

**1RP-4666
Investigation Report
Paladin Energy Corp., East Caprock SWD/Posey A5 Battery
Lea County, New Mexico
May 5, 2017**

Introduction

Larson & Associates, Inc. (LAI) was requested by Paladin Energy Corp. (Paladin) to assess the extent of spills at the East Caprock salt water disposal (SWD) and Posey A5 battery (Site). A New Mexico Oil Conservation Division (OCD) field inspector discovered spills while conducting an inspection on February 23, 2017. Spills were observed around equipment and tanks at the East Caprock SWD and at the separator located near the southeast corner of the Posey A 5 battery. The spill at the East Caprock SWD was caused by a leak at the injection pump that flowed east and north around the tanks. The spill at the East Caprock SWD was mostly contained inside the earthen firewall. The spill at the Posey A 5 battery was caused by a hole in the separator and flowed south along the east side of the lease road for about 300 feet.

On April 4, 2017, Paladin submitted form C-141 (Release Notification and Corrective Action) to the OCD District 1 office in Hobbs, New Mexico. The C-141 noted a spill date of February 13, 2017. The OCD approved the initial C-141 on April 5, 2017, and requested a plan to delineate the vertical and horizontal limits for the spills. The delineation plan was submitted and approved by OCD on April 5, 2017. The Site is located west of Tatum, Lea County, New Mexico. The legal description is Unit O (SW/4, SE/4), Section 11, Township 12 South and Range 32 East. The geodetic position is 33° 17' 22.811" North and 103° 41' 03.547". Figure 1 presents a topographic map. Figure 2 presents an aerial map.

Physical Setting

The physical setting is as follows:

- Elevation is approximately 4,330 feet above mean sea level (MSL);
- Topography slopes toward the east;
- The nearest surface water feature is a depression (playa) located about 3,100 feet east of the Site;
- The soils are designated as "Kimbrough Gravelly Loam" and "Kimbrough-Lea complex", consisting of calcareous alluvium derived from reworking the Blackwater Draw (Pleistocene) and Ogallala (Pliocene) formations, in descending order;
- The soil developed over cemented material (caliche);
- The upper geological unit is the Tertiary-age Blackwater Draw and Ogallala formations, in descending order, comprised of very fine to medium-grained quartz sand and gravel, with minor amount of silt and clay with indistinct to massive crossbeds;
- The Ogallala formation is underlain by clay, silty clay, shale and sandstone of the Chile formation (Triassic) and is about 300 feet thick;
- The nearest fresh water well is located in Unit L (NW/4, SW/4), Section 1, Township 11 South, Range 32 East about 3,200 feet west - northwest (up gradient) of the Site;
- The well is used for livestock watering and has a reported depth to groundwater of approximately 30 feet below ground surface (bgs).

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	<50 feet	20
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 20

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 100 mg/Kg

Soil Samples

On April 6 and 7, 2017, LAI personnel supervised drilling fourteen (14) air rotary drilled borings and four (4) hand auger borings for collecting soil samples. The air rotary borings were drilled by Scarborough Drilling, Inc., Lamesa, Texas, to depths of 15 feet below ground surface (bgs) at SB-12, 20 feet bgs (SB-10, SB-13 and SB-14), 25 feet bgs (SB-1 through SB-5, SB-7, SB-8, SB-9 and SB-11) and 30 feet bgs (SB-6). Soil samples were collected every 5 feet with a jam tube sampler. The hand auger borings were installed by LAI at four (4) locations (HA-1, HA-2, HA-3 and HA-4) where pooling of hydrocarbons was suspected. Auger refusal occurred at about 1 foot bgs (HA-2, HA-3, and HA-4) and 2 feet bgs (HA-1) due to caliche. The soil samples were analyzed by Permian Basin Environmental Laboratory, in Midland, Texas, for benzene, toluene, ethylbenzene, xylene (BTEX), total petroleum hydrocarbons (TPH) and chloride by EPA methods. Table 1 presents the laboratory analytical data summary. Figure 3 presents the soil boring locations. Attachment A presents the laboratory report. Attachment B presents photographs. Attachment C presents the initial C-141 and conditions.

Laboratory Results

Benzene and BTEX in soil samples were below the RRAL of 10 milligrams per kilogram (mg/Kg) and 50 mg/Kg, respectively. TPH was above the RRAL (100 mg/Kg) in the following soil samples:

SB-5, 0 – 1' (34,400 mg/Kg)	SB-11, 0 – 1' (10,400 mg/Kg)
SB-6, 0 – 1' (33,800 mg/Kg)	SB-12, 0 – 1' (24,900 mg/Kg)
SB-6, 5' (6,460 mg/Kg)	SB-13, 0 – 1' (19,900 mg/Kg)
SB-7, 0 – 1' (54,900 mg/Kg)	HA-1, 0 – 1' (6,230 mg/Kg)
SB-7, 5' (1,290 mg/Kg)	HA-1, 1 – 2' (11,700 mg/Kg)
SB-8, 5' (965.8 mg/Kg)	HA-2, 0 – 1' (6,230 mg/kg)
SB-10, 0 – 1' (46,600 mg/Kg)	HA-3, 0 – 1' (11,700 mg/Kg)
SB-10, 5' (237.5 mg/Kg)	HA-4, 0 – 1' (731.4 mg/Kg)

Chloride was above the required delineation limit of 250 milligrams per kilogram (mg/Kg) and the required ten (10) foot separation with groundwater in the deepest soil samples in the following borings:

SB-1, 25' (442 mg/Kg)	SB-12, 15' (521 mg/Kg)
SB-6, 30' (1,320 mg/Kg)	SB-13, 20' (298 mg/Kg)
SB-7, 25' (605 mg/Kg)	SB-14, 20' (1,500 mg/Kg)
SB-8, 25' (1,990 mg/Kg)	HA-1, 1 – 2' (2,000 mg/Kg)
SB-9, 25' (293 mg/Kg)	HA-2, 0 – 1' (3,360 mg/Kg)
SB-10, 20' (408 mg/Kg)	HA-3, 0 – 1' (2,930 mg/kg)
SB-11, 20' (299 mg/Kg)	HA-4, 0 – 1' (1,990 mg/Kg)

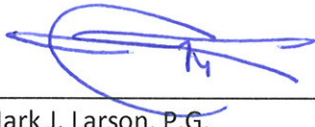
Conclusions

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

- Benzene in the soil samples was below the RRAL of 10 mg/Kg;
- BTEX in the soil samples was below the RRAL of 50 mg/Kg;
- The lateral extent of TPH in soil above the RRAL was delineated;
- The vertical extent of TPH in soil above the RRAL was delineated except in soil samples from the following locations: HA-1, 2' (691.4 mg/Kg), HA-2, 1' (6,230 mg/Kg), HA-3, 1' (11,700 mg/Kg) and HA-4 (731.4 mg/Kg) where additional sampling was not possible with hand auger methods due to caliche in the subsurface;
- TPH was above the RRAL at the following locations and depths:

SB-5 (1')	SB-12 (1')
SB-6 (5')	SB-13 (1')
SB-7 (5')	HA-1 (>2')
SB-10 (5')	HA-2 (>1')
SB-11 (1')	HA-3 (>1')
	HA-4 (>1')
- Chloride concentrations exceeding 250 mg/Kg in the deepest samples at the following locations without 10 feet of separation from groundwater:

SB-1, 25' (442 mg/Kg)	SB-12, 15' (521 mg/Kg)
SB-6, 30' (1,320 mg/Kg)	SB-13, 20' (298 mg/Kg)
SB-7, 25' (605 mg/Kg)	SB-14, 20' (1,500 mg/Kg)
SB-8, 25' (1,990 mg/Kg)	HA-1, 1 – 2' (2,000 mg/Kg)
SB-9, 25' (293 mg/Kg)	HA-2, 0 – 1' (3,360 mg/Kg)
SB-10, 20' (408 mg/Kg)	HA-3, 0 – 1' (2,930 mg/kg)
SB-11, 20' (299 mg/Kg)	HA-4, 0 – 1' (1,990 mg/Kg)



Mark J. Larson, P.G.
Certified Professional Geologist #10490

Tables

Table 1
1RP-4666
Delineation Soil Sample Analytical Data Summary
Paladin Energy Corporation, East Caprock SWD/Posey A5 Battery
Unit O (SW/4, SE/4), Section 11, Township 12 South, Range 32 East
Lea County, New Mexico

	5	4/6/2017	In-Situ	1.2	--	--	<32.9	<32.9	<32.9	<32.9	78.4
	10	4/6/2017	In-Situ	1.2	--	--	--	--	--	--	26.5
	15	4/6/2017	In-Situ	0.9	--	--	--	--	--	--	71.8
	20	4/6/2017	In-Situ	0.3	--	--	--	--	--	--	--
	25	4/6/2017	In-Situ	0.3	--	--	--	--	--	--	--
SB-5	0	4/6/2017	In-Situ	236	<0.0220	2.049	7,120	25,500	1,740	34,400	1,630
	5	4/6/2017	In-Situ	15.5	<0.0211	<0.1475	<26.3	39.6	<26.3	39.6	104
	10	4/6/2017	In-Situ	6.6	--	--	<27.5	<27.5	<27.5	<27.5	270
	15	4/6/2017	In-Situ	22.1	--	--	<30.1	<30.1	<30.1	<30.1	233
	20	4/6/2017	In-Situ	5.1	--	--	<26.3	<26.3	<26.3	<26.3	175
	25	4/6/2017	In-Situ	7.9	--	--	--	--	--	--	45.7
SB-6	0	4/6/2017	In-Situ	256	0.165	10.69	6,060	24,5000	3,210	33,800	2,900
	5	4/6/2017	In-Situ	239	<0.0213	0.290	824	5,000	641	6,460	308
	10	4/6/2017	In-Situ	46	--	--	<26.9	68.6	<26.9	68.6	59.8
	15	4/6/2017	In-Situ	56	--	--	<26.3	150	<26.3	150	174
	20	4/6/2017	In-Situ	49	--	--	<27.2	120	<27.2	120	284
	25	4/6/2017	In-Situ	25.1	--	--	<27.8	163	<27.8	163	313
	30	4/6/2017	In-Situ	20.0	--	--	<28.7	103	<28.7	103	1,320
SB-7	0	4/6/2017	In-Situ	239.1	<0.0211	0.8653	3,650	44,000	7,210	54,900	8,270
	5	4/6/2017	In-Situ	166.5	<0.0213	0.0849	118	1,040	130	1,290	184
	10	4/6/2017	In-Situ	25.6	--	--	<26.3	92.3	<26.3	92.3	372
	15	4/6/2017	In-Situ	9.7	--	--	<27.2	<27.2	<27.2	<27.2	265

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Unit O (SW/4, SE/4), Section 11, Township 12 South, Range 32 East
Lea County, New Mexico

	20	4/6/2017	In-Situ	6.2	--	--	<27.5	<27.5	<27.5	<27.5	189
	25	4/6/2017	In-Situ	24.6	--	--	--	--	--	--	605
SB-8	0	4/6/2017	In-Situ	1.5	--	--	<28.4	<28.4	<28.4	<28.4	17,000
	5	4/6/2017	In-Situ	17.7	--	--	<29.4	873	92.8	965.8	547
	10	4/6/2017	In-Situ	3.9	--	--	<25.8	59.0	<25.8	59.0	68.0
	15	4/6/2017	In-Situ	2.9	--	--	<26.6	73.6	<26.6	73.6	676
	20	4/6/2017	In-Situ	2.3	--	--	--	--	--	--	955
	25	4/6/2017	In-Situ	1.7	--	--	--	--	--	--	1,990
SB-9	0	4/7/2017	In-Situ	0.7	--	--	<25.0	<25.0	<25.0	<25.0	71.2
	5	4/7/2017	In-Situ	0.8	--	--	<26.3	<26.3	<26.3	<26.3	151
	10	4/7/2017	In-Situ	0.6	--	--	--	--	--	--	402
	15	4/7/2017	In-Situ	0.5	--	--	--	--	--	--	796
	20	4/7/2017	In-Situ	0.3	--	--	--	--	--	--	847
	25	4/7/2017	In-Situ	0.3	--	--	--	--	--	--	293
SB-10	0	4/7/2017	In-Situ	36.9	<0.0206	<0.1442	604	39,300	6,670	46,600	4,000
	5	4/7/2017	In-Situ	6.0	<0.00111	<0.0078	<27.8	173	64.5	237.5	1,080
	10	4/7/2017	In-Situ	9.8	--	--	<26.3	331	29.3	360.30	305
	15	4/7/2017	In-Situ	3.4	--	--	<25.0	<25.0	<25.0	<25.0	175
	20	4/7/2017	In-Situ	1.6	--	--	<29.8	<29.8	<29.8	<29.8	408
SB-11	0	4/7/2017	In-Situ	12.6	<0.0211	<0.1475	206	8,900	1,330	10,400	6,570
	5	4/7/2017	In-Situ	8.6	<0.0215	<0.1505	<26.9	<26.9	<26.9	<26.9	787

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Delineation Soil Sample Analytical Data Summary
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Lea County, New Mexico

	10	4/7/2017	In-Situ	2.8	--	--	<25.5	<25.5	<25.5	<25.5	7.63
	15	4/7/2017	In-Situ	1.5	--	--	<27.5	<27.5	<27.5	<27.5	211
	20	4/7/2017	In-Situ	1.2	--	--	<26.6	<26.6	<26.6	<26.6	1,350
	25	4/7/2017	In-Situ	1.0	--	--	--	--	--	--	299
SB-12	0	4/7/2017	In-Situ	188.4	<0.0526	<0.3678	1,160	21,600	2,230	24,900	3,590
	5	4/7/2017	In-Situ	3.2	<0.00102	<0.0071	<25.5	27.3	30.6	57.9	273
	10	4/7/2017	In-Situ	1.6	--	--	<26.0	<26.0	<26.0	<26.0	196
	15	4/7/2017	In-Situ	1.9	--	--	<26.9	<26.9	<26.9	<26.9	521
SB-13	0	4/7/2017	In-Situ	142	<0.521	0.3887	2,330	16,300	1,200	19,900	9,070
	5	4/7/2017	In-Situ	6.4	<0.00114	<0.008	<28.4	<28.4	<28.4	<28.4	2,190
	10	4/7/2017	In-Situ	4.2	--	--	<26.0	<26.0	<26.0	<26.0	429
	15	4/7/2017	In-Situ	2.1	--	--	<27.2	<27.2	<27.2	<27.2	602
	20	4/7/2017	In-Situ	2.0	--	--	<26.9	<26.9	<26.9	<26.9	298
SB-14	0	4/7/2017	In-Situ	0.9	--	--	<25.3	65.0	<25.3	65.0	985
	5	4/7/2017	In-Situ	0.4	--	--	<26.6	<26.6	<26.6	<26.6	809
	10	4/7/2017	In-Situ	0.4	--	--	--	--	--	--	599
	15	4/7/2017	In-Situ	0.4	--	--	--	--	--	--	1,570
	20	4/7/2017	In-Situ	0.3	--	--	--	--	--	--	1,500
HA-1	0 - 1	4/7/2017	In-Situ	220			60.7	2,510	331	2,901.7	4,090
	1 - 2	4/7/2017	In-Situ	90			38.2	556	97.2	691.4	2,000

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Unit O (SW/4, SE/4), Section 11, Township 12 South, Range 32 East
Lea County, New Mexico

HA-2	0 - 1	4/7/2017	In-Situ	98			445	5,210	572	6,230	3,360
HA-3	0 - 1	4/7/2017	In-Situ	192			1,250	9,630	800	11,700	2,930
HA-4	0 - 1	4/7/2017	In-Situ	189			<28.1	632	99.4	731.4	1,990

Notes: laboratory analysis performed by Permian Basin Environmental Lab, Midland, Texas, by EPA SW-846 Methods 8021B (BTEX) and 8015M (TPH)

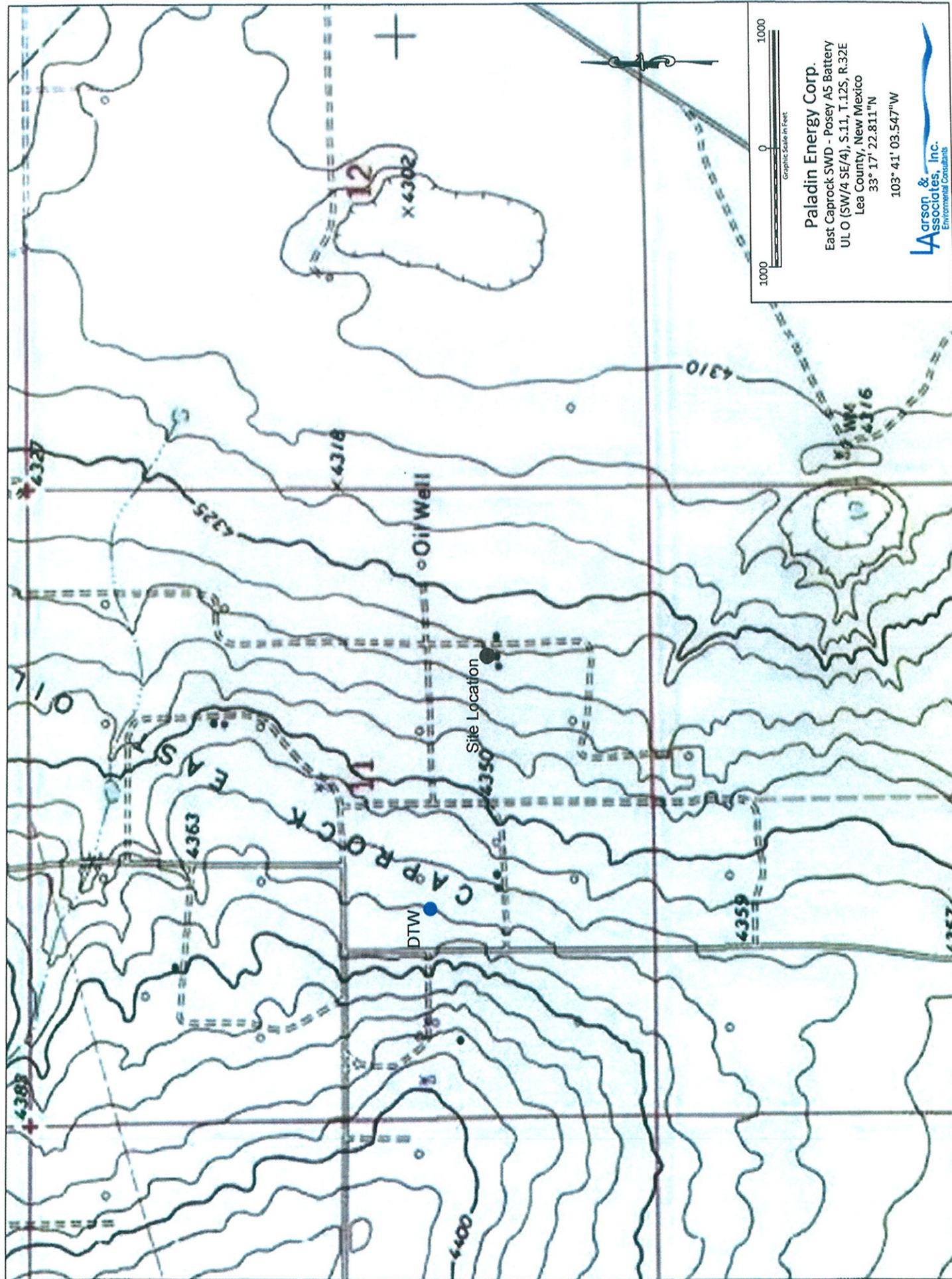
Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

RRAL: Remediation action level calculated from OCD guidance document (August 13, 1993)

Bold and highlighted indicates that analyte was detected above recommended remediation action level (RRAL)

Figures



Paladin Energy Corp.
 East Caprock SWD - Posey A5 Battery
 UL O (SW/4 SE/4), S.11, T.12S, R.32E
 Lea County, New Mexico
 33° 17' 22.811"N
 103° 41' 03.547"W

Larson &
 Associates, Inc.
 Environmental Consultants

Figure 1 - Topographic Map



Figure 2 - Detailed Aerial Map

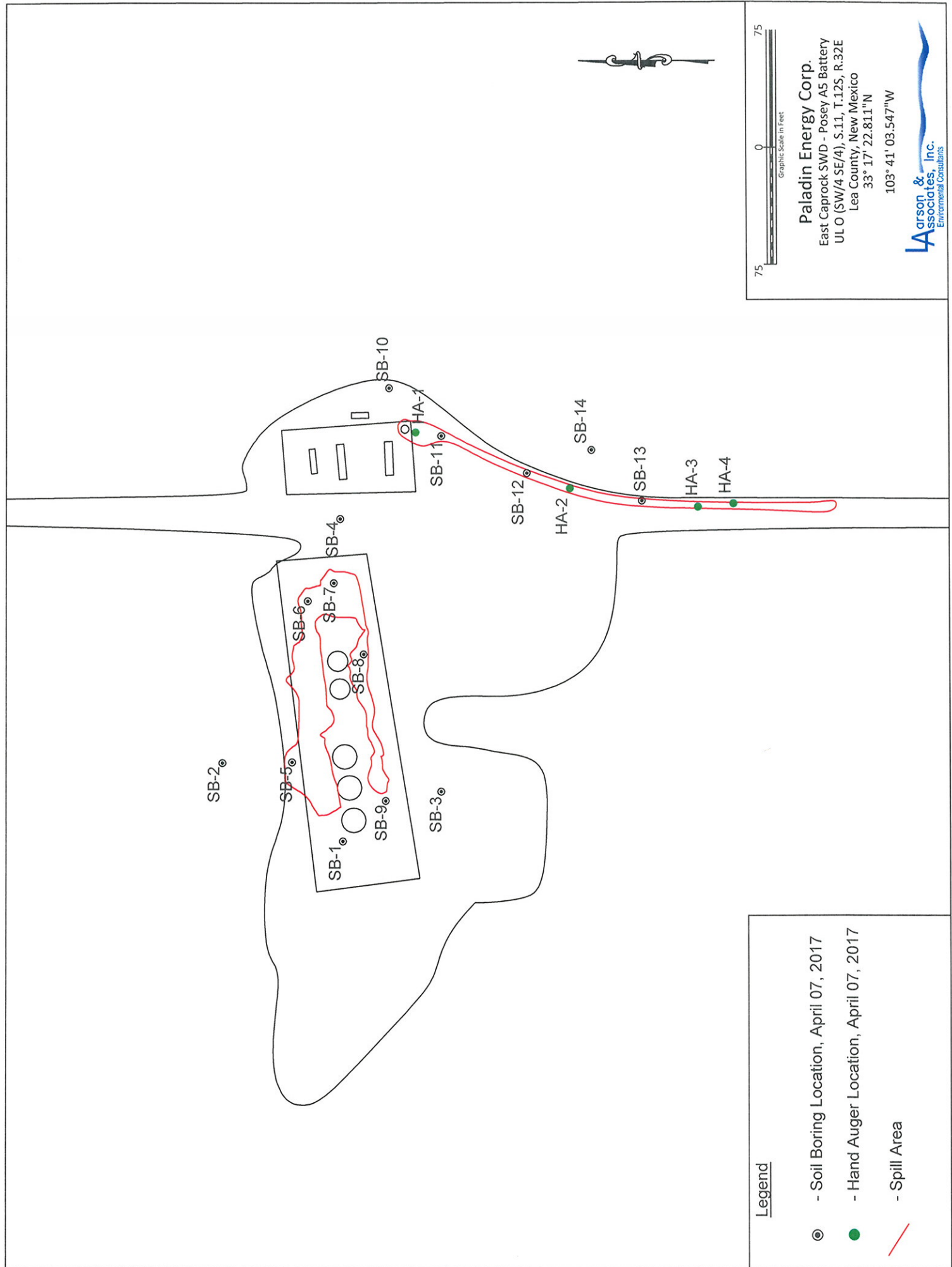


Figure 3 - Site Map Showing Soil Boring Locations, April 07, 2017

Attachment A

Laboratory Report

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

PBELAB

Analytical Report

Prepared for:

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

Project: Paladin East Caprock SWD

Project Number: 17-0135-02

Location: None Given

Lab Order Number: 7D10008



NELAP/TCEQ # T104704156-16-6

Report Date: 05/02/17

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-1 0'	7D10008-01	Soil	04/06/17 10:30	04-10-2017 11:00
SB-1 5'	7D10008-02	Soil	04/06/17 12:04	04-10-2017 11:00
SB-1 10'	7D10008-03	Soil	04/06/17 12:08	04-10-2017 11:00
SB-1 15'	7D10008-04	Soil	04/06/17 12:10	04-10-2017 11:00
SB-1 20'	7D10008-05	Soil	04/06/17 12:13	04-10-2017 11:00
SB-1 25'	7D10008-06	Soil	04/06/17 12:10	04-10-2017 11:00
SB-2 0'	7D10008-07	Soil	04/06/17 12:40	04-10-2017 11:00
SB-2 5'	7D10008-08	Soil	04/06/17 12:47	04-10-2017 11:00
SB-2 10'	7D10008-09	Soil	04/06/17 12:49	04-10-2017 11:00
SB-2 15'	7D10008-10	Soil	04/06/17 12:51	04-10-2017 11:00
SB-3 0'	7D10008-13	Soil	04/07/17 09:40	04-10-2017 11:00
SB-3 5'	7D10008-14	Soil	04/07/17 09:44	04-10-2017 11:00
SB-3 10'	7D10008-15	Soil	04/07/17 09:50	04-10-2017 11:00
SB-3 15'	7D10008-16	Soil	04/07/17 09:52	04-10-2017 11:00
SB-3 20'	7D10008-17	Soil	04/07/17 09:53	04-10-2017 11:00
SB-3 25'	7D10008-18	Soil	04/07/17 09:59	04-10-2017 11:00
SB-4 0'	7D10008-19	Soil	04/06/17 16:06	04-10-2017 11:00
SB-4 5'	7D10008-20	Soil	04/06/17 16:08	04-10-2017 11:00
SB-4 10'	7D10008-21	Soil	04/06/17 16:10	04-10-2017 11:00
SB-4 15'	7D10008-22	Soil	04/06/17 16:13	04-10-2017 11:00
SB-5 0'	7D10008-25	Soil	04/06/17 12:00	04-10-2017 11:00
SB-5 5'	7D10008-26	Soil	04/06/17 12:07	04-10-2017 11:00
SB-5 10'	7D10008-27	Soil	04/06/17 12:09	04-10-2017 11:00
SB-5 15'	7D10008-28	Soil	04/06/17 12:12	04-10-2017 11:00
SB-5 20'	7D10008-29	Soil	04/06/17 12:14	04-10-2017 11:00
SB-5 25'	7D10008-30	Soil	04/06/17 12:20	04-10-2017 11:00
SB-6 0'	7D10008-31	Soil	04/06/17 13:30	04-10-2017 11:00
SB-6 5'	7D10008-32	Soil	04/06/17 13:40	04-10-2017 11:00
SB-6 10'	7D10008-33	Soil	04/06/17 13:43	04-10-2017 11:00
SB-6 15'	7D10008-34	Soil	04/06/17 13:46	04-10-2017 11:00
SB-6 20'	7D10008-35	Soil	04/06/17 13:47	04-10-2017 11:00
SB-6 25'	7D10008-36	Soil	04/06/17 13:51	04-10-2017 11:00
SB-6 30'	7D10008-37	Soil	04/06/17 14:17	04-10-2017 11:00
SB-7 0'	7D10008-38	Soil	04/06/17 14:39	04-10-2017 11:00

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-7 5'	7D10008-39	Soil	04/06/17 14:44	04-10-2017 11:00
SB-7 10'	7D10008-40	Soil	04/06/17 14:48	04-10-2017 11:00
SB-7 15'	7D10008-41	Soil	04/06/17 14:50	04-10-2017 11:00
SB-7 20'	7D10008-42	Soil	04/06/17 14:51	04-10-2017 11:00
SB-7 25'	7D10008-43	Soil	04/06/17 14:56	04-10-2017 11:00
SB-8 0'	7D10008-44	Soil	04/06/17 15:25	04-10-2017 11:00
SB-8 5'	7D10008-45	Soil	04/06/17 15:28	04-10-2017 11:00
SB-8 10'	7D10008-46	Soil	04/06/17 15:37	04-10-2017 11:00
SB-8 15'	7D10008-47	Soil	04/06/17 15:52	04-10-2017 11:00
SB-8 20'	7D10008-48	Soil	04/06/17 15:53	04-10-2017 11:00
SB-8 25'	7D10008-49	Soil	04/06/17 15:59	04-10-2017 11:00
SB-9 0'	7D10008-50	Soil	04/07/17 08:58	04-10-2017 11:00
SB-9 5'	7D10008-51	Soil	04/07/17 09:06	04-10-2017 11:00
SB-9 10'	7D10008-52	Soil	04/07/17 09:09	04-10-2017 11:00
SB-9 15'	7D10008-53	Soil	04/07/17 09:11	04-10-2017 11:00
SB-9 20'	7D10008-54	Soil	04/07/17 09:13	04-10-2017 11:00
SB-9 25'	7D10008-55	Soil	04/07/17 09:17	04-10-2017 11:00
SB-10 0'	7D10008-56	Soil	04/07/17 09:34	04-10-2017 11:00
SB-10 5'	7D10008-57	Soil	04/07/17 09:37	04-10-2017 11:00
SB-10 10'	7D10008-58	Soil	04/07/17 09:44	04-10-2017 11:00
SB-10 15'	7D10008-59	Soil	04/07/17 09:48	04-10-2017 11:00
SB-10 20'	7D10008-60	Soil	04/07/17 09:51	04-10-2017 11:00
SB-11 0'	7D10008-61	Soil	04/07/17 12:10	04-10-2017 11:00
SB-11 5'	7D10008-62	Soil	04/07/17 12:19	04-10-2017 11:00
SB-11 10'	7D10008-63	Soil	04/07/17 12:24	04-10-2017 11:00
SB-11 15'	7D10008-64	Soil	04/07/17 12:25	04-10-2017 11:00
SB-11 20'	7D10008-65	Soil	04/07/17 12:28	04-10-2017 11:00
SB-11 25'	7D10008-66	Soil	04/07/17 12:44	04-10-2017 11:00
SB-12 0'	7D10008-67	Soil	04/07/17 12:57	04-10-2017 11:00
SB-12 5'	7D10008-68	Soil	04/07/17 13:00	04-10-2017 11:00
SB-12 10'	7D10008-69	Soil	04/07/17 13:04	04-10-2017 11:00
SB-12 15'	7D10008-70	Soil	04/07/17 13:05	04-10-2017 11:00
SB-13 0'	7D10008-71	Soil	04/07/17 13:20	04-10-2017 11:00
SB-13 5'	7D10008-72	Soil	04/07/17 13:23	04-10-2017 11:00

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SB-13 10'	7D10008-73	Soil	04/07/17 13:25	04-10-2017 11:00
SB-13 15'	7D10008-74	Soil	04/07/17 13:27	04-10-2017 11:00
SB-13 20'	7D10008-75	Soil	04/07/17 13:36	04-10-2017 11:00
SB-14 0'	7D10008-76	Soil	04/07/17 13:54	04-10-2017 11:00
SB-14 5'	7D10008-77	Soil	04/07/17 13:57	04-10-2017 11:00
SB-14 10'	7D10008-78	Soil	04/07/17 14:00	04-10-2017 11:00
SB-14 15'	7D10008-79	Soil	04/07/17 14:02	04-10-2017 11:00
SB-14 20'	7D10008-80	Soil	04/07/17 14:10	04-10-2017 11:00
HA-1 (0-1)	7D10008-81	Soil	04/07/17 11:25	04-10-2017 11:00
HA-1 (1-2)	7D10008-82	Soil	04/07/17 11:27	04-10-2017 11:00
HA-2 (0-1)	7D10008-83	Soil	04/07/17 14:28	04-10-2017 11:00
HA-3 (0-1)	7D10008-84	Soil	04/07/17 14:30	04-10-2017 11:00
HA-4 (0-1)	7D10008-85	Soil	04/07/17 14:32	04-10-2017 11:00

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-1 0'
7D10008-01 (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	113	1.03	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.8	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C12-C28	ND	25.8	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: 1-Chlorooctane		102 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: o-Terphenyl		101 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	04/11/17	04/11/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-1 5'
7D10008-02 (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	36.3	1.09	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	8.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		88.8 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		99.7 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-1 10'
7D10008-03 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								

Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	456	1.06	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-1 15'
7D10008-04 (Soil)

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							

Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	560	1.04	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	4.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-1 20'
7D10008-05 (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	710	1.01	mg/kg dry	1	P7D2004	04/20/17	04/24/17	EPA 300.0	
% Moisture	1.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Manager: Mark Larson

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SB-1 25'
7D10008-06 (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	442	1.03	mg/kg dry	1	P7D2004	04/20/17	04/24/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Number: 17-0135-02
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SB-2 0'
7D10008-07 (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	733	1.04	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	4.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: 1-Chlorooctane		101 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: o-Terphenyl		100 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	04/11/17	04/11/17	calc	

Permian Basin Environmental Lab, L.P.

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Page 11 of 108

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Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-2 5'
7D10008-08 (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	876	1.03	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.8	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	25.8	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		85.6 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		93.6 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.8	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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SB-2 10'
7D10008-09 (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	71.3	1.12	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	11.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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SB-2 15'
7D10008-10 (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	29.0	1.06	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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SB-3 0'
7D10008-13 (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	2130	10.8	mg/kg dry	10	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: 1-Chlorooctane		104 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: o-Terphenyl		104 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	04/11/17	04/11/17	calc	

Permian Basin Environmental Lab, L.P.

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SB-3 5'
7D10008-14 (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	415	1.02	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	2.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	25.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	25.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	25.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		83.8 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		88.1 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.5	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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SB-3 10'
7D10008-15 (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	162	1.01	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	1.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Permian Basin Environmental Lab, L.P.

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SB-3 15'
7D10008-16 (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	344	1.02	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	2.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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SB-3 20'
7D10008-17 (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	202	1.06	mg/kg dry	1	P7D2004	04/20/17	04/24/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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SB-3 25'
7D10008-18 (Soil)

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								

Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	47.8	1.10	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0
% Moisture	9.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation

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Project Manager: Mark Larson

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SB-4 0'
7D10008-19 (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	348	1.06	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C12-C28	43.1	26.6	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: 1-Chlorooctane		108 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: o-Terphenyl		108 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	43.1	26.6	mg/kg dry	1	[CALC]	04/11/17	04/11/17	calc	

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Project Manager: Mark Larson

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SB-4 5'
7D10008-20 (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	78.4	1.32	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	24.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	32.9	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	32.9	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	32.9	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		87.9 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		96.3 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	32.9	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-4 10'
7D10008-21 (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	26.5	1.11	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	10.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-4 15'
7D10008-22 (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	71.8	1.14	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	12.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-5 0'
7D10008-25 (Soil)

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

Organics by GC

Benzene	ND	0.0220	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Toluene	0.127	0.0440	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	0.397	0.0220	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	0.953	0.0440	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	0.572	0.0220	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		64.7 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	S-GC
Surrogate: 4-Bromofluorobenzene		85.7 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1630	11.0	mg/kg dry	10	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	9.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	7120	137	mg/kg dry	5	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C12-C28	25500	137	mg/kg dry	5	P7D1307	04/11/17	04/11/17	TPH 8015M	
>C28-C35	1740	137	mg/kg dry	5	P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: 1-Chlorooctane		127 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Surrogate: o-Terphenyl		120 %	70-130		P7D1307	04/11/17	04/11/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	34400	137	mg/kg dry	5	{CALC}	04/11/17	04/11/17	calc	

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-5 5'
7D10008-26 (Soil)

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

Organics by GC

Benzene	ND	0.0211	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Toluene	ND	0.0421	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Ethylbenzene	ND	0.0211	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Xylene (p/m)	ND	0.0421	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Xylene (o)	ND	0.0211	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		78.6 %	75-125		P7D2009	04/19/17	04/19/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		70.8 %	75-125		P7D2009	04/19/17	04/19/17	EPA 8021B	S-GC

General Chemistry Parameters by EPA / Standard Methods

Chloride	104	1.05	mg/kg dry	1	P7D1211	04/12/17	04/13/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C12-C28	39.6	26.3	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		85.0 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		94.0 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	39.6	26.3	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-5 10'
7D10008-27 (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	270	1.10	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	9.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	27.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		84.1 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		93.2 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-5 15'
7D10008-28 (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	233	1.20	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	17.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	30.1	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	30.1	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	30.1	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		81.1 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		91.8 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	30.1	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-5 20'
7D10008-29 (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	175	1.05	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		80.1 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		90.1 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.3	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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SB-5 25'
7D10008-30 (Soil)

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit							

Permian Basin Environmental Lab, L.P.

General Chemistry Parameters by EPA / Standard Methods

Chloride	45.7	1.05	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-6 0'
7D10008-31 (Soil)

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

Organics by GC

Benzene	0.165	0.0235	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Toluene	1.90	0.0471	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	4.01	0.0235	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	3.32	0.0471	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	1.30	0.0235	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		81.6 %		75-125	P7D2009	04/19/17	04/20/17	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		82.8 %		75-125	P7D2009	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	2900	11.8	mg/kg dry	10	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	15.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	6060	294	mg/kg dry	10	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C12-C28	24500	294	mg/kg dry	10	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C28-C35	3210	294	mg/kg dry	10	P7D1705	04/11/17	04/12/17	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		89.7 %		70-130	P7D1705	04/11/17	04/12/17	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		94.4 %		70-130	P7D1705	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	33800	294	mg/kg dry	10	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-6 5'
7D10008-32 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	ND	0.0213	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.0426	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.0213	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	0.208	0.0426	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	0.0828	0.0213	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		78.2 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		78.8 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	308	1.06	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	824	133	mg/kg dry	5	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C12-C28	5000	133	mg/kg dry	5	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C28-C35	641	133	mg/kg dry	5	P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		105 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		104 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	6460	133	mg/kg dry	5	[CALC]	04/11/17	04/12/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-6 10'
7D10008-33 (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	59.8	1.08	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C12-C28	68.6	26.9	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		102 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		116 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	68.6	26.9	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-6 15'
7D10008-34 (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	174	1.05	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	150	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		80.6 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		90.8 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	150	26.3	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-6 20'
7D10008-35 (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	284	1.09	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	8.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	120	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		81.7 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		90.0 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	120	27.2	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-6 25'
7D10008-36 (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	313	1.11	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	10.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.8	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	163	27.8	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.8	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		82.7 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		92.7 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	163	27.8	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-6 30'
7D10008-37 (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	1320	1.15	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	13.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	28.7	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	103	28.7	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	28.7	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		82.0 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		90.7 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	103	28.7	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-7 0'
7D10008-38 (Soil)

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

Organics by GC

Benzene	ND	0.0211	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Toluene	0.0503	0.0421	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	0.119	0.0211	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	0.516	0.0421	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	0.180	0.0211	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		84.0 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		69.2 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	S-GC

General Chemistry Parameters by EPA / Standard Methods

Chloride	8270	52.6	mg/kg dry	50	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	3650	263	mg/kg dry	10	P7D1705	04/11/17	04/17/17	TPH 8015M	
>C12-C28	44000	263	mg/kg dry	10	P7D1705	04/11/17	04/17/17	TPH 8015M	
>C28-C35	7210	263	mg/kg dry	10	P7D1705	04/11/17	04/17/17	TPH 8015M	
Surrogate: 1-Chlorooctane		90.3 %	70-130		P7D1705	04/11/17	04/17/17	TPH 8015M	
Surrogate: o-Terphenyl		101 %	70-130		P7D1705	04/11/17	04/17/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	54900	263	mg/kg dry	10	[CALC]	04/11/17	04/17/17	calc	

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Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-7 5'
7D10008-39 (Soil)

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

Organics by GC

Benzene	ND	0.0213	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.0426	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.0213	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	0.0538	0.0426	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	0.0311	0.0213	mg/kg dry	20	P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		76.7 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		90.3 %	75-125		P7D2009	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	184	1.06	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	118	26.6	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C12-C28	1040	26.6	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
>C28-C35	130	26.6	mg/kg dry	1	P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		108 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		118 %	70-130		P7D1705	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	1290	26.6	mg/kg dry	1	[CALC]	04/11/17	04/12/17	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.

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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-7 10'
7D10008-40 (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	372	1.05	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	92.3	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		73.3 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		80.7 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	92.3	26.3	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-7 15'
7D10008-41 (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	265	1.09	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	8.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		84.6 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		94.2 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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SB-7 20'
7D10008-42 (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	1.10	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	9.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	27.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		81.9 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		91.6 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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SB-7 25'
7D10008-43 (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	605	1.14	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	12.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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SB-8 0'
7D10008-44 (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	17000	56.8	mg/kg dry	50	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	12.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	28.4	mg/kg dry	1	P7D1805	04/17/17	04/17/17	TPH 8015M	
>C12-C28	ND	28.4	mg/kg dry	1	P7D1805	04/17/17	04/17/17	TPH 8015M	
>C28-C35	ND	28.4	mg/kg dry	1	P7D1805	04/17/17	04/17/17	TPH 8015M	
Surrogate: 1-Chlorooctane		112 %	70-130		P7D1805	04/17/17	04/17/17	TPH 8015M	
Surrogate: o-Terphenyl		119 %	70-130		P7D1805	04/17/17	04/17/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	28.4	mg/kg dry	1	[CALC]	04/17/17	04/17/17	calc	

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Project Number: 17-0135-02
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SB-8 5'
7D10008-45 (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	547	1.18	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	15.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	29.4	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	873	29.4	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	92.8	29.4	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		81.1 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		96.4 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	966	29.4	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project Manager: Mark Larson

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SB-8 10'
7D10008-46 (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	68.0	1.03	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.8	mg/kg dry	1	P7D2101	04/19/17	04/20/17	TPH 8015M	
>C12-C28	59.0	25.8	mg/kg dry	1	P7D2101	04/19/17	04/20/17	TPH 8015M	
>C28-C35	ND	25.8	mg/kg dry	1	P7D2101	04/19/17	04/20/17	TPH 8015M	
Surrogate: 1-Chlorooctane		98.1 %	70-130		P7D2101	04/19/17	04/20/17	TPH 8015M	
Surrogate: o-Terphenyl		96.2 %	70-130		P7D2101	04/19/17	04/20/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	59	25.8	mg/kg dry	1	[CALC]	04/19/17	04/20/17	calc	

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Project Manager: Mark Larson

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SB-8 15'
7D10008-47 (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	676	1.06	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P7D2101	04/19/17	04/20/17	TPH 8015M	
>C12-C28	73.6	26.6	mg/kg dry	1	P7D2101	04/19/17	04/20/17	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P7D2101	04/19/17	04/20/17	TPH 8015M	
Surrogate: 1-Chlorooctane		94.9 %	70-130		P7D2101	04/19/17	04/20/17	TPH 8015M	
Surrogate: o-Terphenyl		92.9 %	70-130		P7D2101	04/19/17	04/20/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	73.6	26.6	mg/kg dry	1	{CALC}	04/19/17	04/20/17	calc	

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SB-8 20'
7D10008-48 (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	955	1.05	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-8 25'
7D10008-49 (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	1990	5.62	mg/kg dry	5	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	11.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project Manager: Mark Larson

Fax: (432) 687-0456

SB-9 0'
7D10008-50 (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	71.2	1.00	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	ND	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		104 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		103 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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Project Manager: Mark Larson

Fax: (432) 687-0456

SB-9 5'
7D10008-51 (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	151	1.05	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		81.6 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		88.9 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.3	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Midland TX, 79710

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Project Number: 17-0135-02
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Fax: (432) 687-0456

SB-9 10'
7D10008-52 (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	402	1.06	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-9 15'
7D10008-53 (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	796	1.08	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-9 20'
7D10008-54 (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	847	1.10	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	9.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-9 25'
7D10008-55 (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	293	1.14	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	12.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-10 0'
7D10008-56 (Soil)

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

Organics by GC

Benzene	ND	0.0206	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Toluene	ND	0.0412	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Ethylbenzene	ND	0.0206	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Xylene (p/m)	ND	0.0412	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Xylene (o)	ND	0.0206	mg/kg dry	20	P7D2009	04/19/17	04/19/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		72.8 %	75-125		P7D2009	04/19/17	04/19/17	EPA 8021B	S-GC
Surrogate: 4-Bromofluorobenzene		83.2 %	75-125		P7D2009	04/19/17	04/19/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	4000	25.8	mg/kg dry	25	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	604	258	mg/kg dry	10	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	39300	258	mg/kg dry	10	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	6670	258	mg/kg dry	10	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		94.7 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		125 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	46600	258	mg/kg dry	10	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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P.O. Box 50685
Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-10 5'
7D10008-57 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	ND	0.00111	mg/kg dry	1	P7D2009	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.00222	mg/kg dry	1	P7D2009	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.00111	mg/kg dry	1	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	ND	0.00222	mg/kg dry	1	P7D2009	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	ND	0.00111	mg/kg dry	1	P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		77.9 %		75-125	P7D2009	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		80.4 %		75-125	P7D2009	04/19/17	04/20/17	EPA 8021B	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	1080	1.11	mg/kg dry	1	P7D1212	04/12/17	04/17/17	EPA 300.0	
% Moisture	10.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	27.8	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	173	27.8	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	64.5	27.8	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		105 %		70-130	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		104 %		70-130	P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	238	27.8	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-10 10'
7D10008-58 (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	305	1.05	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C12-C28	331	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
>C28-C35	29.3	26.3	mg/kg dry	1	P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		84.9 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		95.4 %	70-130		P7D2002	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	360	26.3	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-10 15'
7D10008-59 (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	175	1.00	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	ND	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		91.6 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		87.0 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-10 20'
7D10008-60 (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	408	1.19	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	16.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	29.8	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	29.8	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	29.8	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		89.6 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		84.1 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	29.8	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-11 0'
7D10008-61 (Soil)

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

Organics by GC

Benzene	ND	0.0211	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.0421	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.0211	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	ND	0.0421	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	ND	0.0211	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		74.4 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	S-GC
Surrogate: 1,4-Difluorobenzene		78.8 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	6570	26.3	mg/kg dry	25	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	206	132	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	8900	132	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	1330	132	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		80.3 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		92.1 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	10400	132	mg/kg dry	5	{CALC}	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-11 5'
7D10008-62 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
Organics by GC									
Benzene	ND	0.0215	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.0430	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.0215	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	ND	0.0430	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	ND	0.0215	mg/kg dry	20	P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		78.0 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		79.2 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	787	1.08	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	ND	26.9	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		110 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		106 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-11 10'
7D10008-63 (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	7.63	1.02	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	2.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.5	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	25.5	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	25.5	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		87.9 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		83.5 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.5	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

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SB-11 15'
7D10008-64 (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	1.10	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	9.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	27.5	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		84.6 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		79.4 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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P.O. Box 50685
Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-11 20'
7D10008-65 (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	1350	1.06	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	26.6	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		84.8 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		79.1 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.6	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

Larson & Associates, Inc.
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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-11 25'
7D10008-66 (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	299	1.05	mg/kg dry	1	P7D2710	04/27/17	04/28/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-12 0'
7D10008-67 (Soil)

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

Organics by GC

Benzene	ND	0.0526	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.105	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.0526	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	ND	0.105	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	ND	0.0526	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		71.7 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	S-GC
Surrogate: 4-Bromofluorobenzene		86.7 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	3590	26.3	mg/kg dry	25	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	5.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	1160	132	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	21600	132	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	2230	132	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		108 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		129 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	24900	132	mg/kg dry	5	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-12 5'
7D10008-68 (Soil)

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

Organics by GC

Benzene	ND	0.00102	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.00204	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.00102	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	ND	0.00204	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	ND	0.00102	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		79.8 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		73.3 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	S-GC

General Chemistry Parameters by EPA / Standard Methods

Chloride	273	1.02	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	2.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.5	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	27.3	25.5	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	30.6	25.5	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		108 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		106 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	57.9	25.5	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-12 10'
7D10008-69 (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	196	1.04	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	4.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		84.2 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		78.2 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-12 15'
7D10008-70 (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	521	1.08	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P7D2001	04/19/17	04/20/17	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P7D2001	04/19/17	04/20/17	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P7D2001	04/19/17	04/20/17	TPH 8015M	
Surrogate: 1-Chlorooctane		102 %	70-130		P7D2001	04/19/17	04/20/17	TPH 8015M	
Surrogate: o-Terphenyl		96.5 %	70-130		P7D2001	04/19/17	04/20/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	04/19/17	04/20/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-13 0'
7D10008-71 (Soil)

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

Organics by GC

Benzene	ND	0.0521	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.104	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	0.186	0.0521	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	0.136	0.104	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	0.0667	0.0521	mg/kg dry	50	P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		77.0 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		96.1 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	9070	26.0	mg/kg dry	25	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	4.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	2330	130	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	16300	130	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	1200	130	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		128 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		113 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	19900	130	mg/kg dry	5	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-13 5'
7D10008-72 (Soil)

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

Organics by GC

Benzene	ND	0.00114	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Toluene	ND	0.00227	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Ethylbenzene	ND	0.00114	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (p/m)	ND	0.00227	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Xylene (o)	ND	0.00114	mg/kg dry	1	P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		79.5 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		76.0 %	75-125		P7D2010	04/19/17	04/20/17	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	2190	11.4	mg/kg dry	10	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	12.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	28.4	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	ND	28.4	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	ND	28.4	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		110 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		109 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	28.4	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-13 10'
7D10008-73 (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	429	1.04	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	4.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P7D2001	04/19/17	04/20/17	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P7D2001	04/19/17	04/20/17	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P7D2001	04/19/17	04/20/17	TPH 8015M	
Surrogate: 1-Chlorooctane		94.3 %	70-130		P7D2001	04/19/17	04/20/17	TPH 8015M	
Surrogate: o-Terphenyl		89.5 %	70-130		P7D2001	04/19/17	04/20/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	04/19/17	04/20/17	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-13 15'
7D10008-74 (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	602	1.09	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0
% Moisture	8.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M
>C12-C28	ND	27.2	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M
>C28-C35	ND	27.2	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M
Surrogate: 1-Chlorooctane		81.0 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M
Surrogate: o-Terphenyl		77.2 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-13 20'
7D10008-75 (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	298	1.08	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: 1-Chlorooctane		89.5 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Surrogate: o-Terphenyl		86.1 %	70-130		P7D2001	04/19/17	04/19/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	04/19/17	04/19/17	calc	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-14 0'
7D10008-76 (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	985	5.05	mg/kg dry	5	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	1.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.3	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	65.0	25.3	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	ND	25.3	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		94.5 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		88.7 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	65	25.3	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-14 5'
7D10008-77 (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	809	1.06	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-14 10'
7D10008-78 (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	599	1.03	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	3.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-14 15'
7D10008-79 (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	1570	1.06	mg/kg dry	1	P7D2006	04/20/17	04/24/17	EPA 300.0	
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

SB-14 20'
7D10008-80 (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	1500	1.06	mg/kg dry	1	P7D2007	04/20/17	04/24/17	EPA 300.0
% Moisture	6.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-1 (0-1)
7D10008-81 (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	4090	11.1	mg/kg dry	10	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	10.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	60.7	27.8	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	2510	27.8	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	331	27.8	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		104 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		107 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	2900	27.8	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

Permian Basin Environmental Lab, L.P.

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

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-1 (1-2)
7D10008-82 (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	2000	1.18	mg/kg dry	1	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	15.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	38.2	29.4	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	556	29.4	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	97.2	29.4	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		113 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		112 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	691	29.4	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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HA-2 (0-1)
7D10008-83 (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	3360	11.1	mg/kg dry	10	P7D1302	04/13/17	04/17/17	EPA 300.0
% Moisture	10.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	445	139	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M
>C12-C28	5210	139	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M
>C28-C35	572	139	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M
Surrogate: 1-Chlorooctane		85.6 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M
Surrogate: o-Terphenyl		91.4 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	6230	139	mg/kg dry	5	[CALC]	04/11/17	04/12/17	calc

Permian Basin Environmental Lab, L.P.

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HA-3 (0-1)
7D10008-84 (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	2930	10.8	mg/kg dry	10	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	7.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	1250	134	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	9630	134	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	800	134	mg/kg dry	5	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		110 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		115 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	11700	134	mg/kg dry	5	[CALC]	04/11/17	04/12/17	calc	

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HA-4 (0-1)
7D10008-85 (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	1990	11.2	mg/kg dry	10	P7D1302	04/13/17	04/17/17	EPA 300.0	
% Moisture	11.0	0.1	%	1	P7D1701	04/17/17	04/17/17	% calculation	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	28.1	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C12-C28	632	28.1	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
>C28-C35	99.4	28.1	mg/kg dry	1	P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: 1-Chlorooctane		98.9 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Surrogate: o-Terphenyl		97.6 %	70-130		P7D1702	04/11/17	04/12/17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	732	28.1	mg/kg dry	1	[CALC]	04/11/17	04/12/17	calc	

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Organics by GC - 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 P7D2009 - General Preparation (GC)

Blank (P7D2009-BLK1)

Prepared & Analyzed: 04/19/17

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00200	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	0.0462		"	0.0600		77.0	75-125			
Surrogate: 4-Bromofluorobenzene	0.0456		"	0.0600		75.9	75-125			

LCS (P7D2009-BS1)

Prepared & Analyzed: 04/19/17

Benzene	0.111	0.00100	mg/kg wet	0.100		111	70-130			
Toluene	0.0915	0.00200	"	0.100		91.5	70-130			
Ethylbenzene	0.0929	0.00100	"	0.100		92.9	70-130			
Xylene (p/m)	0.183	0.00200	"				70-130			
Xylene (o)	0.0826	0.00100	"				70-130			
Surrogate: 4-Bromofluorobenzene	0.0485		"	0.0600		80.8	75-125			
Surrogate: 1,4-Difluorobenzene	0.0560		"	0.0600		93.4	75-125			

LCS Dup (P7D2009-BSD1)

Prepared & Analyzed: 04/19/17

Benzene	0.120	0.00100	mg/kg wet	0.100		120	70-130	8.04	20	
Toluene	0.101	0.00200	"	0.100		101	70-130	9.56	20	
Ethylbenzene	0.101	0.00100	"	0.100		101	70-130	7.90	20	
Xylene (p/m)	0.196	0.00200	"				70-130		20	
Xylene (o)	0.0881	0.00100	"				70-130		20	
Surrogate: 1,4-Difluorobenzene	0.0570		"	0.0600		95.0	75-125			
Surrogate: 4-Bromofluorobenzene	0.0483		"	0.0600		80.5	75-125			

Matrix Spike (P7D2009-MS1)

Source: 7D10008-30

Prepared & Analyzed: 04/19/17

Benzene	0.179	0.00105	mg/kg dry	0.105	ND	170	80-120			QM-07
Toluene	0.160	0.00211	"	0.105	ND	152	80-120			QM-07
Ethylbenzene	0.160	0.00105	"	0.105	ND	152	80-120			QM-07
Xylene (p/m)	0.315	0.00211	"		ND		80-120			
Xylene (o)	0.149	0.00105	"		ND		80-120			
Surrogate: 4-Bromofluorobenzene	0.0607		"	0.0632		96.0	75-125			
Surrogate: 1,4-Difluorobenzene	0.0643		"	0.0632		102	75-125			

Permian Basin Environmental Lab, L.P.

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Organics by GC - 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 P7D2009 - General Preparation (GC)

Matrix Spike Dup (P7D2009-MSD1)		Source: 7D10008-30		Prepared & Analyzed: 04/19/17						
Benzene	0.163	0.00105	mg/kg dry	0.105	ND	155	80-120	9.23	20	QM-07
Toluene	0.148	0.00211	"	0.105	ND	141	80-120	7.68	20	QM-07
Ethylbenzene	0.146	0.00105	"	0.105	ND	138	80-120	9.21	20	QM-07
Xylene (p/m)	0.286	0.00211	"		ND		80-120		20	
Xylene (o)	0.135	0.00105	"		ND		80-120		20	
Surrogate: 1,4-Difluorobenzene	0.0605		"	0.0632		95.8	75-125			
Surrogate: 4-Bromofluorobenzene	0.0594		"	0.0632		94.0	75-125			

Batch P7D2010 - General Preparation (GC)

Blank (P7D2010-BLK1)		Prepared & Analyzed: 04/19/17								
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00200	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	0.0465		"	0.0600		77.6	75-125			
Surrogate: 4-Bromofluorobenzene	0.0474		"	0.0600		79.1	75-125			

LCS (P7D2010-BS1)		Prepared & Analyzed: 04/19/17								
Benzene	0.0987	0.00100	mg/kg wet	0.100		98.7	70-130			
Toluene	0.0920	0.00200	"	0.100		92.0	70-130			
Ethylbenzene	0.0904	0.00100	"	0.100		90.4	70-130			
Xylene (p/m)	0.178	0.00200	"				70-130			
Xylene (o)	0.0855	0.00100	"				70-130			
Surrogate: 4-Bromofluorobenzene	0.0585		"	0.0600		97.6	75-125			
Surrogate: 1,4-Difluorobenzene	0.0610		"	0.0600		102	75-125			

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Organics by GC - 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 P7D2010 - General Preparation (GC)

LCS Dup (P7D2010-BSD1)

Prepared & Analyzed: 04/19/17

Benzene	0.104	0.00100	mg/kg wet	0.100		104	70-130	5.05	20	
Toluene	0.0981	0.00200	"	0.100		98.1	70-130	6.37	20	
Ethylbenzene	0.0972	0.00100	"	0.100		97.2	70-130	7.17	20	
Xylene (p/m)	0.189	0.00200	"				70-130		20	
Xylene (o)	0.0867	0.00100	"				70-130		20	
Surrogate: 4-Bromofluorobenzene	0.0564		"	0.0600		94.0	75-125			
Surrogate: 1,4-Difluorobenzene	0.0596		"	0.0600		99.2	75-125			

Matrix Spike (P7D2010-MS1)

Source: 7D10008-60

Prepared & Analyzed: 04/19/17

Benzene	0.212	0.00119	mg/kg dry	0.119	ND	178	80-120			QM-07
Toluene	0.209	0.00238	"	0.119	ND	175	80-120			QM-07
Ethylbenzene	0.203	0.00119	"	0.119	ND	171	80-120			QM-07
Xylene (p/m)	0.403	0.00238	"		ND		80-120			
Xylene (o)	0.200	0.00119	"		ND		80-120			
Surrogate: 4-Bromofluorobenzene	0.0721		"	0.0714		101	75-125			
Surrogate: 1,4-Difluorobenzene	0.0762		"	0.0714		107	75-125			

Matrix Spike Dup (P7D2010-MSD1)

Source: 7D10008-60

Prepared: 04/19/17 Analyzed: 04/20/17

Benzene	0.181	0.00119	mg/kg dry	0.119	ND	152	80-120	15.8	20	QM-07
Toluene	0.168	0.00238	"	0.119	ND	141	80-120	21.3	20	QM-07
Ethylbenzene	0.160	0.00119	"	0.119	ND	135	80-120	23.6	20	QM-07
Xylene (p/m)	0.311	0.00238	"		ND		80-120		20	
Xylene (o)	0.147	0.00119	"		ND		80-120		20	
Surrogate: 4-Bromofluorobenzene	0.0678		"	0.0714		94.9	75-125			
Surrogate: 1,4-Difluorobenzene	0.0738		"	0.0714		103	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
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Batch P7D1211 - * DEFAULT PREP *****

Blank (P7D1211-BLK1) Prepared: 04/12/17 Analyzed: 04/13/17

Chloride ND 1.00 mg/kg wet

LCS (P7D1211-BS1) Prepared: 04/12/17 Analyzed: 04/13/17

Chloride 411 1.00 mg/kg wet 400 103 80-120

LCS Dup (P7D1211-BSD1) Prepared: 04/12/17 Analyzed: 04/13/17

Chloride 404 1.00 mg/kg wet 400 101 80-120 1.91 20

Duplicate (P7D1211-DUP1) Source: 7D12003-03 Prepared: 04/12/17 Analyzed: 04/13/17

Chloride 16200 50.5 mg/kg dry 16300 0.862 20

Duplicate (P7D1211-DUP2) Source: 7D10008-13 Prepared: 04/12/17 Analyzed: 04/13/17

Chloride 2130 10.8 mg/kg dry 2130 0.152 20

Matrix Spike (P7D1211-MS1) Source: 7D12003-03 Prepared: 04/12/17 Analyzed: 04/13/17

Chloride 20900 50.5 mg/kg dry 5050 16300 90.8 80-120

Batch P7D1212 - * DEFAULT PREP *****

Blank (P7D1212-BLK1) Prepared: 04/12/17 Analyzed: 04/17/17

Chloride ND 1.00 mg/kg wet

LCS (P7D1212-BS1) Prepared: 04/12/17 Analyzed: 04/17/17

Chloride 419 1.00 mg/kg wet 400 105 80-120

LCS Dup (P7D1212-BSD1) Prepared: 04/12/17 Analyzed: 04/17/17

Chloride 424 1.00 mg/kg wet 400 106 80-120 1.11 20

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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 P7D1212 - * DEFAULT PREP *****

Duplicate (P7D1212-DUP1)		Source: 7D10008-27		Prepared: 04/12/17 Analyzed: 04/17/17						
Chloride	270	1.10	mg/kg dry		270			0.110	20	
Duplicate (P7D1212-DUP2)		Source: 7D10008-44		Prepared: 04/12/17 Analyzed: 04/17/17						
Chloride	17000	56.8	mg/kg dry		17000			0.0369	20	
Matrix Spike (P7D1212-MS1)		Source: 7D10008-27		Prepared: 04/12/17 Analyzed: 04/17/17						
Chloride	1300	1.10	mg/kg dry	1100	270	93.4	80-120			

Batch P7D1302 - * DEFAULT PREP *****

Blank (P7D1302-BLK1)				Prepared: 04/13/17 Analyzed: 04/17/17						
Chloride	ND	1.00	mg/kg wet							
LCS (P7D1302-BS1)				Prepared: 04/13/17 Analyzed: 04/17/17						
Chloride	392	1.00	mg/kg wet	400		98.1	80-120			
LCS Dup (P7D1302-BSD1)				Prepared: 04/13/17 Analyzed: 04/17/17						
Chloride	392	1.00	mg/kg wet	400		98.1	80-120	0.0229	20	
Duplicate (P7D1302-DUP1)		Source: 7D10008-58		Prepared: 04/13/17 Analyzed: 04/17/17						
Chloride	305	1.05	mg/kg dry		305			0.114	20	
Duplicate (P7D1302-DUP2)		Source: 7D10008-76		Prepared: 04/13/17 Analyzed: 04/17/17						
Chloride	985	5.05	mg/kg dry		985			0.00512	20	
Matrix Spike (P7D1302-MS1)		Source: 7D10008-58		Prepared: 04/13/17 Analyzed: 04/17/17						
Chloride	1310	1.05	mg/kg dry	1050	305	95.8	80-120			

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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 P7D1701 - * DEFAULT PREP *****

Blank (P7D1701-BLK1)				Prepared & Analyzed: 04/17/17						
% Moisture	ND	0.1	%							
Duplicate (P7D1701-DUP1)				Source: 7D10008-26 Prepared & Analyzed: 04/17/17						
% Moisture	4.0	0.1	%		5.0			22.2	20	
Duplicate (P7D1701-DUP2)				Source: 7D10008-53 Prepared & Analyzed: 04/17/17						
% Moisture	7.0	0.1	%		7.0			0.00	20	
Duplicate (P7D1701-DUP3)				Source: 7D10008-82 Prepared & Analyzed: 04/17/17						
% Moisture	14.0	0.1	%		15.0			6.90	20	
Duplicate (P7D1701-DUP4)				Source: 7D11003-03 Prepared & Analyzed: 04/17/17						
% Moisture	9.0	0.1	%		8.0			11.8	20	
Duplicate (P7D1701-DUP5)				Source: 7D12006-01 Prepared & Analyzed: 04/17/17						
% Moisture	6.0	0.1	%		6.0			0.00	20	
Duplicate (P7D1701-DUP6)				Source: 7D12011-16 Prepared & Analyzed: 04/17/17						
% Moisture	3.0	0.1	%		3.0			0.00	20	

Batch P7D2004 - * DEFAULT PREP *****

Blank (P7D2004-BLK1)				Prepared: 04/20/17 Analyzed: 04/24/17						
Chloride	ND	1.00	mg/kg wet							
LCS (P7D2004-BS1)				Prepared: 04/20/17 Analyzed: 04/24/17						
Chloride	422	1.00	mg/kg wet	400		106	80-120			

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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 P7D2004 - * DEFAULT PREP *****

LCS Dup (P7D2004-BSD1)

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	419	1.00	mg/kg wet	400	105	80-120	0.751	20
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Duplicate (P7D2004-DUP1)

Source: 7D13018-14

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	94.7	1.04	mg/kg dry	95.0	0.285	20
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Duplicate (P7D2004-DUP2)

Source: 7D18002-04

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	1690	10.6	mg/kg dry	1690	0.0125	20
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Matrix Spike (P7D2004-MS1)

Source: 7D13018-14

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	1040	1.04	mg/kg dry	1040	95.0	90.6	80-120
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Batch P7D2006 - * DEFAULT PREP *****

Blank (P7D2006-BLK1)

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	ND	1.00	mg/kg wet
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LCS (P7D2006-BS1)

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	423	1.00	mg/kg wet	400	106	80-120
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LCS Dup (P7D2006-BSD1)

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	420	1.00	mg/kg wet	400	105	80-120	0.610	20
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Duplicate (P7D2006-DUP1)

Source: 7D10008-18

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	47.3	1.10	mg/kg dry	47.8	1.06	20
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Duplicate (P7D2006-DUP2)

Source: 7D10008-54

Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	848	1.10	mg/kg dry	847	0.126	20
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Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7D2006 - * DEFAULT PREP *****

Matrix Spike (P7D2006-MS1) Source: 7D10008-18 Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	1120	1.10	mg/kg dry	1100	47.8	97.9	80-120			
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Batch P7D2007 - * DEFAULT PREP *****

Blank (P7D2007-BLK1) Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	ND	1.00	mg/kg wet							
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LCS (P7D2007-BS1) Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	413	1.00	mg/kg wet	400		103	80-120			
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LCS Dup (P7D2007-BSD1) Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	419	1.00	mg/kg wet	400		105	80-120	1.35	20	
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Duplicate (P7D2007-DUP1) Source: 7D18003-01 Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	25.0	1.18	mg/kg dry		26.1			4.23	20	
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Duplicate (P7D2007-DUP2) Source: 7D19008-07 Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	80.6	1.15	mg/kg dry		81.9			1.66	20	
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Matrix Spike (P7D2007-MS1) Source: 7D18003-01 Prepared: 04/20/17 Analyzed: 04/24/17

Chloride	1160	1.18	mg/kg dry	1180	26.1	96.2	80-120			
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Batch P7D2710 - * DEFAULT PREP *****

Blank (P7D2710-BLK1) Prepared: 04/27/17 Analyzed: 04/28/17

Chloride	ND	1.00	mg/kg wet							
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Project Number: 17-0135-02
Project Manager: Mark Larson

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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 P7D2710 - * DEFAULT PREP *****

LCS (P7D2710-BS1)

Prepared: 04/27/17 Analyzed: 04/28/17

Chloride	405	1.00	mg/kg wet	400		101	80-120			
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LCS Dup (P7D2710-BSD1)

Prepared: 04/27/17 Analyzed: 04/28/17

Chloride	405	1.00	mg/kg wet	400		101	80-120	0.0691	20	
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Duplicate (P7D2710-DUP1)

Source: 7D25010-01

Prepared: 04/27/17 Analyzed: 04/28/17

Chloride	6030	29.8	mg/kg dry		6160			2.07	20	
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Duplicate (P7D2710-DUP2)

Source: 7D27001-17

Prepared: 04/27/17 Analyzed: 04/28/17

Chloride	ND	1.03	mg/kg dry		ND				20	
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Matrix Spike (P7D2710-MS1)

Source: 7D25010-01

Prepared: 04/27/17 Analyzed: 04/28/17

Chloride	7820	29.8	mg/kg dry	2380	6160	69.7	80-120			
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Project Number: 17-0135-02
Project Manager: Mark Larson

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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 P7D1307 - TX 1005

Blank (P7D1307-BLK1)

Prepared & Analyzed: 04/11/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	98.6		"	100		98.6	70-130			
Surrogate: o-Terphenyl	48.6		"	50.0		97.3	70-130			

LCS (P7D1307-BS1)

Prepared & Analyzed: 04/11/17

C6-C12	841	25.0	mg/kg wet	1000		84.1	75-125			
>C12-C28	844	25.0	"	1000		84.4	75-125			
Surrogate: 1-Chlorooctane	104		"	100		104	70-130			
Surrogate: o-Terphenyl	53.1		"	50.0		106	70-130			

LCS Dup (P7D1307-BSD1)

Prepared & Analyzed: 04/11/17

C6-C12	857	25.0	mg/kg wet	1000		85.7	75-125	1.92	20	
>C12-C28	832	25.0	"	1000		83.2	75-125	1.43	20	
Surrogate: 1-Chlorooctane	101		"	100		101	70-130			
Surrogate: o-Terphenyl	51.9		"	50.0		104	70-130			

Batch P7D1702 - TX 1005

Blank (P7D1702-BLK1)

Prepared: 04/11/17 Analyzed: 04/12/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	103		"	100		103	70-130			
Surrogate: o-Terphenyl	50.8		"	50.0		102	70-130			

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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 P7D1702 - TX 1005

LCS (P7D1702-BS1)

Prepared: 04/11/17 Analyzed: 04/12/17

C6-C12	824	25.0	mg/kg wet	1000		82.4	75-125			
>C12-C28	795	25.0	"	1000		79.5	75-125			
Surrogate: 1-Chlorooctane	96.6		"	100		96.6	70-130			
Surrogate: o-Terphenyl	48.7		"	50.0		97.4	70-130			

LCS Dup (P7D1702-BSD1)

Prepared: 04/11/17 Analyzed: 04/12/17

C6-C12	828	25.0	mg/kg wet	1000		82.8	75-125	0.412	20	
>C12-C28	773	25.0	"	1000		77.3	75-125	2.85	20	
Surrogate: 1-Chlorooctane	99.1		"	100		99.1	70-130			
Surrogate: o-Terphenyl	44.4		"	50.0		88.8	70-130			

Batch P7D1705 - TX 1005

Blank (P7D1705-BLK1)

Prepared & Analyzed: 04/11/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	98.6		"	100		98.6	70-130			
Surrogate: o-Terphenyl	53.4		"	50.0		107	70-130			

LCS (P7D1705-BS1)

Prepared & Analyzed: 04/11/17

C6-C12	887	25.0	mg/kg wet	1000		88.7	75-125			
>C12-C28	1140	25.0	"	1000		114	75-125			
Surrogate: 1-Chlorooctane	124		"	100		124	70-130			
Surrogate: o-Terphenyl	49.9		"	50.0		99.8	70-130			

LCS Dup (P7D1705-BSD1)

Prepared & Analyzed: 04/11/17

C6-C12	879	25.0	mg/kg wet	1000		87.9	75-125	0.965	20	
>C12-C28	1130	25.0	"	1000		113	75-125	0.929	20	
Surrogate: 1-Chlorooctane	116		"	100		116	70-130			
Surrogate: o-Terphenyl	49.0		"	50.0		97.9	70-130			

Permian Basin Environmental Lab, L.P.

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P7D1705 - TX 1005

Matrix Spike (P7D1705-MS1)

Source: 7D11003-03

Prepared: 04/11/17 Analyzed: 04/12/17

C6-C12	985	27.2	mg/kg dry	1090	19.5	88.9	75-125			
>C12-C28	1220	27.2	"	1090	26.1	110	75-125			
Surrogate: 1-Chlorooctane	130		"	109		119	70-130			
Surrogate: o-Terphenyl	59.0		"	54.3		109	70-130			

Matrix Spike Dup (P7D1705-MSD1)

Source: 7D11003-03

Prepared: 04/11/17 Analyzed: 04/12/17

C6-C12	981	27.2	mg/kg dry	1090	19.5	88.5	75-125	0.429	20	
>C12-C28	1250	27.2	"	1090	26.1	113	75-125	2.11	20	
Surrogate: 1-Chlorooctane	141		"	109		130	70-130			
Surrogate: o-Terphenyl	60.0		"	54.3		110	70-130			

Batch P7D1805 - TX 1005

Blank (P7D1805-BLK1)

Prepared & Analyzed: 04/17/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	97.7		"	100		97.7	70-130			
Surrogate: o-Terphenyl	49.7		"	50.0		99.5	70-130			

LCS (P7D1805-BS1)

Prepared & Analyzed: 04/17/17

C6-C12	746	25.0	mg/kg wet	900		82.9	75-125			
>C12-C28	859	25.0	"	900		95.4	75-125			
Surrogate: 1-Chlorooctane	95.7		"	100		95.7	70-130			
Surrogate: o-Terphenyl	46.7		"	50.0		93.4	70-130			

LCS Dup (P7D1805-BSD1)

Prepared & Analyzed: 04/17/17

C6-C12	727	25.0	mg/kg wet	900		80.8	75-125	2.57	20	
>C12-C28	880	25.0	"	900		97.7	75-125	2.42	20	
Surrogate: 1-Chlorooctane	92.4		"	100		92.4	70-130			
Surrogate: o-Terphenyl	43.5		"	50.0		87.0	70-130			

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc.
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Midland TX, 79710

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P7D1805 - TX 1005

Matrix Spike (P7D1805-MS1)

Source: 7D13009-07

Prepared & Analyzed: 04/17/17

C6-C12	838	28.7	mg/kg dry	1030	26.6	78.5	75-125			
>C12-C28	878	28.7	"	1030	14.1	83.5	75-125			
Surrogate: 1-Chlorooctane	112		"	115		97.3	70-130			
Surrogate: o-Terphenyl	53.9		"	57.5		93.8	70-130			

Matrix Spike Dup (P7D1805-MSD1)

Source: 7D13009-07

Prepared & Analyzed: 04/17/17

C6-C12	911	28.7	mg/kg dry	1030	26.6	85.5	75-125	8.58	20	
>C12-C28	959	28.7	"	1030	14.1	91.3	75-125	8.89	20	
Surrogate: 1-Chlorooctane	119		"	115		104	70-130			
Surrogate: o-Terphenyl	56.7		"	57.5		98.6	70-130			

Batch P7D2001 - TX 1005

Blank (P7D2001-BLK1)

Prepared & Analyzed: 04/19/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	94.3		"	100		94.3	70-130			
Surrogate: o-Terphenyl	44.1		"	50.0		88.2	70-130			

LCS (P7D2001-BS1)

Prepared & Analyzed: 04/19/17

C6-C12	842	25.0	mg/kg wet	1000		84.2	75-125			
>C12-C28	804	25.0	"	1000		80.4	75-125			
Surrogate: 1-Chlorooctane	94.7		"	100		94.7	70-130			
Surrogate: o-Terphenyl	38.8		"	50.0		77.5	70-130			

LCS Dup (P7D2001-BSD1)

Prepared & Analyzed: 04/19/17

C6-C12	845	25.0	mg/kg wet	1000		84.5	75-125	0.354	20	
>C12-C28	822	25.0	"	1000		82.2	75-125	2.25	20	
Surrogate: 1-Chlorooctane	94.2		"	100		94.2	70-130			
Surrogate: o-Terphenyl	39.8		"	50.0		79.7	70-130			

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P7D2001 - TX 1005

Matrix Spike (P7D2001-MS1)

Source: 7D10008-75

Prepared & Analyzed: 04/19/17

C6-C12	859	26.9	mg/kg dry	1080	23.7	77.7	75-125			
>C12-C28	838	26.9	"	1080	ND	77.9	75-125			
Surrogate: 1-Chlorooctane	102		"	108		94.5	70-130			
Surrogate: o-Terphenyl	46.4		"	53.8		86.4	70-130			

Matrix Spike Dup (P7D2001-MSD1)

Source: 7D10008-75

Prepared & Analyzed: 04/19/17

C6-C12	839	26.9	mg/kg dry	1080	23.7	75.8	75-125	2.47	20	
>C12-C28	830	26.9	"	1080	ND	77.2	75-125	0.860	20	
Surrogate: 1-Chlorooctane	99.2		"	108		92.2	70-130			
Surrogate: o-Terphenyl	45.3		"	53.8		84.2	70-130			

Batch P7D2002 - TX 1005

Blank (P7D2002-BL.K1)

Prepared & Analyzed: 04/19/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	94.0		"	100		94.0	70-130			
Surrogate: o-Terphenyl	51.6		"	50.0		103	70-130			

LCS (P7D2002-BS1)

Prepared & Analyzed: 04/19/17

C6-C12	917	25.0	mg/kg wet	1000		91.7	75-125			
>C12-C28	1160	25.0	"	1000		116	75-125			
Surrogate: 1-Chlorooctane	115		"	100		115	70-130			
Surrogate: o-Terphenyl	44.9		"	50.0		89.8	70-130			

LCS Dup (P7D2002-BSD1)

Prepared & Analyzed: 04/19/17

C6-C12	913	25.0	mg/kg wet	1000		91.3	75-125	0.459	20	
>C12-C28	1140	25.0	"	1000		114	75-125	2.07	20	
Surrogate: 1-Chlorooctane	107		"	100		107	70-130			
Surrogate: o-Terphenyl	44.0		"	50.0		88.0	70-130			

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Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

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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 P7D2002 - TX 1005

Matrix Spike (P7D2002-MS1)

Source: 7D10008-34

Prepared & Analyzed: 04/19/17

C6-C12	933	26.3	mg/kg dry	1050	18.1	86.9	75-125			
>C12-C28	1260	26.3	"	1050	150	105	75-125			
Surrogate: 1-Chlorooctane	115		"	105		109	70-130			
Surrogate: o-Terphenyl	52.4		"	52.6		99.5	70-130			

Matrix Spike Dup (P7D2002-MSD1)

Source: 7D10008-34

Prepared & Analyzed: 04/19/17

C6-C12	940	26.3	mg/kg dry	1050	18.1	87.6	75-125	0.858	20	
>C12-C28	1280	26.3	"	1050	150	107	75-125	1.92	20	
Surrogate: 1-Chlorooctane	123		"	105		117	70-130			
Surrogate: o-Terphenyl	58.2		"	52.6		111	70-130			

Batch P7D2101 - TX 1005

Blank (P7D2101-BLK1)

Prepared: 04/19/17 Analyzed: 04/20/17

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	95.4		"	100		95.4	70-130			
Surrogate: o-Terphenyl	47.2		"	50.0		94.5	70-130			

LCS (P7D2101-BS1)

Prepared: 04/19/17 Analyzed: 04/20/17

C6-C12	850	25.0	mg/kg wet	1000		85.0	75-125			
>C12-C28	838	25.0	"	1000		83.8	75-125			
Surrogate: 1-Chlorooctane	93.7		"	100		93.7	70-130			
Surrogate: o-Terphenyl	42.1		"	50.0		84.2	70-130			

LCS Dup (P7D2101-BSD1)

Prepared: 04/19/17 Analyzed: 04/20/17

C6-C12	874	25.0	mg/kg wet	1000		87.4	75-125	2.86	20	
>C12-C28	846	25.0	"	1000		84.6	75-125	0.948	20	
Surrogate: 1-Chlorooctane	95.3		"	100		95.3	70-130			
Surrogate: o-Terphenyl	43.0		"	50.0		86.1	70-130			

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.

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

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P7D2101 - TX 1005

Matrix Spike (P7D2101-MS1)

Source: 7D19005-01

Prepared: 04/19/17 Analyzed: 04/20/17

C6-C12	1230	50.0	mg/kg dry	1000	23.1	121	75-125			
>C12-C28	2470	50.0	"	1000	1420	106	75-125			
Surrogate: 1-Chlorooctane	112		"	100		112	70-130			
Surrogate: o-Terphenyl	45.8		"	50.0		91.6	70-130			

Matrix Spike Dup (P7D2101-MSD1)

Source: 7D19005-01

Prepared: 04/19/17 Analyzed: 04/20/17

C6-C12	1270	50.0	mg/kg dry	1000	23.1	124	75-125	2.78	20	
>C12-C28	2670	50.0	"	1000	1420	126	75-125	17.3	20	QM-07
Surrogate: 1-Chlorooctane	117		"	100		117	70-130			
Surrogate: o-Terphenyl	47.0		"	50.0		94.0	70-130			

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

Project: Paladin East Caprock SWD
Project Number: 17-0135-02
Project Manager: Mark Larson

Fax: (432) 687-0456

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.

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 Control Spike

MS Matrix Spike

Dup Duplicate

Report Approved By: _____

Date: 5/2/2017

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.

Data Reported to:

DATE: 4-10-17
PO #:
PROJECT LOCATION OR NAME:
LAI PROJECT #: 17-035-02

PAGE 1 OF 6
LAB WORK ORDER #: 1010008
Collector: Trevis Williams

CHAIN-OF-CUSTODY

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES	TURN AROUND TIME	LABORATORY USE ONLY:
						HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE			
SB-1 0'		4-6-17	10:30	S	2							
5'			12:04									
10'			12:06									
15'			12:10									
20'			12:13									
25'			12:16									
SB-2 0'			12:40									
5'			12:47									
10'			12:49									
15'			12:51									
20'			12:52									
25'			12:55									
SB-3 0'			4-7-17									
5'			9:44									
10'			9:50									
TOTAL												

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	4.10.2017	RECEIVED BY: (Signature)	4.10.17 11:00
RELINQUISHED BY: (Signature)		RECEIVED BY: (Signature)	

TURN AROUND TIME	LABORATORY USE ONLY:
NORMAL ☒	RECEIVING TEMP: 57 THERM #:
1 DAY ☐	CUSTODY SEALS: ☐ BROKEN ☒ INTACT ☐ NOT USED
2 DAY ☐	CARRIER BILL #
OTHER ☐	DEMAND DELIVERED

Date Reported to:

DATE: 4-10-17
PO #: 17-035-02
PROJECT LOCATION OR NAME: Paladyn East Capital SUD
LAB PROJECT #: 17-035-02
COLLECTOR: Trevis Williams

CHAIN-OF-CUSTODY

TIME ZONE: Time zone/State:	TRRP report? ☐ Yes ☒ No	S=SOIL W=WATER A=AIR	P=PAINT SL=SLUDGE OT=OTHER	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES	TURN AROUND TIME	LABORATORY USE ONLY:
									HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE			
MM															
SB-3	15'			4-7-17	9:52	5	4								
	20'				9:53										
	25'				9:59										
SB-4	0'			4-6-17	4:06										
	5'				4:06										
	10'				4:10										
	15'				4:13										
	20'				4:14										
	25'				4:16										
SB-5	0'				12:00										
	5'				12:07										
	10'				12:09										
	15'				12:12										
	20'				12:14										
	25'				12:20										
TOTAL															
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		TURN AROUND TIME		LABORATORY USE ONLY:					
RELINQUISHED BY: (Signature)		4-10-17		RECEIVED BY: (Signature)		4-10-17		NORMAL ☒		RECEIVING TEMP: 51.2		THERM #: _____			
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		1 DAY ☐		CUSTODY SEALS - ☐ BROKEN ☒ CONTACT ☐ NOT USED					
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		2 DAY ☐		CARRIER BILL # _____					
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		DATE/TIME		OTHER ☐		HAND DELIVERED ☒					

4-10-17 11:00

4-10-17 11:00

1 DAY ☐

2 DAY ☐

OTHER ☐

HAND DELIVERED

Data Reported to:

DATE: 4-10-17
PO #:
PROJECT LOCATION OR NAME: Paladin East Capech Sub
LAI PROJECT #: 17-0135-02
COLLECTOR: Trent Williams

CHAIN-OF-CUSTODY

TIME ZONE: Time zone/State:	TRRP report? ☐ Yes ☒ No	S=SOIL W=WATER A=AIR	P=PAINT SL=SLUDGE OT=OTHER	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION				ANALYSES	TURN AROUND TIME	LABORATORY USE ONLY:
									HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE			
Field Sample I.D.															
58-6 0'				4617	1:30	1:40	S	1							
5'					1:40	1:43									
10'					1:46	1:47									
15'					1:47	1:51									
20'					1:51	2:17									
25'					2:17	2:39									
30'					2:39	2:44									
58-7 0'					2:44	2:56									
5'					2:56	3:25									
10'					3:25	3:28									
15'															
20'															
25'															
30'															
58-8 0'															
5'															
TOTAL															

RELINQUISHED BY: (Signature) [Signature] DATE/TIME 4-10-2017 RECEIVED BY: (Signature) _____

RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____

RELINQUISHED BY: (Signature) _____ DATE/TIME 4-10-17 11:00 RECEIVED BY: (Signature) _____

RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____

TURN AROUND TIME: ☒ NORMAL ☐ 1 DAY ☐ 2 DAY ☐ OTHER ☐

LABORATORY USE ONLY: RECEIVING TEMP: 5.2 THERM #: _____

CUSTODY SEALS - ☒ BROKEN ☒ INTACT ☐ NOT USED

CARRIER BILL # _____

☒ HAND DELIVERED

Data Reported to:

DATE: 4-10-17 PAGE 4 OF 6
PO #: LAB WORK ORDER # 1010004
PROJECT LOCATION OR NAME: Paladin East Camp SWP
LAI PROJECT #: 17-0135-02 COLLECTOR: Travis Luthers

CHAIN-OF-CUSTODY

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION					ANALYSES		FIELD NOTES
						HCl	HNO ₃	H ₂ SO ₄ ☐ NaOH ☐	ICE	UNPRESERVED	BTEX ☐ MTBE ☐	TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐	
16 SB-8 10'		4-10-17	3:37	S	1								
17 15'			3:52										
18 20'			3:53										
19 25'			3:59										
20 SB-9 0'		4-10-17	8:58										
21 5'			9:06										
22 10'			9:09										
23 15'			9:11										
24 20'			9:13										
25 25'			9:17										
26 SB-10 0'			10:34										
27 5'			10:37										
28 10'			10:44										
29 15'			10:48										
30 20'			10:51										
TOTAL													

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>[Signature]</i>	4.10.2017		
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>[Signature]</i>			
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>[Signature]</i>	4-10-17 11:00		

TURN AROUND TIME	LABORATORY USE ONLY:
NORMAL ☒	RECEIVING TEMP: <u>5.2</u> THERM #: _____
1 DAY ☐	CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED
2 DAY ☐	CARRIER BILL # _____
OTHER ☐	HAND DELIVERED ☒

CHAIN-OF-CUSTODY

Arson & Associates, Inc.
Environmental Consultants

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

Data Reported to:

DATE: 4-10-17 PAGE 5 OF 6
PO #: LAB WORK ORDER # 1010006
PROJECT LOCATION OR NAME: Paladin East Creek SWD
LAI PROJECT #: 17-013502 COLLECTOR: Tyous Lullwater

TRRP report? ☐ Yes ☒ No TIME ZONE: <u>7:00 AM</u> Time zone/State:		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER		PRESERVATION HCl ☐ HNO ₃ ☐ H ₂ SO ₄ ☐ NaOH ☐ ICE ☐ UNPRESERVED ☐		ANALYSES BTEX ☐ MTBE ☐ TPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ GASOLINE MOD 8015 ☐ DIESEL - MOD 8015 ☐ VOC 8280 ☐ SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ 8081 PESTICIDES ☐ 8082 PCBs ☐ TCLP - METALS (RCRA) ☐ TCLP VOC ☐ TCLP - PEST ☐ HERB ☐ Semi-VOC ☐ OTHER LIST ☐ TOTAL METALS (RCRA) ☐ D.W. 200.8 ☐ TCLP ☐ LEAD - TOTAL ☐ FLASHPOINT ☐ TDS ☐ TOX ☐ % MOISTURE ☐ CYANIDE ☐ RCI ☐ TSS ☐ pH ☐ HEXAVALENT CHROMIUM ☐ EXPLOSIVES ☐ PCHLORATE ☐ CHLORIDE ☐ CARBONS ☐ ALKALINITY ☐ 360 ☐ 360 ☐	
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers				
SB-11 0'		4-7-17	12:10	S	1				
5'			12:19						
10'			12:24						
15'			12:25						
20'			12:28						
25'			12:44						
SB-12 0'			12:57						
5'			1:00						
10'			1:04						
15'			1:05						
SB-13 0'			1:20						
5'			1:23						
10'			1:25						
15'			1:27						
20'			1:34						
TOTAL									

RELINQUISHED BY: (Signature) [Signature] DATE/TIME 4-10-17
 RELINQUISHED BY: (Signature) [Signature] DATE/TIME 4-10-17
 RELINQUISHED BY: (Signature) [Signature] DATE/TIME 4-10-17 RECEIVED BY: (Signature) [Signature]

TURN AROUND TIME
 NORMAL ☒ 1 DAY ☐
 2 DAY ☐ OTHER ☐

LABORATORY USE ONLY:
 RECEIVING TEMP: 52 THERM #:
 CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED
 CARRIER BILL #
 HAND DELIVERED ☒

Date Reported to:

DATE: 4-10-17
PO #: 1010008
LAB WORK ORDER #: 1010008
PROJECT LOCATION OR NAME: Palack East Creek SWD
LAI PROJECT #: 17-0135-02
COLLECTOR: Travis Williams

CHAIN-OF-CUSTODY

TRRP report? ☐ Yes ☒ No TIME ZONE: _____ Time zone/State: _____		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER		PRESERVATION HCl ☐ HNO ₃ ☐ H ₂ SO ₄ ☐ NaOH ☐ ICE ☐ UNPRESERVED ☐		ANALYSES BTEX ☐ MTBE ☐ TPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ GASOLINE MOD 8015 ☐ DIESEL - MOD 8015 ☐ VOC 8260 ☐ SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ 8081 PESTICIDES ☐ 8161 HERBICIDES ☐ TCIP - METALS (RCRA) ☐ TCIP - SEMI-VOC ☐ TOTAL METALS (RCRA) ☐ OTHER LIST ☐ LEAD - TOTAL ☐ D.W. 200.8 ☐ TCIP ☐ TDS ☐ TOX ☐ FLASHPOINT ☐ pH ☐ HEXAVALENT CHROMIUM ☐ EXPLOSIVES ☐ PENTACHLORATE ☐ CHLORIDE ☐ ANIONS ☐ ALKALINITY ☐ BGS ☐ HOLD ☐					
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	UNPRESERVED	ANALYSES	
SB-14 0'		4-7-17	1:54	S	1					X			
5'			11:57										
10'			2:00										
15'			2:02										
20'			2:10										
HA-1 (0-1)			11:25										
0-2)			11:27										
HA-2 (0-1)			2:28										
HA-3 (0-1)			2:30										
HA-4 (0-1)			2:32										
TOTAL													
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		TURN AROUND TIME		LABORATORY USE ONLY:		RECEIVING TEMP: 52 THERM #:			
RELINQUISHED BY: (Signature)		4:10:10		RECEIVED BY: (Signature)		NORMAL ☒ 1 DAY ☐ 2 DAY ☐ OTHER ☐		CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED					
RELINQUISHED BY: (Signature)		DATE/TIME		RECEIVED BY: (Signature)		OTHER		CARRIER BILL #		HAND DELIVERED ☒			
DATE/TIME		4-11-17		RECEIVED BY: (Signature)		11:00							

Attachment B

Photographs



Location Sign Viewing West



Spill Area North and East of Battery Viewing Northwest



Spill Area North of Battery Viewing West



Spill Area South and East of Battery Viewing Southwest



Spill Area South of Battery Viewing West



Spill at Separator Viewing East



Spill at Separator Viewing Northeast



Spill at Separator Viewing North

Attachment C

Initial C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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 October 10, 2003

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

Release Notification and Corrective Action

OPERATOR		☒ Initial Report	☐ Final Report
Name of Company: Paladin Energy Corporation	Contact: Mickey Horn		
Address: 10290 Monroe Drive Suite 301, Dallas, TX 75229	Telephone No.: (214) 352-7273		
Facility Name: East Caprock SWD/Posey A 5 Battery	Facility Type: SWD/Battery		
Surface Owner: Ricky Pierce	Mineral Owner	Lease No./API No. 3002500102	

LOCATION OF RELEASE

Unit Letter O / P	Section 11	Township 12S	Range 32E	Feet from the 1,350	North/South Line South	Feet from the 1,350	East/West Line East	County Lea
-----------------------------	---------------	-----------------	--------------	------------------------	---------------------------	------------------------	------------------------	---------------

Latitude: N33° 17' 22.811" Longitude: W103° 41' 03.547"

NATURE OF RELEASE

Type of Release: Produced Water/Oil	Volume of Release: Unknown	Volume Recovered: None
Source of Release: Injection Pump leak/hole in separator	Date and Hour of Occurrence: 02-13-2017	Date and Hour of Discovery: 02-23-2017
Was Immediate Notice Given? ☐ Yes ☒ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		
RECEIVED By Olivia Yu at 4:20 pm, Apr 05, 2017		

Describe Cause of Problem and Remedial Action Taken.* Leak at injection pump and hole in separator (repaired)

Describe Area Affected and Cleanup Action Taken.* Injection pump leak caused fluid (produced water and oil) to run east along south side of SWD to low area near east end of battery and west along north side of battery encroaching into pasture north of battery. Hole in separator caused oil to run south along east edge of lease road for about 250 feet. Will delineate and remediate to RRALs.

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

Signature: <i>Mickey Horn</i>		OIL CONSERVATION DIVISION	
Printed Name: Mickey Horn		Approved by District Supervisor: <i>[Signature]</i>	
Title: Operations Manager		Approval Date: 4/5/2017	Expiration Date:
E-mail Address: paladinmidland@suddenlink.net		Conditions of Approval: see attached directive	Attached ☒
Date: 04-03-2017 Phone: (432) 522-2162			

Attach Additional Sheets If Necessary

1RP-4666

nOY1709559710

FOY1709559104

pOY1709560088

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 4/3/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number 1R-4666 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 division-approved corrective action 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 division 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 5/5/2017. 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