



Kerr-McGee Oil & Gas Onshore LP
1099 18th Street, Suite 1800
Denver, Colorado 80202
720-929-6000 Fax 720-929-7000

October 3, 2016

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

**Re: Sump Closure Summary Report
UPRC-63N65W/17NESW
API: 05-123-15035
Facility ID: 327694
NESW Sec 17-T3N-R65W
COGCC Remediation #8961**

Dear Mr. Mickelson:

Apex Companies, LLC (Apex) is providing Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee) with this Sump Closure Summary Report (Report) to document sampling activities and the results of environmental testing at the above-referenced site. This Report is being submitted under the Form 27 Management Plan for Closure of Produced Water Vessels, which has been assigned Remediation #8961 by the COGCC. Apex provided the environmental services at the site that included collection of confirmation samples from the excavation and documentation of field activities, as described below.

Site Assessment Activities

The field activities described herein were performed on September 1, 2016, with the purpose of assessing potential hydrocarbon impacts at the site related to the closure of a produced water concrete sump. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided on Figure 1.

The final extent of the excavation measured approximately 17 feet by 10 feet with an approximate depth of 5 feet below ground surface (bgs). No impacted soils were encountered in the excavation during closure activities. A liner was not present below the tanks and groundwater was not encountered in the excavation.

Confirmation soil samples were collected from the sidewalls of the excavation area at approximately 4 feet bgs and from the base of the excavation, beneath the former concrete sump, at 5 feet bgs. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the base of the excavation (B01@5') was

submitted to Origins Laboratory in Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) – gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8260, and TPH – diesel range and residual range organics (DRO and RRO) by USEPA Method 8015, electrical conductivity (EC), and pH. Soil analytical data is summarized in Table 1, and the laboratory analytical report is provided in Attachment A.

Results

Analytical results from soil sample B01@5' indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The remaining soil samples, collected from the sidewalls of the excavation area, were not submitted for laboratory analysis as analytical data confirmed the absence of petroleum hydrocarbon impacts above regulatory standards.

Conclusions

Analytical results described herein confirm BTEX and TPH impacts are not present at concentrations above applicable regulatory standards in the former sump location. Consequently, no further site assessment or remedial activity is necessary. Prior to site assessment activities, the produced water sump was permanently removed.

Please contact me at (303)242-8671 if you have any questions regarding this report or require additional information.

Sincerely,

Apex Companies, LLC

A handwritten signature in blue ink that reads "Jacob H. Hildebrand".

Jacob Hildebrand, PMP
Project Manager

Attachments:

Figure 1 – Site Map
Table 1 – Soil Sample Results Summary Table
Attachment A – Laboratory Analytical Report



Figure 1
UPRC-63N65W/17NESW
Site Layout

Legend

- Soil Sample
- Existing Equipment
- Former Equipment
- Former Secondary Containment
- Excavation Extent

Sample Location

B: benzene
TPH: total petroleum hydrocarbons

Bold values exceed COGCC Table
910-1 allowable concentrations

Site Characteristics

Legal Location: NESW, Sec 17, T3N R65W
County: Weld
Land Use: Non-cropland
Topography: 3-9%
Run-Off Risk: Low
Soil Type: Valent sand

REVISED	BY	COMMENT
9/14/2016	BJB	Figure 1

Apex Companies, LLC
beau.bergstrom@apexcos.com
M:\Projects\Anadarko\DJ_Basin\Remediation\UPRC63N65W_17NESW\Projects
UPRC63N65W_17NESW_Fig1.dwg 20160914.mxd

Table 1 - Soil Sample Analytical Results



Kerr-McGee Oil & Gas Onshore LP
 Location Name: UPRC-63N65W/17NESW
 Location ID: 327694
 County: Weld

COGCC Allowable Concentration →			Organics in Soil							Inorganics in Soil	
			500			0.17	85	100	175	(<4 or 2x background)	(6-9)
Sample ID	Sample Date	Depth (feet bgs)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	TPH-RRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes - total (mg/kg)	Electrical Conductivity (mmhos/cm)	pH
B01@5'	09/01/16	5'	<5.00	<25.0	<100	<0.050	<0.050	<0.050	<0.050	0.0491	8.71

Notes:

TPH Total petroleum hydrocarbons
 GRO Gasoline range hydrocarbons (C6 - C10)
 DRO Diesel range organics (C10 - C28)
 RRO Residual range organics (C28 - C36)

Bold cell indicates result exceeded COGCC Table 910-1 allowable concentration for the contaminant / inorganic of concern

bgs below ground surface
 mg/kg milligrams per kilogram
 mmhos/cm millimhos per centimeter
 NA Not analyzed / not available
 COGCC Colorado Oil and Gas Conservation Commission

Attachment A

Laboratory Analytical Report



September 12, 2016

Apex Companies, LLC

Chris Hines

4150 Darley Avenue, Suite 1

Boulder CO 80305

Project Name - KMG - UPRC 63N65W/17NESW

Project Number - [none]

Attached are your analytical results for KMG - UPRC 63N65W/17NESW received by Origins Laboratory, Inc. September 01, 2016. This project is associated with Origins project number X609013-01.

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

Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01 @ 5'	X609013-01	Soil	September 1, 2016 16:20	09/01/2016 18:00

The project name was changed to UPRC 63N65W/17NESW per the email from Jake on 09/12/16.

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.

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

[illegible]

Origins Laboratory, Inc.

Jeff Pellipini

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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X609013

Client: Apex

Client Project ID: UPRC 417-125

Checklist Completed by: Jeff Smith

Shipped Via: H/D

(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 9/1/12

Airbill #: N/A

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

Cooler Number/Temperature: 1 / 23.5 °C 1 °C 1 °C (Describe) _____ °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"/>		<u>Sampled Some Dry</u>
Is there ice present (document if blue ice is used)	<u>9/1/12</u> <input checked="" type="checkbox"/>	<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"/>			<u>pH</u>
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 HNO ₃ , HCL, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +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) JMS

Date/Time Reviewed 9/1/12

Origins Laboratory, Inc.

Jen Pellegrini

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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

B01 @ 5'
9/1/2016 4:20:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X609013-01 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B6I0102	09/01/2016	09/01/2016	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

Surrogate: o-Terphenyl 89.8 % 59-131 " " "

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B6I0105	09/01/2016	09/01/2016	U
Benzene	ND	0.050	"	"	"	"	"	U
Toluene	ND	0.050	"	"	"	"	"	U
Ethylbenzene	ND	0.050	"	"	"	"	"	U
Xylenes, total	ND	0.050	"	"	"	"	"	U

Surrogate: 1,2-Dichloroethane-d4 102 % 70-130 " " "
Surrogate: Toluene-d8 99.6 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 106 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.71		pH Units	1	B6I0106	09/01/2016	09/01/2016	
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0491		mmhos/cm	"	B6I0107	09/01/2016	"	
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Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

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
Batch B610105 - EPA 5030 (soil)										
Blank (B610105-BLK1)					Prepared: 09/01/2016 Analyzed: 09/01/2016					
Gasoline Range Hydrocarbons	ND	0.200	mg/kg							U
Benzene	ND	0.002	"							U
Toluene	ND	0.002	"							U
Ethylbenzene	ND	0.002	"							U
Xylenes, total	ND	0.002	"							U
Surrogate: 1,2-Dichloroethane-d4	66		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	67		"	62.5		107	70-130			

Origins Laboratory, Inc.



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4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

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
Batch B610105 - EPA 5030 (soil)										
LCS (B610105-BS1)					Prepared: 09/01/2016 Analyzed: 09/01/2016					
Benzene	0.087	0.002	mg/kg	0.100		87.4	77.1-124			
Toluene	0.086	0.002	"	0.100		86.1	74.5-128			
Ethylbenzene	0.091	0.002	"	0.100		90.6	66.4-127			
m,p-Xylene	0.184	0.004	"	0.200		92.0	76.6-124			
o-Xylene	0.091	0.002	"	0.100		90.9	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	68		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		103	70-130			

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Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

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
Batch B6I0105 - EPA 5030 (soil)										
LCS Dup (B6I0105-BSD1)					Prepared: 09/01/2016 Analyzed: 09/01/2016					
Benzene	0.096	0.002	mg/kg	0.100		96.1	77.1-124	9.55	20	
Toluene	0.094	0.002	"	0.100		94.2	74.5-128	8.94	20	
Ethylbenzene	0.098	0.002	"	0.100		98.1	66.4-127	8.01	20	
m,p-Xylene	0.198	0.004	"	0.200		99.0	76.6-124	7.35	20	
o-Xylene	0.098	0.002	"	0.100		98.1	76.6-124	7.62	20	
Surrogate: 1,2-Dichloroethane-d4	68		ug/kg	62.5		108	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.9	70-130			
Surrogate: 4-Bromofluorobenzene	63		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

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 B6I0102 - EPA 3580

Blank (B6I0102-BLK1)

Prepared: 09/01/2016 Analyzed: 09/01/2016

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	43		"	50.0		86.1	59-131			

LCS (B6I0102-BS1)

Prepared: 09/01/2016 Analyzed: 09/01/2016

Diesel (C10-C28)	1120	50.0	mg/kg				64-121			
Residual Range Organics (C28-C40)	1000	200	"				58-124			
Surrogate: o-Terphenyl	54		"	50.0		109	59-131			

Matrix Spike (B6I0102-MS1)

Source: X608302-01

Prepared: 09/01/2016 Analyzed: 09/01/2016

Diesel (C10-C28)	1080	50.0	mg/kg		21.7		53-125			
Residual Range Organics (C28-C40)	980	200	"		ND		47-133			
Surrogate: o-Terphenyl	55		"	50.0		111	59-131			

Matrix Spike Dup (B6I0102-MSD1)

Source: X608302-01

Prepared: 09/01/2016 Analyzed: 09/01/2016

Diesel (C10-C28)	1060	50.0	mg/kg		21.7		53-125		20	
Residual Range Organics (C28-C40)	964	200	"		ND		47-133		20	
Surrogate: o-Terphenyl	52		"	50.0		104	59-131			

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

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 B6I0106 - NO PREP										
Duplicate (B6I0106-DUP1)		Source: X609013-01			Prepared: 09/01/2016 Analyzed: 09/01/2016					
pH	8.78		pH Units		8.71			0.800	25	
Batch B6I0107 - NO PREP										
Blank (B6I0107-BLK1)		Prepared: 09/01/2016 Analyzed: 09/01/2016								
Specific Conductance (EC)	0.00330		mmhos/cm							
Duplicate (B6I0107-DUP1)		Source: X609013-01			Prepared: 09/01/2016 Analyzed: 09/01/2016					
Specific Conductance (EC)	0.0490		mmhos/cm		0.0491			0.204	25	

Origins Laboratory, Inc.



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Apex Companies, LLC
4150 Darley Avenue, Suite 1
Boulder CO 80305

Chris Hines
Project Number: [none]
Project: KMG - UPRC 63N65W/17NESW

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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