INFORMATION ONLY

1RP-4715

DELINEATION REPORT Salado Draw Produced/ Brackish Water Release Lea County, New Mexico

Latitude: 32.0225° Longitude: -103.6436°

Project No. 17-0154-01

July 18, 2017

Prepared for:

Chevron USA Inc. 6301 Deauville Boulevard Midland, Texas 79706

Prepared by:

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

Mark J. Larson, P.G.

Certified Professional Geologist #10490

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1RP-4715 Delineation Report Salado Draw Produced/Brackish Water Release Lea County, New Mexico July 18, 2017

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1RP-4715 Delineation Report Salado Draw Produced/Brackish Water Release Lea County, New Mexico July 18, 2017

1.0 INTRODUCTION

Larson & Associates, Inc. (LAI) has prepared this delineation report on behalf of Chevron USA Inc. (Chevron) for a produced/brackish water release from a frac flat hose in Unit I (NE/4, SE/4), Section 29, Township 26 South, Range 35 East, in Lea County, New Mexico (Site). The Site is located about 30 miles southwest of Jal, New Mexico. The geodetic position is 32.0225° and -103.6436°. Chevron submitted the initial C-141 on June 7, 2017. The New Mexico Oil Conservation Division (OCD) District 1 assigned the release remediation permit number 1RP-4715. Chevron submitted an amended C-141 after an error was discovered in the GPS coordinate on the OCD approved C-141. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

1.1 Background

The release occurred on May 26, 2017, after a tractor trailer ran over a 12 inch above-ground frac flat hose. Approximately 620 barrels (bbl) of produced water and brackish water was spilled with about 260 bbl recovered with a vacuum truck. The water was returned to the tanks. The spill occurred on the north side of a caliche lease road and flowed east to west adjacent the north side of the road for a distance of about 760 feet. The spill crossed over the lease road to the south flowed east to west for a distance of about 190 feet. The spill on the north side of the lease road was contained the lease road and berm of a high pressure gas pipeline for a lateral distance between about 2 and 15 feet. The spill area on the south side of the lease road was about 7 feet in width. No surface water or vegetation was affected from the spill.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is about 3,130feet above mean sea level (MSL);
- The topography slopes gently to the south and southeast;
- No surface water features are present within 1 mile of the Site;
- The surface soil is designated "Pyote and Maljamar fine sands" consisting of about 30 inches of fine sand underlain by fine sandy loam to approximately 60 inches;
- The soil is sandy eolian deposits derived from sedimentary rock; and
- Groundwater occurs at about 150 feet below ground surface (bgs) according to records from the New Mexico Office of the State Engineer (NMOSE) and U.S. Geological Survey.

1.2 Recommended Remediation Action Levels

Recommended remediation action levels (RRALs) were calculated for benzene, total BTEX (benzene, ethylbenzene, toluene and xylenes) and total petroleum hydrocarbons (TPH) based on the following criteria established by the New Mexico Oil Conservation Division (OCD) in *"Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993"*:

Criteria	Result	Score
Depth-to-Groundwater	>100 feet	0
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

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

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

Additionally, OCD requires vertical delineation to 600 mg/Kg for chloride where groundwater depth is greater than 100 feet.

2.0 SPILL DELINEATION

2.1 EM-38 Conductivity Survey

On June 6, 2017, LAI personnel used an electromagnetic (EM-38) terrain conductivity meter to qualitatively assess the spill. The EM-38 is a hand-held instrument manufactured by Geonics, Ltd., in Toronto, Ontario, Canada, and was operated in the vertical dipole (VD) mode. The EM-38 has exploration capabilities from approximately 0 to 4.9 feet bgs in the VD mode. A background location (S-5) was established southwest of the area to measure the conductivity of unaffected soil which was measured at 4.2 millimhos per meter (mmhos/m). The maximum EM-38 VD readings from the spill area on the north side of the lease road ranged from 54 mmhos/m near the spill origin (S-2) to 77.5 mmhos/m west of the spill at S-3. The EM-38 VD readings ranged between about 12 and 18 times background. The maximum EM-38 VD reading from the spill area on the south side of the lease road was 32.3 mmhos/m at S-7 located directly south of the spill origin. An EM-38 VD reading was collected about 50 feet south (S-6) to qualitatively assess the horizontal limit of the spill. The EM-38 VD reading at S-6 was 3.3 mmhos/m and less than the background reading. Figure 3 presents a Site drawing showing the locations of maximum EM-38 VD readings and the EM-38 VD values and the background location (BG).

2.2 Soil Samples

On June 6, 2017, LAI personnel used direct-push technology (DPT) to collect soil samples at six (6) locations (S-1 through S-6 and S-7) and background (S-5). DPT uses hydraulics to push or percussion hammer and stainless steel core barrel approximately 4 feet in length into the subsurface. The core barrel retrieves a soil core approximately 1.7 inches in diameter and about 4 feet in length depending on recovery. The core barrel is equipped with dedicated polyethylene liners to minimize possible cross contamination between samples. Soil samples were collected to a maximum depth of about 11 feet bgs near the spill origin (S-2). Background samples (S-5) were collected to about 3 feet bgs. Soil samples from the remaining location were collected to a maximum depth of about 6 feet bgs where sample collection terminated due to caliche. The borings were plugged with bentonite and locations were recorded with a Trimble[®] global position system (GPS) receiver. Figure 3 presents the soil sample locations.

The soil samples were collected in glass containers that were hand delivered under chain of custody and preservation Permian Basin Environmental Lab (PBEL), in Midland, Texas. The laboratory analyzed the upper sample (0 to 1 foot) from each location, including background, for total petroleum hydrocarbons (TPH) including gasoline range organics (GRO), diesel range organics (DRO) and oil range organics (ORO)

1RP-4715 Delineation Report Salado Draw Produced/Brackish Water Release Lea County, New Mexico July 18, 2017 background samples were analyzed for chloride

by EPA SW-846 Method 8015. All samples including the background samples were analyzed for chloride by EPA Method 300. Table 1 presents the investigation sample laboratory analytical data summary. Appendix A presents the laboratory report. Appendix B presents photographs.

Referring to Table 1, TPH was below the analytical method reporting limit and RRAL in the upper sample (0 to 1 foot) from each boring location therefore no additional samples were analyzed for TPH. Chloride was analyzed in all samples including the background samples from location S-5. The background chloride concentrations were less than the method reporting limit of 1.00 to 1.02 milligrams per kilogram (mg/Kg). The highest chloride values were reported in soil samples S-7 located directly opposite of the spill origin on the south side of the lease road. Chloride was reported in soil samples S-7, 0 to 1 foot and S-7, 2 to 3 feet at 1,130 mg/Kg and 1,090 mg/Kg, respectively. Chloride decreased below the OCD delineation limit of 600 mg/Kg in samples from location S-2 at 6 to 7 feet (12.5 mg/Kg), 8 to 9 feet (<1.19 mg/Kg), 9 to 10 feet (<1.06 mg/Kg) and 10 to 11 feet (<1.15 mg/Kg). The spill was delineated laterally in soil samples S-6 in which chloride was less than the method reporting limits. The spill did not extend beyond the 16 inch frac flat hose north of the road and is assumed to be limited to the area between the road and a high pressure gas pipeline for a distance between about 2 and 15 feet.

3.0 CONCLUSIONS

The following conclusions are based on the results of the spill delineation:

- 1. The spill occurred along the caliche lease road and did not affect vegetation or surface water;
- 2. Groundwater occurs at about 150 feet bgs;
- 3. No fresh water wells or surface water are located within 1,000 horizontal feet of the spill;
- 4. Soil samples were collected at six (6) locations representing the highest EM-38 VD readings from 0 to 4.9 feet bgs;
- 5. TPH was less than the analytical method reporting limits in soil samples from 0 to 1 foot bgs, therefore, no additional soil samples were analyzed for TPH;
- Chloride was delineated vertically and horizontally to 600 mg/Kg except locations S-1 and S-7;
- 7. Chloride was delineated vertically below 600 mg/Kg in the deepest boring (S-2) located adjacent to the spill origin.

4.0 **RECOMMENDATIONS**

Chevron believes no further action is required for this spill event due to depth to groundwater exceeding 100 feet in depth and no surface water within 1,000 horizontal feet. The spill occurred on the edge of caliche lease road and did not affect vegetation. Therefore, Chevron requests OCD to close the remediation permit (1RP-4715). Appendix C presents the initial C-141, amended C-141 and final C-141.

Tables

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Delineation Soil Sample Analytical Data Summary

Chevron North America E1, Salado Draw Produced Water Spill

UL M (SW/4, SW/4), Section 24, Township 26 South, Range 32 East

Lea County, New Mexico

N32° 01' 21.19" W103° 38' 13.22"

				TTOT OF COTAL CTITS TO SOU					L IU L UBPY
Sample	Depth	Collection	Benzene	BTEX	C6 - C12	C12 - C28	C28 - C35	HdT	Chloride
	(Feet)	Date	(mg/kg)	(mg/Kg)	(mg/Kg)	(mg/kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
RRAL:			10	50				5,000	*600
S-1	0 - 1	6/2/2017	<0.00109	<0.00761	<27.2	<27.2	<27.2	<27.2	354
	1-2	6/2/2017	ł	ł	I	1	1	1	417
	2 - 3	6/2/2017	ł	I	ı	I	I	ł	616
	4 -5	6/2/2017	1	I	I	I	I	I	415
	5 - 6	6/2/2017	I	I	I	I	I	1	657
S-2	0-1	6/2/2017	<0.00103	<0.00721	<25.8	<25.8	<25.8	<25.8	877
	1-2	6/2/2017	I	1	I	1	I	I	486
	2 - 3	6/2/2017	1	I	1	I	4	1	338
	4 -5	6/2/2017	I	I	1	1	I	I	784
	5 - 6	6/2/2017	I	I	ł	1	I	ł	625
	6 - 7	6/2/2017							12.5
	8 - 9	6/2/2017							<1.19
	9 - 10	6/2/2017							<1.06
	10 - 11	6/2/2017							<1.15
S-3	0 - 1	6/2/2017	<0.00118	<0.00824	<29.4	<29.4	<29.4	<29.4	332
	1 - 2	6/2/2017	1	1	1	1	1	I	843
	2 - 3	6/2/2017	I	I	1	1	1	I	873
	4 -5	6/2/2017	I	1	I	1	1	l	49.2
	5-6	6/2/2017	ł	I	I	1	1	I	82.0
S-4	0 - 1	6/2/2017	<0.00104	<0.00724	<26.0	<26.0	<26.0	<26.0	811
	1-2	6/2/2017	1	I	1	1	1	1	608
	2 - 3	6/2/2017	1	I	I	1	1	t	692
	3 - 4	6/2/2017	1	1	ł	I	1	1	691

Table 1

Delineation Soil Sample Analytical Data Summary

Chevron North America E2, Salado Draw Produced Water Spill

UL M (SW/4, SW/4), Section 24, Township 26 South, Range 32 East

Lea County, New Mexico

N32° 01' 21.19" W103° 38' 13.22"

Sample	Depth	Collection	Benzene	BTEX	C6 - C12	C12 - C28	C28 - C35	НдТ	Chloride
	Feet)	Date	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
RRAL:			10	50				5,000	*600
	4 -5	6/2/2017	2	1	(ţ		1,010
	5-6	6/2/2017	1	ł	ł	1	1	ł	788
S-5	0 - 1	6/2/2017	<0.00100	<0.00700	<25.0	<25.0	<25.0	<25.0	<1.00
	1-2	6/2/2017	1	4	1	1	1	ş	<1.01
	2 - 3	6/2/2017	1	1	1	1	1	2	<1.02
S-6	0 - 1	6/2/2017	-	ł	ţ	1	ſ	4	<1.00
	1-2	6/2/2017		1	ł	ł	1	1	<1.14
	2 - 3	6/2/2017	۲ ۱	1	ţ		ļ	1	<1.03
	4 -5	6/2/2017	l		1	1	}	1	<0.01
	5 . 6	6/2/2017	ţ	ł	1	1	Ļ	ł	<1.04
S-7	0 - 1	6/2/2017	<0.00108	0.01	<26.9	<26.9	<26.9	<26.9	1,130
	1 - 2	6/2/2017	<u>.</u>	ł	I	I	}		417
	2 - 3	6/2/2017	1	ŝ	1	ł	ſ		1,090
	4 -5	6/2/2017	1		1	ł	e t	1	121
	5 - 6	6/2/2017	ł	ł	ł	ł	ł	1	30.6

Notes: Analysis performed by Xenco Laboratories, Lubbock, Texas by EPA SW-846 Methods 8021B (BTEX), 8015M (TPH) and 300 (chloride).

*: OCD delineation limit

Depth in feet below ground surface (bgs) mg/Kg: milligrams per kilogram equivalent to parts per million (ppm) Figures



Figure 1 - Topographic Map





Appendix A Laboratory Report PERMIAN BASIN ENVIRONMENTAL LAB, LP 1400 Rankin Hwy Midland, TX 79701



Analytical Report

Prepared for:

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

Project: Salado Draw Project Number: 17-0154-01 Location:

Lab Order Number: 7F05002



NELAP/TCEQ # T104704516-16-7

Report Date: 06/14/17

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	Larson & Associates, inc.	Project:	Salado Draw	Fax: (432) 687-0456
	P.O. Box 50685	Project Number:	17-0154-01	
	Midland TX, 79710	Project Manager:	Mark Larson	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1 0-1	7F05002-01	Soil	06/02/17 13:00	06-05-2017 09:45
S-1 1-2	7F05002-02	Soil	06/02/17 13:00	06-05-2017 09:45
S-1 2-3	7F05002-03	Soil	06/02/17 13:00	06-05-2017 09:45
S-1 4-5	71-05002-04	Soil	06/02/17 13:20	06-05-2017 09:45
S-1 5-6	7F05002-05	Soil	06/02/17 13:20	06-08-2017 09:45
S-2 0-1	7F05002-11	Soil	06/02/17 13:50	06-05-2017 09:45
S-2 1-2	7F05002-12	Soil	06/02/17 13:50	06-05-2017 09:45
S-2 2-3	71-05002-13	Soil	06/02/17 13:50	06-05-2017 09:45
S-2 4-5	71-05002-14	Soil	06/02/17 13:55	06-05-2017 09:45
S-2 5-6	7F05002-15	Soil	06/02/17 13:55	06-05-2017 09:45
S-2 6-7	7F05002-16	Soil	06/02/17 13:55	06-05-2017 09:45
S-2 8-9	7F05002-17	Soil	06/02/17 14:05	06-05-2017 09:45
S-2 9-10	7F05002-18	Soil	06/02/17 14:05	06-05-2017 09:45
S-2 10-11	7F05002-19	Soil	06/02/17 14:05	06-05-2017 09:45
S-3 0-1	7F05002-20	Soil	06/02/17 14:40	06-05-2017 09:45
S-3 1-2	7F05002-21	Soil	06/02/17 14:40	06-05-2017 09:45
S-3 2-3	7F05002-22	Soil	06/02/17 14:40	06-05-2017 09:45
S-3 4-5	7F05002-23	Soil	06/02/17 14:50	06-05-2017 09:45
S-3 5-6	7F05002-24	Soi}	06/02/17 14:50	06-05-2017 09:45
S-4 0-1	7F05002-30	Soil	06/02/17 15:20	06-05-2017 09:45
S-4 1-2	7F05002-31	Soil	06/02/17 15:20	06-05-2017 09:45
S-4 2-3	7F05002-32	Soil	06/02/17 15:20	06-05-2017 09:45
S-4 3-4	7F05002-33	Soil	06/02/17 15:20	06-05-2017 09:45
S-4 4-5	7F05002-34	Soil	06/02/17 15:30	06-05-2017 09:45
S-4 5-6	7F05002-35	Soil	06/02/17 15:30	06-05-2017 09:45
S-5 0-1	71-05002-41	Soil	06/02/17 16:00	06-05-2017 09:45
S-5 1-2	71-05002-42	Soil	06/02/17 16:00	06-05-2017 09:45
S-5 2-3	71-05002-43	Soil	06/02/17 16:00	06-05-2017 09:45
S-6 0-1	71-05002-44	Soil	06/02/17 16:10	06-05-2017 09:45
S-6 1-2	7)*05002-45	Soil	06/02/17 16:10	06-05-2017 09:45
S-6 2-3	7F05002-46	Soil	06/02/17 16:10	06-05-2017 09:45
S-6 4-5	7105002-47	Soil	06/02/17 16:15	06-05-2017 09:45
S-6 5-6	7105002-48	Soil	06/02/17 16:15	06-05-2017 09:45
S-7 0-1	71-05002-51	Soil	06/02/17 16:30	06-05-2017 09:45

1400 Rankin HWY Midland, TX 79701 432-686-7235

Larson & Associates, Inc.	Project: Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-7 1-2	7F05002-52	Soil	06/02/17 16:30	06-05-2017 09:45
S-7 2-3	7F05002-53	Soil	06/02/17 16:30	06-05-2017 09:45
S-7 4-5	7F05002-54	Soil	06/02/17 16:40	06-05-2017 09:45
S-7 5-6	7805002-55	Soil	06/02/17 16:40	06-05-2017 09:45

Permian Basin Environmental Lab, L.P.

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Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson

S-1 0-1

7F05002-01 (Soil)

Analyie	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Pern	nian Basin E	Invironmen	tal Lab, I	J.P.				
Organics by GC									
Benzene	ND	0.00109	ing/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Toluene	ND	0.00217	mg/kg_dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Ethylbenzene	ND	0.00109	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (p/m)	ND	0.00217	mg/kg dry	j	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (o)	ND	0.00109	mg/kg dry)	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		90.3 %	75-1	25	P7F0804	06/08/17	06/08/17	EPA 8021B	·
Surrogate: 1.4-Difluorobenzene		87.4 %	75-1.	25	P7F0804	06/08/17	06/08/17	EPA 8021B	
General Chemistry Parameters by EPA /	Standard Method	ls							
Chloride	354	1,09	mg/kg dry	1	P7F0905	06/09/17	06/13/17	EPA 300.0	<u>,</u>
% Moisture	8.0	0.1	%	1	P7F0705	06/07/17	06/07/17	ASTM D2216	
Total Petroleum Hydrocarbons C6-C35 h	y EPA Method 80	15M							
C6-C12	ND	27.2	mg/kg dry	1	P7F0802	06/07/17	06/08/17	TPH 8015M	
>C12-C28	טא	27.2	mg/kg dry	1	P7F0802	06/07/17	06/08/17	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	l	P7F0802	06/07/17	06/08/17	TPH 8015M	
Surrogate: 1-Chlorooctane		131 %	70-1	30	P7F0802	06/07/17	06/08/17	TPH 8015M	S-GC
Surrogate: o-Terphenyl		136 %	70-1		P7F0802	06/07/17	06/08/17	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	(CALC)	06/07/17	06/08/17	cale	

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Numi roject Manaj		4-01				Fax: (432) 68	7-0456
			S-1 1-2 002-02 (So	it)					
Analyte	Resuit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters by E	PA / Standard Methods	•							
Chloride % Molsture	417 14.0	i.16 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax: (432) 68	7-0456
			S-1 2-3 002-03 (So	il)					
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters by I	EPA / Standard Method	6							
Chloride % Molsture	616 4.0	1.04 0.1	mg∕kg dey %)	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax; (432) 68	7-0456
			S-1 4-5 002-04 (So	il)					
Analyte	Resuit	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, i	L,P,				
<u>General Chemistry Parameters by E</u>	PA / Standard Method	S							
Chioride % Moisture	416 16.0	1.19 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Pi Pr	Fax: (432) 687-0456							
	······································		S-1 5-6 002-05 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permia	n Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters by E	PA / Standard Methods								
Chlaride % Moisture	657 5.0	1.05 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/1 7	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson

Fax: (432) 687-0456

S-2 0-1

7F05002-11 (Soil)

Analyte		Reporting							
Anaye	Result	Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Perr	nian Basin E	Invironment	al Lab, l	L.P.				
Organics by GC									
Benzene	סא	0.00103	mg/kg dry]	P7F0804	06/08/17	06/08/17	EPA 8021B	
Toluene	ND	0.00206	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Ethylbenzene	ND	0.00103	mg/kg dry	1	£7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (p/m)	ND	0.00206	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (o)	ND	0.00103	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		85.8 %	75-12	5	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		91.3 %	75-12	5	P7F0804	06/08/17	06/08/17	EPA 8021B	
<u> General Chemistry Parameters by EPA /</u>	Standard Method	ls							
Chloride	877	1.03	mg/kg dry	1	P7F0905	06/09/17	06/13/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7F0705	06/07/17	06/07/17	ASTM D2216	
l'otal Petroleum Hydrocarbons C6-C35 h	y EPA Method 8	015M							
C6-C12	שא	25.8	mg/kg dry]	P7F0903	06/08/17	06/08/17	TPH 8015M	
C12-C28	ND	25.8	mg/kg dry	1	P71-0903	06/08/17	06/08/17	TPH 8015M	
•C28-C35	ND	25.8	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
Surrogate: 1-Chiorooctone		104 %			P7F0903	06/08/17	06/08/17	TPH 8015M	••••••
Surrogate: o-Terphenyl		109 %	70-13		177:0903	06/08/17	06/08/17	TPH 8015M	
fotal Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	06/08/17	06/08/17	calc	

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson							
			S-2 1-2 002-12 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	Invironme	ntal Lab, I	L.P.				
General Chemistry Parameters by	EPA / Standard Methods								
Chloride % Moisture	486 11.0	1.12 0.1	mg/kg dry %	} 1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson							:7-0456
			S-2 2-3 002-13 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	atal Lab, I	".P.				
General Chemistry Parameters by E	PA / Standard Methods	5							
Chlorid <i>e</i> % Moisture	338 13.0	1.15 0.1	ing/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax: (432) 68	7-0456
			S-2 4-5 002-14 (So	il)					
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	ե.թ.				
General Chemistry Parameters by	EPA / Standard Method	S							
Chloride % Moisture	784 16.0	1.19 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Numi Project Manaj		4-01				Fax: (432) 68	7-0456
			S-2 5-6 002-15 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	P.				
General Chemistry Parameters by E	PA / Standard Methods	ŝ							
Chloridc % Moisture	625 6.0	1.06 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2236	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num roject Mana		4-01				Fax: (432) 68	7-0456
			S-2 6-7 002-16 (So	il)				_	
Analyte	Result	Reporting Limit	Units	Dilution	Baich	Propared	Analyzed	Mcthod	Notes
	Perna	an Basin E	nvironme	ntal Lab, l	L.P.				
General Chemistry Parameters by	EPA / Standard Methods								
Chloride % Moisture	12.5 10.0	J.JJ 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson							
			S-2 8-9 002-17 (So	il)					
Analylo	Result	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Perm	ian Basin E	Invironme	ntal Lab, I	L.P.				
<u>General Chemistry Parameters by</u>	EPA / Standard Methods								
Chloride % Moisture	ND 16.0	1.19 0.1	mg/kg dry %	}	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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

Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson

Fax: (432) 687-0456

06/07/17 ASTM D2216

S-2 9-10

7F05002-18 (Soil)

· · · · · · · · · · · · · · · · · · ·				,					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Anałyzed	Method	Notes
	Perm	ilan Basin E	nvironmen	ntal Lab, L	P.				
General Chemistry Parameters	by EPA / Standard Method	S							
Chloride	ND	1.06	mg/kg dry	۱	P7F0905	06/09/17	06/13/17	EPA 300.0	······,
% Moisture	6.0	0.1	%	1	P7F0705	06/07/17	06/07/17	ASTM D2216	

06/07/17

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson						Fax: (432) 68	7-0456
			-2 10-11 002-19 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permia	n Basin E	Invironme	ntal Lab, I	L.P.				
General Chemistry Parameters by	EPA / Standard Methods								
Chloride % Moisture	ND 13.0	1.15 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson								Fax: (432) 687-0456		
						·····					
			S-3 0-1 002-20 (Soil)								
Analyle	Result	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes		
	Pern	nian Basin E	Invironment	al Lab, I	L.P.						
Organics by GC											
Benzene	DND	0.00118	mg/kg dry	1	P7F0804	06/08/17	06/08/)7	EPA 8021B			
Toluene	ND	0.00235	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B			
Ethylbenzene	ND	0.00118	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B			
Xylene (p/m)	ND	0.00235	mg/kg dry	1	P7F0864	06/08/17	06/08/17	EPA 8021B			
Xylene (o)	ND	0.00118	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B			
Surrogate: 1,4-Difluorobenzene	······	86.8 %	75-12	5	P7F0804	06/08/17	06/08/17	EPA 8021B			
Surragate: 4-Bromofluorabenzene		90.3 %	75-12	5	P7F0804	06/08/17	06/08/17	EPA 8021B			
General Chemistry Parameters by EPA	Standard Method	is									
Chloride	332	1.18	mg/kg dry	1	P7F0905	06/09/17	06/13/17	EPA 300.0			
% Moisture	15.0	0.1	%	l	P7F0705	06/07/17	06/07/17	ASTM D2216			
<u> Fotal Petroleum Hydrocarbons C6-C35 l</u>	ov EPA Method 8)15M									
C6-C12	ND	29.4	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH \$015M			
>C12-C28	ND	29.4	mg/kg dry	I.	P7F0903	06/08/17	06/08/17	TPH 8015M			
>C28-C35	ND	29.4	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M			
Surrogate: 1-Chloraoctane		105 %	70-13))	P7/F0903	06/08/17	06/08/17	TPH 8015M	• ••••••••		
Surrogate: o-Terphenyl		110 %	70-13)	P7F0903	06/08/17	06/08/17	TPH 8015M			
Total Petroleum Hydrocarbon C6-C35	ND	29.4	mg/kg dry	}	[CALC]	06/08/17	06/08/17	calc			

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Numi Project Mana		4-0}				Fax: (432) 68	7-0456
			S-3 1-2 002-21 (So	il)					
Anaiyic	Result	Reporting Limit	Units	Dílution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	L .P .				
General Chemistry Parameters by E	PA / Standard Method	<u>s</u>							
Chloríde % Moisture	843 9.0	1.10 0.1	mg/kg dry %	1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Numl Project Manaj		4-01				Fax: (432) 68	7-0456
			8-3 2-3 002-22 (So	ił)					
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters by E	PA / Standard Methods	}							•
Chloride % Moisture	873 8.0	1.09 0.1	mg⁄kg dry %	l l	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Manaj		4-01				Fax: (432) 68	7-0456
			8-3 4-5 002-23 (So	il)					
· · · · · · · · · · · · · · · · · · ·								·····	
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironmei	ntal Lab, I					
General Chemistry Parameters by E	PA / Standard Method	\$							
Chloride	49.2	1.23	mg/kg dry	1	P7F0905	06/09/17	06/13/17	EPA 300.0	****
% Moisture	19.0	0,1	%	ł	P7F0705	06/07/17	06/07/17	ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax: (432) 68	7-0456
			S-3 5-6 002-24 (So	il)					
Analyte	Resuli	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironmen	ital Lab, I	P.				
<u>General Chemistry Parameters by E</u>	PA / Standard Method	s							
Chloride % Molsture	82.0 7.0	1.08 0.1	mg/kg dry %	ł 1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685		•	eet: Salado					Fax: (432) 687-0456	
Midland TX, 79710		Project Num Project Mana							
interaction in the second seco		Project Mana	Ret: Matk F	arson					······
			S-4 0-1						
·		7F05	002-30 (Soi	l)					
		Reporting							
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Melhod	Note
	Pern	tian Basin H	nvironmer	ital Lab, I	P.				
Organics by GC									
Benzene	ND	0.00104	nıg/kg dry)	P7F0804	06/08/17	06/08/17	EPA 8021B	
Foluene	ND	0.00208	nig/kg dry	ł	P7F0804	06/08/17	06/08/17	EPA 8021B	
Ethylbenzene	DN	0.00104	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (p/m)	ND	0.00208	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (o)	ND	0.00104	mg/kg dry	ł	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 1.4-Difluorobenzene		84.5 %	75-1	25	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 4-Bromofluorohenzene		91.0 %	75-1	25	P7F0804	06/08/17	06/08/17	EPA 8021B	
General Chemistry Parameters by EPA	/ Standard Method	Is							
Chloride	811	1.04	mg/kg dry	1	P7F0905	06/09/17	06/13/17	EPA 300.0	
% Moisture	4.0	0.1	%	1	P7P0705	06/07/17	06/07/17	ASTM D2216	
fotal Petroleum Hydrocarbons C6-C35	by EPA Method 80	15 <u>M</u>							
C6-C12	ND	26.0	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
-C28-C35	ND	26.0	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
Surrogate: 1-Chlorooctane		97.5 %	70-1	30	P7F0903	06/08/17	06/08/17	TPH 8015M	
Surrogate: o-Terphényl		101 %	70-1	30	P7F0903	06/08/17	06/08/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	06/08/17	06/08/17	calc	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson							
			S-4 1-2 002-31 (So	il)			· · · · · · · · · · · · · · · · · · ·		
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters b	y EPA / Standard Methods								
Chloride % Molsture	608 5.0	1.05 0.1	mg/kg dry %	1	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	*******

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson								7-0456
			8-4 2-3 102-32 (So	11)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, L	P.				
General Chemistry Parameters by E	PA / Standard Method	5							
Chloride	692	1.05	mg/kg dry)	P7F0906	06/09/17	06/13/17	EPA 300.0	

%

0.1

5.0

P7F0705

06/07/17

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Permian Basin Environmental Lab, L.P.

% Moisture

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06/07/17 ASTM D2216

Larson & Associates, Inc. P.O. Box \$0685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax: (432) 68	7-0456
			S-4 3-4 002-33 (So	it)					
Analyic	Rcsult	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	L.P.				
<u>General Chemistry Parameters by E</u>	PA / Standard Methods	ì							
Chloride % Moisture	691 5.0	1.05 0.1	mg/kg dry %	1	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	ЕРА 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proje Project Numl Project Manag		4-01				Fax: (432) 68	87-0456
			5-4 4-5)02-34 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironme	ntal Lab, I	P.				
General Chemistry Parameters by E	PA / Standard Method	<u>s</u>							
Chloride	1010	1.08	ing/kg dry	ł	P7F0906	06/09/17	06/13/17	EPA 300.0	

%

1

P7F0705

06/07/17

06/07/17 ASTM D2216

0.1

7.0

Permian Basin Environmental Lab, L.P.

% Moisture

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	I P	Fax: (432) 68	7-0456						
······································			8-4 5-6 002-35 (So	il)					
Analyte	Rosuii	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	Invironme	ntal Lab, I	_,P,				
General Chemistry Parameters by F	PA / Standard Methods								
Chloride % Moisture	788 5.0	1.05 0.1	mg/kg dry %	1 1	P7F0905 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Draw 4-01 arson				Fax: (432) 68	7-0456		
			S-5 0-1						
		7F05	002-41 (Soi	il) 				***	****
Analyte	Rosult	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Pern	1ian Basin H	Invironmei	utal Lab, I	P.				
Organics by GC									
Benzene	ND	0.00100	mg/kg dry		P7F0804	06/08/17	06/08/17	EPA 8021B	
Toluenc	ND	0.00200	mg/kg dry	I	P7F0804	06/08/17	06/08/17	EPA 8021B	
Bihylbenzenc	ND	0.00100	mg/kg dry	I	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 1.4-Difluorobenzene		88.4 %	75-1	25	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 4-Bramofluorobenzene		92.6 %	75-1	25	P7F0804	06/08/17	06/08/17	EPA 8021B	
General Chemistry Parameters by EPA	/ Standard Method	ls							
Chloride	ND	1.00	mg/kg dry	1	P7F0906	06/09/}7	06/13/17	EPA 300.0	
% Moisture	ND	0.1	%	1	P7F0705	06/07/17	06/07/17	ASTM D2216	
l'otal Petroleum Hydrocarbons C6-C35	by EPA Method 8t)15M							
C6-C12	ND	25.0	mg/kg dry	}	P7F0903	06/08/17	06/08/17	TPH 8015M	
·C12-C28	ND	25.0	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
•C28-C35	ND	25.0	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
Surrogate: 1-Chlorooctane		108 %	70-1	30	P7F0903	06/08/17	06/08/17	TPH 8015M	
Surrogute: o-Terphenyl		113 %	70-1		P7F0903	06/08/17	06/08/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	(CALC)	06/08/17	06/08/17	calc	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Salado Draw Project Number: 17-0154-01 Project Manager: Mark Larson							Fax: (432) 68	7-0456
			S-5 1-2 002-42 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	Invironme	ntal Lab, I	P.				
General Chemistry Parameters by F	PA / Standard Methods	5							
Chloride % Moisture	ND 1,0	1.01 0.}	mg/kg dry %	1	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	ł	Fax: (432) 68	7-0456						
			8-5 2-3 902-43 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironnie	utal Lab, I	P.				
<u>General Chemistry Parameters by E</u>	PA / Standard Method	s							
Chloride % Moisture	ND 2.0	1.02 0.1	mg/kg dry %	}	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midłand TX, 79710		ject Numl	eet: Salado ber: 17-015 ger: Mark L	4-01				Fax: (432) 68	7-0456
			S-6 0-1 002-44 (So	il)					
Analyte	Result	Reporting Limit	Ünits	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permiar	n Basin E	nvironme	ntal Lab, I	P.				
General Chemistry Parameters by E	PA / Standard Methods								
Chloride % Moisture	ND ND	1.00 0.}	mg/kg dry %	1 1	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num roject Mana,		4-01				Fax: (432) 68	7-0456
			S-6 1-2 002-45 (So	il)					
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Permi	an Basin E	nvironme	ntal Lab, I	L.P.				
General Chemistry Parameters by E	PA / Standard Methods								
Chioride % Moisture	ND 12.0	1.14 0.1	mg/kg dry %	1	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	1	Fax: (432) 68	7-0456						
			8-6 2-3 002-46 (So	il)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	nvironmei	ntal Lab, I	., P .				
General Chemistry Parameters by F	PA / Standard Method	s							
Chloride % Moisture	ND 3.0	1,03 0.1	mg/kg dry %		Р7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax: (432) 68	7-0456
			S-6 4-5 002-47 (So	it)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	Invironme	ntal Lab, I	P.				
General Chemistry Parameters by F	PA / Standard Method	s							
Chloride	ND	1.01	mg/kg dry	I	P7F0906	06/09/17	06/13/17	EPA 300.0	
% Moisture	1,0	0.1	%	1	P7F0705	06/07/17	06/07/17	ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proj Project Num Project Mana		4-01				Fax: (432) 68	7-0456
			S-6 5-6 002-48 (So	il)					
Analyle	Rosult	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	Invironme	ntal Lab, I	P.				
General Chemistry Parameters by E	PA / Standard Method	5							
Chloride % Moisture	ND 4,0	1.04 0.1	mg/kg dry %	1	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		-	ect: Salado L ber: 17-0154 ger: Mark La	-01				Fax: (432) 68	7-0456
			S-7 0-1						
		7F05	002-51 (Soil)					
Analyte	Rosult	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Регп	nian Basin E	Invironmen	tal Lab, I	.P.				
Organics by GC									
Benzene	ND	0.00108	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Toluene	ND	0.00215	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	l	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (p/m)	ND	0.00215	ing/kg dry	L	P7F0804	06/08/17	06/08/17	EPA 8021B	
Xylene (0)	ND	0.00108	mg/kg dry	1	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene	· · · · · · · · · · ·	93.4 %	75-12	5	P7F0804	06/08/17	06/08/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		88.8 %	75-12	5	P7F0804	06/08/17	06/08/17	EPA 8021B	
General Chemistry Parameters by EPA /	Standard Method	is							
Chloride	1130	1.08	mg/kg dry	1	P7F0906	06/09/17	06/13/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7F0705	06/07/17	06/07/17	ASTM D2216	
<u>l'otal Petroleum Hydrocarbons C6-C35 t</u>	y EPA Method 80)15M							
C6-C12	ND	26.9	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
•C28-C35	ND	26. 9	mg/kg dry	1	P7F0903	06/08/17	06/08/17	TPH 8015M	
Surrogate: 1-Chlorooctane	n an	110%	70-13	0	P7F0903	06/08/17	06/08/17	TPH 8015M	
surrogate: o-Terphenyl		113 %	70-13		P7F0903	06/08/17	06/08/17	TPH 8015M	
fotal Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	(CALC)	06/08/17	06/08/17	cale	
					-				

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Larson & Associates, Inc. P.O. Box 50685 Midłand TX, 79710		Proj Project Numl Project Manaj		4-01				Fax: (432) 687	7-0456
			8-7 1-2 002-52 (Soi	11)					
				,					
Analyic	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Perm	ian Basin E	Invironme	ntal Lab, I	P.				
General Chemistry Parameters by E	PA / Standard Method	s							
Chloride	417	1.05	mg/kg dry	1	P7F0906	06/09/17	06/13/17	EPA 300.0	
% Moisture	5.0	0.1	%	l	P7F0705	06/07/17	06/07/17	ASTM D2216	

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	Project Numb		4-01				Fax; (432) 681	~0430
		S-7 2-3						
	7F050)02-53 (So	il)					<u></u>
Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Perm	ian Basin E	nvironme	ntal Lab, I	L. P ,				
A / Standard Method	<u>s</u>							
1090	1.05	mg/kg dry	1	P7F0906	06/09/17	06/13/17	EPA 300.0	
	Result Result Perm A / Standard Method	Project Numb Project Manag 7F050 Reporting Result Limit Permian Basin E A / Standard Methods 1090 j.05	Project Number: 17-015 Project Manager: Mark L S-7 2-3 7F05002-53 (So Reporting Result Limit Units Permian Basin Environme: A / Standard Methods 1090 1.05 mg/kg dry	Project Number: 17-0154-01 Project Manager: Mark Larson S-7 2-3 7F05002-53 (Soil) Reporting Result Limit Units Dilution Permian Basin Environmental Lab, 1 A / Standard Methods 1090 1.05 mg/kg dry 1	Project Number: 17-0154-01 Project Manager: Mark Larson S-7 2-3 7F05002-53 (Soil) Reporting Result Limit Units Dilution Batch Permian Basin Environmental Lab, L.P. A / Standard Methods 1090 1.05 mg/kg dry 1 P7F0906	Project Number: 17-0154-01 Project Manager: Mark Larson S-7 2-3 7F05002-53 (Soil) Reporting Result Limit Units Dilution Batch Prepared Permian Basin Environmental Lab, L.P. A / Standard Methods 1090 1.05 mg/kg dry 1 P7F0906 06/09/17	Project Number: 17-0154-01 Project Manager: Mark Larson S-7 2-3 7F05002-53 (Soil) Reporting Result Limit Units Dilution Batch Prepared Analyzed Permian Basin Environmental Lab, L.P. A / Standard Methods 1090 1.05 mg/kg dry 1 P7F0906 06/09/17 06/13/17	Project Number: 17-0154-01 Project Manager: Mark Larson S-7 2-3 7F05002-53 (Soil) Reporting Result Limit Units Dilution Batch Prepared Analyzed Method Permian Basin Environmental Lab, L.P. A / Standard Methods 1090 1.05 mg/kg dry 1 P7F0906 06/09/17 06/13/17 EPA 300.0

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Proje Project Numb roject Manag		1-01				Fax: (432) 687	7-0456
		-	8-7 4-5 102-54 (Soi	ii)					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	Permi	an Basin E	nvironmei	ntal Lab, I	L.P.				
General Chemistry Parameters by	EPA / Standard Methods								
Chloride % Moisture	121 8.0	1.09 0.1	mg/kg dry %	ł	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		oject Numb	eet: Salado ber: 17-0154 ger: Mark L	1-01				Fax: (432) 681	7-0456
		-	8-7 5-6 002-55 (Soi	il)			<i></i>		
Apałyte	Result	Reporting Limit	Units	Dilution	Batch	Propared	Analyzed	Method	Notes
	Permia	n Basin E	nvironme	ntal Lab, I	. P.				
General Chemistry Parameters I	by EPA / Standard Methods							······	···· ····
Chloride % Moisture	30,6 9,0	1.10 0.1	mg/kg dry %	3	P7F0906 P7F0705	06/09/17 06/07/17	06/13/17 06/07/17	EPA 300.0 ASTM D2216	

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	Larson & Associates, Inc.	Project:	Salado Draw	Fax: (432) 687-0456
	P.O. Box 50685	Project Number:	17-0154-01	
1	Midland TX, 79710	Project Manager:	Mark Larson	
- 1				

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyle	Result	Reporting Limit	Units	Spike Lovel	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P7F0804 - General Preparation	1 (GC)									
Blank (P7F0804-BLK1)				Prepared &	Analyzed:	06/08/17				
Benzenc	ND	0.00100	mg/kg wet	·····			• • • • • • • • • • • • • • • • • • • •			
Toluene	ND	0.00200	ы							
Ethylbenzene	ND	0.00100	4							
Xylenc (p/m)	ND	0.00200	**							
Xylene (o)	ND	0.00100								
Surrogate: 1.4-Difluorobenzene	0.0535			0.0600		89.2	75-125			atorika na tanana a se
Surrogate: 4-Bromofluorobenzene	0.0561		u	0.0600		93,4	75-125			
LCS (P7F0804-BS1)				Prepared &	Analyzed:	06/08/17				
Benzene	0.118	0.00100	mg/kg wei	0.100	a an	118	70-130			
Toluene	0.109	0.00200	"	0.100		109	70-130			
Ethylbenzene	0.116	0.00100	*	0.100		116	70-130			
Xylene (p/m)	0.204	0.00200	11				70-130			
Xylenc (0)	0.104	0.00100	"				70-130			
Surrogute: 1,4-Difluorobenzene	0.0603		9	0.0600	••••••	101	75-125			
Surrogate: 4-Bromofluorobenzene	0.0579		"	0.0600		96.5	75-125			
LCS Dup (P7F0804-BSD1)				Prepared &	Analyzed	: 06/08/17				
Benzenc	0.123	0.00100	mg/kg wet	0.100		123	70-130	4,22	20	
Toluene	0.112	0.00200	15	0.100		112	70-130	2.50	20	
Ethylbenzene	0.118	0.00100	*1	0.100		118	70-130	2.24	20	
Xylenc (p/m)	0.206	0.00200					70-130		20	
Xylene (0)	0.104	0.00100	P.				70-130		20	
Surrogate: 4-Bromofluorobenzene	0.0565		μ	0.0600		94.2	75-125			
Surrogate: 1,4-Difluorobenzene	0.0611		"	0.0600		102	75-125			
Matrix Spike (P7F0804-MS1)	Soi	urce: 7F07002	1-14	Prepared &	Analyzed	: 06/08/17				****
Benzene	0.141	0.00101	mg/kg dry	0.202	ND	69.8	80-120			QM-0
Toluene	0.101	0.00202	н	0.202	ND	49.8	80-120			QM-0.
Ethylbenzene	0.0725	0.00101	"	0.202	ND	35.9	80-120			QM-0
Xylene (p/m)	0.128	0.00202	н		טא		80-120			
Xylene (o)	0.0673	0.00101	r		ND		80-120			
Surrogate: 1.4-Difluorobenzene	0.0647		P	0.0606		107	75-125			••
Surrogate: 4-Bromofluorobenzene	0.0595		4	0.0606		98.1	75-125			

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc.	Project:	Salado Draw	Fax: (432) 687-0450	j.
P.O. Box 50685	Project Number:	17-0154-01		
Midland TX, 79710	Project Manager:	Mark Larson		

Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Límit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P7F0804 - General Preparation (C	GC)	<u></u>				······································				
Matrix Spike Dup (P7F0804-MSD1)	Sour	ce: 7F07002	-14	Prepared &	2 Analyzed:	06/08/17				
Benzene	0.164	0.00101	mg/kg dry	0.202	ND	81.1	80-120	15.1	20	
Toluene	0.128	0.00202		0.202	ND	63.3	80-120	23.9	20	QM-0
Ethylbenzene	0.111	0.00101	*1	0.202	ND	54.9	80-120	41.8	20	QM-0
Xylene (p/m)	0.189	0.00202	U.		ND		80-120		20	
Xylone (o)	0.0999	0.00101	ч		ND		80-120		20	
Surrogate: 4-Bromoflucrobenzene	0.0617		a	0.0606		102	75-125			
Surragate: 1,4-Difluorobenzene	0.0640		a	0.0606		106	75-125			

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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 P7F0705 - *** DEFAULT PREP ***										
Blank (P7F0795-BLK1)				Prepared &	k Analyzed:	06/07/17				
% Moisture	ND	0.1	%							
Blank (P7F0705-BLK2)				Prepared &	k Analyzed:	06/07/17				
6 Moisture	ND	0.1	%							
Duplicate (P7F0705-DUP1)	Sour	ce: 7F05002-	54	Prepared &	& Analyzed:	: 06/07/17				
% Moisture	8.0	0.1	%	Survey	8.0			0.00	20	
Suplicate (P7F0705-DUP2)	Sour	ce: 7F06004-	01	Prepared &	k Analyzed:	: 06/07/17				
		A	%					0.00	20	
% Moisture	9.0	Ó. ł	70		9.0			0.00	20	
Batch P7F0905 - *** DEFAULT PREP ***		0.1	₩o					0.00	20	
Batch P7F0905 - *** DEFAULT PREP *** Bank (P7F0905-BLK1)	;			Prepared: (9.0 06/09/17 A	nalyzed: 00	5/13/17	0.00		
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1)	; 		≫o mg∕kg wet	Prepared: (nalyzed: 00	5/13/17			
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Chloride	;									
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Moride .CS (P7F0905-BS1)	;	1.00			06/09/17 A					
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Chloride LCS (P7F0905-BS1) Chloride	ND	1.00	mg/kg w¢t	Prepared: (400	06/09/17 A	nalyzed: 0(103	5/13/17 80-120			· · · · ·
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Intoride .CS (P7F0905-BS1) Intoride .CS Dup (P7F0905-BSD1)	ND	1.00	mg/kg w¢t	Prepared: (400 Prepared: (06/09/17 A 06/09/17 A	nalyzed: 0(103	5/13/17 80-120	0.706	20	· · · · · · · · · · · · · · · · · · ·
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Moride .CS (P7F0905-BS1) Moride .CS Dup (P7F0905-BSD1) Moride	ND 414 411	1.00	mg/kg wet mg/kg wet mg/kg wet	Prepared: (400 Prepared: (400	06/09/17 A 06/09/17 A	nalyzed: 06 103 .nalyzed: 06 103	5/13/17 80-120 5/13/17 80-120			
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Moride .CS (P7F0905-BS1) Moride .CS Dup (P7F0905-BSD1) Moride Duplicate (P7F0905-DUP1)	ND 414 411	1.00 1.00 3.00 ce: 7F05902-	mg/kg wet mg/kg wet mg/kg wet	Prepared: (400 Prepared: (400 Prepared: (06/09/17 A 06/09/17 A 06/09/17 A	nalyzed: 06 103 .nalyzed: 06 103	5/13/17 80-120 5/13/17 80-120			· · · · · · · · · · · · · · · · · · ·
Batch P7F0905 - *** DEFAULT PREP *** Blank (P7F0905-BLK1) Chloride .CS (P7F0905-BS1)	ND 414 411 Sour 354	1.00 1.00 3.00 ce: 7F05902-	mg/kg wet mg/kg wet mg/kg wet Ø1 mg/kg dry	Prepared: (400 Prepared: (400 Prepared; (06/09/17 A 06/09/17 A 06/09/17 A	nalyzed: 00 103 nalyzed: 00 103 nalyzed: 00	5/13/17 80-120 5/13/17 80-120 6/13/17	0,706	20	

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710		Pr Project Nu Project Ma)154-01					Fax: (432) (587-0456
General (Chemistry Para	meters by	EPA/S	Standard	Metho	ds - Qua	lity Cont	rol		
	Perm	ian Basin	Environ	mental I	.ab, L.P	,				
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	נויא	RPD Límit	Notes
Batch P7F0905 - *** DEFAULT PRE	p ***	······································								
Matrix Spike (P7F0905-MS1)	Sou	ree: 7F05002-	01	Prepared: C	06/09/17 A	nalyzed: 0	5/13/17			
Chloride	1460	1.09	mg/kg dry	1090	354	102	80-120			
Batch P7F0906 - *** DEFAULT PRE	P ***									
Blank (P7F0906-BLK1)				Prepared: 0)6/09/17 A	nalyzed: 0	5/13/17			
Chloride	ND		mg/kg wet							
LCS (P7F0906-BS1)				Prepared: ()6/09/17 A	Analyzed: 0	5/13/17			
Chloride	420	1.00	mg/kg wet	400		105	80-120			
UCS Dup (P7F0906-BSD1)				Prepared: (06/09/17 A	Analyzed: 0	6/13/17			
Chloride	422	1.00	mg/kg wei	400		105	80-120	0.328	20	
Duplicate (P7F0906-DUP1)	Sou	rce: 7F05002	-31	Prepared: (06/09/17 /	Analyzed: 0	6/13/17			
Chloride	608		mg/kg dry		608			0.00	20	
Duplicate (P7F0906-DUP2)	Sou	rce: 7F05002	-46	Prepared: (06/09/17 /	Analyzed: 0	6/13/17			
Chloride	ND		mg/kg dry		ND				20	
Matrix Spike (P7F0906-MS1)	Sou	rce: 7F05002	-31	Prepared: (06/09/17 /	Analyzed: 0	6/13/17			
Chloride	1720	1.05	mg/kg dry	1050	608	106	80-120			

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

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch P7F0802 - TX 1005										
Blank (P7F0802-BLK1)				Prepared &	Analyzed:	06/07/17				
C6-C12	ND	25.0	mg/kg wet	• • • • • • • • • • • • • • • • • • • •						
>C12-C28	ND	25.0	μ							
>C28-C35	ND	25.0	м							
Surrogute: 1-Chlorooctane	110		w	100		110	70-130	ta na atrizina in c		
Surrogate: o-Terphenyl	\$5.4		"	50.0		\overline{m}	70-130			
LCS (P7F0802-BS1)				Prepared &	analyzed:	06/07/17				
C6-C12	851	25.0	mg/kg wet	1000		85.1	75-125			
>C12-C28	798	25.0	U.	1000		79.8	75-125			
Surrogate: 1-Chlorooctane	99 .9		, , , , , , , , , , , , , , , , , , , ,	100		99.9	70-130			
Surrogate: o-Terphenyl	47.2		"	50.0		94.1	70-130			
LCS Dup (P7F0802-BSD1)				Prepared &	2 Analyzed:	06/07/17				
C6-C12	850	25.0	mg/kg wet	1000		85.0	75-125	0.185	20	·······
>C12-C28	818	25.0	47	1000		81.8	75-125	2.39	20	
Surrogate: 1-Chlorooctane	101		u	100		101	70-130			
Surrogate: o-Terphenyl	47.9		"	50,0		95.9	70-130			
Matrix Spike (P7F0802-MS1)	Sour	cc: 7F02014	-01	Prepared: (06/07/17 A	nalyzed: 00	5/08/17			
C6-C12	1000	30.9	ing/kg dry	1230	17.7	79.9	75-125			
>C12-C28	1430	30.9	u	1230	1250	13.9	75-125			QM-0
Survogate: 1-Chloroactane	128			123		104	70-130			
Surragate: o-Terphenyl	61.1		"	61.7		98.9	70-130			
Matrix Spike Dup (P7F0802-MSD1)	Sour	cc: 7F02014	-01	Prepared: (06/07/17 A	nalyzed: 00	5/08/17			
C6-C12	1010	30.9	mg/kg dry	1230	17.7	80.8	75-125	1.00	20	
>C12-C28	1510	30.9	n	1230	1250	20,7	75-125	39.5	20	QM-0
Surrogata: 1-Chlorosctane	131		"	123		106	70-130			· • · · · · · · · · · · · · · · · · · ·
Surrogate: o-Terphenyl	62.5		"	61.7		101	70-130			

Permian Basin Environmental Lab, L.P.

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

	Perm	ian Basin	Environ	mental I	Lab, L.P	•				
Analyte	Rosult	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P7F0903 - TX 1005										
Blank (P7F0903-BLK1)				Prepared &	a Analyzed:	06/08/17				
C6-C12	NĐ	25.0	mg/kg wet							~
>C12-C28	ND	25.0	7							
>C28-C35	ND	25.0	14							
Surrogate: 1-Chlorooctane	107		"	100		107	70-130			
Surrogate: o-Terphenyl	55.0		**	\$0.0		110	70-130			
LCS (P7F0903-BS1)				Prepared &	Analyzed:	06/08/17				
C6-C12	816	25.0	mg/kg wet	1000	a or is no sharana	81.6	75-125	·		
>C12-C28	882	25.0	11	1000		88.2	75-125			
Surrogate: 1-Chlorooctane	110		н	100		110	70-130			
Surrogate: o-Terphenyl	51.8		"	\$0.0		104	70-130			
LCS Dup (P7F0903-BSD1)				Prepared &	k Analyzed:	06/08/17				
C6-C12	950		mg/kg wet	1000	n tan kanalana sa k	95.0	75-125	15.2	20	************
>C12-C28	842	25.0		1000		84.2	75-125	4.64	20	
Surrogate: 1-Chlorooctane	106	•••••	4	100	•	100	70-130			
Surrogate: o-Terphanyl	50.0		и	50.0		100	20-130			

Permian Basin Environmental Lab, L.P.

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f				
	Larson & Associates, Inc.	Project:	Salado Draw	Fax: (432) 687-0456
	P.O. Box 50685	Project Number:	17-0154-01	
	Midland TX, 79710	Project Manager:	Mark Larson	
- 1				

Notes and Definitions

S-GC1	Surrogate recovery outside of control limits. A second analysis confirmed the original results
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
BULK	Samples received in Bulk soil containers
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 Constal Spike
MŠ	Matrix Spike
Dup	Duplicate

Report Approved By:

Date: <u>6/14/2017</u>

Breat Barron, Laboratory Director/Technical Director

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

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

Permian Basin Environmental Lab, L.P.

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1			<i>u</i> · · ·	
	Larson & Associates, Inc.	Project: S	Salado Draw	Fax: (432) 687-0456
	P.O. Box 50685	Project Number: 1	17-0154-01	
	Midland TX, 79710	Project Manager: M	Mark Larson	

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Appendix B

Photographs

1RP-4715 Attachment B Delineation Report Salado Draw Produced/Brackish Water Release Lea County, New Mexico June 2, 2017



Direct Push Soil Sampling at Location S-2 (Spill Origin) Viewing West



Direct Push Soil Sampling at Location S-2 (Spill Origin) Viewing South

1RP-4715 Attachment B Delineation Report Salado Draw Produced/Brackish Water Release Lea County, New Mexico June 2, 2017



Damaged Frac Flat Hose and Spill Area Viewing West (Soil Sample Point S-4 in Background)



Soil Sample Location S-7 Viewing South

Appendix C

Initial and Final C-141

Appendix C

Initial and Final C-141

State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised August 8, 2011

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

Oil Conservation Division 1220 South St. Francis Dr.

Sant	ta Fe, NM 87505
Release Notifica	tion and Corrective Action
	OPERATOR 🛛 Initial Report 🗌 Final Repo
Name of Company Chevron USA Inc.	Contact Josepha DeLeon
Address 6301 Deauville Blvd., Midland, TX. 79706	Telephone No. 575-263-0424 Cell - 432-425-1528
Facility Name Salado Draw Area	Facility Type: Lease Road
Surface Owner Mineral Ow	ner API No's.
Federal Private	Not Applicable; spill occurred on
T T T T T T T T T T T T T T T T T T T	lease road
	Set for an and an and a set of the
	TION OF RELEASE
Unit Letter Section Township Range Feet from the N 29 26S 35E	North/South Line Feet from the East/West Line County Lea
Latitude <u>32.012</u>	2119 Longitude -103.381322 INCORRECT GPS COORDINATE:
NATU	URE OF RELEASE
Type of Release: Spill	Volume of Release: Volume Recovered:
	620 barrels produced/brackish 260 barrels produced/brackish water
Source of Release: 12" frac flat hose	water Date and Hour of Occurrence: Date and Hour of Discovery
Source of Release. 12 The nat hose	Date and Hour of Occurrence:Date and Hour of Discovery05/26/2017; 06:00 PM05/26/2017; 06:00 PM
Was Immediate Notice Given?	If YES, To Whom?
🛛 Yes 🗌 No 🗌 Not Requ	
By Whom? Amy Barnhill	Jim Amos - BLM
Was a Watercourse Reached?	Date and Hour: 05/27/2017; 03:20 PM If YES, Volume Impacting the Watercourse.
🗌 Yes 🖾 No	
If a Watercourse was Impacted, Describe Fully.*	
N/A	By Olivia Yu at 9:15 am, Jun 08, 2017
	By Onvia 10 at 3.15 am, 5011 00, 2011
Describe Cause of Problem and Remedial Action Taken.*	
A tractor trailer ran over above-ground 12" trac flat hose, releasing 6	520 barrels produced/brackish water on land. Recovered 260 barrels.
Describe Area Affected and Cleanup Action Taken.*	
The spill to land was on disturbed ditch and did not impact ve	getation nor flow to any sensitive habitat, or water way. Vacuum truck
recovered 260 barrels. Remediation plan will be submitted.	
The head of the second s	
regulations all operators are required to report and/or file cortain rela	e to the best of my knowledge and understand that pursuant to NMOCD rules and ease 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 rem	rediate contamination that pose a threat to ground water, surface water, human health
or the environment. In addition, NMOCD acceptance of a C-141 rep	port does not relieve the operator of responsibility for compliance with any other
federal, state, or local laws and/or regulations.	
$\cap \cap \mathcal{U}$	OIL CONSERVATION DIVISION
Juleden	
	Approved by Environmental Specialist:
Signature:	
Printed Name: Josepha DeLeon	0
	Annual Data 6/8/2017
fitle: HES Compliance Support - Environmental	Approval Date: 0/0/2017 Expiration Date:
E-mail Address: jdxd@chevron.com	Conditions of Approval:
	See attached directive
Date: 06/7/2017 Phone: 575-263-0424	
ttach Additional Sheets If Necessary	
	1RP-4715 fOY1716526248 nOY1716526342

pOY1716526704

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _6/7/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4715_ has been assigned. Please refer to this case number in all future correspondence.

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

The responsible person shall complete <u>division-approved corrective action</u> for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the divisian or with an abatement plan submitted in accordance with 19.15.30 NMAC. [emphasis added]

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District _1_ office in __Hobbs_____ on or before _7/8/2017_. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

• Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.

• Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C₆ thru C₃₆), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.

- Nominal detection limits for field and laboratory analyses must be provided.
- Composite sampling is not generally allowed.

• Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

•Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

• If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

• Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.

Jim Griswold OCD Environmental Bureau Chief 1220 South St. Francis Drive Santa Fe, New Mexico 87505 505-476-3465 jim.griswold@state.nm.us

Form C-141 Revised August 8, 2011

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

				ease Notifi	cation		A LOCUTO IA	CLIVIA	
						OPERA	FOR	🖂 Initi	al Report 🔲 Final Repor
		Chevron USA			(Contact Jos	epha DeLeon		
		ille Blvd., 1		TX. 79706			No. 575-263-04	24 Cell – 432-	425-1528
Facility Na	ame Salado	o Draw Area			1	Facility Typ	e: Lease Road		
Surface Or Federal	wner			Mineral Private	Owner			API Not Ap lease r	oplicable; spill occurred on
				LOC	ATION	OF RE	LEASE		
Unit Letter I	Section 29	Township 26S	Range 35E	Feet from the		South Line	Feet from the	East/West Line	County Lea
							le <u>-103.381322</u>		
				NA	FURE	OF REL		1	
Type of Rel	ease: Spill					Volume of 620 barrels water	Release: s produced/bracki		Recovered: els produced/brackish water
		frac flat hose				Date and H 05/26/201	lour of Occurrent 7; 06:00 PM		Hour of Discovery 117; 06:00 PM
Was Immed	liate Notice		Yes [] No 🗌 Not F	Required	If YES, To Olivia Yu; Jim Amos	Maxey Brown -	NMOCD	
By Whom?							Hour: 05/27/2017	; 03:20 PM	
Was a Wate	rcourse Rea] Yes 🛛] No			olume Impacting		
If a Waterco N/A	ourse was In	pacted, Desci	ribe Fully.	*					
		lem and Reme r above-groun			ng 620 ba	arrels produc	ed/brackish water	on land. Recove	red 260 barrels.
The spill to	and was		ditch and			ion nor flov	v to any sensitiv	e habitat, or wa	ter way. Vacuum truck
regulations a public health should their or the enviro	all operators or the envi operations l onment. In a	are required to ironment. The have failed to	to report and e acceptane adequately OCD accept	nd/or file certain ce of a C-141 rep investigate and	release no ort by the remediate	otifications a e NMOCD n e contaminat	nd perform corre narked as "Final F ion that pose a th	ctive actions for re Report" does not re reat to ground wat	rsuant to NMOCD rules and eleases which may endanger elieve the operator of liability er, surface water, human health compliance with any other
							OIL CON	SERVATIO	N DIVISION
	()	leter	n.						
	An	a we				Approved by	Environmental S	Specialist:	
Signature:	0								
	V	DeLeon							
Printed Nam	e: Josepha	DeLeon Support - En	vironment	al		Approval Da	te:	Expiratio	n Date:
	e: Josepha Compliance		vironment	al		Approval Da Conditions o		Expiratio	n Date:
Printed Nam Title: HES (E-mail Addr Date: 06/7/2	e: Josepha Compliance ess: jdxd@	Support - Env	: 575-263					Expiratio	

State of New Mexico Energy Minerals and Natural Resources

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

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

						OPERA	TOR	٦	Initio	al Report	\boxtimes	Final Report
		Chevron US/					sepha DeLeon	 			لاسكا	
		ille Blvd., N		ГХ 79706		7	No.: (575) 263-	-0424				
Facility Na	ne: Salado	o Draw Area	1	· · · ·			e: Lease Road					
Surface Ow	ner: Fede	eral		Mine	ral Owner	: Private			Lease N lease ro	No. NA – sj vad	pill oc	curred on
				LC	CATIC	ON OF RE	LEASE	*****				
Unit Letter	Section	Township	Range	Feet from t		h/South Line	Feet from the	East/W	est Line	County		
I	29	265	35E	700		South	50	E	ast		Lea	
			I	Latitude: 32	2.012119	' Longitu	de: -103.38132	22°				
Process of the la	D 1			N	ATURI	E OF REL			F / 2			
Source of Re	lease: 17" (ed/Brackish îrac flat hose	Water Spil	[]			Release: 620 bb			Recovered:		
							four of Occurren 7; 06:00 pm			Hour of Dis 17; 06:00 pn		
Was Immedi	ate Notice G		Yes [) No 🗌 N	ot Required	If YES, To	Whom? Olivia					zt 1, Jim
By Whom? A						Date and F	Tour: 05/27/2017	· 03·20 nm	n			
Vas a Watero		hed?		-			olume Impacting					
		11	Vac 🔽	1 1 1.								
			Yes 🖾									
f a Watercou	rse was Imp	pacted, Descri										
		pacted, Descri	ibe Fully.	N/A	<u> </u>				·····-			
Describe Cau	sc of Proble	pacted, Description	ibe Fully.	* N/A n Taken.* T	ractor trail	er ran over abo	ve-ground 12" fr	ac flat hos	se, releasi	ng 620 bbl c	ofprod	uces/brackisl
Describe Cau vater adjacen	sc of Proble t to lease ro	pacted, Description of the second sec	ibe Fully. dial Action ed 260 bbl	* N/A n Taken.* T								
Describe Cau water adjacen Describe Arc:	sc of Proble t to lease ro	pacted, Deservert and Remea ad. Recovert and Cleanup A	ibe Fully. dial Action ed 260 bbl Action Tak	* N/A n Taken.* T	vas restricte	ed to area hetw	een lease road ar	id berm fo	r high pre	ssure gas n	ineline	for a lateral
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