



September 7, 2016

Mr. Erik Mickelson
Senior HSE Representative
Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202

**RE: Sump Closure Report
Floyd C. Shaw Unit #2
API# 05-123-09964
Spill/Release Point ID# 446961
NESE Sec 1-T2N-R67W
Weld County, Colorado**

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 Fantastyk Red V 1-09 tank battery (API# 05-123-19181), which adjoins the tank battery for the subject well. The produced water sump at the subject site was removed during excavation activities associated with the release at the adjoining tank battery. Impacted soil extended from the release area at the Fantastyk Red V 1-09 tank battery to beneath the Floyd C. Shaw Unit #2 produced water sump. There was no indication of a separate release from the Floyd C. Shaw Unit #2 produced water sump.

In July 2016, the produced water sump associated with the Fantastyk Red V 1-09 well overflowed onto the ground surface inside the tank battery containment berm. While removing the produced water sump, a corrosion hole was discovered in an associated dump line. The volume of the release is unknown. The release became reportable on July 22, 2016, due to the volume of soil impact removed (Spill/Release Point ID# 446961).

On July 22, 2016, following removal of the Fantastyk Red V 1-09 produced water sump, groundwater with impacts exceeding Colorado Groundwater Quality Standards (CGWQS) (benzene at 1,110 micrograms per liter) was confirmed. Excavation activities are ongoing at the site. Groundwater monitoring wells will be installed and monitoring will be conducted on a quarterly basis. Further details are presented in the Form 27 accompanying this Sump Closure Report. The general site layout and groundwater sample location are depicted on the Excavation Site Map provided as Figure 1. The groundwater sample analytical results for the Fantastyk Red V 1-09 location are summarized in Table 1, and the laboratory analytical report is attached.

The produced water sump at this facility has been permanently removed. Following completion of site investigation activities, the excavation area will be backfilled and contoured to match pre-



existing site conditions. No further action is required with respect to the produced water sump associated with the Floyd C. Shaw Unit #2 tank battery.

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

Sincerely,

LT ENVIRONMENTAL, INC.

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

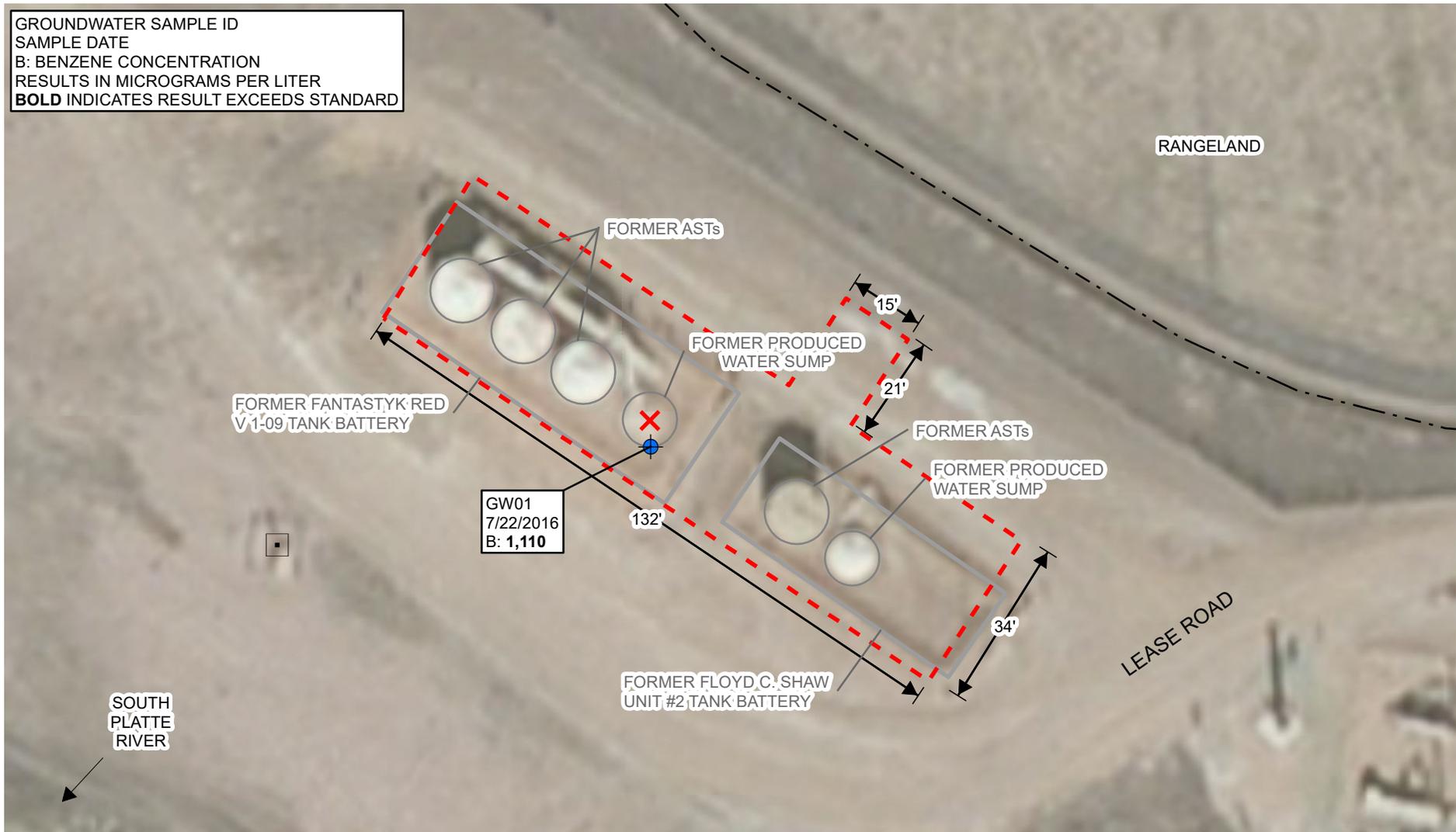
Michael J. Furtaw, P.G.
Project Geologist

A handwritten signature in blue ink that reads "Justin Solomon". The signature is written in a cursive, flowing style.

Justin Solomon
Senior Environmental Scientist

Attachments

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



LEGEND

- RELEASE LOCATION
- GROUNDWATER SAMPLE
- WELLHEAD
- IRRIGATION DITCH
- MEASURED DIMENSION
- EXCAVATION EXTENT
- FORMER BERM
- AST: ABOVEGROUND STORAGE TANK

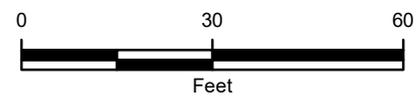


IMAGE COURTESY OF ESRI

FIGURE 1
 EXCAVATION SITE MAP
 FANTASTYK RED V 1-09
 NESE SEC 1-T2N-R67W
 WELD COUNTY, COLORADO
 KERR-MCGEE OIL & GAS ONSHORE LP



TABLE 1
GROUNDWATER ANALYTICAL AND FIELD RESULTS
FANTASTYK RED V 1-09
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	07/22/2016	1110	248	435	1180	8.00
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





July 25, 2016

LT Environmental, Inc.

John Cocroft

4600 West 60th Avenue

Arvada CO 80003

Project Name - KMG - Fantasyk Red V 1-09

Project Number - 014216/WO# 89080333

Attached are your analytical results for KMG - Fantasyk Red V 1-09 received by Origins Laboratory, Inc. July 22, 2016. This project is associated with Origins project number X607248-01.

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



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: 014216/WO# 89080333
Project: KMG - Fantasyk Red V 1-09

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW01	X607248-01	Water	July 22, 2016 13:30	07/22/2016 16:45

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: 014216/WO# 89080333
 Project: KMG - Fantasy Red V 1-09

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X607248

Client: LTE

Client Project ID: Fantasy Red V1-09

Checklist Completed by: LTE Smith

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

Date/time completed: 7/22/16

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 3.7 °C / _____ °C / _____ °C (Describe)

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"/>		
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.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 7/22/16

Origins Laboratory, Inc.

Jefe Pellegrini

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

John Cocroft
 Project Number: 014216/WO# 89080333
 Project: KMG - Fantasyk Red V 1-09

GW01
7/22/2016 1:30:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X607248-01 (Water)

BTEX by EPA 8260C

Benzene	1110	50.0	ug/L	50	B6G2104	07/22/2016	07/22/2016	
Toluene	248	4.00	"	4	"	"	07/22/2016	
Ethylbenzene	435	4.00	"	"	"	"	"	
Xylenes, total	1180	4.00	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4	101 %	84-121			"	"	"	
Surrogate: Toluene-d8	104 %	85-115			"	"	"	
Surrogate: 4-Bromofluorobenzene	98.2 %	84-114			"	"	"	

Origins Laboratory, Inc.



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

John Cocroft
 Project Number: 014216/WO# 89080333
 Project: KMG - Fantasyk Red V 1-09

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 B6G2104 - EPA 5030B (Water)

Blank (B6G2104-BLK1)

Prepared: 07/21/2016 Analyzed: 07/22/2016

Benzene	ND	1.00	ug/L							U
Toluene	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Xylenes, total	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	64		"	62.5		103	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.7	85-115			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.3	84-114			

Origins Laboratory, Inc.



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LT Environmental, Inc.
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 Arvada CO 80003

John Cocroft
 Project Number: 014216/WO# 89080333
 Project: KMG - Fantasyk Red V 1-09

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 B6G2104 - EPA 5030B (Water)

LCS (B6G2104-BS1)

Prepared: 07/21/2016 Analyzed: 07/22/2016

Benzene	51.6	1.00	ug/L	50.0		103	73.3-129			
Toluene	51.0	1.00	"	50.0		102	76.2-123			
Ethylbenzene	50.9	1.00	"	50.0		102	73.6-130			
m,p-Xylene	101	2.00	"	100		101	76.1-126			
o-Xylene	51.0	1.00	"	50.0		102	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	59		"	62.5		94.9	84-121			
Surrogate: Toluene-d8	63		"	62.5		101	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: 014216/WO# 89080333
 Project: KMG - Fantasyk Red V 1-09

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 B6G2104 - EPA 5030B (Water)

Matrix Spike (B6G2104-MS1)	Source: X607215-01			Prepared: 07/21/2016 Analyzed: 07/22/2016						
Benzene	50.3	1.00	ug/L	50.0	ND	101	74-130			
Toluene	50.4	1.00	"	50.0	ND	101	73-131			
Ethylbenzene	51.5	1.00	"	50.0	ND	103	76-132			
m,p-Xylene	102	2.00	"	100	0.200	102	69-139			
o-Xylene	51.2	1.00	"	50.0	ND	102	74-131			
Surrogate: 1,2-Dichloroethane-d4	60		"	62.5		95.5	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.6	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

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John Cocroft
 Project Number: 014216/WO# 89080333
 Project: KMG - Fantasyk Red V 1-09

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 B6G2104 - EPA 5030B (Water)

Matrix Spike Dup (B6G2104-MSD1)	Source: X607215-01			Prepared: 07/21/2016 Analyzed: 07/22/2016						
Benzene	47.7	1.00	ug/L	50.0	ND	95.4	74-130	5.37	20	
Toluene	47.3	1.00	"	50.0	ND	94.7	73-131	6.28	20	
Ethylbenzene	48.1	1.00	"	50.0	ND	96.2	76-132	6.75	20	
m,p-Xylene	95.3	2.00	"	100	0.200	95.1	69-139	6.81	20	
o-Xylene	48.9	1.00	"	50.0	ND	97.8	74-131	4.65	20	
Surrogate: 1,2-Dichloroethane-d4	61		"	62.5		96.8	84-121			
Surrogate: Toluene-d8	62		"	62.5		99.3	85-115			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		101	84-114			

Origins Laboratory, Inc.



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4600 West 60th Avenue
Arvada CO 80003

John Cocroft
Project Number: 014216/WO# 89080333
Project: KMG - Fantasyk Red V 1-09

Notes and Definitions

U Sample is Non-Detect.

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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Jen Pellegrini For Noelle Doyle Mathis, President