



November 17, 2015

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

**Re: Sump Replacement Summary Letter Report
Wardell-63N65W18NESE (Wardell H 18-9)
API: 05-123-15858
Facility ID: 328332
Legal: NESE Sec 18-T3N-R65W
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 Replacement 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/Replacement of Produced Water Vessels, which has been assigned Remediation #8961 by the Colorado Oil and Gas Conservation Commission (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 replacement of two produced water sumps on August 15, 2014. Soil sampling activities, laboratory analytical results, and conclusions are presented below. The general site layout, excavation dimensions, and sample locations are provided in the attached site map (Attachment A).

The final extent of the western excavation area measured approximately 16 feet by 20 feet with an approximate depth of 5 feet below ground surface (bgs). The final extent of the eastern excavation area measured approximately 18 feet by 20 feet with an approximate depth of 5 feet bgs. No impacted material was removed from the site during replacement activities. A liner was not present in either excavation, and groundwater was not encountered in the excavation areas.

Confirmation soil samples were collected from the base and sidewalls of the western and eastern excavation areas 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). Confirmation soil samples collected from the base of each excavation area were

submitted to eAnalytics Laboratory in Loveland, Colorado for laboratory 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 soil samples collected from the final extent of the excavation areas indicated that BTEX and TPH concentrations were below the applicable COGCC Table 910-1 standards. The remaining eight soil samples collected from the sidewalls of the excavation areas 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 locations. Consequently, no further site assessment or remedial activity is recommended at this time. Following site assessment activities, the produced water sumps were replaced and the excavation areas were backfilled and contoured to match pre-existing site conditions. The production facility remains operational.

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 Report

Table

TABLE 1
WARDELL-63N65W18NESE
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)
COGCC standards for soil (mg/kg) ⁽¹⁾			0.17	85	100	175	500		
B01@5'	08/15/14	5.0	<0.01	<0.01	<0.01	<0.01	<50	<50	<50
B02@5'	08/15/14	5.0	<0.01	<0.01	<0.01	<0.01	<50	<50	<50

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.

ft. bgs = Feet below ground surface.

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

Attachment A



DATE:	November 17, 2015
DESIGNED BY:	B. Nelson
DRAWN BY:	B. Nelson



Kerr-McGee Oil and Gas Onshore, LP
Wardell-63N65W18NESE
 NESE, Section 18, Township 3 North, Range 65 West
 Weld County, Colorado

Sample Location
Map

FIGURE
1

Attachment B

Test Report

eANALYTICS LABORATORY

August 17, 2014

Client: Tasman Geosciences / Anadarko

Project: Wardell H 18-9

Lab ID: 1969

Date Samples Received: 8/15/2014

Number of Samples: 10

Sample Condition: Samples arrived intact and in appropriate sample containers

Sample Temperature: Within acceptable range of 2-6° C, or as specified in EPA Method

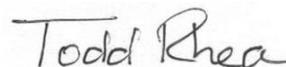
The quality control procedures associated with the requested analyses were satisfactorily passed before the samples were run.

Thank you for allowing eAnalytics Laboratory to provide laboratory services for you.

Sincerely,



Christopher Dieken
Quality Assurance Manager



Todd Rhea
Laboratory Manager

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538

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CLIENT INFORMATION <small>(*New Clients please fill out completely)</small>			ANALYSIS INFORMATION <small>(Select analysis by checking box on corresponding sample line)</small>																		
Company: Tasman Geosciences / Anadarko			Number of Containers	Matrix (S) Soil (W) Water (V) Vapor (O) Other	BTEX (EPA 8260)	BTEX/GRO (EPA 8260)	DRO/ORO (EPA 8015)	TPH-GRO/DRO/ORO (EPA 8260/8015)	SAR (US Dept of Ag Method 20B)	EC (US Dept of Ag Method 3)	pH (EPA 9045D)	Other Analysis									
Project: Wardell H 13-9																					
Project Manager: Paul Schneider / Phil Hamlin																					
Sampler: Brad Margus +																					
Phone/Email: 720-409-8791																					
Address: 6899 Pecos Street, Unit C Denver, CO 80221																					
Lab ID	Sample Name	Sampling Date/Time																			
1	N01@4'	8/15/14 1640 AM/PM	1	S		X	X														
2	E01@4'	1641 AM/PM																			
3	S01@4'	1642 AM/PM																			
4	W01@4'	1643 AM/PM																			
5	B01@5'	1644 AM/PM																			
6	N02@4'	1650 AM/PM																			
7	E02@4'	1651 AM/PM																			
8	S02@4'	1652 AM/PM																			
9	W02@4'	1653 AM/PM																			
10	B02@5'	8/15/14 1654 AM/PM	1	S		X	X														

Comments: **Run B01+B02, Hold others**

Turnaround Time (Business Days)
TAT begins when sample is received by eANALYTICS

Normal (5-10 Days) Rush analysis requires an extra charge. If possible please inform eANALYTICS in advance for rush analysis.

3 Day (1.25x)

1 Day (2x)

Same Day (3x)

Next Bus. Morning (APC Pricing)

For eANALYTICS Use

Samples Received Intact Yes / No

Received Within Temperature Range (2-6°C) Yes / No

Sample Preservative Ice / None Acid / Other

Record of Custody

Relinquished by: *[Signature]* Date: **8/15/14**

Company: **Tasman** Time: **1910** AM/PM

Received by: _____ Date: _____

Company: _____ Time: _____ AM/PM

Relinquished by: _____ Date: _____

Company: _____ Time: _____ AM/PM

Received by: *[Signature]* Date: **8/15/14**

Company: **eANALYTICS** Time: **1910** AM/PM

WO # 1969

eANALYTICS: Environmental testing made Easy

Page 1 of 1

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538



Client: Tasman Geosciences / Anadarko Lab ID: 1969
 Project: Wardell H 18-9
 Analysis: Volatile Organics Method: EPA8260
 TPH EPA8260/8015

Sample Name	Benzene mg/kg	Toluene mg/kg	Ethyl- benzene mg/kg	Total Xylenes mg/kg	TPH	TPH	TPH	Date Sampled	Date Analyzed	Lab ID
					GRO C6-C10 mg/kg	DRO C10-C28 mg/kg	ORO C28-C36 mg/kg			
B01 @ 5'	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	< 50	08/15/14	08/15/14	1969 5
B02 @ 5'	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	< 50	08/15/14	08/15/14	1969 10

eAnalytics Laboratory

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Client: Tasman Geosciences / Anadarko

Lab ID: 1969

Project: Wardell H 18-9

Method: EPA8260

Sample Name	Dibromo-fluoromethane % Recovery	1,2 Dichloro-ethane-D4 % Recovery	Toluene-D8 % Recovery	Bromo-fluorobenzene % Recovery	Date Sampled	Date Analyzed	Lab ID
B01 @ 5'	109	104	90	100	08/15/14	08/15/14	1969 5
B02 @ 5'	87	98	95	102	08/15/14	08/15/14	1969 10



Client: Tasman Geosciences / Anadarko Lab ID: 1969
 Project: Wardell H 18-9
 Analysis: Volatile Organics Method: EPA8260
 TPH EPA8260/8015

Sample Name	Benzene % Rec	Toluene % Rec	Ethyl- benzene % Rec	Total Xylenes % Rec	TPH GRO C6-C10 % Rec	TPH DRO C10-C28 % Rec	TPH ORO C28-C36 % Rec	Date Analyzed	Lab ID
Laboratory Control Sample (70-130%)	90	99	91	101	95	102	93	08/15/14	LCS 1969 1
Method Blank	< 0.01 mg/kg	< 0.01 mg/kg	< 0.01 mg/kg	< 0.01 mg/kg	< 50 mg/kg	< 50 mg/kg	< 50 mg/kg	08/15/14	MB 1969 1

eAnalytics Laboratory

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