



February 16, 2016

Mr. Erik Mickelson
Senior HSE Representative
Kerr-McGee Oil & Gas Onshore LP
501 North Division Boulevard
Platteville, Colorado 80651

RE: Sump Excavation Report
Lorenz-63N66W/30SWSW (Lorenz #1)
Weld County, Colorado
SWSW SEC 30-T3N-R66W
API # 05-123-08306
Facility # 318057

Dear Mr. Mickelson:

LT Environmental, Inc. (LTE) was contracted by Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) to conduct environmental oversight activities at the above-referenced site. The oversight activities included collecting confirmation sidewall soil and groundwater samples from the sump excavation, documenting field activities, and reviewing laboratory analytical results. In addition to the information provided below, Kerr-McGee submitted a Form 19 – Spill/ Release Report (Initial with Supplemental) to the Colorado Oil and Gas Conservation Commission (COGCC) on December 3, 2015.

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, soil sample locations, and groundwater sample locations are depicted on the Excavation Site Map provided as Figure 1.

On November 25, 2015, following the removal of the produced water sump, four representative confirmation soil samples (N01 @ 2.5', E01 @ 2.5', S01 @ 2.5', and W01 @ 2.5') were collected from the sidewalls of the excavation. While conducting field screening activities, LTE personnel observed soil staining and odor in confirmation sidewall soil samples N01 @ 2.5' and W01 @ 2.5'. The confirmation sidewall soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8260C, total petroleum hydrocarbons (TPH) by USEPA Methods 8015C and 8260C, pH by USEPA Method 9045D, and specific conductance (EC) by USEPA Method 9050A. Laboratory analytical results for the confirmation sidewall soil samples indicated that BTEX, TPH, pH, and EC levels were compliant with the COGCC Table 910-1 allowable levels at the extent of the northern, eastern, and southern sidewalls. Laboratory analytical results for the western confirmation sidewall soil sample (W01 @ 2.5') indicated that the TPH concentration exceeded the COGCC Table 910-1 allowable level at 2,250 milligrams per kilogram.



On December 1, 2015, following the removal of additional soil from the western sidewall of the excavation, two confirmation soil samples (N02@2.5' and S02@2.5') were collected from the northern and southern excavation sidewalls. Laboratory analytical results for the confirmation sidewall soil samples indicated that BTEX, TPH, pH, and EC levels were compliant with the COGCC Table 910-1 allowable levels at the extent of the northern and southern sidewalls.

On December 2, 2015, following the removal of additional soil from the western sidewall of the excavation, one confirmation soil sample (W01@0.5') was collected from the western excavation sidewall based on the depth to water at 1 foot below ground surface (bgs). Laboratory analytical results for the confirmation sidewall soil sample indicated that BTEX, TPH, pH, and EC levels were compliant with the COGCC Table 910-1 allowable levels at the extent of the western sidewall. The confirmation soil sample analytical results are summarized in Table 1 and the laboratory analytical reports are attached.

During excavation sampling activities, groundwater was encountered in the excavation at approximately 3 feet bgs during the sampling conducted on November 25, 2015 and at 1 foot bgs during the sampling conducted on December 2, 2015. On November 25, 2015, a representative groundwater sample (GW01) was collected and submitted for laboratory analysis of BTEX by USEPA Method 8260C. While conducting excavation groundwater sampling activities, LTE personnel observed an odor and a sheen on the excavation groundwater. Laboratory analytical results for excavation groundwater sample GW01 indicated that the benzene concentration exceeded the Colorado Groundwater Quality Standard (CGWQS) for benzene at a concentration of 96.8 micrograms per liter ($\mu\text{g/L}$). On December 2, 2015, following the removal of approximately 180 barrels of groundwater from the excavation extent, a second excavation groundwater sample (GW02) was collected and submitted for laboratory analysis of BTEX. Laboratory analytical results for groundwater sample GW02 indicated that the benzene concentration of 1.5 $\mu\text{g/L}$ was less than the CGWQS. Prior to backfilling the excavation, an additional 160 barrels of impacted groundwater were removed from the excavation and transported to a licensed injection facility. Eighty pounds of Chemically Oxygenated Granular Activated Carbon (COGAC[®]), a carbon-based bioremediation product, were applied to the phreatic and smear zones as the excavation was backfilled. Laboratory analytical results for the excavation groundwater samples are summarized in Table 2 and the laboratory analytical reports are attached.

The sump excavation measured approximately 44 feet east to west by 14 feet north to south to an approximate depth of 4 feet bgs. Approximately 220 cubic yards of impacted soil were excavated and transported to the Ker-McGee Land Treatment Facility in Weld County, Colorado. The produced water sump was reinstalled at a new location at this site.



Please contact LTE at (303) 433-9788 if you have any questions regarding this Sump Excavation Report or if you require additional information.

Sincerely,

LT ENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'Kristofer Shepherd', with a large, stylized initial 'K'.

Kristofer Shepherd
Staff Geologist

A handwritten signature in blue ink, reading 'Michael J. Furtaw', in a cursive style.

Michael J. Furtaw, P.G.
Project Geologist

Attachments



LEGEND

- ✕ RELEASE LOCATION
- SOIL SAMPLE
- ⊕ GROUNDWATER SAMPLE
- M METER HOUSE
- FORMER WELLHEAD
- EXCAVATION EXTENT
- BERM
- FORMER BERM
- AST: ABOVEGROUND STORAGE TANK
- ECD: EMISSION CONTROL DEVICE

GROUNDWATER SAMPLE ID
 B: BENZENE CONCENTRATION
 ALL RESULTS IN MICROGRAMS PER LITER
BOLD INDICATES RESULT EXCEEDS STANDARD

IMAGE COURTESY OF ESRI

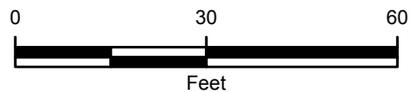


FIGURE 1
 EXCAVATION SITE MAP
 LORENZ-63N66W/30SW
 SWSW SEC 30-T3N-R66W
 WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP



TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
LORENZ-63N66W/30SWSW
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Soil Sample ID	Depth (bgs)	Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	DRO (mg/kg)	GRO (mg/kg)	ORO (mg/kg)	pH (su)	Specific Conductance (mmhos/cm)
E01 @ 2.5'	2.5'	11/25/2015	<0.002	<0.002	<0.002	<0.002	<50	<0.200	<200	8.14	0.0833
N01 @ 2.5'	2.5'	11/25/2015	<0.002	<0.002	0.002	<0.002	<50	3.06	<200	7.62	0.258
S01 @ 2.5'	2.5'	11/25/2015	<0.002	<0.002	<0.002	<0.002	<50	<0.200	<200	7.84	0.108
W01 @ 2.5'	2.5'	11/25/2015	<0.050	0.105	0.872	1.39	120	2130	<200	7.70	0.141
N02 @ 2.5'	2.5'	12/01/2015	0.002	<0.002	0.012	0.174	260	1.24	160	8.36	0.0893
S02 @ 2.5'	2.5'	12/01/2015	0.107	<0.050	0.874	<0.050	200	200	<100	7.79	0.131
W02 @ 0.5'	0.5'	12/02/2015	<0.002	<0.002	<0.002	<0.002	<25	<0.200	<100	8.03	0.489
COGCC Allowable Levels			0.17	85	100	175	500*	500*	500*	6-9	4

Notes: bgs - below ground surface

COGCC - Colorado Oil and Gas Conservation Commission

DRO - diesel range organics

GRO - gasoline range organics

mg/kg - milligrams per kilogram

mmhos/cm - millimhos per centimeter

NA - not analyzed/not available

ORO - oil range organics

su - standard units

* - Standard applies to combined DRO-GRO-ORO

< - less than laboratory reporting limit

Bold indicates result exceeds allowable level



TABLE 2
GROUNDWATER ANALYTICAL AND FIELD RESULTS
LORENZ-63N66W/30SWSW
WELD COUNTY, COLORADO
KERR-MCGEE OIL & GAS ONSHORE LP

Well Name	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Depth Water/ (Product Thickness) (ft bgs)
GW01	11/25/2015	96.8	282	22.2	244	3.00
GW02	12/02/2015	1.5	<1.0	8.3	49.0	1.00
CGWQS		5	1000	700	1400	

Notes: CGWQS - Colorado Groundwater Quality Standards
ft bgs - feet below ground surface
NA - not analyzed/not available
NM - not measured

µg/L - micrograms per liter
< - less than laboratory reporting limit
Bold indicates result exceeds allowable level
Excavation groundwater depth is approximate



November 30, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Lorenz #1

Project Number - 014215233

Attached are your analytical results for KMG - Lorenz #1 received by Origins Laboratory, Inc. November 25, 2015. This project is associated with Origins project number X511303-01.

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



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N01 @ 2.5'	X511303-01	Soil	November 25, 2015 12:30	11/25/2015 14:45
E01 @ 2.5'	X511303-02	Soil	November 25, 2015 12:35	11/25/2015 14:45
S01 @ 2.5'	X511303-03	Soil	November 25, 2015 12:40	11/25/2015 14:45
W01 @ 2.5'	X511303-04	Soil	November 25, 2015 12:45	11/25/2015 14:45
GW01	X511303-06	Water	November 25, 2015 12:55	11/25/2015 14:45

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.

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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

www.originslaboratory.com

page 1 of 1



Client: LTE
 Address: 4600 W 60th Ave.
 Telephone Number: (303) 433-9788
 Email Address: Jcocroft@ltenv.com

Project Manager: John Cocroft
 Project Name: Lorenz #1
 Project Number: 014215233
 Samples Collected By: KS
 Attn: Sun Lake

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis		Sample Instructions		
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other	X		Y	Z
N01@2.5'	11/25/15	12:30	2	X				X				X	X	X	ATTA is analyzed Only MUD SAR ↓ ↓ ↓ Hold All Run BTEX
E01@2.5'		12:35	2	X				X				X	X	X	
S01@2.5'		12:40	2	X				X				X	X	X	
L01@2.5'		12:45	2	X				X				X	X	X	
B401		12:50	2	X				X							
G1201		12:55	3	X				X				X			
Relinquished By: <u>[Signature]</u>	Date: <u>11/25/2015</u>	Time: <u>1400</u>	Received By: <u>PAUL JUNG</u>	Date: <u>11/25/15</u>	Time: <u>1400</u>	Turnaround Time: Same Day <input checked="" type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input type="checkbox"/> 72 Hr <input type="checkbox"/>	Standard: <u>KS</u>								
Relinquished By: <u>[Signature]</u>	Date: <u>11/25/15</u>	Time: <u>1445</u>	Received By: <u>[Signature]</u>	Date: <u>11/25/15</u>	Time: <u>1445</u>										

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

Date Results Needed: 12/30/15 (0800)

Origins Laboratory, Inc.

Jefe Pellegrini

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: 014215233
 Project: KMG - Lorenz #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS11303 Client: LTE
 Client Project ID: Lorenz #1
 Checklist Completed by: Jeff Smith Shipped Via: HTD
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Date/time completed: 11/25/15 Airbill #: NA
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____
 (Describe)
 Cooler Number/Temperature: 1 / 45 °C _____ / _____ °C _____ / _____ °C
 Thermometer ID: 1003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	✓			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	X			PH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	✓			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	✓			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	✓			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		X		
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)		T		
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.

Reviewed by (Project Manager) Jeff Smith Date/Time Reviewed 11/25/15

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

N01 @ 2.5'
11/25/2015 12:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 90.0 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	3.06	0.200	mg/kg	1	B5K2507	11/25/2015	11/25/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	0.002	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 113 % 70-130 " " "
Surrogate: Toluene-d8 98.0 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 106 % 70-130 " " "

pH in Soil by EPA 9045D

pH	7.62		pH Units	1	B5K2504	11/25/2015	11/25/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.258		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015	
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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: 014215233
 Project: KMG - Lorenz #1

E01 @ 2.5'
11/25/2015 12:35:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 84.7 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5K2507	11/25/2015	11/25/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 109 % 70-130 " " "

Surrogate: Toluene-d8 92.4 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 105 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.14		pH Units	1	B5K2504	11/25/2015	11/25/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0833		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015	
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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: 014215233
 Project: KMG - Lorenz #1

S01 @ 2.5'
11/25/2015 12:40:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-03 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 75.5 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5K2507	11/25/2015	11/25/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 114 % 70-130 " " "
Surrogate: Toluene-d8 91.3 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 106 % 70-130 " " "

pH in Soil by EPA 9045D

pH	7.84		pH Units	1	B5K2504	11/25/2015	11/25/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.108		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015	
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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: 014215233
 Project: KMG - Lorenz #1

W01 @ 2.5'
11/25/2015 12:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-04 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	120	50	mg/kg	1	B5K2506	11/25/2015	11/27/2015	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl 65.9 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	2130	50.0	mg/kg	250	B5K2507	11/25/2015	11/29/2015	
Benzene	ND	0.050	"	25	"	"	11/25/2015	
Toluene	0.105	0.050	"	"	"	"	"	
Ethylbenzene	0.872	0.050	"	"	"	"	"	
Xylenes, total	1.39	0.050	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 114 % 70-130 " " 11/29/2015
Surrogate: Toluene-d8 128 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 113 % 70-130 " " "

pH in Soil by EPA 9045D

pH	7.70		pH Units	1	B5K2504	11/25/2015	11/25/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.141		mmhos/cm	"	B5K2505	11/25/2015	11/25/2015	
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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: 014215233
 Project: KMG - Lorenz #1

GW01
11/25/2015 12:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X511303-06 (Water)

BTEX by EPA 8260C

Benzene	96.8	5.0	ug/L	5	B5K2502	11/25/2015	11/25/2015	
Toluene	282	5.0	"	"	"	"	"	
Ethylbenzene	22.2	5.0	"	"	"	"	"	
Xylenes, total	244	5.0	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	113 %	84-121			"	"	"	
Surrogate: Toluene-d8	103 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	100 %	84-114			"	"	"	

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

Blank (B5K2502-BLK1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	71		"	62.5		114	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.8	84-114			

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.

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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

LCS (B5K2502-BS1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Benzene	50.7	1.0	ug/L	50.0		101	75-126			
Toluene	50.1	1.0	"	50.0		100	78.7-126			
Ethylbenzene	51.8	1.0	"	50.0		104	80-130			
m,p-Xylene	106	2.0	"	100		106	77.2-133			
o-Xylene	53.4	1.0	"	50.0		107	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	84-121			
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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.

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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

Matrix Spike (B5K2502-MS1)	Source: X511239-01			Prepared: 11/25/2015 Analyzed: 11/25/2015						
Benzene	52.4	1.0	ug/L	50.0	ND	105	74-130			
Toluene	50.9	1.0	"	50.0	ND	102	73-131			
Ethylbenzene	52.5	1.0	"	50.0	ND	105	76-132			
m,p-Xylene	109	2.0	"	100	ND	109	69-139			
o-Xylene	55.7	1.0	"	50.0	ND	111	74-131			
Surrogate: 1,2-Dichloroethane-d4	68		"	62.5		108	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2502 - EPA 5030B (Water)

Matrix Spike Dup (B5K2502-MSD1)	Source: X511239-01			Prepared: 11/25/2015 Analyzed: 11/25/2015						
Benzene	48.4	1.0	ug/L	50.0	ND	96.8	74-130	7.88	20	
Toluene	47.4	1.0	"	50.0	ND	94.9	73-131	6.98	20	
Ethylbenzene	49.5	1.0	"	50.0	ND	99.0	76-132	5.98	20	
m,p-Xylene	101	2.0	"	100	ND	101	69-139	7.53	20	
o-Xylene	50.8	1.0	"	50.0	ND	102	74-131	9.19	20	
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5		104	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.3	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)

Blank (B5K2507-BLK1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	68.5		ug/kg	62.5		110	70-130			
Surrogate: Toluene-d8	57.6		"	62.5		92.2	70-130			
Surrogate: 4-Bromofluorobenzene	64.5		"	62.5		103	70-130			

Origins Laboratory, Inc.



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LT Environmental, Inc.
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 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)

LCS (B5K2507-BS1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Benzene	0.105	0.002	mg/kg	0.100		105	77.1-124			
Toluene	0.089	0.002	"	0.100		88.7	74.5-128			
Ethylbenzene	0.096	0.002	"	0.100		95.7	66.4-127			
m,p-Xylene	0.197	0.004	"	0.200		98.7	76.6-124			
o-Xylene	0.095	0.002	"	0.100		95.3	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	66.7		ug/kg	62.5		107	70-130			
Surrogate: Toluene-d8	57.5		"	62.5		92.0	70-130			
Surrogate: 4-Bromofluorobenzene	63.3		"	62.5		101	70-130			

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 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)

Matrix Spike (B5K2507-MS1)	Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015						
Benzene	0.101	0.002	mg/kg	0.100	0.004	96.8	71.8-126			
Toluene	0.091	0.002	"	0.100	ND	90.9	65.1-130			
Ethylbenzene	0.093	0.002	"	0.100	ND	92.8	62.2-130			
m,p-Xylene	0.193	0.004	"	0.200	ND	96.5	46.5-137			
o-Xylene	0.092	0.002	"	0.100	ND	91.7	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	66.4		ug/kg	62.5		106	70-130			
Surrogate: Toluene-d8	57.5		"	62.5		92.0	70-130			
Surrogate: 4-Bromofluorobenzene	63.2		"	62.5		101	70-130			

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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5K2507 - EPA 5030 (soil)

Matrix Spike Dup (B5K2507-MSD1)	Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015						
Benzene	0.101	0.002	mg/kg	0.100	0.004	96.8	71.8-126	0.00	11.3	
Toluene	0.089	0.002	"	0.100	ND	89.0	65.1-130	2.13	15.4	
Ethylbenzene	0.092	0.002	"	0.100	ND	91.6	62.2-130	1.32	19.6	
m,p-Xylene	0.193	0.004	"	0.200	ND	96.3	46.5-137	0.218	19.2	
o-Xylene	0.091	0.002	"	0.100	ND	90.7	54.2-134	1.14	17.9	
Surrogate: 1,2-Dichloroethane-d4	67.2		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	57.3		"	62.5		91.7	70-130			
Surrogate: 4-Bromofluorobenzene	63.7		"	62.5		102	70-130			

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 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 8015C - 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 B5K2506 - EPA 3580

Blank (B5K2506-BLK1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	42		"	50.0		84.6	59-131			

LCS (B5K2506-BS1)

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	690	50	mg/kg				64-121			
Residual Range Organics (C28-C36)	750	200	"	1000		75.4	58-124			
Surrogate: o-Terphenyl	41		"	50.0		82.4	59-131			

Matrix Spike (B5K2506-MS1)

Source: X511301-01

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	1100	50	mg/kg		ND		53-125			
Residual Range Organics (C28-C36)	1200	200	"	1000	18	114	47-133			
Surrogate: o-Terphenyl	52		"	50.0		104	59-131			

Matrix Spike Dup (B5K2506-MSD1)

Source: X511301-01

Prepared: 11/25/2015 Analyzed: 11/25/2015

Diesel (C10-C28)	690	50	mg/kg		ND		53-125	41.5	20	QM-07
Residual Range Organics (C28-C36)	730	200	"	1000	18	71.4	47-133	45.2	20	QM-07
Surrogate: o-Terphenyl	41		"	50.0		81.9	59-131			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B5K2504 - NO PREP										
Duplicate (B5K2504-DUP1)		Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
pH	7.26		pH Units		7.53			3.65	25	
Batch B5K2505 - NO PREP										
Blank (B5K2505-BLK1)		Prepared: 11/25/2015 Analyzed: 11/25/2015								
Specific Conductance (EC)	0.00360		mmhos/cm							
Duplicate (B5K2505-DUP1)		Source: X511301-01			Prepared: 11/25/2015 Analyzed: 11/25/2015					
Specific Conductance (EC)	0.0858		mmhos/cm		0.0909			5.77	25	

Origins Laboratory, Inc.



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #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

All soil results are reported at a wet weight basis.

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.

Jen Pellegrini For Noelle Doyle Mathis, President

December 02, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Lorenz #1

Project Number - 014215233

Attached are your analytical results for KMG - Lorenz #1 received by Origins Laboratory, Inc. December 01, 2015. This project is associated with Origins project number X512013-01.

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



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
N02 @ 2.5'	X512013-01	Soil	December 1, 2015 14:45	12/01/2015 16:58
S02 @ 2.5'	X512013-02	Soil	December 1, 2015 14:55	12/01/2015 16:58

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS12013

Client: LTE

Client Project ID: Lorenz #1

Checklist Completed by: Jeff Smith

Shipped Via: H/D
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 12/1/15

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 2.7 °C 1 °C 1 °C 1 °C

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	X			PH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)			X	
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.

Jeff Smith
 Reviewed by (Project Manager)

12/1/15
 Date/Time Reviewed

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

N02 @ 2.5'
12/1/2015 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512013-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	260	25	mg/kg	1	B5L0102	12/01/2015	12/01/2015	
Residual Range Organics (C28-C36)	160	100	"	"	"	"	"	

Surrogate: *o*-Terphenyl 75.9 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	1.24	0.200	mg/kg	1	B5L0106	12/01/2015	12/01/2015	
Benzene	0.002	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	0.012	0.002	"	"	"	"	"	
Xylenes, total	0.174	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 89.6 % 70-130 " " "
 Surrogate: Toluene-d8 103 % 70-130 " " "
 Surrogate: 4-Bromofluorobenzene 93.7 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.36		pH Units	1	B5L0107	12/01/2015	12/01/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0893		mmhos/cm	"	B5L0108	"	12/01/2015	
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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: 014215233
 Project: KMG - Lorenz #1

S02 @ 2.5'
12/1/2015 2:55:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512013-02 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	200	25	mg/kg	1	B5L0102	12/01/2015	12/01/2015	
Residual Range Organics (C28-C36)	ND	100	"	"	"	"	"	

Surrogate: o-Terphenyl 77.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	200	5.00	mg/kg	25	B5L0106	12/01/2015	12/01/2015	
Benzene	0.107	0.050	"	"	"	"	"	
Toluene	ND	0.050	"	"	"	"	"	
Ethylbenzene	0.874	0.050	"	"	"	"	"	
Xylenes, total	ND	0.050	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 83.6 % 70-130 " " "
Surrogate: Toluene-d8 118 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 109 % 70-130 " " "

pH in Soil by EPA 9045D

pH	7.79		pH Units	1	B5L0107	12/01/2015	12/01/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.131		mmhos/cm	"	B5L0108	"	12/01/2015	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)

Blank (B5L0106-BLK1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	56.9		ug/kg	62.5		91.0	70-130			
Surrogate: Toluene-d8	64.0		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	59.9		"	62.5		95.8	70-130			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)

LCS (B5L0106-BS1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

Benzene	0.096	0.002	mg/kg	0.100		95.5	77.1-124			
Toluene	0.095	0.002	"	0.100		95.1	74.5-128			
Ethylbenzene	0.082	0.002	"	0.100		82.0	66.4-127			
m,p-Xylene	0.165	0.004	"	0.200		82.4	76.6-124			
o-Xylene	0.083	0.002	"	0.100		83.4	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	57.1		ug/kg	62.5		91.4	70-130			
Surrogate: Toluene-d8	64.7		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	61.4		"	62.5		98.3	70-130			

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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)

Matrix Spike (B5L0106-MS1)	Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015						
Benzene	0.099	0.002	mg/kg	0.100	0.002	97.8	71.8-126			
Toluene	0.092	0.002	"	0.100	ND	91.8	65.1-130			
Ethylbenzene	0.111	0.002	"	0.100	0.012	99.2	62.2-130			
m,p-Xylene	0.477	0.004	"	0.200	0.174	151	46.5-137			QM-07, QR-02
o-Xylene	0.081	0.002	"	0.100	ND	81.1	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	59.4		ug/kg	62.5		95.0	70-130			
Surrogate: Toluene-d8	64.6		"	62.5		103	70-130			
Surrogate: 4-Bromofluorobenzene	60.1		"	62.5		96.1	70-130			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0106 - EPA 5030 (soil)

Matrix Spike Dup (B5L0106-MSD1)	Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015						
Benzene	0.104	0.002	mg/kg	0.100	0.002	102	71.8-126	4.50	11.3	
Toluene	0.101	0.002	"	0.100	ND	101	65.1-130	9.98	15.4	
Ethylbenzene	0.107	0.002	"	0.100	0.012	94.9	62.2-130	3.91	19.6	
m,p-Xylene	0.390	0.004	"	0.200	0.174	108	46.5-137	20.1	19.2	QR-02, QR-03
o-Xylene	0.088	0.002	"	0.100	ND	88.0	54.2-134	8.14	17.9	
Surrogate: 1,2-Dichloroethane-d4	54.0		ug/kg	62.5		86.4	70-130			
Surrogate: Toluene-d8	65.1		"	62.5		104	70-130			
Surrogate: 4-Bromofluorobenzene	58.3		"	62.5		93.3	70-130			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 8015C - 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 B5L0102 - EPA 3580

Blank (B5L0102-BLK1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	77		"	50.0		155	59-131			

LCS (B5L0102-BS1)

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28)	890	50	mg/kg	1000		88.6	64-121			
Residual Range Organics (C28-C36)	890	200	"	1000		89.5	58-124			
Surrogate: o-Terphenyl	48		"	50.0		96.4	59-131			

Matrix Spike (B5L0102-MS1)

Source: X512005-01

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28)	870	50	mg/kg	1000	ND	87.0	53-125			
Residual Range Organics (C28-C36)	940	200	"	1000	26	91.7	47-133			
Surrogate: o-Terphenyl	51		"	50.0		101	59-131			

Matrix Spike Dup (B5L0102-MSD1)

Source: X512005-01

Prepared: 12/01/2015 Analyzed: 12/01/2015

Diesel (C10-C28)	880	50	mg/kg	1000	ND	87.9	53-125	1.07	20	
Residual Range Organics (C28-C36)	930	200	"	1000	26	90.1	47-133	1.76	20	
Surrogate: o-Terphenyl	50		"	50.0		101	59-131			

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 4600 West 60th Avenue
 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B5L0107 - NO PREP										
Duplicate (B5L0107-DUP1)		Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015					
pH	8.38		pH Units		8.36			0.239	25	
Batch B5L0108 - NO PREP										
Blank (B5L0108-BLK1)		Prepared: 12/01/2015 Analyzed: 12/01/2015								
Specific Conductance (EC)	0.00290		mmhos/cm							
Duplicate (B5L0108-DUP1)		Source: X512013-01			Prepared: 12/01/2015 Analyzed: 12/01/2015					
Specific Conductance (EC)	0.0783		mmhos/cm		0.0893			13.1	25	

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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Notes and Definitions

- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
- QR-02 The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- 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
- All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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December 03, 2015

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Lorenz #1

Project Number - 014215233

Attached are your analytical results for KMG - Lorenz #1 received by Origins Laboratory, Inc. December 02, 2015. This project is associated with Origins project number X512026-01.

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



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

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W02 @ 0.5'	X512026-01	Soil	December 2, 2015 10:45	12/02/2015 16:35
GW02	X512026-02	Water	December 2, 2015 15:30	12/02/2015 16:35

Mike changed the sample ID on -01 from W01 @ 0.5' to W02 @ 0.5' on 12/3/15.

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: XS12026 Client: LTE
 Client Project ID: Lorenz #1
 Checklist Completed by: Jeff Smith Shipped Via: HTD
 (UPS, FedEx, Hand Delivered, Pick-up, etc.)
 Date/time completed: 12/2/15 Airbill #: NA
 Matrix(s) Received: (Check all that apply): Soil/Solid Water Other: _____ (Describe)
 Cooler Number/Temperature: 1 / 1.5 °C _____ / _____ °C _____ / _____ °C
 Thermometer ID: T003

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"/>			
Is there ice present (document if blue ice is used)	<input checked="" type="checkbox"/>			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		<input checked="" 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 checked="" type="checkbox"/>		
Were all samples received intact ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	<input checked="" type="checkbox"/>			PH
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	<input checked="" type="checkbox"/>			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.		<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 HNO3, HCL, H2SO4) / (pH >10 for samples preserved with NaAsO2+NaOH, ZnAc+NaOH)		<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.

Jeff Smith Reviewed by (Project Manager) 12/2/15 Date/Time Reviewed

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

W02 @ 0.5'
12/2/2015 10:45:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512026-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25	mg/kg	1	B5L0205	12/02/2015	12/02/2015	
Residual Range Organics (C28-C36)	ND	100	"	"	"	"	"	

Surrogate: o-Terphenyl 89.6 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	B5L0204	12/02/2015	12/02/2015	
Benzene	ND	0.002	"	"	"	"	"	
Toluene	ND	0.002	"	"	"	"	"	
Ethylbenzene	ND	0.002	"	"	"	"	"	
Xylenes, total	ND	0.002	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4 112 % 70-130 " " "

Surrogate: Toluene-d8 88.9 % 70-130 " " "

Surrogate: 4-Bromofluorobenzene 104 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.03		pH Units	1	B5L0208	12/02/2015	12/02/2015	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.489		mmhos/cm	"	B5L0209	12/02/2015	12/02/2015	
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LT Environmental, Inc.
 4600 West 60th Avenue
 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #1

GW02
12/2/2015 3:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X512026-02 (Water)

BTEX by EPA 8260C

Benzene	1.5	1.0	ug/L	1	B5L0105	12/02/2015	12/02/2015	
Toluene	ND	1.0	"	"	"	"	"	
Ethylbenzene	8.3	1.0	"	"	"	"	"	
Xylenes, total	49.0	1.0	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4	108 %	87.4-110			"	"	"	
Surrogate: Toluene-d8	108 %	83.7-117			"	"	"	
Surrogate: 4-Bromofluorobenzene	106 %	84.1-109			"	"	"	

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Blank (B5L0105-BLK1)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	55		"	62.5		88.4	84-121			
Surrogate: Toluene-d8	61		"	62.5		98.4	85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Blank (B5L0105-BLK2)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	ND	1.0	ug/L							
Toluene	ND	1.0	"							
Ethylbenzene	ND	1.0	"							
Xylenes, total	ND	1.0	"							
Surrogate: 1,2-Dichloroethane-d4	70		"	62.5		111	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	65		"	62.5		104	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

LCS (B5L0105-BS1)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	47.1	1.0	ug/L	50.0	94.2	75-126				
Toluene	48.5	1.0	"	50.0	97.1	78.7-126				
Ethylbenzene	47.7	1.0	"	50.0	95.3	80-130				
m,p-Xylene	93.5	2.0	"	100	93.5	77.2-133				
o-Xylene	46.6	1.0	"	50.0	93.2	77.9-126				
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5	86.4	84-121				
Surrogate: Toluene-d8	61		"	62.5	98.1	85-115				
Surrogate: 4-Bromofluorobenzene	65		"	62.5	104	84-114				

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 Arvada CO 80003

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

LCS (B5L0105-BS2)

Prepared: 12/01/2015 Analyzed: 12/02/2015

Benzene	55.5	1.0	ug/L	50.0		111	75-126			
Toluene	54.8	1.0	"	50.0		110	78.7-126			
Ethylbenzene	56.3	1.0	"	50.0		113	80-130			
m,p-Xylene	115	2.0	"	100		115	77.2-133			
o-Xylene	57.9	1.0	"	50.0		116	77.9-126			
Surrogate: 1,2-Dichloroethane-d4	65		"	62.5		104	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	85-115			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.1	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Matrix Spike (B5L0105-MS1)	Source: X512001-01			Prepared: 12/01/2015 Analyzed: 12/02/2015						
Benzene	57.0	1.0	ug/L	50.0	ND	114	74-130			
Toluene	57.7	1.0	"	50.0	ND	115	73-131			
Ethylbenzene	55.5	1.0	"	50.0	ND	111	76-132			
m,p-Xylene	110	2.0	"	100	ND	110	69-139			
o-Xylene	55.2	1.0	"	50.0	ND	110	74-131			
Surrogate: 1,2-Dichloroethane-d4	54		"	62.5		86.3	84-121			
Surrogate: Toluene-d8	63		"	62.5		100	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Matrix Spike (B5L0105-MS2)	Source: X512001-02			Prepared: 12/01/2015 Analyzed: 12/02/2015						
Benzene	54.6	1.0	ug/L	50.0	1.2	107	74-130			
Toluene	54.8	1.0	"	50.0	4.4	101	73-131			
Ethylbenzene	115	1.0	"	50.0	63.1	104	76-132			
m,p-Xylene	584	2.0	"	100	471	113	69-139			
o-Xylene	72.9	1.0	"	50.0	22.9	100	74-131			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	65		"	62.5		104	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Matrix Spike Dup (B5L0105-MSD1)	Source: X512001-01			Prepared: 12/01/2015 Analyzed: 12/02/2015						
Benzene	50.5	1.0	ug/L	50.0	ND	101	74-130	12.0	20	
Toluene	51.9	1.0	"	50.0	ND	104	73-131	10.5	20	
Ethylbenzene	48.4	1.0	"	50.0	ND	96.8	76-132	13.6	20	
m,p-Xylene	98.3	2.0	"	100	ND	98.3	69-139	11.4	20	
o-Xylene	49.4	1.0	"	50.0	ND	98.9	74-131	10.9	20	
Surrogate: 1,2-Dichloroethane-d4	52		"	62.5		83.2	84-121			S-04
Surrogate: Toluene-d8	64		"	62.5		102	85-115			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	84-114			

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0105 - EPA 5030B (Water)

Matrix Spike Dup (B5L0105-MSD2)	Source: X512001-02			Prepared: 12/01/2015 Analyzed: 12/02/2015						
Benzene	53.4	1.0	ug/L	50.0	1.2	105	74-130	2.07	20	
Toluene	54.8	1.0	"	50.0	4.4	101	73-131	0.0729	20	
Ethylbenzene	116	1.0	"	50.0	63.1	106	76-132	1.01	20	
m,p-Xylene	624	2.0	"	100	471	154	69-139	6.65	20	QM-07
o-Xylene	76.9	1.0	"	50.0	22.9	108	74-131	5.30	20	
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		106	84-121			
Surrogate: Toluene-d8	67		"	62.5		106	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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

John Cocroft
 Project Number: 014215233
 Project: KMG - Lorenz #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 B5L0204 - EPA 5030 (soil)

Blank (B5L0204-BLK1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Gasoline Range Hydrocarbons	ND	0.200	mg/kg							
Benzene	ND	0.002	"							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	72.2		ug/kg	62.5		115	70-130			
Surrogate: Toluene-d8	54.9		"	62.5		87.9	70-130			
Surrogate: 4-Bromofluorobenzene	62.9		"	62.5		101	70-130			

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Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5L0204 - EPA 5030 (soil)

LCS (B5L0204-BS1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Benzene	0.100	0.002	mg/kg	0.100		100	77.1-124			
Toluene	0.086	0.002	"	0.100		86.4	74.5-128			
Ethylbenzene	0.087	0.002	"	0.100		86.7	66.4-127			
m,p-Xylene	0.181	0.004	"	0.200		90.7	76.6-124			
o-Xylene	0.087	0.002	"	0.100		86.8	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	67.7		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	56.2		"	62.5		89.9	70-130			
Surrogate: 4-Bromofluorobenzene	64.8		"	62.5		104	70-130			

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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 B5L0204 - EPA 5030 (soil)

Matrix Spike (B5L0204-MS1)	Source: X512021-02			Prepared: 12/02/2015 Analyzed: 12/02/2015						
Benzene	0.212	0.002	mg/kg	0.200	ND	106	71.8-126			
Toluene	0.182	0.002	"	0.200	ND	90.9	65.1-130			
Ethylbenzene	0.182	0.002	"	0.200	ND	91.2	62.2-130			
m,p-Xylene	0.378	0.004	"	0.400	0.002	93.9	46.5-137			
o-Xylene	0.181	0.002	"	0.200	0.001	89.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	68.3		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	54.8		"	62.5		87.7	70-130			
Surrogate: 4-Bromofluorobenzene	64.7		"	62.5		104	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B5L0204 - EPA 5030 (soil)

Matrix Spike Dup (B5L0204-MSD1)	Source: X512021-02			Prepared: 12/02/2015 Analyzed: 12/02/2015						
Benzene	0.220	0.002	mg/kg	0.200	ND	110	71.8-126	3.78	11.3	
Toluene	0.186	0.002	"	0.200	ND	93.1	65.1-130	2.37	15.4	
Ethylbenzene	0.188	0.002	"	0.200	ND	94.1	62.2-130	3.14	19.6	
m,p-Xylene	0.388	0.004	"	0.400	0.002	96.5	46.5-137	2.68	19.2	
o-Xylene	0.187	0.002	"	0.200	0.001	92.8	54.2-134	3.11	17.9	
Surrogate: 1,2-Dichloroethane-d4	68.2		ug/kg	62.5		109	70-130			
Surrogate: Toluene-d8	55.5		"	62.5		88.7	70-130			
Surrogate: 4-Bromofluorobenzene	65.6		"	62.5		105	70-130			

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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 8015C - 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 B5L0205 - EPA 3580

Blank (B5L0205-BLK1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	ND	50	mg/kg							
Residual Range Organics (C28-C36)	ND	200	"							
Surrogate: o-Terphenyl	45		"	50.0		90.9	59-131			

LCS (B5L0205-BS1)

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	860	50	mg/kg	1000		85.6	64-121			
Residual Range Organics (C28-C36)	930	200	"	1000		92.8	58-124			
Surrogate: o-Terphenyl	43		"	50.0		85.0	59-131			

Matrix Spike (B5L0205-MS1)

Source: X512021-02

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	890	50	mg/kg	1000	ND	88.9	53-125			
Residual Range Organics (C28-C36)	900	200	"	1000	22	87.6	47-133			
Surrogate: o-Terphenyl	39		"	50.0		78.1	59-131			

Matrix Spike Dup (B5L0205-MSD1)

Source: X512021-02

Prepared: 12/02/2015 Analyzed: 12/02/2015

Diesel (C10-C28)	910	50	mg/kg	1000	ND	91.2	53-125	2.50	20	
Residual Range Organics (C28-C36)	890	200	"	1000	22	87.1	47-133	0.553	20	
Surrogate: o-Terphenyl	45		"	50.0		90.7	59-131			

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Classical Chemistry Parameters - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B5L0208 - NO PREP										
Duplicate (B5L0208-DUP1)		Source: X512026-01			Prepared: 12/02/2015 Analyzed: 12/02/2015					
pH	8.07		pH Units		8.03			0.497	25	
Batch B5L0209 - NO PREP										
Blank (B5L0209-BLK1)		Prepared: 12/02/2015 Analyzed: 12/02/2015								
Specific Conductance (EC)	0.00370		mmhos/cm							
Duplicate (B5L0209-DUP1)		Source: X512026-01			Prepared: 12/02/2015 Analyzed: 12/02/2015					
Specific Conductance (EC)	0.497		mmhos/cm		0.489			1.62	25	

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Arvada CO 80003

John Cocroft
Project Number: 014215233
Project: KMG - Lorenz #1

Notes and Definitions

- S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- 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
- All soil results are reported at a wet weight basis.

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