and managed under the CCME CEQG (CCME 2018) and therefore should be subtracted from this fraction;
- PHC CWS fraction F2 encompasses the range of equivalent carbon number from C11 through C16. Constituents of fraction F2 are semi-volatile petroleum hydrocarbons and include constituents of gasoline and diesel fuels. The polycyclic aromatic hydrocarbon (PAH)

parameter, naphthalene is a constituent of fraction F2 and it is assessed and managed under the CCME CEQG (CCME 2018) and therefore should be subtracted from this fraction;

- PHC CWS fraction F3 encompasses the range of equivalent carbon number from C17 through C34. Constituents of fraction F3 include typical lubricating oils and greases, heavy fuel oils, road oils and asphalts. The other PAH parameters are constituent of fraction F3 and are assessed and managed under the CCME CEQG (CCME 2018) and therefore should be subtracted from this fraction; and
- PHC CWS fraction F4 encompasses ranges of equivalent carbon number from C35 through C50+. PHC within this fraction often make up a significant proportion of crude oils.

The PHC CWS also includes consideration of fine-grained versus coarse-grained soils in the determination of guideline values. The soils at Ulu Gold Project are predominantly coarse-grained. The median grain size is greater than 75 micrometres (μm).

4 Sampling Program

The contaminated soil intrusive investigation was undertaken September 3 to 5, 2019. Twenty-seven test pits were excavated and sampled. Four of these test pits were in the former Camp 3 tank farm area, while the remaining test pits were advanced to investigate areas of potential petroleum hydrocarbon (PHC) contamination at the Ulu underground exploration site. The test pit locations are illustrated on Figure 2 and the test pit logs are provided in Appendix Table 1. The test pits within the shop and former tank farms were excavated by hand. An excavator was used to advance the other test pits.

Soil samples were collected from the various horizons encountered in the test pits as listed in Appendix Table 2. Approximately 250 grams of soil was sealed in a Ziplock[®] bag for field screening and soil was placed in laboratory supplied glass jars at each sample site. In areas where volatile organic compound (gasoline) impacts were suspected duplicate samples were collected insitu using Terra Core[®] soil sampler and the soil transferred to a vial containing methanol for preservation.

5 Results

5.1 Field Screening

The concentration of organic vapour in soil impacted by hydrocarbons was measured on-site using a bag-headspace method. This method involves placing soil in a sealable polyethylene bag, sealing the bag, disaggregating the soil in the bag and allowing organic vapours to accumulate in the bag's headspace. The concentration of organic vapour was then measured using a portable gas meter (RKI Eagle II[®]) calibrated to hexane (HEX) and isobutylene (IBL) standards. The portable gas meter measurements were combined with the visual appearance of the soil and olfactory indicators to select which samples were to be submitted for analytical testing at a Canadian Association for Laboratory Accreditation (CALA) – accredited laboratory. Field

screening results are provided in the sample log (Appendix Table 2) and with the petroleum hydrocarbon results (Appendix Table 3).

5.2 Laboratory Analytical Results

The samples results are compared to CCME guidelines in Appendix Table 3 and Appendix Table 4. Results which exceed the guidelines for parkland/wildland land use are bolded.

5.3 Discussion

Camp 3 Tank Farm

Four test pits were excavated by hand within the footprint of the former Camp 3 tank farm. Two samples from each test pit were field screened with the portable gas meter. Organic vapours were not detected with the portable gas meter. Three samples were submitted for analytical testing, including samples from test pits TP19-3 and TP19-4 where mild PHC odours were observed. The samples were tested for PHC fractions F2 and F3 and the results meet the CCME PL guidelines.

Soil from Camp 3 Tank Farm inside the Main Tank Farm

Five test pits were excavated by hand in the stockpile of soil relocated to the main tank farm during the remediation of the Camp 3 tank farm. Concentrations exceed CCME PL guidelines for surface soil for PHC fractions F2 and F3. One sample from test pit TP19-8 (sample 20513 returned 2,820 mg/kg F3) exceed the CCME PL guideline for subsoils of 2,500 mg/kg.

Main Tank Farm

The main tank farm includes a lined area within the berm for fuel handling activities. Two test pits were excavated by hand to assess the soil that covers the liner. Concentrations exceed CCME PL guidelines for subsoils for PHC fractions F2 and F3 and PAH parameters naphthalene and phenanthrene.

Five test pits were excavated around the perimeter of the main tank farm with the excavator. Concentrations of PHC fraction F2 exceed the CCME PL guidelines for subsoil on the east side of the tank farm from 1.0 m below surface to bedrock/original ground as illustrated on Figure 3. Concentrations of PAH parameter phenanthrene exceeded the CCME PL guideline in test pit TP19-15. The soil between surface and 1.0 m depth meets the CCME PL guidelines for surface soils outside of the footprint of the main tank farm.

Day Tank

Test pit TP19-13 was excavated by hand within the 6 m by 5 m berm around the former day tank. The day tank was removed in 2018. A liner was encountered at 0.3 m below surface within the day tank area. The soil above the liner exceed CCME PL guidelines for surface soil for PHC fractions F1, F2 and F3. The PHC fraction F2 also exceeds the CCME PL guideline subsoil. There was no exceedance of the CCME PL guidelines for BETX.

Three test pits were excavated around the perimeter of the former day tank farm with the excavator. Two to three samples from each test pit were field screened with the portable gas meter. Organic vapours concentrations ranged for 0 to 5 ppm (HEX). Select samples were tested for PHC fractions F1 to F4, BETX and PAH and the results meet the CCME PL guidelines for surface soil.

Shop Floor

Four test pits were dug by hand inside to the shop. Much of the shop floor is covered with wood flooring and the uncovered section at the west end has a liner 0.3 m below surface (Figure 4). The welding area of the shop has metal plates on the floor.

Test pit TP19-14 was excavated in an area of dark soil. Concentrations of PHC fraction F3 in the upper 0.15 m of TP19-14 were 13,600 mg/kg, which is five times more than the CCME PL guideline for subsoils (2,500 mg/kg). Below 0.15 m the concentration of PHC fraction F3 decreased to 3,830 mg/kg. PHC fraction F2 exceeded the CCME PL guideline for surface soil from surface to bottom of the test pit (0.5 m).

Test pit TP19-25 was excavated in a gap between the wood and metal plate flooring. PHC fraction F3 exceeded the CCME PL guideline for subsoil in the upper 0.08 m of the test pit. Concentrations of PHC fraction F2 met the CCME PL guideline for surface soil.

Test pit TP19-26 was excavated in the lined area at the west end of the shop. PHC fraction F3 exceeds the CCME PL guideline for subsoil in the soil that overlain what appeared to be bedding sand placed on top of the liner.

Test pit TP19-27 was excavated in an area not covered with wood on the north side of the shop. The samples were tested for PHC fractions F2 to F4 and the results meet the CCME PL guidelines for surface soil.

Parking Areas

Four test pits were dug with the excavator to investigate areas where equipment was parked and possibly worked on outside around the parameter of the shop. Two to three samples from each test pit were field screened with the portable gas detector. Organic vapours were not detected with the portable gas detector. Three samples were submitted for analytical testing, including a sample from test pit TP19-21 where moderate PHC odours were observed from surface to 0.25 m depth. The samples were tested for PHC fractions F1 to F4, BETX and PAH and the results meet the CCME PL guidelines for surface soil for all samples except the one shallow sample collected from TP19-21.

6 Conclusions and Recommendations

The contamination at the Ulu Gold Project was predominately related to diesel impacts. Field screening Hexane (HEX) results greater than 100 ppm and isobutylene (IBL) results greater than 10 ppm generally indicated that the soil was contaminated with PHC fractions F1 and/or F2. The

portable gas detector did not provide reliable results to characterize soil as contaminated with PHC fraction F3 or F4.

The Camp 3 Fuel Tank area has been remediated and the soils there meet CCME PL guidelines for PHC. The soil that was relocated from Camp 3 to the main tank farm generally exceeds CCME PL guidelines for surface soil but not subsoil. The soil that did exceed CCME PL guidelines for subsoil may be remediated sufficiently through aeration when it is removed from the tank farm and it should be tested for PHC fractions F2 and F3 prior to being transferred to the soil treatment facility.

The main tank farm liner appears to have been compromised and contamination has spread to the east above the pad/original ground interface. No indications of PHC impacts were observed on the tundra below the pad. Three tundra soil samples within 10 m of the contaminated area of the pad should be collected from 0.10 m below surface to confirm this observation. Soil and rock that has not been impacted by PHC contamination should be segregated during excavation of the area to reduce the volume of soil requiring treatment at the STF. Soil that has a mild to moderate odor of PHC's should be stockpiled adjacent to the excavation and samples collected to test for PHC fractions F2 and F3 prior to being transferred to the STF.

The soil above the liner in the day tank farm has been impacted with gasoline and diesel. Results to date have detected no lateral migration of contamination.

The soil in the shop floor encountered spotty contamination that was shallow. Care should be taken not to blend the contaminated soil with uncontaminated soil when remediating the area.

The estimated volume of PHC contaminated soil in each area is listed in Table A. This estimate is considered to be conservative and with active excavation management and the use of temporary stockpiles the volume of soil requiring treatment can be reduced.

Table A: Estimated Volumes of Petroleum Hydrocarbon Contaminated soil

Area	Soil to be Treated (m ³)	Soil to be Managed by Burial (m ³)	Soil to be Shipped Off-site for Treatment (m ³)
Camp 3 Tank Farm	0	0	0
Camp 3 Stockpile	125 ¹	1100	0
Main Tank Farm	5000	²	0
Day Tank Farm	300 ³		0
Shop Floor	100	²	40
Parking Areas		25	10

¹ The soil may be remediated sufficiently to meet subsoil objectives when it is off loaded.

² Segregation of soil during excavation could reduce the volume of soil destined for treatment in the soil treatment facility (STF)

³ This volume assumes that the contamination extends from surface to bedrock. The actual volume of contaminated soil to be managed may be closer to 30 m³.

During excavation the soil should be tested for PHC CWS fractions F2 to F4, plus PHC fraction F1 at the day tank and the results compared to the CCME PL guidelines as listed in Table B.

Table B: Soil Quality Remediation Objectives for Petroleum Hydrocarbons

Objectives for Coarse-Grained Soils	F1 mg/kg	F2 mg/kg	F3 mg/kg	F4 mg/kg
Surface (0 to 1.5m depth)	210	150	300	2,800
Subsoil (>1.5m depth)	700	1,000	2,500	10,000

SRK Consulting (Canada) Inc.

*This signature was scanned with the
author's approval for exclusive use in
this document. Any other use is not
authorized.*

Arlene Stearman, PGeo, FGC
Principal Consultant

Disclaimer—SRK Consulting (Canada) Inc. has prepared this document for Blue Star Gold Corp.. Any use or decisions by which a third party makes of this document are the responsibility of such third parties. In no circumstance does SRK accept any consequential liability arising from commercial decisions or actions resulting from the use of this report by a third party.

The opinions expressed in this report have been based on the information available to SRK at the time of preparation. SRK has exercised all due care in reviewing information supplied by others for use on this project. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information, except to the extent that SRK was hired to verify the data.

7 References

Canadian Council of Ministers of the Environment (CCME), 1999 – Updated to September 2018. Canadian Environmental Quality Guidelines. Canadian Council of Ministers of the Environment, Winnipeg.

Canadian Council of Ministers of the Environment (CCME), 2001, Revised 2008. Canada-Wide Standards for Petroleum Hydrocarbons in Soil: Technical Supplement. January 2008.

Stantec Consulting Ltd. (Stantec), 2018. Memo: Camp 3 Tank Farm Remedial Excavation, Ulu Gold Project, Kitikmeot, Nunavut. Prepared for Mandalay Resources Corporation. December 10, 2018.

Stantec Consulting Ltd. (Stantec), 2019. Draft Memo: Ulu Contaminated Soil Volume Estimate. Prepared for Mandalay Resources Corporation. February 14, 2019.

Figures



 **srk consulting**

BLUE STAR
GOLD CORP.

Contaminated Soil Investigation

Location Plan

SRK JOB NO.: 1CB041.000

FILE NAME: Ulu-SiteFacil-utm-12_20141010.dwg

Ulu Gold Project

DATE:
March 2020

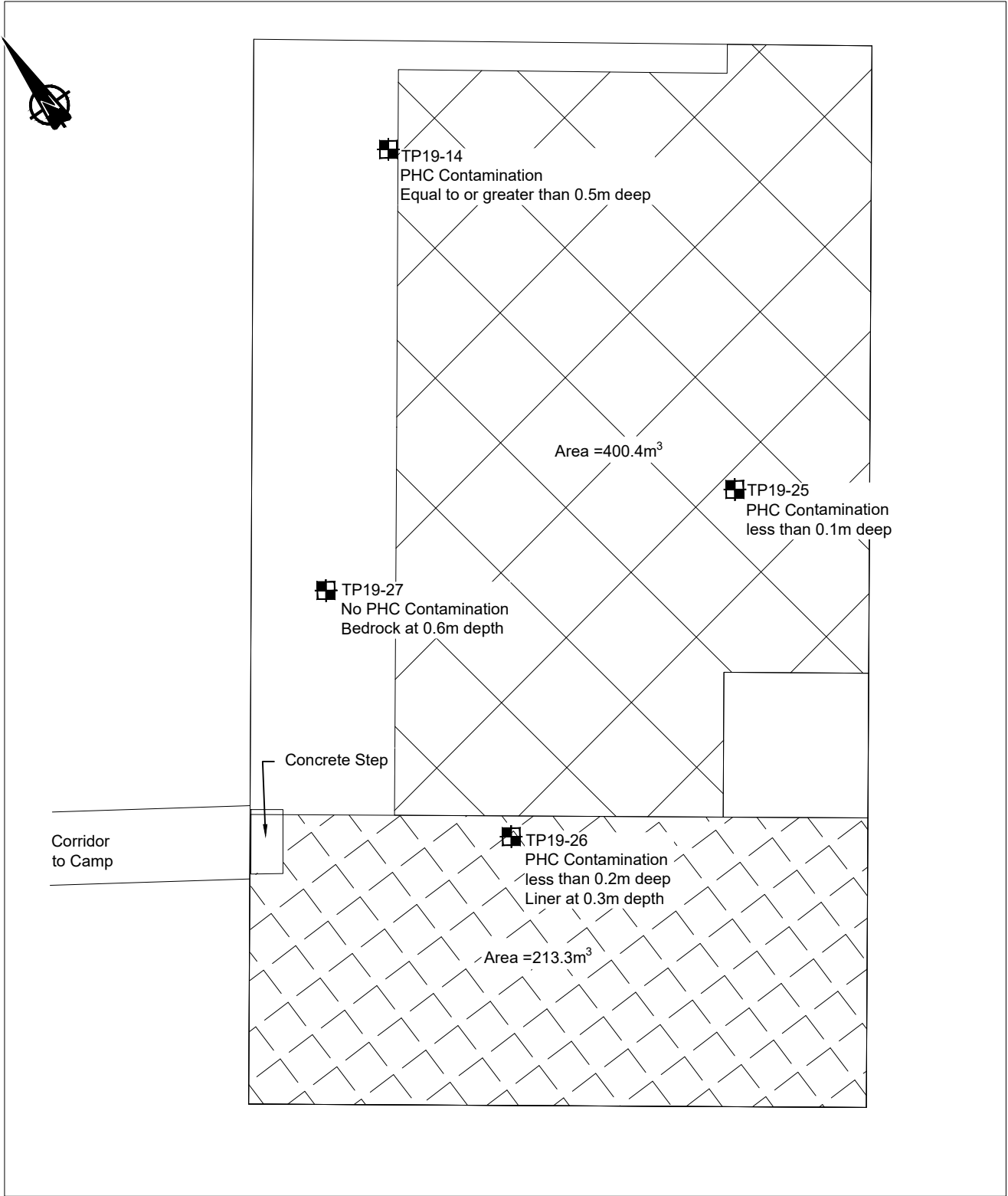
APPROVED:
AS

FIGURE:
1





Site Area



Detail A

- LEGEND**
- Planking and Metal Plates on Floor
 - Lined Area
 - No Liner or Cover
 - Test Pit

- REFERENCE**
- Coordinate System is WGS84 UTM Zone 12N.
 - Background Image from drone survey completed 07/17/2019.

DRAFT FOR DISCUSSION
NOT FOR CONSTRUCTION



Contaminated Soil Investigation

Shop Floor Configuration

SRK JOB NO.: 1CB041.000
FILE NAME: 1CB041.000 - Indoor Facility.dwg

Ulu Gold Project

DATE: Mar2020
APPROVED:
FIGURE: 4

Tables

Location	Test Pit	Unit from (m)	Unit to (m)	Description	USCS
Camp 3 Tank Farm	TP19-1	0	0.2	coarse sand; dry; beige	SW
		0.2	0.3	fine sand; beige; damp	SW
		0.3	0.7	fine sand; beige; dry	SW
	TP19-2	0	0.64	fine sand; beige; dry	SW
	TP19-3	0	0.7	coarse sand and gravel; gravel up to 2.5"; odour at 60-65 cm	SW
	TP19-4	0	0.7	sand with gravel; mild odour	SW
Camp 3 Stockpile	TP19-5	0	0.4	sand; strong PHC odour	SW
	TP19-6	0	0.5	sand; strong PHC odour	SW
	TP19-7	0	0.4	sand	SW
	TP19-8	0	0.4	sand	SW
	TP19-9	0	0.4	sand	SW
Main Tank Farm Perimeter	TP19-10	0	0.15	sand and gravel	SW
		0.15	1.3	blasted rock with some sand and silt	GP
		1.3	1.3	water, no sheen	Water
Main Tank Farm Drivethru	TP19-11	0	0.14	sand; moist below 10 cm; PHC odour	SW
		0.14	0.14	liner	Liner
	TP19-12	0	0.8	sand and gravel; moist below 25 cm; cold below 70 cm	SW
Day Tank	TP19-13	0	0.3	sand; some gravel, water at 15 cm; strong PHC odour; berm is 6 x 5 m	SW
		0.3	0.3	liner	Liner
Shop Floor	TP19-14	0	0.15	dark gray sand with gravel and cobbles	SW
		0.15	0.5	light gray sand with gravel and cobbles; cobbles up to 6" diameter	SW
Main Tank Farm Perimeter	TP19-15	0	1.9	sand and gravel with <15% cobbles; moist below 15 cm; strong PHC odour below 100 cm	SW
	TP19-16	0	1.5	sand with gravel; damp and odour below 130 cm	SW
		1.5	1.6	sand	SW
		1.6	1.6	bedrock	Bedrock
	TP19-17	0	0.7	sandy till	ML
		0.7	0.7	bedrock	Bedrock
	TP19-18	0	0.3	esker sand; reddish brown	SW
		0.3	1.4	silty sand and angular cobbles; blasted rock; beige; moderate PHC odour below 100 cm	GP
		1.4	1.7	silty sand with angular cobbles and gravel; blasted rock; odour continues to base of excavation	GP
Day Tank Farm Perimeter	TP19-19	0	0.4	beige; sand and gravel and cobbles	SW
		0.4	1.6	reddish; sand and gravel and cobbles; mild odour at 100 cm, no odour at base	SW
	TP19-20	0	1.7	sand and gravel with cobbles; odour between 50 and 100 cm	SW

Location	Test Pit	Unit from (m)	Unit to (m)	Description	USCS
Shop Perimeter	TP19-21	0	0.25	compacted sand and gravel with cobbles <4" diameter; moderate odour;	SW
		0.25	1.1	loose sand and gravel; less cobbles	SW
		1.1	1.1	bedrock	Bedrock
	TP19-22	0	0.2	beige sand with >15% gravel	SW
		0.2	1.5	reddish; sand and with grave; and cobbles up to 1' diameter	SW
		1.5	1.6	silt and clayey with sand and cobbles; roots	SC
		1.6	1.6	bedrock	Bedrock
	TP19-23	0	0.1	beige sand with some gravel	SW
		0.1	1.6	silty sand and gravel and cobbles and boulders 4' diameter; reddish brown	SW-SM
		1.6	1.6	bedrock	Bedrock
	TP19-24	0	1.5	sand with gravel	SW
		1.5	1.6	silty sand; cold till	SW-SM
		1.6	1.6	bedrock	Bedrock
Shop Floor	TP19-25	0	0.08	dark maroon sand and gravel; welding rods bits and other metal debris	SW
		0.08	0.3	gray sand with gravel; pockets of rusty red sand	SW
	TP19-26	0	0.18	dark brown; silty sand and gravel with some cobbles; compact; some bits of timber	SW
		0.18	0.3	sand with gravel	SW
		0.3	0.3	liner	Liner
	TP19-27	0	0.3	brown; sand and gravel with cobbles	SW
		0.3	0.6	beige; sand	SW
		0.6	0.6	bedrock	Bedrock

Notes:

USCS = Unified Soil Classification System

Location	Test Pit	Sample ID	sample from (m)	sample to (m)	Field Screen	
					HEX (ppm)	IBL (ppm)
Camp 3 Tank Farm	TP19-1	20501	0.20	0.30	0	0
	TP19-1	20502	0.60	0.70	0	0
	TP19-2	20503	0.10	0.20	0	0
	TP19-2	20504	0.60	0.64	0	0
	TP19-3	20505	0.10	0.20	0	0
	TP19-3	20506	0.60	0.65	0	0
	TP19-4	20507	0.10	0.20	0	0
	TP19-4	20508	0.60	0.70	0	0
Camp 3 Stockpile	TP19-5	20509	0.30	0.40	170	78
	TP19-5	20510	0.30	0.40	-	-
	TP19-6	20511	0.40	0.50	105	94
	TP19-7	20512	0.15	0.25	30	46
	TP19-8	20513	0.20	0.30	10	14
	TP19-9	20514	0.25	0.35	75	76
Main Tank Farm Perimeter	TP19-10	20515	0.10	0.15	0	2
Main Tank Farm Drivethru	TP19-11	20516	0.10	0.14	95	108
	TP19-12	20517	0.15	0.25	240	184
	TP19-12	20518	0.70	0.80	6% LEL	414
Day Tank	TP19-13	20519	0.00	0.30	380	24
Shop Floor	TP19-14	20520	0.00	0.15	8	12
	TP19-14	20521	0.40	0.50	0	6
Main Tank Farm Perimeter	TP19-10	20522	0.25	0.40	0	0
	TP19-10	20523	1.00	1.30	0	0
	TP19-15	20524	0.15	0.25	0	0
	TP19-15	20525	0.75	0.85	0	0
	TP19-15	20526	1.70	1.90	110	112
	TP19-16	20527	0.15	0.25	0	0
	TP19-16	20528	1.50	1.60	125	114
	TP19-17	20529	0.60	0.70	0	0
	TP19-18	20530	0.20	0.30	0	2
	TP19-18	20531	1.40	1.70	195	150
Day Tank Farm Perimeter	TP19-19	20532	0.40	0.50	0	0
	TP19-19	20533	1.30	1.60	5	0
	TP19-20	20534	0.25	0.35	0	0
	TP19-20	20535	0.60	0.70	0	0
	TP19-20	20536	1.40	1.70	0	6

Location	Test Pit	Sample ID	sample from (m)	sample to (m)	Field Screen	
					HEX (ppm)	IBL (ppm)
Shop Perimeter	TP19-21	20556	0.10	0.20	0	0
	TP19-21	20557	0.60	0.70	0	0
	TP19-21	20558	0.90	1.10	0	0
	TP19-22	20559	0.10	0.20	0	0
	TP19-22	20560	0.70	0.80	0	0
	TP19-22	20561	1.50	1.60	0	0
	TP19-23	20562	0.10	0.25	0	0
	TP19-23	20563	0.70	0.80	0	0
	TP19-23	20564	1.40	1.60	0	0
	TP19-24	20565	0.10	0.20	0	0
	TP19-24	20566	1.40	1.60	0	0
Shop Floor	TP19-25	20567	0.00	0.08	0	0
	TP19-25	20568	0.15	0.30	0	0
	TP19-26	20569	0.00	0.10	0	0
	TP19-26	20570	0.20	0.30	0	0
	TP19-27	20571	0.50	0.10	15	0
	TP19-27	20572	0.45	0.50	0	0

Notes:

HEX = Organic Vapour Field Screen calibrated to Hexane

IBL = Organic Vapour Field Screen calibrated to Isobutylene

LEL = Lower Explosive Limit

Field screening results are measured based on a 'dry head space' method using a combustible gas

Table 3: Petroleum Hydrocarbon Results

Location:		Camp 3 Tank Farm			Camp 3 Stockpile					Main Tank Farm Drivethru		Main Tank Farm Perimeter				
Test Pit ID:		TP19-2	TP19-3	TP19-4	TP19-5	TP19-5	TP19-6	TP19-8	TP19-9	TP19-11	TP19-12	TP19-10	TP19-10	TP19-15	TP19-15	TP19-16
Sample ID:		20503	20506	20508	20509	20510	20511	20513	20514	20516	20518	20515	20522	20525	20526	20528
Sample Date:		9/3/2019	9/3/2019	9/3/2019	9/3/2019	9/3/2019	9/3/2019	9/3/2019	9/3/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019
Sample Depth from (m):		0.1	0.6	0.6	0.3	0.3	0.4	0.2	0.25	0.1	0.7	0.1	0.25	0.75	1.70	1.50
Sample Depth to (m):		0.2	0.65	0.7	0.4	0.4	0.5	0.3	0.35	0.14	0.8	0.15	0.40	0.85	1.90	1.60
Field screen Hexane (ppm) ^g :		0	0	0	170	duplicate	105	10	75	95	6% LEL	0	0	0	110	125
Field Screen Isobutylene (ppm) ^g :		0	0	0	78	of 20509	94	14	76	108	414	2	0	0	112	114
PARAMETER	PL ^c															
Moisture %		5.45	4.18	6.6	6.71	7.24	6.94	4.33	8.93	6.18	3.66	2.35	3.51	3.66	5.49	6.4
Monocyclic Aromatic Hydrocarbons ^a																
Benzene surface ^{d,e,h}	11	-	-	-	<0.0050	<0.0050	-	-	<0.0050	<0.0050	-	<0.0050	-	-		
Benzene subsoil ^{d,e,h}	62														<0.0050	<0.0050
Ethylbenzene surface ^{d,e}	55	-	-	-	<0.010	<0.010	-	-	<0.010	<0.010	-	<0.010	-	-		
Ethylbenzene subsoil ^{d,e}	110														<0.010	<0.010
Toluene surface ^{d,e}	75	-	-	-	<0.050	<0.050	-	-	<0.050	<0.050	-	<0.050	-	-		
Toluene subsoil ^{d,e}	150														<0.050	<0.050
ortho-Xylene	NC	-	-	-	0.052	0.083	-	-	<0.050	<0.050	-	<0.050	-	-	0.088	0.128
meta- & para-Xylene	NC	-	-	-	<0.050	<0.050	-	-	<0.050	<0.050	-	<0.050	-	-	<0.050	0.065
Xylenes surface ^{d,f}	65	-	-	-	<0.10	<0.10	-	-	<0.10	<0.10	-	<0.10	-	-		
Xylenes subsoil ^{d,f}	130														<0.10	0.19
Petroleum Hydrocarbons ^b																
F1 (C6-C10) surface ^{d,e,i}	210	-	-	-	13	32	-	-	18	15	-	<10	-	-		
F1 (C6-C10) subsoil ^{d,e,i}	700														45	21
F2 (C10-C16) surface ^{d,e,j}	150	<30	<30	42	551	477	622	124	548	4700	2500	<30	<30	<30		
F2 (C10-C16) subsoil ^{d,e,j}	1000														2720	770
F3 (C16-C34) surface ^{d,e,j}	300	<50	<50	<50	118	129	147	2820	424	2820	674	51	<50	<50		
F3 (C16-C34) subsoil ^{d,e,k}	2500														410	125
F4 (C34-C50) surface ^{d,e}	2800	-	-	-	<50	<50	-	-	<50	<50	<50	<50	<50	<50		
F4 (C34-C50) subsoil ^{d,e}	10000														<50	<50

Bold

Concentration greater than or equal to the CCME soil quality for Parkland (PL) use.

Notes:

Units are in milligrams per kilogram (mg/kg).

NC = not calculated

LEL = Lower Explosive Limit

a) CEQG Soil Quality for the Protection of Environment and Human Health. 1999, with updates to 2018. Accessed January 2020.

Available online at <http://st-ts.ccme.ca/en/index.html>

b) Petroluem Hydrocarbon Canada-Wide Standards (PHC CWS). 2008.

c) The site-specific exposure pathways used to determin the Parkland (PL) standards include: soil ingestion, soil contact, nutrient cycling and management limits.

d) Guidelines are dependant upon depth of sample (surface <1.5m, subsoil >1.5m depth).

e) Guideline is dependant on medium grain size of soil analyzed (Fine <75 µm, Coarse >75 µm). Median grain size of soil sampled is coarse.

f) The more restrictive fine-grained objective is applied.

g) Field screening results are measured based on a 'dry headspace' method using a combustible gas meter calibrated to a hexane and isobutylene standard.

h) Soil quality criterion of 10⁻⁶ incremental lifetime cancer risk (ILCR) used instead of 10⁻⁵ ILCR.

i) Where results are reported for both F1 (C6-C10) and F1-BETX the result for F1-BETX is presented.

j) Where results are report for both F2 (C10-C6) and F2-Naphthalene the result for F2-Naphthalene is presented.

k) Where results are reported for F3 (C16-C34) and F3-PAH the result for F3-PAH is presented.

Table 3: Petroleum Hydrocarbon Results

Location:		Main Tank Farm Perimeter		Day Tank	Day Tank Farm Perimeter					Shop Floor						
Test Pit ID:		TP19-17	TP19-18	TP19-13	TP19-19	TP19-19	TP19-20	TP19-20	TP19-23	TP19-14	TP19-14	TP19-25	TP19-25	TP19-26	TP19-26	TP19-27
Sample ID:		20529	20531	20519	20532	20533	20535	20536	20562	20520	20521	20567	20568	20569	20570	20571
Sample Date:		9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/4/2019	9/5/2019	9/4/2019	9/4/2019	9/5/2019	9/5/2019	9/5/2019	9/5/2019	9/5/2019
Sample Depth from (m):		0.60	1.40	0.00	0.40	1.30	0.60	1.40	0.10	0.00	0.40	0.00	0.15	0.00	0.20	0.05
Sample Depth to (m):		0.70	1.70	0.30	0.50	1.60	0.70	1.70	0.25	0.15	0.50	0.08	0.30	0.10	0.30	0.10
Field screen Hexane (ppm) ^g :		0	195	380	0	5	0	0	0	8	0	0	0	0	0	15
Field Screen Isobutylene (ppm) ^g :		0	150	24	0	0	0	6	0	12	6	0	0	0	0	0
PARAMETER	PL ^c															
Moisture %		6.03	8.84	15.8	3.79	4.02	4.16	5.26	3.6	2.28	3.23	13.7	5.91	5.94	4.59	2.65
Monocyclic Aromatic Hydrocarbons ^a																
Benzene surface ^{d,e,h}	11	-	<0.0050	0.0053	-	<0.0050	-	<0.0050	<0.0050	-	-	-	-	<0.0050	<0.0050	-
Benzene subsoil ^{d,e,h}	62															
Ethylbenzene surface ^{d,e}	55	-	0.027	2.09	-	<0.010	-	<0.010	<0.010	-	-	-	-	<0.010	<0.010	-
Ethylbenzene subsoil ^{d,e}	110															
Toluene surface ^{d,e}	75	-	<0.050	0.621	-	<0.050	-	<0.050	<0.050	-	-	-	-	<0.050	<0.050	-
Toluene subsoil ^{d,e}	150															
ortho-Xylene	NC	-	0.17	7.95	-	<0.050	-	<0.050	<0.050	-	-	-	-	<0.050	<0.050	-
meta- & para-Xylene	NC	-	0.108	9.74	-	<0.050	-	<0.050	<0.050	-	-	-	-	<0.050	<0.050	-
Xylenes surface ^{d,f}	65	-	0.28	17.7	-	<0.10	-	<0.10	<0.10	-	-	-	-	<0.10	<0.10	-
Xylenes subsoil ^{d,f}	130															
Petroleum Hydrocarbons ^b																
F1 (C6-C10) surface ^{d,e,i}	210	-	80	344	-	11	-	<10	<10	-	-	-	-	<10	<10	-
F1 (C6-C10) subsoil ^{d,e,i}	700															
F2 (C10-C16) surface ^{d,e,j}	150	<30	3660	6500	<30	<30	<30	62	<30	591	538	98	<30	105	<30	<30
F2 (C10-C16) subsoil ^{d,e,j}	1000															
F3 (C16-C34) surface ^{d,e,j}	300			2010				71	<50	13600	3830	5690	<50	3880	130	230
F3 (C16-C34) subsoil ^{d,e,k}	2500															
F4 (C34-C50) surface ^{d,e}	2800	-		<50	-	-	<50	-	<50	2110	457	1040	<50	712	<50	<50
F4 (C34-C50) subsoil ^{d,e}	10000		-													

Bold Concentration greater than or equal to the CCME soil quality for Parkland (PL) use.

Notes:

Units are in milligrams per kilogram (mg/kg).

NC = not calculated

LEL = Lower Explosive Limit

a) CEQG Soil Quality for the Protection of Environment and Human Health. 1999, with updates to 2018. Accessed January 2020.

Available online at <http://st-ts.ccme.ca/en/index.html>

b) Petroluem Hydrocarbon Canada-Wide Standards (PHC CWS). 2008.

c) The site-specific exposure pathways used to determin the Parkland (PL) standards include: soil ingestion, soil contact, nutrient cycling and management limits.

d) Guidelines are dependant upon depth of sample (surface <1.5m, subsoil >1.5m depth).

e) Guideline is dependant on medium grain size of soil analyzed (Fine <75 µm, Coarse >75 µm). Median grain size of soil sampled is coarse.

f) The more restrictive fine-grained objective is applied.

g) Field screening results are measured based on a 'dry headspace' method using a combustible gas meter calibrated to a hexane and isobutylene standard.

h) Soil quality criterion of 10⁻⁶ incremental lifetime cancer risk (ILCR) used instead of 10⁻⁵ ILCR.

i) Where results are reported for both F1 (C6-C10) and F1-BETX the result for F1-BETX is presented.

j) Where results are report for both F2 (C10-C6) and F2-Naphthalene the result for F2-Naphthalene is presented.

k) Where results are reported for F3 (C16-C34) and F3-PAH the result for F3-PAH is presented.

Table 3: Petroleum Hydrocarbon Results

Location:		Shop Floor	Shop Perimeter				
Test Pit ID:		TP19-27	TP19-21	TP19-21	TP19-22	TP19-22	TP19-24
Sample ID:		20572	20556	20557	20559	20560	20565
Sample Date:		9/5/2019	9/5/2019	9/5/2019	9/5/2019	9/5/2019	9/5/2019
Sample Depth from (m):		0.45	0.10	0.60	0.10	0.70	0.10
Sample Depth to (m):		0.50	0.20	0.70	0.20	0.80	0.20
Field screen Hexane (ppm) ^g :		0	0	0	0	0	0
Field Screen Isobutylene (ppm) ^g :		0	0	0	0	0	0
PARAMETER	PL ^c						
Moisture %		3.79	4.07	4.78	4.09	3.34	3.08
Monocyclic Aromatic Hydrocarbons ^a							
Benzene surface ^{d,e,h}	11	-	<0.0050	-	<0.0050	-	<0.0050
Benzene subsoil ^{d,e,h}	62						
Ethylbenzene surface ^{d,e}	55	-	<0.010	-	<0.010	-	<0.010
Ethylbenzene subsoil ^{d,e}	110						
Toluene surface ^{d,e}	75	-	<0.050	-	<0.050	-	<0.050
Toluene subsoil ^{d,e}	150						
ortho-Xylene	NC	-	<0.050	-	<0.050	-	<0.050
meta- & para-Xylene	NC	-	<0.050	-	<0.050	-	<0.050
Xylenes surface ^{d,f}	65	-	<0.10	-	<0.10	-	<0.10
Xylenes subsoil ^{d,f}	130						
Petroleum Hydrocarbons ^b							
F1 (C6-C10) surface ^{d,e,i}	210	-	<10	-	<10	-	<10
F1 (C6-C10) subsoil ^{d,e,i}	700						
F2 (C10-C16) surface ^{d,e,j}	150	<30	306	<30	<30	<30	<30
F2 (C10-C16) subsoil ^{d,e,j}	1000						
F3 (C16-C34) surface ^{d,e,j}	300	<50	979	<50	<50	<50	<50
F3 (C16-C34) subsoil ^{d,e,k}	2500						
F4 (C34-C50) surface ^{d,e}	2800	<50	171	<50	<50	<50	<50
F4 (C34-C50) subsoil ^{d,e}	10000						

Bold

Concentration greater than or equal to the CCME soil quality for Parkland (PL) use.

- Notes:
- Units are in milligrams per kilogram (mg/kg).
- NC = not calculated
- LEL = Lower Explosive Limit
- a) CEQG Soil Quality for the Protection of Environment and Human Health. 1999, with updates to 2018. Accessed January 2020.
Available online at <http://st-ts.ccme.ca/en/index.html>
- b) Petroluem Hydrocarbon Canada-Wide Standards (PHC CWS). 2008.
- c) The site-specific exposure pathways used to determin the Parkland (PL) standards include: soil ingestion, soil contact, nutrient cycling and management limits.
- d) Guidelines are dependant upon depth of sample (surface <1.5m, subsoil >1.5m depth).
- e) Guideline is dependant on medium grain size of soil analyzed (Fine <75 µm, Coarse >75 µm). Median grain size of soil sampled is coarse.
- f) The more restrictive fine-grained objective is applied.
- g) Field screening results are measured based on a 'dry headspace' method using a combustible gas meter calibrated to a hexane and isobutylene standard.
- h) Soil quality criterion of 10⁻⁶ incremental lifetime cancer risk (ILCR) used instead of 10⁻⁵ ILCR.
- i) Where results are reported for both F1 (C6-C10) and F1-BETX the result for F1-BETX is presented.
- j) Where results are report for both F2 (C10-C6) and F2-Naphthalene the result for F2-Naphthalene is presented.
- k) Where results are reported for F3 (C16-C34) and F3-PAH the result for F3-PAH is presented.

Table 4: Polycyclic Aromatic Hydrocarbon Results

Location:		Camp 3 Stockpile			Main Tank Farm Drivethru		Main Tank Farm Perimeter					Day Tank	Day Tank Perimeter		Shop Floor
Test Pit ID:		TP19-5	TP19-5	TP19-9	TP19-11	TP19-12	TP19-10	TP19-10	TP19-15	TP19-15	TP19-16	TP19-13	TP19-20	TP19-23	TP19-14
Sample ID:		20509	20510	20514	20516	20518	20515	20522	20525	20526	20528	20519	20535	20562	20520
Sample Date:		3-Sep-2019	3-Sep-2019	3-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	4-Sep-2019	5-Sep-2019	4-Sep-2019
Sample Depth from (m):		0.30	0.30	0.25	0.10	0.70	0.10	0.25	0.75	1.70	1.50	0.00	0.60	0.10	0.00
Sample Depth to (m):		0.40	0.40	0.35	0.14	0.80	0.15	0.40	0.85	1.90	1.60	0.30	0.70	0.25	0.15
PARAMETER	PL														
Environmental Health Guidelines ^a															
Acenaphthene	NC	<0.020	<0.020	<0.0090	<0.20	<0.30	<0.0050	<0.0050	<0.0050	<0.20	<0.10	<0.40	<0.0050	<0.0050	<0.020
Acenaphthylene	NC	<0.010	<0.0080	<0.0050	<0.030	<0.020	<0.0050	<0.0050	<0.0050	<0.050	<0.0060	<0.070	<0.0050	<0.0050	<0.0050
Anthracene	2.5	<0.0050	<0.0080	<0.0070	<0.20	<0.030	<0.0040	<0.0040	<0.0040	<0.0070	<0.0070	<0.070	<0.0040	<0.0040	<0.040
Benz(a)anthracene	NC	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b&j)fluoranthene	NC	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020
Benzo(b+j+k)fluoranthene	1	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.022
Benzo(g,h,i)perylene	NC	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	NC	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibenz(a,h)anthracene	1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0070
Fluoranthene	50	<0.010	<0.010	<0.020	0.237	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.20	<0.010	<0.010	<0.030
Fluorene	NC	0.051	0.05	<0.020	<0.20	<0.20	<0.010	<0.010	<0.010	<0.090	<0.040	<0.80	<0.010	<0.010	<0.060
Indeno(1,2,3-c,d)pyrene	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1-Methylnaphthalene	NC	0.195	0.139	0.1	<0.060	3.22	<0.050	<0.050	<0.050	3.45	0.977	4.71	<0.050	<0.050	0.084
2-Methylnaphthalene	NC	0.063	0.048	0.017	<0.070	3.83	<0.010	<0.010	<0.010	1.24	0.62	1.92	<0.010	<0.010	0.03
Naphthalene	0.6 ^b	<0.050	<0.040	<0.020	<0.080	1.21	<0.010	<0.010	<0.010	<0.20	<0.060	<1.0	<0.010	<0.010	<0.050
Phenanthrene	0.1 ^c	<0.030	<0.030	<0.020	<0.040	0.795	<0.010	<0.010	<0.010	0.185	0.055	<1.0	<0.010	<0.010	<0.060
Pyrene	10	0.017	0.018	0.05	0.686	0.065	<0.010	<0.010	<0.010	0.017	<0.010	0.663	<0.010	<0.010	0.132
Quinoline	0.1	<0.060	<0.050	<0.050	<0.20	<0.20	<0.050	<0.050	<0.050	<0.20	<0.050	<2.0	<0.050	<0.050	<0.050
Human Health Guidelines ^a															
B(a)P Total Potency Equivalent	0.6 ^d	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
IACR (CCME)	≤1 ^e	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15

Bold

 Concentration greater than or equal to the CCME soil quality for Parkland (PL) use.

Notes:

Units are in milligrams per kilogram (mg/kg).

"<" = Less than analytical method detection limit.

NC = not calculated

a) CEQG Soil Quality for the Protection of Environment and Human Health. 1999, with updates to 2018. Accessed January 2020.

Available online at <http://st-ts.ccme.ca/en/index.html>

b) Where impact to surface water is a concern the PL objective is 0.013 mg/kg for Naphthalene.

c) Where impact to surface water is a concern the PL objective is 0.046 mg/kg for Phenanthrene.

d) Soil quality criterion of 10⁻⁶ incremental lifetime cancer risk (ILCR) used instead of 10⁻⁵ ILCR.

e) Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater quality. No potable groundwater use for areas investigated.

Table 4: Polycyclic Aromatic Hydrocarbon Results

Location:		Shop Floor							Shop Perimeter				
Test Pit ID:		TP19-14	TP19-25	TP19-25	TP19-26	TP19-26	TP19-70	TP19-70	TP19-21	TP19-21	TP19-22	TP19-22	TP19-24
Sample ID:		20521	20567	20568	20569	20570	20571	20572	20556	20557	20559	20560	20565
Sample Date:		4-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019	5-Sep-2019
Sample Depth from (m):		0.40	0.00	0.15	0.00	0.20	0.05	0.45	0.10	0.60	0.10	0.70	0.10
Sample Depth to (m):		0.50	0.08	0.30	0.10	0.30	0.10	0.50	0.20	0.70	0.20	0.80	0.20
PARAMETER	PL												
Environmental Health Guidelines ^a													
Acenaphthene	NC	<0.020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	NC	<0.0070	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Anthracene	2.5	<0.020	<0.0060	<0.0040	<0.0070	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Benz(a)anthracene	NC	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	20	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b&j)fluoranthene	NC	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b+j+k)fluoranthene	1	<0.022	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(g,h,i)perylene	NC	<0.010	0.021	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	1	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chrysene	NC	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dibenz(a,h)anthracene	1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	50	<0.030	<0.020	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010
Fluorene	NC	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene	1	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
1-Methylnaphthalene	NC	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	NC	<0.020	0.027	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Naphthalene	0.6 ^b	<0.020	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	0.1 ^c	<0.030	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Pyrene	10	0.048	0.069	<0.010	0.105	<0.010	<0.010	<0.010	0.096	<0.010	<0.010	<0.010	<0.010
Quinoline	0.1	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Human Health Guidelines ^a													
B(a)P Total Potency Equivalent	0.6 ^d	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
IACR (CCME)	≤1 ^e	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15

Bold

Concentration greater than or equal to the CCME soil quality for Parkland (PL) use.

Notes:

Units are in milligrams per kilogram (mg/kg).

"<" = Less than analytical method detection limit.

NC = not calculated

a) CEQG Soil Quality for the Protection of Environment and Human Health. 1999, with updates to 2018. Accessed January 2020.

Available online at <http://st-ts.ccme.ca/en/index.html>

b) Where impact to surface water is a concern the PL objective is 0.013 mg/kg for Naphthalene.

c) Where impact to surface water is a concern the PL objective is 0.046 mg/kg for Phenanthrene.

d) Soil quality criterion of 10⁻⁶ incremental lifetime cancer risk (ILCR) used instead of 10⁻⁵ ILCR.

e) Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater quality. No potable groundwater use for areas investigated.

Laboratory Certificates



SRK CONSULTING (CANADA) INC.
ATTN: Arlene Stearman
2200 - 1066 W. Hastings St.
Vancouver BC V6E 3X2

Date Received: 06-SEP-19
Report Date: 20-SEP-19 17:52 (MT)
Version: FINAL

Client Phone: 604-235-8541

Certificate of Analysis

Lab Work Order #: L2343486

Project P.O. #: Ulu

Job Reference:

C of C Numbers: 17-817772

Legal Site Desc:

Edward Ngai
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-3 SOIL 03-SEP-19 20503	L2343486-6 SOIL 03-SEP-19 20506	L2343486-8 SOIL 03-SEP-19 20508	L2343486-9 SOIL 03-SEP-19 20509	L2343486-10 SOIL 03-SEP-19 20510
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		5.45	4.18	6.60	6.71	7.24
Volatile Organic Compounds	Benzene (mg/kg)					<0.0050	<0.0050
	Ethylbenzene (mg/kg)					<0.010	<0.010
	Toluene (mg/kg)					<0.050	<0.050
	o-Xylene (mg/kg)					0.052	0.083
	m+p-Xylene (mg/kg)					<0.050	<0.050
	Xylenes (mg/kg)					<0.10	<0.10
	F1(C6-C10) (mg/kg)					13	32
	F1-BTEX (mg/kg)					13	32
	Surrogate: 4-Bromofluorobenzene (SS) (%)					127.0	129.5
	Surrogate: 3,4-Dichlorotoluene (SS) (%)					90.7	110.9
	Surrogate: 1,4-Difluorobenzene (SS) (%)					120.1	117.2
Hydrocarbons	F2 (C10-C16) (mg/kg)		<30	<30	42	551	477
	F2-Naphth (mg/kg)					551	477
	F3 (C16-C34) (mg/kg)		<50	<50	<50	118	129
	F3-PAH (mg/kg)					118	129
	F4 (C34-C50) (mg/kg)					<50	<50
	Chrom. to baseline at nC50					YES	YES
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)		92.2	87.6	85.6	99.9	83.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)					<0.020 ^{DLCI}	<0.020 ^{DLCI}
	Acenaphthylene (mg/kg)					<0.010 ^{DLCI}	<0.0080 ^{DLCI}
	Anthracene (mg/kg)					<0.0050 ^{DLQ}	<0.0080 ^{DLQ}
	Benz(a)anthracene (mg/kg)					<0.010	<0.010
	Benzo(a)pyrene (mg/kg)					<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)					<0.010	<0.010
	Benzo(b+j+k)fluoranthene (mg/kg)					<0.015	<0.015
	Benzo(g,h,i)perylene (mg/kg)					<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)					<0.010	<0.010
	Chrysene (mg/kg)					<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)					<0.0050	<0.0050
	Fluoranthene (mg/kg)					<0.010	<0.010
	Fluorene (mg/kg)					0.051	0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)					<0.010	<0.010
	1-Methylnaphthalene (mg/kg)					0.195	0.139
	2-Methylnaphthalene (mg/kg)					0.063	0.048

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2343486-11 SOIL 03-SEP-19 20511	L2343486-13 SOIL 03-SEP-19 20513	L2343486-14 SOIL 03-SEP-19 20514	L2343486-15 SOIL 04-SEP-19 20515	L2343486-16 SOIL 04-SEP-19 20516
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	6.94	4.33	8.93	2.35	6.18
Volatile Organic Compounds	Benzene (mg/kg)			<0.0050	<0.0050	<0.0050
	Ethylbenzene (mg/kg)			<0.010	<0.010	<0.010
	Toluene (mg/kg)			<0.050	<0.050	<0.050
	o-Xylene (mg/kg)			<0.050	<0.050	<0.050
	m+p-Xylene (mg/kg)			<0.050	<0.050	<0.050
	Xylenes (mg/kg)			<0.10	<0.10	<0.10
	F1(C6-C10) (mg/kg)			18	<10	15
	F1-BTEX (mg/kg)			18	<10	15
	Surrogate: 4-Bromofluorobenzene (SS) (%)			124.3	127.5	128.7
	Surrogate: 3,4-Dichlorotoluene (SS) (%)			83.9	117.8	83.4
	Surrogate: 1,4-Difluorobenzene (SS) (%)			123.6	126.6	129.0
Hydrocarbons	F2 (C10-C16) (mg/kg)	622	124	548	<30	4700
	F2-Naphth (mg/kg)			548	<30	4700
	F3 (C16-C34) (mg/kg)	147	2820	424	51	2830
	F3-PAH (mg/kg)			424	51	2820
	F4 (C34-C50) (mg/kg)			<50	<50	<50
	Chrom. to baseline at nC50			YES	YES	YES
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	94.8	93.3	99.0	93.2	111.4
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)			<0.0090 ^{DLCl}	<0.0050	<0.20 ^{DLCl}
	Acenaphthylene (mg/kg)			<0.0050	<0.0050	<0.030 ^{DLCl}
	Anthracene (mg/kg)			<0.0070 ^{DLQ}	<0.0040	<0.20 ^{DLQ}
	Benz(a)anthracene (mg/kg)			<0.010	<0.010	<0.010
	Benzo(a)pyrene (mg/kg)			<0.010	<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)			<0.010	<0.010	<0.010
	Benzo(b+j+k)fluoranthene (mg/kg)			<0.015	<0.015	<0.015
	Benzo(g,h,i)perylene (mg/kg)			<0.010	<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)			<0.010	<0.010	<0.010
	Chrysene (mg/kg)			<0.010	<0.010	<0.020 ^{DLCl}
	Dibenz(a,h)anthracene (mg/kg)			<0.0050	<0.0050	<0.0050
	Fluoranthene (mg/kg)			<0.020 ^{DLCl}	<0.010	0.237 ^{DLCl}
	Fluorene (mg/kg)			<0.020 ^{DLCl}	<0.010	<0.20 ^{DLCl}
	Indeno(1,2,3-c,d)pyrene (mg/kg)			<0.010	<0.010	<0.010
	1-Methylnaphthalene (mg/kg)			0.100	<0.050	<0.060 ^{DLCl}
	2-Methylnaphthalene (mg/kg)			0.017	<0.010	<0.070 ^{DLCl}

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2343486-18 SOIL 04-SEP-19 20518	L2343486-19 SOIL 04-SEP-19 20519	L2343486-20 SOIL 04-SEP-19 20520	L2343486-21 SOIL 04-SEP-19 20521	L2343486-22 SOIL 04-SEP-19 20522
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	3.66	15.8	2.28	3.23	3.51
Volatile Organic Compounds	Benzene (mg/kg)		0.0053			
	Ethylbenzene (mg/kg)		2.09			
	Toluene (mg/kg)		0.621			
	o-Xylene (mg/kg)		7.95			
	m+p-Xylene (mg/kg)		9.74			
	Xylenes (mg/kg)		17.7			
	F1(C6-C10) (mg/kg)		365			
	F1-BTEX (mg/kg)		344			
	Surrogate: 4-Bromofluorobenzene (SS) (%)		123.5			
	Surrogate: 3,4-Dichlorotoluene (SS) (%)		112.5			
	Surrogate: 1,4-Difluorobenzene (SS) (%)		128.1			
Hydrocarbons	F2 (C10-C16) (mg/kg)	2500	6500	591	538	<30
	F2-Naphth (mg/kg)	2500	6500	591	538	<30
	F3 (C16-C34) (mg/kg)	675	2010	13600	3830	<50
	F3-PAH (mg/kg)	674	2010	13600	3830	<50
	F4 (C34-C50) (mg/kg)	<50	<50	2110	457	<50
	Chrom. to baseline at nC50	YES	YES	YES	YES	YES
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	101.8	128.3	104.8	95.5	86.1
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.30 ^{DLCI}	<0.40 ^{DLCI}	<0.020 ^{DLCI}	<0.020 ^{DLCI}	<0.0050
	Acenaphthylene (mg/kg)	<0.020 ^{DLCI}	<0.070 ^{DLCI}	<0.0050 ^{DLCI}	<0.0070 ^{DLCI}	<0.0050
	Anthracene (mg/kg)	<0.030 ^{DLQ}	<0.070 ^{DLQ}	<0.040 ^{DLQ}	<0.020 ^{DLQ}	<0.0040
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)	<0.010	<0.010	<0.020 ^{DLCI}	<0.010	<0.010
	Benzo(b+j+k)fluoranthene (mg/kg)	<0.015	<0.015	<0.022	<0.022	<0.015
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	<0.010 ^{DLCI}	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.020 ^{DLCI}	<0.010
	Chrysene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050 ^{DLCI}	<0.0050 ^{DLCI}	<0.0070 ^{DLCI}	<0.0050 ^{DLCI}	<0.0050
	Fluoranthene (mg/kg)	<0.020 ^{DLCI}	<0.20 ^{DLCI}	<0.030 ^{DLCI}	<0.030 ^{DLCI}	<0.010
	Fluorene (mg/kg)	<0.20 ^{DLCI}	<0.80 ^{DLCI}	<0.060 ^{DLCI}	<0.050 ^{DLCI}	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	1-Methylnaphthalene (mg/kg)	3.22	4.71	0.084	<0.050 ^{DLCI}	<0.050
	2-Methylnaphthalene (mg/kg)	3.83	1.92	0.030	<0.020 ^{DLCI}	<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2343486-25 SOIL 04-SEP-19 20525	L2343486-26 SOIL 04-SEP-19 20526	L2343486-28 SOIL 04-SEP-19 20528	L2343486-29 SOIL 04-SEP-19 20529	L2343486-31 SOIL 04-SEP-19 20531
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	3.66	5.49	6.40	6.03	8.84
Volatile Organic Compounds	Benzene (mg/kg)		<0.0050	<0.0050		<0.0050
	Ethylbenzene (mg/kg)		<0.010	<0.010		0.027
	Toluene (mg/kg)		<0.050	<0.050		<0.050
	o-Xylene (mg/kg)		0.088	0.128		0.170
	m+p-Xylene (mg/kg)		<0.050	0.065		0.108
	Xylenes (mg/kg)		<0.10	0.19		0.28
	F1(C6-C10) (mg/kg)		45	21		81
	F1-BTEX (mg/kg)		45	21		80
	Surrogate: 4-Bromofluorobenzene (SS) (%)		129.9	127.2		113.9
	Surrogate: 3,4-Dichlorotoluene (SS) (%)		N/A	N/A		N/A
	Surrogate: 1,4-Difluorobenzene (SS) (%)		122.1	125.2		126.8
Hydrocarbons	F2 (C10-C16) (mg/kg)	<30	2720	770	<30	3660
	F2-Naphth (mg/kg)	<30	2720	770		
	F3 (C16-C34) (mg/kg)	<50	411	125	<50	604
	F3-PAH (mg/kg)	<50	410	125		
	F4 (C34-C50) (mg/kg)	<50	<50	<50		
	Chrom. to baseline at nC50	YES	YES	YES		
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	97.9	110.6	102.8	93.7	93.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.20	<0.10		
	Acenaphthylene (mg/kg)	<0.0050	<0.050	<0.0060		
	Anthracene (mg/kg)	<0.0040	<0.0070	<0.0070		
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(b&j)fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(b+j+k)fluoranthene (mg/kg)	<0.015	<0.015	<0.015		
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010		
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Chrysene (mg/kg)	<0.010	<0.010	<0.010		
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050		
	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010		
	Fluorene (mg/kg)	<0.010	<0.090	<0.040		
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010		
	1-Methylnaphthalene (mg/kg)	<0.050	3.45	0.977		
	2-Methylnaphthalene (mg/kg)	<0.010	1.24	0.620		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-32 SOIL 04-SEP-19 20532	L2343486-33 SOIL 04-SEP-19 20533	L2343486-35 SOIL 04-SEP-19 20535	L2343486-36 SOIL 04-SEP-19 20536	L2343486-37 SOIL 05-SEP-19 20556
Grouping	Analyte						
SOIL							
Physical Tests	Moisture (%)		3.79	4.02	4.16	5.26	4.07
Volatile Organic Compounds	Benzene (mg/kg)			<0.0050		<0.0050	<0.0050
	Ethylbenzene (mg/kg)			<0.010		<0.010	<0.010
	Toluene (mg/kg)			<0.050		<0.050	<0.050
	o-Xylene (mg/kg)			<0.050		<0.050	<0.050
	m+p-Xylene (mg/kg)			<0.050		<0.050	<0.050
	Xylenes (mg/kg)			<0.10		<0.10	<0.10
	F1(C6-C10) (mg/kg)			11		<10	<10
	F1-BTEX (mg/kg)			11		<10	<10
	Surrogate: 4-Bromofluorobenzene (SS) (%)			113.8		127.9	127.0
	Surrogate: 3,4-Dichlorotoluene (SS) (%)			79.6		113.5	117.5
	Surrogate: 1,4-Difluorobenzene (SS) (%)			123.9		128.5	120.0
Hydrocarbons	F2 (C10-C16) (mg/kg)		<30	<30	<30	62	306
	F2-Naphth (mg/kg)				<30		306
	F3 (C16-C34) (mg/kg)		<50	<50	<50	71	979
	F3-PAH (mg/kg)				<50		978
	F4 (C34-C50) (mg/kg)				<50		171
	Chrom. to baseline at nC50				YES		YES
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)		83.9	83.7	82.5	89.6	91.0
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)				<0.0050		<0.010 ^{DLCL}
	Acenaphthylene (mg/kg)				<0.0050		<0.0050
	Anthracene (mg/kg)				<0.0040		<0.0040
	Benz(a)anthracene (mg/kg)				<0.010		<0.010
	Benzo(a)pyrene (mg/kg)				<0.010		<0.010
	Benzo(b&j)fluoranthene (mg/kg)				<0.010		<0.010
	Benzo(b+j+k)fluoranthene (mg/kg)				<0.015		<0.015
	Benzo(g,h,i)perylene (mg/kg)				<0.010		<0.010
	Benzo(k)fluoranthene (mg/kg)				<0.010		<0.010
	Chrysene (mg/kg)				<0.010		<0.010
	Dibenz(a,h)anthracene (mg/kg)				<0.0050		<0.0050
	Fluoranthene (mg/kg)				<0.010		<0.010
	Fluorene (mg/kg)				<0.010		<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)				<0.010		<0.010
	1-Methylnaphthalene (mg/kg)				<0.050		<0.050
	2-Methylnaphthalene (mg/kg)				<0.010		<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2343486-38 SOIL 05-SEP-19 20557	L2343486-40 SOIL 05-SEP-19 20559	L2343486-41 SOIL 05-SEP-19 20560	L2343486-43 SOIL 05-SEP-19 20562	L2343486-46 SOIL 05-SEP-19 20565
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	4.78	4.09	3.34	3.60	3.08
Volatile Organic Compounds	Benzene (mg/kg)		<0.0050		<0.0050	<0.0050
	Ethylbenzene (mg/kg)		<0.010		<0.010	<0.010
	Toluene (mg/kg)		<0.050		<0.050	<0.050
	o-Xylene (mg/kg)		<0.050		<0.050	<0.050
	m+p-Xylene (mg/kg)		<0.050		<0.050	<0.050
	Xylenes (mg/kg)		<0.10		<0.10	<0.10
	F1(C6-C10) (mg/kg)		<10		<10	<10
	F1-BTEX (mg/kg)		<10		<10	<10
	Surrogate: 4-Bromofluorobenzene (SS) (%)		126.7		123.9	114.9
	Surrogate: 3,4-Dichlorotoluene (SS) (%)		123.9		128.2	124.0
	Surrogate: 1,4-Difluorobenzene (SS) (%)		125.9		128.5	119.9
Hydrocarbons	F2 (C10-C16) (mg/kg)	<30	<30	<30	<30	<30
	F2-Naphth (mg/kg)	<30	<30	<30	<30	<30
	F3 (C16-C34) (mg/kg)	<50	<50	<50	<50	<50
	F3-PAH (mg/kg)	<50	<50	<50	<50	<50
	F4 (C34-C50) (mg/kg)	<50	<50	<50	<50	<50
	Chrom. to baseline at nC50	YES	YES	YES	YES	YES
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	88.2	76.0	94.6	93.1	95.9
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(b+j+k)fluoranthene (mg/kg)	<0.015	<0.015	<0.015	<0.015	<0.015
	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Chrysene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	1-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2343486-48 SOIL 05-SEP-19 20567	L2343486-49 SOIL 05-SEP-19 20568	L2343486-50 SOIL 05-SEP-19 20569	L2343486-51 SOIL 05-SEP-19 20570	L2343486-52 SOIL 05-SEP-19 20571
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	13.7	5.91	5.94	4.59	2.65
Volatile Organic Compounds	Benzene (mg/kg)			<0.0050	<0.0050	
	Ethylbenzene (mg/kg)			<0.010	<0.010	
	Toluene (mg/kg)			<0.050	<0.050	
	o-Xylene (mg/kg)			<0.050	<0.050	
	m+p-Xylene (mg/kg)			<0.050	<0.050	
	Xylenes (mg/kg)			<0.10	<0.10	
	F1(C6-C10) (mg/kg)			<10	<10	
	F1-BTEX (mg/kg)			<10	<10	
	Surrogate: 4-Bromofluorobenzene (SS) (%)			112.5	115.0	
	Surrogate: 3,4-Dichlorotoluene (SS) (%)			124.5	121.5	
	Surrogate: 1,4-Difluorobenzene (SS) (%)			127.4	123.3	
Hydrocarbons	F2 (C10-C16) (mg/kg)	98	<30	105	<30	<30
	F2-Naphth (mg/kg)	98	<30	105	<30	<30
	F3 (C16-C34) (mg/kg)	5690	<50	3880	130	230
	F3-PAH (mg/kg)	5690	<50	3880	130	230
	F4 (C34-C50) (mg/kg)	1040	<50	712	<50	<50
	Chrom. to baseline at nC50	YES	YES	YES	YES	YES
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	81.0	124.0	98.0	89.1	103.6
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)	<0.0060 ^{DLQ}	<0.0040	<0.0070 ^{DLCl}	<0.0040	<0.0040
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(b&j)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Benzo(b+j+k)fluoranthene (mg/kg)	<0.015	<0.015	<0.015	<0.015	<0.015
	Benzo(g,h,i)perylene (mg/kg)	0.021	<0.010	<0.010	<0.010	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Chrysene (mg/kg)	<0.020 ^{DLCl}	<0.010	<0.010	<0.010	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050 ^{DLCl}	<0.0050	<0.0050	<0.0050	<0.0050
	Fluoranthene (mg/kg)	<0.020	<0.010	<0.010	<0.010	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.020 ^{DLQ}	<0.010	<0.010	<0.010	<0.010
	1-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	0.027	<0.010	<0.010	<0.010	<0.010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2343486-53 SOIL 05-SEP-19 20572				
Grouping	Analyte					
SOIL						
Physical Tests	Moisture (%)	3.79				
Volatile Organic Compounds	Benzene (mg/kg)					
	Ethylbenzene (mg/kg)					
	Toluene (mg/kg)					
	o-Xylene (mg/kg)					
	m+p-Xylene (mg/kg)					
	Xylenes (mg/kg)					
	F1(C6-C10) (mg/kg)					
	F1-BTEX (mg/kg)					
	Surrogate: 4-Bromofluorobenzene (SS) (%)					
	Surrogate: 3,4-Dichlorotoluene (SS) (%)					
	Surrogate: 1,4-Difluorobenzene (SS) (%)					
Hydrocarbons	F2 (C10-C16) (mg/kg)	<30				
	F2-Naphth (mg/kg)	<30				
	F3 (C16-C34) (mg/kg)	<50				
	F3-PAH (mg/kg)	<50				
	F4 (C34-C50) (mg/kg)	<50				
	Chrom. to baseline at nC50	YES				
	Surrogate: 2-Bromobenzotrifluoride, F2-F4 (%)	86.4				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050				
	Acenaphthylene (mg/kg)	<0.0050				
	Anthracene (mg/kg)	<0.0040				
	Benz(a)anthracene (mg/kg)	<0.010				
	Benzo(a)pyrene (mg/kg)	<0.010				
	Benzo(b&j)fluoranthene (mg/kg)	<0.010				
	Benzo(b+j+k)fluoranthene (mg/kg)	<0.015				
	Benzo(g,h,i)perylene (mg/kg)	<0.010				
	Benzo(k)fluoranthene (mg/kg)	<0.010				
	Chrysene (mg/kg)	<0.010				
	Dibenz(a,h)anthracene (mg/kg)	<0.0050				
	Fluoranthene (mg/kg)	0.011				
	Fluorene (mg/kg)	<0.010				
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010				
	1-Methylnaphthalene (mg/kg)	<0.050				
	2-Methylnaphthalene (mg/kg)	<0.010				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-3 SOIL 03-SEP-19 20503	L2343486-6 SOIL 03-SEP-19 20506	L2343486-8 SOIL 03-SEP-19 20508	L2343486-9 SOIL 03-SEP-19 20509	L2343486-10 SOIL 03-SEP-19 20510
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)					^{DLCI} <0.050	^{DLCI} <0.040
	Phenanthrene (mg/kg)					^{DLQ} <0.030	^{DLQ} <0.030
	Pyrene (mg/kg)					0.017	0.018
	Quinoline (mg/kg)					^{DLCI} <0.060	<0.050
	Surrogate: Chrysene d12 (%)					91.1	81.1
	Surrogate: Naphthalene d8 (%)					97.6	86.3
	Surrogate: Phenanthrene d10 (%)					94.5	84.0
	B(a)P Total Potency Equivalent (mg/kg)					<0.020	<0.020
	IACR (CCME)					<0.15	<0.15

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-11 SOIL 03-SEP-19 20511	L2343486-13 SOIL 03-SEP-19 20513	L2343486-14 SOIL 03-SEP-19 20514	L2343486-15 SOIL 04-SEP-19 20515	L2343486-16 SOIL 04-SEP-19 20516
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)				<0.020 ^{DLCl}	<0.010	<0.080 ^{DLCl}
	Phenanthrene (mg/kg)				<0.020 ^{DLQ}	<0.010	<0.040 ^{DLCl}
	Pyrene (mg/kg)				0.050	<0.010	0.686 ^{DLCl}
	Quinoline (mg/kg)				<0.050	<0.050	<0.20 ^{DLCl}
	Surrogate: Chrysene d12 (%)				76.0	80.1	105.7
	Surrogate: Naphthalene d8 (%)				92.9	89.5	110.0
	Surrogate: Phenanthrene d10 (%)				90.7	93.5	94.0
	B(a)P Total Potency Equivalent (mg/kg)				<0.020	<0.020	<0.020
	IACR (CCME)				<0.15	<0.15	<0.15

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2343486-18	L2343486-19	L2343486-20	L2343486-21	L2343486-22
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	04-SEP-19	04-SEP-19	04-SEP-19	04-SEP-19	04-SEP-19
		Sampled Time					
		Client ID	20518	20519	20520	20521	20522
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)	1.21	<1.0 ^{DLCI}	<0.050 ^{DLCI}	<0.020 ^{DLCI}	<0.010	
	Phenanthrene (mg/kg)	0.795	<1.0 ^{DLQ}	<0.060 ^{DLQ}	<0.030 ^{DLQ}	<0.010	
	Pyrene (mg/kg)	0.065	0.663	0.132	0.048	<0.010	
	Quinoline (mg/kg)	<0.20 ^{DLCI}	<2.0 ^{DLCI}	<0.050	<0.050	<0.050	
	Surrogate: Chrysene d12 (%)	87.1	100.0	72.9	85.5	78.4	
	Surrogate: Naphthalene d8 (%)	93.8	111.5	95.5	94.9	89.9	
	Surrogate: Phenanthrene d10 (%)	87.6	94.3	95.0	93.5	97.8	
	B(a)P Total Potency Equivalent (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020	
	IACR (CCME)	<0.15	<0.15	<0.15	<0.15	<0.15	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L2343486-25	L2343486-26	L2343486-28	L2343486-29	L2343486-31
		Description	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampled Date	04-SEP-19	04-SEP-19	04-SEP-19	04-SEP-19	04-SEP-19
		Sampled Time					
		Client ID	20525	20526	20528	20529	20531
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)	<0.010	<0.20 ^{DLCI}	<0.060 ^{DLCI}			
	Phenanthrene (mg/kg)	<0.010	0.185	0.055			
	Pyrene (mg/kg)	<0.010	0.017 ^{DLCI}	<0.010			
	Quinoline (mg/kg)	<0.050	<0.20 ^{DLCI}	<0.050			
	Surrogate: Chrysene d12 (%)	81.2	96.0	88.8			
	Surrogate: Naphthalene d8 (%)	90.8	107.6	97.2			
	Surrogate: Phenanthrene d10 (%)	96.5	90.6	95.8			
	B(a)P Total Potency Equivalent (mg/kg)	<0.020	<0.020	<0.020			
	IACR (CCME)	<0.15	<0.15	<0.15			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-32 SOIL 04-SEP-19 20532	L2343486-33 SOIL 04-SEP-19 20533	L2343486-35 SOIL 04-SEP-19 20535	L2343486-36 SOIL 04-SEP-19 20536	L2343486-37 SOIL 05-SEP-19 20556
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)				<0.010		<0.010
	Phenanthrene (mg/kg)				<0.010		<0.010
	Pyrene (mg/kg)				<0.010		0.096
	Quinoline (mg/kg)				<0.050		<0.050
	Surrogate: Chrysene d12 (%)				95.7		97.8
	Surrogate: Naphthalene d8 (%)				93.6		94.8
	Surrogate: Phenanthrene d10 (%)				101.4		99.2
	B(a)P Total Potency Equivalent (mg/kg)				<0.020		<0.020
	IACR (CCME)				<0.15		<0.15

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-38 SOIL 05-SEP-19 20557	L2343486-40 SOIL 05-SEP-19 20559	L2343486-41 SOIL 05-SEP-19 20560	L2343486-43 SOIL 05-SEP-19 20562	L2343486-46 SOIL 05-SEP-19 20565
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Phenanthrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Quinoline (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	
	Surrogate: Chrysene d12 (%)	94.1	96.6	93.5	96.4	94.2	
	Surrogate: Naphthalene d8 (%)	95.4	100.5	92.6	98.1	102.9	
	Surrogate: Phenanthrene d10 (%)	100.3	104.2	98.3	101.9	105.1	
	B(a)P Total Potency Equivalent (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020	
	IACR (CCME)	<0.15	<0.15	<0.15	<0.15	<0.15	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2343486-48 SOIL 05-SEP-19 20567	L2343486-49 SOIL 05-SEP-19 20568	L2343486-50 SOIL 05-SEP-19 20569	L2343486-51 SOIL 05-SEP-19 20570	L2343486-52 SOIL 05-SEP-19 20571
Grouping	Analyte						
SOIL							
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)	0.011	<0.010	<0.010	<0.010	<0.010	
	Phenanthrene (mg/kg)	0.022	<0.010	<0.010	<0.010	<0.010	
	Pyrene (mg/kg)	0.069	<0.010	0.105	<0.010	<0.010	
	Quinoline (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050	
	Surrogate: Chrysene d12 (%)	96.7	116.4	99.8	90.2	104.6	
	Surrogate: Naphthalene d8 (%)	99.3	111.9	93.4	89.3	100.0	
	Surrogate: Phenanthrene d10 (%)	101.2	124.4	96.5	96.5	108.7	
	B(a)P Total Potency Equivalent (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020	
	IACR (CCME)	<0.15	<0.15	<0.15	<0.15	<0.15	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
SOIL						
Polycyclic Aromatic Hydrocarbons	Naphthalene (mg/kg)	<0.010				
	Phenanthrene (mg/kg)	<0.010				
	Pyrene (mg/kg)	<0.010				
	Quinoline (mg/kg)	<0.050				
	Surrogate: Chrysene d12 (%)	65.5				
	Surrogate: Naphthalene d8 (%)	64.1				
	Surrogate: Phenanthrene d10 (%)	69.3				
	B(a)P Total Potency Equivalent (mg/kg)	<0.020				
	IACR (CCME)	<0.15				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Qualifiers for Individual Parameters Listed:			
Qualifier	Description		
DLCI	Detection Limit Raised: Chromatographic Interference due to co-elution.		
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.		
SOL:MI	Surrogate recovery outside acceptable limits due to matrix interference		

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTXS,F1-MEOH-ED	Soil	BTEX and F1	EPA 8260C/5021A and CWS PHC Tier 1
This analysis involves the extraction of a subsample of the sediment/soil with methanol added in the field at the time of subsampling. The soil methanol extract is added to water and reagents, then heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. BTX Target compound concentrations are measured using mass spectrometry detection. The instrumental portion of F1 analysis is carried out in accordance with the Canada Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method (2001).			
F2F3-PAH-CALC-VA	Soil	F2&F3 minus PAHs [Calculation]	CCME CWS PHC TIER 1 (2001)
This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." For F2 (C10-C16) and F3 (C16-C34), a subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extractor. The extract undergoes a silica-gel clean-up to remove polar compounds prior to analysis by on-column GC/FID. The F2-Naphth and F3-PAH results are then calculated as follows:			
1. F2-Naphth: F2 (C10-C16) minus naphthalene. 2. F3-PAH: F3 (C16-C34) minus selected PAHs (phenanthrene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene).			
F2F3-TUMB-H/A-FID-VA	Soil	Petroleum Hydrocarbon by Tumbler GCFID	CCME PETROLEUM HYDROCARBONS
This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." For C10 to C34 hydrocarbons (F2 & F3) a subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extractor. The extract undergoes a silica-gel clean-up to remove polar compounds and is analyzed by on-column GC/FID.			
Notes:			
1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16. 2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34. 3. This method is validated for use. 4. Data from analysis of quality control samples is available upon request. 5. Reported results are expressed as milligrams per dry kilogram.			
F2F4-TUMB-H/A-FID-VA	Soil	CWS F2-F4 Hydrocarbons by Tumbler GCFID	CCME PETROLEUM HYDROCARBONS
This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." For C10 to C50 hydrocarbons (F2, F3, F4) and gravimetric heavy hydrocarbons (F4G-sg), a subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extractor. The extract undergoes a silica-gel clean-up to remove polar compounds. F2, F3 & F4 are analyzed by on-column GC/FID, and F4G-sg is analyzed gravimetrically.			
Notes:			
1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16. 2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34. 3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50. 4. F4G: Gravimetric Heavy Hydrocarbons 5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment. 6. Where F4 (C34-C50) and F4G-sg results are reported for a sample, the larger of the reported values is used for comparison against the relevant CCME standard for F4. 7. The gravimetric heavy hydrocarbon results (F4G-sg), cannot be added to the C6 to C50 hydrocarbon results. 8. This method is validated for use. 9. Data from analysis of quality control samples is available upon request. 10. Reported results are expressed as milligrams per dry kilogram.			
MOISTURE-VA	Soil	Moisture content	CCME PHC in Soil - Tier 1 (mod)
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of two hours.			
PAH-TMB-H/A-MS-VA	Soil	PAH - Rotary Extraction (Hexane/Acetone)	EPA 3570/8270
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation. Because the two isomers cannot be readily chromatographically separated, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.			

Reference Information

Benzo(a)pyrene Total Potency Equivalents [B(a)P TPE] represents the sum of estimated cancer potency relative to B(a)P for all potentially carcinogenic unsubstituted PAHs, and is calculated as per the CCME PAH Soil Quality Guidelines reference document (2010).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

17-817772

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

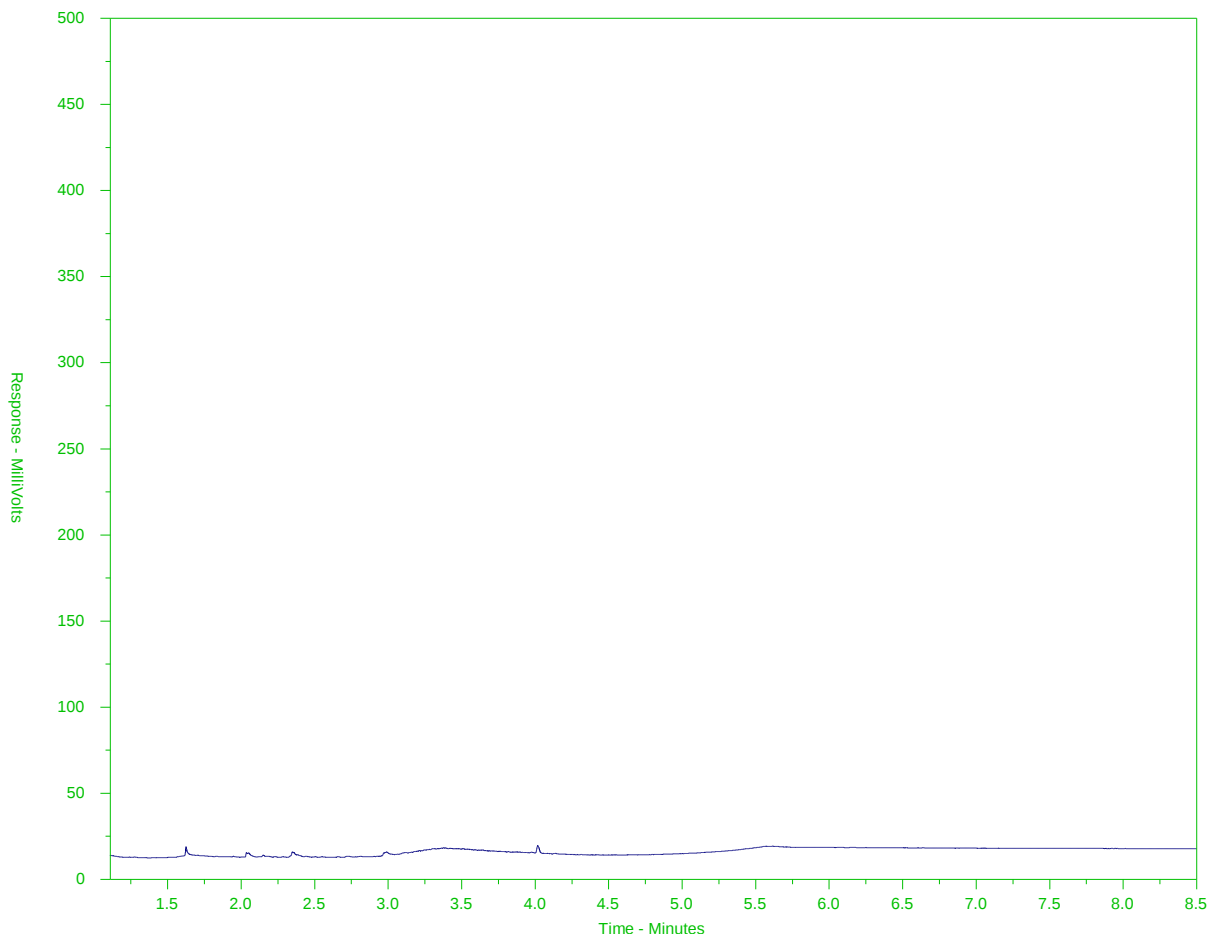
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-3
Client Sample ID: 20503



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

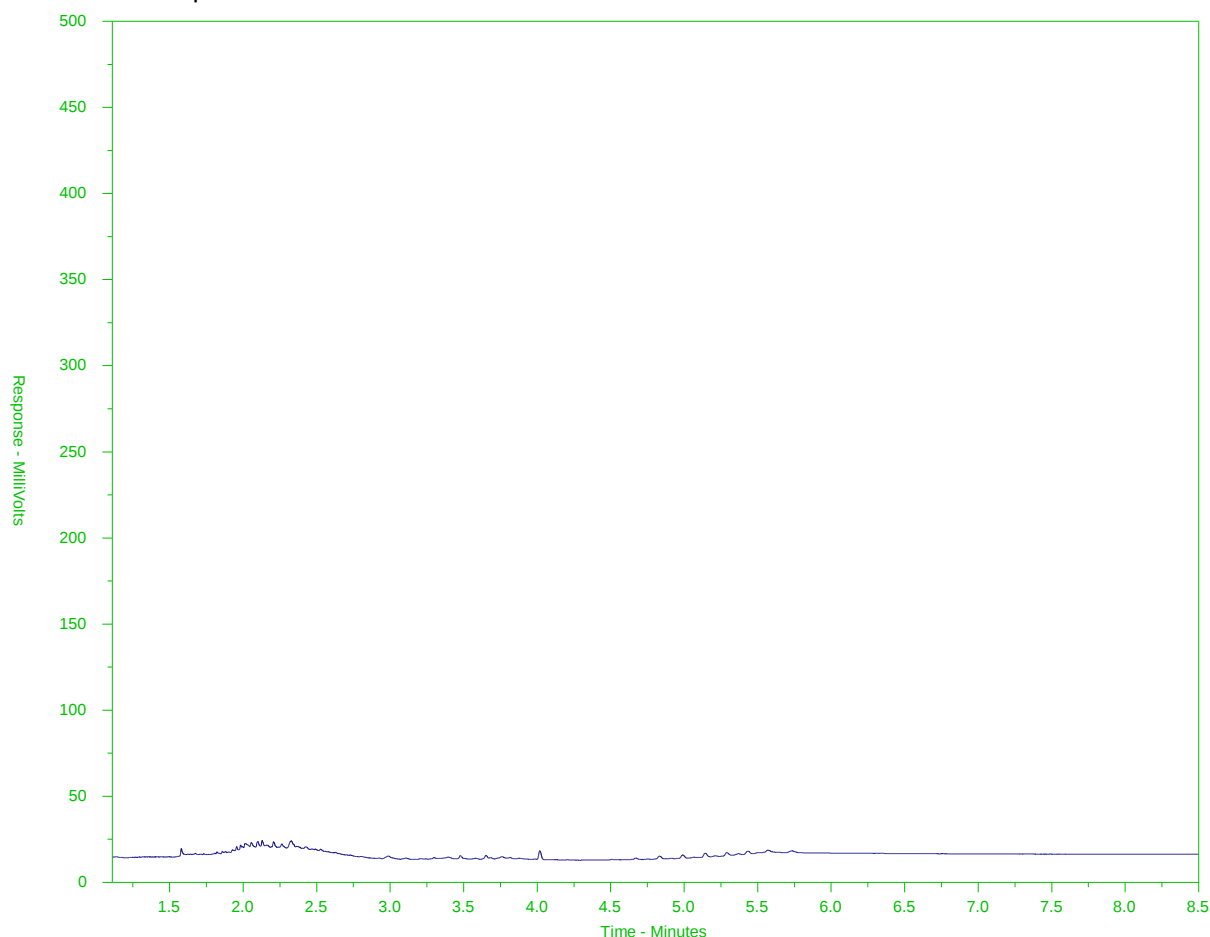
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-6
Client Sample ID: 20506



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

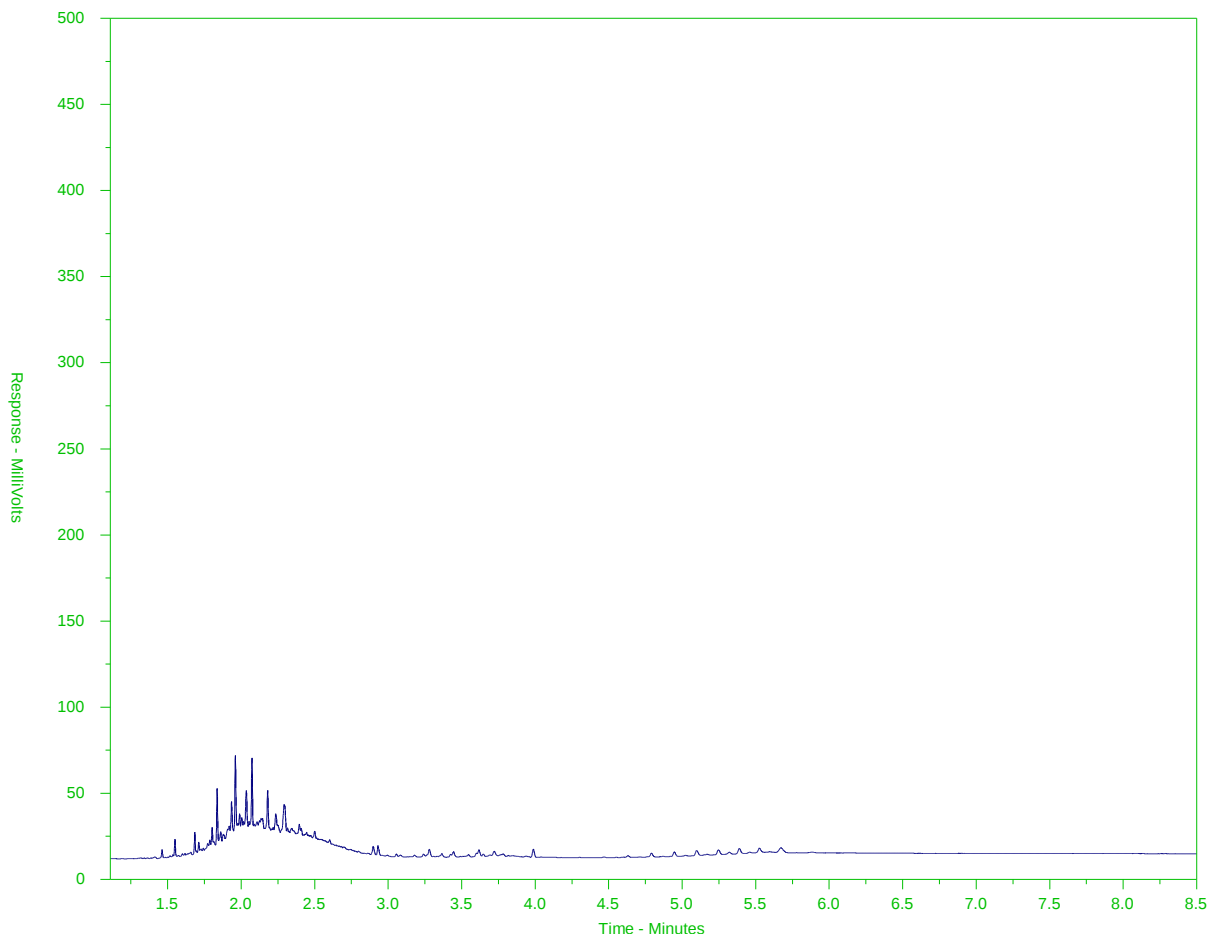
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-8
Client Sample ID: 20508



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

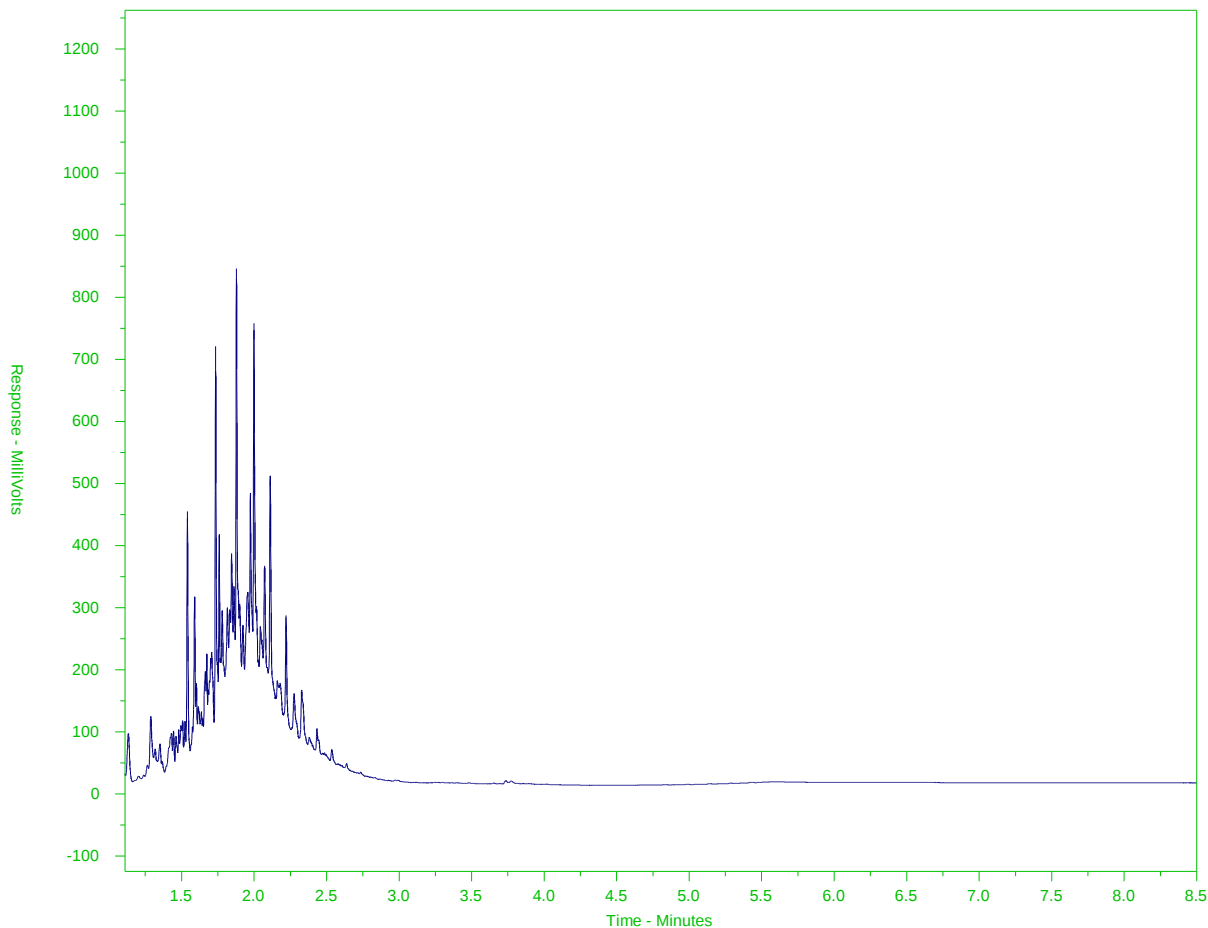
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-9
Client Sample ID: 20509



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

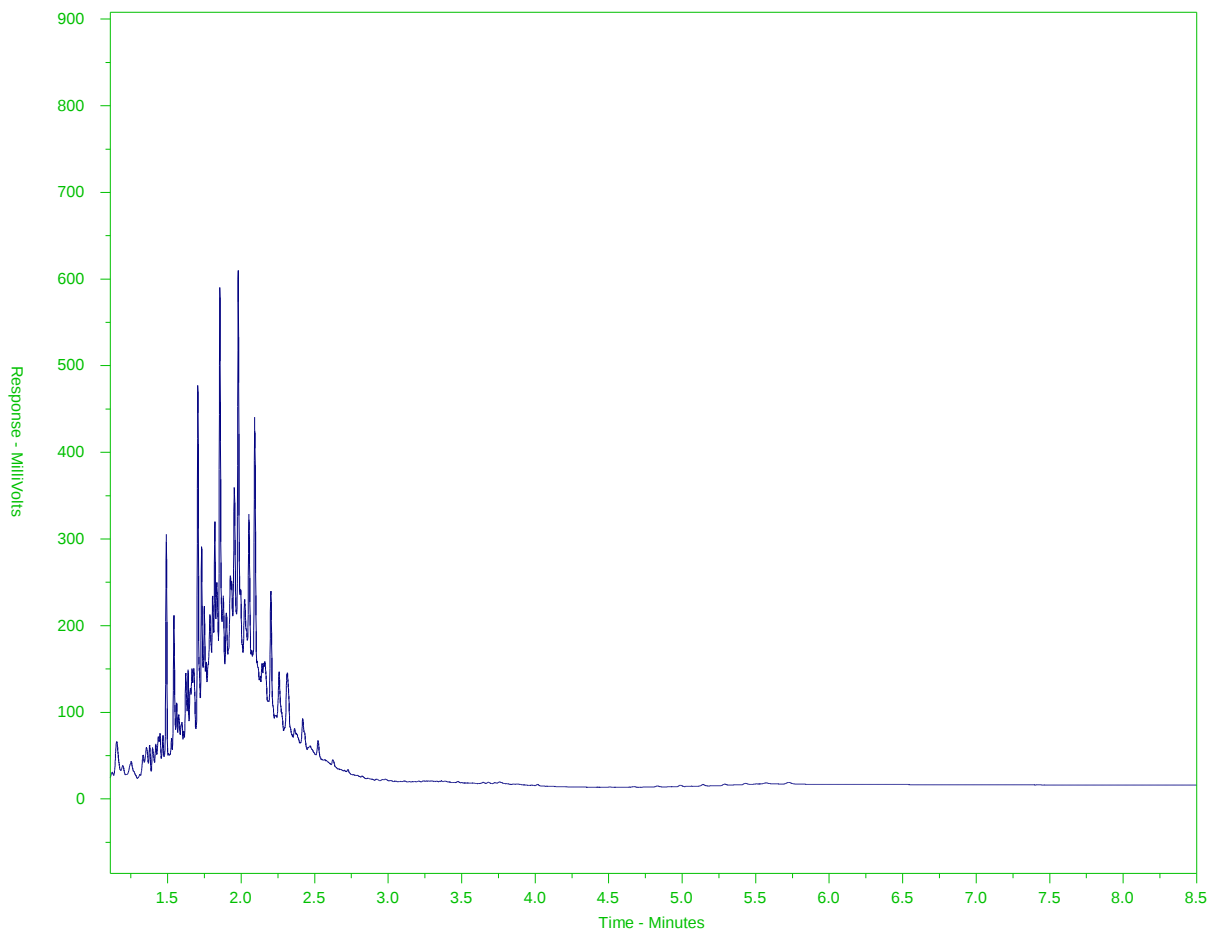
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-10
Client Sample ID: 20510



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

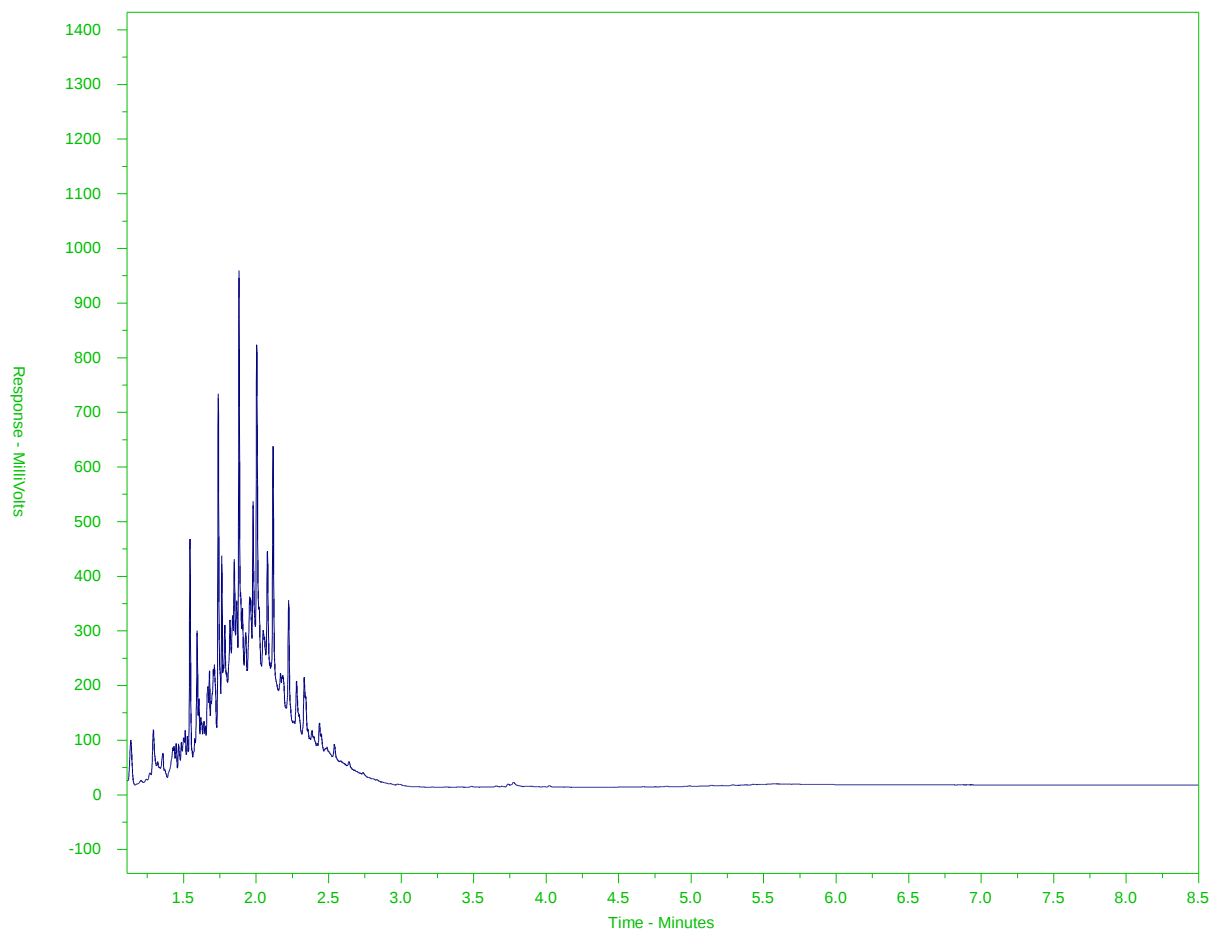
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-11
Client Sample ID: 20511



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

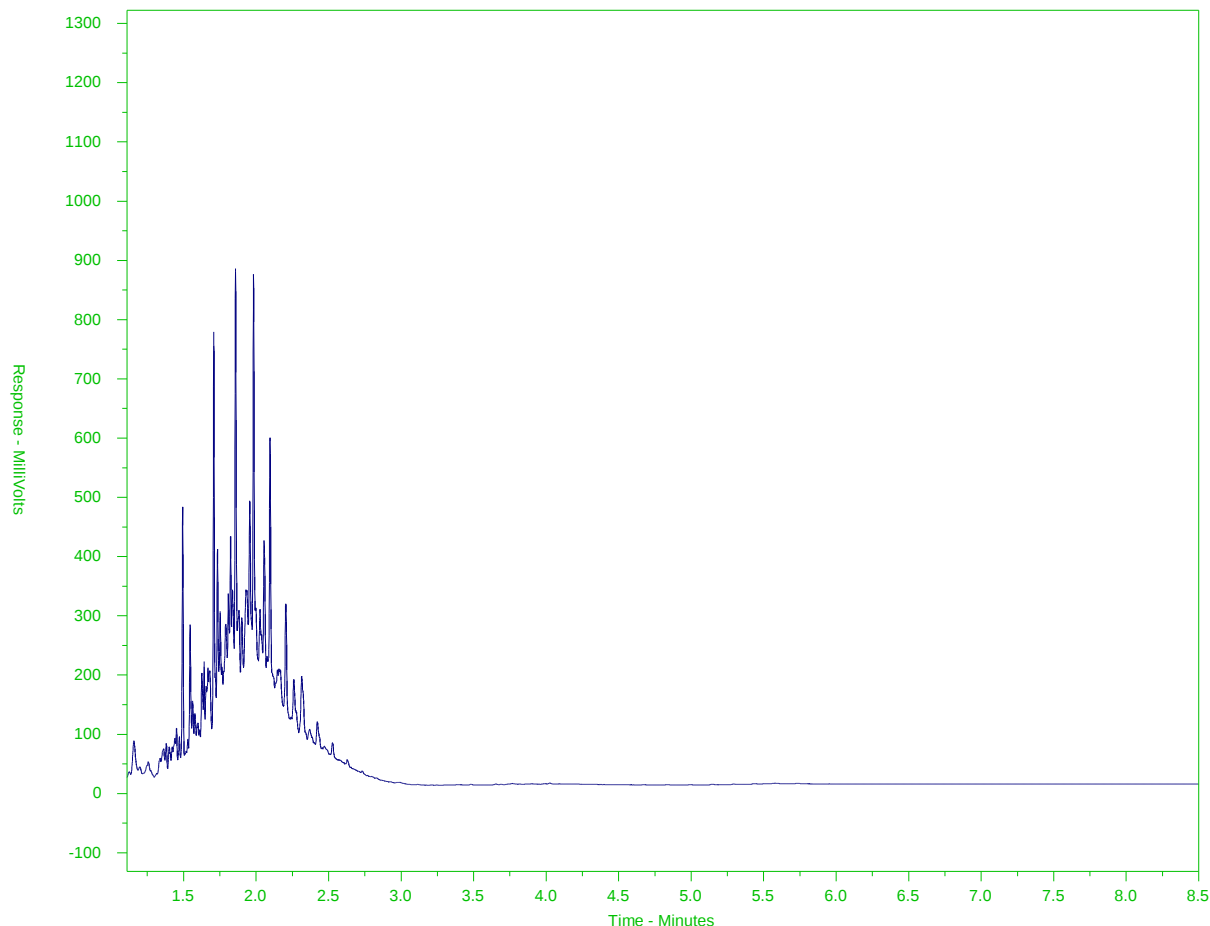
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WG3161220-C-3#L2343486-11
 Client Sample ID: 20511



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

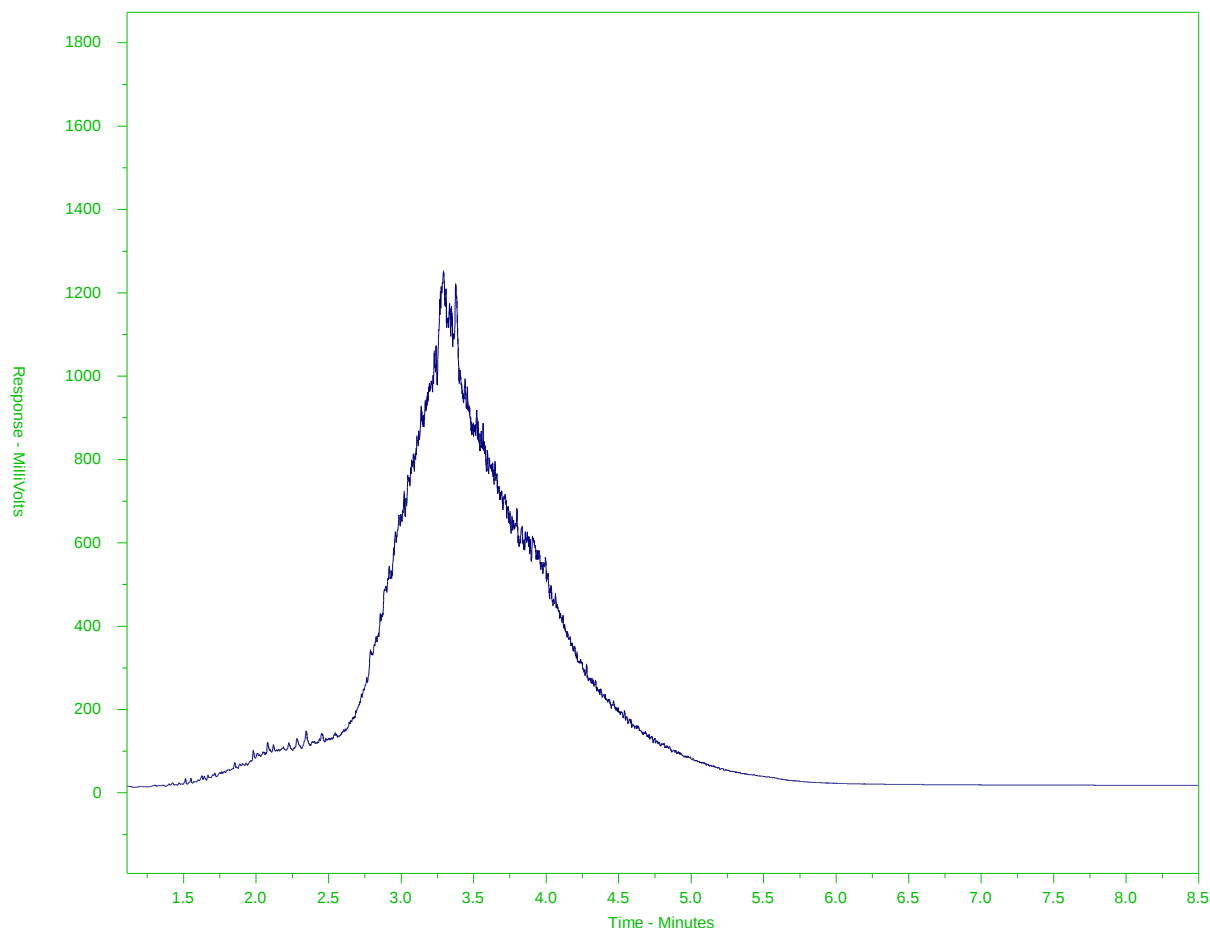
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-13
Client Sample ID: 20513



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

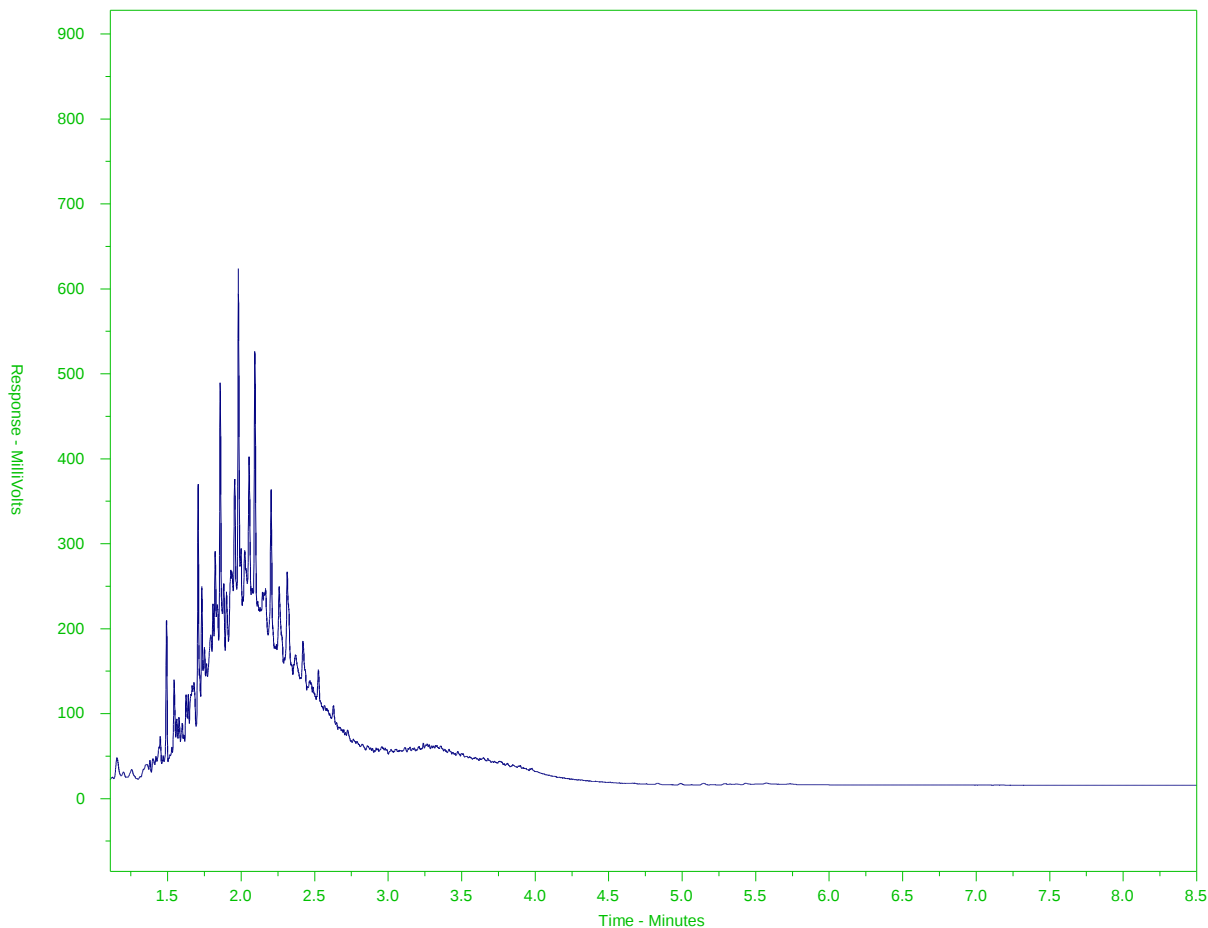
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-14
Client Sample ID: 20514



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

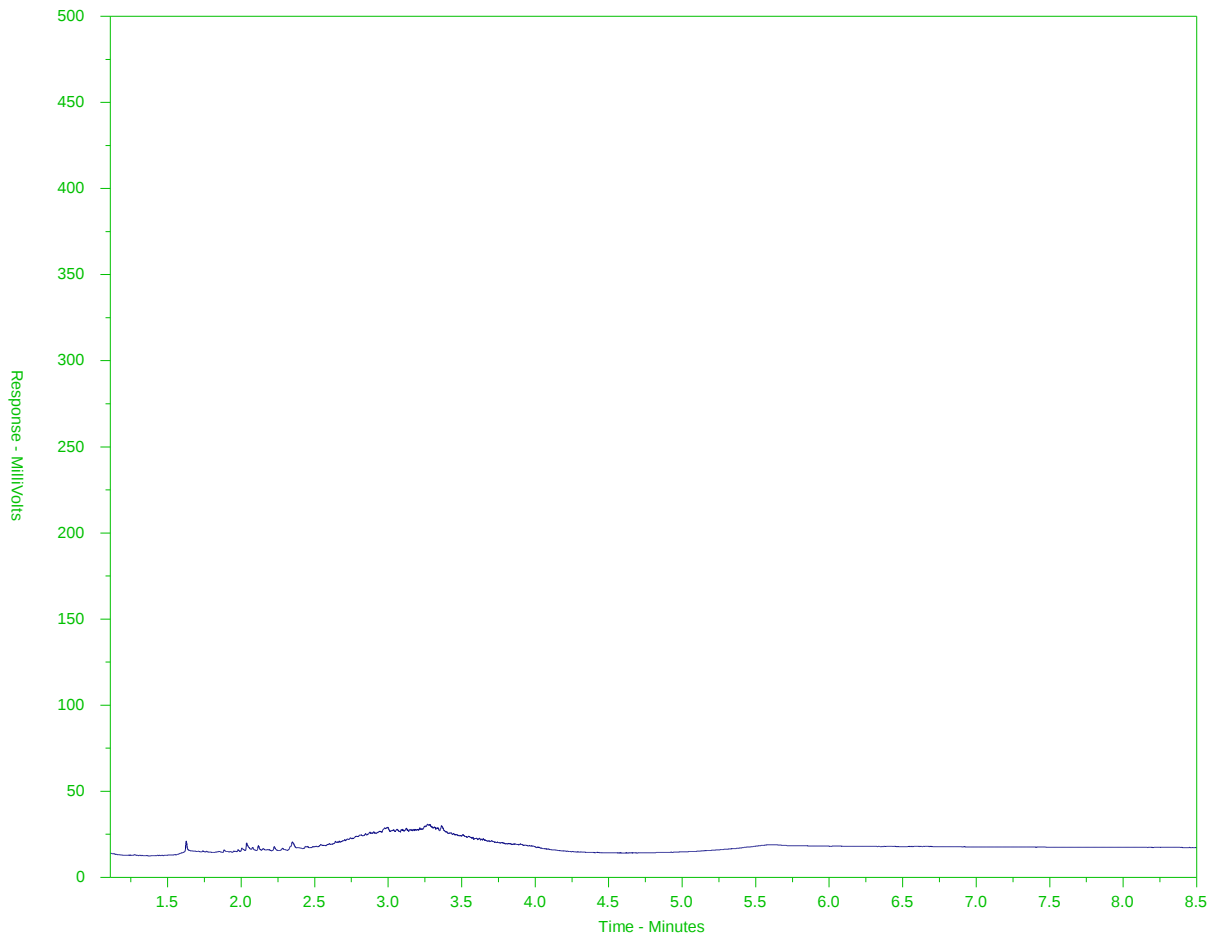
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-15
Client Sample ID: 20515



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

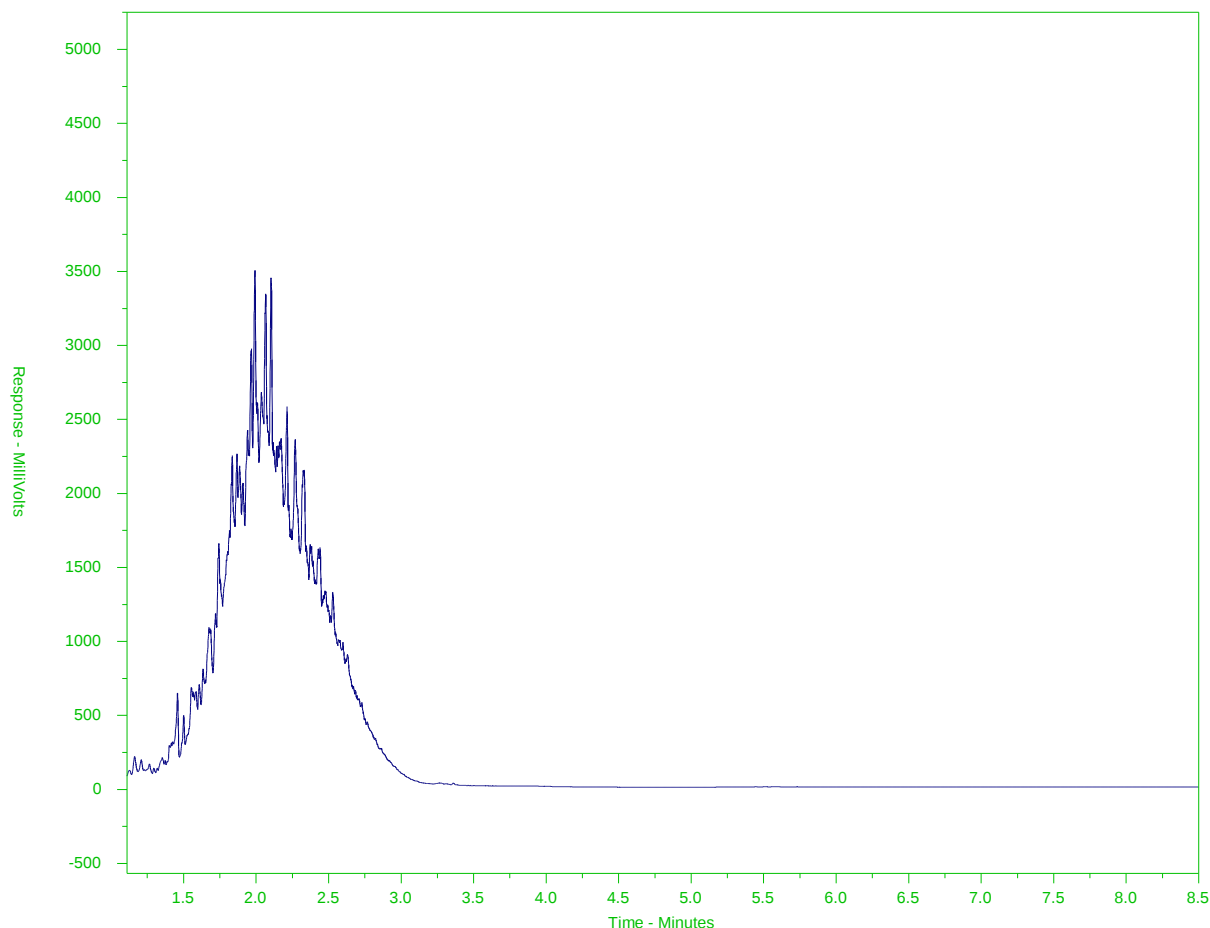
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-16
Client Sample ID: 20516



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

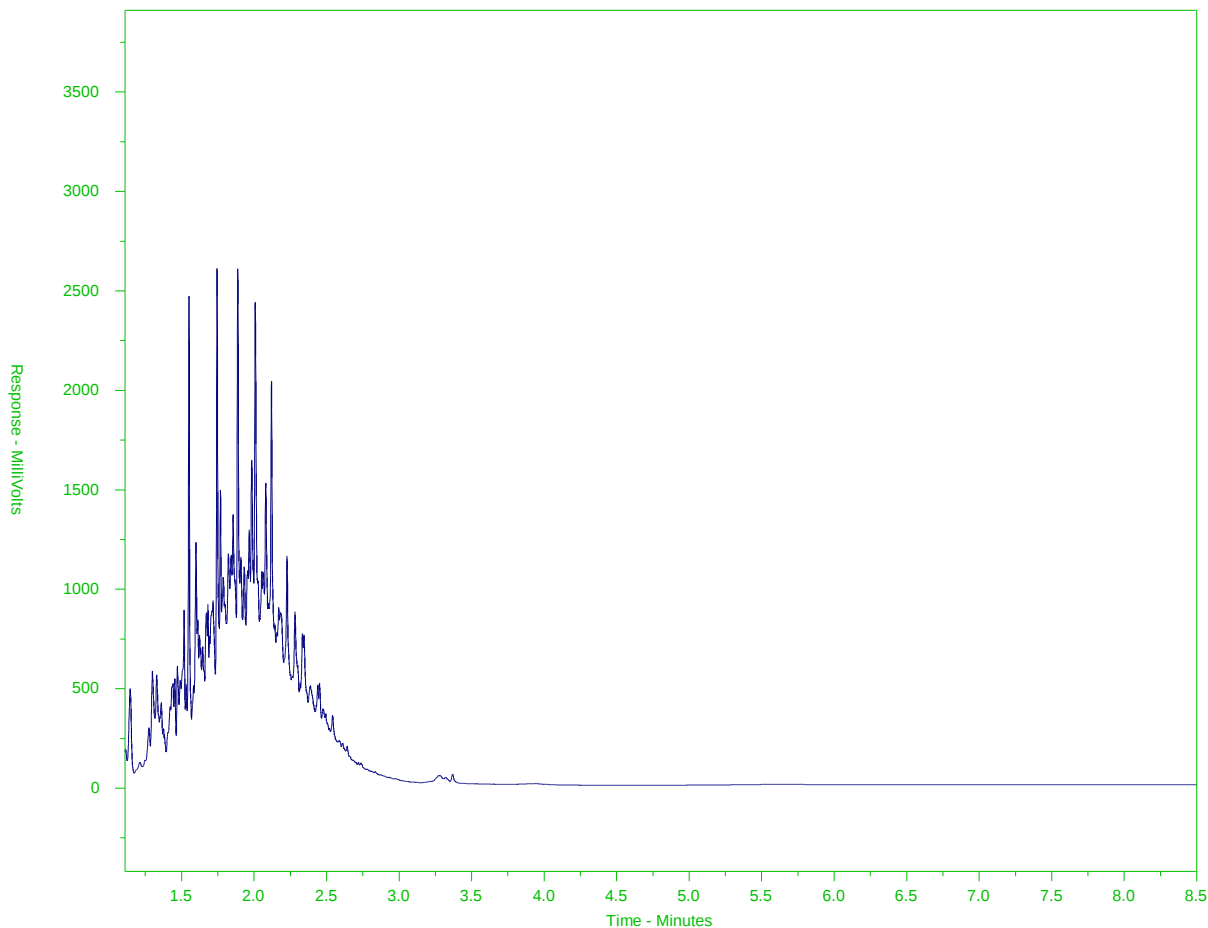
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-18
Client Sample ID: 20518



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

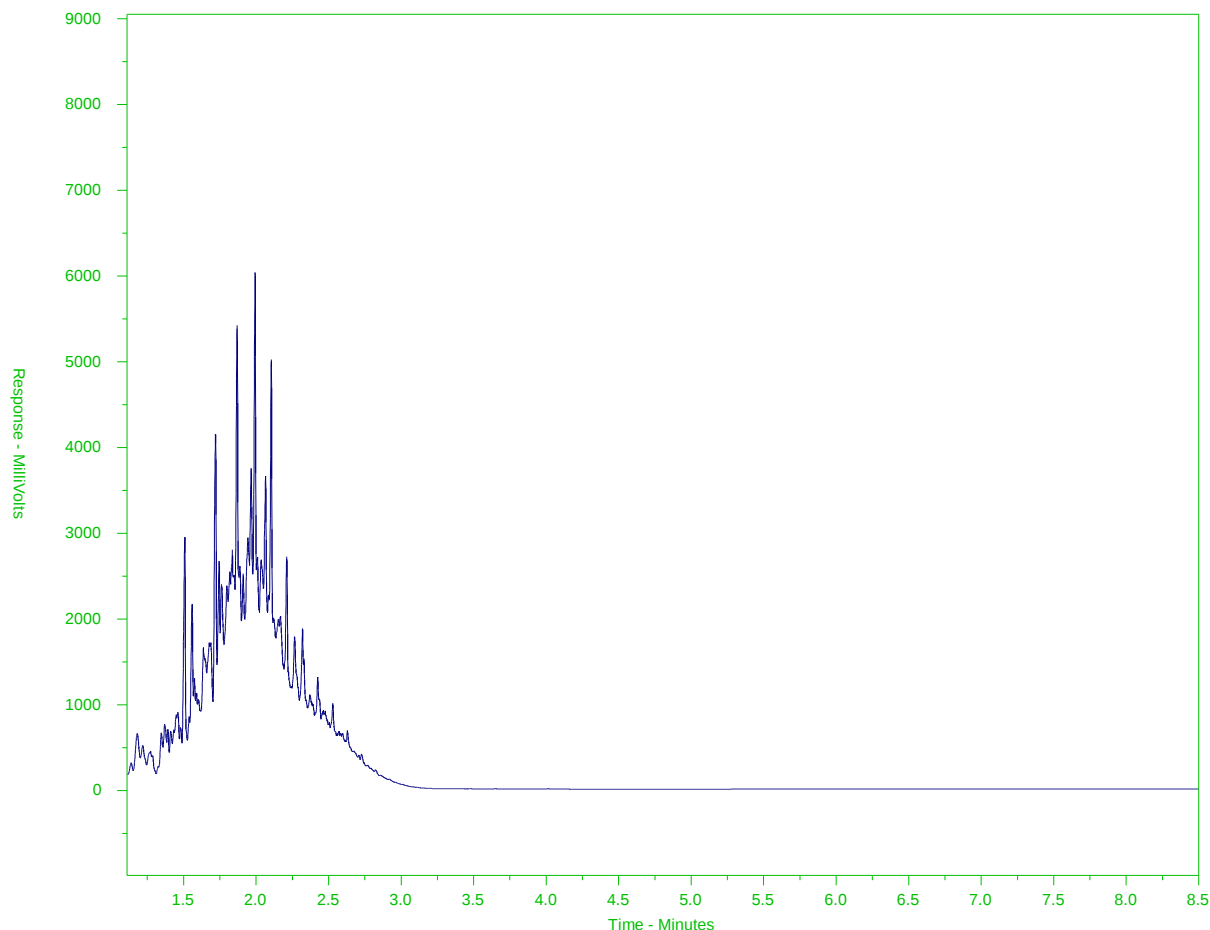
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-19
Client Sample ID: 20519



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

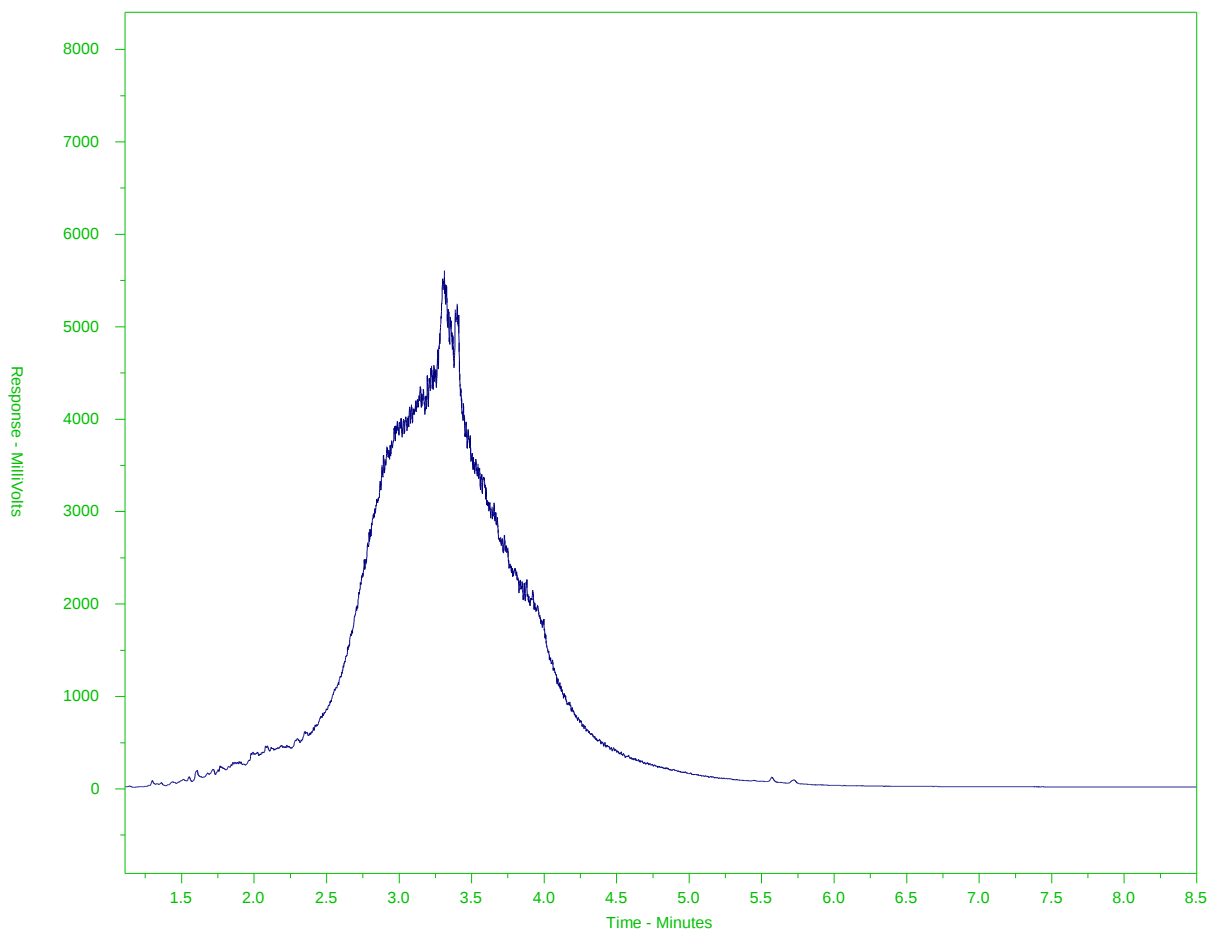
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-20
Client Sample ID: 20520



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

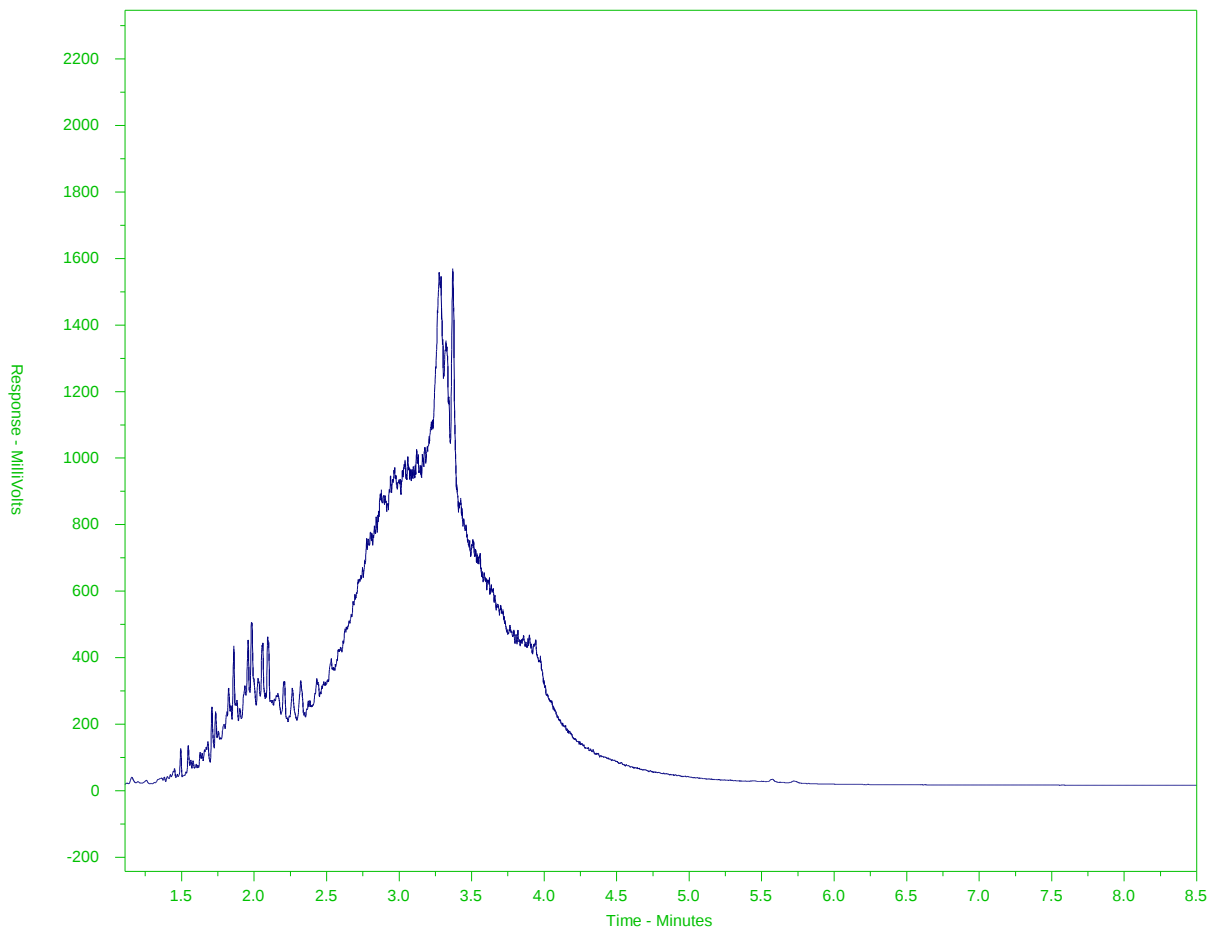
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-21
Client Sample ID: 20521



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

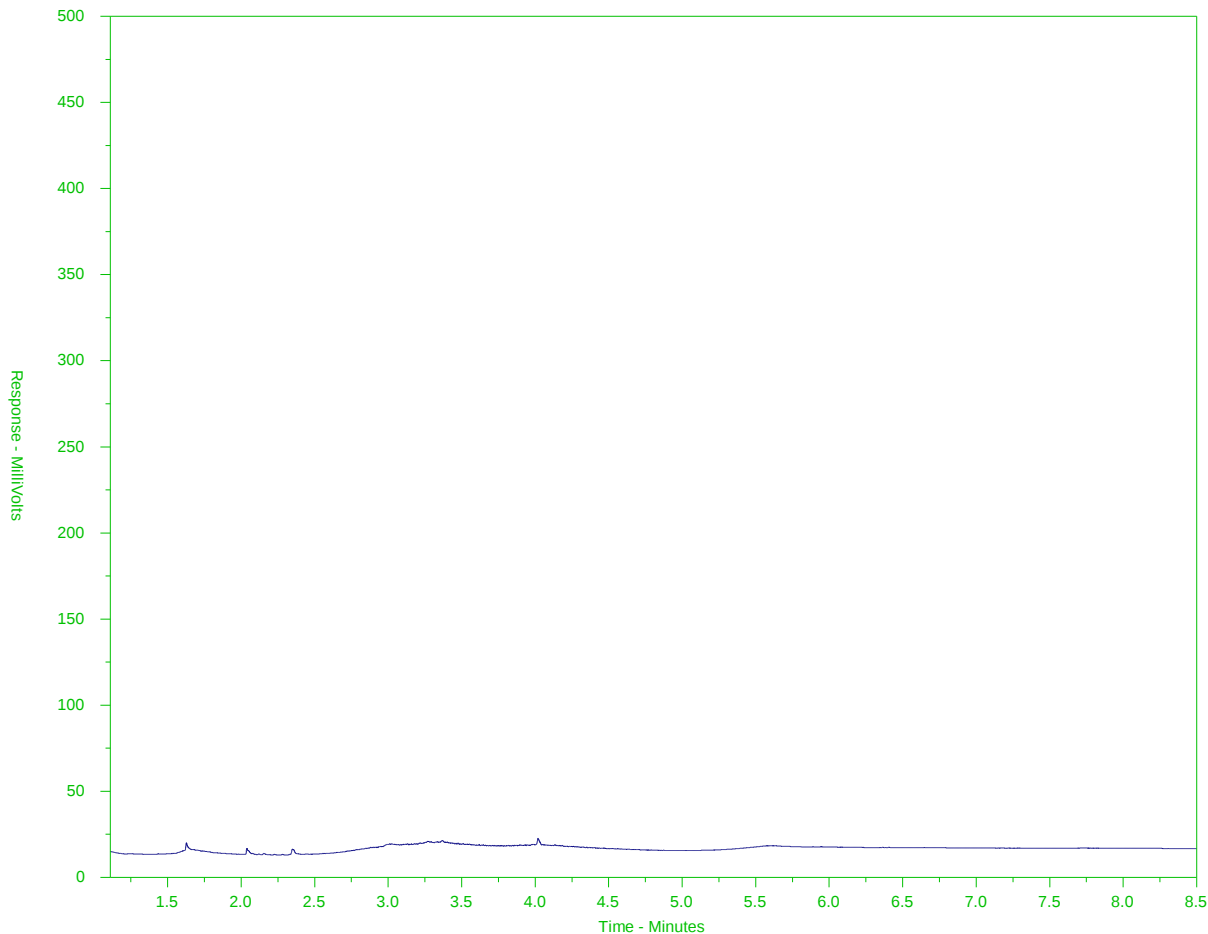
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-22
Client Sample ID: 20522



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

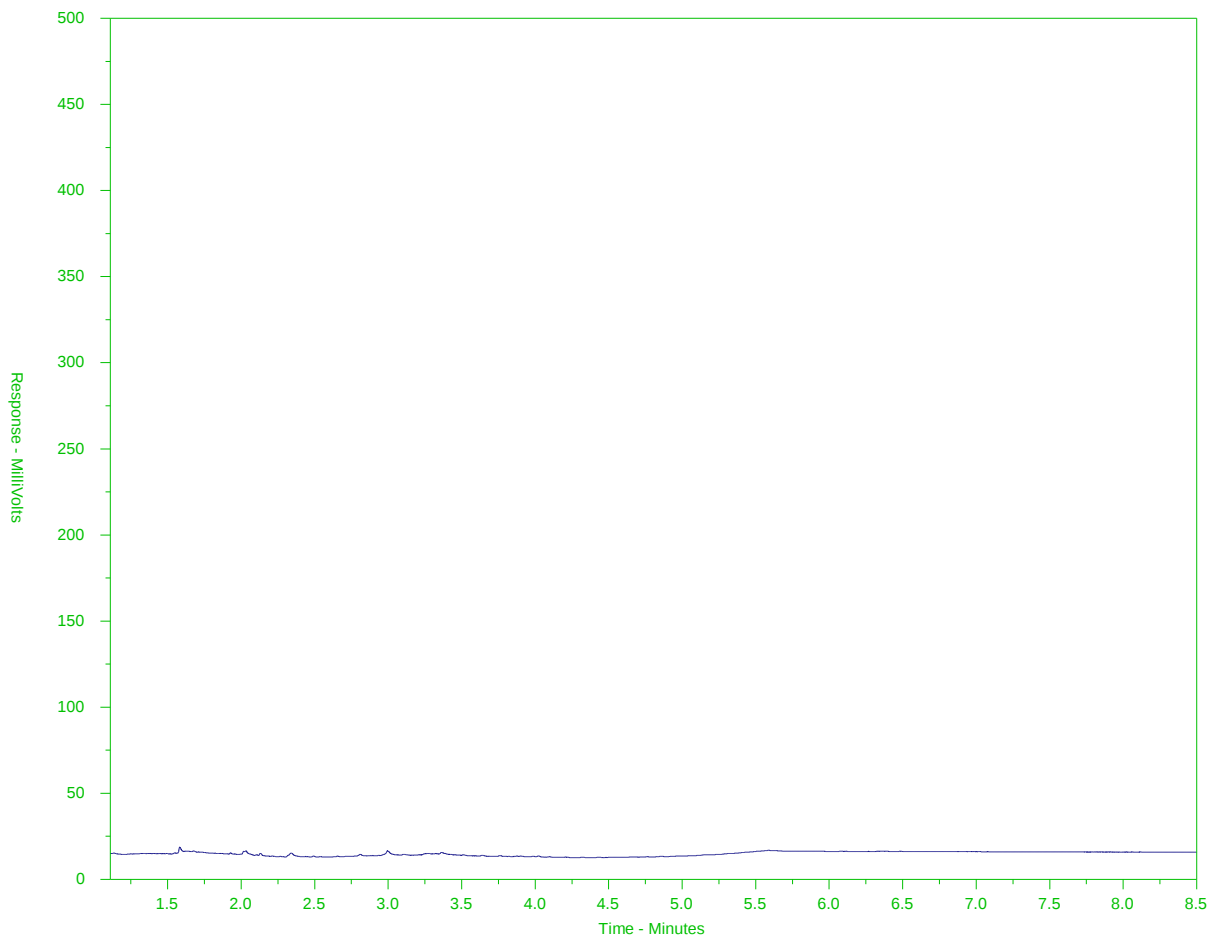
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-25
Client Sample ID: 20525



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

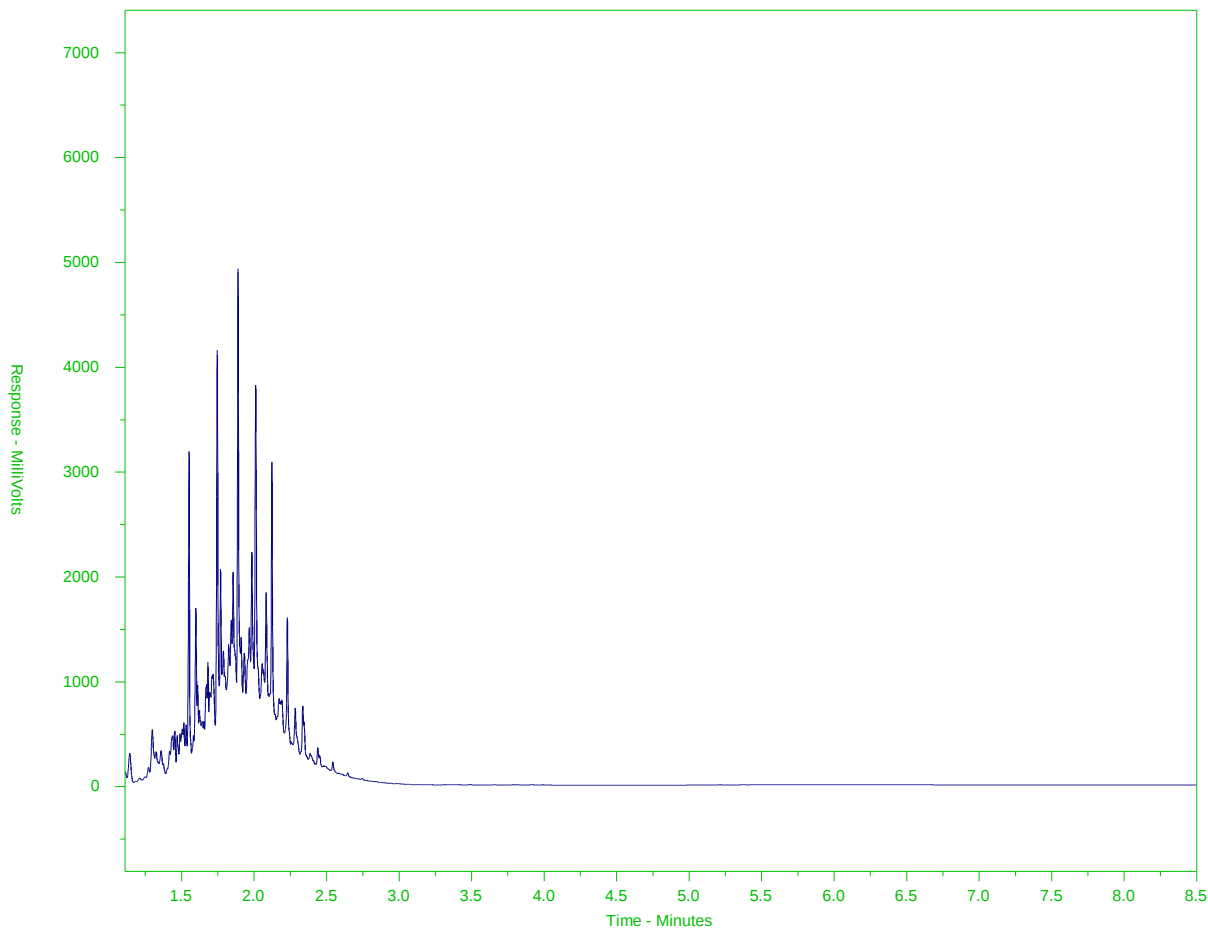
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-26
Client Sample ID: 20526



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

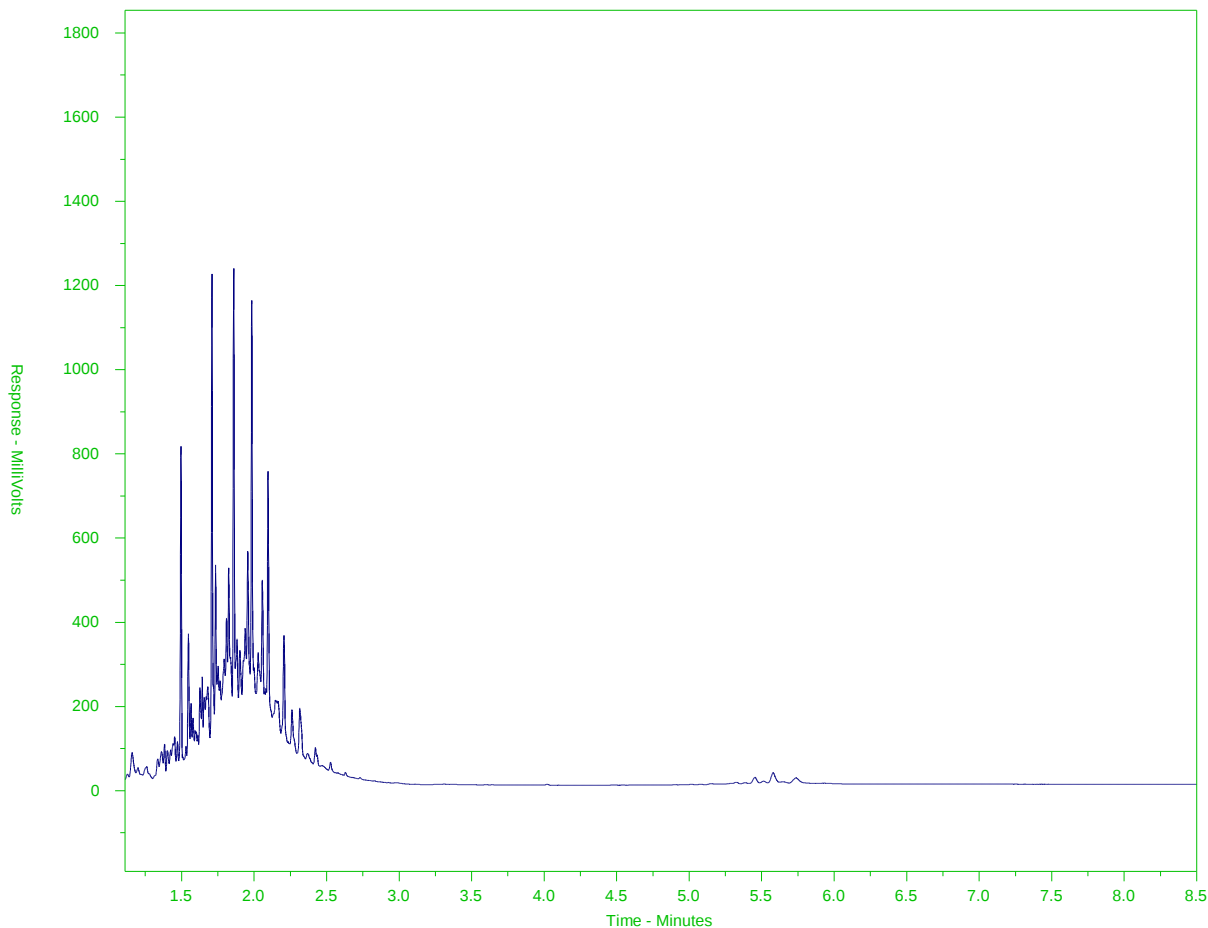
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-28
Client Sample ID: 20528



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

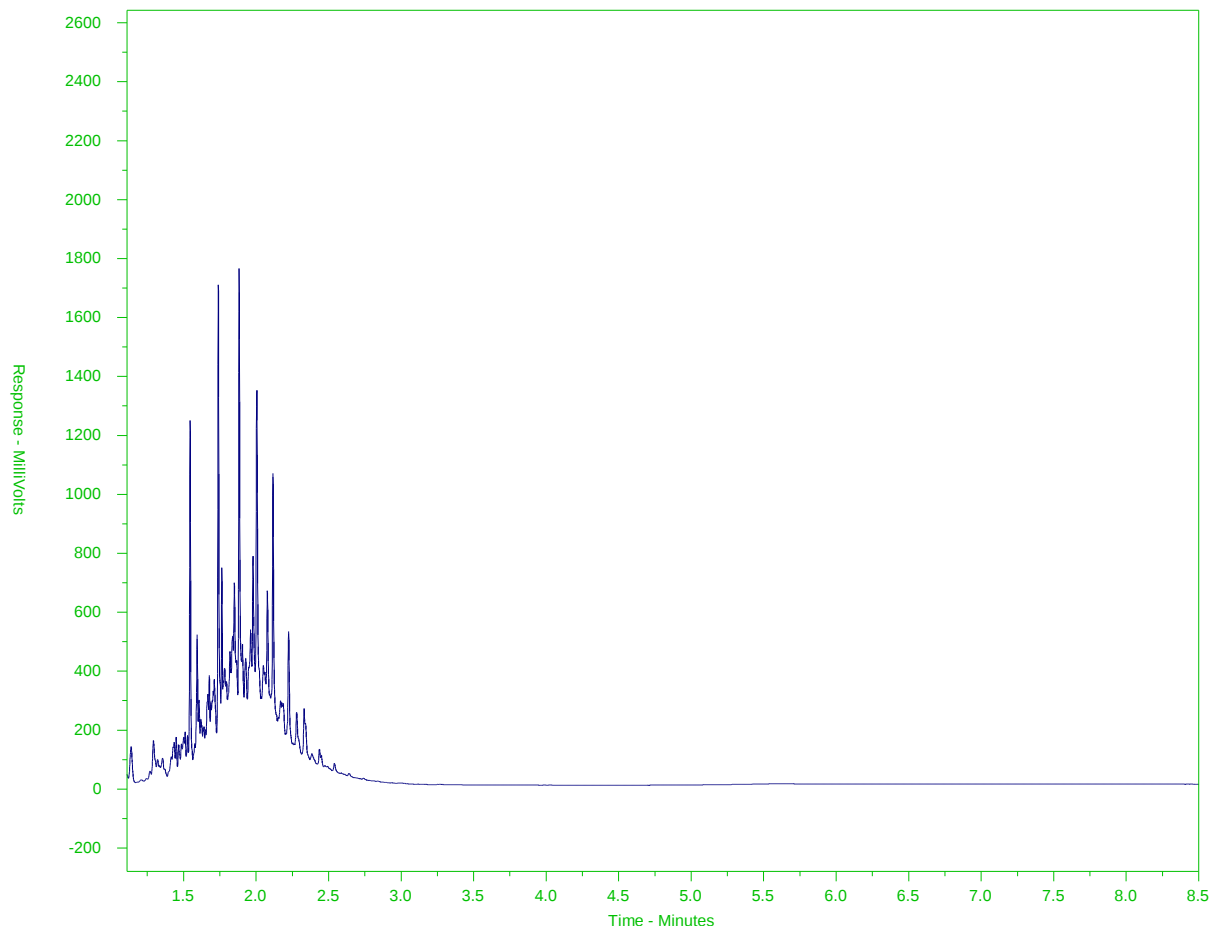
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WG3161220-C-6#L2343486-C-28
Client Sample ID: 20528



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

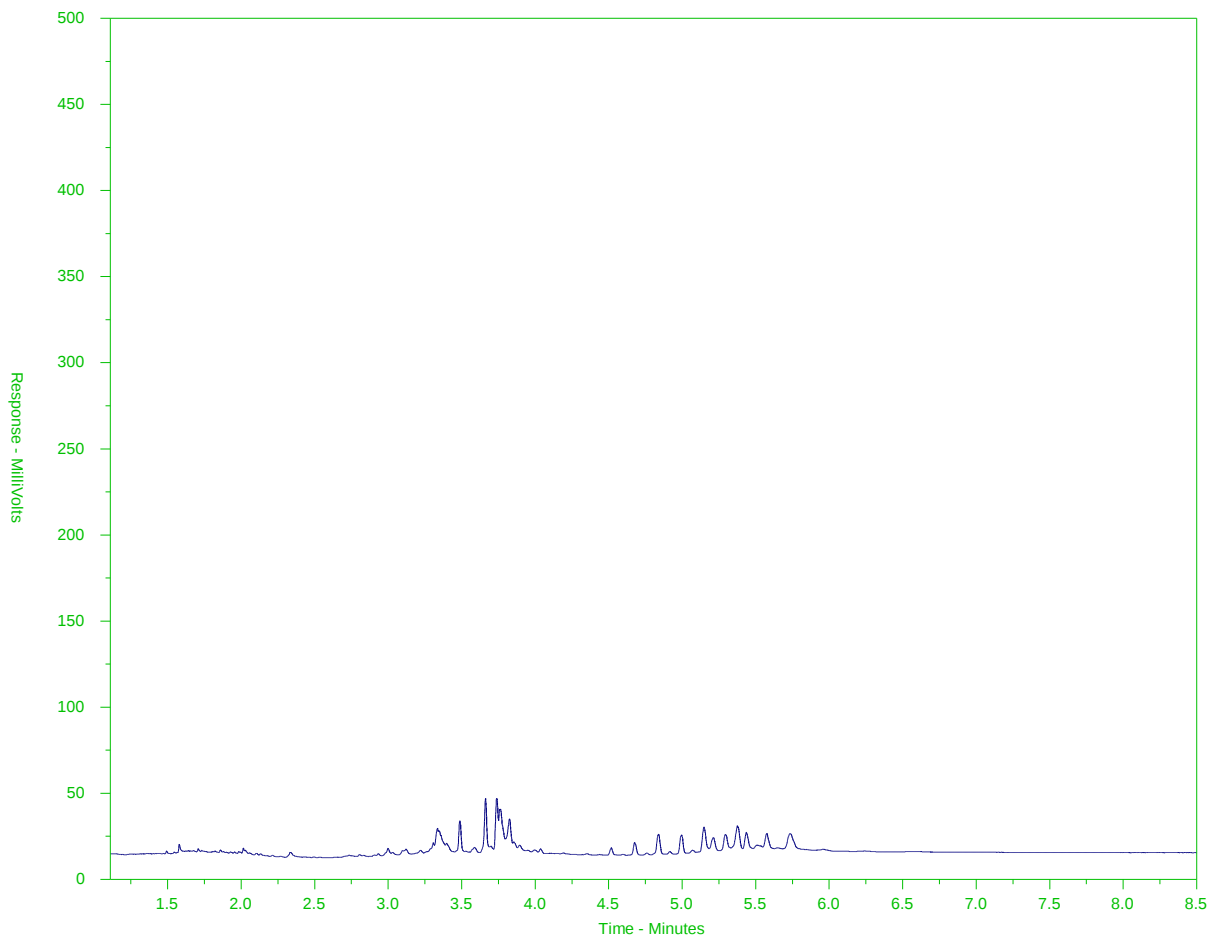
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-29
Client Sample ID: 20529



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →			← Motor Oils / Lubricants / Grease →	
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

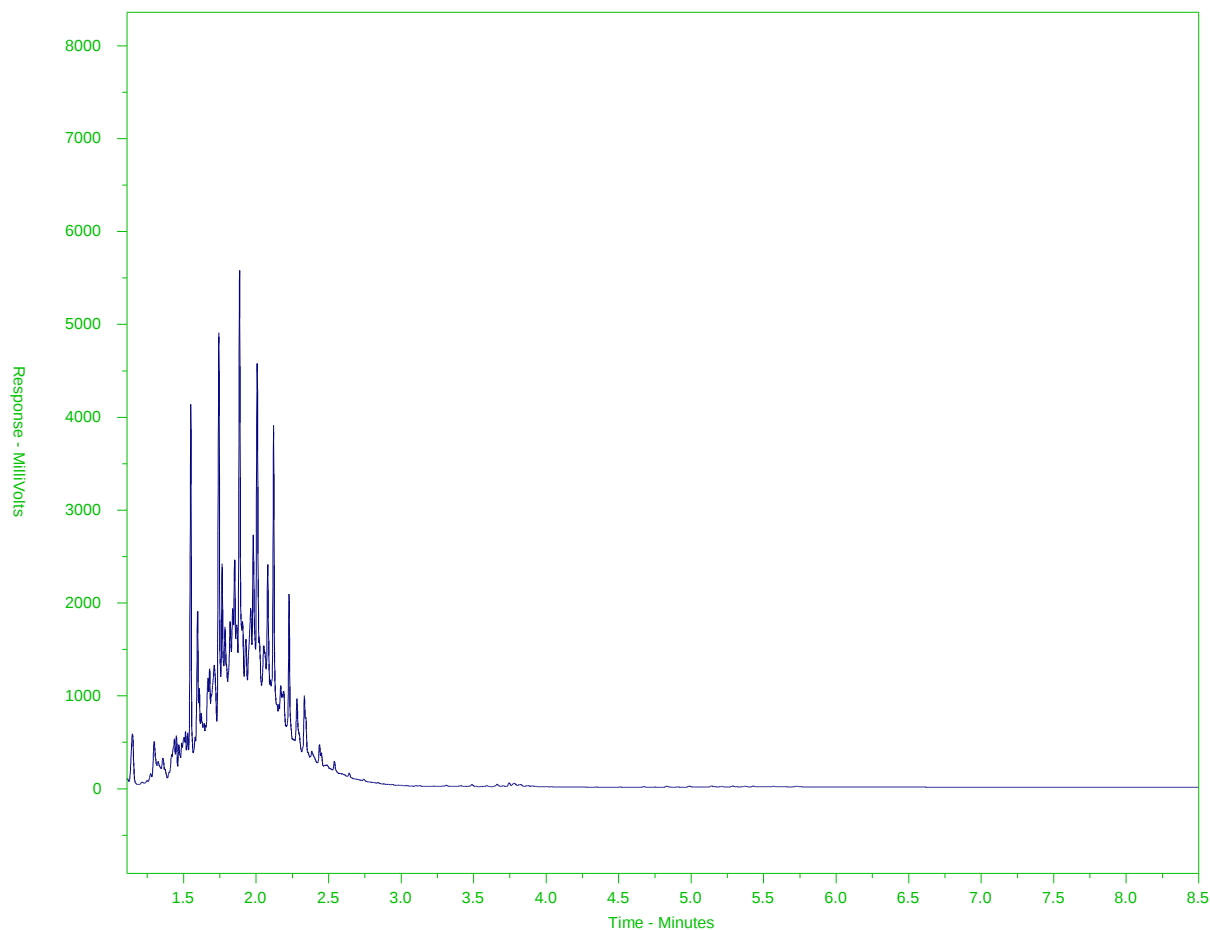
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-31
Client Sample ID: 20531



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

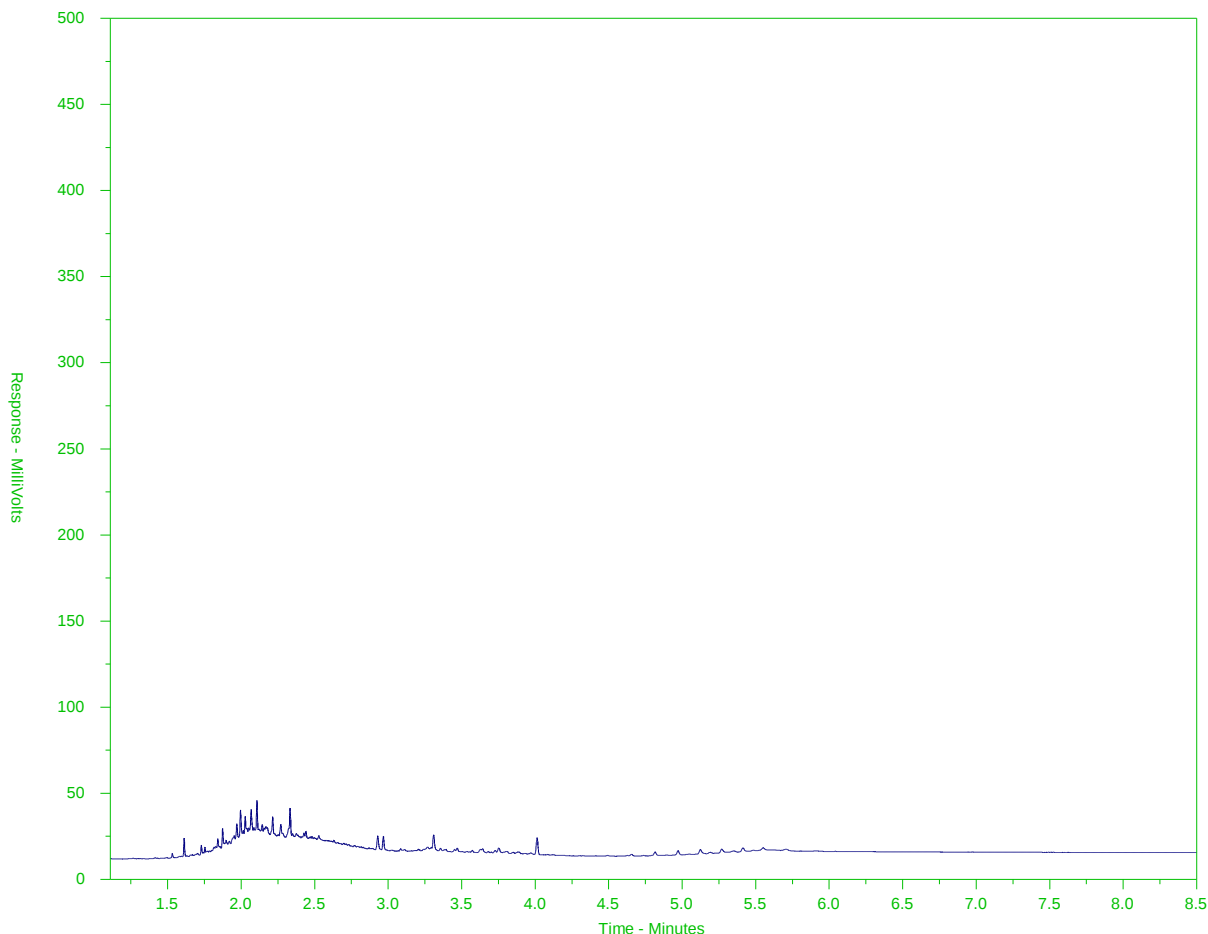
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-32
Client Sample ID: 20532



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

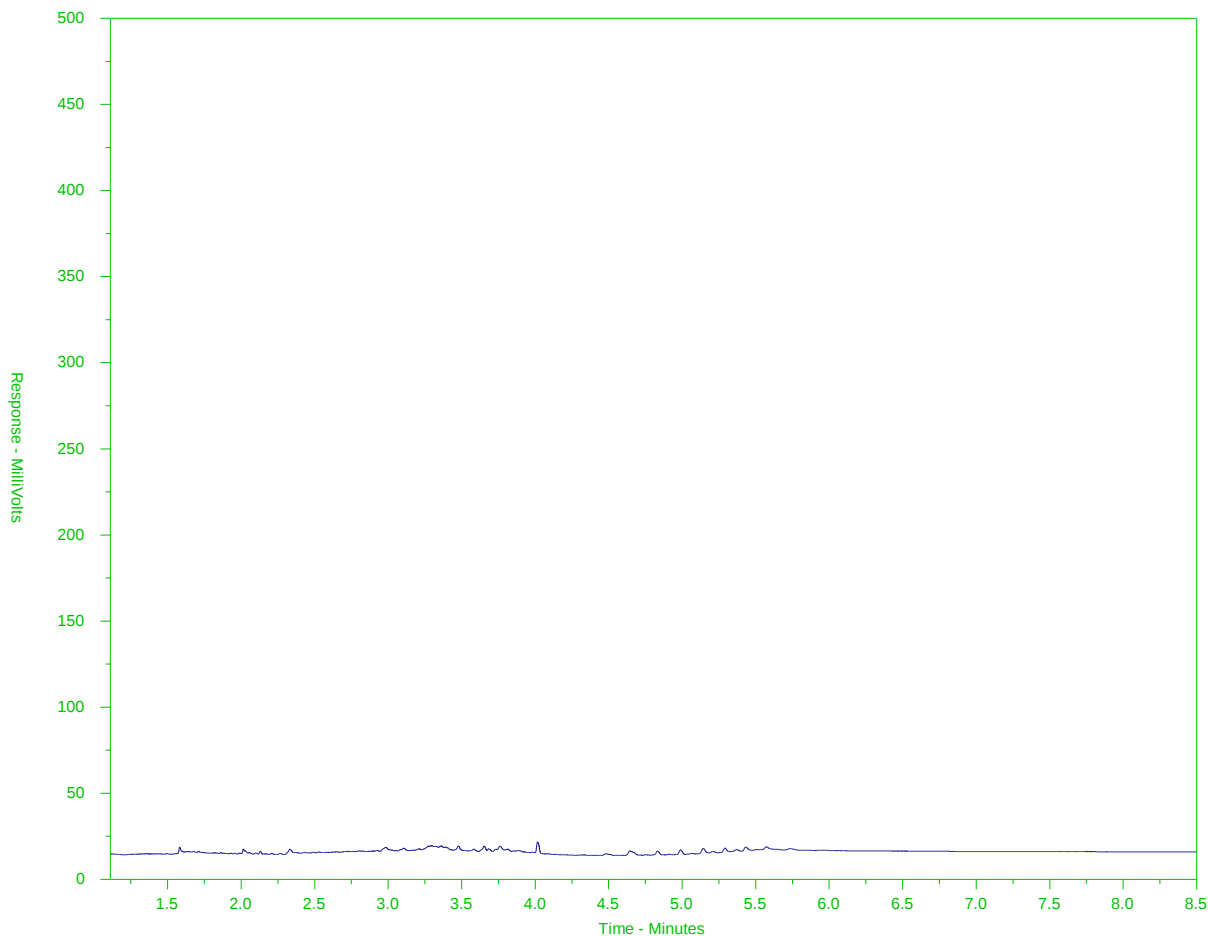
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-33
Client Sample ID: 20533



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

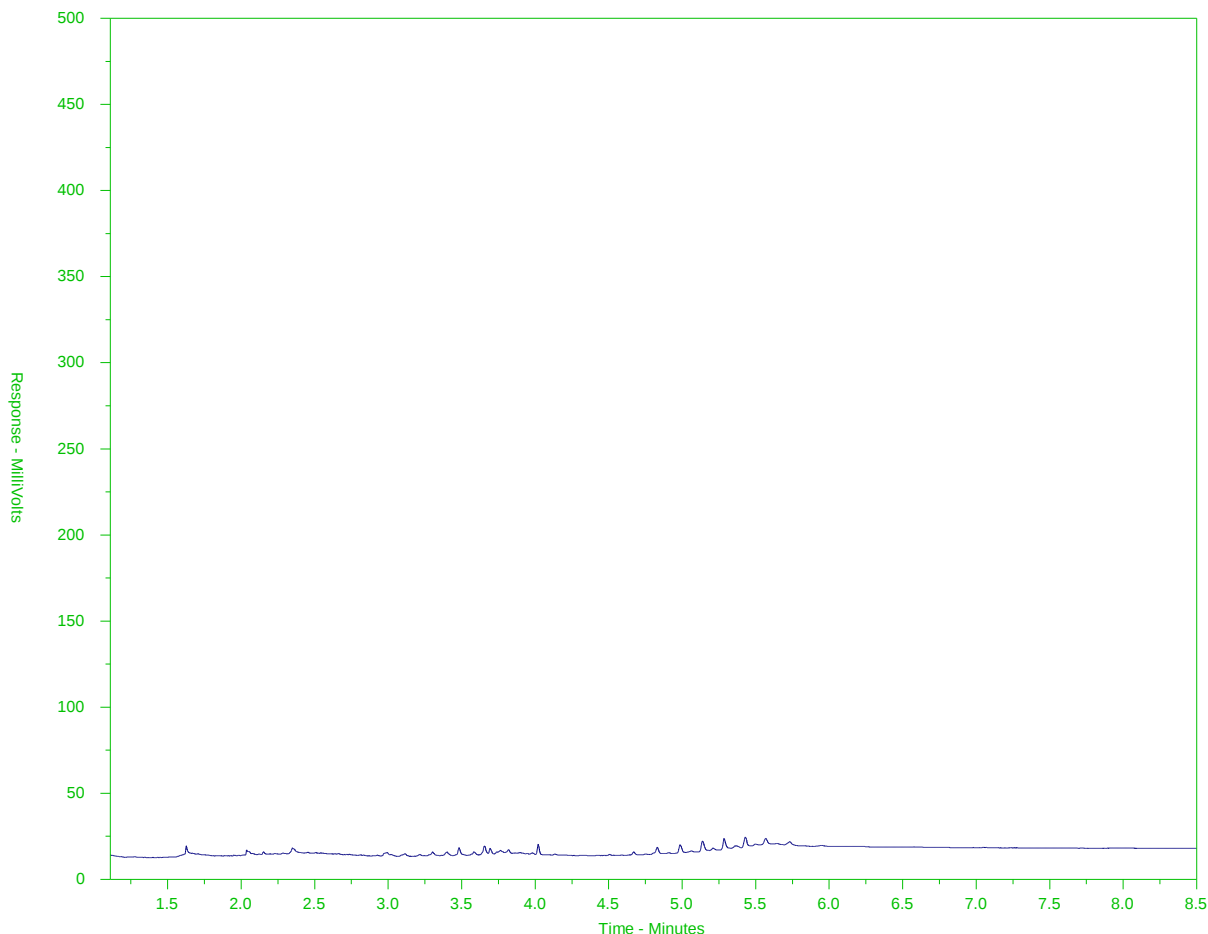
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-35
Client Sample ID: 20535



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

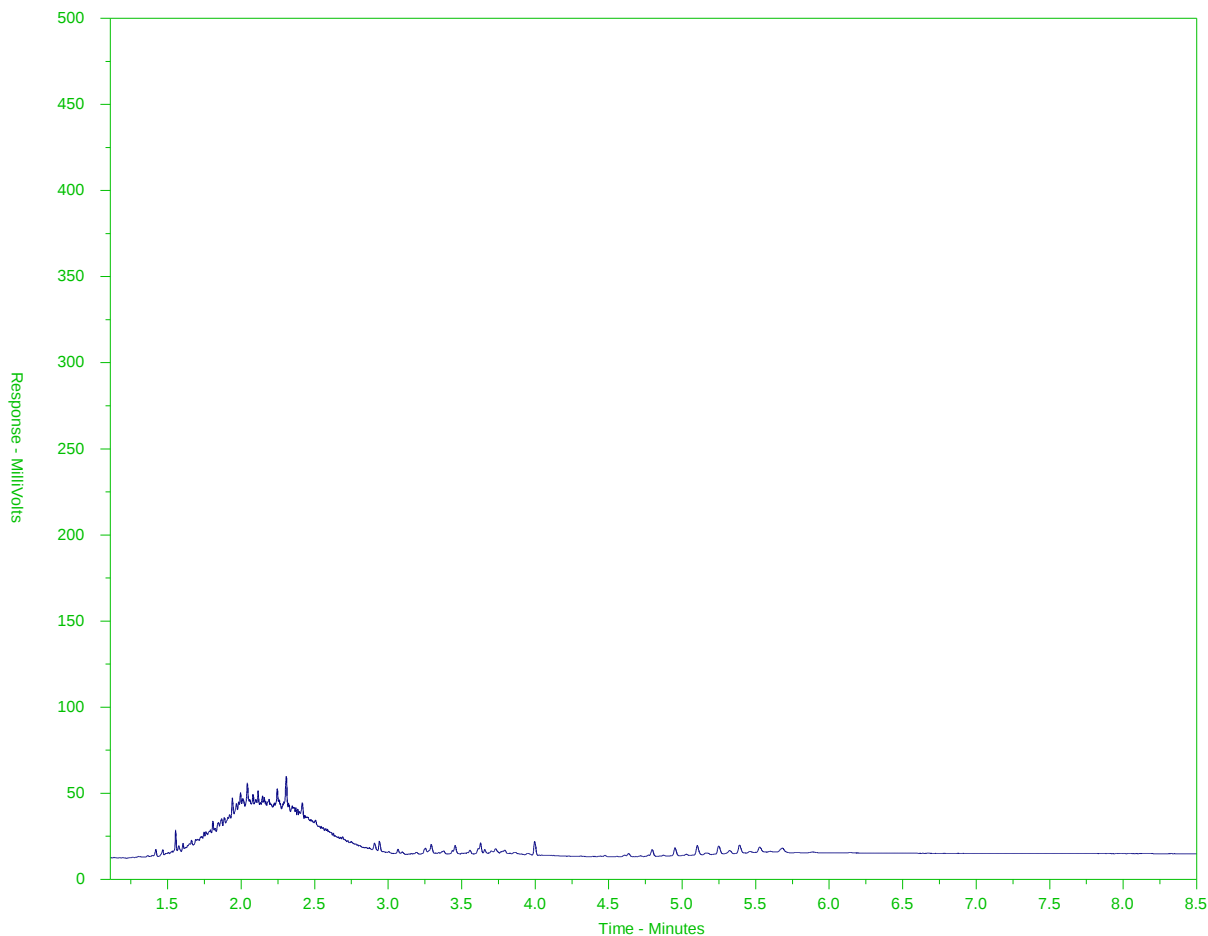
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-36
Client Sample ID: 20536



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

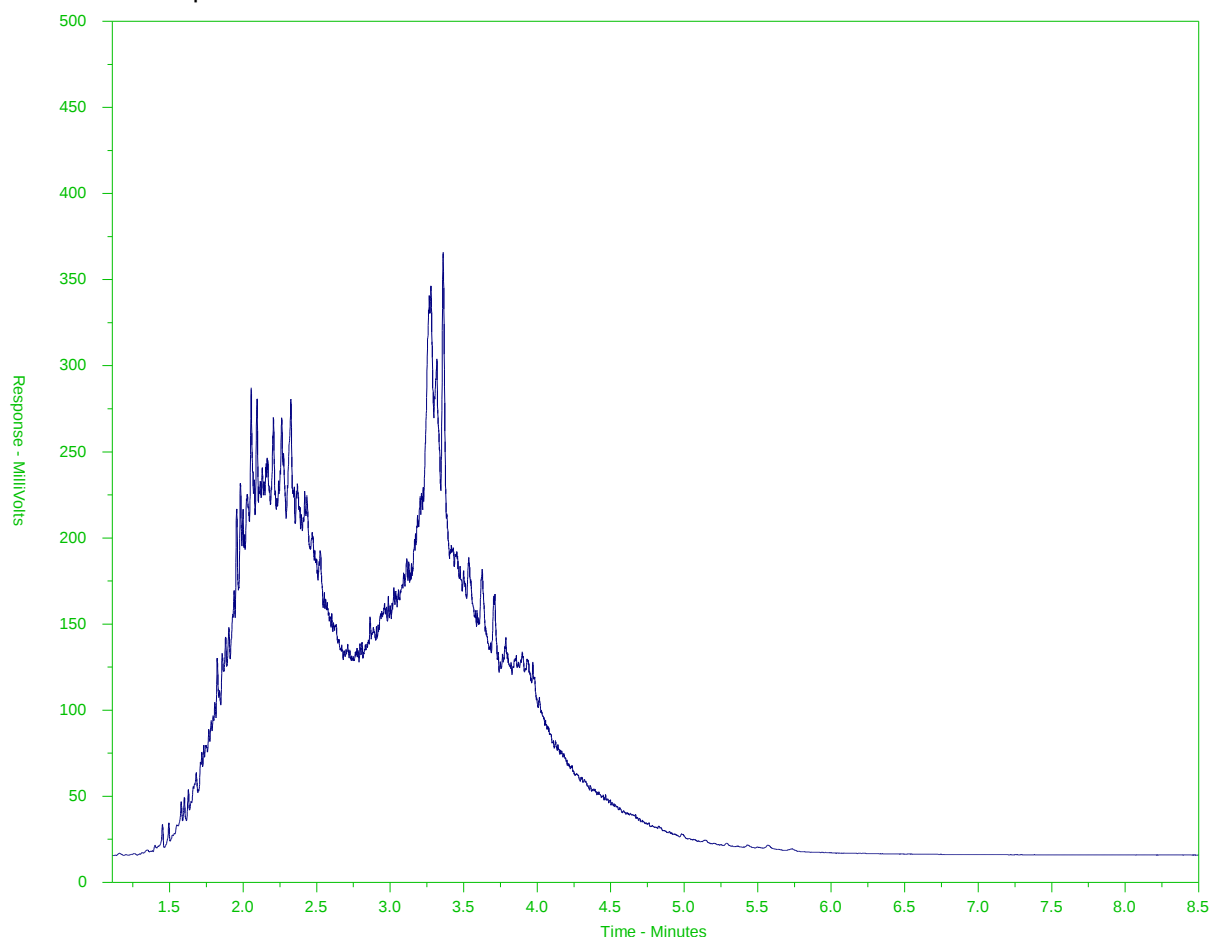
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-37
Client Sample ID: 20556



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

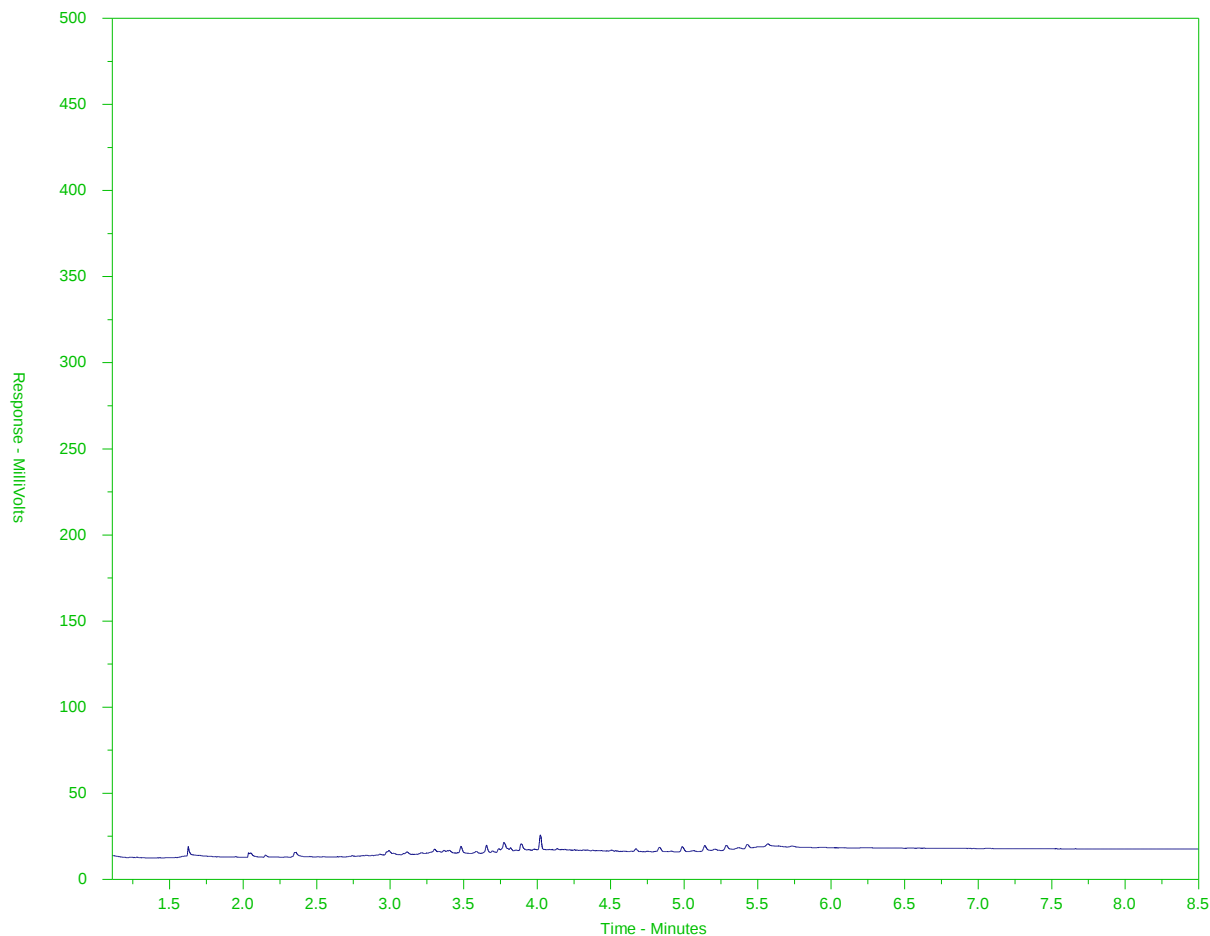
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-38
Client Sample ID: 20557



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

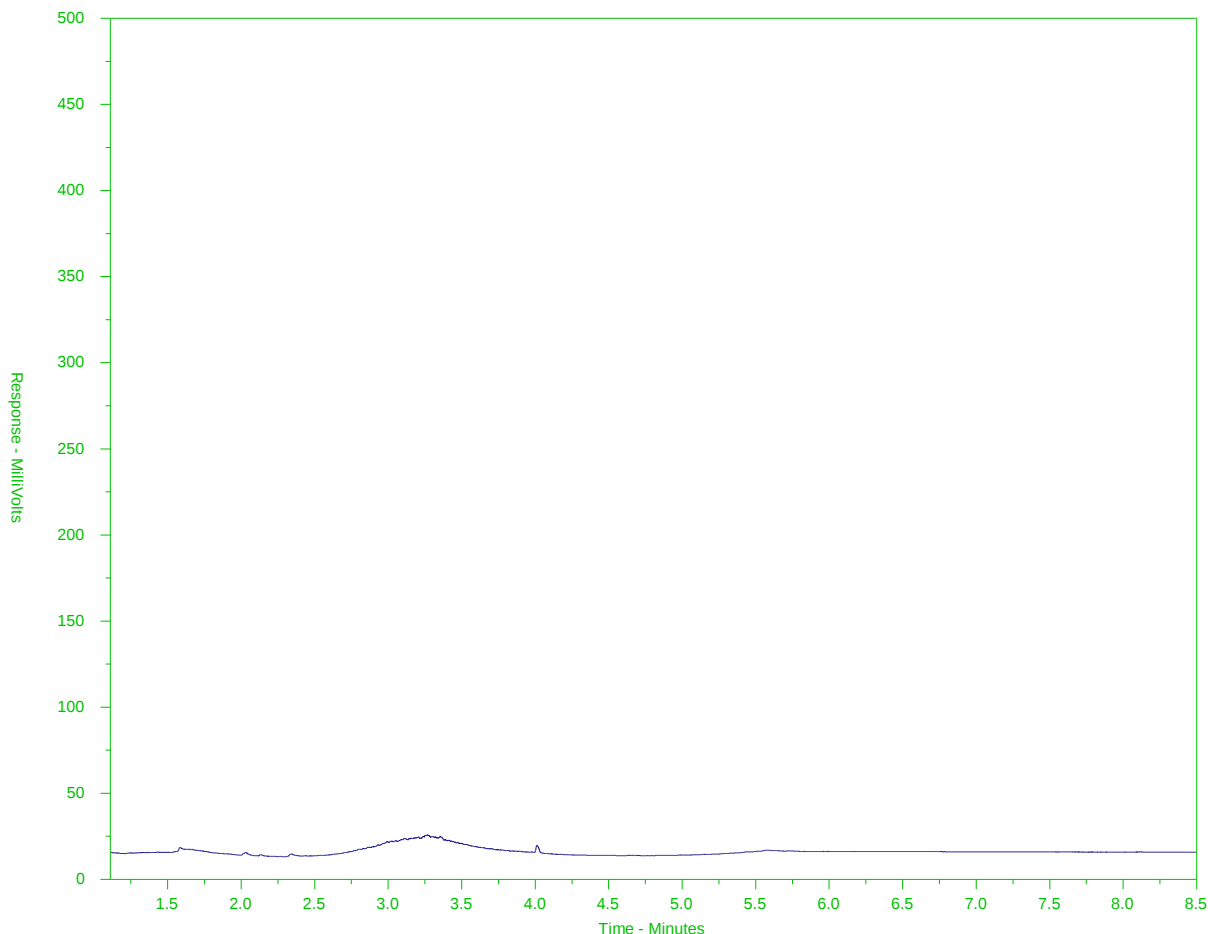
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-40
Client Sample ID: 20559



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

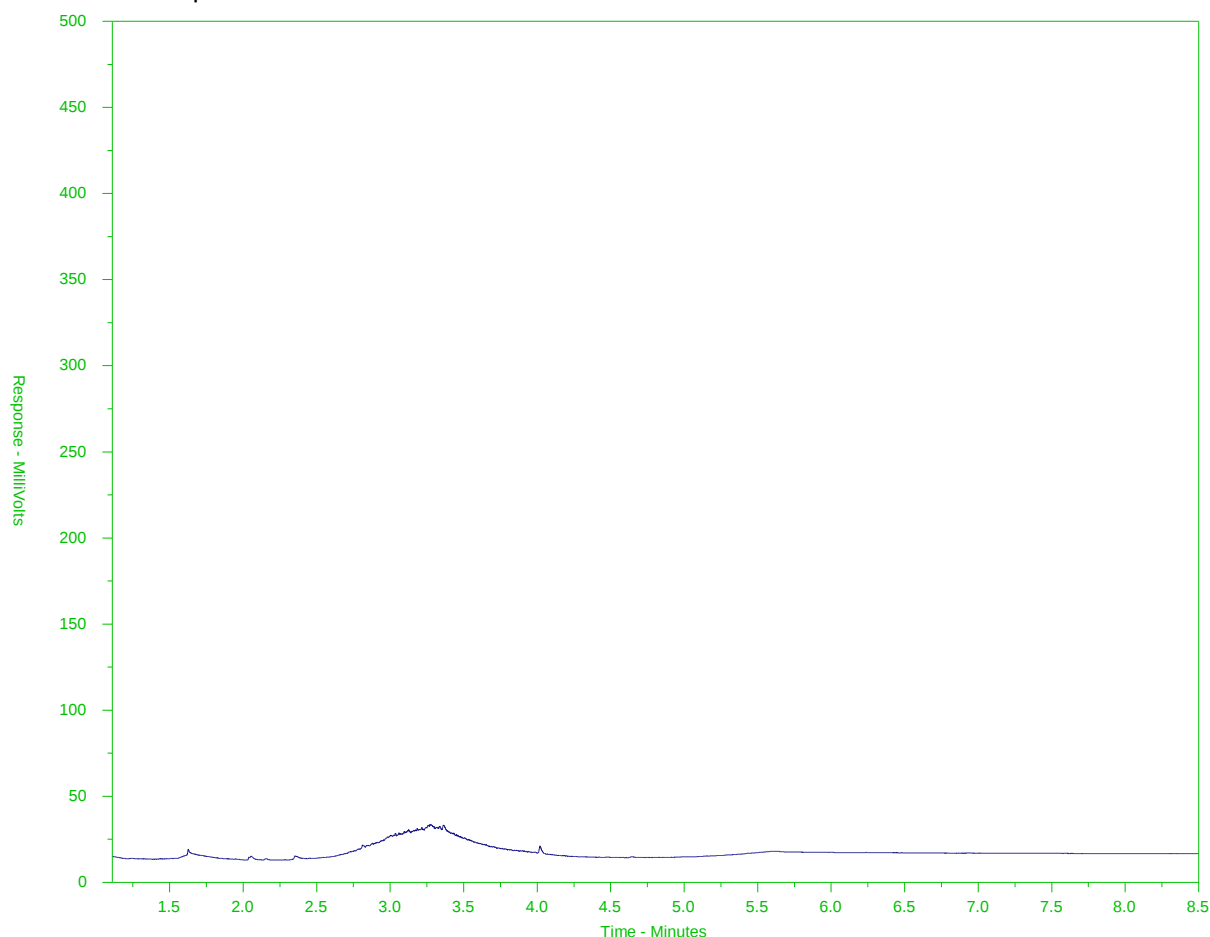
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WG3165835-C-3#L2343486-C-40
Client Sample ID: 20559



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

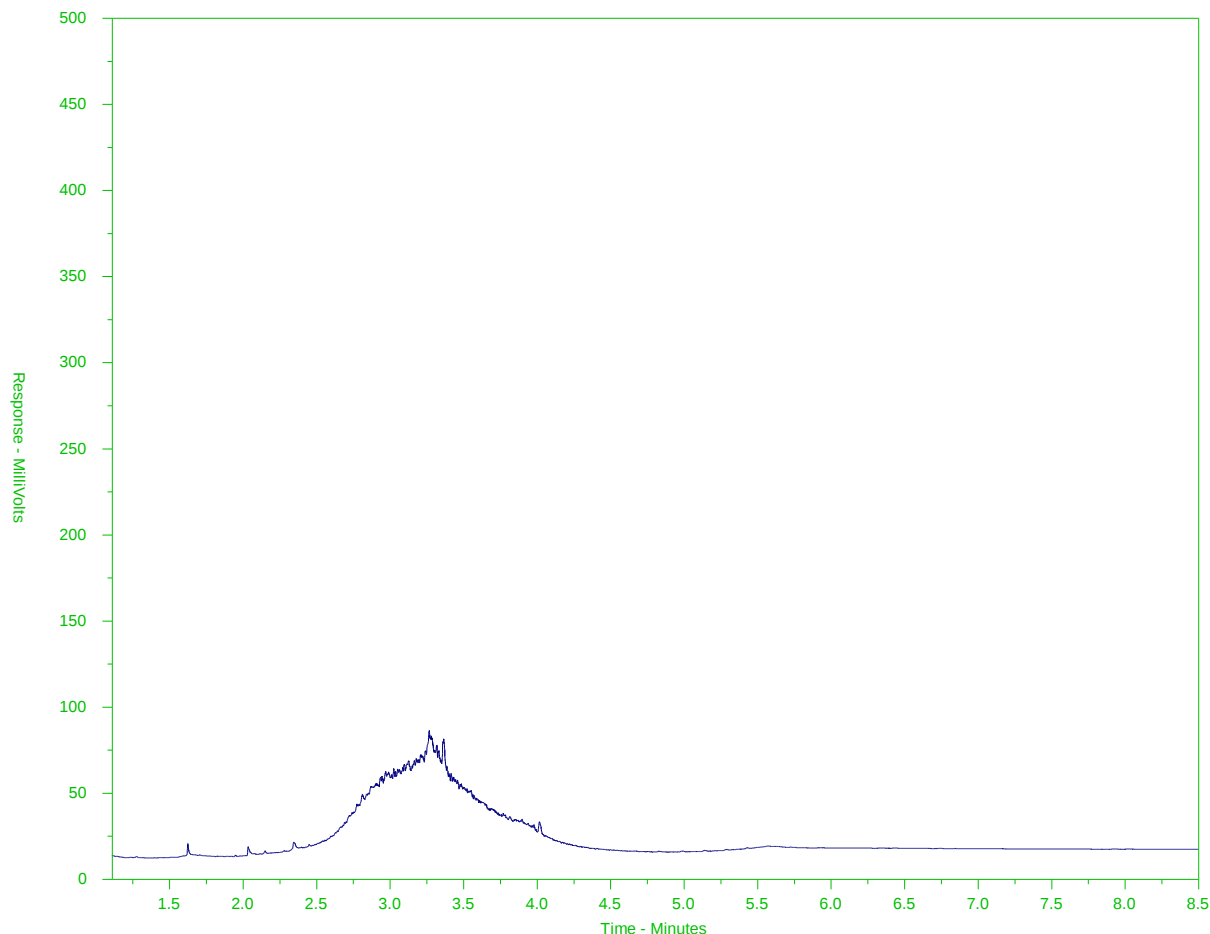
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: WGG3161191-C-3#L2343486-40
Client Sample ID: 20559



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

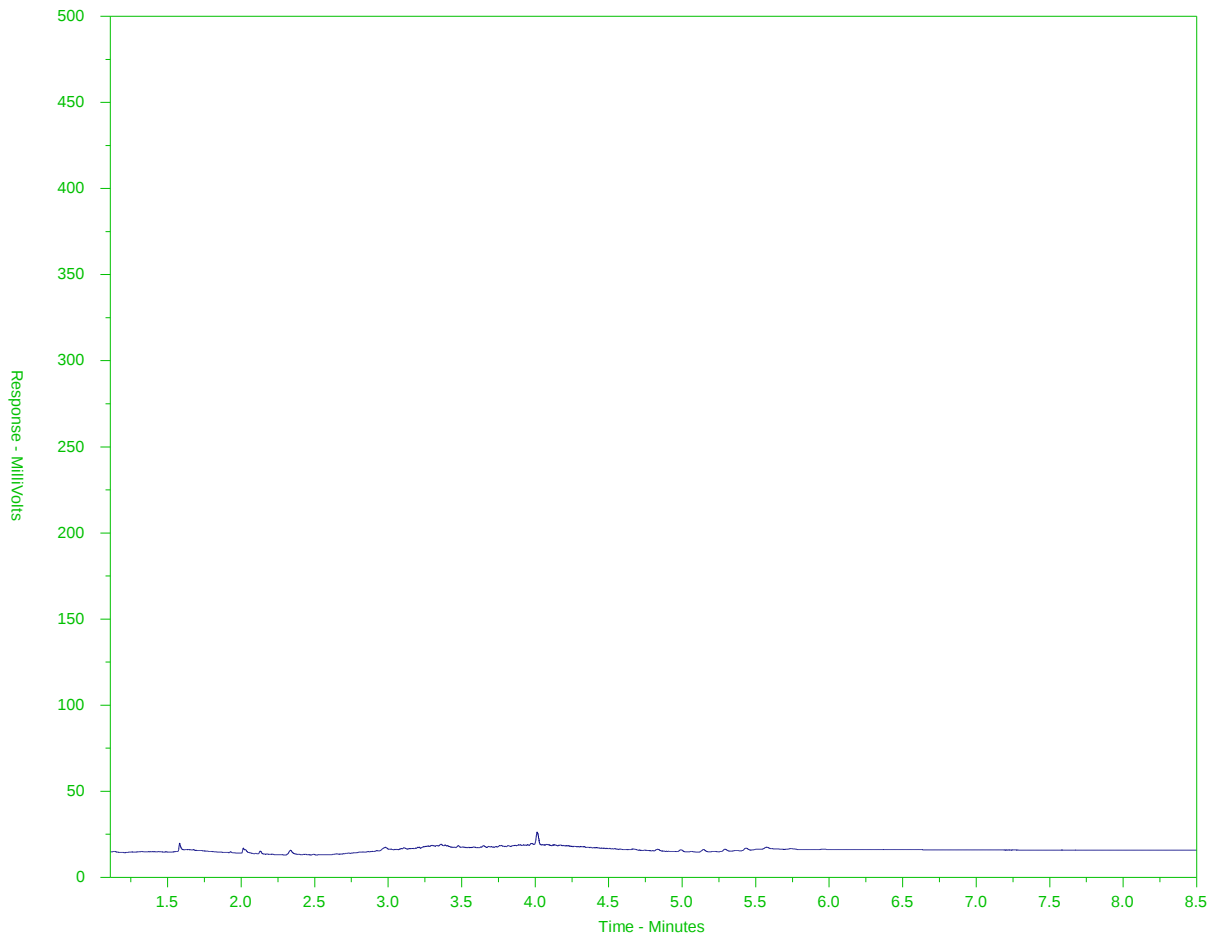
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-41
Client Sample ID: 20560



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

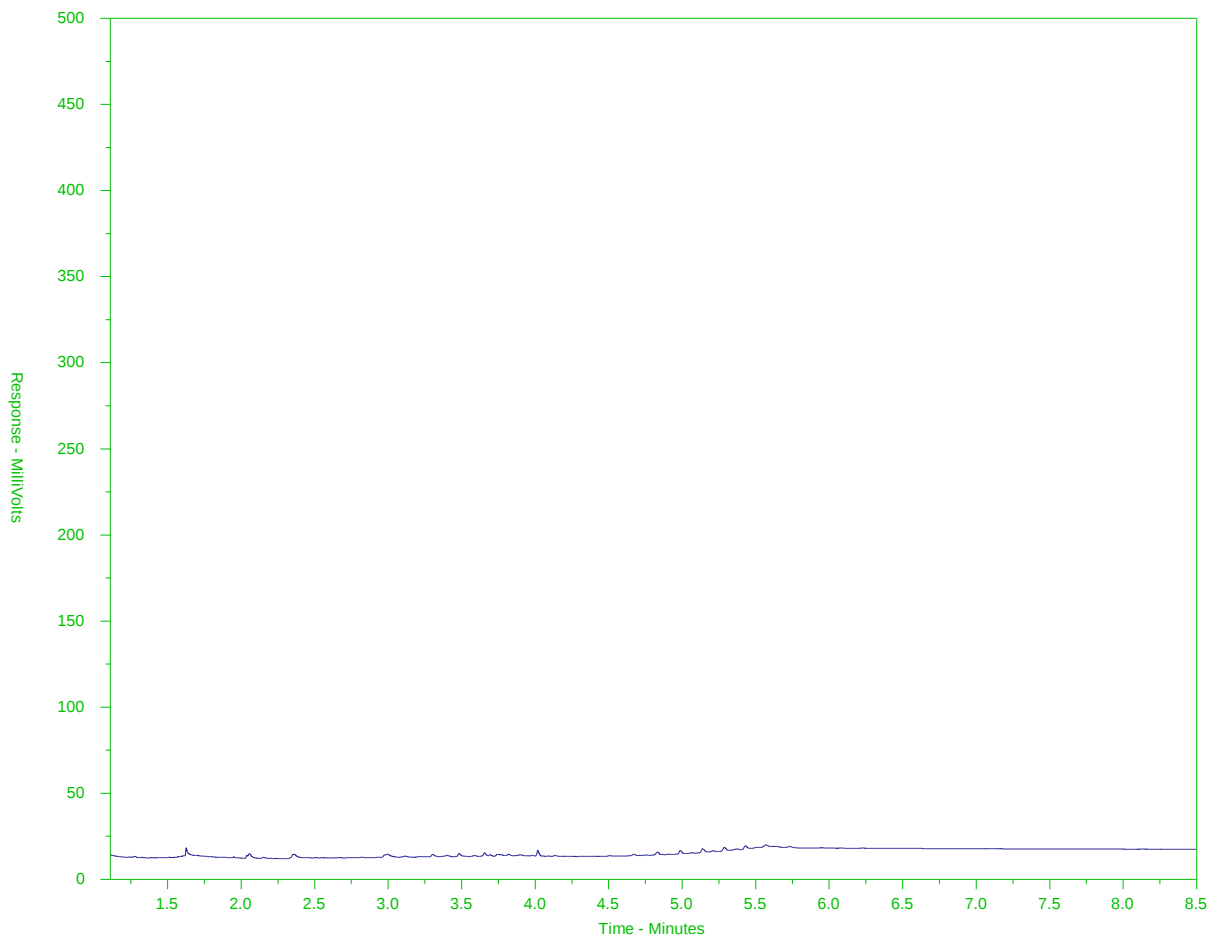
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-43
Client Sample ID: 20562



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

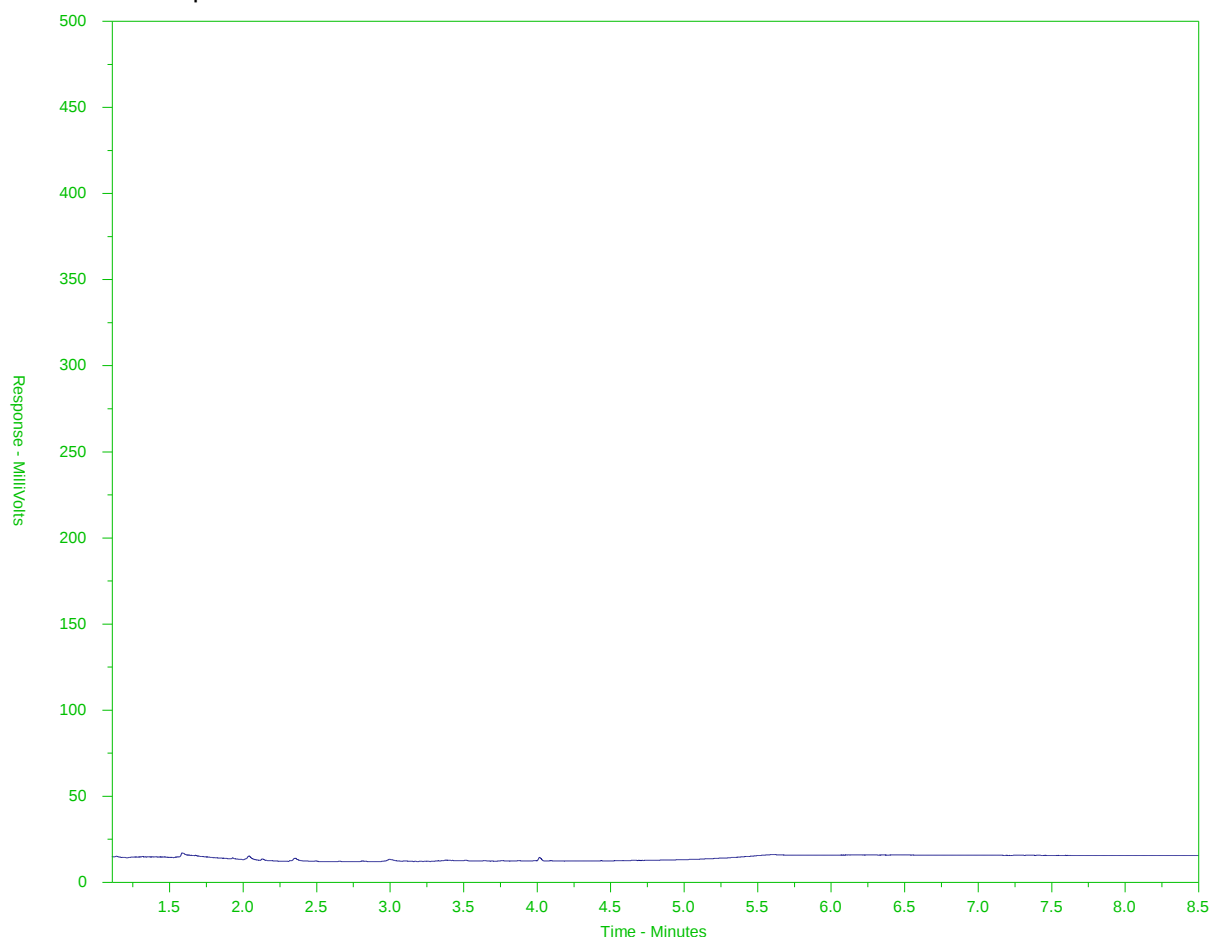
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-46
Client Sample ID: 20565



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

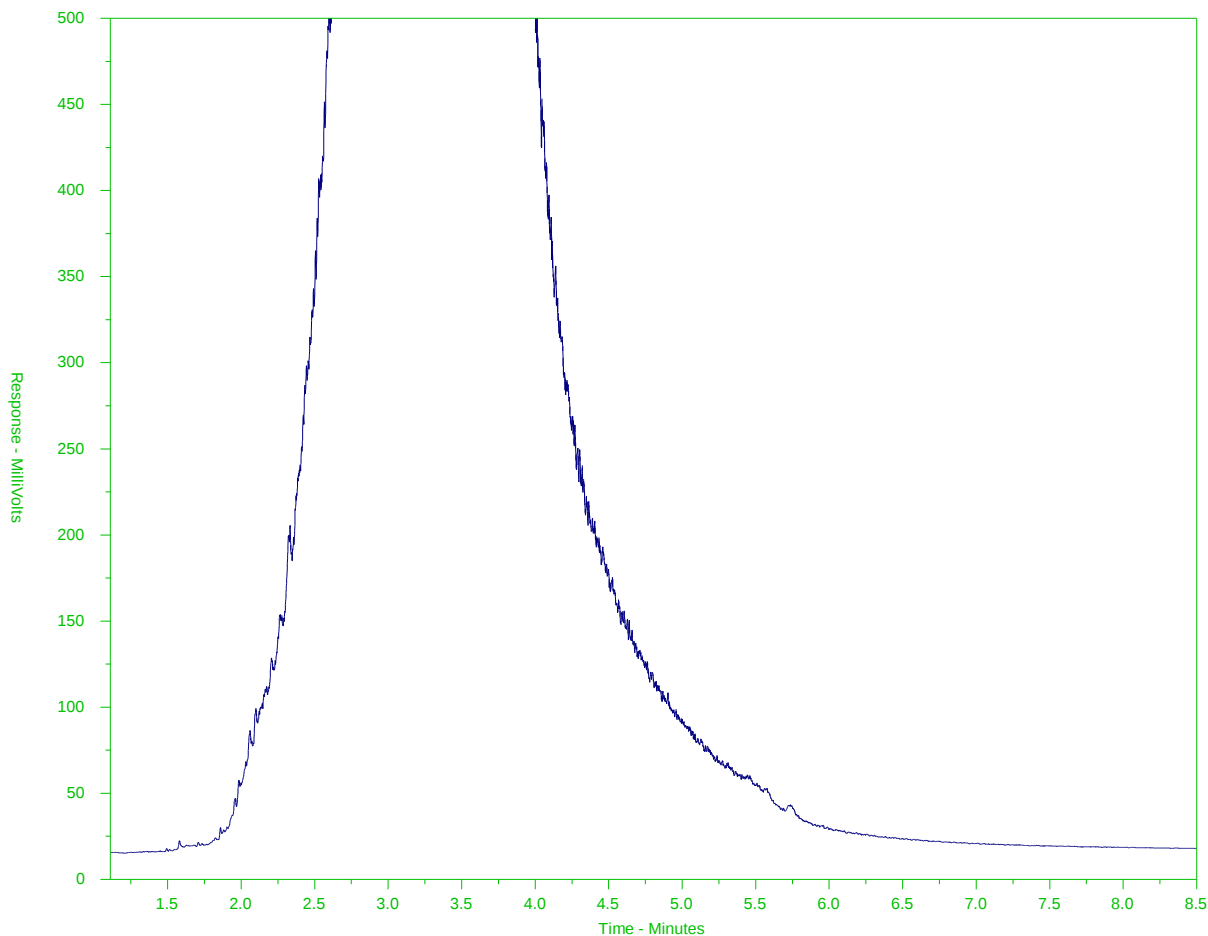
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-48
Client Sample ID: 20567



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

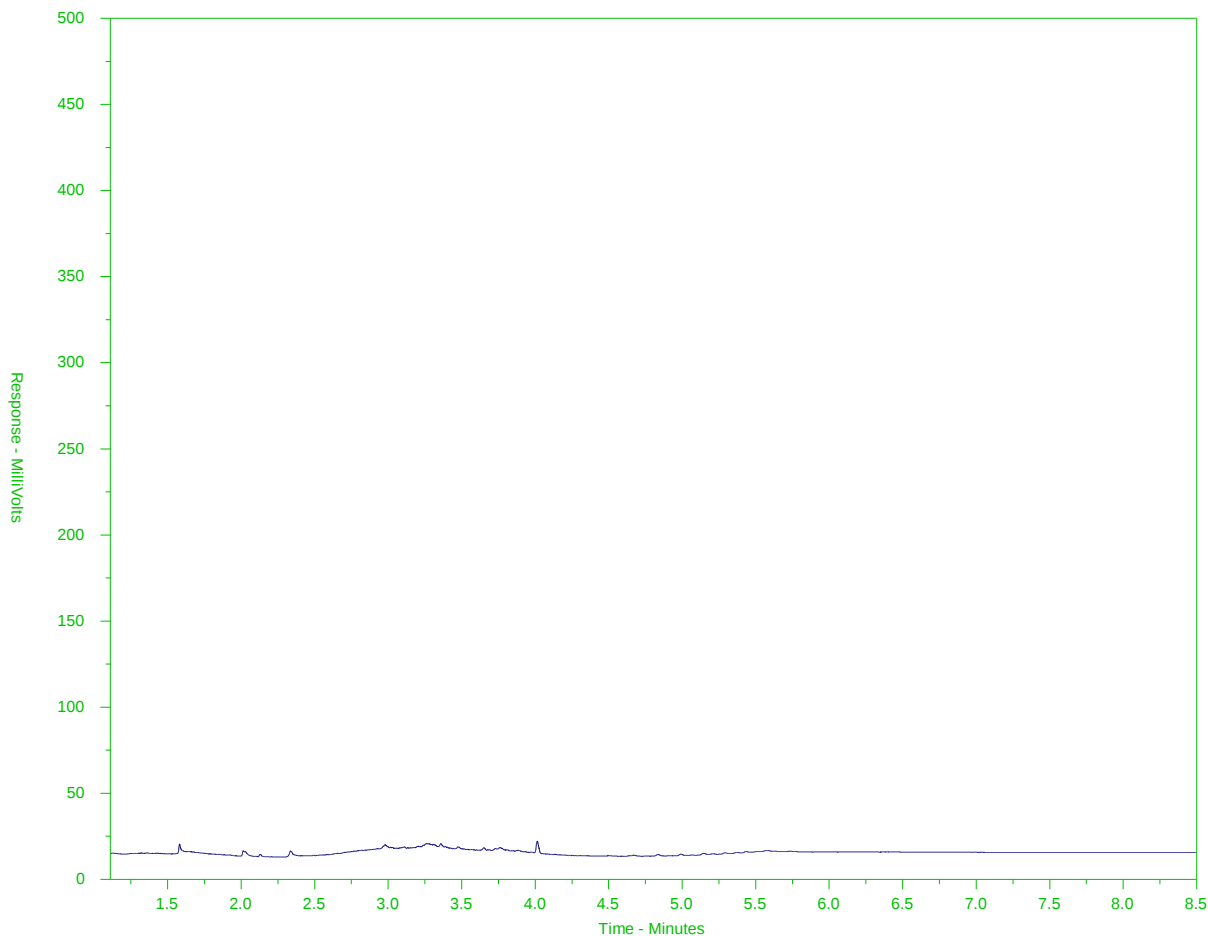
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-49
Client Sample ID: 20568



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

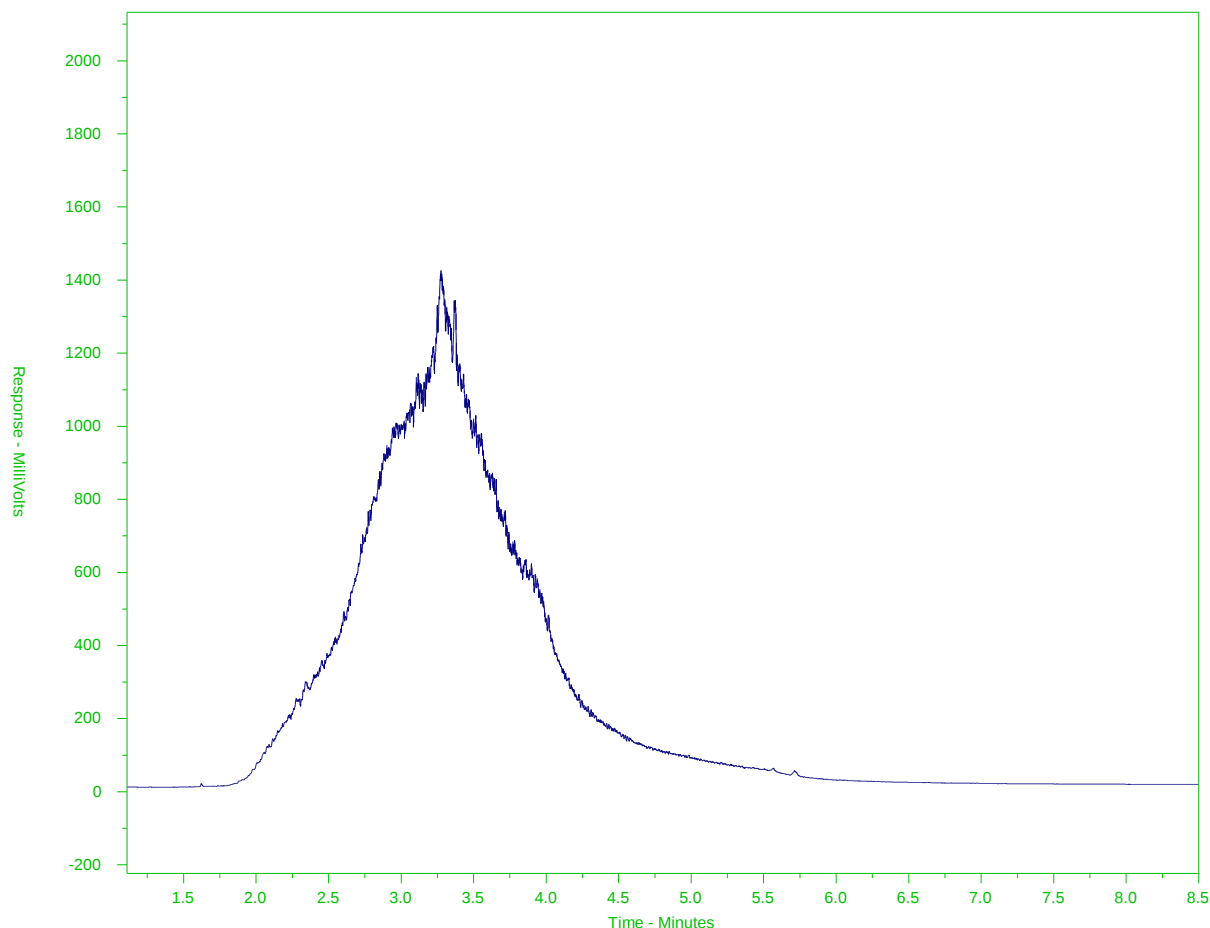
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-50
Client Sample ID: 20569



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

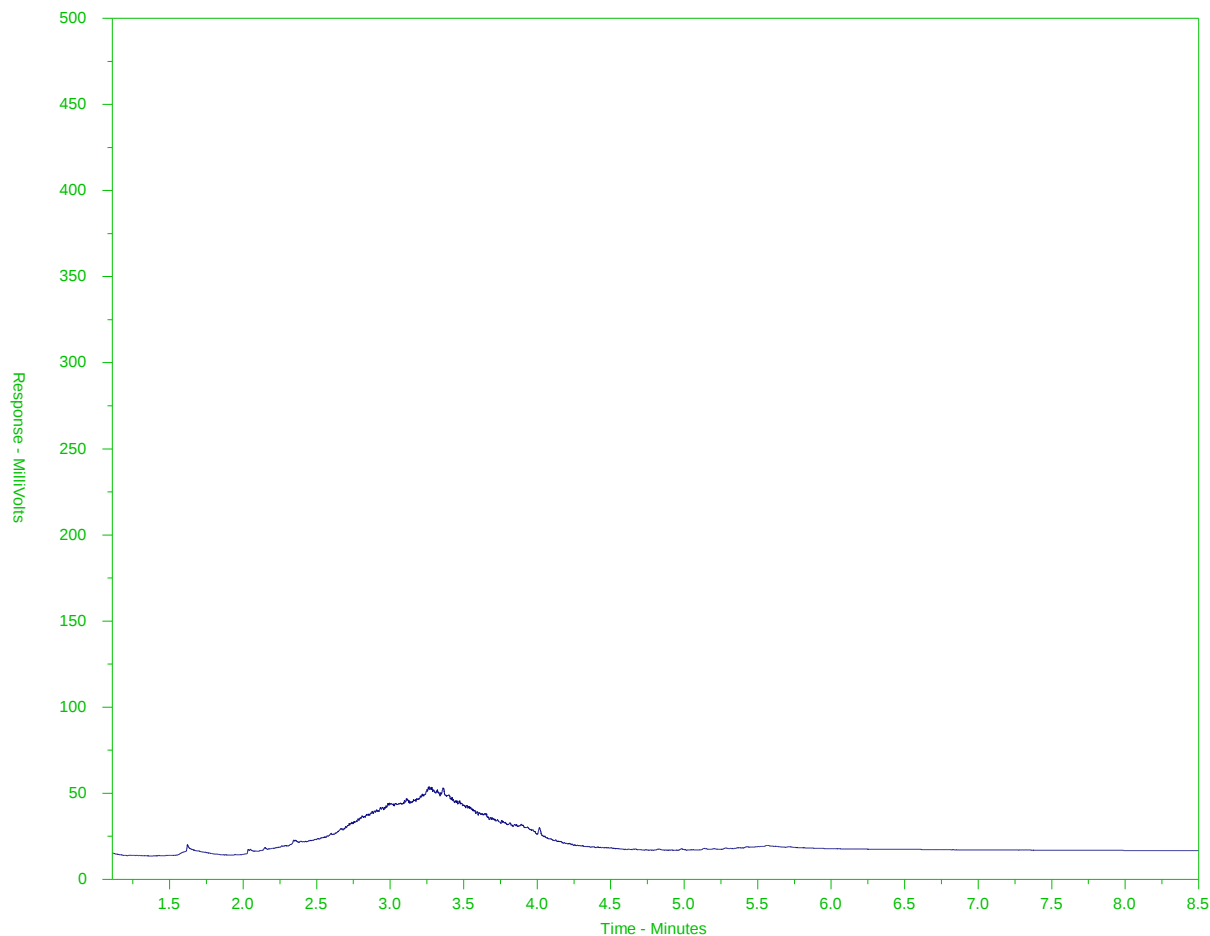
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-51
Client Sample ID: 20570



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

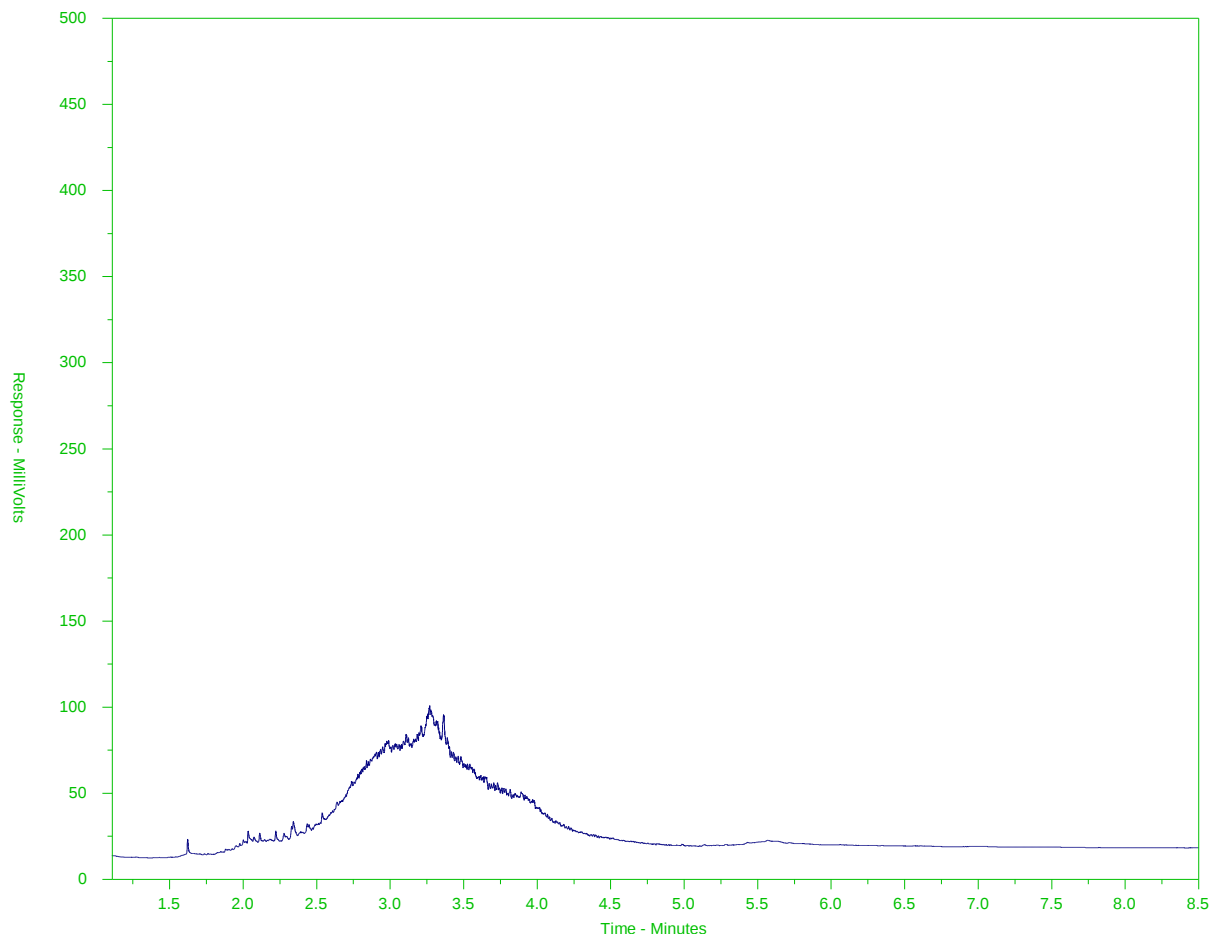
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-52
Client Sample ID: 20571



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

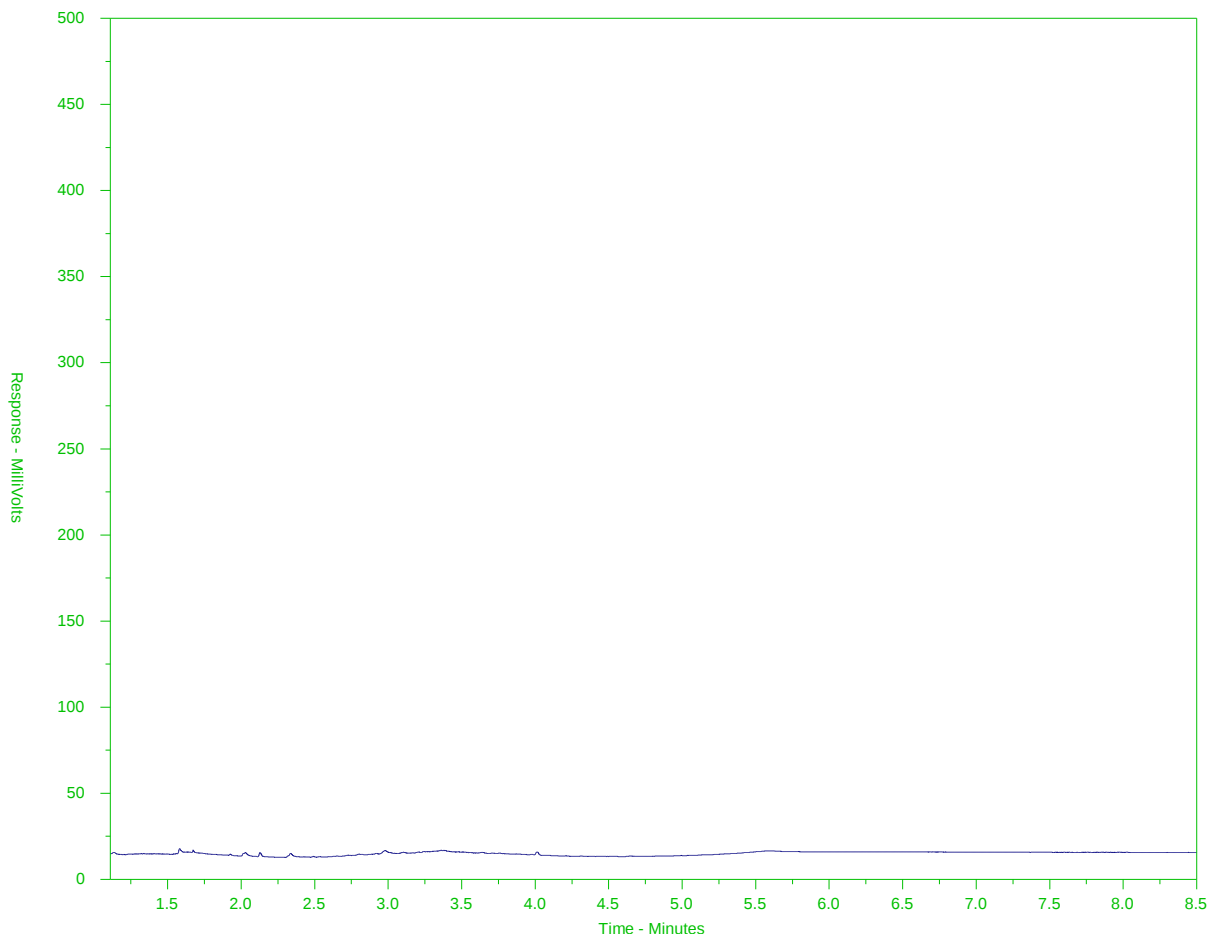
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2343486-C-53
Client Sample ID: 20572



F2		F3	F4	
nC10	nC16		nC34	nC50
174°C	287°C		481°C	575°C
345°F	549°F		898°F	1067°F
← Gasoline →		← Motor Oils / Lubricants / Grease →		
← Diesel / Jet Fuels →				

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.



ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2343486-COFC

COC Number: 17-817772

- Page 1 of 5

Report To: SRK		Report Format / Distribution: ☒ PDF ☒ FAX ☐ EQ (BOUTA)		Select Service Level Below - Contact your AML to confirm all EAP TATs (surcharge may apply)	
Company: A. Stearnman		Select Report Format: ☒ PDF ☒ FAX ☐ EQ (BOUTA)		Regular (R) ☐ Standard (S) & received by 3 pm - business days - no surcharge apply	
Contact: Got 681 4196		Quality Control (QC) Report with Report: ☒ YES ☐ NO		4 day (P4-20%) ☐ 3 day (P3-25%) ☐ 2 day (P2-50%) ☐	
Phone: Company address below will appear on the final report		☐ Complete Report in Country on Report - please specify which law required		1 Business day (E - 100%) ☐	
Street: Suite 2200, 1066 W. Hastings		Email 1 or Fax: astearman@srk.com		Same Day, Weekend or Statutory holiday (E2-200% (laboratory opening fees may apply)) ☐	
City/Province: Vancouver, BC		Email 2: draydwin@srk.com		Data and Time Required for all EAP TATs: ☐	
Postal Code: V6C 2K5		Email 3: draydwin@srk.com		cc-recipient: harmen	
Invoice To: Same as Report To		Invoice Distribution: ☒ Email ☐ FAX ☐ FAX		Analysis Request	
Copy of Invoice with Report: ☐ YES ☐ NO		Select Invoice Distribution: ☒ Email ☐ FAX ☐ FAX		Backlog (B) (P), Prepaid (P) (F) and Prepaid (P) (F) fees	
Company: Project Information		Email 1 or Fax: ml@srk.com		SUSPECTED HAZARD (see Special Instructions)	
Contact: Project Information		Email 2: astearman@srk.com		SAMPLES ON HOLD	
ALS Account # / Quote #: Q76237		Email 3: astearman@srk.com			
Lab #: PO/ASE: 010		Lab/Client Code: PO#			
Location: 010		Requester: PO#			
ALS Lab Work Order # (lab use only): 2343486		ALS Contact: Sample: A. Stearnman			
Sample Identification and Coordinates (This description will appear on the report)		Data (date only)		Time (human)	
1. 20501		3-9-19		Soil	
2. 20502		3-9-19			
3. 20503		3-9-19			
4. 20504					
5. 20505					
6. 20506					
7. 20507					
8. 20508					
9. 20509 X		E1 - sampled 6-9-19			
10. 20510 X		E1			
11. 20511					
12. 20512 X		3-9-19			
Drinking Water (DW) Samples (client use)		Special Instructions / Specify criteria to add on report by clicking on the drop-down list below (electronic COC only)			
Are samples taken from a Regulated DW System? ☐ YES ☐ NO		X harmen			
Are samples for human consumption use? ☐ YES ☐ NO					
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			
Release by: Stearman Date: 6-9-19 Time: 4pm		Received by: harmen Date: 6/16/19 Time: 16:30			
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION		WHITE - LABORATORY COPY YELLOW - CLIENT COPY			

L2343486-COFC

2, Sept 10, 12pm



L2343486-COFC

COC Number: 17-817773

Page 2 of 5

Report To Contact and company name below will appear on the final report Company: <u>SRK</u> Contact: <u>A. Stearnman</u> Phone: _____ Company address below will appear on the final report Street: _____ City/Province: _____ Postal Code: _____		Report Format / Distribution Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL) Quality Control (QC) Report with Report ☐ YES ☐ NO ☐ Compare Results to Criteria on Report - provide details below if box checked Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX Email 1 or Fax: _____ Email 2: _____ Email 3: _____		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply 4 day [P4-20%] ☐ 1 Business day [E - 100%] 3 day [P3-25%] ☐ Same Day, Weekend or Statutory holiday [E2 -200%] 2 day [P2-50%] ☐ (Laboratory opening fees may apply) Date and Time Required for all E&P TATs: _____ dd-mm-yy hh:mm For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																														
Invoice To Same as Report To ☐ YES ☐ NO Copy of Invoice with Report ☐ YES ☐ NO Company: _____ Contact: _____		Invoice Distribution Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX Email 1 or Fax: _____ Email 2: _____		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>NUMBER OF CONTAINERS</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> <th>13</th> <th>14</th> <th>15</th> <th>16</th> <th>17</th> <th>18</th> <th>19</th> <th>20</th> <th>21</th> <th>22</th> <th>23</th> <th>24</th> <th>25</th> <th>26</th> <th>27</th> <th>28</th> <th>29</th> <th>30</th> <th>31</th> <th>32</th> <th>33</th> <th>34</th> <th>35</th> <th>36</th> <th>37</th> <th>38</th> <th>39</th> <th>40</th> <th>41</th> <th>42</th> <th>43</th> <th>44</th> <th>45</th> <th>46</th> <th>47</th> <th>48</th> <th>49</th> <th>50</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		NUMBER OF CONTAINERS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																										
NUMBER OF CONTAINERS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																																
Project Information ALS Account # / Quote #: <u>Q76237</u> Job #: _____ PG/APE: <u>UW</u> LSD: _____ ALS Lab Work Order # (lab use only): _____		Oil and Gas Required Fields (client use) APE/Well Center: _____ POB: _____ Major/Minor Code: _____ Routing Code: _____ Requisitioner: _____ Location: _____ ALS Contact: _____ Sampler: <u>A. Stearnman</u>		SAMPLES ON HOLD SUSPECTED HAZARD (see Special Instructions)																																																																																																														
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>ALS Sample # (lab use only)</th> <th>Sample Description and/or Coordinates (This description will appear on the report)</th> <th>Date (dd-mm-yy)</th> <th>Time (hh:mm)</th> <th>Sample type</th> </tr> </thead> <tbody> <tr> <td>13</td> <td>20513x</td> <td>3-9-19</td> <td></td> <td>Soil</td> </tr> <tr> <td>14</td> <td>20514x FI-sample 8-9-19</td> <td>3-9-19</td> <td></td> <td></td> </tr> <tr> <td>15</td> <td>20515</td> <td>4-9-19</td> <td></td> <td></td> </tr> <tr> <td>16</td> <td>20516</td> <td></td> <td></td> <td></td> </tr> <tr> <td>17</td> <td>20517 *</td> <td></td> <td></td> <td></td> </tr> <tr> <td>18</td> <td>20518</td> <td></td> <td></td> <td></td> </tr> <tr> <td>19</td> <td>20519 !x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>20</td> <td>20520</td> <td></td> <td></td> <td></td> </tr> <tr> <td>21</td> <td>20521</td> <td></td> <td></td> <td></td> </tr> <tr> <td>22</td> <td>20522 *</td> <td></td> <td></td> <td></td> </tr> <tr> <td>23</td> <td>20523 x</td> <td></td> <td></td> <td></td> </tr> <tr> <td>24</td> <td>20524</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		ALS Sample # (lab use only)	Sample Description and/or Coordinates (This description will appear on the report)			Date (dd-mm-yy)	Time (hh:mm)	Sample type	13	20513x	3-9-19		Soil	14	20514x FI-sample 8-9-19	3-9-19			15	20515	4-9-19			16	20516				17	20517 *				18	20518				19	20519 !x				20	20520				21	20521				22	20522 *				23	20523 x				24	20524																																																	
ALS Sample # (lab use only)	Sample Description and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample type																																																																																																														
13	20513x	3-9-19		Soil																																																																																																														
14	20514x FI-sample 8-9-19	3-9-19																																																																																																																
15	20515	4-9-19																																																																																																																
16	20516																																																																																																																	
17	20517 *																																																																																																																	
18	20518																																																																																																																	
19	20519 !x																																																																																																																	
20	20520																																																																																																																	
21	20521																																																																																																																	
22	20522 *																																																																																																																	
23	20523 x																																																																																																																	
24	20524																																																																																																																	
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? ☐ YES ☐ NO Are samples for human consumption use? ☐ YES ☐ NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only) <u>x large jar</u> <u>! FI</u>		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen ☐ GIE Observations Yes ☐ No ☐ Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐ Cooling Initiated ☐ INITIAL COOLER TEMPERATURES °C: _____ FINAL COOLER TEMPERATURES °C: <u>14°</u>																																																																																																														
SHIPMENT, RELEASE (client use) Released by: _____ Date: _____ Time: _____		INITIAL SHIPMENT RECEPTION (lab use only) Received by: _____ Date: _____ Time: _____		FINAL SHIPMENT RECEPTION (lab use only) Received by: <u>Li</u> Date: <u>Sept 16</u> Time: <u>12pm</u>																																																																																																														

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY



ALS Environmental

www.alslab.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2343486-COFC

COC Number: 17-817774

Page 3 of 5

Report To		Contact and company name please will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AAM to confirm all EEP TATs (surcharges may apply)	
Company:	525	Select Report Format:	☐ PDF ☐ EXCEL ☐ EDD (optional)	Regular (P)	☐ Standard TAT if received by 3 pm - business days - no surcharges apply	1 Business day (E - 100%)	
Contact:	A. Steenstra	Quality Control (QC) Report with Report	☐ YES ☐ NO	3 day (P3-25%)	☐	Same Day, Weekend or Statutory holiday (E2-200%)	
Phone:		Company address below will appear on the final report	☐ Complete last section if change on report - provide details below if box checked	2 day (P2-50%)	☐	(Laboratory operating hours may vary)	
Street:		Email 1 or Fax	☐ EMAIL ☐ MAIL ☐ FAX	Data and TATs Requested for all EEP TATs			
City/Province:		Email 2		Data and TATs Requested for all EEP TATs			
Postal Code:		Email 3		Data and TATs Requested for all EEP TATs			
Invoice To	Same as Report To	Invoice Distribution	☐ EMAIL ☐ MAIL ☐ FAX	Data and TATs Requested for all EEP TATs			
Copy of Invoice with Report	☐ YES ☐ NO	Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	Data and TATs Requested for all EEP TATs			
Company:		Email 1 or Fax		Data and TATs Requested for all EEP TATs			
Contact:		Email 2		Data and TATs Requested for all EEP TATs			
Project Information				Analysis Request			
ALS Account # / Quote #:	076237	All Oil and Gas Required Fields (client use)		Analysis Request			
Job #:		AFCCM Order	PO#	Analysis Request			
PO / AFE:	110	Reference Code:	Sampling Code:	Analysis Request			
LSD:		Requisitioner:	Location:	Analysis Request			
ALS Lab Work Order # (lab use only):				Analysis Request			
Sample Identification and/or Coordinates (this description will appear on the report)				Analysis Request			
Job #	20525	Date	4-9-14	Sample	50.1	Sample Type	
Job #	20527	Date		Sample		Sample Type	
Job #	20529	Date		Sample		Sample Type	
Job #	20529	Date		Sample		Sample Type	
Job #	20530	Date		Sample		Sample Type	
Job #	20531	Date		Sample		Sample Type	
Job #	20532	Date		Sample		Sample Type	
Job #	20533	Date		Sample		Sample Type	
Job #	20534	Date		Sample		Sample Type	
Job #	20535	Date		Sample		Sample Type	
Job #	20536	Date		Sample		Sample Type	
Drinking Water (DW) Samples (client use)				Special Instructions / Specify Criteria to add on report by checking on the drop-down list below (electronic COC only)			
Are samples taken from a Regulated DW system?				☐ YES ☐ NO			
Are samples for human consumption use?				☐ YES ☐ NO			
SHIPPING RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)			
Released by:	Date:	Received by:	Date:	WHITE - LABORATORY COPY YELLOW - CLIENT COPY			
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPING INFORMATION				WHITE - LABORATORY COPY YELLOW - CLIENT COPY			

SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 568 9878



L2343486-COFC

17 - 817775

Page 4 of 5

[illegible]

If any water sampling is taken from a Regulated Drinking Water (RDW) System, please submit using an Authorized DW COC form.



L2343486-COFC

COC Number: 17 - 817776

Page 5 of 5

Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																	
Company: SRK		Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)		Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply																																																	
Contact: A. Stearman		Quality Control (QC) Report with Report ☐ YES ☐ NO		4 day [P4-20%] ☐ 1 Business day [E - 100%] ☐																																																	
Phone:		☐ Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%] ☐ Same Day, Weekend or Statutory holiday [E2 - 200%] ☐																																																	
Company address below will appear on the final report		Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		2 day [P2-50%] ☐ (Laboratory opening fees may apply)!																																																	
Street:		Email 1 or Fax		Date and Time Required for all E&P TATs: dd-mm-yy hh:mm																																																	
City/Province:		Email 2		For tests that can not be performed according to the service level selected, you will be contacted.																																																	
Postal Code:		Email 3		Analysis Request																																																	
Invoice To	Same as Report To ☐ YES ☐ NO	Invoice Distribution		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="12">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below</th> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below																																															
Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below																																																					
Copy of Invoice with Report ☐ YES ☐ NO		Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX																																																			
Company:		Email 1 or Fax																																																			
Contact:		Email 2																																																			
Project Information		Oil and Gas Required Fields (client use)																																																			
ALS Account # / Quote #: Q76237		AFS/Cost Center		PC#																																																	
Job #:		Major/Minor Code:		Routing Code:																																																	
PO / AFE: 010		Requisition:																																																			
LSD:		Location:																																																			
ALS Lab Work Order # (lab use only)		ALS Contact:		Sampler:																																																	
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS																																																
49	20568	5-9-19		Soil	4																																																
50	20569				4																																																
51	20570				4																																																
52	20571				4																																																
53	20572				4																																																
Drinking Water (DW) Samples (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)																																																	
Are samples taken from a Regulated DW System? ☐ YES ☐ NO				Frozen ☐ SIF Observations Yes ☐ No ☐																																																	
Are samples for human consumption/use? ☐ YES ☐ NO				Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐																																																	
				Cooling Initiated ☐																																																	
				INITIAL COOLER TEMPERATURES °C																																																	
				FINAL COOLER TEMPERATURES °C																																																	
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)																																																	
Released by:	Date:	Received by:	Date:	Received by:	Date:																																																

SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)