# APPROVED

# 1RP-3345 CONFIRMATION SAMPLE REPORT Vaca 24 Fed Well #1 Produced Water Release

Lea County, New Mexico

LAI Project No. 16-0128-06

September 6, 2016

Prepared for:

EOG Resources, Inc. 5509 Champions Drive Midland, Texas 797067

Prepared by:

Larson & Associates, Inc. 507 North Marienfeld Street, Suite 205 Midland, Texas 79701

Mark J. Larson, P.G.

Certified Professional Geologist #10490



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## **Introduction**

This report presents laboratory results of soil samples to confirm remediation of a produced water release from a four (4) inch diameter poly flow line at the Vaca 24 Fed Well #1 (Site). The Site is located in Unit H (SE/4, NE/4), Section 24, Township 25 South and Range 33 East in Lea County, New Mexico. The geodetic position is North 32.1179° and West -103.5208°. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

# **Background**

On April 25, 2014, EOG Resources, Inc. (EOG) reported that approximately 20 barrels (bbls) of produced water was released from a four (4) inch poly flow line. Approximately 15 bbl were recovered with a vacuum truck. The initial C-141 was submitted to the New Mexico Oil Conservation Division (OCD) District 1 on April 27, 2014 and was assigned remediation permit number 1RP-3345. The C-141 states that EOG proposed to delineate the impacted area, vertically and horizontally by collecting soil samples and having them analyzed for TPH, BTEX, and chlorides. The impacted area would be excavated, stockpiled on poly-plastic and transported to Sundance disposal facility. Clean material will be brought in to backfill to normal grade. The approved C-141 required remediation to be completed by November 22, 2014. No final report was submitted to OCD to confirm remediation was performed.

## **Setting**

The setting is as follows:

- Elevation is approximately 3,335 feet above mean sea level (AMSL);
- Topography slopes toward the southeast;
- There are no surface water features within 1 mile of the Site;
- Groundwater is greater than 100 feet below ground surface (bgs) according to records from the New Mexico Office of the State Engineer (NMOSE);
- The nearest fresh water well is approximately 2.5 miles southeast of the Site in Unit H (SE/4, NE/4), Section 31, Township 25 South and Range 33 East;
- Depth to groundwater is reported at 240.14 feet below ground surface (bgs).

# **Remediation Action Levels**

Remediation action levels (RRAL) were calculated for benzene, BTEX and TPH based on the following criteria established by the OCD (*Guidelines for Remediation of Leaks, Spills and Releases, August 13,* 1993):

Criteria	Result	Score
Depth-to-Groundwater	>100 Feet	0
Wellhead Protection Area	No	0
Distance to Surface Water	>1,000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 0

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 5,000 mg/Kg

### Soil Samples and Laboratory Analysis

During an initial Site visit LAI personnel observed a four (4) inch poly flow line and spill area near the southwest corner of the location. On August 26, 2016, LAI personnel used a Terraprobe<sup>®</sup> direct push rig to collect soil samples at four (4) locations (DP-1 through DP-4) between about 6 and 8 feet bgs. The upper samples (0 to 2 feet) were analyzed for total petroleum hydrocarbons (TPH) by EPA SW-846 method 8015 including gasoline (GRO) and diesel range (DRO) organic. All samples were analyzed for chloride by method 300. A background soil sample was collected north of the location from about 0 to 2 feet bgs and analyzed for chloride by method 300. Table 1 presents the analytical data summary. Figure 3 presents a Site drawing and sample locations. Appendix A presents the laboratory report. Appendix B presents photographs.

Referring to Table 1, TPH was less than the method reporting limit in samples from 0 to 2 feet at locations DP-1 through DP-4. Chloride was 5.49 milligrams per kilogram (mg/Kg) in sample DP-1, 0 to 2 feet and below the method reporting limit in the remaining samples including the background sample.

#### **Conclusions**

The laboratory results confirm TPH is below the recommended remediation action levels (RRAL) and chloride is less the OCD recommended delineation level of 250 mg/Kg. EOG requests no further action for this spill incident. Appendix C presents the initial and final C-141.

Tables

Table 1

# Unit L (NW/4, SW/4), Section 24, Township 25 South, Range 33 East Investigation Soil Sample Analytical Data Summary EOG Resources, Inc., Vaca 24, Fed #1 Lea County, New Mexico

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Sample	Depth	Collection	Status	GRO	DRO	ORO	ТРН	Chloride
	(Feet)	Date		C6-C12	>C12 - C28	>C28 - C36		
OCD RRAL:							5,000	*250
DP-1	0 - 2	8/26/2016	In-Situ	<25.8	<25.8	<25.8	<25.8	5.49
	2 - 4	8/26/2016	In-Situ	I	I	I	I	1.51
	4 - 6	8/26/2016	In-Situ	I	I	I	I	<1.03
	6 - 8	8/26/2016	In-Situ	ł	ł	I	ł	<1.08
DP-2	0 - 2	8/26/2016	In-Situ	<25.8	<25.8	<25.8	<25.8	<1.03
	2 - 4	8/26/2016	In-Situ	I	I	1	1	<1.02
	4 - 6	8/26/2016	In-Situ	I	I	I	ł	<1.03
DP-3	0 - 2	8/26/2016	In-Situ	<25.8	<25.8	<25.8	<25.8	<1.03
	2 - 4	8/26/2016	In-Situ	1	1	1	1	<1.01
	4 - 6	8/26/2016	In-Situ	ł	I	I	I	<1.02
DP-4	0 - 2	8/26/2016	In-Situ	<25.5	<25.5	<25.5	<25.5	<1.02
	2 - 4	8/26/2016	In-Situ	I	I	I	I	<1.01
	4 - 6	8/26/2016	In-Situ	I	I	I	1	<1.04
	6 - 8	8/26/2016	In-Situ	1	I	ł	I	<1.04
DP-BG	0 - 2	8/26/2016	In-Situ	1	I	ł	I	<1.15

Notes: analysis performed by Permian Basin Environmental Lab, Midland, Texas, by EPA SW-846 method 8015M (TPH) and 300.0 (chloride) Depth inches below ground surface (bgs) mg/Kg: milligrams per kilogram equivalent to parts per million (ppm) \*: OCD delineation limit **Bold and highlighted denotes analyte detected at concentration above the OCD Recommended Remediation Action Level (RRAL)** 

Figures



Figure 1 - Topographic Map



Figure 2 - Aerial Map



Appendix A

Laboratory Report

PERMIAN BASIN ENVIRONMENTAL LAB, LP 1400 Rankin Hwy Midland, TX 79701



# Analytical Report

# **Prepared for:**

Mark Larson Larson & Associates, Inc. P.O. Box 50685 Midland, TX 79710

Project: Vaca Ridge 24 Project Number: 16-0128-06 Location: Vaca Ridge 24

Lab Order Number: 6H26007



NELAP/TCEQ # T104704156-13-3

Report Date: 08/31/16

Larson & Associates, Inc.	Project:	Vaca Ridge 24	Fax: (432) 687-0456
P.O. Box 50685	Project Number:	16-0128-06	
Midland TX, 79710	Project Manager:	Mark Larson	
	Project Manager.	Mark Larson	

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-1 (0-2)	6H26007-01	Soil	08/26/16 01:20	08-26-2016 08:35
DP-1 (2-4)	6H26007-02	Soil	08/26/16 01:20	08-26-2016 08:35
DP-1 (4-6)	6H26007-03	Soil	08/26/16 01:30	08-26-2016 08:35
DP-1 (6-8)	6H26007-04	Soil	08/26/16 01:30	08-26-2016 08:35
DP-2 (0-2)	6H26007-05	Soil	08/26/16 01:40	08-26-2016 08:35
DP-2 (2-4)	6H26007-06	Soil	08/26/16 01:40	08-26-2016 08:35
DP-2 (4-6)	6H26007-07	Soil	08/26/16 01:45	08-26-2016 08:35
DP-3 (0-2)	6H26007-08	Soil	08/26/16 01:50	08-26-2016 08:35
DP-3 (2-4)	6H26007-09	Soil	08/26/16 01:50	08-26-2016 08:35
DP-3 (4-6)	6H26007-10	Soil	08/26/16 01:55	08-26-2016 08:35
DP-4 (0-2)	6H26007-11	Soil	08/26/16 02:00	08-26-2016 08:35
DP-4 (2-4)	6H26007-12	Soil	08/26/16 02:00	08-26-2016 08:35
DP-4 (4-6)	6H26007-13	Soil	08/26/16 02:05	08-26-2016 08:35
DP-4 (6-8)	6H26007-14	Soil	08/26/16 02:05	08-26-2016 08:35
DP-BG (0-2)	6H26007-15	Soil	08/26/16 02:10	08-26-2016 08:35

#### Project: Vaca Ridge 24 Project Number: 16-0128-06 Project Manager: Mark Larson

DP-1 (0-2)

6H26007-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Pern	nian Basin E	nvironmei	ntal Lab, I	L.P.				
General Chemistry Parameters by EPA /	Standard Method	s							
Chloride	5.49	1.03	mg/kg dry	1	P6H2805	08/28/16	08/29/16	EPA 300.0	
% Moisture	3.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	
Total Petroleum Hydrocarbons C6-C35 I	y EPA Method 80	15M							
C6-C12	ND	25.8	mg/kg dry	1	P6H3005	08/26/16	08/29/16	TPH 8015M	
>C12-C28	ND	25.8	mg/kg dry	1	P6H3005	08/26/16	08/29/16	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P6H3005	08/26/16	08/29/16	TPH 8015M	
Surrogate: 1-Chlorooctane		88.1 %	70-1	30	P61+3005	08/26/16	08/29/16	TPH 8015M	
Surrogate: o-Terphenyl		87.9 %	70-1	30	P6H3005	08/26/16	08/29/16	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	08/26/16	08/29/16	calc	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proje troject Numb roject Manag		8-06				Fax: (432) 68	7-0456
			P-1 (2-4) 007-02 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	nvironme	ntal Lab, I	L <b>.P.</b>				
General Chemistry Parameters by	EPA / Standard Methods								
Chloride % Moisture	1.51 2.0	1.02 0.1	mg/kg dry %	1	P6H2805 P6H3007	08/28/16 08/30/16	08/29/16 08/30/16	EPA 300.0 % calculation	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		oject Num	ect: Vaca R per: 16-012 ger: Mark L	8-06				Fax: (432) 68	37-0456
			P-1 (4-6) 007-03 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permia	n Basin F	Invironme	ntal Lab, I	L.P.				
General Chemistry Parameters by H	EPA / Standard Methods								
Chloride	ND	1.03	mg/kg dry	1	P6H2805	08/28/16	08/29/16	EPA 300.0	
% Moisture	3.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proje Project Numb roject Manag		8-06				Fax: (432) 68	7-0456
			P-1 (6-8) 007-04 (So	il)					
			·	· · · · · · · ·					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	nvironme	ntal Lab, I	L. <b>P.</b>				
General Chemistry Parameters by I	EPA / Standard Methods								
Chloride	ND	1.08	mg/kg dry	I	P6H2805	08/28/16	08/29/16	EPA 300.0	
% Moisture	7.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

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Midland TX, 79710		Project Mana							
		D	P-2 (0-2)						
		6H26	007-05 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~								
	Perm	ian Basin H	Invironme	ntal Lab, I	L.P.				
General Chemistry Parameters by EPA /	Standard Method	<u>s</u>							
Chloride	ND	1.03	mg/kg dry	1	P6H2805	08/28/16	08/29/16	EPA 300.0	
% Moisture	3.0	0.1	%	l	P6H3007	08/30/16	08/30/16	% calculation	
Total Petroleum Hydrocarbons C6-C35 I	oy EPA Method 80	15M							
C6-C12	ND	25.8	mg/kg dry	1	P6H3005	08/26/16	08/29/16	TPH 8015M	
>C12-C28	ND	25.8	mg/kg dry	1	P6H3005	08/26/16	08/29/16	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	i	P6H3005	08/26/16	08/29/16	TPH 8015M	
Surrogate: 1-Chlorooctane		88.6 %	70	30	P6H3005	08/26/16	08/29/16	TPH 8015M	
Surrogate: o-Terphenyl		88.9 %	70-1	30	P6H3005	08/26/16	08/29/16	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	08/26/16	08/29/16	calc	

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			P-2 (2-4) 007-06 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	L. <b>P.</b>				
General Chemistry Parameters by EPA	/ Standard Methods	i							
Chloride % Moisture	ND 2.0	1.02 0.1	mg/kg dry %	1	P6H2805 P6H3007	08/28/16 08/30/16	08/29/16 08/30/16	EPA 300.0 % calculation	

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			P-2 (4-6) 007-07 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Baich	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters by H	EPA / Standard Methods								
Chloride	ND	1.03	mg/kg dry	1	P6H2805	08/28/16	08/29/16	EPA 300.0	
% Moisture	3.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

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P.O. Box 50685		Project Numł	per: 16-0128-	06					
Midland TX, 79710	ſ	Project Manag	ger: Mark La	rson					
		D	P-3 (0-2)						
		6H26	007-08 (Soil	)					
		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
			Invironment						
			mg/kg dry	1	P6H2805	08/28/16	08/29/16	EPA 300.0	
<mark>General Chemistry Parameters by EPA /</mark> Chloride % Moisture	Standard Methods	8		1		08/28/16 08/30/16	08/29/16 08/30/16	EPA 300.0 % calculation	
Chloride % Moisture	Standard Methods ND 3.0	5 1.03 0.1	mg/kg dry	1	P6H2805	+			
Chloride % Moisture Total Petroleum Hydrocarbons C6-C35 b	Standard Methods ND 3.0	5 1.03 0.1	mg/kg dry	1	P6H2805	+			
Chloride % Moisture Total Petroleum Hydrocarbons C6-C35 b C6-C12	Standard Methods ND 3.0 by EPA Method 801	1.03 0.1	mg/kg dry %	1 1 1	P6H2805 P6H3007	08/30/16	08/30/16	% calculation	
Chloride <b>% Moisture</b> <u>Total Petroleum Hydrocarbons C6-C35 b</u> C6-C12 >C12-C28	Standard Methods ND 3.0 by EPA Method 801 ND	1.03 0.1 15M 25.8	mg/kg dry % mg/kg dry	1 1 1 1 1 1	P6H2805 P6H3007 P6H3005	08/30/16	08/30/16	% calculation TPH 8015M	
Chloride <b>% Moisture</b> Total Petroleum Hydrocarbons C6-C35 b C6-C12 >C12-C28 >C28-C35	Standard Methods ND 3.0 by EPA Method 801 ND ND	1.03 0.1 15M 25.8 25.8	mg/kg dry % mg/kg dry mg/kg dry	1 1 1 1 1	P6H2805 P6H3007 P6H3005 P6H3005	08/30/16 08/26/16 08/26/16	08/30/16 08/29/16 08/29/16	% calculation TPH 8015M TPH 8015M	
Chloride	Standard Methods ND 3.0 by EPA Method 801 ND ND	5 1.03 0.1 15M 25.8 25.8 25.8	mg/kg dry % mg/kg dry mg/kg dry mg/kg dry	1 1 1 1 1	P6H2805 P6H3007 P6H3005 P6H3005 P6H3005	08/30/16 08/26/16 08/26/16 08/26/16	08/30/16 08/29/16 08/29/16 08/29/16	% calculation TPH 8015M TPH 8015M TPH 8015M	

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			P-3 (2-4) 007-09 (So	il)					
······		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin F	Invironme	ntal Lab, I	L. <b>P.</b>				
General Chemistry Parameters by I	EPA / Standard Methods								
Chloride	ND	1.01	mg/kg dry	1	P6H2805	08/28/16	08/29/16	EPA 300.0	
% Moisture	1.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

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			P-3 (4-6) 007-10 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permia	n Basin H	Invironme	ntal Lab, I	L.P.				
General Chemistry Parameters by E	PA / Standard Methods								
Chloride	ND	1.02	mg/kg dry	1	P6H3004	08/29/16	08/30/16	EPA 300.0	
% Moisture	2.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

Larson & Associates, Inc.		Proj	ect: Vaca Rid	ige 24				Fax: (432) 68	7-0456
P.O. Box 50685		•	per: 16-0128						
Midland TX, 79710	E	Project Manag	ger: Mark La	rson	i.				
		D	P-4 (0-2)						
		6H26	007-11 (Soil	l)					
		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironmen	tal Lab, l	L.P.				
General Chemistry Parameters by EPA	/ Standard Methods								
General Chemistry Parameters by EPA Chloride	<u>/ Standard Method</u> ND	1.02	mg/kg dry	1	P6H3004	08/29/16	08/30/16	EPA 300.0	
			mg/kg dry %	1	P6H3004 P6H3007	08/29/16 08/30/16	08/30/16 08/30/16	EPA 300.0 % calculation	
Chloride	ND 2.0	1.02 0.1		] [					
Chloride % Moisture Fotal Petroleum Hydrocarbons C6-C35	ND 2.0	1.02 0.1		1 I i					
Chloride % Moisture	ND 2.0 by EPA Method 801	1.02 0.1	%	1 I 1 1	P6H3007	08/30/16	08/30/16	% calculation	
Chloride % Moisture Fotal Petroleum Hydrocarbons C6-C35 26-C12	ND 2.0 by EPA Method 801 ND	1.02 0.1 1 <b>5M</b> 25.5	% mg/kg dry	1 1 1 1	P6H3007 P6H3005	08/30/16	08/30/16	% calculation TPH 8015M	
Chloride % <b>Moisture</b> Fotal Petroleum Hydrocarbons C6-C35 C6-C12 -C12-C28	ND 2.0 by EPA Method 801 ND ND	1.02 0.1 15M 25.5 25.5	% mg/kg dry mg/kg dry	1	P6H3007 P6H3005 P6H3005	08/30/16 08/26/16 08/26/16	08/30/16 08/29/16 08/29/16	% calculation TPH 8015M TPH 8015M	
Chloride % <b>Moisture</b> Fotal Petroleum Hydrocarbons C6-C35 C6-C12 -C12-C28 -C28-C35	ND 2.0 by EPA Method 801 ND ND	1.02 0.1 1 <b>5M</b> 25.5 25.5 25.5	% mg/kg dry mg/kg dry mg/kg dry	1 30	P6H3007 P6H3005 P6H3005 P6H3005	08/30/16 08/26/16 08/26/16 08/26/16	08/30/16 08/29/16 08/29/16 08/29/16	% calculation TPH 8015M TPH 8015M TPH 8015M	

	Project Numb	per: 16-012	8-06				Fax: (432) 68	7-0456
		` '	il)					
Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Perm	ian Basin E	nvironme	ntal Lab, I	L.P.				
PA / Standard Methods								
ND	1.01	mg/kg dry %	1	P6H3004 P6H3007	08/29/16	08/30/16	EPA 300.0 % calculation	
	P Result Perm PA / Standard Methods	Project Numb Project Manag D 6H26 Reporting Result Limit Permian Basin E PA / Standard Methods ND 1.01	Project Number: 16-012 Project Manager: Mark L DP-4 (2-4) 6H26007-12 (So Reporting Result Limit Units Permian Basin Environmer PA / Standard Methods ND 1.01 mg/kg dry	6H26007-12 (Soil)   Reporting   Result Limit Units Dilution   Permian Basin Environmental Lab, 1   PA / Standard Methods   ND 1.01 mg/kg dry 1	Project Number: 16-0128-06 Project Manager: Mark Larson DP-4 (2-4) 6H26007-12 (Soil) Reporting Result Limit Units Dilution Batch Permian Basin Environmental Lab, L.P. PA / Standard Methods ND 1.01 mg/kg dry 1 P6H3004	Project Number: 16-0128-06 Project Manager: Mark Larson DP-4 (2-4) 6H26007-12 (Soil) Reporting Result Limit Units Dilution Batch Prepared Permian Basin Environmental Lab, L.P. PA / Standard Methods ND 1.01 mg/kg dry 1 P6H3004 08/29/16	Project Number: 16-0128-06 Project Manager: Mark Larson DP-4 (2-4) 6H26007-12 (Soil) Reporting Result Limit Units Dilution Batch Prepared Analyzed Permian Basin Environmental Lab, L.P. PA / Standard Methods ND 1.01 mg/kg dry 1 P6H3004 08/29/16 08/30/16	Project: Vada Ridge 24 Project: Vada Ridge 24 Project Number: 16-0128-06 Project Manager: Mark Larson DP-4 (2-4) 6H26007-12 (Soil) Result Limit Units Dilution Batch Prepared Analyzed Method Permian Basin Environmental Lab, L.P. PA / Standard Methods ND 1.01 mg/kg dry 1 P6H3004 08/29/16 08/30/16 EPA 300.0

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proje Project Numł roject Manag		8-06				Fax: (432) 68	7-0456
			P-4 (4-6) 007-13 (So	il)					
Analyte	Result	Reporting Límit	Uníts	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	Invironme	ntal Lab, I	L.P.				
General Chemistry Parameters by EP	A / Standard Methods								
Chloride	ND	1.04	mg/kg dry	1	P6H3004	08/29/16	08/30/16	EPA 300.0	
% Moisture	4.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

Permian Basin Environmental Lab, L.P.

The results in this report apply to the samples analyzed in accordance with the samples received in the laboratory. This analytical report must be reproduced in its entirety, with written approval of Permian Basin Environmental Lab.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Project Num	ect: Vaca R ber: 16-012 ger: Mark L	8-06				Fax: (432) 68	7-0456
			P-4 (6-8) 007-14 (Se	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	Environme	ntal Lab, l	L. <b>P</b> .				
General Chemistry Parameters by F	PA / Standard Methods								
Chloride	ND	1.04	mg/kg dry	1	P6H3004	08/29/16	08/30/16	EPA 300.0	
% Moisture	4.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Numl Project Manaj		8-06				Fax: (432) 68	37-0456
			-BG (0-2) 007-15 (So						
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin F	Invironme	ntal Lab,	L.P.				
General Chemistry Parameters by B	PA / Standard Method	<u>s</u>							
Chloride	ND	1.15	mg/kg dry	1	P6H3004	08/29/16	08/30/16	EPA 300.0	
% Moisture	13.0	0.1	%	1	P6H3007	08/30/16	08/30/16	% calculation	

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.										
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPÐ	RPD Limit	Note
Batch P6H2805 - *** DEFAULT PREP **	: <b>*</b>									
Blank (P6H2805-BLK1)				Prepared 8	د Analyzed:	08/28/16				
Chloride	ND	1.00	mg/kg wet							
LCS (P6H2805-BS1)				Prepared 8	& Analyzed:	08/28/16				
Chloride	837	1.00	mg/kg wet	800		105	80-120			
LCS Dup (P6H2805-BSD1)				Prepared &	& Analyzed:	08/28/16				
Chloride	831	1.00	mg/kg wet	800		104	80-120	0.705	20	
Duplicate (P6H2805-DUP1)	Sou	rce: 6H26003	3-03	Prepared &	è Analyzed:	08/28/16				
Chloride	2240	5.62	mg/kg dry		2180			2.82	20	
Duplicate (P6H2805-DUP2)	Sou	rce: 6H26007	7-01	Prepared:	08/28/16 A:	nalyzed: 0	8/29/16			
Chloride	5.64	1.03	mg/kg dry		5.49			2.59	20	
Matrix Spike (P6H2805-MS1)	Sou	rce: 6H26003	3-03	Prepared:	08/28/16 A	nalyzed: 0	8/30/16			
Chloride	4740	5.62	mg/kg dry	2250	2180	114	80-120			
Batch P6H3004 - *** DEFAULT PREP **	**									
Blank (P6H3004-BLK1)				Prepared:	08/29/16 A	nalyzed: 0	8/30/16			
Chłoride	ND	1.00	mg/kg wet							
LCS (P6H3004-BS1)				Prepared:	08/29/16 A	nalyzed: 0	8/30/16			
Chloride	424	1.00	mg/kg wet	400		106	80-120			
Duplicate (P6H3004-DUP1)	Sou	rce: 6H2900:	5-18	Prepared:	08/29/16 A	nalyzed: 0	8/30/16			
Chloride	4480	28.4	mg/kg dry		4480			0.114	20	

Permian Basin Environmental Lab, L.P.

#### General Chemistry Parameters by EPA / Standard Methods - Quality Control

#### Permian Basin Environmental Lab, L.P.

		Reporting	11.14	Spike	Source	%REC	%REC Limits	RPD	RPD Limit	Notes
Analyte	Result	Limit	Units	Level	Result	%RBC	Limits	KPD	Lunu	indics
Batch P6H3004 - *** DEFAULT PREP ***										
Duplicate (P6H3004-DUP2)	Sour	rce: 6H26008	-02	Prepared: (	08/29/16 A	nalyzed: 08	/30/16			
Chloride	679	1.14	mg/kg dry		679			0,100	20	
Matrix Spike (P6H3004-MS1)	Sou	ce: 6H29005	-18	Prepared: (	08/29/16 A	nalyzed: 08	/30/16			
hloride	9440	28.4	mg/kg dry	4550	4480	109	80-120			
3atch P6H3007 - *** DEFAULT PREP ***										
Blank (P6H3007-BLK1)				Prepared 8	k Analyzed:	08/30/16				
6 Moisture	ND	0.1	%							
Blank (P6H3007-BLK2)				Prepared &	k Analyzed	08/30/16				
6 Moisture	ND	0.1	%							
Duplicate (P6H3007-DUP1)	Source: 6H25010-15			Prepared 8	k Analyzed:	: 08/30/16				
6 Moisture	2.0	0.1	%		3.0			40.0	20	
Duplicate (P6H3007-DUP2)	Source: 6H26006-01		Prepared &	k Analyzed	: 08/30/16					
6 Moisture	5.0	0.1	%		4.0			22.2	20	
Duplicate (P6H3007-DUP3)	Sou	rce: 6H26008	-10	Prepared &	k Analyzed	: 08/30/16				
6 Moisturc	4.0	0.1	%		5.0			22.2	20	
Duplicate (P6H3007-DUP4)	Sou	rce: 6H29005	-13	Prepared &	& Analyzed	: 08/30/16				
6 Moisture	11.0	0.1	%		15.0			30.8	20	
Puplicate (P6H3007-DUP5)	Sou	rce: 6H29005	-20	Prepared &	& Analyzed	: 08/30/16				
6 Moisture	8.0	0.1	%		7.0			13.3	20	

# Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control

#### Permian Basin Environmental Lab, L.P.

	Denuit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPÐ Limit	Notes
Analyte	Result	Lamu	Units	Levei	Resur	20 K.C.C.	LIIIIIG	KI D	1.1111	
Batch P6H3005 - TX 1005										
Blank (P6H3005-BLK1)				Prepared: (	08/26/16 Ai	nalyzed: 08	/27/16			
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0								
>C28-C35	ND	25.0								
Surrogate: 1-Chlorooctane	94.1		n	100		94.1	70-130			
Surrogate: o-Terphenyl	49.8		п	50.0		99.6	70-130			
LCS (P6H3005-BS1)				Prepared: (	08/26/16 Ai	nałyzed: 08	/27/16			
C6-C12	870	25.0	mg/kg wet	1000		87.0	75-125			
>C12-C28	943	25.0	и	1000		94.3	75-125			
Surrogate: 1-Chlorooctane	132		н	100	.,	132	70-130			S-G
Surrogate: o-Terphenyl	60.4		"	50.0		121	70-130			
LCS Dup (P6H3005-BSD1)				Prepared: (	08/26/16 A	nalyzed: 08	8/27/16			
C6-C12	813	25.0	mg/kg wet	1000		81.3	75-125	6.76	20	
>C12-C28	936	25.0	и	1000		93.6	75-125	0.715	20	
Surrogate: 1-Chlorooctane	127		4	100		127	70-130			
Surrogate: o-Terphenyl	59.7		"	50.0		119	70-130			
Matrix Spike (P6H3005-MS1)	Sou	rce: 6H2600	7-01	Prepared:	08/26/16 A	nalyzed: 08	8/29/16			
C6-C12	1080	25.8	mg/kg dry	1030	ND	104	75-125			
>C12-C28	1070	25.8	0	1030	15.7	102	75-125			
Surrogate: 1-Chlorooctane	165		"	134		123	70-130			
Surrogate: o-Terphenyl	74.7		n	67.0		111	70-130			
Matrix Spike Dup (P6H3005-MSD1)	Sou	rce: 6H2600	7-01	Prepared:	08/26/16 A	nalyzed: 08	8/29/16			
C6-C12	1090	25.8	mg/kg dry	1030	ND	105	75-125	0.960	20	
>C12-C28	1100	25.8		1030	15.7	105	75-125	3.48	20	
Surrogate: 1-Chlorooctane	168		w	134		125	70-130			
Surrogate: o-Terphenyl	74.6		n	67.0		$\overline{m}$	70-130			

#### Notes and Definitions

- S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- LCS Laboratory Control Spike
- MS Matrix Spike
- Dup Duplicate

Press Provence Report Approved By: Date: 8/31/2016

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

Permian Basin Environmental Lab, L.P.



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Appendix B

Photographs



Well Sign



Spill Area and Location of Soil Samples Viewing Southwest

Appendix C

Initial and Final C-141

District					l	Hobbs (	CD			
District 1 1625 N. French Dr., Hobbs, NM 88240			f New Mexico					F	orm C-141	
District II 811 S. First St., Artesia, NM 88210	Energy M	inerals	s and Natural Resources			EP 22	2014		ugust 8, 2011	
District III	Oile	Conser	ervation Division					riate Distr	ict Office in	
1000 Rio Brazos Road, Aztec, NM 87410 District IV				, Francis Dr.				vith 19.15	ict Office in .29 NMAC.	
1220 S. St. Francis Dr., Santa Fe, NM 87505	Santa Fe			Share and the second se			Ø			
П-1-						-		····	·····	
Kele	ase Notin	catioi	÷ .	orrective A	ction	l				
			OPERA		·····	🛛 Initia	l Report	J	Final Repo	
Name of Company EOG Resources, Inc.	70702	www.www.www.www.www.www.	Contact Za			******				
				Telephone No. 432-425-2023						
			Facility Type Other - Produced Water Poly Line							
Surface Owner	Mineral C	Dwner	r API No. 30-025-36676						·	
	LOCA	ATIO	N OF REI	LEASE						
Unit Letter Section Township Range	Feet from the	· · · · · · · · · · · · · · · · · · ·	South Line	Feet from the	East	Vest Line	County			
NWSW 1238 33E 24 775 G	1980'	N		990'	E.		Lca			
	<u> </u>	 								
Vaca 24Fed 1 Lati	tude <u>32.11</u>	74	_ Longitud	e <u>~103.5</u>	<u>20</u> 8	,				
Vaca d'Irea L	NAT	URE	OF REL	EASE						
Type of Release Produced Water				Release 20 bbls		Volume R	ecovered	15 bbls		
Source of Release			1	our of Occurrent	e	Date and	Hour of D	iscovery		
4in HDPE produced water line Was Immediate Notice Given?			4-25-2014	Whom?		0900				
	No 🗌 Not Re	equired	If YES, To Whom? James Amos, BLM plus record states OCD notification 4-27-14 at 1100							
By Whom? Ryan Kainer, EOG Resources		~~~~~	Date and Hour 4-27-2014 1100							
Was a Watercourse Reached?			If YES, Volume Impacting the Watercourse.							
🗋 Yes 🖾	No									
If a Watercourse was Impacted, Describe Fully.*		*********	L							
Describe Cause of Problem and Remedial Action	Taken.*									
Approximately 20 bbl of produced water spilled fi	om a 4in poly li	ine that r	aptured. Ap	orox. 15 bbls wet	e recove	ered by vac	track. EC	G propos	ed to	
delineate the impacted area, vertically and horizon	taily by collecti	ng soil s	amples and h	aving them analy	zed for	tph, blex, a	nd chlorid	es. The ir	npacted	
area would be excavated, stockpiled on poly-plast	ic and transporte	ed to Sur	idance dispos	al facility. Clear	n materia	al would be	brought in	n to backfi	ili to norma	
grade.										
									·····	
Describe Area Affected and Cleanup Action Take	3.*									
I hereby certify that the information given above is	true and comp	lete to th	e best of my	knowledge and i	ndersta	d that mure	uant to N	MOCD rul	lee and	
regulations all operators are required to report and	or file certain r	elease no	tifications ar	id perform correct	tive act	ions for rele	eases which	h may enq	langer	
public health or the environment. The acceptance	of a C-141 repo	rt by the	NMOCD ma	arked as "Final R	eport" d	oes not reli	eve the op	crator of I	liability	
should their operations have failed to adequately in or the environment. In addition, NMOCD accepta	vestigate and re	emediate	contaminatio	on that pose a thr	cat to gr	ound water	, surface v	vater, harr	ian health	
federal, state, or local laws and/orregulations.	uce of a C+141 1	ισροπ αθ	os not reneve	s are operator of	esponsi	DURY 101 CO	mpnance	with any	ouler	
				OIL CON	SERV	ATION	DIVISI	ON		
Signature:										
Signature,										
Printed Name: Zane Kurtz, EOG Resources, Inc.		- ha	pproved by	Environmental S	pecialis					
1						·····		. 1	,	
Fille: Sr. Safety & Environmental Rep.		-1^	pproval Date	: <u>7-11-/7</u>		Expiration I	.)ate: 4"	+ + * / 7		
E-mail Address: zane_kurtz@eogresources.com		c	conditions of				Attache	a n		
Date: 00.22.2014 Disc. 420.42	6 0000		Sitesny	Slar rayant					. 0	
Date: 09-22-2014 Phone: 432-42	5-2023		Delunie	& constante	Alan.	appar	1_173	A= 934	<b>د</b> _ا	

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DISTRICT 1025 N. French Dr., Hobbs, NM ROAD Distri SUIS Fest St. Astesia MI SCHO Deservatili 1000 RAD BORDS ROAD ADDC: NM \$7418 Destor 1220 S. St. Frances Dr., Samta Fe, NM \$7505

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# 2RP-2186 State of New Mexico Energy Minerals and Natural Resources

Form ( 📿 he was haven to go

Some Cory & preserve Descript (Max & according with 19 15 25 1924)

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

# **Release Notification and Corrective Action**

		OPERATOR	🗌 🗌 instal Report 🛛 Final heper				
Name of Company: EOG Resources, Inc.		Contact: Zane Kurtz	·				
Address: 5509 Champions Dr., Midland, TX 79705		Telephone No.7 432-425-28					
Facility Name: Vaca 24 Fed =1		Facility Type: Produced Water Poly Late					
Surface Owner: Federal	Mineral Owner:	Federal	API No. 30-705-36676				

#### LOCATION OF RELEASE North South Lanc Fort from the Ens To State ্ প্ৰায়াৰ প Range Unit Letter Same Township Feet from the 5.25 10 304 Н 24 255 33Ē 1980 North

Latitude 32.1179° Longitude -103.5208°

#### NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release 20 th	Volume Recovered 15 mil			
Source of Release: 4 inch HDPE produced water line	Date and Hour of Occurrence 4-25-2014	Date and Hour of Discovery While M			
Was Immediate Notice Given?	If YES. To Whene? James Amos (BLM) plus record state OCD actification 4-27-2014 at 11-50				
By Whorn? Ryan Kainer, EOG Resources	Date and Hour: 4-27-2014 11:00 If YES. Volume Impacting the Watercourse.				
Was a Watercourse Reached?					
If a Watercourse was Immarted Describe Fully *					

DOLE MAR 1 ted. Describe Fully.

Describe Cause of Problem and Remedial Action Taken. \*Approximately 20 bbl of produced water spilled from a 4m porty line. Approx. 15 bbls were recovered by vac track.

Describe Area Affected and Cleanup Action Taken. • Initial C-141 states EOG proposed to delineate the impacted area, vertically and horizontally by collecting soil samples and having them analyzed for tph. btex and chlorides. The impacted area would be excavated, sucception on poly-plastic and transported to Sundance disposal facility. Clean material would be brought in to backfill to normal grade.

On August 26, 2016, LAI personnel collected soil samples at 4 locations from spill area to confirm area was cleaned up per instal C-141. TPH was less than method reporting limit in samples from 0 to 1 foot and chloride was less than 250 me Kg.

I hereby certify that the information given above is true and complete to the best of my knowledge and anderstand that pursuant to NMOCD rates and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not referve the operator of fairfully should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, instant heaving or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

2 K	Approved by Exvironmented Specialist					
Signature: Printed Name: Zane Kurtz, EOG Resources, Inc.						
Title: Sr. Environmental Representative	Approval Date: 09/12/2016 ///					
E-mail Address: zane_kurtz @eogresources.com	Conditions of Approval:					
Date: 09-06-2016 Phone: 432-556-8074	100 3345					

Attach Additional Sheets II Necessary

1RP-3345

# Scanned by CamScanner