



November 11, 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
Palombo-63N67W23SENW (Palombo 23-3L & 23-6L)
API: 05-123-15389
Facility ID: 327979
Legal: SENW Sec 23-T3N-R67W
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 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 the produced water sump on May 20, 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 10 feet by 14 feet with an approximate depth of 5 feet below ground surface (bgs). No impacted material was removed during the replacement of the produced water sump at this location. 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 3 feet bgs, respectively. Soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The confirmation soil samples collected from the base and east sidewall of the excavation area were submitted to eAnalytics Laboratory in Loveland, 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, and TPH – diesel range and oil range organics (DRO and ORO) by USEPA Method 8015. Soil analytical data is summarized in Table 1 and laboratory analytical reports are provided in Attachment B.

Results

Soil analytical results from the samples collected from the base and east 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 west, south, and north 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 replaced and the excavation area was 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 Reports

Table

TABLE 1
PALOMBO-63N67W23SEW
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'	05/20/14	5.0	<0.01	<0.01	<0.01	<0.01	<50	<50	<50
E01@3'	05/20/14	3.0	<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



Legend

- Excavation Extent
- Steel Berm
- Soil Sample Location
- Existing Infrastructure

Notes

All Locations are Approximate Unless Otherwise Noted.

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

0 ft. 7.5 ft. 15 ft.

Image Source: Google Earth 2015

DATE:	November 11, 2015
DESIGNED BY:	B. Nelson
DRAWN BY:	B. Nelson



Kerr-McGee Oil and Gas Onshore, LP
Palombo-63N67W23SENW
 SENW, Section 23, Township 3 North, Range 67 West
 Weld County, Colorado

Sample Location
Map

FIGURE
1

Attachment B

Test Report

eANALYTICS LABORATORY

May 20, 2014

Client: Tasman Geosciences / Anadarko
Project: Palombo 23-3L & 23-6L
Lab ID: 1421
Date Samples Received: 5/20/2014
Number of Samples: 5
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

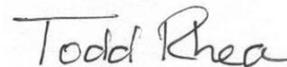
The quality control procedures associated with the requested analyses were satisfactorily passed before the samples were run.

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



Client: Tasman Geosciences / Anadarko Lab ID: 1421

Project: Palombo 23-3L & 23-6L

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	05/20/14	05/20/14	1421 1
E01 @ 3'	< 0.01	< 0.01	< 0.01	< 0.01	< 50	< 50	< 50	05/20/14	05/20/14	1421 3



Client: Tasman Geosciences / Anadarko Lab ID: 1421
 Project: Palombo 23-3L & 23-6L 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'	98	86	111	92	05/20/14	05/20/14	1421 1
E01 @ 3'	97	100	102	111	05/20/14	05/20/14	1421 3

eANALYTICS
LABORATORY

Client: Tasman Geosciences / Anadarko Lab ID: 1421

Project: Palombo 23-3L & 23-6L

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%)	100	104	99	90	104	92	91	05/20/14	LCS 1421 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	05/20/14	MB 1421 1

eAnalytics Laboratory

1767 Rocky Mountain Avenue Loveland CO 80538