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December 30, 2015

VIA EMAIL: Kellie.Jones@state.nm.us

Kellie Jones  
Environmental Specialist  
Oil Conservation Division  
1625 N. French Drive  
Hobbs, New Mexico 88240

**Re: Closure Report, Vaca Ridge 30 Flow Line Spill, Lea County, New Mexico, December 2, 2015**

Dear Ms. Jones,

The above referenced report is submitted electronically to the New Mexico Oil Conservation Division (OCD) on behalf of EOG Resources, Inc. (EOG). The reports presents the remediation of a produced water spill in Lea County, New Mexico. Please let me know if you need bound hard copies of the report. Please contact Zane Kurtz with EOG at (432) 425-2023, or me at (432) 687-0901 (office), (432) 557-9703 (cell), with any questions you may have.

Sincerely,

**Larson & Associates, Inc.**

A handwritten signature in black ink, appearing to read 'Kim Huckaba', is written over a light blue horizontal line.

Kimberly Huckaba  
Staff Geologist  
khuckaba@laenvironmental.com

CC: Shelly Tucker – BLM  
Zane Kurtz -- EOG

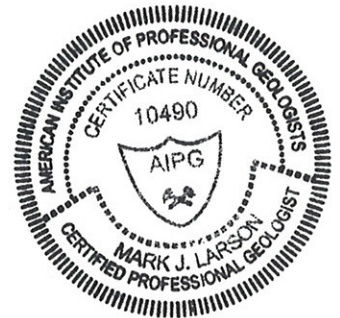
**Closure Report  
Vaca Ridge 30 Flow Line Spill  
Lea County, New Mexico  
1RP-3825**

LAI Project No. 15-0148-01

December 2, 2015

Prepared for:  
EOG Resources, Inc.  
5509 Champions Drive  
Midland, Texas 79706

Prepared by:  
Larson & Associates, Inc.  
507 North Marienfeld, Suite 205  
Midland, Texas 79701



A handwritten signature in black ink that reads "Kim M. Huckaba".

---

Kimberly M. Huckaba  
Staff Geologist

A handwritten signature in blue ink that appears to read "Mark J. Larson".

---

Mark J. Larson, P.G.  
Certified Professional Geologist #10490  
President/Sr. project Manager

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## **1.0 EXECUTIVE SUMMARY**

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) and U.S. Bureau of Land Management (BLM) on behalf of EOG Resources, Inc. (EOG) to present the remediation of a produced water spill near the Vaca Ridge 30 Fed Com #1 SWD (Site) in Lea County, New Mexico. The spill occurred from failure of a poly flow line, on August 26, 2015. Approximately 40 barrels (bbl) of produced water was released with about 15 bbl recovered by a vacuum truck.

On September 1 and 28, 2015 LAI personnel used a Terraprobe® direct push rig to collect soil samples at four (4) locations between 4 to 14 feet below ground surface (bgs). An air rotary rig with jam tube sampler was used to collect samples at location DP-1 for chloride delineation. Samples from 0 to 1 foot below ground surface (bgs) were analyzed for total petroleum hydrocarbons (TPH) including gasoline (GRO), diesel (DRO) and oil (ORO) range hydrocarbons by method SW-846-8015 and reported concentrations below the method reporting limit (RL) and OCD recommended remediation action level (RRAL) of 5,000 mg/Kg. Chloride was vertically delineated to 250 milligrams per kilogram (mg/Kg) by method E300.

On September 25 through October 11, 2015 SDR Enterprises, Inc. (SDR), excavated soil to 4 feet bgs west side of the lease road and 1 foot bgs east of the lease road. Approximately 740 cubic yards of soil was disposed at Sundance Services, Inc., located east of Eunice, New Mexico. On November 4, 2015, SDR installed approximately 10,195 square feet of 20 mil thickness polyethylene liner in the bottom of the 4 foot excavation. Both excavations were backfilled with clean topsoil acquired near the location. On November 16, 2015 LAI seeded the remediation area with BLM mix #2.

**EOG requests no further action for the spill.**

## **2.0 INTRODUCTION**

Larson & Associates, Inc. (LAI) submits this report to the New Mexico Oil Conservation Division (OCD) and U.S. Bureau of Land Management (BLM) on behalf of EOG Resources, Inc. (EOG) to present the investigation and remediation of a produced water spill from a flow line associated with the Vaca Ridge 30 Fed Com #1 SWD (Site) in Lea County, New Mexico. The spill occurred on August 26, 2015, due to poly flow line failure. The initial C-141 was submitted to OCD on August 27, 2015 and surface owner (U.S. Bureau of Land Management). The OCD assigned remediation project number 1RP-3825 to the spill. The Site is located in Unit J (SW/4, NE/4) of Section 31, Township 24 South, and Range 34 East. The geodetic position is north 32° 10' 36.45" and west 103° 30' 27.31". Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

### **2.1 Background**

EOG discovered the release on August 26, 2015. EOG estimated approximately 40 barrels (bbl) of produced water was released with about 15 bbl recovered by a vacuum truck. The net loss was approximately 25 bbl. The release occurred over a pipeline right of way with 2 lines buried at about 5 feet below ground surface (bgs). The release flowed south and east and covered an area measuring about 7,850 square feet or about 0.18 acres. The release terminated about 500 feet southeast of the point of origin.

### **2.2 Setting**

The setting is as follows:

- The surface elevation is about 3,475 feet above mean sea level (MSL);
- The topography is slightly undulating and slopes to the southeast;
- The nearest surface water feature is an intermittent drainage that terminates near the Site;
- The soils are designated as "Simona-Upton association", consisting of calcareous eolian deposits derived from reworking the Blackwater Draw (Pleistocene) and Ogallala (Pliocene) formations, in descending order;
- The soil developed over a petrocalcic (caliche) horizon that occurs between about 4 and 8 feet below ground surface (bgs);
- Groundwater is greater than 200 feet bgs according to records from the New Mexico Office of the State Engineer (OSE);
- No fresh water wells are located within 1-mile of the Site according to OSE records;
- The nearest fresh water well is located about 7.4 miles east of the Site, in Unit C (NE/, NW/4), Section 35, Township 24 south, Range 34 East.

## **3.0 INVESTIGATION**

Initial samples were collected on September 1, 2015. LAI personnel used a Terraprobe® direct push rig to collect soil samples at four (4) locations (DP-1 through DP-4) to about 8 feet bgs. On September 28, 2015, additional samples were collected at DP-1 and DP-2 to delineate the vertical extent of chloride in soil. On October 16, 2015, Scarborough Drilling, Inc. (Scarborough) used an air rotary rig and jam tube sampler to collect samples about every 5 feet to 25 feet at location DP-1. Permian Basin Environmental

Lab (PBEL) in Midland, Texas, analyzed the upper sample (0 to 1 foot) for total petroleum hydrocarbons (TPH) by SW-846 method 8015 modified for gasoline (GRO) and diesel (DRO) components. All samples were analyzed for chloride by method 300. Table 1 presents the analytical data summary. Figure 3 presents the sample locations. Attachment A presents the laboratory report.

TPH was below the analytical method reporting limit (RL) and OCD recommended remediation action level (RRAL) of 5,000 mg/Kg. Chloride was delineated vertically to 250 milligrams per kilogram (mg/Kg) at locations DP-1 through DP-4. The highest chloride concentrations were reported in samples from DP-1 and DP-2 located closest to the origin. Chloride decreased in concentration below 250 mg/Kg between about 15 (DP-1) and 12 (DP-2) feet bgs.

Groundwater was not observed and the boring was plugged with bentonite. Soil boring logs were prepared according to the Unified Soil Classification System (USCS). Appendix B presents the boring logs.

#### 4.0 REMEDIATION

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

<b>Ranking Criteria</b>	<b>Result</b>	<b>Ranking Score</b>
Depth-to-Groundwater	>100 feet	0
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0
<b>Total Score:</b>		0

The remediation action level for TPH is 5,000 mg/kg.

The following conclusions are based on the OCD recommended remediation action level (RRAL):

- TPH are below the RRAL in all soil samples;
- Chloride was delineated vertically and horizontally to 250 mg/Kg.

The remediation plan included excavating soil to about 4 feet bgs west of the lease road and installing a 20 mil thickness polyethylene liner in the bottom of the excavation. The spill area east of the lease road was approved for excavating to about 1 foot bgs. The remediation plan was approved by the BLM on October 14, 2015.

Between September 25 and October 11, 2015, SDR Enterprises excavated approximately 740 cubic yards of soil which was disposed at Sundance Services, Inc, located east of Eunice, New Mexico. Topsoil was acquired near the location for backfilling the excavations. On November 4, 2015, SDR installed approximately 10,195 square feet of 20 mil thickness polyethylene liner in the bottom of the excavation

west of the lease road. Both excavations were backfilled with clean topsoil. Backfilling was approved by OCD and BLM on October 26, 2015 and October 28, 2015, respectively. On November 16, 2015, LAI seeded the remediation area with BLM #2 mix clean topsoil. Figure 4 presents the area of soil excavation and polyethylene liner based on global positioning system (GPS) measurements. Appendix C presents the regulatory communications. Appendix D presents photo documentation. Appendix E presents the initial and final form C-141.

## **5.0 RECOMMENDATION**

EOG requests no further action for the release and final closure approval.

## Table



Table 1  
Investigation Soil Sample Analytical Data Summary  
EOC Resources, Inc., Vaca Ridge 30 Fed Com #1 Flowline Spill  
UL G (SW/4, NE/4), Section 31, Township 24 South, Range 34 East  
Lea County, New Mexico  
1RP-3825

Sample	Depth (Feet)	Collection Date	C6 - C12 (mg/Kg)	>C12 - C28 (mg/kg)	>C28 - C35 (mg/Kg)	TPH (mg/kg)	Chloride (mg/kg)
OCD RRAL:							
DP-1	0 - 1	09/01/2015	<28.1	<28.1	<28.1	<28.1	7,140
	1 - 2	09/01/2015	--	--	--	--	3,690
	2 - 4	09/01/2015	--	--	--	--	5,450
	4 - 6	09/01/2015	--	--	--	--	8,080
	10	09/28/2015	--	--	--	--	4,370
	12	09/28/2015	--	--	--	--	24.9
	14	09/28/2015	--	--	--	--	5,240
	15	10/16/2015	--	--	--	--	298
	20	10/16/2015	--	--	--	--	<1.04
	25	10/16/2015	--	--	--	--	80.5
DP-2	0 - 1	09/01/2015	<27.5	<27.5	<27.5	<27.5	7,140
	1 - 2	09/01/2015	--	--	--	--	6,070
	2 - 4	09/01/2015	--	--	--	--	8,190
	4 - 6	09/01/2015	--	--	--	--	2,450
	6 - 8	09/01/2015	--	--	--	--	1,680
	10	09/28/2015	--	--	--	--	1,100
	12	09/28/2015	--	--	--	--	14.9
	14	09/28/2015	--	--	--	--	581
DP-3	0 - 1	09/01/2015	<26.6	<26.6	<26.6	<26.6	63.6
	1 - 2	09/01/2015	--	--	--	--	45.3
	2 - 4	09/01/2015	--	--	--	--	7.40

**Table 1**  
**Investigation Soil Sample Analytical Data Summary**  
**EOC Resources, Inc., Vaca Ridge 30 Fed Com #1 Flowline Spill**  
**UL G (SW/4, NE/4), Section 31, Township 24 South, Range 34 East**  
**Lea County, New Mexico**  
**1RP-3825**

	4 - 6	09/01/2015	--	--	--	--	--	13.9
<b>DP-4</b>	0 - 1	09/01/2015	<26.9	<26.9	<26.9	<26.9	<26.9	2,540
	1 - 2	09/01/2015	--	--	--	--	--	182
	2 - 4	09/01/2015	--	--	--	--	--	6.08

Notes: Laboratory analysis performed by Permian Basin Environmental Lab, Midland, Texas, by EPA SW-846 method 8015M (TPH) and 300.0 (chloride)  
 Depth in feet below ground surface (bgs)  
 mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)  
 RRAL: denotes Remediation Action Level calculated from OCD guidance document(August 13, 1993)

## Figures

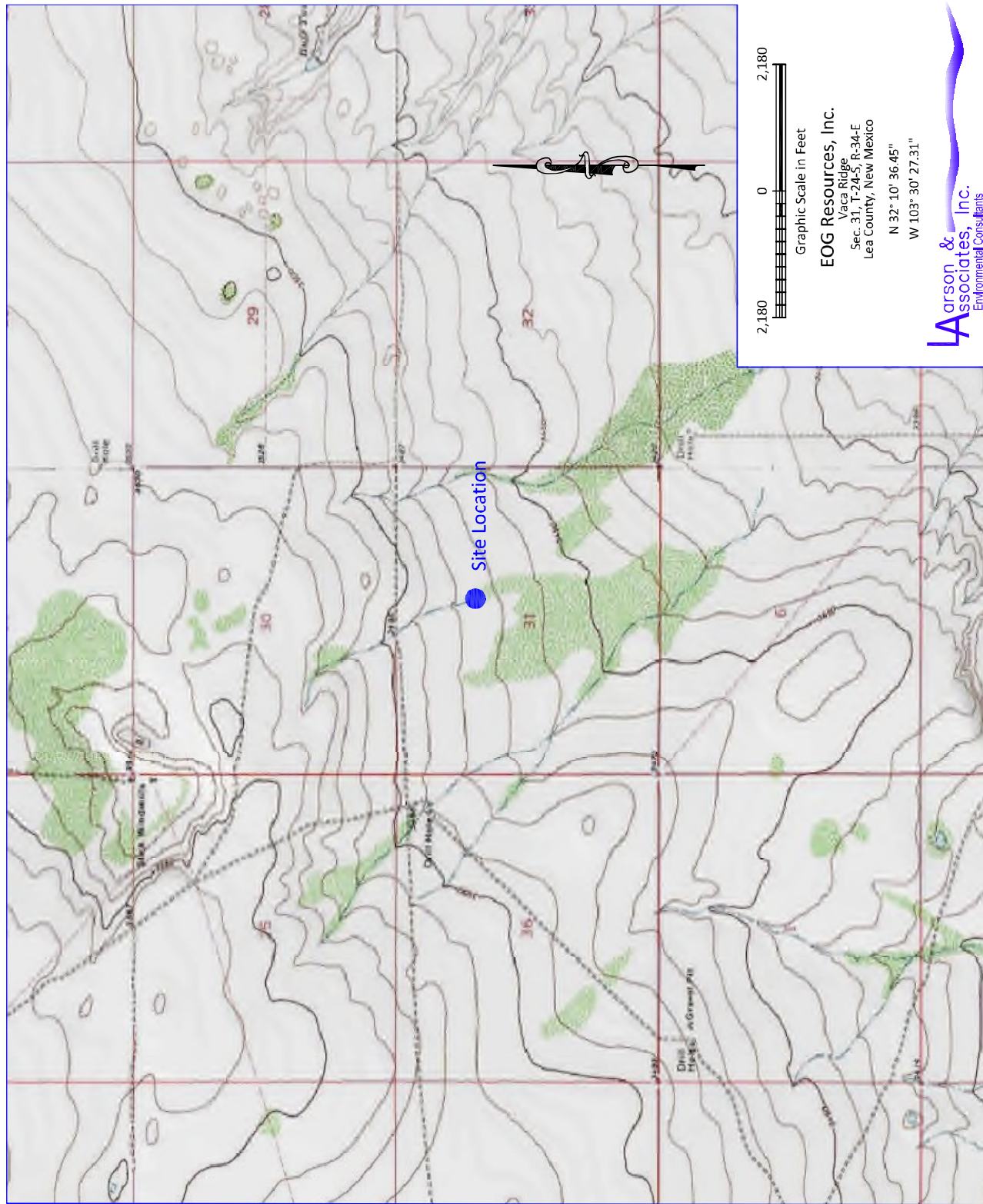


Figure 1 - Topographic Map





Figure 2 - Aerial Map

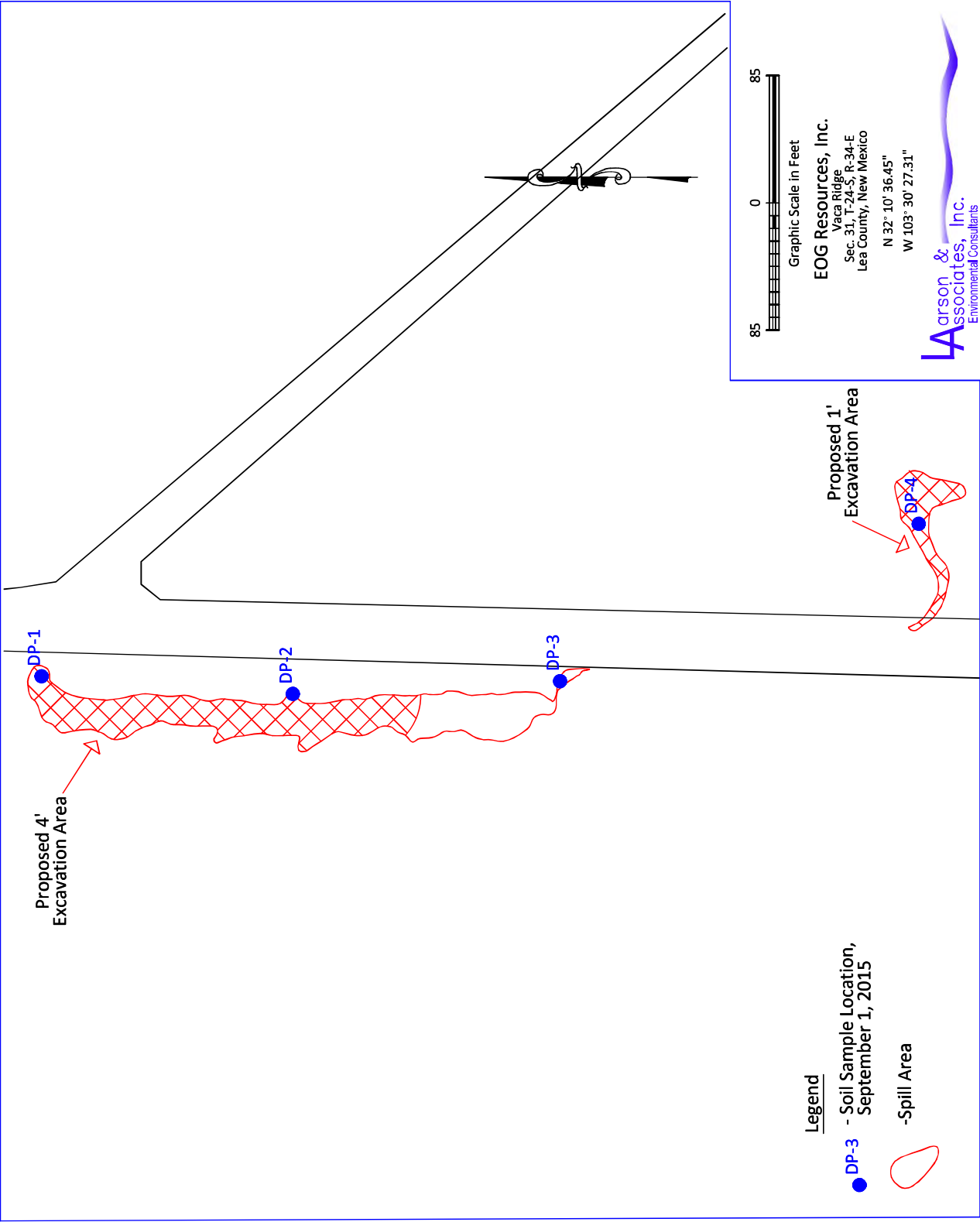


Figure 3 - Site Drawing

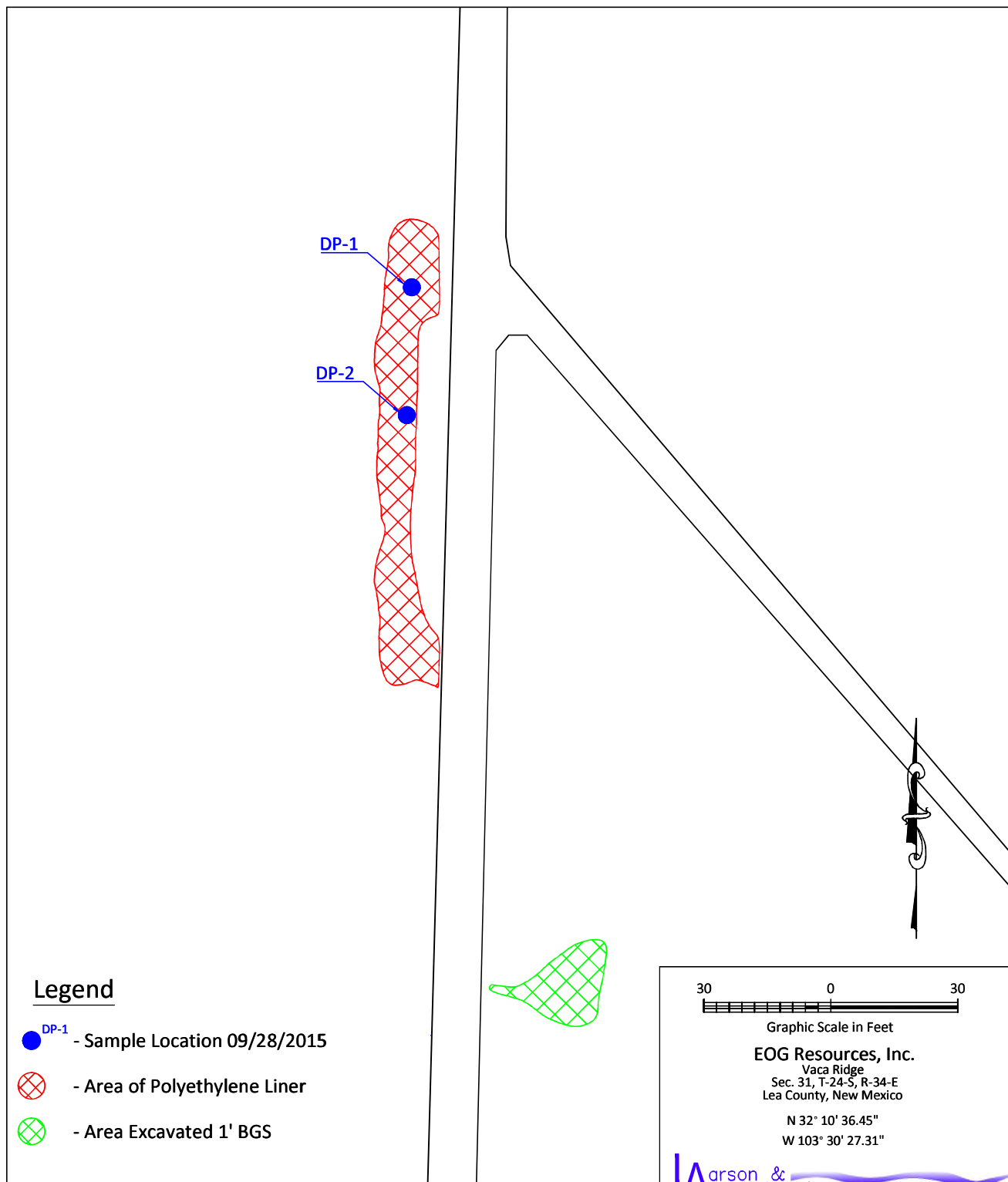


Figure 4 - Area of Polyethylene Liner

## **APPENDIX A**

### **Laboratory Reports**



**PERMIAN BASIN  
ENVIRONMENTAL LAB, LP  
10014 SCR 1213  
Midland, TX 79706**



## Analytical Report

**Prepared for:**

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Location: New Mexico  
Lab Order Number: 5129001



**NELAP/TCEQ # T104704156-13-3**

Report Date: 09/29/15

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-1 (10ft)	5I29001-01	Soil	09/28/15 11:00	09-28-2015 16:55
DP-1 (12ft)	5I29001-02	Soil	09/28/15 11:15	09-28-2015 16:55
DP-1 (14ft)	5I29001-03	Soil	09/28/15 11:30	09-28-2015 16:55
DP-2 (10ft)	5I29001-04	Soil	09/28/15 12:00	09-28-2015 16:55
DP-2 (12ft)	5I29001-05	Soil	09/28/15 12:15	09-28-2015 16:55
DP-2 (14ft)	5I29001-06	Soil	09/28/15 12:30	09-28-2015 16:55
DP-3 (1ft)	5I29001-07	Soil	09/28/15 12:45	09-28-2015 16:55
DP-4 (1ft)	5I29001-08	Soil	09/28/15 13:00	09-28-2015 16:55

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-1 (10ft)**  
**5129001-01 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

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

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>4370</b>	27.2	mg/kg dry	25	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>8.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-1 (12ft)**  
**5129001-02 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>24.9</b>	1.25	mg/kg dry	1	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>20.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-1 (14ft)**  
**5129001-03 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>5240</b>	28.1	mg/kg dry	25	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>11.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-2 (10ft)**  
**5129001-04 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>1100</b>	5.38	mg/kg dry	5	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>7.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-2 (12ft)**  
**5129001-05 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>14.9</b>	1.05	mg/kg dry	1	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>5.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-2 (14ft)**  
**5129001-06 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>581</b>	1.09	mg/kg dry	1	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>8.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	



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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-3 (1ft)**  
**5129001-07 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>4060</b>	27.2	mg/kg dry	25	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>8.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-4 (1ft)**  
**5129001-08 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>288</b>	1.09	mg/kg dry	1	P512906	09/29/15	09/29/15	EPA 300.0	
<b>% Moisture</b>	<b>8.0</b>	0.1	%	1	P512905	09/29/15	09/29/15	% calculation	

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**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	RPD	RPD Limit	Notes
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**Batch P5I2905 - \*\*\* DEFAULT PREP \*\*\***

<b>Blank (P5I2905-BLK1)</b>		Prepared & Analyzed: 09/29/15								
% Moisture	ND	0.1	%							
<b>Duplicate (P5I2905-DUP1)</b>		<b>Source: 5I28002-01</b>		Prepared & Analyzed: 09/29/15						
% Moisture	8.0	0.1	%		8.0			0.00	20	
<b>Duplicate (P5I2905-DUP2)</b>		<b>Source: 5I28015-03</b>		Prepared & Analyzed: 09/29/15						
% Moisture	4.0	0.1	%		3.0			28.6	20	

**Batch P5I2906 - \*\*\* DEFAULT PREP \*\*\***

<b>Blank (P5I2906-BLK1)</b>		Prepared & Analyzed: 09/29/15								
Chloride	ND	1.00	mg/kg wet							
<b>LCS (P5I2906-BS1)</b>		Prepared & Analyzed: 09/29/15								
Chloride	101	1.00	mg/kg wet	100		101	80-120			
<b>LCS Dup (P5I2906-BSD1)</b>		Prepared & Analyzed: 09/29/15								
Chloride	102	1.00	mg/kg wet	100		102	80-120	0.453	20	
<b>Duplicate (P5I2906-DUP1)</b>		<b>Source: 5I28002-04</b>		Prepared & Analyzed: 09/29/15						
Chloride	600	1.04	mg/kg dry		600			0.0122	20	
<b>Duplicate (P5I2906-DUP2)</b>		<b>Source: 5I28009-03</b>		Prepared & Analyzed: 09/29/15						
Chloride	ND	1.19	mg/kg dry		ND				20	
<b>Matrix Spike (P5I2906-MS1)</b>		<b>Source: 5I28002-04</b>		Prepared & Analyzed: 09/29/15						
Chloride	650	1.04	mg/kg dry	52.1	600	96.8	80-120			

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.*

10014 SCR 1213 Midland, TX 79706 432-686-7235

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

Project: Vaca Ridge 30  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

### Notes and Definitions

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

Report Approved By:



Date:

9/29/2015

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.

5I290061

CHAIN-OF-CUSTODY

**Varson & Associates, Inc.**  
Environmental Consultants

507 N. Mortenfeld, Ste. 200  
Midland, TX 79701  
432-687-0901

Data Reported to:

DATE: 9/28/2015  
PO #: 15-0148-01  
PROJECT LOCATION OR NAME: Vaca Ridge 30  
LAB PROJECT #: 15-0148-01

LAB WORK ORDER #: 30  
COLLECTOR: Seal Sussner

Page 13 of 13

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES	FIELD NOTES	
						HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/>	ICE			UNPRESERVED
21 DP-1 (104)	01	9/28/15	11:00	S	1					X		
22 DP-1 (124)			11:15									
23 DP-1 (144)			11:30									
24 DP-2 (104)	02		12:00									
25 DP-2 (124)			12:15									
26 DP-2 (144)			12:30									
27 DP-3 (144)	03		12:45									
28 DP-4 (144)	04		1:00									
TOTAL												
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						TURN AROUND TIME
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						NORMAL <input type="checkbox"/>
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						1 DAY <input type="checkbox"/>
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						2 DAY <input type="checkbox"/>
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						OTHER <input type="checkbox"/>
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						LABORATORY USE ONLY:
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						RECEIVING TEMP: <u>30°C</u> THERM #: <u>41</u>
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						CUSTODY SEALS - <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input type="checkbox"/> NOT USED
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						<input type="checkbox"/> CARRIER BILL #
RELINQUISHED BY: (Signature)						RECEIVED BY: (Signature)						<input type="checkbox"/> HAND DELIVERED

**PERMIAN BASIN  
ENVIRONMENTAL LAB, LP  
10014 SCR 1213  
Midland, TX 79706**



## Analytical Report

**Prepared for:**

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Location: Jal, NM  
Lab Order Number: 5J16012



**NELAP/TCEQ # T104704156-13-3**

Report Date: 10/23/15

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-1 15'	5J16012-01	Soil	10/16/15 10:36	10-16-2015 15:40
DP-1 20'	5J16012-02	Soil	10/16/15 10:40	10-16-2015 15:40
DP-1 25'	5J16012-03	Soil	10/16/15 10:46	10-16-2015 15:40

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-1 15'**  
**5J16012-01 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>298</b>	1.06	mg/kg dry	1	P5J2103	10/20/15	10/21/15	EPA 300.0	
<b>% Moisture</b>	<b>6.0</b>	0.1	%	1	P5J2001	10/20/15	10/20/15	% calculation	



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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-1 20'**  
**5J16012-02 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	ND	1.04	mg/kg dry	1	P5J2103	10/20/15	10/21/15	EPA 300.0	
% Moisture	4.0	0.1	%	1	P5J2001	10/20/15	10/20/15	% calculation	

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**DP-1 25'**  
**5J16012-03 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>80.5</b>	1.04	mg/kg dry	1	P5J2203	10/22/15	10/22/15	EPA 300.0	
<b>% Moisture</b>	<b>4.0</b>	0.1	%	1	P5J2301	10/23/15	10/23/15	% calculation	

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**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	RPD	RPD Limit	Notes
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**Batch P5J2001 - % Solids**

**Blank (P5J2001-BLK1)**

Prepared & Analyzed: 10/20/15

% Moisture ND 0.1 %

**Duplicate (P5J2001-DUP1)**

Source: 5J16012-02

Prepared & Analyzed: 10/20/15

% Moisture 4.0 0.1 % 4.0 0.00 20

**Batch P5J2103 - \*\*\* DEFAULT PREP \*\*\***

**Blank (P5J2103-BLK1)**

Prepared: 10/20/15 Analyzed: 10/21/15

Chloride ND 1.00 mg/kg wet

**LCS (P5J2103-BS1)**

Prepared: 10/20/15 Analyzed: 10/21/15

Chloride 100 1.00 mg/kg wet 100 100 80-120

**LCS Dup (P5J2103-BSD1)**

Prepared: 10/20/15 Analyzed: 10/21/15

Chloride 101 1.00 mg/kg wet 100 101 80-120 1.19 20

**Duplicate (P5J2103-DUP1)**

Source: 5J16011-02

Prepared: 10/20/15 Analyzed: 10/21/15

Chloride 440 1.09 mg/kg dry 436 1.12 20

**Duplicate (P5J2103-DUP2)**

Source: 5J20002-04

Prepared: 10/20/15 Analyzed: 10/21/15

Chloride 2390 6.10 mg/kg dry 2370 0.833 20

**Matrix Spike (P5J2103-MS1)**

Source: 5J16011-02

Prepared: 10/20/15 Analyzed: 10/21/15

Chloride 515 1.09 mg/kg dry 67.9 436 117 80-120

**Batch P5J2203 - \*\*\* DEFAULT PREP \*\*\***

**Blank (P5J2203-BLK1)**

Prepared & Analyzed: 10/22/15

Chloride ND 1.00 mg/kg wet

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**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 Limits	RPD	RPD Limit	Notes
<b>Batch P5J2203 - *** DEFAULT PREP ***</b>									
<b>LCS (P5J2203-BS1)</b>					Prepared & Analyzed: 10/22/15				
Chloride	116	1.00	mg/kg wet	100	116	80-120			
<b>LCS Dup (P5J2203-BSD1)</b>					Prepared & Analyzed: 10/22/15				
Chloride	116	1.00	mg/kg wet	100	116	80-120	0.00	20	
<b>Duplicate (P5J2203-DUP1)</b>					<b>Source: 5J20003-03</b> Prepared & Analyzed: 10/22/15				
Chloride	719	5.49	mg/kg dry		716		0.306	20	
<b>Duplicate (P5J2203-DUP2)</b>					<b>Source: 5J20002-27</b> Prepared & Analyzed: 10/22/15				
Chloride	254	1.05	mg/kg dry		257		1.19	20	
<b>Matrix Spike (P5J2203-MS1)</b>					<b>Source: 5J20003-03</b> Prepared & Analyzed: 10/22/15				
Chloride	854	5.49	mg/kg dry	110	716	125	80-120		QM-07

**Batch P5J2301 - % Solids**

<b>Blank (P5J2301-BLK1)</b>					Prepared & Analyzed: 10/23/15				
% Moisture	ND	0.1	%						
<b>Duplicate (P5J2301-DUP1)</b>					<b>Source: 5J22003-01</b> Prepared & Analyzed: 10/23/15				
% Moisture	10.0	0.1	%		9.0		10.5	20	
<b>Duplicate (P5J2301-DUP2)</b>					<b>Source: 5J22007-01</b> Prepared & Analyzed: 10/23/15				
% Moisture	7.0	0.1	%		7.0		0.00	20	
<b>Duplicate (P5J2301-DUP3)</b>					<b>Source: 5J22014-21</b> Prepared & Analyzed: 10/23/15				
% Moisture	8.0	0.1	%		9.0		11.8	20	

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

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

**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	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

**Batch P5J2301 - % Solids**

**Duplicate (P5J2301-DUP4)**

**Source: 5J22017-01**

Prepared & Analyzed: 10/23/15

% Moisture	8.0	0.1	%		7.0			13.3	20	
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Larson & Associates, Inc.  
P.O. Box 50685  
Midland TX, 79710

Project: Vaca Ridge  
Project Number: 15-0148-01  
Project Manager: Mark Larson

Fax: (432) 687-0456

### Notes and Definitions

QM-07     The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

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

Report Approved By:



Date:

10/23/2015

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.



## CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Permian Basin Environmental Lab, LP  
10014 S. County Road 1213  
Midland, Texas 79706

Phone: 432-686-7235

Project Manager:

Kimberly Hufbauer

Project Name:

Yaca Ridge

Company Name:

Larsen and Associates

Project #:

15-0148-01

Company Address:

Project Loc:

Jed, NM

City/State/Zip:

PO #:

Telephone No:

432 519 9103

Fax No:

Report Format:

☐ Standard☐ TRRP☐ NPDES

Sampler Signature:

Kimberly Hufbauer

e-mail:

Kimberly.Hufbauer@pbblab.com

(lab use only)

ORDER #:

53110003

LAB # (lab use only)

FIELD CODE

Beginning Depth

Ending Depth

Date Sampled

Time Sampled

Field Filtered

Total #. of Containers

Ice

HNO<sub>3</sub>

HCl

H<sub>2</sub>SO<sub>4</sub>

NaOH

Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

None

Other (Specify)

DW=Drinking Water SL=Sludge

GW=Groundwater S=Soil/Solid

NP=Non-Potable Specify Other

TPH: 418.1 8015M 8015B

TPH: TX 1005 TX 1006

Cations (Ca, Mg, Na, K)

Anions SO<sub>4</sub>, Alkalinity

SAR / ESP / CEC

Metals: As Ag Ba Cd Cr Pb Hg Se

Volatiles

Semivolatiles

BTEX 8021B/8030 or BTEX 8260

RCI

N.O.R.M.

HOLD

XXXXX

XXXXX

XXXXX

RUSH TAT (Pre-Schedule) 24, 48, 72 hrs

Standard TAT

Special Instructions:

Kimberly Hufbauer

\* 10-16-15 DP-1 25 FT - 40 FT

Received by:

Received by:

Received by:

Received by:

Received by:

Received by:

Received by:

Received by:

Received by:

Received by:

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Received by:

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Received by PBEL:

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Received by:

Received by:

Received by:

Received by:

Received by:

Received by:

Laboratory Comments:

Sample Containers: Inter?

VOCs Free of Headspace?

Labels on container(s)

Custody seals on container(s)

Custody seals on cooler(s)

Sample Hand Delivered

By Sampler/Client Rep?

Temperature Upon Receipt

Ad used:

Factor

## **APPENDIX B**

### **Boring Log**



Boring Record																				
Geolog. Unit	Depth (Feet) (1"=5')	Lithologic Description  Start: 10:25 Stop: 11:12	Unified Soil Classification	Graphic Log	PID READING PPM X 1											SAMPLE		REMARKS		
																NUMBER	RECOVERY	DEPTH	BACKGROUND PID READING	
					2	4	6	8	10	12	14	16	18	AIR: 0 PPM	SOIL: 0 PPM					
		Excavated to 4'																		
	5	Calichi 7.5YR8/2 Pinkish White Fine - coarse grains Poorly Sorted, Sub rounded Quartz sand Indurated	Calichi												NR	14				
	10														2	15		10:36		
	15																			
	20	Sand 5YR5/4, Reddish Brown, Very Fine Grained, Well Sorted, Rounded Quartz Sand	SM												NR	19				
	25														2	20		10:40		
	30	Sand 10YR6/2, Light Brownish Gray, Very Fine Grained, Well Sorted, Rounded Quartz Sand													NR	24				
	35	Silt 5YR4/6, Yellowish Red, Chunks of Clay													3	25		10:46		
	40																			
	45	Chunks of Indurated Sand, GLEI 6/1 Greenish Gray Fine - Medium Grains Round - Subrounded Moderately Sorted	ML												NR	29				
	50	Sand/Silt 5YR4/6, Fine to Coarse Grains, Poorly Sorted, Sub-rounded Chunks of Clay TD: 40' No Water Observed													4	30		10:55		
																34				
																35		11:01		
																		11:12		

ONE CONTINUOUS AUGER SAMPLER	WATER TABLE ( TIME OF BORING )	JOB NUMBER : Vaca Ridge, 15-0148-01
STANDARD PENETRATION TEST	LABORATORY TEST LOCATION	HOLE DIAMETER : 5"
UNDISTURBED SAMPLE	PENETROMETER (TONS/ SQ. FT )	LOCATION : Jal, NM
WATER TABLE ( 24 HRS )	NR NO RECOVERY	LAI GEOLOGIST : KH
		DRILLING CONTRACTOR : SDC
DRILL DATE : 10-16-15	BORING NUMBER : DP-1	DRILLING METHOD : Jam Tube

## **APPENDIX C**

### **Regulatory Communications**

**Mark Larson**

---

**From:** Jones, Kellie, EMNRD [Kellie.Jones@state.nm.us]  
**Sent:** Tuesday, September 29, 2015 4:55 PM  
**To:** Mark Larson  
**Cc:** Keyes, Jamie, EMNRD; Zane\_Kurtz@eogresources.com; Tucker, Shelly  
**Subject:** FW: 1RP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD Spill Investigation Summary and Remediation Plan Approval Request  
**Attachments:** EOG Resources, Vaca Ridge 30 Fed Com #1 Produced Water Release Draft Investigation Summary, September 17, 2015.pdf

Mark,

The OCD approves the work plan. Please ensure BLM approval/concurrence.

Thank you!

Kellie Jones  
Environmental Specialist, District 1  
Oil Conservation Division, EMNRD  
575-393-6161 ext. 111  
575-370-3180 (emergency-cell)  
E-Mail: [kellie.jones@state.nm.us](mailto:kellie.jones@state.nm.us)

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

**From:** Mark Larson (<mailto:Mark@laenvironmental.com>)  
**Sent:** Wednesday, September 23, 2015 4:03 PM  
**To:** Jones, Kellie, EMNRD; Oberding, Tomas, EMNRD  
**Cc:** Zane Kurtz  
**Subject:** Re: 1RP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD Spill Investigation Summary and Remediation Plan Approval Request

Dear Kellie,  
Thank you for taking time this morning to meet and discuss the investigation summary and remediation plan for the above referenced spill. As requested during the meeting I would appreciate written approval prior to commencing remediation which is scheduled for Friday, September 25, 2015. Please contact me if you have questions.  
Sincerely,

Mark J. Larson, P.G.  
President/Sr. Project Manager  
507 N. Marienfeld St., Suite 205  
Midland, Texas 79701  
(432) 687-0901 ( O )  
(432) 556-8656 ( C )



Celebrating 15 Years in Business!

--  
This message has been scanned for viruses and dangerous content by [MailScanner](#), and is believed to be clean.

**Mark Larson**

---

From: Tucker, Shelly [stucker@blm.gov]  
Sent: Wednesday, October 14, 2015 12:16 PM  
To: Jones, Kellie, EMNRD  
Cc: Mark Larson; Keyes, Jamie, EMNRD; Zane, Kurtz@eogresources.com  
Subject: Re: FW: 1RP-3825 - EOIG Resources Vaca Ridge Fed Com #1 SWD Spill Investigation Summary and Remediation Plan Approval Request

Zane,

I am so sorry....I thought I had already approved this plan....

The BLM accepts/approves your submitted proposal.

The BLM approval/acceptance does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment or if the location fails to reclaim properly. In such an event that the location does not revegetate, or future issues with contaminants are encountered, the operator will be asked to address the issues until the contaminant issues are fully mitigated and the location is successfully reclaimed. In addition, BLM approval does not relieve the operator of responsibility for compliance with any other federal, state or local laws/regulations.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

*Shelly J Tucker*

Environmental Protection Specialist  
Bureau of Land Management

620 E. Greene St  
Carlsbad, NM 88220

575.234.5905 - Direct  
575.361.0084 - Cellular

[stucker@blm.gov](mailto:stucker@blm.gov)



On Tue, Sep 29, 2015 at 3:55 PM, Jones, Kellie, EMNRD <[Kellie.Jones@state.nm.us](mailto:Kellie.Jones@state.nm.us)> wrote:

Mark,

The OCD approves the work plan. Please ensure BLM approval/concurrence.

Thank you!

Kellie Jones

Environmental Specialist, District 1

Oil Conservation Division, EMNRD

575-393-6161 ext. 111

575-370-3180 (emergency-cell)

E-Mail: [kellie.jones@state.nm.us](mailto:kellie.jones@state.nm.us)

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

---

**Mark Larson**

**From:** Jones, Kellie, EMNRD [Kellie.Jones@state.nm.us]  
**Sent:** Monday, October 26, 2015 8:33 AM  
**To:** Mark Larson; stucker@blm.gov; Zane Kurtz  
**Cc:** Keyes, Jamie, EMNRD  
**Subject:** RE: 1RP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD and 1RP-3844 - EOG Diamond 31 Fed #2 SWD Spill Investigation Summary and Remediation Plan Approval Request

Mark,

Good morning.

For Vaca Ridge, permission to back fill is granted. Please ensure BLM approval/concurrence.

For Diamond 31, please note that the sample(s) taken at the stockpile should be discrete rather than composite. Permission to back fill is granted. Please ensure BLM approval/concurrence.

Thanks,

Kellie Jones  
Environmental Specialist, District 1  
Oil Conservation Division, EMNRD  
575-393-6161 ext. 111  
575-370-3180 (emergency-cell)  
E-Mail: [kellie.jones@state.nm.us](mailto:kellie.jones@state.nm.us)

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

---

**From:** Mark Larson [mailto:Mark@laenvironmental.com]  
**Sent:** Friday, October 23, 2015 4:22 PM  
**To:** Jones, Kellie, EMNRD; stucker@blm.gov; Zane Kurtz  
**Subject:** FW: 1RP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD and 1RP-3844 - EOG Diamond 31 Fed #2 SWD Spill Investigation Summary and Remediation Plan Approval Request

Kellie,  
The attached data tables present the vertical chloride results of soil samples collected from locations DP-3 (1RP-3825) and DP-4 (1RP-3844). The chloride concentrations in soil from 20 and 25 feet below ground surface at DP-3 (1RP-3825) and DP-4 (1RP-3844) are below 250 mg/Kg, therefore, your approval to install the liner, backfill and seed is requested? Soil will be excavated to about 1 foot from the area where soil was stockpiled (Diamond 31 Fed #2 SWD) and disposed. Another composite sample will be collected and analyzed for TPH and chloride. I will forward these results when received from the lab. Please do not hesitate to call Zane Kurtz or me if you have questions.  
Mark Larson

---

**From:** Mark Larson  
**Sent:** Friday, October 23, 2015 4:53 PM  
**To:** 'Jones, Kellie, EMNRD'  
**Cc:** 'Zane Kurtz'  
**Subject:** Re: 1RP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD and 1RP-3844 - EOG Diamond 31 Fed #2 SWD Spill Investigation Summary and Remediation Plan Approval Request

Kellie,  
Soil was excavated to 4 feet. The site was too wet to move in a drilling rig at DP-1 (chloride) until last Friday, October 16, 2015, at which time we collected the vertical samples. The laboratory reported chloride at 298 mg/Kg (15 feet) and <1.04 mg/Kg (20 feet). I'm expecting to have the results this afternoon for the sample from 25 feet. If the analytical result is similar to 20 feet we should be good for installing the liner, backfill and seed next week assuming the weather holds. I will issue this final report after seeding has occurred.

This is the similar for the Diamond 31 Fed. #2 SWD spill (1RP-3844). Soil has been excavated to 4 feet and vertical samples were collected at DP-4 on Friday, October 16, 2015. The lab reported chloride at 413 mg/Kg (15 feet), 436 mg/Kg (20 feet) and 217 mg/Kg (25 feet). I'm expecting the lab results this afternoon for the sample from 30 feet. If the result is similar to or lower than 217 mg/Kg we should be ready to install the liner, backfill and seed. At your request, a composite sample was collected from the location where soil from the spill was piles on the ground. This soil has been hauled to disposal but the residual TPH and chloride concentrations at 0.5 feet is 7,668 mg/Kg and 650 mg/Kg, respectively. I will recommend to EOG to excavate soil from this area (about 20' x 20') to about 1 foot bgs. I will forward the results and request approval to backfill if the results are acceptable to OCD? Please contact Zane Kurtz or me if you have questions.

Sincerely,  
Mark Larson

---

**From:** Jones, Kellie, EMNRD [mailto:Kellie.Jones@state.nm.us]  
**Sent:** Friday, October 23, 2015 3:45 PM  
**To:** Tucker, Shelly  
**Cc:** Mark Larson; Keyes, Jamie, EMNRD; [Zane\\_Kurtz@eogresources.com](mailto:Zane_Kurtz@eogresources.com)  
**Subject:** RE: 1RP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD Spill Investigation Summary and Remediation Plan Approval Request

The last information that I have on this was the Investigation summary that was submitted 17 Sept 15.

Kellie Jones  
Environmental Specialist, District 1  
Oil Conservation Division, EMNRD  
575-393-6161 ext. 111  
575-370-3180 (emergency-cell)  
E-Mail: [kellie.jones@state.nm.us](mailto:kellie.jones@state.nm.us)



OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

From: Tucker, Shelly [<mailto:stucker@blm.gov>]

Sent: Friday, October 23, 2015 2:41 PM

To: Jones, Kellie, EMNRD

Cc: Mark Larson; Keyes, Jamie, EMNRD; [Zane\\_Kurtz@eogresources.com](mailto:Zane_Kurtz@eogresources.com)

Subject: Re: FW: IRP-3825 - EDG Resources Vaca Ridge Fed Com #1 SWD Spill Investigation Summary and Remediation Plan Approval Request

I was checking on the status of this site.

The BLM approval/acceptance does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment or if the location fails to reclaim properly. In such an event that the location does not revegetate, or future issues with contaminants are encountered, the operator will be asked to address the issues until the contaminant issues are fully mitigated and the location is successfully reclaimed. In addition, BLM approval does not relieve the operator of responsibility for compliance with any other federal, state or local laws/regulations.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

*Shelly J Tucker*

Environmental Protection Specialist  
Bureau of Land Management

620 E. Greene St  
Carlsbad, NM 88220

575.234.5905 - Direct  
575.361.0084 - Cellular

[stucker@blm.gov](mailto:stucker@blm.gov)



On Wed, Oct 14, 2015 at 11:18 AM, Tucker, Shelly <[stucker@blm.gov](mailto:stucker@blm.gov)> wrote:

Zane,

I am so sorry...I thought I had already approved this plan....

The BLM accepts/approves your submitted proposal.

The BLM approval/acceptance does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that may pose a threat to groundwater, surface water, human health or the environment or if the location fails to reclaim properly. In such an event that the location does not revegetate, or future issues with contaminants are encountered, the operator will be asked to address the issues until the contaminant issues are fully mitigated and the location is successfully reclaimed. In addition, BLM approval does not relieve the operator of responsibility for compliance with any other federal, state or local laws/regulations.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

*Shelly J Tucker*

Environmental Protection Specialist  
Bureau of Land Management

620 E. Greene St  
Carlsbad, NM 88220

575.234.5905 - Direct  
575.361.0084 - Cellular

[stucker@blm.gov](mailto:stucker@blm.gov)



On Tue, Sep 29, 2015 at 3:55 PM, Jones, Kellie, EMNRD <[Kellie.Jones@state.nm.us](mailto:Kellie.Jones@state.nm.us)> wrote:

Mark,

The OCD approves the work plan. Please ensure BLM approval/concurrence.

Thank you!

Kellie Jones

Environmental Specialist, District 1

Oil Conservation Division, EMNRD

575-393-6161 ext 111

575-370-3180 (emergency-cell)

E-Mail: [kellie.jones@state.nm.us](mailto:kellie.jones@state.nm.us)

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

**From:** Mark Larson [mailto:[Mark@laenvironmental.com](mailto:Mark@laenvironmental.com)]

**Sent:** Wednesday, September 23, 2015 4:03 PM

**To:** Jones, Kellie, EMNRD; Oberding, Tomas, EMNRD

**Cc:** Zane Kurtz

**Subject:** Re: IIRP-3825 - EOG Resources Vaca Ridge Fed Com #1 SWD Spill Investigation Summary and Remediation Plan Approval Request

Dear Kellie,

Thank you for taking time this morning to meet and discuss the investigation summary and remediation plan for the above referenced spill. As requested during the meeting I would appreciate written approval prior to commencing remediation which is scheduled for Friday, September 25, 2015. Please contact me if you have questions.

Sincerely,

Mark J. Larson, P.G.

President/Sr. Project Manager

507 N. Marienfeld St., Suite 205

Midland, Texas 79701

(432) 687-0901 ( O )

(432) 556-8656 ( C )



## **APPENDIX D**

### **Photographs**





Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing Southwest, September 28, 2015



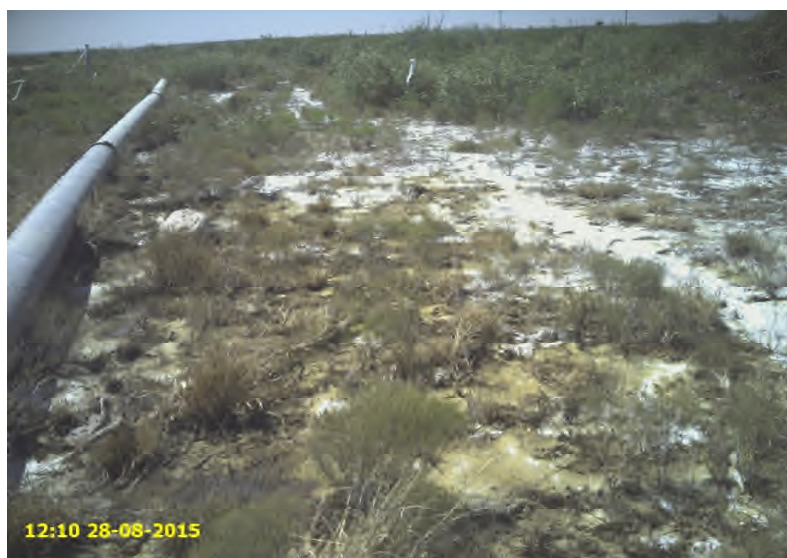
Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing West, September 28, 2015



Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing East, September 28, 2015



Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing South, September 28, 2015



Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing South, September 28, 2015



Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing Southwest, September 28, 2015





Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing Southeast, September 28, 2015



Vaca Ridge 30 Fed Com #1 Poly Line Produced Water Spill, Viewing Southeast, September 28, 2015

## **APPENDIX E**

### **Initial and Final C-141**

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

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

**RECEIVED**

By OCD District 1 at 3:29 pm, Aug 28, 2015

Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

**Release Notification and Corrective Action**

**OPERATOR**

☒ Initial Report ☐ Final Report

EOG Resources, Inc.	Contact Zane Kurtz
Address 5509 Champions Drive, Midland, TX 79706	Telephone No. 432-425-2023
Facility Name Vaca Ridge 30 Fed Com #1 poly line	Facility Type Salt Water Disposal water line
Surface Owner EOG	Mineral Owner EOG Resources
API No. 30-025-28873	

**LOCATION OF RELEASE**

Unit Letter G	Section 31	Township 24S	Range 34E	Feet from the 1471	North/South Line N	Feet from the 2184	East/West Line E	County Lea
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Latitude 32.17727 Longitude -103.50748

**NATURE OF RELEASE**

Type of Release Produced Water	Volume of Release 40 bbls	Volume Recovered 15bbls
Source of Release: weak spot in flow line	Date and Hour of Occurrence 8/26/2015	Date and Hour of Discovery 8/26/2015
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. N/A	

If a Watercourse was Impacted, Describe Fully.\*

**APPROVED**

By OCD District 1 at 3:29 pm, Aug 28, 2015

**Describe Cause of Problem and Remedial Action Taken \***

Weak spot in poly flow line caused release of 40bbls produce water alongside lease road. 15bbls recovered by vac truck upon discovery. 3<sup>rd</sup> party consultant will travel to site to delineate horizontal and vertical impacts. A work plan will be prepared to remediate impacted area. Work plan will include excavation of impacted material with direction to use poly liner prior to proper disposal at Sundance disposal in Eunice, NM. Clean backfill will be used once final clearance is granted.

**Describe Area Affected and Cleanup Action Taken.\***

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules 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 relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health 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.

**OIL CONSERVATION DIVISION**

Signature:

Printed Name: Zane Kurtz, EOG Resources

Title: Sr. Environmental Rep.

E-mail Address: zane\_kurtz@egoresources.com

Date: 8-27-2015

Phone: 432-425-2023

Approved by Environmental Specialist:

Approval Date: 08/28/2015

Expiration Date: 10/28/2015

Conditions of Approval:  
Discrete site samples required. Delineate and  
remediate per NMOCD guidelines.

Attached ☐  
1 RP 3825

Geotagged photos of remediation required.  
Ensure BLM concurrence/approval.

pjXK1524055673

njXK1524055566

\* Attach Additional Sheets If Necessary

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

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

Form C-141  
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in  
accordance with 19.15.29 NMAC.

**Release Notification and Corrective Action**

**OPERATOR**

☐ Initial Report ☒ Final Report



Name of Company EOG Resources, Inc.	Contact Zane Kurtz	
Address 5509 Champions Drive, Midland, TX 79706	Telephone No. 432-425-2023	
Facility Name Vaca Ridge 30 Fed Com #1 poly line	Facility Type salt Water Disposal water line	
Surface Owner EOG	Mineral Owner EOG Resources	API No. 30-025-28873

**LOCATION OF RELEASE**

Unit Letter J	Section 31	Township 24S	Range 34E	Feet from the 1471	North/South Line N	Feet from the 2184	East/West Line E	County Lea
------------------	---------------	-----------------	--------------	-----------------------	-----------------------	-----------------------	---------------------	---------------

**Latitude** 32.17727 **Longitude** -103.50748

**NATURE OF RELEASE**

Type of Release Produced Water	Volume of Release 40 bbls	Volume Recovered 15 bbls
Source of Release: Weak spot in flow line	Date and Hour of Occurrence 8/26/2015	Date and Hour of Discovery 8/26/2015
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? N/A	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse. N/A	
If a Watercourse was Impacted, Describe Fully.* N/A		
Describe Cause of Problem and Remedial Action Taken.* Weak spot in poly flow line caused release of 40bbls of produced water alongside lease road. 15bbls recovered by vac truck upon discovery. OCD issued remediation project number IRP-3825.		
Describe Area Affected and Cleanup Action Taken.* Larson and Associates, Inc. collected samples from the site which delineated horizontal and vertical impacts. Benzene and total BTEX, and TPH were reported below the RL in soil samples at 0-1 feet bgs. Chloride was delineated vertically to 250 milligrams per kilogram (mg/Kg) at locations DP-1 through DP-4. Chloride decreased in concentration below 250 mg/Kg between about 15 (DP-1) and 12 (DP-2) feet bgs. Groundwater was not observed. Impacted material was excavated to 4 feet bgs and a polyethylene liner was placed at the bottom of the excavation. Clean topsoil was used to backfill the location. Impacted soil was disposed at Lea Land Landfill in Hobbs, NM.		
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOC rules 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 NMOC marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOC 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.		
Signature: 	1RP-3825 <u>OIL CONSERVATION DIVISION</u>	
Printed Name: Zane Kurtz, EOG Resources	Approved by Environmental Specialist: 	
Title: Sr. Environmental Rep.	Approval Date: 01/13/2016	Expiration Date: ///
E-mail Address: zane_kurtz@eogresources.com	Conditions of Approval: ///	Attached <input type="checkbox"/>
Date: 12-18-2015 Phone: 432-425-2023		

\* Attach Additional Sheets If Necessary