



July 31, 2013

Mr. Paul Schneider
Senior Staff EHS Representative
Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

**Re: Sump Excavation Summary Letter Report
Hanson 14-1
API# 05-123-09218
SESW 1-T2S-R65W**

Dear Mr. Schneider:

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 shown on the attached hand-sketched map.

After removing the produced water sump, one representative confirmation soil sample (B01@5') was collected from the soil directly beneath the water sump. The soil sample was submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260B and total petroleum hydrocarbons (TPH) by EPA Methods 8015 and 8260B. The laboratory analytical results are summarized on Table 1 and provided in the attached analytical laboratory report.

The sump excavation measured approximately 20 feet north to south by 15 feet east to west to an approximate depth of 5 feet below ground surface. No indication of petroleum hydrocarbon impacts, including soil staining or odor, was observed beneath the water sump. In addition, TPH and BTEX concentrations were below Colorado Oil and Gas Conservation Commission allowable levels and laboratory reporting limits in soil sample B01@5'. Based on the field observations and 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 black ink that reads "Jeremy Espinoza". The signature is fluid and cursive, with the first and last names being the most prominent.

Jeremy Espinoza
Staff Geologist

A handwritten signature in black ink that reads "Justin Solomon". The signature is cursive and somewhat stylized, with the first name being the most prominent.

Justin Solomon
Project Environmental Scientist

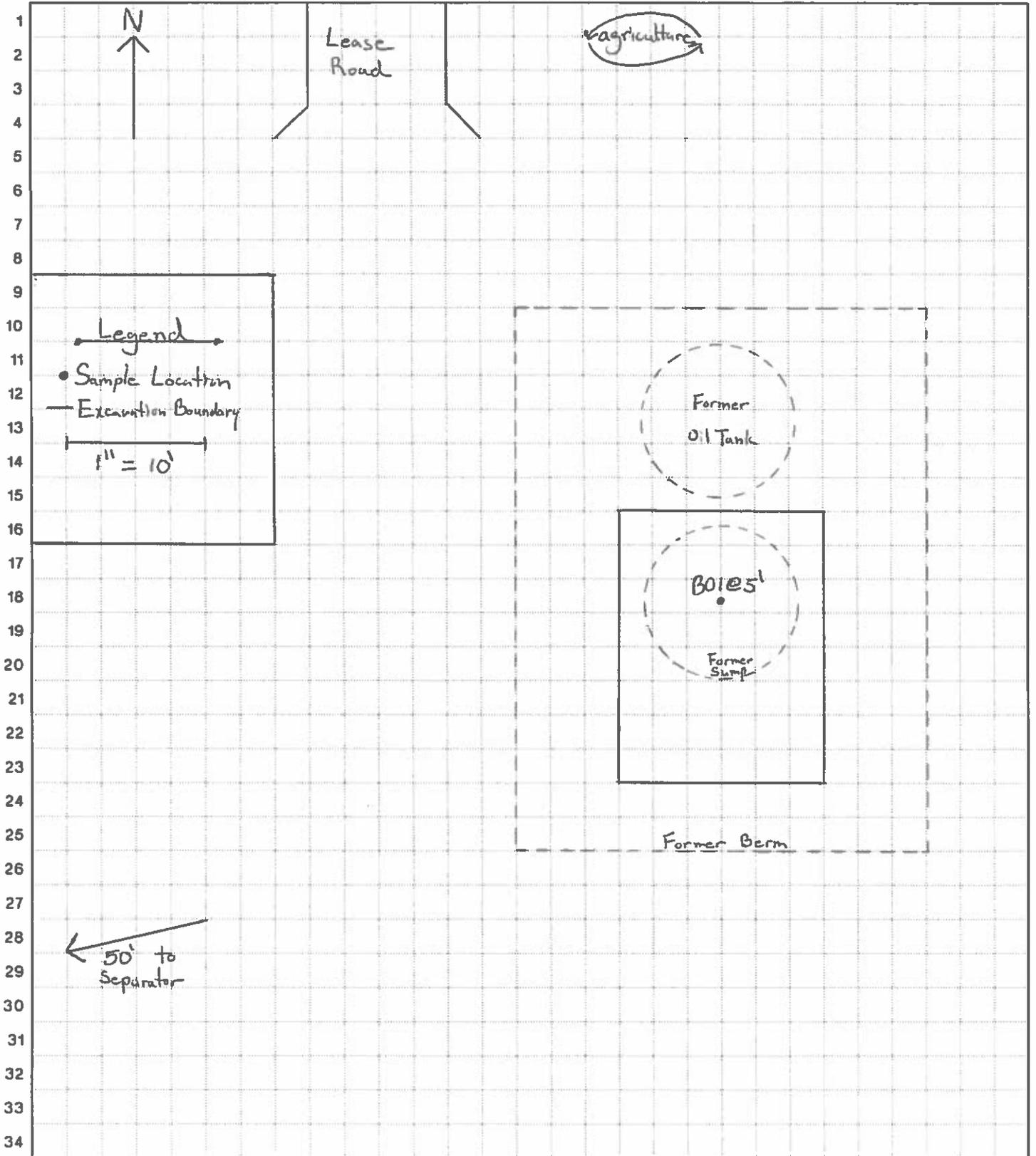
Attachments



PROJECT Hanson 14-1
PROJECT MANAGER John Cocroft
JOB No. 0142-13173
LOCATION 120th + Hayesmount, E 1 1/2 mi, S 1/2 into

DATE 07/30/13
CONT. No. _____
BY Jeremy Espinoza CHK'D _____
SHEET No. 1 OF 1

05L10038 10/1097



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

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS
HANSON 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)
B01@5'	5'	07/01/2013	<0.0050	<0.0050	<0.0050	<0.0050	<50	<0.50	<50
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



Summit Scientific

741 Corporate Circle – Suite I ♦ Golden, Colorado 80401

303.277.9310 - laboratory ♦ 303.277.9531 - fax

July 02, 2013

John Cocroft
LT Environmental, Inc.
4600 West 60th Avenue
Arvada, CO 80003
RE: KMG - Hansen 14-1

Enclosed are the results of analyses for samples received by Summit Scientific on 07/01/13 17:00. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Paul Shrewsbury For Ben Shrewsbury
President / Laboratory Manager



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

Project: KMG - Hansen 14-1

Project Number: 0142
Project Manager: John Cocroft

Reported:
07/02/13 07:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01@5'	R307007-01	Soil	07/01/13 13:40	07/01/13 17:00

Summit Scientific R307007

741 Corporate Circle Suite 1 • Golden, Colorado 80401
303-277-9310 • 303-277-9331 Fax

Client: LT Environmental, Inc.
Address: 4600 West 60th Avenue
City/State/Zip: Arvada, CO 80003
Phone: (303) 433-5788
Project Manager: John Cocroft
E-Mail: jcocroft@ltenv.com
Project Name: Hansen 14-1
Project Number: 0142
Sampler Name: S2
Page 1 of 1

Sample Description	Date Sampled	Time Sampled	Number of Containers	Preservative		Matrix		Analyze For:		Special Instructions	
				HCl	None	Other (Specify)	Groundwater	Soil	Air - Canister Serial #		Other (Specify)
B01@5'	7/1/13	1340	1	X	X	X	X	X	X	X	Hold
B01@4'	7/1/13	1345	1	X	X	X	X	X	X	X	Hold
E01@4'	7/1/13	1350	1	X	X	X	X	X	X	X	Hold
S01@4'	7/1/13	1355	1	X	X	X	X	X	X	X	Hold
B01@4'	7/1/13	1400	1	X	X	X	X	X	X	X	Hold

Received by:	Date/Time:	Received by:	Date/Time:	Received by:	Date/Time:
[Signature]	7/1/13 1710	[Signature]	7/1/13	[Signature]	7/1/13

Turn Around Time (Check)	Notes:
<input checked="" type="checkbox"/> Same Day <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 72 Hours <input type="checkbox"/> Standard	Sample Integrity: 49 Temperature Upon Receipt: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Summit Scientific

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

Project: KMG - Hansen 14-1

Project Number: 0142
Project Manager: John Cocroft

Reported:
07/02/13 07:23

B01@5'
R307007-01 (Soil)

Summit Scientific

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **07/01/13 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (TEPH-DRO)	ND	50	mg/kg	1	3070111	07/01/13	07/01/13	8015M	
C28-C36 (TEPH-ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **07/01/13 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: <i>o</i> -Terphenyl		91.2 %	30-150		"	"	"	"	

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **07/01/13 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0050	mg/kg	1	3070109	07/01/13	07/01/13	EPA 8260B	
Toluene	ND	0.0050	"	"	"	"	"	"	
Ethylbenzene	ND	0.0050	"	"	"	"	"	"	
Xylenes (total)	ND	0.0050	"	"	"	"	"	"	
Gasoline Range Hydrocarbons	ND	0.50	"	"	"	"	"	"	

Date Sampled: **07/01/13 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4		94.4 %	23-173		"	"	"	"	
Surrogate: Toluene-d8		90.6 %	20-170		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %	21-167		"	"	"	"	

Summit Scientific

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

Project: KMG - Hansen 14-1

Project Number: 0142
Project Manager: John Cocroft

Reported:
07/02/13 07:23

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

Analyte	Reporting			Spike Level	Source		%REC		RPD		Notes
	Result	Limit	Units		Result	%REC	Limits	RPD	Limit		

Batch 3070111 - EPA 3550A

Blank (3070111-BLK1)				Prepared & Analyzed: 07/01/13							
C10-C28 (TEPH-DRO)	ND	50	mg/kg								
C28-C36 (TEPH-ORO)	ND	50	"								
LCS (3070111-BS1)				Prepared & Analyzed: 07/01/13							
C10-C28 (TEPH-DRO)	607	50	mg/kg	501	121	73-134					
LCS Dup (3070111-BSD1)				Prepared & Analyzed: 07/01/13							
C10-C28 (TEPH-DRO)	627	50	mg/kg	501	125	73-134	3.23		11		
Matrix Spike (3070111-MS1)				Source: R307002-01		Prepared: 07/01/13 Analyzed: 07/02/13					
C10-C28 (TEPH-DRO)	687	50	mg/kg	501	ND	137	50-148				
Matrix Spike Dup (3070111-MSD1)				Source: R307002-01		Prepared: 07/01/13 Analyzed: 07/02/13					
C10-C28 (TEPH-DRO)	655	50	mg/kg	501	ND	131	50-148	4.71		13	

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

Project: KMG - Hansen 14-1

Project Number: 0142
Project Manager: John Cocroft

Reported:
07/02/13 07:23

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 3070109 - EPA 5030 Soil MS

Blank (3070109-BLK1)

Prepared & Analyzed: 07/01/13

Benzene	ND	0.0050	mg/kg							
Toluene	ND	0.0050	"							
Ethylbenzene	ND	0.0050	"							
Xylenes (total)	ND	0.0050	"							
Gasoline Range Hydrocarbons	ND	0.50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0375</i>		<i>"</i>	<i>0.0397</i>		<i>94.5</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0374</i>		<i>"</i>	<i>0.0400</i>		<i>93.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0413</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

LCS (3070109-BS1)

Prepared & Analyzed: 07/01/13

Benzene	0.0902	0.0050	mg/kg	0.100		90.2	58-130			
Toluene	0.0906	0.0050	"	0.100		90.6	61-134			
Ethylbenzene	0.106	0.0050	"	0.100		106	74-139			
m,p-Xylene	0.209	0.010	"	0.200		105	73-137			
o-Xylene	0.105	0.0050	"	0.100		105	73-141			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0353</i>		<i>"</i>	<i>0.0397</i>		<i>89.0</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0381</i>		<i>"</i>	<i>0.0400</i>		<i>95.2</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0397</i>		<i>"</i>	<i>0.0400</i>		<i>99.2</i>	<i>21-167</i>			

LCS Dup (3070109-BSD1)

Prepared & Analyzed: 07/01/13

Benzene	0.0951	0.0050	mg/kg	0.100		95.1	58-130	5.28	13	
Toluene	0.0946	0.0050	"	0.100		94.6	61-134	4.31	16	
Ethylbenzene	0.109	0.0050	"	0.100		109	74-139	3.33	12	
m,p-Xylene	0.216	0.010	"	0.200		108	73-137	3.05	14	
o-Xylene	0.107	0.0050	"	0.100		107	73-141	1.84	12	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0358</i>		<i>"</i>	<i>0.0397</i>		<i>90.3</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0388</i>		<i>"</i>	<i>0.0400</i>		<i>96.9</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0407</i>		<i>"</i>	<i>0.0400</i>		<i>102</i>	<i>21-167</i>			

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Project: KMG - Hansen 14-1

Project Number: 0142
Project Manager: John Cocroft

Reported:
07/02/13 07:23

Volatile Organic Compounds by EPA Method 8260B - Quality Control
Summit Scientific

Analyte	Reporting			Spike	Source	%REC		RPD		Notes
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	

Batch 3070109 - EPA 5030 Soil MS

Matrix Spike (3070109-MS1)	Source: R307002-01			Prepared & Analyzed: 07/01/13						
Benzene	0.0789	0.0050	mg/kg	0.100	ND	78.9	30-131			
Toluene	0.0790	0.0050	"	0.100	ND	79.0	30-134			
Ethylbenzene	0.0886	0.0050	"	0.100	ND	88.6	22-153			
m,p-Xylene	0.175	0.010	"	0.200	ND	87.6	10-159			
o-Xylene	0.0870	0.0050	"	0.100	ND	87.0	31-151			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0405</i>		<i>"</i>	<i>0.0397</i>		<i>102</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0386</i>		<i>"</i>	<i>0.0400</i>		<i>96.4</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0414</i>		<i>"</i>	<i>0.0400</i>		<i>103</i>	<i>21-167</i>			

Matrix Spike Dup (3070109-MSD1)	Source: R307002-01			Prepared: 07/01/13 Analyzed: 07/02/13						
Benzene	0.0788	0.0050	mg/kg	0.100	ND	78.8	30-131	0.114	34	
Toluene	0.0790	0.0050	"	0.100	ND	79.0	30-134	0.00	30	
Ethylbenzene	0.0876	0.0050	"	0.100	ND	87.6	22-153	1.12	24	
m,p-Xylene	0.175	0.010	"	0.200	ND	87.3	10-159	0.343	68	
o-Xylene	0.0865	0.0050	"	0.100	ND	86.5	31-151	0.553	38	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0402</i>		<i>"</i>	<i>0.0397</i>		<i>101</i>	<i>23-173</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0382</i>		<i>"</i>	<i>0.0400</i>		<i>95.5</i>	<i>20-170</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0401</i>		<i>"</i>	<i>0.0400</i>		<i>100</i>	<i>21-167</i>			

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

Project: KMG - Hansen 14-1

Project Number: 0142
Project Manager: John Cocroft

Reported:
07/02/13 07:23

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Summit Scientific

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