



June 12, 2015

Mr. Sam LaRue  
Senior HSE Representative  
Kerr-McGee Oil & Gas Onshore LP  
1099 18<sup>th</sup> Street, Suite 1800  
Denver, Colorado 80202

**Re: Sump Closure Summary Letter Report  
Douthit 16-26  
API: 05-123-22551  
Facility ID: 336351  
Legal: SESE Sec 26-T3N-R68W  
Remediation Project #8961**

Dear Mr. LaRue:

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 November 13, 2014. 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 20 feet by 20 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 present at the location, 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. A soil sample was not collected from the base of the excavation due to the presence of a liner beneath the produced water sump. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil sample collected from the west sidewall 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 8260B, and TPH – diesel range and oil range organics (DRO and ORO) by USEPA Method 8015. 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 west sidewall 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 three soil samples collected from the north, south, and east 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 (720) 409-8791 if you have any questions regarding this report or require additional information.

Sincerely,

A handwritten signature in blue ink that reads 'Christine Wasko'.

Christine Wasko  
Project Scientist

## **Attachments:**

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

**Table**

**TABLE 1**  
**DOUTHIT 16-26**  
**SOIL SAMPLE RESULTS SUMMARY TABLE**  
**KERR-McGEE OIL AND GAS ONSHORE LP**

Sample ID	Date Sampled	Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TVPH - GRO (mg/kg)	TEPH - DRO + ORO (mg/kg)
<b>COGCC standards for soil (mg/kg) <sup>(1)</sup></b>			<b>0.17</b>	<b>85</b>	<b>100</b>	<b>175</b>	<b>500</b>	
W01@4'	11/13/2014	4	<0.002	<0.002	<0.002	<0.002	<0.200	<200

**Notes:**

1. Standards for soil are taken from 2 CCR 404-1, Table 910-1, effective February 1, 2014.

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

mg/kg = Milligrams per kilogram.

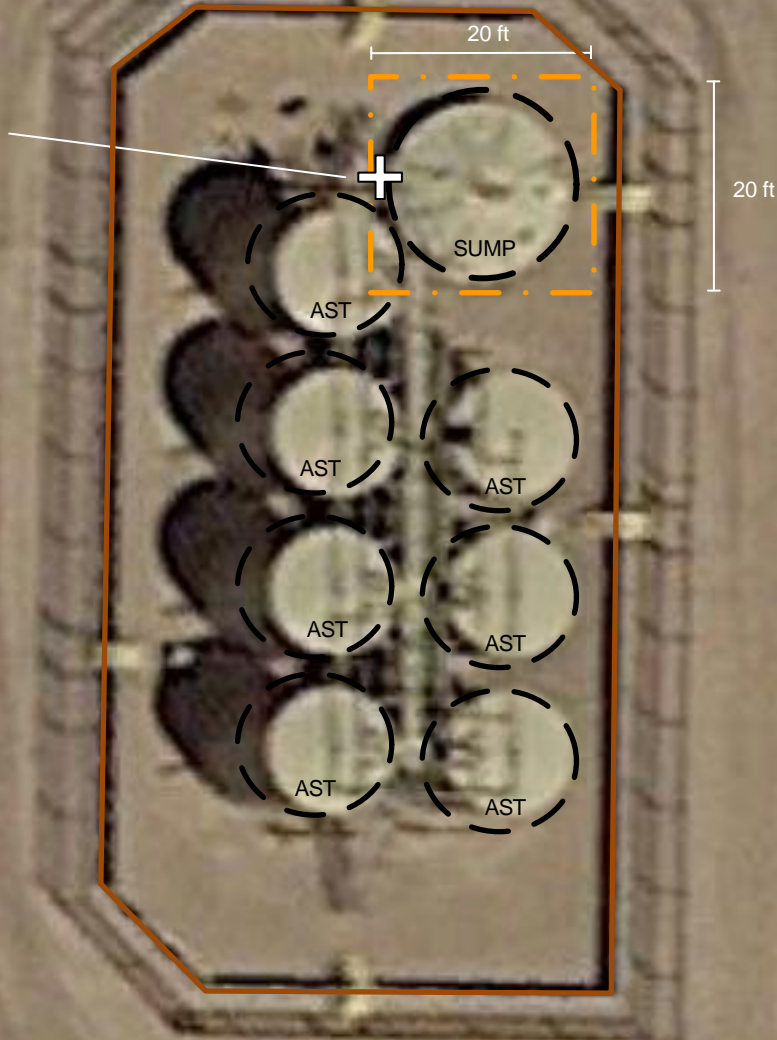
bgs = Below ground surface.

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

## **Attachment A**

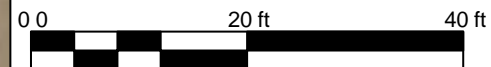


W01@ 4'  
B - <0.002 mg/kg  
TPH - <200 mg/kg



B – Benzene  
TPH – Total Petroleum Hydrocarbons  
mg/kg – Milligrams Per Kilogram

Image Source:  
Google Earth 2015



DRAWN BY: BRN

DATE: 6/15/2015

**Facility Diagram**  
Kerr-McGee Oil and Gas Onshore, LP  
Douthit 16-26  
SESE S26 T3N R68W  
Weld County, CO



**TASMAN** 6899 Pecos St., Unit C  
GEOSCIENCES Denver, CO 80221

**LEGEND**

- Approximate Excavation Extent
- Former Infrastructure
- Berm
- Approximate Soil Sample Location

FIGURE 1  
SITE MAP

## **Attachment B**

November 14, 2014

Tasman Geosciences

Christine Wasko

6899 Pecos Street, Unit C

Denver

CO 80211

**Project Name - Douthit 16-26**

**Project Number - [none]**

Attached are your analytical results for Douthit 16-26 received by Origins Laboratory, Inc. November 13, 2014. This project is associated with Origins project number X411121-04.

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

Christine Wasko

Project Number: [none]

Project: Douthit 16-26

## CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
W01 @ 4	X411121-04	Soil	November 13, 2014 14:45	11/13/2014 16:37

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.*

Ross S Hutto For Noelle Doyle Mathis, President

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

www.originslaboratory.com

page 1 of 1

**ORIGINS** LABORATORY, INC

Client: Tasman Geo

Project Manager/Send Report To: Christine Wasko

Address:

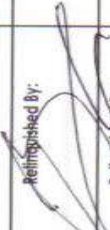

Email Address: twasko@tasman-geo.com

Telephone Number: 917 230 2807

Project Name/Number: Douthit 16-26

Samples Collected By: Brack Nelson

Sample ID: X411121

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative					Matrix			Analysis/Method	Sample Instructions	
				Unpreserved	HCl	HNO <sub>3</sub>	Other	Groundwater	Soil	Air Summa #	Other			
N0104	11/15/14	1437	1	X					X			Hold	1	
S0104	11/15/14	1440	1	X					X			Hold	2	
E0104	11/15/14	1443	1	X					X			Hold	3	
N0104	11/15/14	1445	1	X					X			15 EX 16 RW (8145) TPH-Dipheno (8154)	4	
													5	
													6	
													7	
													8	
													9	
													10	
Relinquished By: 	Date: 11/15/14	Time: 1637										Date: 11/15/14	Time: 1637	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: 	Date: 11/15/14	Time: 1637										Date: 11/15/14	Time: 1637	

Comments:

Denta Bacille Standard

Origins Laboratory, Inc.

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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

Origins Laboratory

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

## Sample Receipt Checklist

Origins Work Order: X411121

Client: Tasman

Client Project ID: Douthit 16-26

Checklist Completed by: Jeff Smith

Shipped Via: Pick Up

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

Date/time completed: 11/13/14

Airbill #: NA

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

Cooler Number/Temperature: 118 °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 <sup>(1)</sup> ?	<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 <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Was adequate sample volume provided <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Are short holding time analytes or samples with HTs due within 48 hours present <sup>(1)</sup> ?		<input checked="" type="checkbox"/>		
Is a chain-of-custody (COC) present and filled out completely <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Does the COC agree with the number and type of sample bottles received <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Do the sample IDs on the bottle labels match the COC <sup>(1)</sup> ?	<input checked="" type="checkbox"/>			
Is the COC properly relinquished by the client with date and time recorded <sup>(1)</sup> ?	<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 <sup>(1)</sup> ? (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 <sub>3</sub> , HCL, H <sub>2</sub> SO <sub>4</sub> ) / (pH > 10 for samples preserved with NaAsO <sub>2</sub> +NaOH, ZnAc+NaOH)			<input checked="" type="checkbox"/>	
Additional Comments (if any):				

<sup>(1)</sup> 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)

11/14/14 6:00  
Date/Time Reviewed

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.

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

W01 @ 4

11/13/2014 2:45:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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**Origins Laboratory, Inc.**  
**X411121-04 (Soil)**

**DRO/RRO by EPA8015C**

Diesel (C10-C28)	ND	50	mg/kg	1	4K13008	11/13/2014	11/13/2014
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"

Surrogate: o-Terphenyl 73.4 % 59-131 " " "

**GBTEX by EPA 8260C**

Gasoline Range Hydrocarbons	ND	0.200	mg/kg	1	4K13007	11/13/2014	11/13/2014
Benzene	ND	0.002	"	"	"	"	"
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4 106 % 70-130 " " "  
Surrogate: Toluene-d8 103 % 70-130 " " "  
Surrogate: 4-Bromofluorobenzene 96.7 % 70-130 " " "

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

**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 4K13007 - EPA 5030 (soil)**

**Blank (4K13007-BLK1)**

Prepared: 11/13/2014 Analyzed: 11/13/2014

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	63.5		ug/kg	62.5		102	70-130			
Surrogate: Toluene-d8	62.2		"	62.5		99.4	70-130			
Surrogate: 4-Bromofluorobenzene	61.2		"	62.5		97.8	70-130			

Origins Laboratory, Inc.



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Ross S Hutto For Noelle Doyle Mathis, President

Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

**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 4K13007 - EPA 5030 (soil)**

**LCS (4K13007-BS1)**

Prepared: 11/13/2014 Analyzed: 11/13/2014

Benzene	0.095	0.002	mg/kg	0.100		94.8	77.1-124			
Toluene	0.098	0.002	"	0.100		98.2	74.5-128			
Ethylbenzene	0.100	0.002	"	0.100		100	66.4-127			
m,p-Xylene	0.199	0.004	"	0.200		99.6	76.6-124			
o-Xylene	0.099	0.002	"	0.100		98.5	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	59.4		ug/kg	62.5		95.1	70-130			
Surrogate: Toluene-d8	62.3		"	62.5		99.7	70-130			
Surrogate: 4-Bromofluorobenzene	62.6		"	62.5		100	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

**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 4K13007 - EPA 5030 (soil)**

Matrix Spike (4K13007-MS1)		Source: X411115-02			Prepared: 11/13/2014 Analyzed: 11/13/2014					
Benzene	0.091	0.002	mg/kg	0.100	ND	90.8	71.8-126			
Toluene	0.090	0.002	"	0.100	ND	90.3	65.1-130			
Ethylbenzene	0.095	0.002	"	0.100	ND	94.7	62.2-130			
m,p-Xylene	0.188	0.004	"	0.200	ND	93.9	46.5-137			
o-Xylene	0.095	0.002	"	0.100	ND	95.3	54.2-134			
Surrogate: 1,2-Dichloroethane-d4	61.9		ug/kg	62.5		99.1	70-130			
Surrogate: Toluene-d8	62.9		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	63.7		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

**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 4K13007 - EPA 5030 (soil)**

Matrix Spike Dup (4K13007-MSD1)		Source: X411115-02			Prepared: 11/13/2014 Analyzed: 11/13/2014					
Benzene	0.091	0.002	mg/kg	0.100	ND	91.4	71.8-126	0.680	11.3	
Toluene	0.094	0.002	"	0.100	ND	93.7	65.1-130	3.74	15.4	
Ethylbenzene	0.093	0.002	"	0.100	ND	93.4	62.2-130	1.40	19.6	
m,p-Xylene	0.190	0.004	"	0.200	ND	95.1	46.5-137	1.35	19.2	
o-Xylene	0.094	0.002	"	0.100	ND	94.1	54.2-134	1.35	17.9	
Surrogate: 1,2-Dichloroethane-d4	63.2		ug/kg	62.5		101	70-130			
Surrogate: Toluene-d8	63.4		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	63.8		"	62.5		102	70-130			

Origins Laboratory, Inc.



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Tasman Geosciences  
6899 Pecos Street, Unit C  
Denver CO 80211

Christine Wasko  
Project Number: [none]  
Project: Douthit 16-26

## 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 8015M - 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 4K13008 - EPA 3580

#### Blank (4K13008-BLK1)

Prepared: 11/13/2014 Analyzed: 11/13/2014

Diesel (C10-C28) ND 50 mg/kg

Residual Range Organics (C28-C36) ND 200 "

Surrogate: o-Terphenyl 33 g 50.0 65.7 59-131

#### LCS (4K13008-BS1)

Prepared: 11/13/2014 Analyzed: 11/13/2014

Diesel (C10-C28) 1100 50 mg/kg 1000 107 64-121

Residual Range Organics (C28-C36) 840 200 " 1000 83.9 58-124

Surrogate: o-Terphenyl 36 g 50.0 72.6 59-131

#### Matrix Spike (4K13008-MS1)

Source: X411117-01

Prepared: 11/13/2014 Analyzed: 11/13/2014

Diesel (C10-C28) 1100 50 mg/kg 1000 ND 113 53-125

Residual Range Organics (C28-C36) 870 200 " 1000 ND 86.9 47-133

Surrogate: o-Terphenyl 35 g 50.0 69.5 59-131

#### Matrix Spike Dup (4K13008-MSD1)

Source: X411117-01

Prepared: 11/13/2014 Analyzed: 11/13/2014

Diesel (C10-C28) 1000 50 mg/kg 1000 ND 103 53-125 9.88 20

Residual Range Organics (C28-C36) 770 200 " 1000 ND 77.2 47-133 11.8 20

Surrogate: o-Terphenyl 30 g 50.0 60.7 59-131

Origins Laboratory, Inc.



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Tasman Geosciences

6899 Pecos Street, Unit C

Denver CO 80211

Christine Wasko

Project Number: [none]

Project: Douthit 16-26

### Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Origins Laboratory, Inc.



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Ross S Hutto For Noelle Doyle Mathis, President