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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, Diamond 31 Fed Com #1 SWD Spill, Lea County, New Mexico, December 22, 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

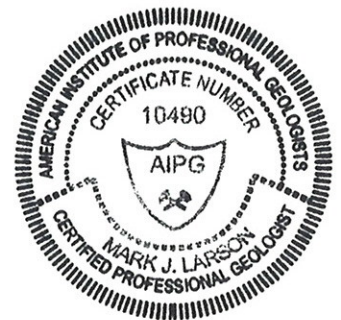
Closure Report
Diamond 31 Fed Com #1 SWD Spill
Lea County, New Mexico
1RP-3844

LAI Project No. 15-0150-01

December 22, 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



Kimberly M. Huckaba
Staff Geologist

Mark J. Larson, PG
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 produced water spill at the Diamond 31 Fed Com #1 SWD, in Lea County, New Mexico. The spill occurred after lightning struck tanks at the Diamond 31 Fed Com #1 SWD (Site), on August 28, 2015. A fire ensued causing approximately 1,560 barrels (bbl) of produced water to be released inside the lined steel containment. Approximately 10 bbl of produced water escaped and flowed east of containment.

On September 4, 2015 LAI personnel used a Terraprobe® direct push rig to collect soil samples at four (4) locations (DP-1 through DP-4) between approximately 4 and 14 feet below ground surface (bgs). An air rotary rig and jam tube sampler were used to collect samples for chloride delineation at location DP-3. Samples from 0 to 1 foot 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) as well as the 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.

Between August 28 and October 13, 2015, SDR Enterprises, Inc. (SDR), excavated soil to about 4 feet bgs. Approximately 1,885 cubic yards of soil was disposed at Lea Land, LLC. On November 4, 2015, SDR installed approximately 5,160 square feet of 20 mil thickness polyethylene liner in the bottom of the 4 foot excavation. Soil was excavated to 2 feet bgs at the location of a soil pile. Soil was excavated to about 1 foot bgs in the area of a former soil pile and hauled to Lea Land Landfill, LLC. The excavations were backfilled with clean topsoil acquired from Lea Land, LLC. On November 16, 2015 LAI seeded the remediation area with BLM mix #2.

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

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 at the Diamond 31 Fed Com #1 SWD, in Lea County, New Mexico. The spill occurred on August 28, 2015, after lightening struck the tanks causing a fire. EOG submitted an initial C-141 on September 8, 2015 and notified the surface owner (U.S. Bureau of Land Management). The OCD assigned remediation project number 1RP- 3844 to the spill. The Site is located in Unit G (NE/4, SW/4) of Section 31, Township 24 South, Range 34 East. The geodetic position is north 32° 10' 19.82" and west 103° 30' 37.96". Figure 1 presents a location and topographic map. Figure 2 presents an aerial map.

2.1 Background

The spill occurred on August 28, 2015, due to lightning striking the tank battery causing a fire. The estimated volume of the spill was 1,570 barrels (bbl) with about 1,560 bbl captured within the lined steel containment and recovered. Approximately 10 bbl of produced water escaped and flowed east of the containment. The spill covered an area measuring about 5,100 square feet.

2.2 Setting

The setting is as follows:

- The surface elevation is about 3,455 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 located about 1,050 feet southwest of the Site;
- The soils are designated as "Berino-Cacique loamy fine sands association", consisting of loamy fine sand to about 05 feet bgs and sandy clay loam to about 5 feet bgs, derived from reworking the Blackwater Draw (Pleistocene) and Ogallala (Pliocene) formations, in descending order;
- 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

3.1 Soil Samples

Soil samples were collected on September 4, 2015. LAI personnel used a direct push rig to collect samples at four (4) locations (DP-1 through DP-4) between approximately 6 and 8 feet bgs. 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 in order to delineate chloride at DP-3. 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.

On October 26, 2015, LAI personnel collected 5 discrete soil samples (SP-1 through SP-5) from the area where soil was stockpiled from the initial response. The TPH concentration was 3,920 mg/Kg in SP-4 and above the RRAL. Chloride was below 250 mg/Kg. Soil was excavated from the area measuring about 20 by 20 feet to a depth of 1 foot. The soil was hauled to Lea Land Landfill.

Referring to table 1, 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.

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

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:

<i>Ranking Criteria</i>	<i>Result</i>	<i>Ranking Score</i>
Depth-to-Groundwater	>100 feet	0
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0
Total Score:		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 was approved by OCD and BLM (September 29, 2015) that included excavating soil to about 4 feet bgs and installing a 20 mil thickness polyethylene liner in the bottom of the excavation. OCD also requested soil exaction to about 2 feet bgs from the area where soil was previously stockpiled.

Between August 28 and October 13, 2015, SDR Enterprises excavated approximately 1,885 cubic yards of soil which was disposed at Lea Land, LLC, located between Hobbs and Carlsbad, New Mexico. Clean topsoil was hauled back from Lea Land, LLC for backfilling the excavations. On October 27, 2015, SDR installed approximately 5,160 square feet of 20 mil thickness polyethylene liner in the bottom of the

excavation east of the containment. The excavation above the liner was backfilled with clean topsoil. Backfilling was approved by OCD and BLM on October 26, 2015. 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. 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 and Remediation Soil Sample Analytical Data Summary
EOC Resources, Inc., Diamond 31 Fed Com #1 Tank Battery Spill
UL G (SW/4, NE/4), Section 31, Township 24 South, Range 34 East
Lea County, New Mexico
1RP-3844

Sample	Depth (Feet)	Collection Date	Status	C6 - C12 (mg/Kg)	>C12 - C28 (mg/Kg)	>C28 - C35 (mg/Kg)	TPH (mg/kg)	Chloride (mg/Kg)
OCD RRAL: 5,000								
DP-1	0 - 1	09/04/2015	Excavated	<27.2	593	117	710	3,090
	1 - 2	09/04/2015	Excavated	--	--	--	--	194
	2 - 4	09/04/2015	Excavated	--	--	--	--	1,100
	4 - 6	09/04/2015	In-Situ	--	--	--	--	1,830
DP-2	0 - 1	09/04/2015	Excavated	<26.0	42.0	<26.0	42.0	189
	1 - 2	09/04/2015	Excavated	--	--	--	--	97.6
	2 - 4	09/04/2015	Excavated	--	--	--	--	697
	4 - 6	09/04/2015	In-Situ	--	--	--	--	3,930
DP-3	0 - 1	09/04/2015	Excavated	<26.0	58.0	<26.0	58.0	2,160
	1 - 2	09/04/2015	Excavated	--	--	--	--	424
	2 - 4	09/04/2015	Excavated	--	--	--	--	3,040
	4 - 6	09/04/2015	In-Situ	--	--	--	--	6,190
	6 - 7	09/04/2015	In-Situ	--	--	--	--	6,690
	10	10/16/2015	In-Situ	--	--	--	--	
	15	10/16/2015	In-Situ	--	--	--	--	436
	20	10/16/2015	In-Situ	--	--	--	--	217
	25	10/16/2015	In-Situ	--	--	--	--	97.3
DP-4	0 - 1	09/04/2015	Excavated	<27.2	<27.2	<27.2	<27.2	6,650
	1 - 2	09/04/2015	Excavated	--	--	--	--	2,210
	2 - 4	09/04/2015	Excavated	--	--	--	--	28.5
	4 - 6	09/04/2015	In-Situ	--	--	--	--	5,000
	6 - 8	09/04/2015	In-Situ	--	--	--	--	3,000
	10	09/04/2015	In-Situ	--	--	--	--	413
Soil Pile								
SP1		09/04/2015	Disposed	3,310	23,300	3,890	30,500	5,570

Table 1

Investigation and Remediation Soil Sample Analytical Data Summary
 EOC Resources, Inc., Diamond 31 Fed Com #1 Tank Battery Spill
 UL G (SW/4, NE/4), Section 31, Township 24 South, Range 34 East
 Lea County, New Mexico
 1RP-3844

Soil Beneath Pile (Soil Excavated to Approximately 1 Foot and Disposed)									
SP-1	1.0 - 1.5	10/26/2015	In-Situ	<26.0	<26.0	<26.0	<26.0	<26.0	211
SP-2	1.0 - 1.5	10/26/2015	In-Situ	<26.3	<26.3	<26.3	<26.3	<26.3	<1.05
SP-3	1.0 - 1.5	10/26/2015	In-Situ	<26.0	<26.0	<26.0	<26.0	<26.0	<1.04
SP-4	1.0 - 1.5	10/26/2015	In-Situ	555	2,910	455	3,920	3,920	12.8
SP-5	1.0 - 1.5	10/26/2015	In-Situ	106	<26.3	40.6	40.6	40.6	106

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: Recommended Remediation Action Level (RRAL) calculated from OCD guidance document (August 13, 1993)

Bold and highlighted denotes concentration greater than OCD Recommended Remediation Action Level (RRAL)

Figures

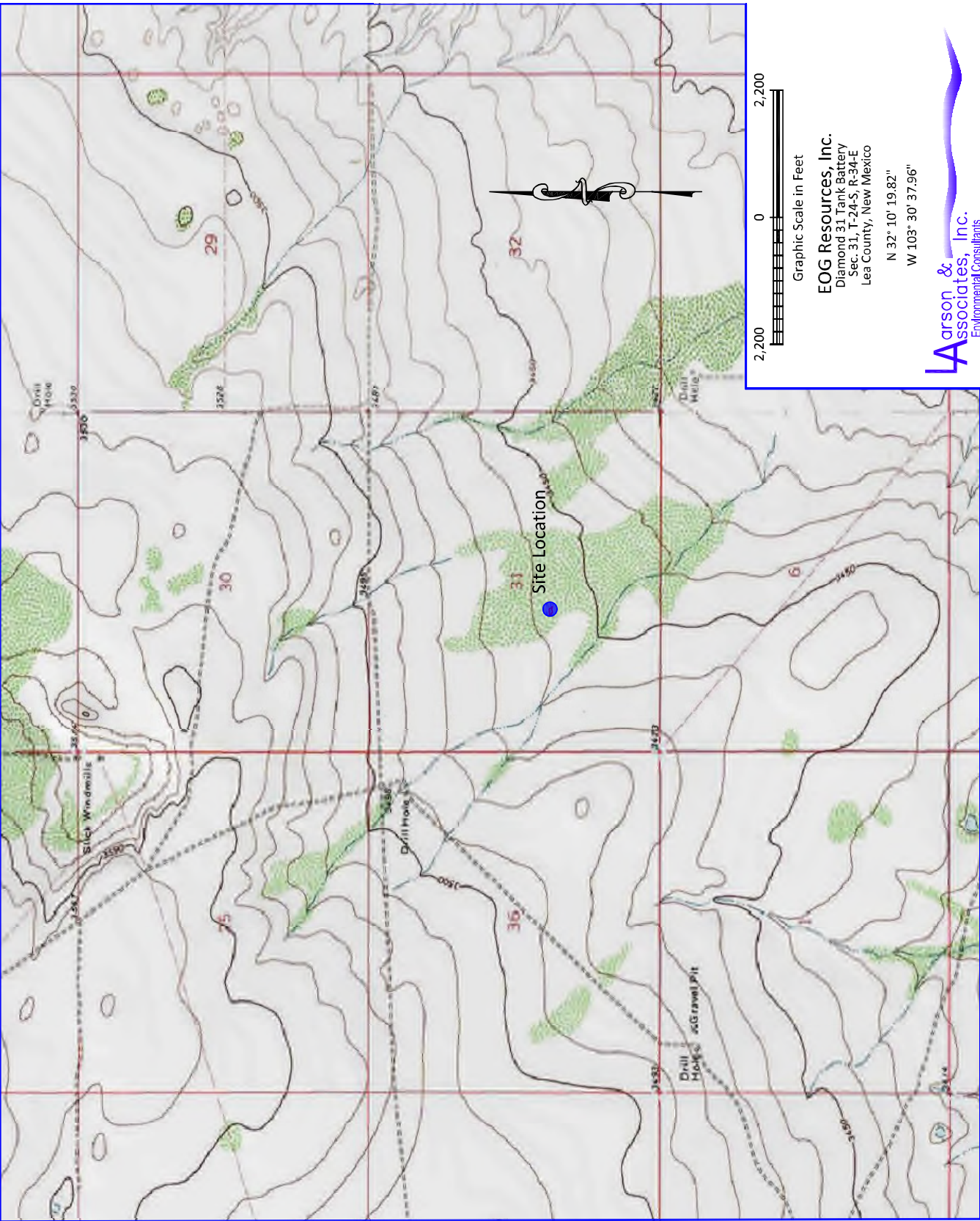


Figure 1 - Topographic Map

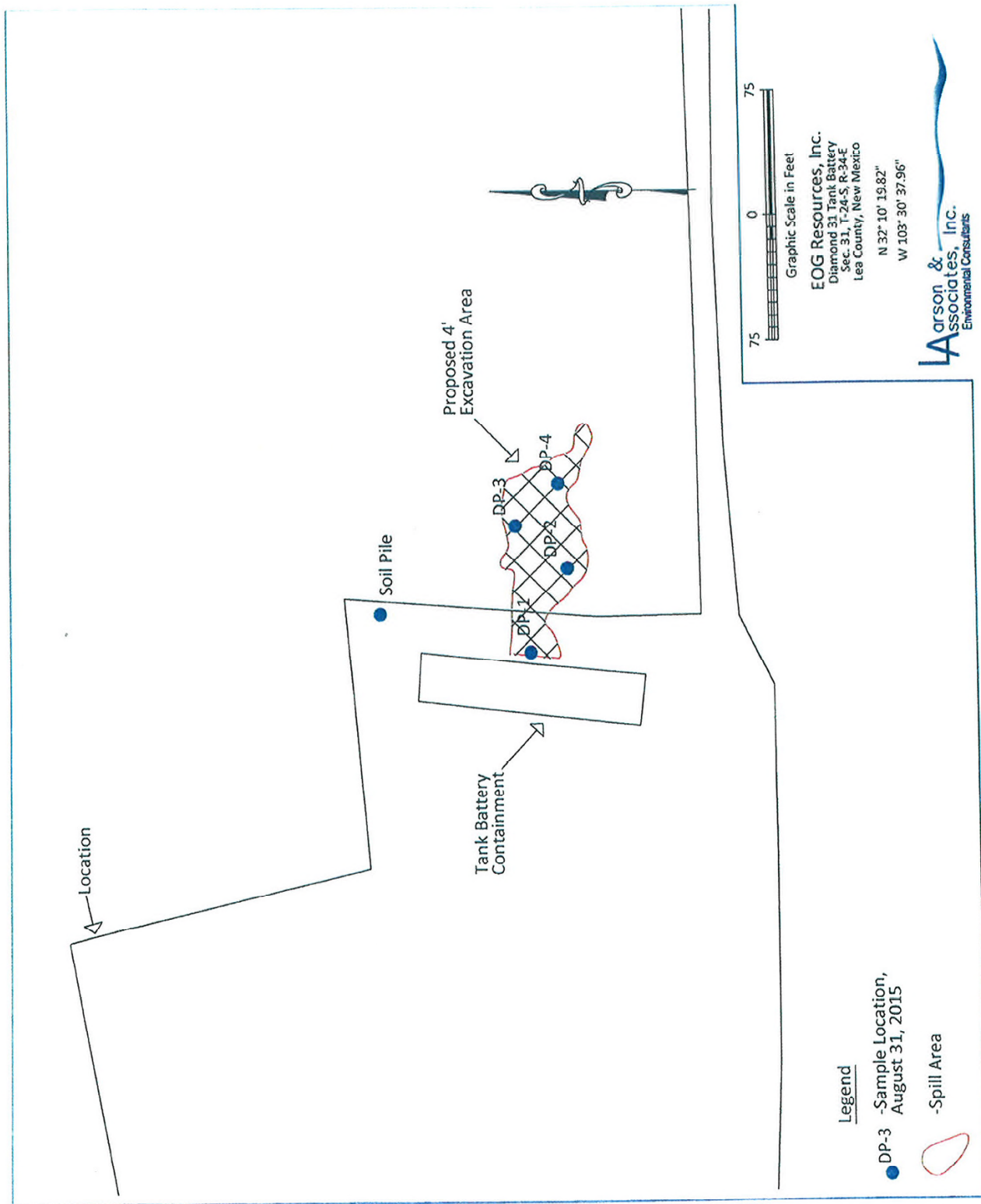
EOG Resources, Inc.
Diamond 31 Tank Battery
Sec. 31, T-24-S, R-34-E
Lea County, New Mexico

N 32° 10' 19.82"
W 103° 30' 37.96"

Larson & Associates, Inc.
Environmental Consultants



Figure 2 - Aerial Map



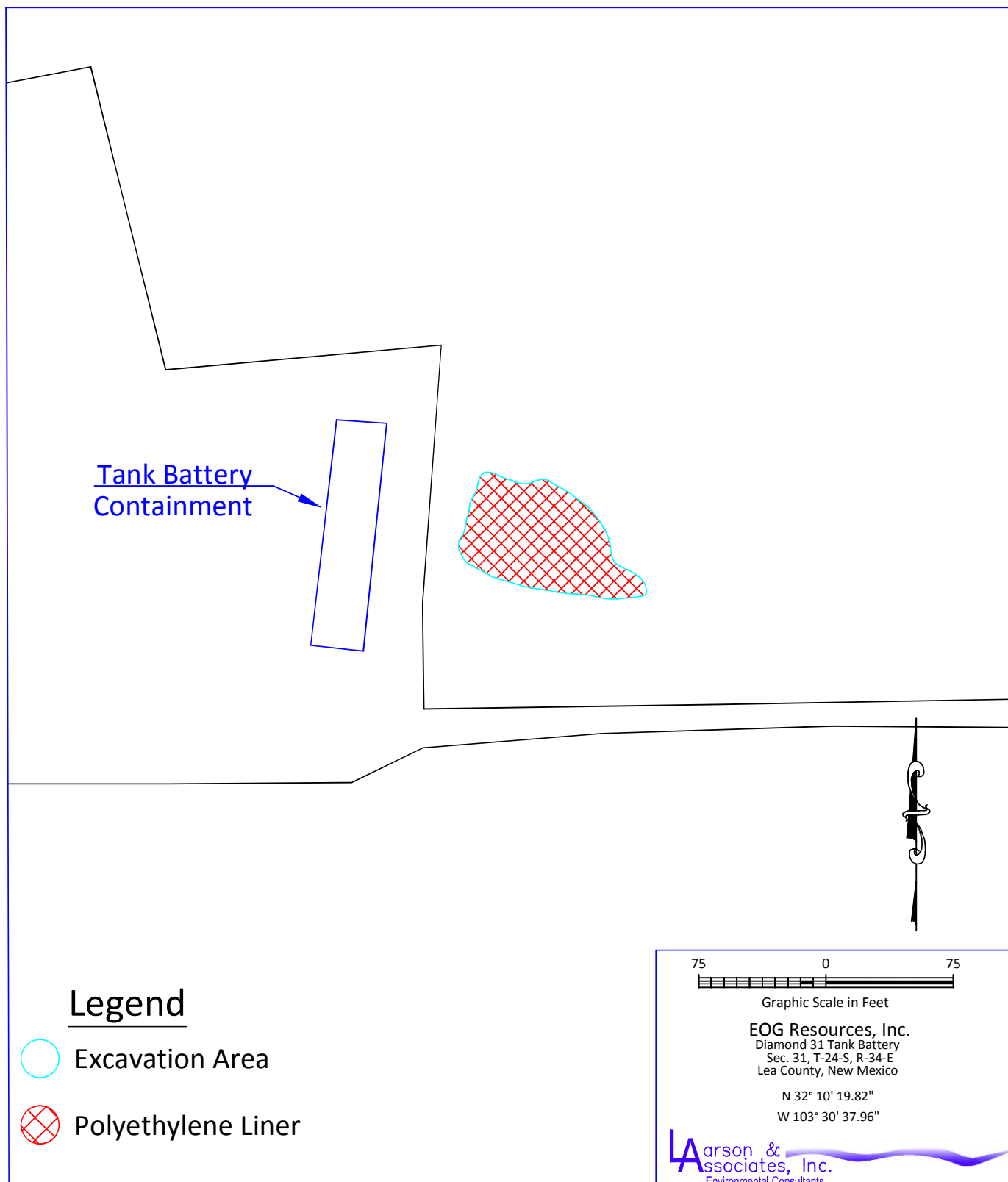


Figure 4 - Area of Polyethylene Liner

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: Diamond 31
Project Number: 15-0150-01
Location: New Mexico
Lab Order Number: 5108011



NELAP/TCEQ # T104704156-13-3

Report Date: 09/14/15

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP 1 (0-1)	5I08011-01	Soil	09/04/15 11:15	09-08-2015 09:25
DP 1 (1-2)	5I08011-02	Soil	09/04/15 11:15	09-08-2015 09:25
DP 1 (2-4)	5I08011-03	Soil	09/04/15 11:15	09-08-2015 09:25
DP 1 (4-6)	5I08011-04	Soil	09/04/15 11:30	09-08-2015 09:25
DP 2 (0-1)	5I08011-05	Soil	09/04/15 11:45	09-08-2015 09:25
DP 2 (1-2)	5I08011-06	Soil	09/04/15 11:45	09-08-2015 09:25
DP 2 (2-4)	5I08011-07	Soil	09/04/15 11:45	09-08-2015 09:25
DP 2 (4-6)	5I08011-08	Soil	09/04/15 11:50	09-08-2015 09:25
DP 3 (0-1)	5I08011-09	Soil	09/04/15 12:15	09-08-2015 09:25
DP 3 (1-2)	5I08011-10	Soil	09/04/15 12:15	09-08-2015 09:25
DP 3 (2-4)	5I08011-11	Soil	09/04/15 12:15	09-08-2015 09:25
DP 3 (4-6)	5I08011-12	Soil	09/04/15 12:20	09-08-2015 09:25
DP 3 (6-7)	5I08011-13	Soil	09/04/15 12:20	09-08-2015 09:25
DP 4 (0-1)	5I08011-14	Soil	09/04/15 12:45	09-08-2015 09:25
DP 4 (1-2)	5I08011-15	Soil	09/04/15 12:45	09-08-2015 09:25
DP 4 (2-4)	5I08011-16	Soil	09/04/15 12:45	09-08-2015 09:25
DP 4 (4-6)	5I08011-17	Soil	09/04/15 12:55	09-08-2015 09:25
DP 4 (6-8)	5I08011-18	Soil	09/04/15 12:55	09-08-2015 09:25
SP 1 COMP	5I08011-19	Soil	09/04/15 13:15	09-08-2015 09:25

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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DP 1 (0-1)
5I08011-01 (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

Chloride	3090	27.2	mg/kg dry	25	P511101	09/08/15	09/08/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P510901	09/09/15	09/09/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P511004	09/08/15	09/09/15	TPH 8015M	
>C12-C28	593	27.2	mg/kg dry	1	P511004	09/08/15	09/09/15	TPH 8015M	
>C28-C35	117	27.2	mg/kg dry	1	P511004	09/08/15	09/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		111 %	70-130		P511004	09/08/15	09/09/15	TPH 8015M	
Surrogate: o-Terphenyl		142 %	70-130		P511004	09/08/15	09/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	710	27.2	mg/kg dry	1	[CALC]	09/08/15	09/09/15	calc	

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP 1 (1-2)
5I08011-02 (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	194	1.05	mg/kg dry	1	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	5.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% 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.

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

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP 1 (2-4)
5I08011-03 (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

Chloride	1100	1.06	mg/kg dry	1	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	6.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP 1 (4-6)
5I08011-04 (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

Chloride	1830	11.1	mg/kg dry	10	P5I1101	09/08/15	09/08/15	EPA 300.0	
% Moisture	10.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
--	---	---------------------

DP 2 (0-1)
5I08011-05 (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

Chloride	189	1.04	mg/kg dry	1	P511404	09/09/15	09/14/15	EPA 300.0	
% Moisture	4.0	0.1	%	1	P510901	09/09/15	09/09/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P511004	09/08/15	09/09/15	TPH 8015M	
>C12-C28	42.0	26.0	mg/kg dry	1	P511004	09/08/15	09/09/15	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P511004	09/08/15	09/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		106 %		70-130	P511004	09/08/15	09/09/15	TPH 8015M	
Surrogate: o-Terphenyl		138 %		70-130	P511004	09/08/15	09/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	42.0	26.0	mg/kg dry	1	[CALC]	09/08/15	09/09/15	calc	

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP 2 (1-2)
5I08011-06 (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

Chloride	97.6	1.03	mg/kg dry	1	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	3.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP 2 (2-4)
5I08011-07 (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

Chloride	697	1.06	mg/kg dry	1	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	6.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% 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.

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

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

Project: Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

DP 2 (4-6)
5I08011-08 (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

Chloride	3930	26.9	mg/kg dry	25	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	7.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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DP 3 (0-1)
5I08011-09 (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	2160	10.4	mg/kg dry	10	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	4.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P5I1103	09/09/15	09/09/15	TPH 8015M	
>C12-C28	58.0	26.0	mg/kg dry	1	P5I1103	09/09/15	09/09/15	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P5I1103	09/09/15	09/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		117 %		70-130	P5I1103	09/09/15	09/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		149 %		70-130	P5I1103	09/09/15	09/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	58.0	26.0	mg/kg dry	1	[CALC]	09/09/15	09/09/15	calc	

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DP 3 (1-2)
5I08011-10 (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	424	1.04	mg/kg dry	1	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	4.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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DP 3 (2-4)
5I08011-11 (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	3040	26.3	mg/kg dry	25	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	5.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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DP 3 (4-6)
5I08011-12 (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	6190	26.9	mg/kg dry	25	P5I1101	09/08/15	09/08/15	EPA 300.0	
% Moisture	7.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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DP 3 (6-7)
5I08011-13 (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	6690	27.2	mg/kg dry	25	P5I1101	09/08/15	09/08/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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DP 4 (0-1)
5I08011-14 (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	6650	27.2	mg/kg dry	25	P5I1101	09/08/15	09/08/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P5I1103	09/09/15	09/09/15	TPH 8015M	
>C12-C28	ND	27.2	mg/kg dry	1	P5I1103	09/09/15	09/09/15	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P5I1103	09/09/15	09/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		115 %	70-130		P5I1103	09/09/15	09/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		143 %	70-130		P5I1103	09/09/15	09/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	09/09/15	09/09/15	calc	

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DP 4 (1-2)
5I08011-15 (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	2210	10.6	mg/kg dry	10	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	6.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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Project Number: 15-0150-01
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DP 4 (2-4)
5I08011-16 (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	28.5	1.02	mg/kg dry	1	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	2.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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DP 4 (4-6)
5I08011-17 (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	5000	27.5	mg/kg dry	25	P5I1405	09/09/15	09/14/15	EPA 300.0	
% Moisture	9.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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DP 4 (6-8)
5I08011-18 (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	3000	27.8	mg/kg dry	25	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	10.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Permian Basin Environmental Lab, L.P.

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SP 1 COMP
5I08011-19 (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	5570	52.6	mg/kg dry	50	P5I1404	09/09/15	09/14/15	EPA 300.0	
% Moisture	5.0	0.1	%	1	P5I0901	09/09/15	09/09/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	3310	132	mg/kg dry	5	P5I1103	09/09/15	09/09/15	TPH 8015M	
>C12-C28	23300	132	mg/kg dry	5	P5I1103	09/09/15	09/09/15	TPH 8015M	
>C28-C35	3890	132	mg/kg dry	5	P5I1103	09/09/15	09/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		106 %	70-130		P5I1103	09/09/15	09/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		150 %	70-130		P5I1103	09/09/15	09/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	30500	132	mg/kg dry	5	[CALC]	09/09/15	09/09/15	calc	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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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 P5I0901 - % Solids										
Blank (P5I0901-BLK1)	Prepared & Analyzed: 09/09/15									
% Moisture	ND	0.1	%							
Duplicate (P5I0901-DUP1)	Source: 5I08001-01		Prepared & Analyzed: 09/09/15							
% Moisture	14.0	0.1	%		14.0			0.00	20	
Duplicate (P5I0901-DUP2)	Source: 5I08011-09		Prepared & Analyzed: 09/09/15							
% Moisture	4.0	0.1	%		4.0			0.00	20	
Batch P5I1101 - *** DEFAULT PREP ***										
Blank (P5I1101-BLK1)	Prepared & Analyzed: 09/08/15									
Chloride	ND	1.00	mg/kg wet							
LCS (P5I1101-BS1)	Prepared & Analyzed: 09/08/15									
Chloride	114	1.00	mg/kg wet	100		114	80-120			
LCS Dup (P5I1101-BSD1)	Prepared & Analyzed: 09/08/15									
Chloride	109	1.00	mg/kg wet	100		109	80-120	4.77	20	
Duplicate (P5I1101-DUP1)	Source: 5I03004-01		Prepared & Analyzed: 09/08/15							
Chloride	2090	25.5	mg/kg dry		2090			0.146	20	
Duplicate (P5I1101-DUP2)	Source: 5I03017-03		Prepared & Analyzed: 09/11/15							
Chloride	3410	28.7	mg/kg dry		3360			1.54	20	
Matrix Spike (P5I1101-MS1)	Source: 5I03004-01		Prepared & Analyzed: 09/08/15							
Chloride	2160	25.5	mg/kg dry	102	2090	64.5	80-120			QM-07

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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 P5I1404 - * DEFAULT PREP *****

Blank (P5I1404-BLK1)

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride ND 1.00 mg/kg wet

LCS (P5I1404-BS1)

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride 99.5 1.00 mg/kg wet 100 99.5 80-120

LCS Dup (P5I1404-BSD1)

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride 96.2 1.00 mg/kg wet 100 96.2 80-120 3.40 20

Duplicate (P5I1404-DUP1)

Source: 5I08004-01

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride 164 1.06 mg/kg dry 164 0.0585 20

Matrix Spike (P5I1404-MS1)

Source: 5I08004-01

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride 267 1.06 mg/kg dry 93.1 164 111 80-120

Batch P5I1405 - * DEFAULT PREP *****

Blank (P5I1405-BLK1)

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride ND 1.00 mg/kg wet

LCS (P5I1405-BS1)

Prepared: 09/09/15 Analyzed: 09/14/15

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

LCS Dup (P5I1405-BSD1)

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride 100 1.00 mg/kg wet 100 100 80-120 0.379 20

Duplicate (P5I1405-DUP1)

Source: 5I08011-17

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride 4990 27.5 mg/kg dry 5000 0.160 20

Permian Basin Environmental Lab, L.P.

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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 P511405 - * DEFAULT PREP *****

Matrix Spike (P511405-MS1)

Source: 5108011-17

Prepared: 09/09/15 Analyzed: 09/14/15

Chloride	6260	27.5	mg/kg dry	1100	5000	115	80-120			
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - 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 P5I1004 - TX 1005										
Blank (P5I1004-BLK1)				Prepared & Analyzed: 09/08/15						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	124		"	100		124	70-130			
Surrogate: o-Terphenyl	78.8		"	50.0		158	70-130			S-GC
LCS (P5I1004-BS1)				Prepared & Analyzed: 09/08/15						
C6-C12	911	25.0	mg/kg wet	1000		91.1	75-125			
>C12-C28	1000	25.0	"	1000		100	75-125			
Surrogate: 1-Chlorooctane	111		"	100		111	70-130			
Surrogate: o-Terphenyl	67.9		"	50.0		136	70-130			S-GC
LCS Dup (P5I1004-BSD1)				Prepared & Analyzed: 09/08/15						
C6-C12	912	25.0	mg/kg wet	1000		91.2	75-125	0.128	20	
>C12-C28	1000	25.0	"	1000		100	75-125	0.0240	20	
Surrogate: 1-Chlorooctane	110		"	100		110	70-130			
Surrogate: o-Terphenyl	67.8		"	50.0		136	70-130			S-GC
Matrix Spike (P5I1004-MS1)				Source: 5I08011-01	Prepared: 09/08/15 Analyzed: 09/09/15					
C6-C12	933	27.2	mg/kg dry	1090	ND	85.8	75-125			
>C12-C28	1160	27.2	"	1090	593	51.9	75-125			
Surrogate: 1-Chlorooctane	119		"	109		109	70-130			
Surrogate: o-Terphenyl	72.8		"	54.3		134	70-130			S-GC
Matrix Spike Dup (P5I1004-MSD1)				Source: 5I08011-01	Prepared: 09/08/15 Analyzed: 09/09/15					
C6-C12	951	27.2	mg/kg dry	1090	ND	87.5	75-125	1.92	20	
>C12-C28	1180	27.2	"	1090	593	53.8	75-125	3.53	20	
Surrogate: 1-Chlorooctane	122		"	109		112	70-130			
Surrogate: o-Terphenyl	74.9		"	54.3		138	70-130			S-GC

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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - 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 P5I1103 - TX 1005										
Blank (P5I1103-BLK1)				Prepared & Analyzed: 09/09/15						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	125		"	100		125	70-130			
Surrogate: o-Terphenyl	79.0		"	50.0		158	70-130			S-GC
LCS (P5I1103-BS1)				Prepared & Analyzed: 09/09/15						
C6-C12	861	25.0	mg/kg wet	1000		86.1	75-125			
>C12-C28	957	25.0	"	1000		95.7	75-125			
Surrogate: 1-Chlorooctane	106		"	100		106	70-130			
Surrogate: o-Terphenyl	64.7		"	50.0		129	70-130			
LCS Dup (P5I1103-BSD1)				Prepared & Analyzed: 09/09/15						
C6-C12	874	25.0	mg/kg wet	1000		87.4	75-125	1.40	20	
>C12-C28	975	25.0	"	1000		97.5	75-125	1.83	20	
Surrogate: 1-Chlorooctane	107		"	100		107	70-130			
Surrogate: o-Terphenyl	66.0		"	50.0		132	70-130			S-GC
Matrix Spike (P5I1103-MS1)				Source: 5I09001-11		Prepared & Analyzed: 09/09/15				
C6-C12	934	25.5	mg/kg dry	1020	ND	91.5	75-125			
>C12-C28	999	25.5	"	1020	ND	97.9	75-125			
Surrogate: 1-Chlorooctane	123		"	102		120	70-130			
Surrogate: o-Terphenyl	77.8		"	51.0		153	70-130			S-GC
Matrix Spike Dup (P5I1103-MSD1)				Source: 5I09001-11		Prepared & Analyzed: 09/09/15				
C6-C12	933	25.5	mg/kg dry	1020	ND	91.5	75-125	0.0459	20	
>C12-C28	1020	25.5	"	1020	ND	99.6	75-125	1.68	20	
Surrogate: 1-Chlorooctane	123		"	102		120	70-130			
Surrogate: o-Terphenyl	76.9		"	51.0		151	70-130			S-GC

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Notes and Definitions

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

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:

9/14/2015

Brent Barron, Laboratory Director/Technical Director

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5106011

CHAIN-OF-CUSTOMER

Marison & Associates, Inc.
Environmental Consultants

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

Data Reported to:

DATE: 9/18/2015 PO #: LAB WORK ORDER # PAGE 2 OF 2
PROJECT LOCATION OR NAME: Diamond 31
LAI PROJECT #: 15-0150-01 COLLECTOR: Stark & J. B. J.

Page 29 of 29

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES	FIELD NOTES	
						HCl	HNO ₃	H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/>	ICE			UNPRESERVED
14 DP4(2-4)	04	9/11/15	12:45	S	1							
17 DP4(4-6)			12:55									
18 DP4(6-8)			↓									
19 SP1 COMP	05	↑	1:15	↑	↑					XX		
TOTAL												
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)												
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)												
RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)												
TURN AROUND TIME NORMAL <input checked="" type="checkbox"/> 1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> OTHER <input type="checkbox"/>												
LABORATORY USE ONLY: RECEIVING TEMP: <u>20</u> THERM #: <u>LAI</u> CUSTODY SEALS - <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input checked="" type="checkbox"/> NOT USED <input type="checkbox"/> CARRIER BILL # <input type="checkbox"/> HAND DELIVERED												

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

PBELAB

Analytical Report

Prepared for:

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

Project: EOG Diamond 31
Project Number: 15-0150-01
Location: New Mexico
Lab Order Number: 5J27003



NELAP/TCEQ # T104704156-13-3

Report Date: 11/04/15

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

Project: EOG Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SP-1	5J27003-01	Soil	10/26/15 13:00	10-27-2015 16:30
SP-2	5J27003-02	Soil	10/26/15 13:05	10-27-2015 16:30
SP-3	5J27003-03	Soil	10/26/15 13:10	10-27-2015 16:30
SP-4	5J27003-04	Soil	10/26/15 13:15	10-27-2015 16:30
SP-5	5J27003-05	Soil	10/26/15 13:20	10-27-2015 16:30

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

Project: EOG Diamond 31
Project Number: 15-0150-01
Project Manager: Mark Larson

Fax: (432) 687-0456

SP-1
5J27003-01 (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

Chloride	211	1.04	mg/kg dry	1	P5K0306	10/29/15	11/03/15	EPA 300.0
% Moisture	4.0	0.1	%	1	P5J2901	10/29/15	10/29/15	% calculation

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M
>C12-C28	ND	26.0	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M
>C28-C35	ND	26.0	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M
Surrogate: 1-Chlorooctane		78.9 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M
Surrogate: o-Terphenyl		97.7 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	10/27/15	10/28/15	calc

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: EOG Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
--	---	---------------------

SP-2
5J27003-02 (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	1.05	mg/kg dry	1	P5K0306	10/29/15	11/03/15	EPA 300.0	
% Moisture	5.0	0.1	%	1	P5J2901	10/29/15	10/29/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C12-C28	ND	26.3	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
Surrogate: 1-Chlorooctane		85.6 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M	
Surrogate: o-Terphenyl		107 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.3	mg/kg dry	1	[CALC]	10/27/15	10/28/15	calc	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: EOG Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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SP-3

5J27003-03 (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

Chloride	ND	1.04	mg/kg dry	1	P5K0306	10/29/15	11/03/15	EPA 300.0	
% Moisture	4.0	0.1	%	1	P5J2901	10/29/15	10/29/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
Surrogate: 1-Chlorooctane		82.3 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M	
Surrogate: o-Terphenyl		103 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	10/27/15	10/28/15	calc	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: EOG Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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SP-4

5J27003-04 (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

Chloride	12.8	1.03	mg/kg dry	1	P5K0306	10/29/15	11/03/15	EPA 300.0	
% Moisture	3.0	0.1	%	1	P5J2901	10/29/15	10/29/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	555	25.8	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C12-C28	2910	25.8	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C28-C35	455	25.8	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		87.2 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		100 %	70-130		P5J2805	10/27/15	10/28/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	3920	25.8	mg/kg dry	1	[CALC]	10/27/15	10/28/15	calc	

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: EOG Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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SP-5
5J27003-05 (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

Chloride	106	1.05	mg/kg dry	1	P5K0306	10/29/15	11/03/15	EPA 300.0	
% Moisture	5.0	0.1	%	1	P5J2901	10/29/15	10/29/15	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C12-C28	40.6	26.3	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P5J2805	10/27/15	10/28/15	TPH 8015M	
Surrogate: 1-Chlorooctane		84.9 %		70-130	P5J2805	10/27/15	10/28/15	TPH 8015M	
Surrogate: o-Terphenyl		104 %		70-130	P5J2805	10/27/15	10/28/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	40.6	26.3	mg/kg dry	1	[CALC]	10/27/15	10/28/15	calc	

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

Project: EOG Diamond 31
Project Number: 15-0150-01
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 P5J2901 - % Solids										
Blank (P5J2901-BLK1)	Prepared & Analyzed: 10/29/15									
% Moisture	ND	0.1	%							
Duplicate (P5J2901-DUP1)	Source: 5J28002-02 Prepared & Analyzed: 10/29/15									
% Moisture	5.0	0.1	%		5.0			0.00	20	
Duplicate (P5J2901-DUP2)	Source: 5J28006-11 Prepared & Analyzed: 10/29/15									
% Moisture	15.0	0.1	%		15.0			0.00	20	
Batch P5K0306 - *** DEFAULT PREP ***										
Blank (P5K0306-BLK1)	Prepared: 10/29/15 Analyzed: 11/03/15									
Chloride	ND	1.00	mg/kg wet							
LCS (P5K0306-BS1)	Prepared: 10/29/15 Analyzed: 11/03/15									
Chloride	101	1.00	mg/kg wet	100		101	80-120			
LCS Dup (P5K0306-BSD1)	Prepared: 10/29/15 Analyzed: 11/03/15									
Chloride	102	1.00	mg/kg wet	100		102	80-120	1.58	20	
Duplicate (P5K0306-DUP1)	Source: 5J27003-01 Prepared: 10/29/15 Analyzed: 11/03/15									
Chloride	210	1.04	mg/kg dry		211			0.203	20	
Duplicate (P5K0306-DUP2)	Source: 5J28007-02 Prepared: 10/29/15 Analyzed: 11/03/15									
Chloride	1130	1.10	mg/kg dry		1120			1.25	20	
Matrix Spike (P5K0306-MS1)	Source: 5J27003-01 Prepared: 10/29/15 Analyzed: 11/03/15									
Chloride	308	1.04	mg/kg dry	104	211	93.4	80-120			

Permian Basin Environmental Lab, L.P.

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Page 8 of 11

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: EOG Diamond 31 Project Number: 15-0150-01 Project Manager: Mark Larson	Fax: (432) 687-0456
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - 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 P5J2805 - TX 1005

Blank (P5J2805-BLK1)

Prepared & Analyzed: 10/27/15

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	102		"	100		102	70-130			
Surrogate: o-Terphenyl	63.8		"	50.0		128	70-130			

LCS (P5J2805-BS1)

Prepared & Analyzed: 10/27/15

C6-C12	853	25.0	mg/kg wet	1000		85.3	75-125			
>C12-C28	815	25.0	"	1000		81.5	75-125			
Surrogate: 1-Chlorooctane	89.8		"	100		89.8	70-130			
Surrogate: o-Terphenyl	53.8		"	50.0		108	70-130			

LCS Dup (P5J2805-BSD1)

Prepared & Analyzed: 10/27/15

C6-C12	1000	25.0	mg/kg wet	1000		100	75-125	16.3	20	
>C12-C28	943	25.0	"	1000		94.3	75-125	14.6	20	
Surrogate: 1-Chlorooctane	106		"	100		106	70-130			
Surrogate: o-Terphenyl	57.9		"	50.0		116	70-130			

Duplicate (P5J2805-DUP1)

Source: 5J27002-02

Prepared: 10/27/15 Analyzed: 10/28/15

C6-C12	26.2	30.9	mg/kg dry		21.7			18.8	20	
>C12-C28	ND	30.9	"		49.8				20	
Surrogate: 1-Chlorooctane	128		"	123		103	70-130			
Surrogate: o-Terphenyl	79.7		"	61.7		129	70-130			

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

Project: EOG Diamond 31
Project Number: 15-0150-01
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:

11/4/2015

Brent Barron, Laboratory Director/Technical Director

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

Data Reported to:

DATE: 10/26/2015
PO #: _____
PROJECT LOCATION OR NAME _____
LAI PROJECT #: 15-0150

PAGE 1 OF 1

Page 11 of 11

PO #: _____ LAB WORK ORDER #: 5127003
PROJECT LOCATION OR NAME: EOC O. and 31
LAI PROJECT #: 15-0150-01 COLLECTOR: Sam S. [Signature]

COLLECTOR: Sarah Jones

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No TIME ZONE: MM Time zone/State:		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers
SP-1	01	10/26/15	1:00	S	1
SP-2	02		1:05		
SP-3	03		1:10		
SP-4	04		1:15		
SP-5	05		1:20		
				HCl HNO ₃ H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> ICE UNPRESERVED	
ANALYSES BTEX <input type="checkbox"/> MTBE <input type="checkbox"/> TRPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/> GASOLINE MOD 8015 <input checked="" type="checkbox"/> DIESEL - MOD 8015 <input checked="" type="checkbox"/> VOC 8260 <input type="checkbox"/> SVOC 8270 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/> 8081 PESTICIDES <input type="checkbox"/> 8151 HERBICIDES <input type="checkbox"/> 8082 PCBs <input type="checkbox"/> TCLP - METALS (RCRA) <input type="checkbox"/> TCLP VOC <input type="checkbox"/> TCLP - PEST <input type="checkbox"/> HERB <input type="checkbox"/> Sem-VOC <input type="checkbox"/> TOTAL METALS (RCRA) <input type="checkbox"/> OTHER LIST <input type="checkbox"/> LEAD - TOTAL <input type="checkbox"/> D.W. 200.8 <input type="checkbox"/> TCLP <input type="checkbox"/> RCI <input type="checkbox"/> TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/> TDS <input type="checkbox"/> TSS <input type="checkbox"/> % MOISTURE <input type="checkbox"/> CYANIDE <input type="checkbox"/> pH <input type="checkbox"/> HEXAVALENT CHROMIUM <input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> PECTHLORATE <input type="checkbox"/> CHLORIDE <input type="checkbox"/> ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/>					
FIELD NOTES					

**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
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	298	1.06	mg/kg dry	1	P5J2103	10/20/15	10/21/15	EPA 300.0	
% Moisture	6.0	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 20'
5J16012-02 (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

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	

Permian Basin Environmental Lab, L.P.

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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

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

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

Permian Basin Environmental Lab, L.P.

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

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
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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	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P5J2203 - * DEFAULT PREP *****

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

Batch P5J2301 - % Solids

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

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

Page 7 of 10

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	
------------	-----	-----	---	--	-----	--	--	------	----	--

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.

APPENDIX B

Boring Log

Boring Record																			
Geolog. Unit	Depth (Feet) (1"=5')	Lithologic Description Start: 10:40 Stop: 12:12	Unified Soil Classification	Graphic Log	PID READING PPM X <u>1</u>										SAMPLE			REMARKS	
															NUMBER	PID READING	RECOVERY	DEPTH	BACKGROUND PID READING
					2	4	6	8	10	12	14	16	18						
		Excavated approx 3'																	
	5	Sand : 5YR4/6, Yellowish Red Fine-coarsegrains Poor Sorted Sub Rounded, Quartz Sand	SM																
	10	Calichi 7.5YR8/2, Pinkish white Fine-Coarse Grains Poorly Sorted, Sub Rounded Quartz Sand	Calichi												NR	9			
	15	Chunks of Sand Moist 5YR5/4, Reddish brown Fine-Medium Grained Rounded													1	10		11:46	
	20	Calichi 5YR7/4, Pink Fine - Coarse Grains Sub rounded, Poorly Sorted Indurated Quartz Sand													NR	14			
	25	Sand 5YR5/4, Reddish Brown Very Fine Medium Grained Moderately Sorted, Sub rounded Quartz Sand	SM												2	15		11:50	
	30	Silt 5YR4/6, Yellowish Red Very Fine Chunks of Clay													NR	19			
	35														3	20		11:52	
	40														NR	24			
															4	25		12:01	
															NR	29			
															5	30		12:04	
															NR	34			
															6	35		12:07	
															NR	39			
															7	40		12:12	
		TD: 40 FT No Water Observed																	

<div>ONE CONTINUOUS AUGER SAMPLER</div> <div>STANDARD PENETRATION TEST</div> <div>UNDISTURBED SAMPLE</div> <div>WATER TABLE (24 HRS)</div>	<div>WATER TABLE (TIME OF BORING)</div> <div>LABORATORY TEST LOCATION</div> <div>PENETROMETER (TONS/ SQ. FT)</div> <div>NR NO RECOVERY</div>	<div>JOB NUMBER : Diamond 31, 15-0150-01</div> <div>HOLE DIAMETER : 5"</div> <div>LOCATION : Jal, NM</div> <div>LAI GEOLOGIST : KH</div> <div>DRILLING CONTRACTOR : SDC</div> <div>DRILLING METHOD : Jam Tube</div>
--	--	---

	DRILL DATE :	BORING NUMBER :
	10-16-15	DP-3

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

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 12:18 PM
To: Jones, Kellie, EMNRD
Cc: Mark Larson; Keyes, Jamie, EMNRD; Zane, Kurtz@geogresources.com
Subject: Re: FW: 1RP-3825 - EOG 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



On Tue, Sep 29, 2015 at 3:55 PM, Jones, Kellie, EMNRD <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

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.

Mark Larson

From: Jones, Kellie, EMNRD [mailto:Kellie.Jones@state.nm.us]
Sent: Monday, October 26, 2015 8:33 AM
To: Mark Larson; slucker@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

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; slucker@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-1 (1RP-3825) and DP-4 (1RP-3844). The chloride concentrations in soil from 20 and 25 feet below ground surface at DP-1 (1RP-3825) and DP-4 (1RP-3844) are below 250 mg/Kg, therefore, your approval to install the liner, backfill and see 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
Subject: RE: FW: 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

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

Subject: Re: FW: IRP-3825 - EOG 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,

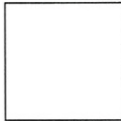
Shelly J Tucker

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



On Wed, Oct 14, 2015 at 11:18 AM, Tucker, Shelly <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,

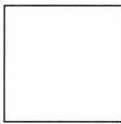
Shelly J Tucker

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



On Tue, Sep 29, 2015 at 3:55 PM, Jones, Kellie, EMNRD <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

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: IRP-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



Diamond 31 Fed Com #1 SWD Sign, Viewing Northeast, September 15, 2015



Previous Location of Battery and Spill Area, Viewing North, September 15, 2015



Liner Installation, Viewing East, October 27, 2015



Liner Installation, Viewing West, October 27, 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

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

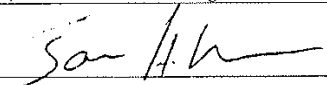
Name of Company EOG Resources, Inc.	Contact Zane Kurtz	
Address 5509 Champions Drive, Midland, TX 79705	Telephone No. 432-425-2023	
Facility Name Diamond 31 Fed Com #1 SWD	Facility Type Salt Water Disposal well	
Surface Owner BLM	Mineral Owner EOG Resources	API No. 30-025-40484

LOCATION OF RELEASE

Unit Letter G	Section 31	Township 24S	Range 34E	Feet from the 3323	North/South Line N	Feet from the 3287	East/West Line E	County Lea
------------------	---------------	-----------------	--------------	-----------------------	-----------------------	-----------------------	---------------------	---------------

Latitude 32.1722 Longitude -103.5111

NATURE OF RELEASE 1.570ⁱⁿ

Type of Release Produced Water	Volume of Release 40 bbls	Volume Recovered 0 bbls
Source of Release Rupture of tanks from lightning strike	Date and Hour of Occurrence 8/28/2015	Date and Hour of Discovery 8/28/15
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.	
If a Watercourse was Impacted, Describe Fully.*		
Describe Cause of Problem and Remedial Action Taken.* Lightning strike at SWD facility caused rupture of tanks and release of 10 bbls produced water off the pad area. Incoming flow onto site was shut off. Jal Fire Department extinguished the fire at site. No free liquids to recover off the pad. 3 rd 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 onto 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.		
Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Jamon Hohensee, EOG Resources	Approved by Environmental Specialist:	
Title: Environmental Rep.	Approval Date:	Expiration Date:
E-mail Address: jamon_hohensee@eogresources.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 8-31-15 Phone: 432-556-8074		

* 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 Diamond 31Fed Com #1SWD	Facility Type salt Water Disposal Well	
Surface Owner EOG	Mineral Owner EOG Resources	API No. 30-025-40484

LOCATION OF RELEASE

Unit Letter G	Section 31	Township 24S	Range 34E	Feet from the 3323	North/South Line N	Feet from the 3287	East/West Line E	County Lea
------------------	---------------	-----------------	--------------	-----------------------	-----------------------	-----------------------	---------------------	---------------

Latitude 32.1722 Longitude -103.5111

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release 1,570 bbls	Volume Recovered 1,560 bbls
Source of Release: Rupture of tanks from lightening strike	Date and Hour of Occurrence 8/28/2015	Date and Hour of Discovery 8/28/2015
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.* Lightening strike at SWD facility caused rupture of tanks and release of 10 bbls of produced water off the pad area toward the east. Incoming flow onto site was shut off. Jal Fire Department extinguished the first at the site. No free liquids to recover off the pad. OCD issued remediation project number 1RP-3844.		
Describe Area Affected and Cleanup Action Taken.* Larson and Associates, Inc. collected samples from the site which delineated horizontal and vertical impacts. Benzene, 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. 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 Sundance disposal in Eunice, NM.		
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.		
Signature: <i>Zane Kurtz, EOG</i>	1RP-3844 <u>OIL CONSERVATION DIVISION</u>	
Printed Name: Zane Kurtz, EOG Resources	Approved by Environmental Specialist: <i>Jane Klyne</i>	
Title: Sr. Environmental Rep.	Approval Date: <u>01/13/2016</u>	Expiration Date: <u>///</u>
E-mail Address: zane_kurtz@eogresources.com	Conditions of Approval: <u>///</u>	Attached <input type="checkbox"/>
Date: 12-18-2015 Phone: 432-425-2023		

* Attach Additional Sheets If Necessary