



January 12, 2015

Mr. Paul Schwarz
HSE Representative
Kerr-McGee Oil & Gas Onshore LP
4000 Burlington Avenue
Evans, Colorado 80620

**Re: Sump Excavation Summary Letter Report
Dolph 14-1
API# 05-123-22073
SESW 1-T2N-R66W**

Dear Mr. Schwarz:

LT Environmental, Inc. (LTE) was contracted by Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) to perform environmental oversight activities at the above referenced site. The oversight activities included collection of a confirmation soil sample from the sump excavation, documentation of field activities, and analytical results review.

The objective of the soil sampling was to determine if petroleum hydrocarbon impacts to subsurface soil resulted from Kerr-McGee operating a produced water sump at the site. The soil sampling activities, laboratory analytical results, and conclusions are summarized below. The general site layout, sump excavation dimensions, and soil sample location are displayed on the attached hand-sketched map.

After removing the produced water sump, one representative confirmation soil sample (S01@3') was collected from the southern sidewall. No soil sample was collected from beneath the water sump due to the presence of a synthetic liner. The soil sample was submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260C and total petroleum hydrocarbons (TPH) by EPA Method 8015C. The laboratory analytical results are summarized in Table 1 and the laboratory analytical report is attached.

The sump excavation measured approximately 15 feet north to south by 15 feet east to west to an approximate depth of 3 feet bgs. No indication of petroleum hydrocarbon impact, including soil staining or odor was observed beneath the water sump. In addition, TPH and BTEX concentrations were compliant with Colorado Oil and Gas Conservation Commission allowable levels in soil sample S01@3'. Based on the field observations and laboratory analytical results, no remedial action is required at this site.



Please call us at (303) 433-9788 if you have any questions regarding this Sump Excavation Summary Letter Report or if you require additional information.

Sincerely,
LT ENVIRONMENTAL, INC.

Reviewed by

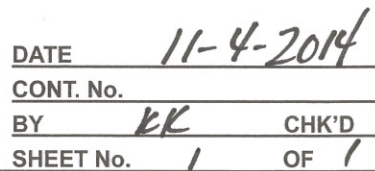
A handwritten signature in blue ink that reads "Kelly L. Kenyon". The signature is written in a cursive, flowing style.

Kelly L. Kenyon
Project Environmental Scientist

A handwritten signature in blue ink that reads "Michael J. Furtaw". The signature is written in a cursive, flowing style.

Michael J. Furtaw, P.G.
Project Geologist

Attachments



95LT0038 10/1997

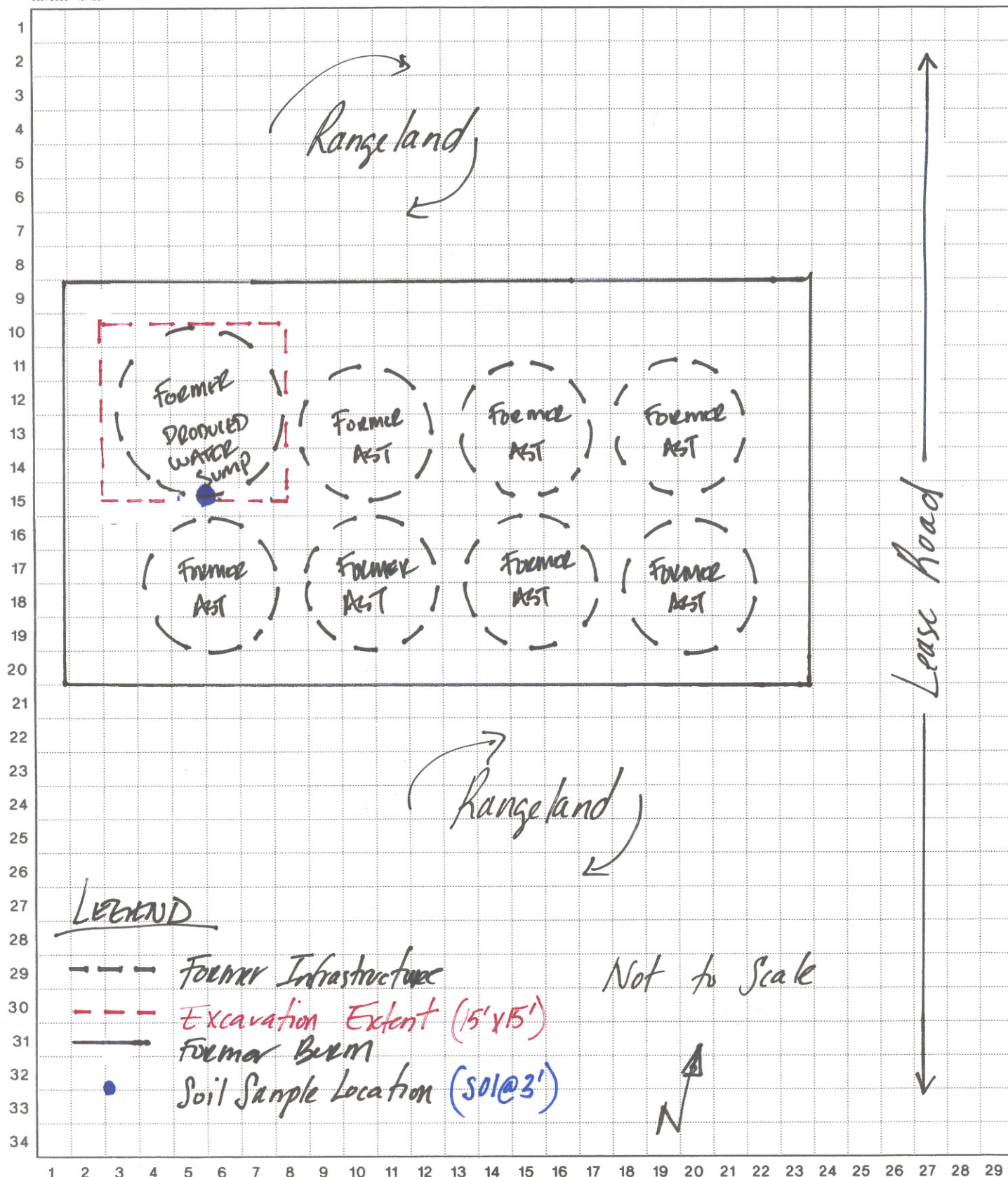


TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
DOLPH 14-1
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Soil Sample ID	Depth (bgs)	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	DRO (mg/kg)	GRO (mg/kg)	ORO (mg/kg)
S01 @ 3'	3'	11/04/2014	<0.002	<0.002	<0.002	<0.002	<50.0	<50.0	<200
COGCC Standards			0.17	85	100	175	500*	500*	500*

Notes: bgs - below ground surface

< - less than

DRO - Diesel Range Organics

ORO - Oil Range Organics

GRO - Gasoline Range Organics

* - Standard applies to combined DRO-GRO-ORO

mg/kg - milligrams per kilogram

NA - Not Analyzed/Not Available

Bold numbers indicate result equaled or exceeded standard.

COGCC - Colorado Oil and Gas Conservation Commission





November 05, 2014

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - Dolph -14-1

Project Number - [none]

Attached are your analytical results for KMG - Dolph -14-1 received by Origins Laboratory, Inc. November 04, 2014. This project is associated with Origins project number X411023-04.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

John Cocroft

Project Number: [none]

Project: KMG - Dolph -14-1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S01 @ 3'	X411023-04	Soil	November 4, 2014 15:35	11/04/2014 17:30

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Ross S Hutto For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

www.originslaboratory.com

page ____ of ____

ORIGINS LABORATORY, INC X411023

Client: LTE Project Manager/Send Report To: J. Cocroft

Address: 4600 W 60th Ave Email Address: _____

Arvada, CO Project Name/Number: Dolph 14-1

Telephone Number: 303-433-9788 Samples Collected By: M. Furtado

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis/Method			Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other	OTEX	TPH	
110103'	11-4-14	1520	1	X					X				X	1
50103'	11-4-14	1525	1	X					X				X	2
60103'	11-4-14	1530	1	X					X				X	3
50103'	11-4-14	1535	1	X					X				X	4
														5
														6
														7
														8
														9
														10
Relinquished By: <u>Matthew</u>	Date: <u>11-4-2014</u>	Time: <u>1730</u>		Received By: <u>[Signature]</u>				Date: <u>11/4/14</u>			Time: <u>1730</u>	Turnaround Time: <input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/> Standard <input type="checkbox"/> S.V.		
Relinquished By: _____	Date: _____	Time: _____		Received By: _____				Date: _____			Time: _____			

Comments: _____

Date Results Needed: _____

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Origins Laboratory, Inc.

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X411023

Client: LTE

Client Project ID: Dolph 14-1

Checklist Completed by: Dee Smith

Shipped Via: HD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11/4/14

Airbill #: NA

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: _____

Cooler Number/Temperature: 15.8 °C 1 °C 1 °C (Describe) 1 °C

Thermometer ID: T203

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/(pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

[Signature]
Reviewed by (Project Manager)

11/4/14 19:22
Date/Time Reviewed

Origins Laboratory, Inc.

[Signature]

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

S01 @ 3'
11/4/2014 3:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X411023-04 (Soil)

BTEX by EPA 8260C

Benzene	ND	0.002	mg/kg	1	4K04011	11/04/2014	11/05/2014
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	111 %	70-130			"	"	"
Surrogate: Toluene-d8	108 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	94.6 %	70-130			"	"	"

TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50.0	mg/kg	1	4K04013	11/04/2014	11/05/2014
Diesel (C10-C28)	ND	50.0	"	"	"	"	"
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"
TPH - Carbon Chain Total	ND	50.0	"	"	"	"	"

Surrogate: o-Terphenyl	66.4 %	65-146			"	"	"
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Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K04011 - EPA 5030 (soil)

Blank (4K04011-BLK1)

Prepared: 11/04/2014 Analyzed: 11/04/2014

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		92.5	70-130			
Surrogate: Toluene-d8	49		"	62.5		79.1	70-130			
Surrogate: 4-Bromofluorobenzene	50		"	62.5		79.4	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K04011 - EPA 5030 (soil)

LCS (4K04011-BS1)

Prepared: 11/04/2014 Analyzed: 11/04/2014

Benzene	0.10	0.002	mg/kg	0.100		104	77.1-124			
Toluene	0.09	0.002	"	0.100		88.8	74.5-128			
Ethylbenzene	0.09	0.002	"	0.100		93.2	66.4-127			
m,p-Xylene	0.18	0.004	"	0.200		88.0	76.6-124			
o-Xylene	0.09	0.002	"	0.100		85.8	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	60		ug/kg	62.5		95.7	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.8	70-130			
Surrogate: 4-Bromofluorobenzene	55		"	62.5		87.5	70-130			

Origins Laboratory, Inc.



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Ross S Hutto For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K04011 - EPA 5030 (soil)

Matrix Spike (4K04011-MS1)		Source: X411015-01			Prepared: 11/04/2014 Analyzed: 11/04/2014					
Benzene	0.12	0.002	mg/kg	0.100	ND	115	71.8-126			
Toluene	0.11	0.002	"	0.100	ND	110	65.1-130			
Ethylbenzene	0.11	0.002	"	0.100	ND	106	62.2-130			
m,p-Xylene	0.20	0.004	"	0.200	ND	97.6	46.5-137			
o-Xylene	0.10	0.002	"	0.100	ND	96.8	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	63		ug/kg	62.5		101	70-130			
Surrogate: Toluene-d8	65		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	55		"	62.5		87.6	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K04011 - EPA 5030 (soil)

Matrix Spike Dup (4K04011-MSD1)		Source: X411015-01			Prepared: 11/04/2014 Analyzed: 11/04/2014					
Benzene	0.10	0.002	mg/kg	0.100	ND	102	71.8-126	12.7	11.3	QM-07
Toluene	0.10	0.002	"	0.100	ND	95.4	65.1-130	14.0	15.4	
Ethylbenzene	0.10	0.002	"	0.100	ND	96.1	62.2-130	9.50	19.6	
m,p-Xylene	0.18	0.004	"	0.200	ND	89.3	46.5-137	8.86	19.2	
o-Xylene	0.09	0.002	"	0.100	ND	87.0	54.2-134	10.7	17.9	
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		98.0	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	56		"	62.5		90.3	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015M - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K04013 - EPA 3580

Blank (4K04013-BLK1)

Prepared: 11/04/2014 Analyzed: 11/04/2014

Gasoline (C6-C10)	ND	50.0	mg/kg
Diesel (C10-C28)	ND	50.0	"
Residual Range Organics (C28-C36)	ND	200	"
TPH - Carbon Chain Total	ND	50.0	"

Surrogate: o-Terphenyl 38 g 50.0 75.7 65-146

LCS (4K04013-BS1)

Prepared: 11/04/2014 Analyzed: 11/04/2014

Gasoline (C6-C10)	1010	50.0	mg/kg	1000	101	66.7-119
Diesel (C10-C28)	1150	50.0	"	1000	115	70.1-127
Residual Range Organics (C28-C36)	940	200	"	1000	94.0	54.5-139

Surrogate: o-Terphenyl 47 g 50.0 94.2 65-146

Matrix Spike (4K04013-MS1)

Source: X411021-01

Prepared: 11/04/2014 Analyzed: 11/04/2014

Gasoline (C6-C10)	1180	50.0	mg/kg	1000	37.7	114	56.4-132
Diesel (C10-C28)	3220	50.0	"	1000	2060	116	57.4-138
Residual Range Organics (C28-C36)	1170	200	"	1000	351	82.2	47.7-129

Surrogate: o-Terphenyl 52 g 50.0 105 65-146

Matrix Spike Dup (4K04013-MSD1)

Source: X411021-01

Prepared: 11/04/2014 Analyzed: 11/04/2014

Gasoline (C6-C10)	1160	50.0	mg/kg	1000	37.7	112	56.4-132	1.75	22
Diesel (C10-C28)	3200	50.0	"	1000	2060	114	57.4-138	0.647	18.3
Residual Range Organics (C28-C36)	1170	200	"	1000	351	81.5	47.7-129	0.590	30.1

Origins Laboratory, Inc.

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Extractable Petroleum Hydrocarbons by 8015M - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4K04013 - EPA 3580

Matrix Spike Dup (4K04013-MSD1)

Source: X411021-01

Prepared: 11/04/2014 Analyzed: 11/04/2014

Surrogate: o-Terphenyl	51		g	50.0		102	65-146			
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Origins Laboratory, Inc.



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Ross S Hutto For Noelle Doyle Mathis, President

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: [none]
Project: KMG - Dolph -14-1

Notes and Definitions

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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