



August 12, 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 Letter Report
UPRR 43 PAN AM L-61N67W/29SESW (UPRR 43 Pan Am L #1)
API: 05-123-09393
Facility ID: 318562
Legal: SESW Sec 29-T1N-R67W
Remediation Project #8961

Dear Mr. Mickelson:

On behalf of Kerr-McGee Oil & Gas Onshore LP (Kerr-McGee), Tasman Geosciences, Inc. (Tasman) has prepared this Sump Closure Summary Letter 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. Tasman provided environmental services at the site that included collection of confirmation soil samples from the excavation and documentation of field activities, as described below.

Site Assessment Activities

The field activities described herein were performed with the purpose of assessing potential hydrocarbon impacts at the site related to the closure of the produced water sump on July 7, 2016. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout and sample locations are provided in the attached site map (Attachment A).

The final extent of the excavation measured approximately 11 feet by 12 feet with an approximate depth of 5 feet below ground surface (bgs). No impacted material was removed from the site during closure activities. A liner was not present at the location, and groundwater was not encountered in the excavation.

Confirmation soil samples were collected from the base and sidewalls of the excavation area at approximately 5 feet and 4 feet bgs, respectively. 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 area 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 8260C, TPH – diesel range and oil range organics (DRO and ORO) 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 B.

Results

Soil analytical results from the sample collected from the base of the final extent of the excavation area indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The remaining four 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 recommended at this time. Following site assessment activities, the produced water sump was removed and the excavation area was backfilled and contoured to match pre-existing site conditions.

Please contact me at (303) 487-1228 if you have any questions regarding this report or require additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Brock Nelson', is written over a light blue circular stamp.

Brock Nelson
Project Geologist

Attachments:

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

Table

TABLE 1
UPRR 43 PAN AM L-61N67W/29SESW (UPRR 43 Pan Am L #1)
SOIL SAMPLE RESULTS SUMMARY TABLE
KERR-McGEE OIL AND GAS ONSHORE LP

Sample ID	Date	Depth (ft. bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH- GRO (mg/kg)	TEPH- DRO (mg/kg)	TEPH- ORO (mg/kg)	EC (mmhos/cm)	pH (units)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	500			4 or 2x BG	6-9
B01 @ 5'	07/07/16	5	<0.050	<0.050	<0.050	<0.050	<5.00	<25.0	<100	0.0816	8.54

Notes:

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective March 16, 2016.

COGCC = Colorado Oil and Gas Conservation Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

TVPH - GRO = Total volatile petroleum hydrocarbons - gasoline range organics

TEPH - DRO = Total extractable petroleum hydrocarbons - diesel range organics

TEPH - ORO = Total extractable petroleum hydrocarbons - oil range organics

EC = Electrical conductivity

BG = Background

mmhos/cm = Millimhos per centimeter

mg/kg = Milligrams per kilogram.

ft. bgs = Feet below ground surface.

BOLD = Analytical result is in exceedance of COGCC Table 910-1 soil standards.

Figure 1



DATE: August 4, 2016		Kerr-McGee Oil and Gas Onshore, LP UPRR 43 PAN AM L-61N67W/29SESW (UPRR 43 Pan Am L #1) SESW, Section 29, Township 1 North, Range 67 West Weld County, Colorado	Sample Location Map	FIGURE 1
DESIGNED BY: K. Forsmark				
DRAWN BY: M. Petersen				

Attachment A

July 08, 2016

Tasman Geosciences

Bob Cornez

6899 Pecos Street, Unit C

Denver

CO 80211

Project Name - KMG - UPRR 43 Pan Am L #1

Project Number - [none]

Attached are your analytical results for KMG - UPRR 43 Pan Am L #1 received by Origins Laboratory, Inc. July 07, 2016. This project is associated with Origins project number X607083-05.

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



Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Bob Cornez

Project Number: [none]

Project: KMG - UPRR 43 Pan Am L #1

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B01 @ 5'	X607083-05	Soil	July 7, 2016 14:50	07/07/2016 17:13

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

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #1

ORIGINS

LABORATORY, INC

www.originslaboratory.com

X607083

page | of |

Client: Tasman for APC

Project Manager: Bob Cornetz

Address: _____

Project Name: VPRK 43 punam L#1

Telephone Number: 9704709042

Project Number: TBD

Samples Collected By: Rob Irvin

Email Address: rcornetz@tasman-gpo.com

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis				Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	As Summa #	Other	8260 GTEX	TPH 800	TPH 800	
N0104'	7/7/16	1430	2	X					X	X	X	X	X	on hold	1
S0104'	7/7/16	1435	2	X					X	X	X	X	X	on hold	2
E0104'	7/7/16	1440	2	X					X	X	X	X	X	on hold	3
W0104'	7/7/16	1445	2	X					X	X	X	X	X	on hold	4
B0105'	7/7/16	1450	2	X					X	X	X	X	X		5
															6
															7
															8
															9
															10
Relinquished By: <u>[Signature]</u>	Date: <u>7/7/16</u>	Time: <u>1713</u>		Received By: <u>[Signature]</u>				Date: <u>7/7/16</u>	Time: <u>1713</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 <input type="checkbox"/>					
Relinquished By: <u>[Signature]</u>	Date: <u>7/7/16</u>	Time: <u>1713</u>		Received By: <u>[Signature]</u>				Date: <u>7/7/16</u>	Time: <u>1713</u>						

Temp Received- 5.6

Date Results Needed

Origins Laboratory, Inc.

Jeff Pellipini

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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #1

Origins Laboratory

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

Sample Receipt Checklist

Origins Work Order: X607083

Client: Tasman

Client Project ID: UPRR 43 Pan Am L #1

Checklist Completed by: Jeff Smith

Shipped Via: HRD

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

Date/time completed: 7/7/16

Airbill #: 111

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

Cooler Number/Temperature: 1 / 5.6 °C 1 / _____ °C 1 / _____ °C (Describe)

Thermometer ID: TDU-3

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

Date/Time Reviewed

Origins Laboratory, Inc.

Jeff 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.

Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #1

B01 @ 5'
7/7/2016 2:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X607083-05 (Soil)

DRO/RRO by EPA8015C

Diesel (C10-C28)	ND	25.0	mg/kg	1	B6G0702	07/07/2016	07/07/2016	U
Residual Range Organics (C28-C40)	ND	100	"	"	"	"	"	U

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

GBTEX by EPA 8260C

Gasoline Range Hydrocarbons	ND	5.00	mg/kg	25	B6G0704	"	07/07/2016	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 99.9 % 70-130 " " "
Surrogate: Toluene-d8 100 % 70-130 " " "
Surrogate: 4-Bromofluorobenzene 92.5 % 70-130 " " "

pH in Soil by EPA 9045D

pH	8.54	pH Units	1	B6G0706	07/07/2016	07/07/2016
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.0816	mmhos/cm	"	B6G0707	07/07/2016	07/07/2016
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Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #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
Batch B6G0704 - EPA 5030 (soil)										
Blank (B6G0704-BLK1)					Prepared: 07/07/2016 Analyzed: 07/07/2016					
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	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.5	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #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
Batch B6G0704 - EPA 5030 (soil)										
LCS (B6G0704-BS1)					Prepared: 07/07/2016 Analyzed: 07/07/2016					
Benzene	0.104	0.002	mg/kg	0.100		104	77.1-124			
Toluene	0.106	0.002	"	0.100		106	74.5-128			
Ethylbenzene	0.089	0.002	"	0.100		88.5	66.4-127			
m,p-Xylene	0.181	0.004	"	0.200		90.6	76.6-124			
o-Xylene	0.091	0.002	"	0.100		90.7	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	61		ug/kg	62.5		97.6	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.1	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #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 B6G0704 - EPA 5030 (soil)

Matrix Spike (B6G0704-MS1)		Source: X607080-01			Prepared: 07/07/2016 Analyzed: 07/07/2016					
Benzene	0.105	0.002	mg/kg	0.100	ND	105	71.8-126			
Toluene	0.105	0.002	"	0.100	ND	105	65.1-130			
Ethylbenzene	0.087	0.002	"	0.100	ND	87.1	62.2-130			
m,p-Xylene	0.178	0.004	"	0.200	ND	89.0	46.5-137			
o-Xylene	0.090	0.002	"	0.100	ND	89.9	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	63		ug/kg	62.5		100	70-130			
Surrogate: Toluene-d8	62		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	57		"	62.5		91.5	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #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 B6G0704 - EPA 5030 (soil)

Matrix Spike Dup (B6G0704-MSD1)		Source: X607080-01			Prepared: 07/07/2016 Analyzed: 07/07/2016					
Benzene	0.091	0.002	mg/kg	0.100	ND	91.4	71.8-126	13.5	11.3	QR-02
Toluene	0.091	0.002	"	0.100	ND	91.3	65.1-130	14.4	15.4	
Ethylbenzene	0.075	0.002	"	0.100	ND	75.1	62.2-130	14.8	19.6	
m,p-Xylene	0.154	0.004	"	0.200	ND	76.8	46.5-137	14.7	19.2	
o-Xylene	0.077	0.002	"	0.100	ND	77.3	54.2-134	15.0	17.9	
Surrogate: 1,2-Dichloroethane-d4	66		ug/kg	62.5		105	70-130			
Surrogate: Toluene-d8	62		"	62.5		99.1	70-130			
Surrogate: 4-Bromofluorobenzene	58		"	62.5		92.0	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #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 B6G0702 - EPA 3580

Blank (B6G0702-BLK1)

Prepared: 07/07/2016 Analyzed: 07/07/2016

Diesel (C10-C28)	ND	50.0	mg/kg							U
Residual Range Organics (C28-C40)	ND	200	"							U
Surrogate: o-Terphenyl	39		"	50.0		77.6	59-131			

LCS (B6G0702-BS1)

Prepared: 07/07/2016 Analyzed: 07/07/2016

Diesel (C10-C28)	936	50.0	mg/kg	1000		93.6	64-121			
Residual Range Organics (C28-C40)	913	200	"	1000		91.3	58-124			
Surrogate: o-Terphenyl	42		"	50.0		83.9	59-131			

LCS Dup (B6G0702-BSD1)

Prepared: 07/07/2016 Analyzed: 07/07/2016

Diesel (C10-C28)	951	50.0	mg/kg	1000		95.1	64-121	1.58	20	
Residual Range Organics (C28-C40)	932	200	"	1000		93.2	58-124	2.04	20	
Surrogate: o-Terphenyl	40		"	50.0		80.0	59-131			

Origins Laboratory, Inc.



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Tasman Geosciences
6899 Pecos Street, Unit C
Denver CO 80211

Bob Cornez
Project Number: [none]
Project: KMG - UPRR 43 Pan Am L #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 B6G0706 - NO PREP										
Duplicate (B6G0706-DUP1)		Source: X607083-05			Prepared: 07/07/2016 Analyzed: 07/07/2016					
pH	8.51		pH Units		8.54			0.352	25	
Batch B6G0707 - NO PREP										
Blank (B6G0707-BLK1)		Prepared: 07/07/2016 Analyzed: 07/07/2016								
Specific Conductance (EC)	0.00270		mmhos/cm							
Duplicate (B6G0707-DUP1)		Source: X607083-05			Prepared: 07/07/2016 Analyzed: 07/07/2016					
Specific Conductance (EC)	0.0810		mmhos/cm		0.0816			0.738	25	

Origins Laboratory, Inc.



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Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Bob Cornez

Project Number: [none]

Project: KMG - UPRR 43 Pan Am L #1

Notes and Definitions

U Sample is Non-Detect.

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.

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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