

Incident ID	nAB1900756452
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	<u>378.62</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: *Each of the following items must be included in the report.*

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

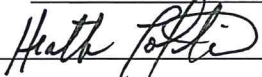
Form C-141

Page 4

State of New Mexico
Oil Conservation Division

Incident ID	nAB1900756452
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I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Heath Loftin Title: Production SuperintendentSignature:  Date: 10/30/2020email: Hloftin@legacyreserves.com Telephone: 432-689-5200**OCD Only**

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

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Remediation Plan

Remediation Plan Checklist: *Each of the following items must be included in the plan.*

- ☒ Detailed description of proposed remediation technique
- ☒ Scaled sitemap with GPS coordinates showing delineation points
- ☒ Estimated volume of material to be remediated
- ☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.

Printed Name: Heath Loftin Title: Production Superintendent

Signature:  Date: 10/30/2020

email: Hloftin@legacyreserves.com Telephone: 432-689-5200

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

State of New Mexico
Oil Conservation Division

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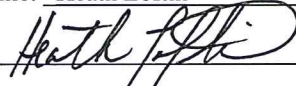
Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: *Each of the following items must be included in the closure report.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Heath Loftin Title: Production Superintendent
 Signature:  Date: 10/30/2020
 email: Hloftin@legacyreserves.com Telephone: 432-689-5200

OCD Only

Received by: Chad Hensley Date: 04/21/2021

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by:  Date: 04/21/2021
 Printed Name: Chad Hensley Title: Environmental Specialist Advanced

**2RP-5154
NAB1900756452
Closure Report
Shugart A State Com #001
Crude Oil Release
Eddy County, New Mexico**

Latitude: N 32.75263°
Longitude: W -103.87630°

LAI Project No. 18-0138-06

October 29, 2020

Prepared for:
Legacy Reserves Operating, LP
303 West Wall Street, Suite 1300
Midland, Texas 79701

Prepared by:
Larson & Associates, Inc.
507 North Marienfeld Street, Suite 202
Midland, Texas 79701



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



Robert Nelson
Sr. Geoscientist

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2RP-5154
Delineation and Closure Report
Shugart A State Well #1
October 29, 2020

1.0 INTRODUCTION

Larson & Associates Inc. (LAI) has prepared this closure report on behalf of Legacy Reserves Operating, LP (Legacy) for submittal to the New Mexico Oil Conservation Division (OCD) District 2 for a crude oil release at the Shugart A State Well #1 (Site) located in Unit K (NE/4, SW/4), Section 6, Township 18 South, Range 31 East in Eddy County, New Mexico. The geodetic position is North 32.75263° and West -103.87630°. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

1.1 Background

The release was discovered on November 14, 2018, when a Bureau of Land Management (BLM) employee noticed crude oil staining inside the earthen berm surrounding the tank battery. The release may have resulted due to leak from the tanks over time. The volume of fluid released is unknown and no fluid was recovered. The spill area measured approximately 20 x 70 feet or about 1,432 square feet. LAI calculated the spill volume at approximately 105 bbls based on the depth of impacted soil between 1 to 6 feet bgs and moisture content of 10% from laboratory analysis. LAI personnel verbally reported the release OCD District 1 (voice message to Olivia Yu) on November 14, 2018. The initial C-141 was submitted on November 19, 2018 and assigned remediation permit number 2RP-5154. Appendix A presents the initial C-141. Appendix B presents OCD communications.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is approximately 3,679 feet above mean sea level (msl).
- The topography slopes gently to the southeast.
- There are no surface water features within 1,000 feet of the Site.
- Kask data provided by the USGS describes the site as having a "Low" risk potential.
- The soils are designated as "Berino-Pajarito complex, 0 to 3 percent slopes, eroded", consisting of 0 to 9 inches of loamy fine sand underlain by 9 to 36 inches of fine sandy loam.
- The geology is the Eolian and piedmont deposits (Holocene to middle Pleistocene) interlayered eolian sands and piedmont-slope deposits.
- Groundwater occurs at approximately 376.82 feet below ground surface (bgs)(1994).
- According to the United States Geologic Survey (USGS) the nearest groundwater well is located in Unit A (NE/4, NE/4), Section 14, Township 18 South, Range 31 East, approximately 2.4 miles or 12,672 feet east of the Site.

1.3 Remediation Levels

The following remediation standards are based on closure criteria for soils impacted by a release as presented in Table 1 of 19.15.29 NMAC:

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 2,500 mg/Kg
- Chloride 20,000 mg/Kg

Further, 19.15.29.13 NMAC (Restoration, Reclamation and Re-Vegetation) requires the operator to restore the impacted surface area that existed prior to the release or their final land use.

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Delineation and Closure Report
Shugart A State Well #1
October 29, 2020

2.0 DELINEATION

On December 21, 2018, LAI personnel collected soil samples from six (6) locations within the spill area (HA-1 through HA-6) using a stainless steel hand auger and four (4) locations outside of the spill area (DP-1 through DP-4) in each cardinal direction (north, east, south, west) using direct push technology (DPT). The samples were collected at 1 foot intervals to approximately 4 feet bgs, depending on subsurface conditions. The soil samples were delivered under preservation and chain of custody to Permian Basin Environmental Laboratory (PBEL) in Midland, Texas. The upper sample from each location was analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA SW-846 Methods 8021B. All samples were analyzed for total petroleum hydrocarbons (TPH) and chloride by EPA Method 8015M, and M300, respectfully. Benzene and BTEX were reported below the OCD delineation limit of 10 mg/Kg and 50 mg/Kg respectively. Chloride ranged from 3.60 mg/Kg (HA-2, 0 to 1 foot) to 1,070 mg/Kg (HA-3, 6 feet). TPH reported above the OCD delineation limit of 2,500 mg/Kg in the following samples:

HA-1, 0 to 1 foot (12,800 mg/Kg)	HA-2, 0 to 1 foot (6,830 mg/Kg)
HA-3, 0 to 1 foot (32,900 mg/Kg)	HA-3, 4 feet (17,300 mg/Kg)
HA-4, 0 to 1 foot (8,770 mg/Kg)	HA-4, 1 to 2 feet (10,300 mg/Kg)
HA-4, 2 to 3 feet (8,080 mg/Kg)	

On July 17, 2019, LAI personnel used DPT to further delineate the release. Soil samples were collected at four (4) locations (DP-1 through DP-4) between 1 and 2 feet bgs. The samples were delivered under preservation and chain of custody to PBEL and analyzed for BTEX, TPH, and chloride by EPA SW-846 Methods 8021B, 8015M, and Method 300, respectfully. TPH reported below the delineation limit of 2,500 mg/Kg for all sample locations.

Under the current rule (19.15.29.11(5)(C), delineation for chloride to 600 mg/Kg is not required where groundwater exceeds 100 feet in depth, therefore the release was delineated vertically for chloride. Table 1 presents the delineation soil sample analytical data summary. Figure 2 presents an aerial map with soil sample locations. Appendix C presents laboratory reports.

3.0 REMEDIATION

Between November 5, 2019 and November 19, 2019, Superior Oilfield Services (SOS) used a backhoe to excavate soil from an area measuring about 40 x 90 feet or approximately 3,600 square feet encompassing delineation samples HA-1 through HA-6, DP-1, DP-3, and DP-4. Soil was excavated to approximately 4.1 feet bgs. Approximately 315 cubic yards of soil were disposed at R360 Halfway., located on Highway 62/180 east of Carlsbad, New Mexico. Appendix D presents the waste manifests.

Between November 7 and November 19, 2019, LAI personnel collected fifteen (15) five-point composite confirmation soil samples from the sidewalls (north, east, south, and west) and bottom of the excavation. The samples were delivered under preservation and chain of custody to PBEL and were analyzed for BTEX, TPH and chloride by EPA SW-846 Methods 8021B, 8015M and Method 300, respectively. All confirmation samples reported BTEX and chloride below the OCD remediation levels. TPH reported above OCD remediation levels in the following confirmation samples:

Sidewall South 1 (S-1), 0-4 feet (1,170 mg/Kg)	Sidewall North 1 (N-1), 0-4 feet (173 mg/Kg)
--	--

2RP-5154
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Shugart A State Well #1
October 29, 2020

Sidewall South 2 (S-2), 0-4 feet (348 mg/Kg)
Sidewall West (W), 0-4 feet (148 mg/Kg)

Bottom 3, 4.1 feet (3,210 mg/Kg)
Bottom 4, 4.1 feet (4,630 mg/Kg)

Between November 19, 2019 and January 10, 2020, SOS excavated an additional two (2) feet of soil encompassing sample points (S-1, S-2, N-1, W, and Bottom 1 through Bottom 9). All subsequent confirmation soil samples reported benzene, BTEX, TPH, and chloride below the OCD remediation levels.

Twelve (12) composite samples each of clean caliche were collected from a nearby pit. BTEX and TPH were below the method reporting limits in the backfill composite samples and chloride was less than 600 mg/Kg. The excavation was backfilled to surface with clean caliche. Table 2 presents the confirmation soil analytical data summary. Figure 3 presents the excavations and confirmation sample locations. Appendix E presents photographs.

4.0 CLOSURE REQUEST

Legacy requests no further action for 2RP-5154.

Tables

Table 1
Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Lea County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500	20,000 / 600
HA-1	0 - 1	12/21/2018	In-Situ	<0.0217	<0.9997	537	10,600	1,690	12,800	6.60
	4	7/17/2019	In-Situ	--	--	<27.2	<27.2	<27.2	<27.2	--
HA-2	0 - 1	12/21/2018	In-Situ	0.0683	31.3383	972	4,930	931	6,830	3.60
	4	7/17/2019	In-Situ	--	--	<27.5	<27.5	<27.5	<27.5	--
HA-3	0 - 1	12/21/2018	In-Situ	0.0615	15.6815	1,420	27,500	3,940	32,900	72.5
	4	7/17/2019	In-Situ	--	--	1,700	12,500	3,150	17,300	--
	6	11/7/2019	In-Situ	<0.00110	<0.00660	<27.5	<27.5	<27.5	<27.5	1,070
	8	11/7/2019	In-Situ	<0.00108	<0.02582	<26.9	<26.9	<26.9	<26.9	754
HA-4	0 - 1	12/21/2018	In-Situ	<0.0215	10.514	626	6,620	1,520	8,770	51.7
	1 - 2	12/21/2018	In-Situ	--	--	1,770	7,420	1,150	10,300	--
	2 - 3	12/21/2018	In-Situ	--	--	547	6,250	1,290	8,080	--
	3 - 4	12/21/2018	In-Situ	--	--	33.6	371	68	472	--
HA-5	0 - 1	12/21/2018	In-Situ	<0.0227	15.023	284	2,350	508	3,140	301
	1 - 2	12/21/2018	In-Situ	--	--	97.8	888	138	1,120	--
	2 - 3	12/21/2018	In-Situ	--	--	37.1	455	92.8	585	--
HA-6	0 - 1	12/21/2018	In-Situ	<0.0215	0.876	552	28,400	5,040	34,000	71.3
	5	11/7/2019	In-Situ	<0.00106	<0.00637	<26.6	101	43.1	144	104
	8	11/7/2019	In-Situ	<0.00106	<0.00637	<26.6	<26.6	<26.6	<26.6	51.3
DP-1	0 - 1	12/21/2018	In-Situ	<0.00120	<0.05532	<30.1	118	49.1	167	817
	1 - 2	12/21/2018	In-Situ	--	--	<26.9	<26.9	<26.9	<26.9	135
DP-2	0 - 1	12/21/2018	In-Situ	<0.00112	<0.05164	<28.1	<28.1	<28.1	<28.1	195
DP-3	0 - 1	12/21/2018	In-Situ	<0.00108	<0.04956	<26.9	<26.9	<26.9	<26.9	218
DP-4	0 - 1	12/21/2018	In-Situ	<0.00118	<0.05416	<29.4	143	32.2	175	4.47
	1 - 2	12/21/2018	In-Situ	--	--	<26.6	47.3	<26.6	47.3	--

Notes: Laboratory analysis performed by Permian Basin Laboratory (PBEL) by EPA 8021B (BTEX) Method 8015M (TPH) and 300 (chloride)

Table 1
Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Lea County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500	20,000 / 600

Depth in feet below ground surface (bgs)

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

*: OCD delineation level

Bold and highlited denote concentration above RRAL

Bold and highliteed denote concentration above OCD delineation limit

Table 1
Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Lea County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500	20,000 / 600

Table 2
Confirmation Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Eddy County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500/100	20,000/600
Sidewall East	0 - 4	11/7/2019	In-Situ	<0.00104	<0.00624	<26.0	<26.0	<26.0	<26.0	66.1
Sidewall South 1	0 - 4	11/7/2019	Excavated	<0.00106	<0.00637	<26.6	900	274	1,170	220
	0 - 4	1/3/2020	In-Situ	<0.00108	<0.00647	<26.9	<26.9	<26.9	<26.9	65.6
Sidewall South 2	0 - 4	11/7/2019	Excavated	<0.00104	<0.00624	<26.0	275	72.9	348	187
	0 - 4	1/3/2020	In-Situ	<0.00108	<0.00647	<26.9	<26.9	<26.9	<26.9	216
Sidewall West	0 - 4	11/7/2019	Excavated	<0.00105	<0.00631	<26.3	148	<26.3	148	101
	0 - 4	1/3/2020	In-Situ	<0.00106	<0.00637	<26.6	<26.6	<26.6	<26.6	54.4
Sidewall North 1	0 - 4	11/7/2019	Excavated	<0.00106	<0.00637	<26.6	173	<26.6	173	46
	0 - 4	1/3/2020	Excavated	<0.00106	<0.00637	<26.6	226	<26.6	226	103
	0 - 4	1/10/2020	In-Situ	<0.00100	<0.00600	<26.6	<26.6	<26.6	<26.6	145
Sidewall North 2	0 - 4	11/7/2019	In-Situ	<0.00104	<0.00624	<26.0	<26.0	<26.0	<26.0	213
Bottom 1	4.1	11/19/2019	Excavated	<0.00100	<0.00600	<26.0	26.9	<26.0	26.9	6.75
	6	1/10/2020	In-Situ	<0.00100	<0.00600	<26.6	<26.6	<26.6	<26.6	522
Bottom 2	4.1	11/19/2019	Excavated	<0.00100	<0.00600	<26.6	93.2	<26.6	93.2	70.2
	6	1/10/2020	In-Situ	<0.00100	<0.00600	<26.6	<26.6	<26.6	<26.6	646
Bottom 3	4.1	11/19/2019	Excavated	<0.00100	<0.00600	321	2,570	320	3,210	80.3
	6	1/10/2020	In-Situ	<0.00100	<0.00600	<26.3	<26.3	<26.3	<26.3	88.3
Bottom 4	4.1	11/19/2019	Excavated	<0.00100	<0.00600	203	3,790	637	4,630	22.3
	6	1/10/2020	In-Situ	<0.00100	<0.00600	26.3	<26.3	<26.3	26.3	75.8
Bottom 5	4.1	11/19/2019	Excavated	<0.00100	<0.00600	<25.5	372	69.1	441	260
	6	1/10/2020	In-Situ	<0.00100	<0.00600	26.6	<26.0	<26.0	26.6	9.48
Bottom 6	4.1	11/19/2019	Excavated	<0.00100	<0.00600	<26.6	110	26.6	110	1,210

Table 2
Confirmation Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Eddy County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500/100	20,000/600
	6	1/10/2020	In-Situ	<0.00100	<0.00600	<26.3	<26.3	<26.3	<26.3	9.07
Bottom 7	4.1	11/19/2019	Excavated	<0.00100	<0.00600	<25.5	68.7	32.1	101	51.9
	6	1/10/2020	In-Situ	<0.00100	<0.00600	<26.3	<26.3	<26.3	<26.3	7.37
Bottom 8	4.1	11/19/2019	Excavated	<0.00100	<0.00600	<26.3	41.3	<26.3	41.3	61.2
	6	1/10/2020	In-Situ	<0.00100	<0.00600	28.8	<26.3	<26.3	28.8	7.35
Backfill -1	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	72.6
Backfill -2	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	27.6
Backfill -3	--	2/3/2020	In-Situ	<0.00101	<0.00606	<25.3	<25.3	<25.3	<25.3	22.5
Backfill -4	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	24.2
Backfill -5	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	34.9
Backfill -6	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	21.6
Backfill -7	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	33.4
Backfill -8	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	13.4
Backfill -9	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	35.6
Backfill -10	--	2/3/2020	In-Situ	<0.00101	<0.00606	<25.3	<25.3	<25.3	<25.3	<1.01
Backfill -11	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	70.4	28.6	99.0	13.6
Backfill -12	--	2/3/2020	In-Situ	<0.00100	<0.00600	<25.0	<25.0	<25.0	<25.0	7.54

Notes: Laboratory analysis performed by Permian Basin Laboratory (PBEL), Midland, Texas by EPA 8021B (BTEX)

Method 8015M (TPH) and 300 (chloride)

Depth in feet below ground surface (bgs)

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

*: OCD delineation level

Bold and highlighted denote concentration above RAL

Table 2
Confirmation Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Eddy County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500/100	20,000/600

Table 2
Confirmation Soil Sample Analytical Data Summary
Legacy Reserves, Shugart State
Eddy County, New Mexico
18-0138-06

Sample	Depth (Feet)	Collection Date	Status	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	C6 - C35 (mg/Kg)	Chloride (mg/Kg)
RRAL				10	50				2,500/100	20,000/600

Figures

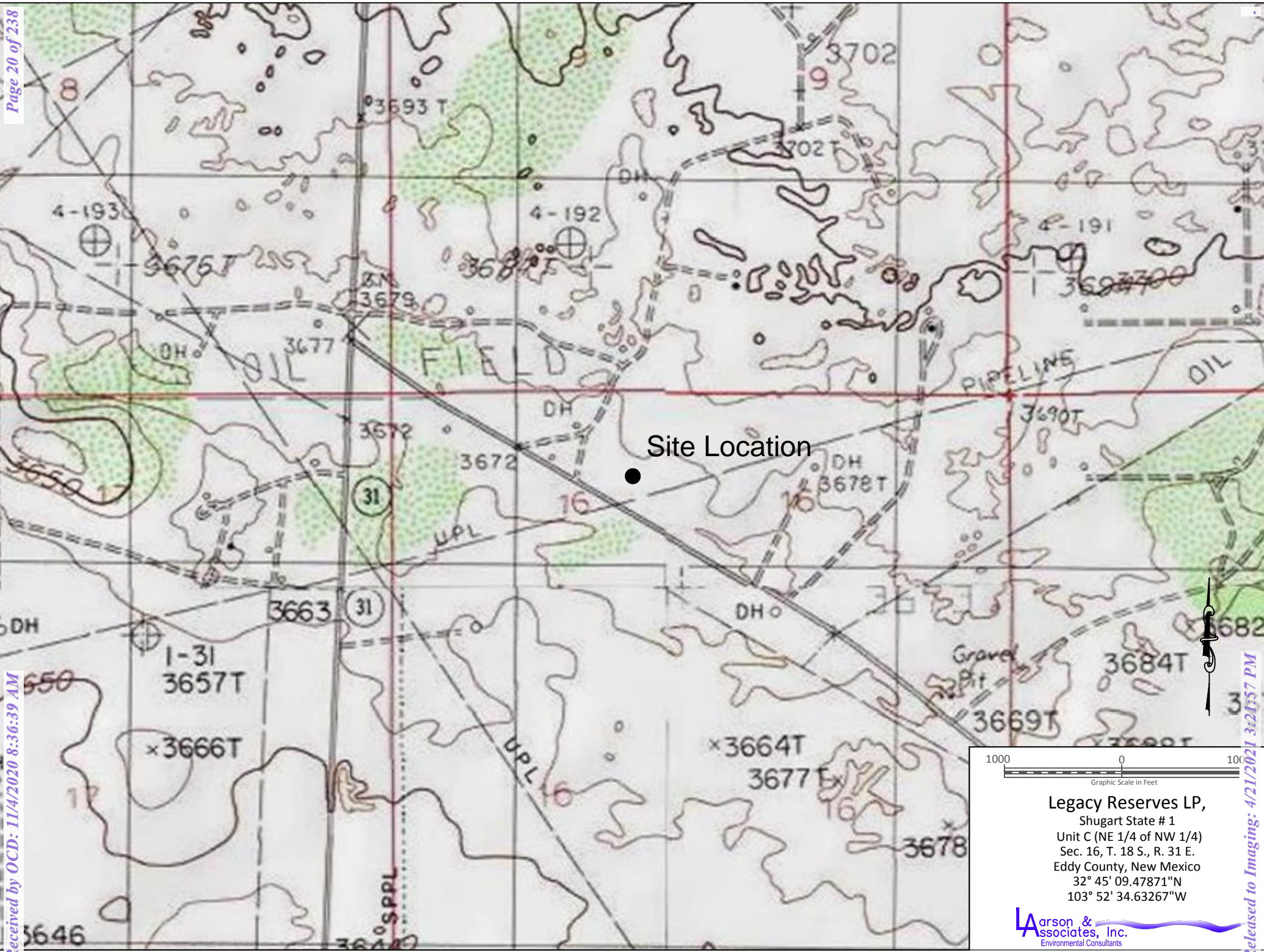


Figure 1 - Topographic Map



Legend

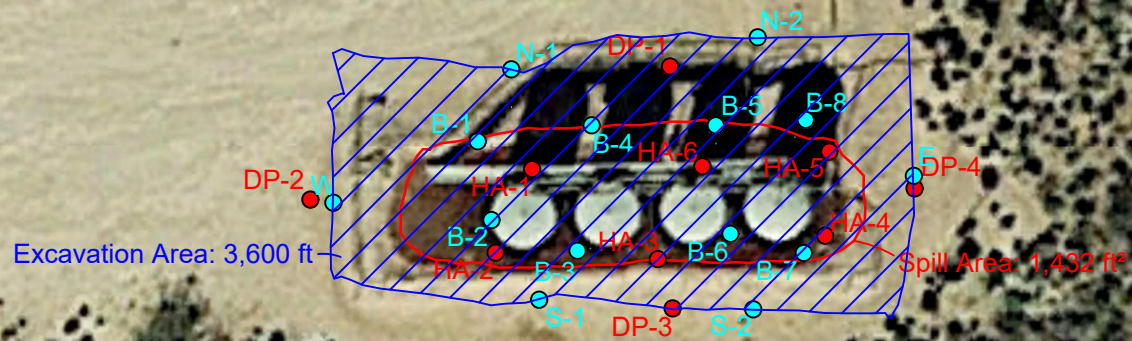
- Spill Area
- Soil Sample Location

30 0 30
Graphic Scale in Feet

Legacy Reserves LP,
Shugart State # 1
Unit C (NE 1/4 of NW 1/4)
Sec. 16, T. 18 S., R. 31 E.
Eddy County, New Mexico
32° 45' 09.47871"N
103° 52' 34.63267"W

Larson & Associates, Inc.
Environmental Consultants

Figure 2 - Aerial Map Showing Soil Sample Locations



Legend

- Spill Area
- Soil Sample Location
- Excavation Location (6")
- Confirmation Sample Location



Legacy Reserves LP,
Shugart State # 1
Unit C (NE 1/4 of NW 1/4)
Sec. 16, T. 18 S., R. 31 E.
Eddy County, New Mexico
32° 45' 09.47871"N
103° 52' 34.63267"W

Larson &
Associates, Inc.
Environmental Consultants

Figure 3 - Aerial Map Showing Soil Sample Locations and Excavation Area

Appendix A

Initial C-141

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

State of New Mexico
Energy Minerals and Natural
Resources Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party Legacy Reserves Operating, LP	OGRID 240974
Contact Name Brian Cunningham	Contact Telephone 432-234-9450
Contact email bcunningham@legacylp.com	Incident # (assigned by OCD)
Contact mailing address 303 W. Wall St. Midland TX 79701	

Location of Release Source

Latitude 32.75263° N Longitude -103.87630° W
(NAD 83 in decimal degrees to 5 decimal places)

Site Name Shugart A State #1	Site Type Tank Battery
Date Release Discovered 11/14/2018	API# (if applicable) 30-015-32438

Unit Letter	Section	Township	Range	County
K	6	18S	31E	Eddy

Surface Owner: ☐ State ☒ Federal ☐ Tribal ☐ Private (Name: _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls) 1,275.25 bbls	Volume Recovered (bbls) 0
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of total dissolved solids (TDS) in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A leak formed in a tank.

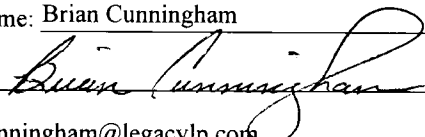
State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? The release was greater than 25 bbls.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Larson and Associates personnel notified Olivia Yu on 11/14/2018 at 15:47 MST and left a voice mail.	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input checked="" type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> been undertaken, explain why: 	
Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.	
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD 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 OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD 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.	
Printed Name: <u>Brian Cunningham</u> Signature: <u></u> email: <u>bcunningham@legacylp.com</u>	Title: <u>Production Foreman</u> Date: <u>11/19/2018</u> Telephone: <u>432-234-9450</u>
OCD Only Received by: _____ Date: _____	

Appendix B
OCD Communications

From: [Bratcher, Mike, EMNRD](#)
To: [Bustamante, Amalia, EMNRD](#)
Cc: [Hamlet, Robert, EMNRD](#); [Venegas, Victoria, EMNRD](#)
Subject: FW: Revised C-141, Shugart A State #1, Legacy Reserves
Date: Thursday, January 3, 2019 9:52:00 AM
Attachments: [C-141 Legacy Reserves Shugart A State #1.pdf](#)

From: Mark Larson <Mark@laenvironmental.com>
Sent: Thursday, January 3, 2019 9:00 AM
To: Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>
Cc: Rachel Owen <rowen@laenvironmental.com>
Subject: [EXT] RE: Revised C-141, Shugart A State #1, Legacy Reserves

Mike,

Please see the C-141 attached which has been revised for the correct API number. We will bring this to Legacy's attention to correct the API number on the location sign. Please contact Rachel Owen or me if you have questions. Sorry for the confusion.

Respectfully,

Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 205
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656
Fax – 432-687-0456
mark@laenvironmental.com



"Serving the Permian Basin Since 2000"

From: Bratcher, Mike, EMNRD [<mailto:mike.bratcher@state.nm.us>]
Sent: Thursday, January 03, 2019 8:54 AM
To: Rachel Owen; Hamlet, Robert, EMNRD
Cc: Mark Larson; bcunningham@legacyp.com; Bustamante, Amalia, EMNRD; Venegas, Victoria, EMNRD
Subject: RE: Revised C-141, Shugart A State #1, Legacy Reserves

Rachel

The problem I have with the API number (**30-015-32438**) used on the C-141 is that it belongs to Basic Energy * Shugart St 2, located in K-16-18s-31e. I can't open a Legacy release under another operator's name/API number. The API number I have listed for Legacy * Shugart A St 1 is: **30-015-26317**, located in C-16-18s-31e. I don't see a change of operator for the Basic Energy well, so not sure why Legacy has applied their sticker to that API numbered sign. Mr. Cunningham might be able to explain it, but for OCD to process a release for Legacy, we need an API number that belongs to Legacy.

If I can help resolve this, please let me know.

Thank you,

Mike Bratcher
NMOCD District 2
811 South First Street
Artesia, NM 88210
575-748-1283 Ext 108

From: Rachel Owen <rowen@laenvironmental.com>

Sent: Thursday, January 3, 2019 6:59 AM

To: Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>

Cc: Mark Larson <Mark@laenvironmental.com>; bcunningham@legacyp.com; Bustamante, Amalia, EMNRD <Amalia.Bustamante@state.nm.us>

Subject: [EXT] RE: Revised C-141, Shugart A State #1, Legacy Reserves

Good Morning Mr. Bratcher,

I have attached a georeferenced photograph of the tank battery sign. It seems like the issue could be cleared up by assigning the Site a more appropriate name. Would you like me to revise the name of the Site on the C-141?

Thank you for your patience regarding this matter.

Respectfully,

Rachel Owen
Staff Geologist
Larson & Associates

Phone: 432.664.5357

Email: rowen@laenvironmental.com



From: Bratcher, Mike, EMNRD [<mailto:mike.bratcher@state.nm.us>]
Sent: Wednesday, January 2, 2019 1:20 PM
To: Rachel Owen; Hamlet, Robert, EMNRD
Cc: Mark Larson; bcunningham@legacylp.com; Bustamante, Amalia, EMNRD
Subject: RE: Revised C-141, Shugart A State #1, Legacy Reserves

Rachel,

This revised C-141 lists the API number for this well as 30-015-32438, and in unit letter K of 6-18s-31e. After some research, OCD records show the Legacy Reserves Shugart A St 1 as having an API number of 30-015-26317, and in unit letter C of 6-18s-31e. Please check your records and if in alignment with mine, please resubmit with the proper identification.

Thank you,

Mike Bratcher
NMOCD District 2
811 South First Street
Artesia, NM 88210
575-748-1283 Ext 108

From: Rachel Owen <rowen@laenvironmental.com>
Sent: Monday, December 31, 2018 12:59 PM
To: Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>
Cc: Mark Larson <Mark@laenvironmental.com>; bcunningham@legacylp.com; Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>
Subject: [EXT] Revised C-141, Shugart A State #1, Legacy Reserves
Importance: High

Good Afternoon Mr. Hamlet,

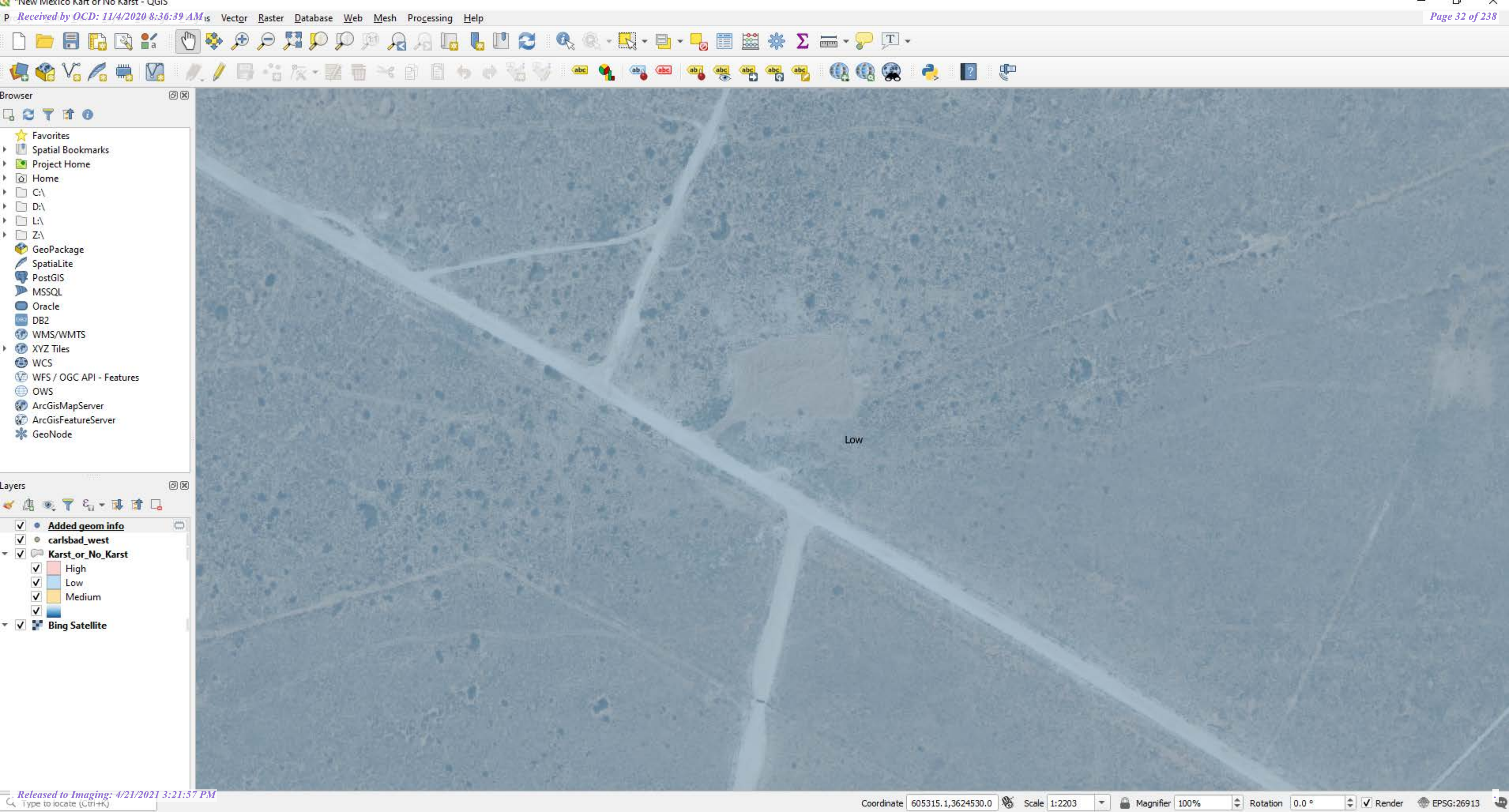
Larson & Associates, Inc. (LAI), on behalf of Legacy Reserves Operating L.P. (Legacy) submits the revised C-141 for a spill at the Shugart A State #1 located in Eddy County, New Mexico. Please contact Brian Cunningham with Legacy at (432) 234-9450, Mark Larson, or myself if you have questions.

Respectfully,

Rachel Owen
Staff Geologist
Larson & Associates
Phone: 432.664.5357
Email: rowen@laenvironmental.com



Appendix C
Karst Potential



Browser

- ★ Favorites
- ▶ Spatial Bookmarks
- ▶ Project Home
- ▶ Home
- ▶ C:\
- ▶ D:\
- ▶ L:\
- ▶ Z:\
- GeoPackage
- Spatialite
- PostGIS
- MSSQL
- Oracle
- DB2
- WMS/WMTS
- ▶ XYZ Tiles
- WCS
- WFS / OGC API - Features
- OWS
- ArcGisMapServer
- ArcGisFeatureServer
- GeoNode

Layers

- ✓ Added geom info
- ✓ carlsbad_west
- ▼ Karst_or_No_Karst
 - ✓ High
 - ✓ Low
 - ✓ Medium
- ▼ Bing Satellite

Appendix D
Waste Manifests



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: OSCAR
 Truck #: 03
 Card #
 Job Ref #

Ticket #: 700-1075415
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service						Quantity Units					
Contaminated Soil (RCRA Exempt)						15.00 yards					
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: DANNY
 Truck #: DT10
 Card #
 Job Ref #

Ticket #: 700-1075416
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERAT
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service										Quantity Units	
Contaminated Soil (RCRA Exempt)										10.00 yards	
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: DANNY
 Truck #: 10
 Card #
 Job Ref #

Ticket #: 700-1075472
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity Units										
Contaminated Soil (RCRA Exempt)	10.00 yards										
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: OSCAR
 Truck #: 03
 Card #
 Job Ref #

Ticket #: 700-1075471
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

15.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: DANNY
 Truck #: DT10
 Card #
 Job Ref #

Ticket #: 700-1075537
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERAT
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service		Quantity Units									
Contaminated Soil (RCRA Exempt)		10.00 yards									
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: OSCAR
 Truck #: 03
 Card #
 Job Ref #

Ticket #: 700-1075536
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service		Quantity Units									
Contaminated Soil (RCRA Exempt)		15.00 yards									
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer:	LEGACY RESERVES OPERATI	Ticket #:	700-1075607
Customer #:	CRI3660	Bid #:	O6UJ9A000DZ8
Ordered by:	BRAIN CUNNINGHAM	Date:	11/8/2019
AFE #:		Generator:	LEGACY RESERVES OPERA1
PO #:		Generator #:	
Manifest #:	NA	Well Ser. #:	999908
Manif. Date:	11/8/2019	Well Name:	SHUGART ST COM A
Hauler:	SUPERIOR OILFIELD SERVICE	Well #:	1
Driver:	OSCAR	Field:	
Truck #:	03	Field #:	
Card #:		Rig:	NON-DRILLING
Job Ref #:		County:	

Facility: CRI

Product / Service		Quantity Units									
Contaminated Soil (RCRA Exempt)		15.00 yards									
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste.
- ☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
- ☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRAIN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/8/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: DANNY
 Truck #: 10
 Card #
 Job Ref #

Ticket #: 700-1075608
 Bid #: O6UJ9A000DZ8
 Date: 11/8/2019
 Generator: LEGACY RESERVES OPERAT
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity Units										
Contaminated Soil (RCRA Exempt)	10.00 yards										
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 413999
 Manif. Date: 11/6/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: JOSE
 Truck #: 02
 Card #
 Job Ref #

Ticket #: 700-1074561
 Bid #: O6UJ9A000DZ8
 Date: 11/6/2019
 Generator: LEGACY RESERVES OPERAT
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

10.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 413996
 Manif. Date: 11/5/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: JOSE
 Truck #: 2
 Card #
 Job Ref #

Ticket #: 700-1074254
 Bid #: O6UJ9A000DZ8
 Date: 11/5/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

10.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 413998
 Manif. Date: 11/5/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: JOSE
 Truck #: 02
 Card #
 Job Ref #

Ticket #: 700-1074345
 Bid #: O6UJ9A000DZ8
 Date: 11/5/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

10.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer:	LEGACY RESERVES OPERATI	Ticket #:	700-1075073
Customer #:	CRI3660	Bid #:	O6UJ9A000DZ8
Ordered by:	BRIAN CUNNINGHAM	Date:	11/7/2019
AFE #:		Generator:	LEGACY RESERVES OPERA1
PO #:		Generator #:	
Manifest #:	NA	Well Ser. #:	999908
Manif. Date:	11/7/2019	Well Name:	SHUGART ST COM A
Hauler:	SOS	Well #:	1
Driver:	DENNIS	Field:	
Truck #:	08	Field #:	
Card #:		Rig:	NON-DRILLING
Job Ref #:		County:	

Facility: CRI

Product / Service		Quantity Units									
Contaminated Soil (RCRA Exempt)		15.00 yards									
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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- ☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRAIN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/7/2019
 Hauler: SOS
 Driver: DENNIS
 Truck #: 08
 Card #
 Job Ref #

Ticket #: 700-1075035
 Bid #: O6UJ9A000DZ8
 Date: 11/7/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity Units										
Contaminated Soil (RCRA Exempt)	15.00 yards										
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

A handwritten signature in black ink, appearing to be "SM", written over a horizontal line.

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 413997
 Manif. Date: 11/5/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: JOSE
 Truck #: 02
 Card #
 Job Ref #

Ticket #: 700-1074296
 Bid #: O6UJ9A000DZ8
 Date: 11/5/2019
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

10.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 414000
 Manif. Date: 11/6/2019
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: JOSE
 Truck #: 2
 Card #
 Job Ref #

Ticket #: 700-1074606
 Bid #: O6UJ9A000DZ8
 Date: 11/6/2019
 Generator: LEGACY RESERVES OPERATI
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

10.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: NA
 Manif. Date: 11/7/2019
 Hauler: SOS
 Driver: DENNIS
 Truck #: 08
 Card #
 Job Ref #

Ticket #: 700-1074978
 Bid #: O6UJ9A000DZ8
 Date: 11/7/2019
 Generator: LEGACY RESERVES OPERAT
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity	Units
Contaminated Soil (RCRA Exempt)	15.00	yards
Lab Analysis:	Cell	pH
	50/51	0.00
	Cl	0.00
	Cond.	0.00
	%Solids	0
	TDS	
	PCI/GM	
	MR/HR	
	H2S	
	% Oil	
	Weight	

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer:	LEGACY RESERVES OPERATI	Ticket #:	700-1095039
Customer #:	CRI3660	Bid #:	O6UJ9A000F5U
Ordered by:	BRIAN CUNNINGHAM	Date:	1/2/2020
AFE #:		Generator:	LEGACY RESERVES OPERA7
PO #:		Generator #:	
Manifest #:	12777	Well Ser. #:	999908
Manif. Date:	1/2/2020	Well Name:	SHUGART ST COM A
Hauler:	SUPERIOR OILFIELD MAINTEN	Well #:	1
Driver:	JOE	Field:	
Truck #:	1	Field #:	
Card #:		Rig:	NON-DRILLING
Job Ref #:		County:	

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

12.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 12777
 Manif. Date: 1/2/2020
 Hauler: SUPERIOR OILFIELD MAINTEN
 Driver: JOE
 Truck #: 1
 Card #
 Job Ref #

Ticket #: 700-1095082
 Bid #: O6UJ9A000F5U
 Date: 1/2/2020
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service		Quantity Units									
Contaminated Soil (RCRA Exempt)		12.00 yards									
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 12777
 Manif. Date: 1/2/2020
 Hauler: SUPERIOR OILFIELD MAINTEN
 Driver: JOE
 Truck #: 1
 Card #
 Job Ref #

Ticket #: 700-1095120
 Bid #: O6UJ9A000F5U
 Date: 1/2/2020
 Generator: LEGACY RESERVES OPERATI
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity Units									
Contaminated Soil (RCRA Exempt)	12.00 yards									
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0					

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

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Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 12777
 Manif. Date: 1/2/2020
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: JOE
 Truck #: 1
 Card #
 Job Ref #

Ticket #: 700-1095171
 Bid #: O6UJ9A000F5U
 Date: 1/2/2020
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity Units										
Contaminated Soil (RCRA Exempt)	12.00 yards										
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

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Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 12777
 Manif. Date: 1/2/2020
 Hauler: SUPERIOR OILFIELD MAINTEN
 Driver: JOE
 Truck #: 1
 Card #
 Job Ref #

Ticket #: 700-1095235
 Bid #: O6UJ9A000F5U
 Date: 1/2/2020
 Generator: LEGACY RESERVES OPERATI
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Permian Basin

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

12.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer:	LEGACY RESERVES OPERATI	Ticket #:	700-1095461
Customer #:	CRI3660	Bid #:	O6UJ9A000F5U
Ordered by:	BYRON CUNNINGS	Date:	1/3/2020
AFE #:		Generator:	LEGACY RESERVES OPERA1
PO #:		Generator #:	
Manifest #:	12776	Well Ser. #:	999908
Manif. Date:	1/3/2020	Well Name:	SHUGART ST COM A
Hauler:	SUPERIOR OILFIELD SERVICE	Well #:	1
Driver:	JOE	Field:	
Truck #:	5	Field #:	
Card #:		Rig:	NON-DRILLING
Job Ref #:		County:	

Facility: CRI

Product / Service

Quantity Units

Contaminated Soil (RCRA Exempt)

15.00 yards

	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
- ☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
- ☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNIGHAM
 AFE #:
 PO #:
 Manifest #: 12776
 Manif. Date: 1/3/2020
 Hauler: SUPERIOR OILFIELD MAINTEN
 Driver: JOE
 Truck #: 3
 Card #
 Job Ref #

Ticket #: 700-1095501
 Bid #: O6UJ9A000F5U
 Date: 1/3/2020
 Generator: LEGACY RESERVES OPERA7
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity	Units
Contaminated Soil (RCRA Exempt)	15.00	yards
Lab Analysis:	Cell	pH
	50/51	0.00
	Cl	Cond.
	0.00	0.00
	%Solids	TDS
	0	
	PCI/GM	MR/HR
	H2S	% Oil
	Weight	

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI Ticket #: 700-1096835
 Customer #: CRI3660 Bid #: O6UJ9A000F5U
 Ordered by: BRAIN CUNNINGHAM Date: 1/7/2020
 AFE #: Generator: LEGACY RESERVES OPERAT
 PO #: Generator #:
 Manifest #: 12783 Well Ser. #: 999908
 Manif. Date: 1/7/2020 Well Name: SHUGART ST COM A
 Hauler: SUPERIOR OILFIELD SERVICE Well #: 1
 Driver: DENNIS Field:
 Truck #: 5 Field #:
 Card #: Rig: NON-DRILLING
 Job Ref #: County

Facility: CRI

Product / Service	Quantity Units										
Contaminated Soil (RCRA Exempt)	15.00 yards										
	Cell	pH	Cl	Cond.	%Solids	TDS	PCI/GM	MR/HR	H2S	% Oil	Weight
Lab Analysis:	50/51	0.00	0.00	0.00	0						

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____



Permian Basin

Customer: LEGACY RESERVES OPERATI
 Customer #: CRI3660
 Ordered by: BRIAN CUNNINGHAM
 AFE #:
 PO #:
 Manifest #: 12783
 Manif. Date: 1/7/2020
 Hauler: SUPERIOR OILFIELD SERVICE
 Driver: DENNIS
 Truck #: 5
 Card #
 Job Ref #

Ticket #: 700-1096880
 Bid #: O6UJ9A000F5U
 Date: 1/7/2020
 Generator: LEGACY RESERVES OPERA1
 Generator #:
 Well Ser. #: 999908
 Well Name: SHUGART ST COM A
 Well #: 1
 Field:
 Field #:
 Rig: NON-DRILLING
 County

Facility: CRI

Product / Service	Quantity	Units
Contaminated Soil (RCRA Exempt)	15.00	yards
Lab Analysis:	Cell 50/51	pH 0.00
	Cl 0.00	Cond. 0.00
	%Solids 0	TDS
	PCI/GM	MR/HR
	H2S	% Oil
	Weight	

Generator Certification Statement of Waste Status

I hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is:

- ☒ RCRA Exempt: Oil Field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste
☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24 or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items):
☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description above)

Driver/ Agent Signature

R360 Representative Signature

Customer Approval

THIS IS NOT AN INVOICE!

Approved By: _____

Date: _____

Appendix E
Laboratory Reports

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



Analytical Report

Prepared for:

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

Project: Shugart A State Well

Project Number: 18-0138-06

Location:

Lab Order Number: 0A06008



NELAP/TCEQ # T104704516-17-8

Report Date: 01/07/20

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

Project: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Sidewall West	0A06008-01	Soil	01/03/20 00:00	01-06-2020 09:11
Sidewall North 1	0A06008-02	Soil	01/03/20 00:00	01-06-2020 09:11
Sidewall South 1	0A06008-03	Soil	01/03/20 00:00	01-06-2020 09:11
Sidewall South 2	0A06008-04	Soil	01/03/20 00:00	01-06-2020 09:11

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

Project: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall West
0A06008-01 (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	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		111 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		94.3 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	54.4	1.06	mg/kg dry	1	P0A0610	01/06/20	01/07/20	EPA 300.0	
% Moisture	4.0	0.1	%	1	P0A0605	01/06/20	01/06/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C12-C28	ND	26.6	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: 1-Chlorooctane		76.2 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: o-Terphenyl		84.6 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.6	mg/kg dry	1	[CALC]	01/06/20	01/06/20	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.

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

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

Project: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall North 1
0A06008-02 (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	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		94.3 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		104 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	103	1.06	mg/kg dry	1	P0A0610	01/06/20	01/07/20	EPA 300.0	
% Moisture	6.0	0.1	%	1	P0A0605	01/06/20	01/06/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C12-C28	226	26.6	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: 1-Chlorooctane		84.4 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: o-Terphenyl		92.8 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	226	26.6	mg/kg dry	1	[CALC]	01/06/20	01/06/20	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.

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

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

Project: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall South 1
0A06008-03 (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	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Toluene	ND	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		105 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		93.5 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	65.6	1.08	mg/kg dry	1	P0A0610	01/06/20	01/07/20	EPA 300.0	
% Moisture	7.0	0.1	%	1	P0A0605	01/06/20	01/06/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: 1-Chlorooctane		83.3 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: o-Terphenyl		91.0 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	01/06/20	01/06/20	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.

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

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

Project: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall South 2
0A06008-04 (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	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Toluene	ND	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.5 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		111 %	75-125		P0A0611	01/06/20	01/06/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	216	1.08	mg/kg dry	1	P0A0610	01/06/20	01/07/20	EPA 300.0	
% Moisture	7.0	0.1	%	1	P0A0605	01/06/20	01/06/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: 1-Chlorooctane		85.1 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Surrogate: o-Terphenyl		92.7 %	70-130		P0A0602	01/06/20	01/06/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	01/06/20	01/06/20	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.

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

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

Project: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0A0611 - General Preparation (GC)

Blank (P0A0611-BLK1)

Prepared & Analyzed: 01/06/20

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	0.111		"	0.120		92.1	75-125			
Surrogate: 4-Bromofluorobenzene	0.130		"	0.120		109	75-125			

LCS (P0A0611-BS1)

Prepared & Analyzed: 01/06/20

Benzene	0.0916	0.00100	mg/kg wet	0.100		91.6	70-130			
Toluene	0.111	0.00100	"	0.100		111	70-130			
Ethylbenzene	0.118	0.00100	"	0.100		118	70-130			
Xylene (p/m)	0.229	0.00200	"	0.200		115	70-130			
Xylene (o)	0.107	0.00100	"	0.100		107	70-130			
Surrogate: 1,4-Difluorobenzene	0.107		"	0.120		89.4	75-125			
Surrogate: 4-Bromofluorobenzene	0.110		"	0.120		91.7	75-125			

LCS Dup (P0A0611-BSD1)

Prepared & Analyzed: 01/06/20

Benzene	0.100	0.00100	mg/kg wet	0.100		100	70-130	9.18	20	
Toluene	0.115	0.00100	"	0.100		115	70-130	3.03	20	
Ethylbenzene	0.115	0.00100	"	0.100		115	70-130	2.65	20	
Xylene (p/m)	0.236	0.00200	"	0.200		118	70-130	2.68	20	
Xylene (o)	0.104	0.00100	"	0.100		104	70-130	3.02	20	
Surrogate: 4-Bromofluorobenzene	0.117		"	0.120		97.8	75-125			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.1	75-125			

Calibration Blank (P0A0611-CCB1)

Prepared & Analyzed: 01/06/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	0.114		"	0.120		95.3	75-125			
Surrogate: 4-Bromofluorobenzene	0.126		"	0.120		105	75-125			

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: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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

Batch P0A0611 - General Preparation (GC)

Calibration Blank (P0A0611-CCB2)

Prepared: 01/06/20 Analyzed: 01/07/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.132		"	0.120		110	75-125			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.8	75-125			

Calibration Check (P0A0611-CCV1)

Prepared & Analyzed: 01/06/20

Benzene	0.103	0.00100	mg/kg wet	0.100		103	80-120			
Toluene	0.119	0.00100	"	0.100		119	80-120			
Ethylbenzene	0.114	0.00100	"	0.100		114	80-120			
Xylene (p/m)	0.229	0.00200	"	0.200		115	80-120			
Xylene (o)	0.119	0.00100	"	0.100		119	80-120			
Surrogate: 4-Bromofluorobenzene	0.121		"	0.120		101	75-125			
Surrogate: 1,4-Difluorobenzene	0.120		"	0.120		99.8	75-125			

Calibration Check (P0A0611-CCV2)

Prepared: 01/06/20 Analyzed: 01/07/20

Benzene	0.0977	0.00100	mg/kg wet	0.100		97.7	80-120			
Toluene	0.115	0.00100	"	0.100		115	80-120			
Ethylbenzene	0.107	0.00100	"	0.100		107	80-120			
Xylene (p/m)	0.233	0.00200	"	0.200		116	80-120			
Xylene (o)	0.112	0.00100	"	0.100		112	80-120			
Surrogate: 1,4-Difluorobenzene	0.108		"	0.120		89.9	75-125			
Surrogate: 4-Bromofluorobenzene	0.117		"	0.120		97.7	75-125			

Calibration Check (P0A0611-CCV3)

Prepared: 01/06/20 Analyzed: 01/07/20

Benzene	0.101	0.00100	mg/kg wet	0.100		101	80-120			
Toluene	0.116	0.00100	"	0.100		116	80-120			
Ethylbenzene	0.111	0.00100	"	0.100		111	80-120			
Xylene (p/m)	0.231	0.00200	"	0.200		115	80-120			
Xylene (o)	0.115	0.00100	"	0.100		115	80-120			
Surrogate: 4-Bromofluorobenzene	0.121		"	0.120		101	75-125			
Surrogate: 1,4-Difluorobenzene	0.118		"	0.120		97.9	75-125			

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: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0A0611 - General Preparation (GC)

Matrix Spike (P0A0611-MS1)		Source: 0A06014-15		Prepared: 01/06/20		Analyzed: 01/07/20				
Benzene	0.0867	0.00100	mg/kg wet	0.100	ND	86.7	80-120			
Toluene	0.0963	0.00100	"	0.100	ND	96.3	80-120			
Ethylbenzene	0.101	0.00100	"	0.100	ND	101	80-120			
Xylene (p/m)	0.177	0.00200	"	0.200	ND	88.6	80-120			
Xylene (o)	0.0774	0.00100	"	0.100	ND	77.4	80-120			QM-07
Surrogate: 1,4-Difluorobenzene	0.131		"	0.120		110	75-125			
Surrogate: 4-Bromofluorobenzene	0.135		"	0.120		113	75-125			

Matrix Spike Dup (P0A0611-MSD1)		Source: 0A06014-15		Prepared: 01/06/20		Analyzed: 01/07/20				
Benzene	0.0883	0.00100	mg/kg wet	0.100	ND	88.3	80-120	1.81	20	
Toluene	0.102	0.00100	"	0.100	ND	102	80-120	5.37	20	
Ethylbenzene	0.114	0.00100	"	0.100	ND	114	80-120	12.0	20	
Xylene (p/m)	0.201	0.00200	"	0.200	ND	101	80-120	12.6	20	
Xylene (o)	0.0899	0.00100	"	0.100	ND	89.9	80-120	14.9	20	
Surrogate: 4-Bromofluorobenzene	0.145		"	0.120		120	75-125			
Surrogate: 1,4-Difluorobenzene	0.137		"	0.120		115	75-125			

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: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P0A0605 - *** DEFAULT PREP ***										
Blank (P0A0605-BLK1)					Prepared & Analyzed: 01/06/20					
% Moisture	ND	0.1	%							
Duplicate (P0A0605-DUP1)					Source: 0A06008-04 Prepared & Analyzed: 01/06/20					
% Moisture	8.0	0.1	%		7.0			13.3	20	
Batch P0A0610 - *** DEFAULT PREP ***										
Blank (P0A0610-BLK1)					Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	ND	1.00	mg/kg wet							
LCS (P0A0610-BS1)					Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	375	1.00	mg/kg wet	400		93.7	80-120			
LCS Dup (P0A0610-BSD1)					Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	394	1.00	mg/kg wet	400		98.6	80-120	5.04	20	
Calibration Blank (P0A0610-CCB1)					Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	0.00		mg/kg wet							
Calibration Check (P0A0610-CCV1)					Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	19.3		mg/kg	20.0		96.7	0-200			
Calibration Check (P0A0610-CCV2)					Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	19.4		mg/kg	20.0		97.1	0-200			
Matrix Spike (P0A0610-MS1)					Source: 0A06008-01 Prepared: 01/06/20 Analyzed: 01/07/20					
Chloride	569	1.06	mg/kg dry	532	54.4	96.7	80-120			

Permian Basin Environmental Lab, L.P.

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

Project: Shugart A State Well
Project Number: 18-0138-06
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 P0A0610 - * DEFAULT PREP *****

Matrix Spike Dup (P0A0610-MSD1)

Source: 0A06008-01

Prepared: 01/06/20 Analyzed: 01/07/20

Chloride	534	1.06	mg/kg dry	532	54.4	90.2	80-120	6.30	20	
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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: Shugart A State Well
Project Number: 18-0138-06
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 P0A0602 - TX 1005

Blank (P0A0602-BLK1)

Prepared & Analyzed: 01/06/20

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	50.0		"	50.0		100	70-130			

LCS (P0A0602-BS1)

Prepared & Analyzed: 01/06/20

C6-C12	1110	25.0	mg/kg wet	1000		111	75-125			
>C12-C28	1110	25.0	"	1000		111	75-125			
Surrogate: 1-Chlorooctane	101		"	100		101	70-130			
Surrogate: o-Terphenyl	46.0		"	50.0		92.0	70-130			

LCS Dup (P0A0602-BSD1)

Prepared & Analyzed: 01/06/20

C6-C12	1100	25.0	mg/kg wet	1000		110	75-125	0.971	20	
>C12-C28	1080	25.0	"	1000		108	75-125	2.99	20	
Surrogate: 1-Chlorooctane	100		"	100		100	70-130			
Surrogate: o-Terphenyl	46.3		"	50.0		92.6	70-130			

Calibration Blank (P0A0602-CCB1)

Prepared & Analyzed: 01/06/20

C6-C12	20.2		mg/kg wet							
>C12-C28	6.17		"							
Surrogate: 1-Chlorooctane	92.6		"	100		92.6	70-130			
Surrogate: o-Terphenyl	50.5		"	50.0		101	70-130			

Calibration Check (P0A0602-CCV1)

Prepared & Analyzed: 01/06/20

C6-C12	550	25.0	mg/kg wet	500		110	85-115			
>C12-C28	549	25.0	"	500		110	85-115			
Surrogate: 1-Chlorooctane	111		"	100		111	70-130			
Surrogate: o-Terphenyl	52.1		"	50.0		104	70-130			

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: Shugart A State Well
Project Number: 18-0138-06
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 P0A0602 - TX 1005

Matrix Spike (P0A0602-MS1)	Source: 0A03005-03			Prepared & Analyzed: 01/06/20						
C6-C12	1060	25.8	mg/kg dry	1030	20.7	101	75-125			
>C12-C28	1080	25.8	"	1030	17.3	103	75-125			
Surrogate: 1-Chlorooctane	90.2		"	103		87.5	70-130			
Surrogate: o-Terphenyl	40.1		"	51.5		77.8	70-130			
Matrix Spike Dup (P0A0602-MSD1)	Source: 0A03005-03			Prepared & Analyzed: 01/06/20						
C6-C12	1050	25.8	mg/kg dry	1030	20.7	99.7	75-125	0.836	20	
>C12-C28	1080	25.8	"	1030	17.3	103	75-125	0.0242	20	
Surrogate: 1-Chlorooctane	93.7		"	103		90.9	70-130			
Surrogate: o-Terphenyl	40.1		"	51.5		77.8	70-130			

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: Shugart A State Well
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

ROI Received on Ice

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:

1/7/2020

Brent Barron, Laboratory Director/Technical Director

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

Permian Basin Environmental Lab, L.P.

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

Varson & Associates, Inc.
Environmental Consultants

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

Data Reported to:

DATE: 1/6/2020 PAGE 1 OF 1
PO#: _____ LAB WORK ORDER#: 0A06008
PROJECT LOCATION OR NAME: Smugart A State Well
LAI PROJECT #: 18-0138-016 COLLECTOR: RD

Page 15 of 15

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



Analytical Report

Prepared for:

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

Project: Shugart State #1
Project Number: 18-0138-06
Location: None Given
Lab Order Number: 0A13001



NELAP/TCEQ # T104704516-18-9

Report Date: 01/15/20

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Sidewall North 1	0A13001-01	Soil	01/10/20 12:50	01-13-2020 10:52
Bottom 1	0A13001-02	Soil	01/10/20 12:55	01-13-2020 10:52
Bottom 2	0A13001-03	Soil	01/10/20 12:56	01-13-2020 10:52
Bottom 3	0A13001-04	Soil	01/10/20 12:58	01-13-2020 10:52
Bottom 4	0A13001-05	Soil	01/10/20 13:00	01-13-2020 10:52
Bottom 5	0A13001-06	Soil	01/10/20 13:02	01-13-2020 10:52
Bottom 6	0A13001-07	Soil	01/10/20 13:05	01-13-2020 10:52
Bottom 7	0A13001-08	Soil	01/10/20 13:07	01-13-2020 10:52
Bottom 8	0A13001-09	Soil	01/10/20 13:10	01-13-2020 10:52

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall North 1

0A13001-01 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		105 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		98.2 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		96.8 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		117 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.6	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	145	1.06	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	6.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 1
0A13001-02 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		108 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		97.6 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		84.2 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		98.6 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.6	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	522	1.06	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	6.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 2
0A13001-03 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		107 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		98.9 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.6	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		69.0 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	S-GC
Surrogate: o-Terphenyl		82.2 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.6	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	646	1.06	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	6.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 3
0A13001-04 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		106 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		98.4 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		85.1 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		102 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.3	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	88.3	1.05	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	5.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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

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P.O. Box 50685
Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 4
0A13001-05 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		105 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		98.5 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	26.3	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		82.7 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		99.5 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.3	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	75.8	1.05	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	5.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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

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P.O. Box 50685
Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 5
0A13001-06 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		107 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		98.0 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	26.6	26.0	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.0	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.0	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		84.1 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		100 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	26.6	26.0	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	9.48	1.04	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	4.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

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Bottom 6
0A13001-07 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		104 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		98.1 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		80.7 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		94.7 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.3	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	9.07	1.05	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	5.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

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Bottom 7
0A13001-08 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		107 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		99.2 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		77.0 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		91.5 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	ND	26.3	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	7.37	1.05	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	5.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

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Bottom 8
0A13001-09 (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	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		105 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.9 %	75-125		P0A1302	01/13/20	01/13/20	EPA 8021B	
C6-C12	28.8	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C12-C28	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
>C28-C35	ND	26.3	mg/kg dry	1	P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: 1-Chlorooctane		72.7 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Surrogate: o-Terphenyl		86.0 %	70-130		P0A1304	01/13/20	01/13/20	TX 1005	
Total Hydrocarbon nC6-nC35	28.8	26.3	mg/kg dry	1	[CALC]	01/13/20	01/13/20	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Chloride	7.35	1.05	mg/kg dry	1	P0A1401	01/14/20	01/14/20	EPA 300.0	
% Moisture	5.0	0.1	%	1	P0A1402	01/14/20	01/14/20	ASTM D2216	

Permian Basin Environmental Lab, L.P.

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

Larson & Associates, Inc.
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Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0A1302 - General Preparation (GC)

Blank (P0A1302-BLK1)

Prepared & Analyzed: 01/13/20

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00200	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	0.124		"	0.120		103	75-125			
Surrogate: 1,4-Difluorobenzene	0.114		"	0.120		95.1	75-125			

LCS (P0A1302-BS1)

Prepared & Analyzed: 01/13/20

Benzene	0.114	0.00100	mg/kg wet	0.100		114	80-120			
Toluene	0.115	0.00100	"	0.100		115	80-120			
Ethylbenzene	0.104	0.00200	"	0.100		104	80-120			
Xylene (p/m)	0.224	0.00100	"	0.200		112	80-120			
Xylene (o)	0.104	0.00100	"	0.100		104	80-120			
Surrogate: 4-Bromofluorobenzene	0.125		"	0.120		104	75-125			
Surrogate: 1,4-Difluorobenzene	0.122		"	0.120		102	75-125			

LCS Dup (P0A1302-BSD1)

Prepared & Analyzed: 01/13/20

Benzene	0.115	0.00100	mg/kg wet	0.100		115	80-120	0.992	20	
Toluene	0.113	0.00100	"	0.100		113	80-120	1.59	20	
Ethylbenzene	0.103	0.00200	"	0.100		103	80-120	1.57	20	
Xylene (p/m)	0.223	0.00100	"	0.200		111	80-120	0.399	20	
Xylene (o)	0.104	0.00100	"	0.100		104	80-120	0.645	20	
Surrogate: 4-Bromofluorobenzene	0.128		"	0.120		107	75-125			
Surrogate: 1,4-Difluorobenzene	0.121		"	0.120		101	75-125			

Calibration Blank (P0A1302-CCB1)

Prepared & Analyzed: 01/13/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.122		"	0.120		102	75-125			
Surrogate: 1,4-Difluorobenzene	0.116		"	0.120		96.8	75-125			

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc.
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Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0A1302 - General Preparation (GC)

Calibration Blank (P0A1302-CCB2)

Prepared & Analyzed: 01/13/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.124		"	0.120		103	75-125			
Surrogate: 1,4-Difluorobenzene	0.116		"	0.120		97.0	75-125			

Calibration Check (P0A1302-CCV1)

Prepared & Analyzed: 01/13/20

Benzene	0.115	0.00100	mg/kg wet	0.100		115	80-120			
Toluene	0.113	0.00100	"	0.100		113	80-120			
Ethylbenzene	0.115	0.00200	"	0.100		115	80-120			
Xylene (p/m)	0.237	0.00100	"	0.200		119	80-120			
Xylene (o)	0.120	0.00100	"	0.100		120	80-120			
Surrogate: 4-Bromofluorobenzene	0.126		"	0.120		105	75-125			
Surrogate: 1,4-Difluorobenzene	0.122		"	0.120		101	75-125			

Calibration Check (P0A1302-CCV2)

Prepared & Analyzed: 01/13/20

Benzene	0.113	0.00100	mg/kg wet	0.100		113	80-120			
Toluene	0.109	0.00100	"	0.100		109	80-120			
Ethylbenzene	0.109	0.00200	"	0.100		109	80-120			
Xylene (p/m)	0.218	0.00100	"	0.200		109	80-120			
Xylene (o)	0.114	0.00100	"	0.100		114	80-120			
Surrogate: 4-Bromofluorobenzene	0.128		"	0.120		107	75-125			
Surrogate: 1,4-Difluorobenzene	0.124		"	0.120		103	75-125			

Calibration Check (P0A1302-CCV3)

Prepared: 01/13/20 Analyzed: 01/14/20

Benzene	0.108	0.00100	mg/kg wet	0.100		108	80-120			
Toluene	0.108	0.00100	"	0.100		108	80-120			
Ethylbenzene	0.113	0.00200	"	0.100		113	80-120			
Xylene (p/m)	0.219	0.00100	"	0.200		110	80-120			
Xylene (o)	0.113	0.00100	"	0.100		113	80-120			
Surrogate: 4-Bromofluorobenzene	0.132		"	0.120		110	75-125			
Surrogate: 1,4-Difluorobenzene	0.125		"	0.120		104	75-125			

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

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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 P0A1302 - General Preparation (GC)

Matrix Spike (P0A1302-MS1)		Source: 0A13001-01		Prepared: 01/13/20		Analyzed: 01/14/20				
Benzene	0.0908	0.00100	mg/kg dry	0.106	ND	85.4	80-120			
Toluene	0.0881	0.00100	"	0.106	ND	82.8	80-120			
Ethylbenzene	0.110	0.00200	"	0.106	ND	103	80-120			
Xylene (p/m)	0.186	0.00100	"	0.213	ND	87.3	80-120			
Xylene (o)	0.0925	0.00100	"	0.106	ND	87.0	80-120			
Surrogate: 4-Bromofluorobenzene	0.141		"	0.128		111	75-125			
Surrogate: 1,4-Difluorobenzene	0.131		"	0.128		103	75-125			

Matrix Spike Dup (P0A1302-MSD1)		Source: 0A13001-01		Prepared: 01/13/20		Analyzed: 01/14/20				
Benzene	0.0878	0.00100	mg/kg dry	0.106	ND	82.5	80-120	3.41	20	
Toluene	0.0889	0.00100	"	0.106	ND	83.6	80-120	0.962	20	
Ethylbenzene	0.107	0.00200	"	0.106	ND	101	80-120	2.43	20	
Xylene (p/m)	0.181	0.00100	"	0.213	ND	85.2	80-120	2.41	20	
Xylene (o)	0.0893	0.00100	"	0.106	ND	84.0	80-120	3.52	20	
Surrogate: 4-Bromofluorobenzene	0.140		"	0.128		110	75-125			
Surrogate: 1,4-Difluorobenzene	0.131		"	0.128		102	75-125			

Batch P0A1304 - TX 1005

Blank (P0A1304-BLK1)				Prepared & Analyzed: 01/13/20						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	107		"	100		107	70-130			
Surrogate: o-Terphenyl	61.4		"	50.0		123	70-130			

LCS (P0A1304-BS1)				Prepared & Analyzed: 01/13/20						
C6-C12	872	25.0	mg/kg wet	1000		87.2	75-125			
>C12-C28	999	25.0	"	1000		99.9	75-125			
Surrogate: 1-Chlorooctane	119		"	100		119	70-130			
Surrogate: o-Terphenyl	55.6		"	50.0		111	70-130			

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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0A1304 - TX 1005

LCS Dup (P0A1304-BSD1)

Prepared & Analyzed: 01/13/20

C6-C12	975	25.0	mg/kg wet	1000		97.5	75-125	11.1	20	
>C12-C28	1100	25.0	"	1000		110	75-125	9.80	20	
Surrogate: 1-Chlorooctane	106		"	100		106	70-130			
Surrogate: o-Terphenyl	60.9		"	50.0		122	70-130			

Calibration Blank (P0A1304-CCB1)

Prepared & Analyzed: 01/13/20

C6-C12	21.4		mg/kg wet							
>C12-C28	12.8		"							
Surrogate: 1-Chlorooctane	111		"	100		111	70-130			
Surrogate: o-Terphenyl	63.5		"	50.0		127	70-130			

Calibration Check (P0A1304-CCV1)

Prepared & Analyzed: 01/13/20

C6-C12	564	25.0	mg/kg wet	500		113	85-115			
>C12-C28	555	25.0	"	500		111	85-115			
Surrogate: 1-Chlorooctane	113		"	100		113	70-130			
Surrogate: o-Terphenyl	64.2		"	50.0		128	70-130			

Matrix Spike (P0A1304-MS1)

Source: 0A13001-09

Prepared & Analyzed: 01/13/20

C6-C12	960	26.3	mg/kg dry	1050	28.8	88.4	75-125			
>C12-C28	1100	26.3	"	1050	ND	105	75-125			
Surrogate: 1-Chlorooctane	107		"	105		102	70-130			
Surrogate: o-Terphenyl	49.8		"	52.6		94.7	70-130			

Matrix Spike Dup (P0A1304-MSD1)

Source: 0A13001-09

Prepared & Analyzed: 01/13/20

C6-C12	952	26.3	mg/kg dry	1050	28.8	87.7	75-125	0.841	20	
>C12-C28	1060	26.3	"	1050	ND	101	75-125	3.70	20	
Surrogate: 1-Chlorooctane	107		"	105		102	70-130			
Surrogate: o-Terphenyl	51.1		"	52.6		97.2	70-130			

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: Shugart State #1
Project Number: 18-0138-06
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 P0A1401 - * DEFAULT PREP *****

Blank (P0A1401-BLK1)				Prepared & Analyzed: 01/14/20						
Chloride	ND	0.100	mg/kg wet							
LCS (P0A1401-BS1)				Prepared & Analyzed: 01/14/20						
Chloride	398	1.00	mg/kg wet	400		99.6	80-120			
LCS Dup (P0A1401-BSD1)				Prepared & Analyzed: 01/14/20						
Chloride	397	1.00	mg/kg wet	400		99.3	80-120	0.259	20	
Calibration Blank (P0A1401-CCB1)				Prepared & Analyzed: 01/14/20						
Chloride	0.00		mg/kg wet							
Calibration Blank (P0A1401-CCB2)				Prepared & Analyzed: 01/14/20						
Chloride	0.00		mg/kg wet							
Calibration Check (P0A1401-CCV1)				Prepared & Analyzed: 01/14/20						
Chloride	18.9		mg/kg	20.0		94.7	0-200			
Calibration Check (P0A1401-CCV2)				Prepared & Analyzed: 01/14/20						
Chloride	19.1		mg/kg	20.0		95.4	0-200			
Calibration Check (P0A1401-CCV3)				Prepared & Analyzed: 01/14/20						
Chloride	18.3		mg/kg	20.0		91.6	0-200			
Matrix Spike (P0A1401-MS1)				Source: 0A13003-01		Prepared & Analyzed: 01/14/20				
Chloride	1890	10.5	mg/kg dry	5260	107	33.9	80-120			QM-07
Matrix Spike (P0A1401-MS2)				Source: 0A13001-03		Prepared & Analyzed: 01/14/20				
Chloride	7360	10.6	mg/kg dry	5320	646	126	80-120			QM-07

Permian Basin Environmental Lab, L.P.

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P0A1401 - * DEFAULT PREP *****

Matrix Spike Dup (P0A1401-MSD1)	Source: 0A13003-01			Prepared & Analyzed: 01/14/20						
Chloride	1470	10.5	mg/kg dry	5260	107	25.9	80-120	25.2	20	QM-07
Matrix Spike Dup (P0A1401-MSD2)	Source: 0A13001-03			Prepared & Analyzed: 01/14/20						
Chloride	7070	10.6	mg/kg dry	5320	646	121	80-120	4.00	20	QM-07

Batch P0A1402 - * DEFAULT PREP *****

Blank (P0A1402-BLK1)	Prepared & Analyzed: 01/14/20									
% Moisture	ND	0.1	%							
Duplicate (P0A1402-DUP1)	Source: 0A13002-17			Prepared & Analyzed: 01/14/20						
% Moisture	6.0	0.1	%		6.0			0.00	20	
Duplicate (P0A1402-DUP2)	Source: 0A13005-01			Prepared & Analyzed: 01/14/20						
% Moisture	ND	0.1	%		ND				20	

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Project Number: 18-0138-06
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: 1/15/2020

Brent Barron, Laboratory Director/Technical Director

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

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

Permian Basin Environmental Lab, L.P.

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

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

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

Data Reported to:

DATE: 1/13/20 PAGE 1 OF 1
PO#: LAB WORK ORDER# DA135001
PROJECT LOCATION OR NAME: smugart state
LAI PROJECT #: 18-0138-06 COLLECTOR: ps

Page 19 of 19

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No TIME ZONE: _____ Time zone/State: _____		S=SOIL W=WATER A=AIR P=PAINT SL=SLUDGE OT=OTHER																													
Field Sample I.D. _____		Lab # _____ Date _____ Time _____																													
Matrix _____		# of Containers _____																													
HCl _____ HNO ₃ _____ H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> ICE _____		UNPRESERVED _____																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">ANALYSES</th> </tr> <tr> <td>BTEX <input checked="" type="checkbox"/></td> <td>TPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/></td> </tr> <tr> <td>GASOLINE MOD 8015 <input checked="" type="checkbox"/></td> <td>DIESEL - MOD 8015 <input checked="" type="checkbox"/></td> </tr> <tr> <td>OIL - MOD 8015 <input checked="" type="checkbox"/></td> <td>VOC 8260 <input type="checkbox"/></td> </tr> <tr> <td>SVOC 8270 <input type="checkbox"/></td> <td>PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/></td> </tr> <tr> <td>8081 PESTICIDES <input type="checkbox"/></td> <td>8151 HERBICIDES <input type="checkbox"/></td> </tr> <tr> <td>TBLP - METALS (RCRA) <input type="checkbox"/></td> <td>TCPLP VOC <input type="checkbox"/></td> </tr> <tr> <td>TCPLP - PEST <input type="checkbox"/> HERB <input type="checkbox"/> Semi-VOC <input type="checkbox"/></td> <td>OTHER LIST <input type="checkbox"/></td> </tr> <tr> <td>TOTAL METALS (RCRA) <input type="checkbox"/></td> <td>TCPLP <input type="checkbox"/></td> </tr> <tr> <td>LEAD - TOTAL <input type="checkbox"/> D.W. 200.8 <input type="checkbox"/></td> <td>TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/></td> </tr> <tr> <td>TDS <input type="checkbox"/> TSS <input type="checkbox"/> % MOISTURE <input type="checkbox"/></td> <td>HEXAVALENT CHROMIUM <input type="checkbox"/></td> </tr> <tr> <td>pH <input type="checkbox"/></td> <td>PECHLORATE <input type="checkbox"/></td> </tr> <tr> <td>EXPLOSIVES <input type="checkbox"/></td> <td>ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/></td> </tr> <tr> <td>CHLORIDES <input type="checkbox"/></td> <td></td> </tr> </table>				ANALYSES		BTEX <input checked="" type="checkbox"/>	TPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/>	GASOLINE MOD 8015 <input checked="" type="checkbox"/>	DIESEL - MOD 8015 <input checked="" type="checkbox"/>	OIL - MOD 8015 <input checked="" type="checkbox"/>	VOC 8260 <input type="checkbox"/>	SVOC 8270 <input type="checkbox"/>	PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/>	8081 PESTICIDES <input type="checkbox"/>	8151 HERBICIDES <input type="checkbox"/>	TBLP - METALS (RCRA) <input type="checkbox"/>	TCPLP VOC <input type="checkbox"/>	TCPLP - PEST <input type="checkbox"/> HERB <input type="checkbox"/> Semi-VOC <input type="checkbox"/>	OTHER LIST <input type="checkbox"/>	TOTAL METALS (RCRA) <input type="checkbox"/>	TCPLP <input type="checkbox"/>	LEAD - TOTAL <input type="checkbox"/> D.W. 200.8 <input type="checkbox"/>	TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/>	TDS <input type="checkbox"/> TSS <input type="checkbox"/> % MOISTURE <input type="checkbox"/>	HEXAVALENT CHROMIUM <input type="checkbox"/>	pH <input type="checkbox"/>	PECHLORATE <input type="checkbox"/>	EXPLOSIVES <input type="checkbox"/>	ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/>	CHLORIDES <input type="checkbox"/>	
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CHLORIDES <input type="checkbox"/>																															
FIELD NOTES _____																															

RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____ RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____ RELINQUISHED BY: (Signature) _____ DATE/TIME _____ RECEIVED BY: (Signature) _____ LABORATORY: _____ DATE/TIME _____ RECEIVED BY: (Signature) _____		TURN AROUND TIME NORMAL <input type="checkbox"/> 1-DAY <input type="checkbox"/> 2-DAY <input checked="" type="checkbox"/> push! OTHER <input type="checkbox"/> _____	
LABORATORY USE ONLY: _____ RECEIVING TEMP: _____ THERM#: _____ CUSTODY SEALS - <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input type="checkbox"/> NOT USED <input type="checkbox"/> CARRIER BILL # _____ <input type="checkbox"/> HAND DELIVERED		TOTAL _____ RECEIVED BY: (Signature) _____ DATE/TIME _____	

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



Analytical Report

Prepared for:

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

Project: Legacy Reserves, Shugart State #1

Project Number: 18-0138-06

Location: NM

Lab Order Number: 0B04001



NELAP/TCEQ # T104704516-17-8

Report Date: 02/19/20

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BF-1	0B04001-01	Soil	02/03/20 12:38	02-04-2020 08:49
BF-2	0B04001-02	Soil	02/03/20 12:39	02-04-2020 08:49
BF-3	0B04001-03	Soil	02/03/20 12:40	02-04-2020 08:49
BF-4	0B04001-04	Soil	02/03/20 12:41	02-04-2020 08:49
BF-5	0B04001-05	Soil	02/03/20 12:42	02-04-2020 08:49
BF-6	0B04001-06	Soil	02/03/20 12:43	02-04-2020 08:49
BF-7	0B04001-07	Soil	02/03/20 12:44	02-04-2020 08:49
BF-8	0B04001-08	Soil	02/03/20 12:45	02-04-2020 08:49
BF-9	0B04001-09	Soil	02/03/20 12:46	02-04-2020 08:49
BF-10	0B04001-10	Soil	02/03/20 12:47	02-04-2020 08:49
BF-11	0B04001-11	Soil	02/03/20 12:48	02-04-2020 08:49
BF-12	0B04001-12	Soil	02/03/20 12:49	02-04-2020 08:49

Larson & Associates, Inc.
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Midland TX, 79710

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-1
0B04001-01 (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	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		94.0 %	75-125		P0B0402	02/04/20	02/04/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		94.7 %	75-125		P0B0402	02/04/20	02/04/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	72.6	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		107 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		131 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	calc	

Permian Basin Environmental Lab, L.P.

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

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P.O. Box 50685
Midland TX, 79710

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-2

0B04001-02 (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	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B0402	02/04/20	02/04/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.5 %	75-125		P0B0402	02/04/20	02/04/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		93.6 %	75-125		P0B0402	02/04/20	02/04/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	27.6	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		107 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		129 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	calc	

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Fax: (432) 687-0456

BF-3

0B04001-03 (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	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Toluene	ND	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Ethylbenzene	ND	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (p/m)	ND	0.00202	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (o)	ND	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		95.2 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		99.0 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	22.5	1.01	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	1.0	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.3	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.3	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.3	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		99.4 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		127 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.3	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-4

0B04001-04 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		94.9 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		96.9 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	24.2	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		112 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		136 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-5

0B04001-05 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		99.6 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		95.3 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	34.9	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		109 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		130 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-6
0B04001-06 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		99.7 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.1 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	21.6	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		112 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		135 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-7

0B04001-07 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		98.9 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		95.9 %	75-125		P0B1004	02/10/20	02/10/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	33.4	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		111 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		136 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-8

0B04001-08 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.0 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		96.9 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	13.4	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		113 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		134 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-9

0B04001-09 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		96.6 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		99.3 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	35.6	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		102 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		121 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-10
0B04001-10 (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	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Toluene	ND	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Ethylbenzene	ND	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (p/m)	ND	0.00202	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (o)	ND	0.00101	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		95.3 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		99.5 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	ND	1.01	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	1.0	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.3	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.3	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.3	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		118 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		139 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.3	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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.

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

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-11

0B04001-11 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		96.6 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		93.0 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	13.6	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0702	02/07/20	02/07/20	TPH 8015M	
>C12-C28	70.4	25.0	mg/kg dry	1	P0B0702	02/07/20	02/07/20	TPH 8015M	
>C28-C35	28.6	25.0	mg/kg dry	1	P0B0702	02/07/20	02/07/20	TPH 8015M	
Surrogate: 1-Chlorooctane		119 %	70-130		P0B0702	02/07/20	02/07/20	TPH 8015M	
Surrogate: o-Terphenyl		131 %	70-130		P0B0702	02/07/20	02/07/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	99.0	25.0	mg/kg dry	1	[CALC]	02/07/20	02/07/20	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

BF-12

0B04001-12 (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	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Ethylbenzene	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (p/m)	ND	0.00200	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		98.9 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		94.6 %	75-125		P0B1004	02/10/20	02/11/20	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	7.54	1.00	mg/kg dry	1	P0B1603	02/16/20	02/17/20	EPA 300.0	
% Moisture	ND	0.1	%	1	P0B0716	02/07/20	02/07/20	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C12-C28	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
>C28-C35	ND	25.0	mg/kg dry	1	P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: 1-Chlorooctane		125 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	
Surrogate: o-Terphenyl		148 %	70-130		P0B0405	02/04/20	02/04/20	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	25.0	mg/kg dry	1	[CALC]	02/04/20	02/04/20	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0B0402 - General Preparation (GC)

Blank (P0B0402-BLK1)

Prepared & Analyzed: 02/04/20

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	0.114		"	0.120		94.7	75-125			
Surrogate: 1,4-Difluorobenzene	0.114		"	0.120		95.4	75-125			

LCS (P0B0402-BS1)

Prepared & Analyzed: 02/04/20

Benzene	0.0927	0.00100	mg/kg wet	0.100		92.7	70-130			
Toluene	0.0924	0.00100	"	0.100		92.4	70-130			
Ethylbenzene	0.116	0.00100	"	0.100		116	70-130			
Xylene (p/m)	0.187	0.00200	"	0.200		93.7	70-130			
Xylene (o)	0.100	0.00100	"	0.100		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.123		"	0.120		102	75-125			
Surrogate: 1,4-Difluorobenzene	0.119		"	0.120		99.2	75-125			

LCS Dup (P0B0402-BSD1)

Prepared & Analyzed: 02/04/20

Benzene	0.0978	0.00100	mg/kg wet	0.100		97.8	70-130	5.34	20	
Toluene	0.0969	0.00100	"	0.100		96.9	70-130	4.74	20	
Ethylbenzene	0.121	0.00100	"	0.100		121	70-130	4.46	20	
Xylene (p/m)	0.193	0.00200	"	0.200		96.5	70-130	2.94	20	
Xylene (o)	0.105	0.00100	"	0.100		105	70-130	4.86	20	
Surrogate: 1,4-Difluorobenzene	0.119		"	0.120		99.3	75-125			
Surrogate: 4-Bromofluorobenzene	0.119		"	0.120		98.9	75-125			

Calibration Blank (P0B0402-CCB1)

Prepared & Analyzed: 02/04/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.300		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.108		"	0.120		90.3	75-125			
Surrogate: 1,4-Difluorobenzene	0.110		"	0.120		92.0	75-125			

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0B0402 - General Preparation (GC)

Calibration Blank (P0B0402-CCB2)

Prepared & Analyzed: 02/04/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.370		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	0.113		"	0.120		94.4	75-125			
Surrogate: 4-Bromofluorobenzene	0.114		"	0.120		95.1	75-125			

Calibration Check (P0B0402-CCV1)

Prepared & Analyzed: 02/04/20

Benzene	0.0939	0.00100	mg/kg wet	0.100		93.9	80-120			
Toluene	0.0926	0.00100	"	0.100		92.6	80-120			
Ethylbenzene	0.0955	0.00100	"	0.100		95.5	80-120			
Xylene (p/m)	0.181	0.00200	"	0.200		90.6	80-120			
Xylene (o)	0.0969	0.00100	"	0.100		96.9	80-120			
Surrogate: 1,4-Difluorobenzene	0.121		"	0.120		101	75-125			
Surrogate: 4-Bromofluorobenzene	0.122		"	0.120		102	75-125			

Calibration Check (P0B0402-CCV2)

Prepared & Analyzed: 02/04/20

Benzene	0.0913	0.00100	mg/kg wet	0.100		91.3	80-120			
Toluene	0.0897	0.00100	"	0.100		89.7	80-120			
Ethylbenzene	0.0926	0.00100	"	0.100		92.6	80-120			
Xylene (p/m)	0.175	0.00200	"	0.200		87.7	80-120			
Xylene (o)	0.0975	0.00100	"	0.100		97.5	80-120			
Surrogate: 1,4-Difluorobenzene	0.120		"	0.120		99.6	75-125			
Surrogate: 4-Bromofluorobenzene	0.121		"	0.120		101	75-125			

Calibration Check (P0B0402-CCV3)

Prepared & Analyzed: 02/04/20

Benzene	0.0923	0.00100	mg/kg wet	0.100		92.3	80-120			
Toluene	0.0920	0.00100	"	0.100		92.0	80-120			
Ethylbenzene	0.0931	0.00100	"	0.100		93.1	80-120			
Xylene (p/m)	0.176	0.00200	"	0.200		88.0	80-120			
Xylene (o)	0.0970	0.00100	"	0.100		97.0	80-120			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.2	75-125			
Surrogate: 4-Bromofluorobenzene	0.118		"	0.120		98.5	75-125			

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0B0402 - General Preparation (GC)

Matrix Spike (P0B0402-MS1)		Source: 0B03005-10		Prepared & Analyzed: 02/04/20						
Benzene	0.0871	0.00109	mg/kg dry	0.109	ND	80.2	80-120			
Toluene	0.0833	0.00109	"	0.109	ND	76.6	80-120			QM-07
Ethylbenzene	0.102	0.00109	"	0.109	ND	94.0	80-120			
Xylene (p/m)	0.166	0.00217	"	0.217	ND	76.3	80-120			QM-07
Xylene (o)	0.0886	0.00109	"	0.109	ND	81.5	80-120			
Surrogate: 4-Bromofluorobenzene	0.133		"	0.130		102	75-125			
Surrogate: 1,4-Difluorobenzene	0.128		"	0.130		98.3	75-125			

Matrix Spike Dup (P0B0402-MSD1)		Source: 0B03005-10		Prepared & Analyzed: 02/04/20						
Benzene	0.0873	0.00109	mg/kg dry	0.109	ND	80.3	80-120	0.224	20	
Toluene	0.0851	0.00109	"	0.109	ND	78.3	80-120	2.21	20	QM-07
Ethylbenzene	0.103	0.00109	"	0.109	ND	94.8	80-120	0.826	20	
Xylene (p/m)	0.166	0.00217	"	0.217	ND	76.5	80-120	0.209	20	QM-07
Xylene (o)	0.0888	0.00109	"	0.109	ND	81.7	80-120	0.208	20	
Surrogate: 1,4-Difluorobenzene	0.128		"	0.130		98.3	75-125			
Surrogate: 4-Bromofluorobenzene	0.132		"	0.130		101	75-125			

Batch P0B1004 - General Preparation (GC)

Blank (P0B1004-BLK1)		Prepared & Analyzed: 02/10/20								
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	0.117		"	0.120		97.4	75-125			
Surrogate: 1,4-Difluorobenzene	0.113		"	0.120		94.6	75-125			

Permian Basin Environmental Lab, L.P.

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

Page 17 of 29

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0B1004 - General Preparation (GC)

LCS (P0B1004-BS1)

Prepared & Analyzed: 02/10/20

Benzene	0.102	0.00100	mg/kg wet	0.100		102	70-130			
Toluene	0.0998	0.00100	"	0.100		99.8	70-130			
Ethylbenzene	0.105	0.00100	"	0.100		105	70-130			
Xylene (p/m)	0.197	0.00200	"	0.200		98.7	70-130			
Xylene (o)	0.109	0.00100	"	0.100		109	70-130			
Surrogate: 1,4-Difluorobenzene	0.118		"	0.120		98.3	75-125			
Surrogate: 4-Bromofluorobenzene	0.123		"	0.120		102	75-125			

LCS Dup (P0B1004-BSD1)

Prepared & Analyzed: 02/10/20

Benzene	0.104	0.00100	mg/kg wet	0.100		104	70-130	2.19	20	
Toluene	0.0980	0.00100	"	0.100		98.0	70-130	1.82	20	
Ethylbenzene	0.102	0.00100	"	0.100		102	70-130	2.70	20	
Xylene (p/m)	0.194	0.00200	"	0.200		97.2	70-130	1.52	20	
Xylene (o)	0.108	0.00100	"	0.100		108	70-130	1.02	20	
Surrogate: 4-Bromofluorobenzene	0.121		"	0.120		100	75-125			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.2	75-125			

Calibration Blank (P0B1004-CCB1)

Prepared & Analyzed: 02/10/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.115		"	0.120		96.0	75-125			
Surrogate: 1,4-Difluorobenzene	0.112		"	0.120		93.0	75-125			

Calibration Blank (P0B1004-CCB2)

Prepared: 02/10/20 Analyzed: 02/11/20

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	0.113		"	0.120		94.4	75-125			
Surrogate: 4-Bromofluorobenzene	0.116		"	0.120		97.0	75-125			

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc.
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Midland TX, 79710

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P0B1004 - General Preparation (GC)

Calibration Check (P0B1004-CCV1)		Prepared & Analyzed: 02/10/20								
Benzene	0.101	0.00100	mg/kg wet	0.100		101	80-120			
Toluene	0.0945	0.00100	"	0.100		94.5	80-120			
Ethylbenzene	0.0960	0.00100	"	0.100		96.0	80-120			
Xylene (p/m)	0.185	0.00200	"	0.200		92.5	80-120			
Xylene (o)	0.104	0.00100	"	0.100		104	80-120			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.7	75-125			
Surrogate: 4-Bromofluorobenzene	0.123		"	0.120		103	75-125			

Calibration Check (P0B1004-CCV2)		Prepared: 02/10/20 Analyzed: 02/11/20								
Benzene	0.0986	0.00100	mg/kg wet	0.100		98.6	80-120			
Toluene	0.0916	0.00100	"	0.100		91.6	80-120			
Ethylbenzene	0.0910	0.00100	"	0.100		91.0	80-120			
Xylene (p/m)	0.177	0.00200	"	0.200		88.6	80-120			
Xylene (o)	0.0996	0.00100	"	0.100		99.6	80-120			
Surrogate: 4-Bromofluorobenzene	0.120		"	0.120		99.9	75-125			
Surrogate: 1,4-Difluorobenzene	0.116		"	0.120		96.5	75-125			

Calibration Check (P0B1004-CCV3)		Prepared: 02/10/20 Analyzed: 02/11/20								
Benzene	0.0974	0.00100	mg/kg wet	0.100		97.4	80-120			
Toluene	0.0914	0.00100	"	0.100		91.4	80-120			
Ethylbenzene	0.0918	0.00100	"	0.100		91.8	80-120			
Xylene (p/m)	0.175	0.00200	"	0.200		87.6	80-120			
Xylene (o)	0.0989	0.00100	"	0.100		98.9	80-120			
Surrogate: 4-Bromofluorobenzene	0.120		"	0.120		100	75-125			
Surrogate: 1,4-Difluorobenzene	0.115		"	0.120		96.1	75-125			

Matrix Spike (P0B1004-MS1)		Source: 0B07010-21		Prepared: 02/10/20 Analyzed: 02/11/20						
Benzene	0.0700	0.00104	mg/kg dry	0.104	ND	67.2	80-120			QM-07
Toluene	0.0615	0.00104	"	0.104	ND	59.0	80-120			QM-07
Ethylbenzene	0.0731	0.00104	"	0.104	ND	70.2	80-120			QM-07
Xylene (p/m)	0.118	0.00208	"	0.208	ND	56.5	80-120			QM-07
Xylene (o)	0.0599	0.00104	"	0.104	ND	57.5	80-120			QM-07
Surrogate: 1,4-Difluorobenzene	0.123		"	0.125		98.6	75-125			
Surrogate: 4-Bromofluorobenzene	0.131		"	0.125		104	75-125			

Permian Basin Environmental Lab, L.P.

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Larson & Associates, Inc.
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Midland TX, 79710

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

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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 P0B1004 - General Preparation (GC)

Matrix Spike Dup (P0B1004-MSD1)

Source: 0B07010-21

Prepared: 02/10/20

Analyzed: 02/11/20

Benzene	0.0723	0.00104	mg/kg dry	0.104	ND	69.4	80-120	3.19	20	QM-07
Toluene	0.0578	0.00104	"	0.104	ND	55.5	80-120	6.18	20	QM-07
Ethylbenzene	0.0673	0.00104	"	0.104	ND	64.6	80-120	8.25	20	QM-07
Xylene (p/m)	0.107	0.00208	"	0.208	ND	51.1	80-120	9.95	20	QM-07
Xylene (o)	0.0558	0.00104	"	0.104	ND	53.6	80-120	7.09	20	QM-07
Surrogate: 1,4-Difluorobenzene	0.123		"	0.125		98.1	75-125			
Surrogate: 4-Bromofluorobenzene	0.126		"	0.125		101	75-125			

Permian Basin Environmental Lab, L.P.

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Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P0B0716 - * DEFAULT PREP *****

Blank (P0B0716-BLK1)		Prepared & Analyzed: 02/07/20								
% Moisture	ND	0.1	%							
Duplicate (P0B0716-DUP1)		Source: 0B04002-14		Prepared & Analyzed: 02/07/20						
% Moisture	10.0	0.1	%		10.0			0.00	20	
Duplicate (P0B0716-DUP2)		Source: 0B04008-05		Prepared & Analyzed: 02/07/20						
% Moisture	4.0	0.1	%		4.0			0.00	20	
Duplicate (P0B0716-DUP3)		Source: 0B04014-12		Prepared & Analyzed: 02/07/20						
% Moisture	5.0	0.1	%		5.0			0.00	20	
Duplicate (P0B0716-DUP4)		Source: 0B04015-16		Prepared & Analyzed: 02/07/20						
% Moisture	3.0	0.1	%		3.0			0.00	20	

Batch P0B1603 - * DEFAULT PREP *****

LCS (P0B1603-BS1)		Prepared: 02/16/20 Analyzed: 02/17/20								
Chloride	443	1.00	mg/kg wet	400		111	80-120			
LCS Dup (P0B1603-BSD1)		Prepared: 02/16/20 Analyzed: 02/17/20								
Chloride	448	1.00	mg/kg wet	400		112	80-120	1.12	20	
Calibration Blank (P0B1603-CCB1)		Prepared: 02/16/20 Analyzed: 02/17/20								
Chloride	0.302		mg/kg wet							
Calibration Blank (P0B1603-CCB2)		Prepared: 02/16/20 Analyzed: 02/17/20								
Chloride	0.289		mg/kg wet							

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P0B1603 - *** DEFAULT PREP ***										
Calibration Check (P0B1603-CCV1)				Prepared: 02/16/20 Analyzed: 02/17/20						
Chloride	21.2		mg/kg	20.0		106	0-200			
Calibration Check (P0B1603-CCV2)				Prepared: 02/16/20 Analyzed: 02/17/20						
Chloride	21.5		mg/kg	20.0		107	0-200			
Matrix Spike (P0B1603-MS1)				Source: 0B14004-03 Prepared: 02/16/20 Analyzed: 02/17/20						
Chloride	531	1.04	mg/kg dry	521	17.1	98.6	80-120			
Matrix Spike (P0B1603-MS2)				Source: 0B04002-01 Prepared: 02/16/20 Analyzed: 02/17/20						
Chloride	2990	28.4	mg/kg dry	2840	195	98.6	80-120			
Matrix Spike Dup (P0B1603-MSD1)				Source: 0B14004-03 Prepared: 02/16/20 Analyzed: 02/17/20						
Chloride	526	1.04	mg/kg dry	521	17.1	97.7	80-120	0.820	20	
Matrix Spike Dup (P0B1603-MSD2)				Source: 0B04002-01 Prepared: 02/16/20 Analyzed: 02/17/20						
Chloride	3020	28.4	mg/kg dry	2840	195	99.6	80-120	0.991	20	

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P0B0405 - TX 1005

Blank (P0B0405-BLK1)

Prepared & Analyzed: 02/04/20

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	114		"	100		114	70-130			
Surrogate: o-Terphenyl	63.3		"	50.0		127	70-130			

LCS (P0B0405-BS1)

Prepared & Analyzed: 02/04/20

C6-C12	834	25.0	mg/kg wet	1000		83.4	75-125			
>C12-C28	1010	25.0	"	1000		101	75-125			
Surrogate: 1-Chlorooctane	113		"	100		113	70-130			
Surrogate: o-Terphenyl	54.1		"	50.0		108	70-130			

LCS Dup (P0B0405-BSD1)

Prepared & Analyzed: 02/04/20

C6-C12	864	25.0	mg/kg wet	1000		86.4	75-125	3.47	20	
>C12-C28	1040	25.0	"	1000		104	75-125	2.90	20	
Surrogate: 1-Chlorooctane	116		"	100		116	70-130			
Surrogate: o-Terphenyl	56.1		"	50.0		112	70-130			

Calibration Blank (P0B0405-CCB1)

Prepared & Analyzed: 02/04/20

C6-C12	12.7		mg/kg wet							
>C12-C28	6.25		"							
Surrogate: 1-Chlorooctane	110		"	100		110	70-130			
Surrogate: o-Terphenyl	61.3		"	50.0		123	70-130			

Calibration Blank (P0B0405-CCB2)

Prepared & Analyzed: 02/04/20

C6-C12	14.8		mg/kg wet							
>C12-C28	3.57		"							
Surrogate: 1-Chlorooctane	114		"	100		114	70-130			
Surrogate: o-Terphenyl	63.7		"	50.0		127	70-130			

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P0B0405 - TX 1005										
Calibration Check (P0B0405-CCV1)				Prepared & Analyzed: 02/04/20						
C6-C12	431	25.0	mg/kg wet	500		86.1	85-115			
>C12-C28	487	25.0	"	500		97.3	85-115			
Surrogate: 1-Chlorooctane	98.6		"	100		98.6	70-130			
Surrogate: o-Terphenyl	51.8		"	50.0		104	70-130			
Calibration Check (P0B0405-CCV2)				Prepared & Analyzed: 02/04/20						
C6-C12	443	25.0	mg/kg wet	500		88.7	85-115			
>C12-C28	529	25.0	"	500		106	85-115			
Surrogate: 1-Chlorooctane	101		"	100		101	70-130			
Surrogate: o-Terphenyl	53.6		"	50.0		107	70-130			
Calibration Check (P0B0405-CCV3)				Prepared: 02/04/20 Analyzed: 02/05/20						
C6-C12	476	25.0	mg/kg wet	500		95.3	85-115			
>C12-C28	569	25.0	"	500		114	85-115			
Surrogate: 1-Chlorooctane	109		"	100		109	70-130			
Surrogate: o-Terphenyl	56.0		"	50.0		112	70-130			
Matrix Spike (P0B0405-MS1)				Source: 0B04001-12 Prepared: 02/04/20 Analyzed: 02/05/20						
C6-C12	950	25.0	mg/kg dry	1000	14.5	93.5	75-125			
>C12-C28	1130	25.0	"	1000	12.0	112	75-125			
Surrogate: 1-Chlorooctane	126		"	100		126	70-130			
Surrogate: o-Terphenyl	62.7		"	50.0		125	70-130			
Matrix Spike Dup (P0B0405-MSD1)				Source: 0B04001-12 Prepared: 02/04/20 Analyzed: 02/05/20						
C6-C12	959	25.0	mg/kg dry	1000	14.5	94.4	75-125	0.984	20	
>C12-C28	1140	25.0	"	1000	12.0	113	75-125	0.780	20	
Surrogate: 1-Chlorooctane	125		"	100		125	70-130			
Surrogate: o-Terphenyl	67.3		"	50.0		135	70-130			S-GC

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P0B0702 - TX 1005

LCS (P0B0702-BS1)

Prepared & Analyzed: 02/07/20

C6-C12	1200	25.0	mg/kg wet	1000		120	75-125			
>C12-C28	1220	25.0	"	1000		122	75-125			
Surrogate: 1-Chlorooctane	164		"	160		102	70-130			
Surrogate: o-Terphenyl	80.8		"	80.0		101	70-130			

LCS Dup (P0B0702-BSD1)

Prepared & Analyzed: 02/07/20

C6-C12	1010	25.0	mg/kg wet	1000		101	75-125	17.2	20	
>C12-C28	1190	25.0	"	1000		119	75-125	2.61	20	
Surrogate: 1-Chlorooctane	117		"	100		117	70-130			
Surrogate: o-Terphenyl	64.0		"	50.0		128	70-130			

Calibration Blank (P0B0702-CCB1)

Prepared & Analyzed: 02/07/20

C6-C12	18.4		mg/kg wet							
>C12-C28	5.79		"							
Surrogate: 1-Chlorooctane	144		"	160		89.9	70-130			
Surrogate: o-Terphenyl	76.3		"	80.0		95.4	70-130			

Calibration Blank (P0B0702-CCB2)

Prepared & Analyzed: 02/07/20

C6-C12	18.6		mg/kg wet							
>C12-C28	3.30		"							
Surrogate: 1-Chlorooctane	130		"	100		130	70-130			
Surrogate: o-Terphenyl	70.1		"	50.0		140	70-130			S-GC

Calibration Check (P0B0702-CCV1)

Prepared & Analyzed: 02/07/20

C6-C12	466	25.0	mg/kg wet	500		93.3	85-115			
>C12-C28	537	25.0	"	500		107	85-115			
Surrogate: 1-Chlorooctane	107		"	100		107	70-130			
Surrogate: o-Terphenyl	56.1		"	50.0		112	70-130			

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P0B0702 - TX 1005

Calibration Check (P0B0702-CCV2)

Prepared & Analyzed: 02/07/20

C6-C12	525	25.0	mg/kg wet	500		105	85-115			
>C12-C28	507	25.0	"	500		101	85-115			
Surrogate: 1-Chlorooctane	98.3		"	100		98.3	70-130			
Surrogate: o-Terphenyl	51.7		"	50.0		103	70-130			

Matrix Spike (P0B0702-MS1)

Source: 0B04003-01

Prepared & Analyzed: 02/07/20

C6-C12	850	25.5	mg/kg dry	1020	12.7	82.1	75-125			
>C12-C28	1020	25.5	"	1020	17.0	97.9	75-125			
Surrogate: 1-Chlorooctane	102		"	102		100	70-130			
Surrogate: o-Terphenyl	56.7		"	51.0		111	70-130			

Matrix Spike Dup (P0B0702-MSD1)

Source: 0B04003-01

Prepared & Analyzed: 02/07/20

C6-C12	836	25.5	mg/kg dry	1020	12.7	80.7	75-125	1.65	20	
>C12-C28	1010	25.5	"	1020	17.0	97.1	75-125	0.891	20	
Surrogate: 1-Chlorooctane	102		"	102		99.7	70-130			
Surrogate: o-Terphenyl	54.3		"	51.0		106	70-130			

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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.

ROI Received on Ice

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:

2/19/2020

Brent Barron, Laboratory Director/Technical Director

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

Permian Basin Environmental Lab, L.P.

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

Larson & Associates, Inc.

Project: Legacy Reserves, Shugart State #1

Fax: (432) 687-0456

P.O. Box 50685

Project Number: 18-0138-06

Midland TX, 79710

Project Manager: Mark Larson

Permian Basin Environmental Lab, L.P.

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

DATE: 02/04/2020 PAGE 1 OF 1
PO#: _____ LAB WORK ORDER#: 0004001
PROJECT LOCATION OR NAME: Legacy - Stuart
LAI PROJECT #: 18-0138-06 COLLECTOR: EC

Page 29 of 29

Released to Imaging: 4/21/2021 3:21:57 PM

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



Analytical Report

Prepared for:

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

Project: Legacy Reserves, Shugart State #1

Project Number: 18-0138-06

Location:

Lab Order Number: 8L21002



NELAP/TCEQ # T104704516-17-8

Report Date: 01/03/19

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
DP-1 (0-1')	8L21002-01	Soil	12/19/18 14:29	12-21-2018 10:00
DP-1 (1-2')	8L21002-02	Soil	12/19/18 14:30	12-21-2018 10:00
DP-2 (0-1')	8L21002-07	Soil	12/19/18 14:51	12-21-2018 10:00
DP-3 (0-1')	8L21002-13	Soil	12/19/18 15:18	12-21-2018 10:00
DP-4 (0-1')	8L21002-19	Soil	12/19/18 15:39	12-21-2018 10:00
DP-4 (1-2')	8L21002-20	Soil	12/19/18 15:42	12-21-2018 10:00

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-1 (0-1')
8L21002-01 (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	0.00120	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Toluene	ND	0.0120	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Ethylbenzene	ND	0.00602	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Xylene (p/m)	ND	0.0241	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Xylene (o)	ND	0.0120	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		108 %	75-125		P8L2610	12/26/18	12/26/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		89.8 %	75-125		P8L2610	12/26/18	12/26/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	817	6.02	mg/kg dry	5	P8L2706	12/27/18	12/27/18	EPA 300.0	
% Moisture	17.0	0.1	%	1	P8L2609	12/21/18	12/26/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	30.1	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
>C12-C28	118	30.1	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
>C28-C35	49.1	30.1	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		108 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M	
Surrogate: o-Terphenyl		122 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	167	30.1	mg/kg dry	1	[CALC]	12/22/18	12/24/18	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-1 (1-2')
8L21002-02 (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	135	1.08	mg/kg dry	1	P8L2706	12/27/18	12/27/18	EPA 300.0
% Moisture	7.0	0.1	%	1	P8L2609	12/21/18	12/26/18	ASTM D2216

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M
>C12-C28	ND	26.9	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M
>C28-C35	ND	26.9	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M
Surrogate: 1-Chlorooctane		113 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M
Surrogate: o-Terphenyl		126 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	12/22/18	12/24/18	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-2 (0-1')
8L21002-07 (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	0.00112	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Toluene	ND	0.0112	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Ethylbenzene	ND	0.00562	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Xylene (p/m)	ND	0.0225	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Xylene (o)	ND	0.0112	mg/kg dry	1	P8L2610	12/26/18	12/26/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		101 %	75-125		P8L2610	12/26/18	12/26/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		87.3 %	75-125		P8L2610	12/26/18	12/26/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	195	1.12	mg/kg dry	1	P8L2706	12/27/18	12/27/18	EPA 300.0	
% Moisture	11.0	0.1	%	1	P8L2609	12/21/18	12/26/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	28.1	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
>C12-C28	ND	28.1	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
>C28-C35	ND	28.1	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		127 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M	
Surrogate: o-Terphenyl		138 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	28.1	mg/kg dry	1	[CALC]	12/22/18	12/24/18	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-3 (0-1')
8L21002-13 (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	0.00108	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Toluene	ND	0.0108	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Ethylbenzene	ND	0.00538	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (p/m)	ND	0.0215	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (o)	ND	0.0108	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		89.2 %	75-125		P8L2709	12/27/18	12/27/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		111 %	75-125		P8L2709	12/27/18	12/27/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	218	1.08	mg/kg dry	1	P8L2706	12/27/18	12/27/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8L2609	12/21/18	12/26/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P8L2405	12/22/18	12/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		104 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M	
Surrogate: o-Terphenyl		116 %	70-130		P8L2405	12/22/18	12/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	12/22/18	12/24/18	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-4 (0-1')
8L21002-19 (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	0.00118	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Toluene	ND	0.0118	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Ethylbenzene	ND	0.00588	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (p/m)	ND	0.0235	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (o)	ND	0.0118	mg/kg dry	1	P8L2709	12/27/18	12/27/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		108 %	75-125		P8L2709	12/27/18	12/27/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		95.8 %	75-125		P8L2709	12/27/18	12/27/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	4.47	1.18	mg/kg dry	1	P8L2706	12/27/18	12/27/18	EPA 300.0	
% Moisture	15.0	0.1	%	1	P8L2609	12/21/18	12/26/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	29.4	mg/kg dry	1	P8L2810	12/24/18	12/24/18	TPH 8015M	
>C12-C28	143	29.4	mg/kg dry	1	P8L2810	12/24/18	12/24/18	TPH 8015M	
>C28-C35	32.2	29.4	mg/kg dry	1	P8L2810	12/24/18	12/24/18	TPH 8015M	
Surrogate: 1-Chlorooctane		109 %	70-130		P8L2810	12/24/18	12/24/18	TPH 8015M	
Surrogate: o-Terphenyl		124 %	70-130		P8L2810	12/24/18	12/24/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	175	29.4	mg/kg dry	1	[CALC]	12/24/18	12/24/18	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

DP-4 (1-2')
8L21002-20 (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

% Moisture	6.0	0.1	%	1	P8L2609	12/21/18	12/26/18	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P8L2810	12/24/18	12/24/18	TPH 8015M
>C12-C28	47.3	26.6	mg/kg dry	1	P8L2810	12/24/18	12/24/18	TPH 8015M
>C28-C35	ND	26.6	mg/kg dry	1	P8L2810	12/24/18	12/24/18	TPH 8015M
Surrogate: 1-Chlorooctane		97.0 %	70-130		P8L2810	12/24/18	12/24/18	TPH 8015M
Surrogate: o-Terphenyl		111 %	70-130		P8L2810	12/24/18	12/24/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	47.3	26.6	mg/kg dry	1	[CALC]	12/24/18	12/24/18	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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P8L2610 - General Preparation (GC)

Blank (P8L2610-BLK1)

Prepared & Analyzed: 12/26/18

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.0100	"							
Ethylbenzene	ND	0.00500	"							
Xylene (p/m)	ND	0.0200	"							
Xylene (o)	ND	0.0100	"							
Surrogate: 1,4-Difluorobenzene	0.0544		"	0.0600		90.7	75-125			
Surrogate: 4-Bromofluorobenzene	0.0589		"	0.0600		98.1	75-125			

LCS (P8L2610-BS1)

Prepared & Analyzed: 12/26/18

Benzene	0.116	0.00100	mg/kg wet	0.100		116	70-130			
Toluene	0.118	0.0100	"	0.100		118	70-130			
Ethylbenzene	0.108	0.00500	"	0.100		108	70-130			
Xylene (p/m)	0.211	0.0200	"	0.200		106	70-130			
Xylene (o)	0.113	0.0100	"	0.100		113	70-130			
Surrogate: 1,4-Difluorobenzene	0.0601		"	0.0600		100	75-125			
Surrogate: 4-Bromofluorobenzene	0.0581		"	0.0600		96.9	75-125			

LCS Dup (P8L2610-BS1)

Prepared & Analyzed: 12/26/18

Benzene	0.113	0.00100	mg/kg wet	0.100		113	70-130	2.36	20	
Toluene	0.115	0.0100	"	0.100		115	70-130	2.76	20	
Ethylbenzene	0.108	0.00500	"	0.100		108	70-130	0.0556	20	
Xylene (p/m)	0.203	0.0200	"	0.200		102	70-130	4.01	20	
Xylene (o)	0.113	0.0100	"	0.100		113	70-130	0.522	20	
Surrogate: 1,4-Difluorobenzene	0.0605		"	0.0600		101	75-125			
Surrogate: 4-Bromofluorobenzene	0.0593		"	0.0600		98.8	75-125			

Matrix Spike (P8L2610-MS1)

Source: 8L26001-10

Prepared & Analyzed: 12/26/18

Benzene	0.0416	0.00115	mg/kg dry	0.115	0.0384	2.78	80-120			QM-07
Toluene	0.0180	0.0115	"	0.115	0.00720	9.39	80-120			QM-07
Ethylbenzene	0.00647	0.00575	"	0.115	ND	5.63	80-120			QM-07
Xylene (p/m)	0.0107	0.0230	"	0.230	ND	4.67	80-120			QM-07
Xylene (o)	0.00598	0.0115	"	0.115	ND	5.20	80-120			QM-07
Surrogate: 1,4-Difluorobenzene	0.0640		"	0.0690		92.7	75-125			
Surrogate: 4-Bromofluorobenzene	0.0682		"	0.0690		98.9	75-125			

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P8L2610 - General Preparation (GC)

Matrix Spike Dup (P8L2610-MSD1)		Source: 8L26001-10		Prepared: 12/26/18		Analyzed: 12/27/18				
Benzene	0.0702	0.00115	mg/kg dry	0.115	0.0384	27.7	80-120	164	20	QM-07
Toluene	0.0389	0.0115	"	0.115	0.00720	27.6	80-120	98.5	20	QM-07
Ethylbenzene	0.0310	0.00575	"	0.115	ND	26.9	80-120	131	20	QM-07
Xylene (p/m)	0.0472	0.0230	"	0.230	ND	20.5	80-120	126	20	QM-07
Xylene (o)	0.0253	0.0115	"	0.115	ND	22.0	80-120	124	20	QM-07
Surrogate: 1,4-Difluorobenzene	0.0813		"	0.0690		118	75-125			
Surrogate: 4-Bromofluorobenzene	0.0833		"	0.0690		121	75-125			

Batch P8L2709 - General Preparation (GC)

Blank (P8L2709-BLK1)				Prepared & Analyzed: 12/27/18						
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.0100	"							
Ethylbenzene	ND	0.00500	"							
Xylene (p/m)	ND	0.0200	"							
Xylene (o)	ND	0.0100	"							
Surrogate: 1,4-Difluorobenzene	0.0531		"	0.0600		88.5	75-125			
Surrogate: 4-Bromofluorobenzene	0.0566		"	0.0600		94.3	75-125			

LCS (P8L2709-BS1)				Prepared & Analyzed: 12/27/18						
Benzene	0.117	0.00100	mg/kg wet	0.100		117	70-130			
Toluene	0.120	0.0100	"	0.100		120	70-130			
Ethylbenzene	0.119	0.00500	"	0.100		119	70-130			
Xylene (p/m)	0.222	0.0200	"	0.200		111	70-130			
Xylene (o)	0.116	0.0100	"	0.100		116	70-130			
Surrogate: 4-Bromofluorobenzene	0.0586		"	0.0600		97.6	75-125			
Surrogate: 1,4-Difluorobenzene	0.0592		"	0.0600		98.7	75-125			

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P8L2709 - General Preparation (GC)

LCS Dup (P8L2709-BSD1)				Prepared & Analyzed: 12/27/18						
Benzene	0.115	0.00100	mg/kg wet	0.100		115	70-130	0.975	20	
Toluene	0.119	0.0100	"	0.100		119	70-130	0.543	20	
Ethylbenzene	0.118	0.00500	"	0.100		118	70-130	0.565	20	
Xylene (p/m)	0.216	0.0200	"	0.200		108	70-130	2.73	20	
Xylene (o)	0.116	0.0100	"	0.100		116	70-130	0.370	20	
Surrogate: 4-Bromofluorobenzene	0.0592		"	0.0600		98.7	75-125			
Surrogate: 1,4-Difluorobenzene	0.0581		"	0.0600		96.9	75-125			

Matrix Spike (P8L2709-MS1)				Source: 8L27002-02 Prepared: 12/27/18 Analyzed: 12/28/18						
Benzene	0.0949	0.00111	mg/kg dry	0.111	ND	85.4	80-120			
Toluene	0.0771	0.0111	"	0.111	ND	69.4	80-120			QM-07
Ethylbenzene	0.0679	0.00556	"	0.111	ND	61.1	80-120			QM-07
Xylene (p/m)	0.102	0.0222	"	0.222	ND	45.8	80-120			QM-07
Xylene (o)	0.0533	0.0111	"	0.111	ND	47.9	80-120			QM-07
Surrogate: 1,4-Difluorobenzene	0.0722		"	0.0667		108	75-125			
Surrogate: 4-Bromofluorobenzene	0.0673		"	0.0667		101	75-125			

Matrix Spike Dup (P8L2709-MSD1)				Source: 8L27002-02 Prepared: 12/27/18 Analyzed: 12/28/18						
Benzene	0.0653	0.00111	mg/kg dry	0.111	ND	58.8	80-120	36.9	20	QM-07, R2
Toluene	0.0490	0.0111	"	0.111	ND	44.1	80-120	44.6	20	QM-07, R2
Ethylbenzene	0.0453	0.00556	"	0.111	ND	40.8	80-120	39.8	20	QM-07, R2
Xylene (p/m)	0.0689	0.0222	"	0.222	ND	31.0	80-120	38.6	20	QM-07, R2
Xylene (o)	0.0312	0.0111	"	0.111	ND	28.1	80-120	52.2	20	QM-07, R2
Surrogate: 4-Bromofluorobenzene	0.0594		"	0.0667		89.1	75-125			
Surrogate: 1,4-Difluorobenzene	0.0675		"	0.0667		101	75-125			

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P8L2609 - * DEFAULT PREP *****

Blank (P8L2609-BLK1)				Prepared: 12/21/18 Analyzed: 12/26/18						
% Moisture	ND	0.1	%							
Duplicate (P8L2609-DUP1)				Source: 8L21001-26 Prepared: 12/21/18 Analyzed: 12/26/18						
% Moisture	20.0	0.1	%		20.0			0.00	20	
Duplicate (P8L2609-DUP2)				Source: 8L21001-53 Prepared: 12/21/18 Analyzed: 12/26/18						
% Moisture	15.0	0.1	%		13.0			14.3	20	
Duplicate (P8L2609-DUP3)				Source: 8L21002-16 Prepared: 12/21/18 Analyzed: 12/26/18						
% Moisture	5.0	0.1	%		6.0			18.2	20	
Duplicate (P8L2609-DUP4)				Source: 8L21004-05 Prepared: 12/21/18 Analyzed: 12/26/18						
% Moisture	21.0	0.1	%		20.0			4.88	20	

Batch P8L2706 - * DEFAULT PREP *****

Blank (P8L2706-BLK1)				Prepared: 12/27/18 Analyzed: 12/28/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8L2706-BS1)				Prepared & Analyzed: 12/27/18						
Chloride	397	1.00	mg/kg wet	400		99.4	80-120			
LCS Dup (P8L2706-BSD1)				Prepared & Analyzed: 12/27/18						
Chloride	396	1.00	mg/kg wet	400		99.1	80-120	0.254	20	
Duplicate (P8L2706-DUP1)				Source: 8L19001-21 Prepared & Analyzed: 12/27/18						
Chloride	10300	27.5	mg/kg dry		10300			0.541	20	

Permian Basin Environmental Lab, L.P.

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P.O. Box 50685
Midland TX, 79710

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P8L2706 - * DEFAULT PREP *****

Duplicate (P8L2706-DUP2)		Source: 8L20005-01			Prepared & Analyzed: 12/27/18					
Chloride	8830	28.4	mg/kg dry		8750			0.908	20	
Matrix Spike (P8L2706-MS1)		Source: 8L19001-21			Prepared & Analyzed: 12/27/18					
Chloride	13000	27.5	mg/kg dry	2750	10300	97.6	80-120			

Permian Basin Environmental Lab, L.P.

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

Project: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P8L2405 - TX 1005

Blank (P8L2405-BLK1)

Prepared: 12/22/18 Analyzed: 12/24/18

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	145		"	130		112	70-130			
Surrogate: o-Terphenyl	84.2		"	65.0		130	70-130			

LCS (P8L2405-BS1)

Prepared: 12/22/18 Analyzed: 12/24/18

C6-C12	952	25.0	mg/kg wet	1000		95.2	75-125			
>C12-C28	1060	25.0	"	1000		106	75-125			
Surrogate: 1-Chlorooctane	121		"	100		121	70-130			
Surrogate: o-Terphenyl	59.0		"	50.0		118	70-130			

LCS Dup (P8L2405-BSD1)

Prepared: 12/22/18 Analyzed: 12/24/18

C6-C12	1040	25.0	mg/kg wet	1000		104	75-125	8.95	20	
>C12-C28	1140	25.0	"	1000		114	75-125	7.67	20	
Surrogate: 1-Chlorooctane	122		"	100		122	70-130			
Surrogate: o-Terphenyl	61.8		"	50.0		124	70-130			

Duplicate (P8L2405-DUP1)

Source: 8L21002-14

Prepared: 12/22/18 Analyzed: 12/24/18

C6-C12	233	26.0	mg/kg dry		263			12.2	20	
>C12-C28	5180	26.0	"		4940			4.93	20	
Surrogate: 1-Chlorooctane	129		"	104		123	70-130			
Surrogate: o-Terphenyl	60.1		"	52.1		115	70-130			

Batch P8L2810 - TX 1005

Blank (P8L2810-BLK1)

Prepared & Analyzed: 12/24/18

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	95.3		"	100		95.3	70-130			
Surrogate: o-Terphenyl	53.9		"	50.0		108	70-130			

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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 P8L2810 - TX 1005

LCS (P8L2810-BS1)

Prepared & Analyzed: 12/24/18

C6-C12	894	25.0	mg/kg wet	1000		89.4	75-125			
>C12-C28	1130	25.0	"	1000		113	75-125			
Surrogate: 1-Chlorooctane	120		"	100		120	70-130			
Surrogate: o-Terphenyl	56.6		"	50.0		113	70-130			

LCS Dup (P8L2810-BSD1)

Prepared & Analyzed: 12/24/18

C6-C12	876	25.0	mg/kg wet	1000		87.6	75-125	2.02	20	
>C12-C28	1190	25.0	"	1000		119	75-125	4.72	20	
Surrogate: 1-Chlorooctane	119		"	100		119	70-130			
Surrogate: o-Terphenyl	58.1		"	50.0		116	70-130			

Duplicate (P8L2810-DUP1)

Source: 8L21002-24

Prepared & Analyzed: 12/24/18

C6-C12	ND	26.0	mg/kg dry		ND				20	
>C12-C28	ND	26.0	"		14.6				20	
Surrogate: 1-Chlorooctane	116		"	104		112	70-130			
Surrogate: o-Terphenyl	66.5		"	52.1		128	70-130			

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: Legacy Reserves, Shugart State #1
Project Number: 18-0138-06
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.

R2 The RPD exceeded the acceptance limit.

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:

1/3/2019

Brent Barron, Laboratory Director/Technical Director

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

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

Permian Basin Environmental Lab, L.P.

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

Larson & Associates, Inc.

Project: Legacy Reserves, Shugart State #1

Fax: (432) 687-0456

P.O. Box 50685

Project Number: 18-0138-06

Midland TX, 79710

Project Manager: Mark Larson

Permian Basin Environmental Lab, L.P.

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

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

DATE: 2/21/2018 PAGE 1 OF 2
PO#: _____ LAB WORK ORDER#: SL21002
PROJECT LOCATION OR NAME: Legacy Recovery, Stuttgart
LAI PROJECT #: 18-0138-06 COLLECTOR: KO / TD

PAGE 1 OF 9

CHAIN-OF-CUSTOMERS

Page 18 of 19

Received by: 11/4/2020 8:36:39 AM

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
TIME ZONE: Time zone/State: <u>MST</u>		#8221002			
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers
DP-1 (0-1')		12/19/18	14:29	S	1
DP-1 (1-2')			14:30		
DP-1 (2-3')			14:31		
DP-1 (3-4')			14:40		
DP-1 (4-6')			14:42		
DP-1 (6-8')			14:44		
DP-2 (0-1')			14:51		
(1-2')			14:56		
(2-3')			14:59		
(3-4')			15:03		
(4-6')			15:06		
(6-8')			15:14		
DP-3 (0-1')			15:18		
(1-2')			15:21		
(2-3')			15:25		
TOTAL					

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

LABORATORY: PBEL

DATE/TIME: 12/21/18

RECEIVED BY: (Signature)

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

LABORATORY USE ONLY: 46-56
 RECEIVING TEMP: 12
 CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
 CARRIER BILL # 12
☐ HAND DELIVERED

ANALYSES
 BTEX ☒ MTBE ☐
 TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐
 GASOLINE MOD 8015 ☒
 DIESEL MOD 8015 ☒
 OIL MOD 8015 ☒
 VOC 8260 ☒
 SVOC 8270 ☒
 8081 PESTICIDES ☐
 8082 PCBS ☐
 TBLP - METALS (RCRA) ☐ TCPL VOC ☐
 TCPL - PEST ☐ HERB ☐ Semi-VOC ☐
 TOTAL METALS (RCRA) ☐ OTHER LIST ☐
 LEAD - TOTAL ☐ D.W. 200.8 ☐ TCPL ☐
 RCI ☐ TOX ☐ FLASHPOINT ☐
 TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐
 PH ☐ HEXAVALENT CHROMIUM ☐
 EXPLOSIVES ☐ PCHLORATE ☐
 CHLORIDE ANIONS ☐ ALKALINITY ☐
303

FIELD NOTES
 Delineate
 chloride
 until delineation
 limit is
 reached
 (600mg/kg)
 Delineate
 IDH until
 100mg/kg
 is reached

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

DATE: 12/21/2018 PAGE 2 OF 2
PO#: _____ LAB WORK ORDER#:
PROJECT LOCATION OR NAME: Shugart State #1
LAI PROJECT #: 18-0138-b6 COLLECTOR: KO/TC

N^o 0501
 OF-CUSTO
 PAGE 2 OF 1

Page 19 of 19

Received by OGD: 11/4/2020 8:36:59 AM

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			S=SOIL W=WATER A=AIR			P=PAINT SL=SLUDGE OT=OTHER		
TIME ZONE: Time zone/State:								
MST								
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION HCl HNO ₃ H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/> ICE UNPRESERVED		
DP-3 (3-4)		6/9/18	5:38	S	1			
(4-6)			15:32					
(6-8)			15:30					
DP-4 (0-1)			15:39					
(1-2)			15:42					
(2-3)			15:45					
(3-4)			15:50					
(4-6)			15:53					
(6-8)			15:50					
TOTAL								
RELINQUISHED BY: (Signature)			DATE/TIME			RECEIVED BY: (Signature)		
RELINQUISHED BY: (Signature)			DATE/TIME			RECEIVED BY: (Signature)		
RELINQUISHED BY: (Signature)			DATE/TIME			RECEIVED BY: (Signature)		
RELINQUISHED BY: (Signature)			DATE/TIME			RECEIVED BY: (Signature)		
LABORATORY: PDEL			DATE/TIME: 12/21/20 10:00			RECEIVED BY: (Signature) CAROLAN E. CANNON		
ANALYSES BTEX <input checked="" type="checkbox"/> MTBE <input type="checkbox"/> TPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/> GASOLINE MOD 8015 <input checked="" type="checkbox"/> DIESEL - MOD 8015 <input checked="" type="checkbox"/> OIL - MOD 8015 <input checked="" type="checkbox"/> VOC 8260 <input type="checkbox"/> SVOC 8270 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/> 8081 PESTICIDES <input type="checkbox"/> 8151 HERBICIDES <input type="checkbox"/> 8082 PCBs <input type="checkbox"/> TBLP - METALS (RCRA) <input type="checkbox"/> TCLP VOC <input type="checkbox"/> TCLP - PEST <input type="checkbox"/> HERB <input type="checkbox"/> Semi-VOC <input type="checkbox"/> TOTAL METALS (RCRA) <input type="checkbox"/> OTHER LIST <input type="checkbox"/> LEAD - TOTAL <input type="checkbox"/> D.W. 200.8 <input type="checkbox"/> TCLP <input type="checkbox"/> RCI <input type="checkbox"/> TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/> TDS <input type="checkbox"/> TSS <input type="checkbox"/> % MOISTURE <input type="checkbox"/> CYANIDE <input type="checkbox"/> PH <input type="checkbox"/> HEXAVALENT CHROMIUM <input type="checkbox"/> EXPLOSIVES <input type="checkbox"/> PENTACHLORATE <input type="checkbox"/> CHLORIDES <input type="checkbox"/> ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/>						FIELD NOTES Delinate chloride until delineation limit is reached (60mg/1kg)		
TURN AROUND TIME NORMAL <input checked="" type="checkbox"/> 1 DAY <input type="checkbox"/> 2 DAY <input type="checkbox"/> OTHER <input type="checkbox"/>						LABORATORY USE ONLY: RECEIVING TEMP: 46-56 THERM#: 14 CUSTODY SEALS - <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input type="checkbox"/> NOT USED <input type="checkbox"/> CARRIER BILL # <input type="checkbox"/> HAND DELIVERED		

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



Analytical Report

Prepared for:

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

Project: Shugart State #1
Project Number: 18-0138-06
Location: None Given
Lab Order Number: 8L27001



NELAP/TCEQ # T104704516-17-8

Report Date: 01/03/19

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-1 (0-1')	8L27001-01	Soil	12/21/18 11:25	12-27-2018 10:32
HA-2 (0-1')	8L27001-02	Soil	12/21/18 11:38	12-27-2018 10:32
HA-3 (0-1')	8L27001-03	Soil	12/21/18 11:48	12-27-2018 10:32
HA-4 (0-1')	8L27001-04	Soil	12/21/18 11:58	12-27-2018 10:32
HA-4 (1-2')	8L27001-05	Soil	12/21/18 12:04	12-27-2018 10:32
HA-4 (2-3')	8L27001-06	Soil	12/21/18 12:10	12-27-2018 10:32
HA-4 (3-4')	8L27001-07	Soil	12/21/18 12:18	12-27-2018 10:32
HA-5 (0-1')	8L27001-08	Soil	12/21/18 12:28	12-27-2018 10:32
HA-5 (1-2')	8L27001-09	Soil	12/21/18 12:54	12-27-2018 10:32
HA-5 (2-3')	8L27001-10	Soil	12/21/18 12:57	12-27-2018 10:32
HA-6 (0-1')	8L27001-12	Soil	12/21/18 13:04	12-27-2018 10:32

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-1 (0-1')
8L27001-01 (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	0.0217	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Toluene	ND	0.217	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Ethylbenzene	ND	0.109	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Xylene (p/m)	ND	0.435	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Xylene (o)	ND	0.217	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		98.1 %		75-125	P8L2709	12/27/18	12/28/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		77.4 %		75-125	P8L2709	12/27/18	12/28/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	6.60	1.09	mg/kg dry	1	P8L2710	12/27/18	12/28/18	EPA 300.0	
% Moisture	8.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	537	272	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	10600	272	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	1690	272	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: 1-Chlorooctane		111 %		70-130	P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: o-Terphenyl		114 %		70-130	P8L2806	12/27/18	12/28/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	12800	272	mg/kg dry	10	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 (0-1')
8L27001-02 (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	0.0683	0.0230	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Toluene	2.48	0.575	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Ethylbenzene	10.5	0.287	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (p/m)	11.5	1.15	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (o)	6.79	0.575	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		85.5 %	75-125		P8L2709	12/27/18	12/27/18	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		76.6 %	75-125		P8L2709	12/27/18	12/27/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	3.60	1.15	mg/kg dry	1	P8L2710	12/27/18	12/28/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	972	287	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	4930	287	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	931	287	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		108 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		115 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	6830	287	mg/kg dry	10	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-3 (0-1')
8L27001-03 (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	0.0615	0.0575	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Toluene	3.22	0.575	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Ethylbenzene	3.53	0.287	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (p/m)	6.41	1.15	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
Xylene (o)	2.46	0.575	mg/kg dry	50	P8L2709	12/27/18	12/27/18	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		83.2 %		75-125	P8L2709	12/27/18	12/27/18	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		82.0 %		75-125	P8L2709	12/27/18	12/27/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	72.5	1.15	mg/kg dry	1	P8L2710	12/27/18	12/28/18	EPA 300.0	
% Moisture	13.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	1420	287	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	27500	287	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	3940	287	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		106 %		70-130	P8L2806	12/27/18	12/28/18	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		114 %		70-130	P8L2806	12/27/18	12/28/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	32900	287	mg/kg dry	10	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-4 (0-1')
8L27001-04 (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	0.0215	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Toluene	0.564	0.215	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Ethylbenzene	3.39	0.108	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Xylene (p/m)	4.00	0.430	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Xylene (o)	2.56	0.215	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		65.5 %	75-125		P8L2709	12/27/18	12/28/18	EPA 8021B	S-GC
Surrogate: 1,4-Difluorobenzene		78.7 %	75-125		P8L2709	12/27/18	12/28/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	51.7	1.08	mg/kg dry	1	P8L2710	12/27/18	12/28/18	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	626	269	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	6620	269	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	1520	269	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: 1-Chlorooctane		104 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: o-Terphenyl		113 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	8770	269	mg/kg dry	10	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-4 (1-2')
8L27001-05 (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

% Moisture	11.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	1770	281	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M
>C12-C28	7420	281	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M
>C28-C35	1150	281	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: 1-Chlorooctane</i>		99.1 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: o-Terphenyl</i>		97.2 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	10300	281	mg/kg dry	10	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-4 (2-3')
8L27001-06 (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

% Moisture	9.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	547	275	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M
>C12-C28	6250	275	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M
>C28-C35	1290	275	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: 1-Chlorooctane</i>		127 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: o-Terphenyl</i>		114 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	8080	275	mg/kg dry	10	[CALC]	12/27/18	12/28/18	calc

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-4 (3-4')
8L27001-07 (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

% Moisture	12.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	33.6	28.4	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M
>C12-C28	371	28.4	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M
>C28-C35	67.5	28.4	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: 1-Chlorooctane</i>		106 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: o-Terphenyl</i>		126 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	472	28.4	mg/kg dry	1	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-5 (0-1')
8L27001-08 (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	0.0227	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Toluene	0.633	0.227	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Ethylbenzene	5.09	0.114	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Xylene (p/m)	5.69	0.455	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Xylene (o)	3.61	0.227	mg/kg dry	20	P8L2709	12/27/18	12/28/18	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		77.4 %	75-125		P8L2709	12/27/18	12/28/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		67.6 %	75-125		P8L2709	12/27/18	12/28/18	EPA 8021B	S-GC

General Chemistry Parameters by EPA / Standard Methods

Chloride	301	1.14	mg/kg dry	1	P8L2710	12/27/18	12/28/18	EPA 300.0	
% Moisture	12.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	284	142	mg/kg dry	5	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	2350	142	mg/kg dry	5	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	508	142	mg/kg dry	5	P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: 1-Chlorooctane		117 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: o-Terphenyl		113 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	3140	142	mg/kg dry	5	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-5 (1-2')
8L27001-09 (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

% Moisture	14.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	97.8	29.1	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	888	29.1	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	138	29.1	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		112 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		135 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	1120	29.1	mg/kg dry	1	[CALC]	12/27/18	12/28/18	calc	

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-5 (2-3')
8L27001-10 (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

% Moisture	10.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	37.1	27.8	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M
>C12-C28	455	27.8	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M
>C28-C35	92.8	27.8	mg/kg dry	1	P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: 1-Chlorooctane</i>		108 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
<i>Surrogate: o-Terphenyl</i>		129 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	585	27.8	mg/kg dry	1	[CALC]	12/27/18	12/28/18	calc

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-6 (0-1')
8L27001-12 (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	0.0215	mg/kg dry	20	P9A0304	12/28/18	12/29/18	EPA 8021B	
Toluene	ND	0.215	mg/kg dry	20	P9A0304	12/28/18	12/29/18	EPA 8021B	
Ethylbenzene	0.348	0.108	mg/kg dry	20	P9A0304	12/28/18	12/29/18	EPA 8021B	
Xylene (p/m)	0.528	0.430	mg/kg dry	20	P9A0304	12/28/18	12/29/18	EPA 8021B	
Xylene (o)	ND	0.215	mg/kg dry	20	P9A0304	12/28/18	12/29/18	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		73.0 %	75-125		P9A0304	12/28/18	12/29/18	EPA 8021B	S-GC
Surrogate: 1,4-Difluorobenzene		84.6 %	75-125		P9A0304	12/28/18	12/29/18	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	71.3	1.08	mg/kg dry	1	P8L2812	12/28/18	01/03/19	EPA 300.0	
% Moisture	7.0	0.1	%	1	P8L2801	12/28/18	12/28/18	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	552	269	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C12-C28	28400	269	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
>C28-C35	5040	269	mg/kg dry	10	P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: 1-Chlorooctane		110 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Surrogate: o-Terphenyl		96.4 %	70-130		P8L2806	12/27/18	12/28/18	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	34000	269	mg/kg dry	10	[CALC]	12/27/18	12/28/18	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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P8L2709 - General Preparation (GC)

Blank (P8L2709-BLK1)

Prepared & Analyzed: 12/27/18

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.0100	"							
Ethylbenzene	ND	0.00500	"							
Xylene (p/m)	ND	0.0200	"							
Xylene (o)	ND	0.0100	"							
Surrogate: 1,4-Difluorobenzene	0.0531		"	0.0600		88.5	75-125			
Surrogate: 4-Bromofluorobenzene	0.0566		"	0.0600		94.3	75-125			

LCS (P8L2709-BS1)

Prepared & Analyzed: 12/27/18

Benzene	0.117	0.00100	mg/kg wet	0.100		117	70-130			
Toluene	0.120	0.0100	"	0.100		120	70-130			
Ethylbenzene	0.119	0.00500	"	0.100		119	70-130			
Xylene (p/m)	0.222	0.0200	"	0.200		111	70-130			
Xylene (o)	0.116	0.0100	"	0.100		116	70-130			
Surrogate: 4-Bromofluorobenzene	0.0586		"	0.0600		97.6	75-125			
Surrogate: 1,4-Difluorobenzene	0.0592		"	0.0600		98.7	75-125			

LCS Dup (P8L2709-BSD1)

Prepared & Analyzed: 12/27/18

Benzene	0.115	0.00100	mg/kg wet	0.100		115	70-130	0.975	20	
Toluene	0.119	0.0100	"	0.100		119	70-130	0.543	20	
Ethylbenzene	0.118	0.00500	"	0.100		118	70-130	0.565	20	
Xylene (p/m)	0.216	0.0200	"	0.200		108	70-130	2.73	20	
Xylene (o)	0.116	0.0100	"	0.100		116	70-130	0.370	20	
Surrogate: 1,4-Difluorobenzene	0.0581		"	0.0600		96.9	75-125			
Surrogate: 4-Bromofluorobenzene	0.0592		"	0.0600		98.7	75-125			

Matrix Spike (P8L2709-MS1)

Source: 8L27002-02

Prepared: 12/27/18 Analyzed: 12/28/18

Benzene	0.0949	0.00111	mg/kg dry	0.111	ND	85.4	80-120			
Toluene	0.0771	0.0111	"	0.111	ND	69.4	80-120			QM-07
Ethylbenzene	0.0679	0.00556	"	0.111	ND	61.1	80-120			QM-07
Xylene (p/m)	0.102	0.0222	"	0.222	ND	45.8	80-120			QM-07
Xylene (o)	0.0533	0.0111	"	0.111	ND	47.9	80-120			QM-07
Surrogate: 4-Bromofluorobenzene	0.0673		"	0.0667		101	75-125			
Surrogate: 1,4-Difluorobenzene	0.0722		"	0.0667		108	75-125			

Permian Basin Environmental Lab, L.P.

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P.O. Box 50685
Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P8L2709 - General Preparation (GC)

Matrix Spike Dup (P8L2709-MSD1)		Source: 8L27002-02		Prepared: 12/27/18		Analyzed: 12/28/18				
Benzene	0.0653	0.00111	mg/kg dry	0.111	ND	58.8	80-120	36.9	20	QM-07, R2
Toluene	0.0490	0.0111	"	0.111	ND	44.1	80-120	44.6	20	QM-07, R2
Ethylbenzene	0.0453	0.00556	"	0.111	ND	40.8	80-120	39.8	20	QM-07, R2
Xylene (p/m)	0.0689	0.0222	"	0.222	ND	31.0	80-120	38.6	20	QM-07, R2
Xylene (o)	0.0312	0.0111	"	0.111	ND	28.1	80-120	52.2	20	QM-07, R2
Surrogate: 4-Bromofluorobenzene	0.0594		"	0.0667		89.1	75-125			
Surrogate: 1,4-Difluorobenzene	0.0675		"	0.0667		101	75-125			

Batch P9A0304 - General Preparation (GC)

Blank (P9A0304-BLK1)				Prepared: 12/28/18		Analyzed: 12/29/18				
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.0100	"							
Ethylbenzene	ND	0.00500	"							
Xylene (p/m)	ND	0.0200	"							
Xylene (o)	ND	0.0100	"							
Surrogate: 4-Bromofluorobenzene	0.0567		"	0.0600		94.6	75-125			
Surrogate: 1,4-Difluorobenzene	0.0553		"	0.0600		92.2	75-125			

LCS (P9A0304-BS1)				Prepared: 12/28/18		Analyzed: 12/29/18				
Benzene	0.106	0.00100	mg/kg wet	0.100		106	70-130			
Toluene	0.107	0.0100	"	0.100		107	70-130			
Ethylbenzene	0.115	0.00500	"	0.100		115	70-130			
Xylene (p/m)	0.184	0.0200	"	0.200		92.1	70-130			
Xylene (o)	0.108	0.0100	"	0.100		108	70-130			
Surrogate: 1,4-Difluorobenzene	0.0619		"	0.0600		103	75-125			
Surrogate: 4-Bromofluorobenzene	0.0564		"	0.0600		94.0	75-125			

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: Shugart State #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9A0304 - General Preparation (GC)

LCS Dup (P9A0304-BSD1)				Prepared: 12/28/18		Analyzed: 12/29/18				
Benzene	0.115	0.00100	mg/kg wet	0.100		115	70-130	7.97	20	
Toluene	0.116	0.0100	"	0.100		116	70-130	8.59	20	
Ethylbenzene	0.108	0.00500	"	0.100		108	70-130	6.13	20	
Xylene (p/m)	0.204	0.0200	"	0.200		102	70-130	10.0	20	
Xylene (o)	0.114	0.0100	"	0.100		114	70-130	5.54	20	
Surrogate: 1,4-Difluorobenzene	0.0632		"	0.0600		105	75-125			
Surrogate: 4-Bromofluorobenzene	0.0620		"	0.0600		103	75-125			

Duplicate (P9A0304-DUP1)				Source: 8L27001-12		Prepared: 12/28/18		Analyzed: 12/29/18		
Benzene	ND	0.0215	mg/kg dry		ND				20	
Toluene	0.0912	0.215	"		0.0981			7.27	20	
Ethylbenzene	0.283	0.108	"		0.348			20.8	20	R2
Xylene (p/m)	0.451	0.430	"		0.528			15.8	20	
Xylene (o)	0.124	0.215	"		0.145			16.0	20	
Surrogate: 1,4-Difluorobenzene	0.0499		"	0.0645		77.3	75-125			
Surrogate: 4-Bromofluorobenzene	0.0565		"	0.0645		87.6	75-125			

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: Shugart State #1
Project Number: 18-0138-06
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 P8L2710 - * DEFAULT PREP *******Blank (P8L2710-BLK1)**

Prepared & Analyzed: 12/27/18

Chloride	ND	1.00	mg/kg wet
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LCS (P8L2710-BS1)

Prepared & Analyzed: 12/27/18

Chloride	401	1.00	mg/kg wet	400	100	80-120
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LCS Dup (P8L2710-BSD1)

Prepared & Analyzed: 12/27/18

Chloride	399	1.00	mg/kg wet	400	99.6	80-120	0.503	20
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Duplicate (P8L2710-DUP1)**Source: 8L21007-01**

Prepared & Analyzed: 12/27/18

Chloride	92.8	6.25	mg/kg dry	95.6	2.99	20
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Duplicate (P8L2710-DUP2)**Source: 8L26007-05**

Prepared: 12/27/18 Analyzed: 12/28/18

Chloride	225	1.12	mg/kg dry	210	7.10	20
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Matrix Spike (P8L2710-MS1)**Source: 8L21007-01**

Prepared: 12/27/18 Analyzed: 12/28/18

Chloride	1340	6.25	mg/kg dry	1250	95.6	99.6	80-120
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Batch P8L2801 - * DEFAULT PREP *******Blank (P8L2801-BLK1)**

Prepared & Analyzed: 12/28/18

% Moisture	ND	0.1	%
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Duplicate (P8L2801-DUP1)**Source: 8L27002-02**

Prepared & Analyzed: 12/28/18

% Moisture	10.0	0.1	%	10.0	0.00	20
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Batch P8L2812 - * DEFAULT PREP *******Blank (P8L2812-BLK1)**

Prepared: 12/28/18 Analyzed: 01/03/19

Chloride	ND	1.00	mg/kg wet
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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: Shugart State #1
Project Number: 18-0138-06
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 P8L2812 - * DEFAULT PREP *****

LCS (P8L2812-BS1)

Prepared: 12/28/18 Analyzed: 01/03/19

Chloride	375	1.00	mg/kg wet	400		93.8	80-120			
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LCS Dup (P8L2812-BSD1)

Prepared: 12/28/18 Analyzed: 01/03/19

Chloride	376	1.00	mg/kg wet	400		94.0	80-120	0.200	20	
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Duplicate (P8L2812-DUP1)

Source: 8L27005-01

Prepared: 12/28/18 Analyzed: 01/03/19

Chloride	4440	26.6	mg/kg dry		4250			4.42	20	
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Matrix Spike (P8L2812-MS1)

Source: 8L27005-01

Prepared: 12/28/18 Analyzed: 01/03/19

Chloride	7160	26.6	mg/kg dry	2660	4250	109	80-120			
----------	------	------	-----------	------	------	-----	--------	--	--	--

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-06
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.

R2 The RPD exceeded the acceptance limit.

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:

1/3/2019

Brent Barron, Laboratory Director/Technical Director

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Permian Basin Environmental Lab, L.P.

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

Larson & Associates, Inc.

Project: Shugart State #1

Fax: (432) 687-0456

P.O. Box 50685

Project Number: 18-0138-06

Midland TX, 79710

Project Manager: Mark Larson

Permian Basin Environmental Lab, L.P.

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



Analytical Report

Prepared for:

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

Project: Shugart State #1
Project Number: 18-0138-05
Location:

Lab Order Number: 9G18004



NELAP/TCEQ # T104704516-18-9

Report Date: 07/24/19

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

Project: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-2 @ 4'	9G18004-01	Soil	07/17/19 15:11	07-18-2019 09:35
HA-2 @ 6'	9G18004-02	Soil	07/17/19 15:40	07-18-2019 09:35
HA-2 @ 8'	9G18004-03	Soil	07/17/19 15:42	07-18-2019 09:35
HA-1 @ 4'	9G18004-04	Soil	07/17/19 16:01	07-18-2019 09:35
HA-3 @ 4'	9G18004-05	Soil	07/17/19 16:25	07-18-2019 09:35

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

Project: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 @ 4'
9G18004-01 (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

% Moisture	9.0	0.1	%	1	P9G1902	07/19/19	07/19/19	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C12-C28	ND	27.5	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C28-C35	ND	27.5	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: 1-Chlorooctane		102 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: o-Terphenyl		108 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	07/22/19	07/23/19	calc

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 @ 6'
9G18004-02 (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

% Moisture	9.0	0.1	%	1	P9G1902	07/19/19	07/19/19	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C12-C28	ND	27.5	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C28-C35	ND	27.5	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: 1-Chlorooctane		105 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: o-Terphenyl		106 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	07/22/19	07/23/19	calc

Permian Basin Environmental Lab, L.P.

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P.O. Box 50685
Midland TX, 79710

Project: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-2 @ 8'
9G18004-03 (Soil)

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

General Chemistry Parameters by EPA / Standard Methods

% Moisture	7.0	0.1	%	1	P9G1902	07/19/19	07/19/19	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C12-C28	ND	26.9	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C28-C35	ND	26.9	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: 1-Chlorooctane		78.1 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: o-Terphenyl		78.9 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	07/22/19	07/23/19	calc

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-1 @ 4'
9G18004-04 (Soil)

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

General Chemistry Parameters by EPA / Standard Methods

% Moisture	8.0	0.1	%	1	P9G1902	07/19/19	07/19/19	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.2	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C12-C28	ND	27.2	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
>C28-C35	ND	27.2	mg/kg dry	1	P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: 1-Chlorooctane		75.4 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Surrogate: o-Terphenyl		77.9 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	07/22/19	07/23/19	calc

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-3 @ 4'
9G18004-05 (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

% Moisture	9.0	0.1	%	1	P9G1902	07/19/19	07/19/19	ASTM D2216
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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	1700	137	mg/kg dry	5	P9G2205	07/22/19	07/23/19	TPH 8015M
>C12-C28	12500	137	mg/kg dry	5	P9G2205	07/22/19	07/23/19	TPH 8015M
>C28-C35	3150	137	mg/kg dry	5	P9G2205	07/22/19	07/23/19	TPH 8015M
<i>Surrogate: 1-Chlorooctane</i>		92.9 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
<i>Surrogate: o-Terphenyl</i>		86.1 %	70-130		P9G2205	07/22/19	07/23/19	TPH 8015M
Total Petroleum Hydrocarbon C6-C35	17300	137	mg/kg dry	5	[CALC]	07/22/19	07/23/19	calc

Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-05
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 P9G1902 - * DEFAULT PREP *****

Blank (P9G1902-BLK1)

Prepared & Analyzed: 07/19/19

% Moisture	ND	0.1	%
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Duplicate (P9G1902-DUP1)

Source: 9G18006-03

Prepared & Analyzed: 07/19/19

% Moisture	15.0	0.1	%	16.0	6.45	20
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Duplicate (P9G1902-DUP2)

Source: 9G18007-02

Prepared & Analyzed: 07/19/19

% Moisture	ND	0.1	%	ND	20
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Permian Basin Environmental Lab, L.P.

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

Project: Shugart State #1
Project Number: 18-0138-05
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 P9G2205 - TX 1005

Blank (P9G2205-BLK1)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	81.8		"	100		81.8	70-130			
Surrogate: o-Terphenyl	46.9		"	50.0		93.8	70-130			

LCS (P9G2205-BS1)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	803	25.0	mg/kg wet	1000		80.3	75-125			
>C12-C28	865	25.0	"	1000		86.5	75-125			
Surrogate: 1-Chlorooctane	97.4		"	100		97.4	70-130			
Surrogate: o-Terphenyl	40.3		"	50.0		80.6	70-130			

LCS Dup (P9G2205-BSD1)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	854	25.0	mg/kg wet	1000		85.4	75-125	6.12	20	
>C12-C28	933	25.0	"	1000		93.3	75-125	7.56	20	
Surrogate: 1-Chlorooctane	104		"	100		104	70-130			
Surrogate: o-Terphenyl	44.8		"	50.0		89.6	70-130			

Calibration Blank (P9G2205-CCB1)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	8.47		mg/kg wet							
>C12-C28	19.6		"							
Surrogate: 1-Chlorooctane	75.4		"	100		75.4	70-130			
Surrogate: o-Terphenyl	42.1		"	50.0		84.1	70-130			

Calibration Blank (P9G2205-CCB2)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	10.2		mg/kg wet							
>C12-C28	17.8		"							
Surrogate: 1-Chlorooctane	75.1		"	100		75.1	70-130			
Surrogate: o-Terphenyl	41.8		"	50.0		83.6	70-130			

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: Shugart State #1
Project Number: 18-0138-05
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 P9G2205 - TX 1005

Calibration Check (P9G2205-CCV1)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	440	25.0	mg/kg wet	500		88.1	85-115			
>C12-C28	450	25.0	"	500		90.0	85-115			
Surrogate: 1-Chlorooctane	87.5		"	100		87.5	70-130			
Surrogate: o-Terphenyl	42.4		"	50.0		84.9	70-130			

Calibration Check (P9G2205-CCV2)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	451	25.0	mg/kg wet	500		90.1	85-115			
>C12-C28	480	25.0	"	500		96.0	85-115			
Surrogate: 1-Chlorooctane	87.9		"	100		87.9	70-130			
Surrogate: o-Terphenyl	41.0		"	50.0		82.0	70-130			

Calibration Check (P9G2205-CCV3)

Prepared: 07/22/19 Analyzed: 07/23/19

C6-C12	446	25.0	mg/kg wet	500		89.2	85-115			
>C12-C28	428	25.0	"	500		85.7	85-115			
Surrogate: 1-Chlorooctane	87.4		"	100		87.4	70-130			
Surrogate: o-Terphenyl	37.3		"	50.0		74.6	70-130			

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: Shugart State #1
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

ROI Received on Ice
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:

7/24/2019

Brent Barron, Laboratory Director/Technical Director

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

Marson & Associates, Inc.
Environmental Consultants

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

Data Reported to:

DATE: 7/18/2019 PAGE 1 OF 1
PO#: 4618004
PROJECT LOCATION OR NAME: Re Sugar State #1
LAB WORK ORDER#: 4618004
LAI PROJECT #: 18-0138-05 COLLECTOR: Ro/RN

CHAIN-OF-CUSTODY

Nº 0710

Page 12 of 12

Received by OCD: 11/4/2020 8:36:39 AM

TRRP report?		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER		TIME ZONE: Time zone/State:		MST		
Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl	HNO ₃	H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/>	ICE	UNPRESERVED
HA-2(4)	1	7/17/19	15:11	S	1					
HA-2(6)	2		15:40							
HA-2(8)	3		15:43							
HA-1(4)	4		16:01							
HA-3(4)	5		16:35							
TOTAL										

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<u>PRC</u>	<u>7-18-19 9:35</u>	<u>PRC</u>	<u>7-18-19 9:35</u>
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
LABORATORY: <u>PRC</u>	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME

TURN AROUND TIME	LABORATORY USE ONLY:
NORMAL <input checked="" type="checkbox"/>	RECEIVING TEMP: <u>10-20</u> THERM#: <u>CEL 12</u>
1 DAY <input type="checkbox"/>	CUSTODY SEALS - <input type="checkbox"/> BROKEN <input type="checkbox"/> INTACT <input type="checkbox"/> NOT USED
2 DAY <input type="checkbox"/>	<input type="checkbox"/> CARRIER BILL #
OTHER <input type="checkbox"/>	<input type="checkbox"/> HAND DELIVERED

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



Revised Analytical Report

Prepared for:

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Location: NM
Lab Order Number: 9K14020



Current Certification

Report Date: 04/27/20

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HA-6 (5')	9K14020-01	Soil	11/07/19 12:00	11-14-2019 11:09
HA-6 (8')	9K14020-02	Soil	11/07/19 12:25	11-14-2019 11:09
Sidewall North -2	9K14020-03	Soil	11/07/19 13:59	11-14-2019 11:09
HA-3 (6')	9K14020-04	Soil	11/07/19 14:40	11-14-2019 11:09
HA-3 (8')	9K14020-05	Soil	11/07/19 14:45	11-14-2019 11:09
Sidewall South -1	9K14020-06	Soil	11/07/19 15:26	11-14-2019 11:09
Sidewall South -2	9K14020-07	Soil	11/07/19 15:32	11-14-2019 11:09
Sidewall West	9K14020-08	Soil	11/07/19 16:05	11-14-2019 11:09
Sidewall North -1	9K14020-09	Soil	11/07/19 16:07	11-14-2019 11:09
Sidewall East	9K14020-10	Soil	11/07/19 16:15	11-14-2019 11:09

PBELAB staff was notified that the Sample ID's on the chain of custody were incorrect for some of the samples. The following changes have been made to the Sample IDs.

"Sidewall West -2" to "Sidewall North -2"

"Sidewall West-1" to "Sidewall North-1"

"Sidewall East -1" to "Sidewall South -1"

"Sidewall East -2" to "Sidewall South -2"

"Sidewall South" to "Sidewall West"

"Sidewall North" to "Sidewall East".

This revised report reflects the above changes.

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-6 (5')
9K14020-01 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		108 %		75-125	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		92.5 %		75-125	P9K1801	11/18/19 10:29	11/18/19 20:22	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	104	1.06	mg/kg dry	1	P9K1923	11/19/19 16:58	11/21/19 19:52	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P9K1511	11/15/19 13:29	11/19/19 00:30	TPH 8015M	
>C12-C28	101	26.6	mg/kg dry	1	P9K1511	11/15/19 13:29	11/19/19 00:30	TPH 8015M	
>C28-C35	43.1	26.6	mg/kg dry	1	P9K1511	11/15/19 13:29	11/19/19 00:30	TPH 8015M	
Surrogate: 1-Chlorooctane		119 %		70-130	P9K1511	11/15/19 13:29	11/19/19 00:30	TPH 8015M	
Surrogate: o-Terphenyl		127 %		70-130	P9K1511	11/15/19 13:29	11/19/19 00:30	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	144	26.6	mg/kg dry	1	[CALC]	11/15/19 13:29	11/19/19 00:30	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.

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

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-6 (8')
9K14020-02 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		111 %	75-125		P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		97.1 %	75-125		P9K1801	11/18/19 10:29	11/18/19 20:43	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	51.3	1.06	mg/kg dry	1	P9K2002	11/20/19 08:24	11/20/19 16:04	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 12:34	TPH 8015M	
>C12-C28	ND	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 12:34	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 12:34	TPH 8015M	
Surrogate: 1-Chlorooctane		99.4 %	70-130		P9K1512	11/15/19 13:32	11/19/19 12:34	TPH 8015M	
Surrogate: o-Terphenyl		106 %	70-130		P9K1512	11/15/19 13:32	11/19/19 12:34	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.6	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 12:34	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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall North -2
9K14020-03 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	
Toluene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	
Ethylbenzene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	
Xylene (p/m)	ND	0.00208	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	
Xylene (o)	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		105 %	75-125		P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		117 %	75-125		P9K1802	11/18/19 10:37	11/18/19 23:27	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	213	1.04	mg/kg dry	1	P9K2002	11/20/19 08:24	11/20/19 16:20	EPA 300.0	
% Moisture	4.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 12:56	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 12:56	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 12:56	TPH 8015M	
Surrogate: 1-Chlorooctane		93.8 %	70-130		P9K1512	11/15/19 13:32	11/19/19 12:56	TPH 8015M	
Surrogate: o-Terphenyl		101 %	70-130		P9K1512	11/15/19 13:32	11/19/19 12:56	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 12:56	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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-3 (6')
9K14020-04 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00110	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	
Toluene	ND	0.00110	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	
Ethylbenzene	ND	0.00110	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	
Xylene (p/m)	ND	0.00220	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	
Xylene (o)	ND	0.00110	mg/kg dry	1	P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		92.6 %	75-125		P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		96.6 %	75-125		P9K1802	11/18/19 10:37	11/18/19 23:47	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1070	5.49	mg/kg dry	5	P9K2002	11/20/19 08:24	11/20/19 16:35	EPA 300.0	
% Moisture	9.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	27.5	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 13:17	TPH 8015M	
>C12-C28	ND	27.5	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 13:17	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 13:17	TPH 8015M	
Surrogate: 1-Chlorooctane		120 %	70-130		P9K1512	11/15/19 13:32	11/19/19 13:17	TPH 8015M	
Surrogate: o-Terphenyl		129 %	70-130		P9K1512	11/15/19 13:32	11/19/19 13:17	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 13:17	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.

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

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

HA-3 (8')
9K14020-05 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00108	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	
Toluene	ND	0.00108	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		107 %	75-125		P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		97.3 %	75-125		P9K1802	11/18/19 10:37	11/19/19 00:08	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	754	1.08	mg/kg dry	1	P9K2014	11/21/19 09:02	11/21/19 10:11	EPA 300.0	
% Moisture	7.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.9	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 13:38	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 13:38	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 13:38	TPH 8015M	
Surrogate: 1-Chlorooctane		77.7 %	70-130		P9K1512	11/15/19 13:32	11/19/19 13:38	TPH 8015M	
Surrogate: o-Terphenyl		84.5 %	70-130		P9K1512	11/15/19 13:32	11/19/19 13:38	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 13:38	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.

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

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall South -1
9K14020-06 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		107 %	75-125		P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		92.5 %	75-125		P9K1802	11/18/19 10:37	11/19/19 00:28	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	220	1.06	mg/kg dry	1	P9K2014	11/21/19 09:02	11/21/19 10:27	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:00	TPH 8015M	
>C12-C28	900	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:00	TPH 8015M	
>C28-C35	274	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:00	TPH 8015M	
Surrogate: 1-Chlorooctane		105 %	70-130		P9K1512	11/15/19 13:32	11/19/19 14:00	TPH 8015M	
Surrogate: o-Terphenyl		114 %	70-130		P9K1512	11/15/19 13:32	11/19/19 14:00	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	1170	26.6	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 14:00	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.

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

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

Project: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall South -2
9K14020-07 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	
Toluene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	
Ethylbenzene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	
Xylene (p/m)	ND	0.00208	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	
Xylene (o)	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		109 %	75-125		P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		82.8 %	75-125		P9K1802	11/18/19 10:37	11/19/19 00:48	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	187	1.04	mg/kg dry	1	P9K2014	11/21/19 09:02	11/21/19 10:42	EPA 300.0	
% Moisture	4.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:21	TPH 8015M	
>C12-C28	275	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:21	TPH 8015M	
>C28-C35	72.9	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:21	TPH 8015M	
Surrogate: 1-Chlorooctane		92.2 %	70-130		P9K1512	11/15/19 13:32	11/19/19 14:21	TPH 8015M	
Surrogate: o-Terphenyl		102 %	70-130		P9K1512	11/15/19 13:32	11/19/19 14:21	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	348	26.0	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 14:21	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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall West
9K14020-08 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00105	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	
Toluene	ND	0.00105	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	
Ethylbenzene	ND	0.00105	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	
Xylene (p/m)	ND	0.00211	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	
Xylene (o)	ND	0.00105	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		109 %	75-125		P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		104 %	75-125		P9K1802	11/18/19 10:37	11/19/19 01:09	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	101	1.05	mg/kg dry	1	P9K2014	11/21/19 09:02	11/21/19 10:57	EPA 300.0	
% Moisture	5.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:43	TPH 8015M	
>C12-C28	148	26.3	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:43	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 14:43	TPH 8015M	
Surrogate: 1-Chlorooctane		86.6 %	70-130		P9K1512	11/15/19 13:32	11/19/19 14:43	TPH 8015M	
Surrogate: o-Terphenyl		96.6 %	70-130		P9K1512	11/15/19 13:32	11/19/19 14:43	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	148	26.3	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 14:43	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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall North -1
9K14020-09 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	
Toluene	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	
Ethylbenzene	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	
Xylene (p/m)	ND	0.00213	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	
Xylene (o)	ND	0.00106	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		101 %	75-125		P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		105 %	75-125		P9K1802	11/18/19 10:37	11/19/19 01:29	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	46.0	1.06	mg/kg dry	1	P9K2014	11/21/19 09:02	11/21/19 11:13	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 15:04	TPH 8015M	
>C12-C28	173	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 15:04	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 15:04	TPH 8015M	
Surrogate: 1-Chlorooctane		106 %	70-130		P9K1512	11/15/19 13:32	11/19/19 15:04	TPH 8015M	
Surrogate: o-Terphenyl		115 %	70-130		P9K1512	11/15/19 13:32	11/19/19 15:04	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	173	26.6	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 15:04	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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

Sidewall East
9K14020-10 (Soil)

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

BTEX by 8021B

Benzene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	
Toluene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	
Ethylbenzene	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	
Xylene (p/m)	ND	0.00208	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	
Xylene (o)	ND	0.00104	mg/kg dry	1	P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		102 %	75-125		P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		94.0 %	75-125		P9K1802	11/18/19 10:37	11/19/19 01:50	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	66.1	1.04	mg/kg dry	1	P9K2014	11/21/19 09:02	11/21/19 11:28	EPA 300.0	
% Moisture	4.0	0.1	%	1	P9K1805	11/18/19 14:25	11/18/19 14:37	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 15:25	TPH 8015M	
>C12-C28	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 15:25	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P9K1512	11/15/19 13:32	11/19/19 15:25	TPH 8015M	
Surrogate: 1-Chlorooctane		111 %	70-130		P9K1512	11/15/19 13:32	11/19/19 15:25	TPH 8015M	
Surrogate: o-Terphenyl		120 %	70-130		P9K1512	11/15/19 13:32	11/19/19 15:25	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	26.0	mg/kg dry	1	[CALC]	11/15/19 13:32	11/19/19 15:25	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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

BTEX by 8021B - 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 P9K1801 - General Preparation (GC)

Blank (P9K1801-BLK1)

Prepared & Analyzed: 11/18/19

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	0.111		"	0.120		92.6	75-125			
Surrogate: 4-Bromofluorobenzene	0.134		"	0.120		112	75-125			

LCS (P9K1801-BS1)

Prepared & Analyzed: 11/18/19

Benzene	0.0870	0.00100	mg/kg wet	0.100		87.0	70-130			
Toluene	0.113	0.00100	"	0.100		113	70-130			
Ethylbenzene	0.117	0.00100	"	0.100		117	70-130			
Xylene (p/m)	0.239	0.00200	"	0.200		119	70-130			
Xylene (o)	0.114	0.00100	"	0.100		114	70-130			
Surrogate: 1,4-Difluorobenzene	0.141		"	0.120		117	75-125			
Surrogate: 4-Bromofluorobenzene	0.131		"	0.120		110	75-125			

LCS Dup (P9K1801-BSD1)

Prepared & Analyzed: 11/18/19

Benzene	0.0844	0.00100	mg/kg wet	0.100		84.4	70-130	3.04	20	
Toluene	0.108	0.00100	"	0.100		108	70-130	4.38	20	
Ethylbenzene	0.117	0.00100	"	0.100		117	70-130	0.0342	20	
Xylene (p/m)	0.224	0.00200	"	0.200		112	70-130	6.44	20	
Xylene (o)	0.111	0.00100	"	0.100		111	70-130	1.91	20	
Surrogate: 4-Bromofluorobenzene	0.119		"	0.120		99.1	75-125			
Surrogate: 1,4-Difluorobenzene	0.125		"	0.120		104	75-125			

Calibration Blank (P9K1801-CCB1)

Prepared & Analyzed: 11/18/19

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.144		"	0.120		120	75-125			
Surrogate: 1,4-Difluorobenzene	0.119		"	0.120		99.5	75-125			

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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

BTEX by 8021B - 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 P9K1801 - General Preparation (GC)

Calibration Blank (P9K1801-CCB2)

Prepared & Analyzed: 11/18/19

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.127		"	0.120		106	75-125			
Surrogate: 1,4-Difluorobenzene	0.129		"	0.120		107	75-125			

Calibration Blank (P9K1801-CCB3)

Prepared & Analyzed: 11/18/19

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.143		"	0.120		119	75-125			
Surrogate: 1,4-Difluorobenzene	0.123		"	0.120		103	75-125			

Calibration Check (P9K1801-CCV1)

Prepared & Analyzed: 11/18/19

Benzene	0.0810	0.00100	mg/kg wet	0.100		81.0	80-120			
Toluene	0.106	0.00100	"	0.100		106	80-120			
Ethylbenzene	0.109	0.00100	"	0.100		109	80-120			
Xylene (p/m)	0.238	0.00200	"	0.200		119	80-120			
Xylene (o)	0.107	0.00100	"	0.100		107	80-120			
Surrogate: 4-Bromofluorobenzene	0.126		"	0.120		105	75-125			
Surrogate: 1,4-Difluorobenzene	0.124		"	0.120		103	75-125			

Calibration Check (P9K1801-CCV2)

Prepared & Analyzed: 11/18/19

Benzene	0.0849	0.00100	mg/kg wet	0.100		84.9	80-120			
Toluene	0.0972	0.00100	"	0.100		97.2	80-120			
Ethylbenzene	0.108	0.00100	"	0.100		108	80-120			
Xylene (p/m)	0.183	0.00200	"	0.200		91.6	80-120			
Xylene (o)	0.0988	0.00100	"	0.100		98.8	80-120			
Surrogate: 1,4-Difluorobenzene	0.125		"	0.120		104	75-125			
Surrogate: 4-Bromofluorobenzene	0.118		"	0.120		98.7	75-125			

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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

BTEX by 8021B - 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 P9K1801 - General Preparation (GC)

Calibration Check (P9K1801-CCV3)

Prepared & Analyzed: 11/18/19

Benzene	0.0896	0.00100	mg/kg wet	0.100		89.6	80-120			
Toluene	0.103	0.00100	"	0.100		103	80-120			
Ethylbenzene	0.112	0.00100	"	0.100		112	80-120			
Xylene (p/m)	0.201	0.00200	"	0.200		100	80-120			
Xylene (o)	0.109	0.00100	"	0.100		109	80-120			
Surrogate: 1,4-Difluorobenzene	0.123		"	0.120		103	75-125			
Surrogate: 4-Bromofluorobenzene	0.119		"	0.120		99.6	75-125			

Matrix Spike (P9K1801-MS1)

Source: 9K14019-07

Prepared & Analyzed: 11/18/19

Benzene	0.0899	0.00109	mg/kg dry	0.109	ND	82.7	80-120			
Toluene	0.0978	0.00109	"	0.109	ND	89.9	80-120			
Ethylbenzene	0.119	0.00109	"	0.109	ND	110	80-120			
Xylene (p/m)	0.185	0.00217	"	0.217	ND	84.9	80-120			
Xylene (o)	0.0942	0.00109	"	0.109	ND	86.6	80-120			
Surrogate: 1,4-Difluorobenzene	0.150		"	0.130		115	75-125			
Surrogate: 4-Bromofluorobenzene	0.134		"	0.130		102	75-125			

Matrix Spike Dup (P9K1801-MSD1)

Source: 9K14019-07

Prepared & Analyzed: 11/18/19

Benzene	0.0901	0.00109	mg/kg dry	0.109	ND	82.8	80-120	0.205	20	
Toluene	0.0942	0.00109	"	0.109	ND	86.6	80-120	3.73	20	
Ethylbenzene	0.116	0.00109	"	0.109	ND	107	80-120	2.81	20	
Xylene (p/m)	0.187	0.00217	"	0.217	ND	86.2	80-120	1.53	20	
Xylene (o)	0.0995	0.00109	"	0.109	ND	91.5	80-120	5.50	20	
Surrogate: 1,4-Difluorobenzene	0.150		"	0.130		115	75-125			
Surrogate: 4-Bromofluorobenzene	0.132		"	0.130		101	75-125			

Batch P9K1802 - General Preparation (GC)

Blank (P9K1802-BLK1)

Prepared & Analyzed: 11/18/19

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 1,4-Difluorobenzene	0.114		"	0.120		95.4	75-125			
Surrogate: 4-Bromofluorobenzene	0.134		"	0.120		112	75-125			

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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

BTEX by 8021B - 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 P9K1802 - General Preparation (GC)

LCS (P9K1802-BS1)		Prepared & Analyzed: 11/18/19								
Benzene	0.0988	0.00100	mg/kg wet	0.100		98.8	70-130			
Toluene	0.112	0.00100	"	0.100		112	70-130			
Ethylbenzene	0.114	0.00100	"	0.100		114	70-130			
Xylene (p/m)	0.218	0.00200	"	0.200		109	70-130			
Xylene (o)	0.115	0.00100	"	0.100		115	70-130			
Surrogate: 1,4-Difluorobenzene	0.136		"	0.120		113	75-125			
Surrogate: 4-Bromofluorobenzene	0.132		"	0.120		110	75-125			

LCS Dup (P9K1802-BSD1)		Prepared & Analyzed: 11/18/19								
Benzene	0.0973	0.00100	mg/kg wet	0.100		97.3	70-130	1.56	20	
Toluene	0.105	0.00100	"	0.100		105	70-130	6.81	20	
Ethylbenzene	0.109	0.00100	"	0.100		109	70-130	4.60	20	
Xylene (p/m)	0.212	0.00200	"	0.200		106	70-130	3.03	20	
Xylene (o)	0.107	0.00100	"	0.100		107	70-130	7.81	20	
Surrogate: 1,4-Difluorobenzene	0.135		"	0.120		112	75-125			
Surrogate: 4-Bromofluorobenzene	0.128		"	0.120		106	75-125			

Calibration Blank (P9K1802-CCB1)		Prepared & Analyzed: 11/18/19								
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.143		"	0.120		119	75-125			
Surrogate: 1,4-Difluorobenzene	0.123		"	0.120		103	75-125			

Calibration Blank (P9K1802-CCB2)		Prepared: 11/18/19 Analyzed: 11/19/19								
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 1,4-Difluorobenzene	0.121		"	0.120		101	75-125			
Surrogate: 4-Bromofluorobenzene	0.135		"	0.120		113	75-125			

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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

BTEX by 8021B - 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 P9K1802 - General Preparation (GC)

Calibration Check (P9K1802-CCV1)		Prepared & Analyzed: 11/18/19								
Benzene	0.0896	0.00100	mg/kg wet	0.100		89.6	80-120			
Toluene	0.103	0.00100	"	0.100		103	80-120			
Ethylbenzene	0.112	0.00100	"	0.100		112	80-120			
Xylene (p/m)	0.201	0.00200	"	0.200		100	80-120			
Xylene (o)	0.109	0.00100	"	0.100		109	80-120			
Surrogate: 1,4-Difluorobenzene	0.123		"	0.120		103	75-125			
Surrogate: 4-Bromofluorobenzene	0.119		"	0.120		99.6	75-125			

Calibration Check (P9K1802-CCV2)		Prepared: 11/18/19 Analyzed: 11/19/19								
Benzene	0.0968	0.00100	mg/kg wet	0.100		96.8	80-120			
Toluene	0.109	0.00100	"	0.100		109	80-120			
Ethylbenzene	0.118	0.00100	"	0.100		118	80-120			
Xylene (p/m)	0.214	0.00200	"	0.200		107	80-120			
Xylene (o)	0.117	0.00100	"	0.100		117	80-120			
Surrogate: 4-Bromofluorobenzene	0.122		"	0.120		101	75-125			
Surrogate: 1,4-Difluorobenzene	0.137		"	0.120		114	75-125			

Calibration Check (P9K1802-CCV3)		Prepared: 11/18/19 Analyzed: 11/19/19								
Benzene	0.0946	0.00100	mg/kg wet	0.100		94.6	80-120			
Toluene	0.108	0.00100	"	0.100		108	80-120			
Ethylbenzene	0.114	0.00100	"	0.100		114	80-120			
Xylene (p/m)	0.206	0.00200	"	0.200		103	80-120			
Xylene (o)	0.106	0.00100	"	0.100		106	80-120			
Surrogate: 1,4-Difluorobenzene	0.135		"	0.120		113	75-125			
Surrogate: 4-Bromofluorobenzene	0.124		"	0.120		104	75-125			

Matrix Spike (P9K1802-MS1)		Source: 9K14020-03		Prepared: 11/18/19 Analyzed: 11/19/19						
Benzene	0.0780	0.00104	mg/kg dry	0.104	ND	74.9	80-120			QM-05
Toluene	0.0868	0.00104	"	0.104	ND	83.3	80-120			
Ethylbenzene	0.115	0.00104	"	0.104	ND	111	80-120			
Xylene (p/m)	0.171	0.00208	"	0.208	ND	82.1	80-120			
Xylene (o)	0.0844	0.00104	"	0.104	ND	81.0	80-120			
Surrogate: 4-Bromofluorobenzene	0.130		"	0.125		104	75-125			
Surrogate: 1,4-Difluorobenzene	0.142		"	0.125		114	75-125			

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: Shugart - Legacy
Project Number: 18-0138-05
Project Manager: Mark Larson

Fax: (432) 687-0456

BTEX by 8021B - 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 P9K1802 - General Preparation (GC)

Matrix Spike Dup (P9K1802-MSD1)	Source: 9K14020-03			Prepared: 11/18/19		Analyzed: 11/19/19				
Benzene	0.0844	0.00104	mg/kg dry	0.104	ND	81.0	80-120	7.84	20	
Toluene	0.0959	0.00104	"	0.104	ND	92.0	80-120	9.96	20	
Ethylbenzene	0.120	0.00104	"	0.104	ND	115	80-120	3.53	20	
Xylene (p/m)	0.180	0.00208	"	0.208	ND	86.2	80-120	4.97	20	
Xylene (o)	0.0926	0.00104	"	0.104	ND	88.9	80-120	9.28	20	
Surrogate: 4-Bromofluorobenzene	0.125		"	0.125		100	75-125			
Surrogate: 1,4-Difluorobenzene	0.146		"	0.125		117	75-125			

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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 P9K1805 - * DEFAULT PREP *****

Blank (P9K1805-BLK1)		Prepared & Analyzed: 11/18/19								
% Moisture	ND	0.1	%							
Duplicate (P9K1805-DUP1)		Source: 9K14018-46		Prepared & Analyzed: 11/18/19						
% Moisture	6.0	0.1	%		6.0			0.00	20	
Duplicate (P9K1805-DUP2)		Source: 9K14020-09		Prepared & Analyzed: 11/18/19						
% Moisture	6.0	0.1	%		6.0			0.00	20	
Duplicate (P9K1805-DUP3)		Source: 9K14023-04		Prepared & Analyzed: 11/18/19						
% Moisture	14.0	0.1	%		14.0			0.00	20	
Duplicate (P9K1805-DUP4)		Source: 9K14024-24		Prepared & Analyzed: 11/18/19						
% Moisture	14.0	0.1	%		14.0			0.00	20	
Duplicate (P9K1805-DUP5)		Source: 9K15002-02		Prepared & Analyzed: 11/18/19						
% Moisture	2.0	0.1	%		2.0			0.00	20	
Duplicate (P9K1805-DUP6)		Source: 9K15003-15		Prepared & Analyzed: 11/18/19						
% Moisture	8.0	0.1	%		8.0			0.00	20	

Batch P9K1923 - * DEFAULT PREP *****

Blank (P9K1923-BLK1)		Prepared: 11/19/19 Analyzed: 11/21/19								
Chloride	ND	0.100	mg/kg wet							
LCS (P9K1923-BS1)		Prepared: 11/19/19 Analyzed: 11/21/19								
Chloride	439	1.00	mg/kg wet	400		110	80-120			

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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 P9K1923 - * DEFAULT PREP *****

LCS Dup (P9K1923-BSD1)				Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	434	1.00	mg/kg wet	400		109	80-120	1.07	20	
Calibration Blank (P9K1923-CCB1)				Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	0.00		mg/kg wet							
Calibration Blank (P9K1923-CCB2)				Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	0.00		mg/kg wet							
Calibration Check (P9K1923-CCV1)				Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	20.7		mg/kg	20.0		104	0-200			
Calibration Check (P9K1923-CCV2)				Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	21.2		mg/kg	20.0		106	0-200			
Calibration Check (P9K1923-CCV3)				Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	20.6		mg/kg	20.0		103	0-200			
Matrix Spike (P9K1923-MS1)		Source: 9K14019-07		Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	9580	10.9	mg/kg dry	1090	8190	128	80-120			QM-07
Matrix Spike (P9K1923-MS2)		Source: 9K14019-16		Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	1680	5.15	mg/kg dry	515	1150	103	80-120			
Matrix Spike Dup (P9K1923-MSD1)		Source: 9K14019-07		Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	9800	10.9	mg/kg dry	1090	8190	148	80-120	2.21	20	QM-07
Matrix Spike Dup (P9K1923-MSD2)		Source: 9K14019-16		Prepared: 11/19/19 Analyzed: 11/21/19						
Chloride	1730	5.15	mg/kg dry	515	1150	112	80-120	2.79	20	

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Midland TX, 79710

Project: Shugart - Legacy
Project Number: 18-0138-05
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 P9K2002 - * DEFAULT PREP *****

Blank (P9K2002-BLK1)

Prepared & Analyzed: 11/20/19

Chloride	ND	0.100	mg/kg wet
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LCS (P9K2002-BS1)

Prepared & Analyzed: 11/20/19

Chloride	423	1.00	mg/kg wet	400	106	80-120
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LCS Dup (P9K2002-BSD1)

Prepared & Analyzed: 11/20/19

Chloride	430	1.00	mg/kg wet	400	107	80-120	1.55	20
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Calibration Blank (P9K2002-CCB1)

Prepared & Analyzed: 11/20/19

Chloride	0.00		mg/kg wet
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Calibration Blank (P9K2002-CCB2)

Prepared & Analyzed: 11/20/19

Chloride	0.00		mg/kg wet
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Calibration Check (P9K2002-CCV1)

Prepared & Analyzed: 11/20/19

Chloride	20.7		mg/kg	20.0	103	0-200
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Calibration Check (P9K2002-CCV2)

Prepared & Analyzed: 11/20/19

Chloride	20.4		mg/kg	20.0	102	0-200
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Calibration Check (P9K2002-CCV3)

Prepared & Analyzed: 11/20/19

Chloride	21.0		mg/kg	20.0	105	0-200
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Matrix Spike (P9K2002-MS1)

Source: 9K19004-13

Prepared & Analyzed: 11/20/19

Chloride	2720	10.0	mg/kg dry	1000	1470	124	80-120
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Matrix Spike (P9K2002-MS2)

Source: 9K19004-12

Prepared & Analyzed: 11/20/19

Chloride	695	1.05	mg/kg dry	526	168	100	80-120
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Project: Shugart - Legacy
Project Number: 18-0138-05
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 P9K2002 - * DEFAULT PREP *****

Matrix Spike Dup (P9K2002-MSD1)		Source: 9K19004-13		Prepared & Analyzed: 11/20/19						
Chloride	2640	10.0	mg/kg dry	1000	1470	116	80-120	3.04	20	
Matrix Spike Dup (P9K2002-MSD2)		Source: 9K19004-12		Prepared & Analyzed: 11/20/19						
Chloride	654	1.05	mg/kg dry	526	168	92.2	80-120	6.15	20	

Batch P9K2014 - * DEFAULT PREP *****

Blank (P9K2014-BLK1)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	ND	0.100	mg/kg wet							
LCS (P9K2014-BS1)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	435	1.00	mg/kg wet	400		109	80-120			
LCS Dup (P9K2014-BSD1)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	432	1.00	mg/kg wet	400		108	80-120	0.853	20	
Calibration Blank (P9K2014-CCB1)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	0.00		mg/kg wet							
Calibration Blank (P9K2014-CCB2)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	0.00		mg/kg wet							
Calibration Check (P9K2014-CCV1)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	20.6		mg/kg	20.0		103	0-200			
Calibration Check (P9K2014-CCV2)		Prepared: 11/20/19 Analyzed: 11/21/19								
Chloride	20.6		mg/kg	20.0		103	0-200			

Permian Basin Environmental Lab, L.P.

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Midland TX, 79710

Project: Shugart - Legacy
Project Number: 18-0138-05
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 P9K2014 - * DEFAULT PREP *****

Calibration Check (P9K2014-CCV3)				Prepared & Analyzed: 11/21/19						
Chloride	20.7		mg/kg	20.0		104	0-200			
Matrix Spike (P9K2014-MS1)				Source: 9K20011-03		Prepared: 11/20/19 Analyzed: 11/21/19				
Chloride	3420	10.6	mg/kg dry	1060	2190	115	80-120			
Matrix Spike (P9K2014-MS2)				Source: 9K08019-01		Prepared & Analyzed: 11/21/19				
Chloride	2380	5.88	mg/kg dry	588	1690	117	80-120			
Matrix Spike Dup (P9K2014-MSD1)				Source: 9K20011-03		Prepared: 11/20/19 Analyzed: 11/21/19				
Chloride	3300	10.6	mg/kg dry	1060	2190	105	80-120	3.33	20	
Matrix Spike Dup (P9K2014-MSD2)				Source: 9K08019-01		Prepared & Analyzed: 11/21/19				
Chloride	2380	5.88	mg/kg dry	588	1690	118	80-120	0.373	20	

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Project: Shugart - Legacy
Project Number: 18-0138-05
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 P9K1511 - TX 1005										
Blank (P9K1511-BLK1)										
					Prepared: 11/15/19 Analyzed: 11/18/19					
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	115		"	100		115	70-130			
Surrogate: o-Terphenyl	60.6		"	50.0		121	70-130			
LCS (P9K1511-BS1)										
					Prepared: 11/15/19 Analyzed: 11/18/19					
C6-C12	967	25.0	mg/kg wet	1000		96.7	75-125			
>C12-C28	1040	25.0	"	1000		104	75-125			
Surrogate: 1-Chlorooctane	101		"	100		101	70-130			
Surrogate: o-Terphenyl	50.4		"	50.0		101	70-130			
LCS Dup (P9K1511-BSD1)										
					Prepared: 11/15/19 Analyzed: 11/18/19					
C6-C12	971	25.0	mg/kg wet	1000		97.1	75-125	0.376	20	
>C12-C28	982	25.0	"	1000		98.2	75-125	6.24	20	
Surrogate: 1-Chlorooctane	101		"	100		101	70-130			
Surrogate: o-Terphenyl	50.2		"	50.0		100	70-130			
Calibration Blank (P9K1511-CCB1)										
					Prepared: 11/15/19 Analyzed: 11/18/19					
C6-C12	17.6		mg/kg wet							
>C12-C28	14.1		"							
Surrogate: 1-Chlorooctane	117		"	100		117	70-130			
Surrogate: o-Terphenyl	61.7		"	50.0		123	70-130			
Calibration Blank (P9K1511-CCB2)										
					Prepared: 11/15/19 Analyzed: 11/18/19					
C6-C12	14.3		mg/kg wet							
>C12-C28	14.0		"							
Surrogate: 1-Chlorooctane	126		"	100		126	70-130			
Surrogate: o-Terphenyl	65.6		"	50.0		131	70-130			S-GC

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Project: Shugart - Legacy
Project Number: 18-0138-05
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 P9K1511 - TX 1005

Calibration Check (P9K1511-CCV1)

Prepared: 11/15/19 Analyzed: 11/18/19

C6-C12	479	25.0	mg/kg wet	500		95.7	85-115			
>C12-C28	501	25.0	"	500		100	85-115			
Surrogate: 1-Chlorooctane	117		"	100		117	70-130			
Surrogate: o-Terphenyl	52.2		"	50.0		104	70-130			

Calibration Check (P9K1511-CCV2)

Prepared: 11/15/19 Analyzed: 11/18/19

C6-C12	511	25.0	mg/kg wet	500		102	85-115			
>C12-C28	521	25.0	"	500		104	85-115			
Surrogate: 1-Chlorooctane	125		"	100		125	70-130			
Surrogate: o-Terphenyl	56.4		"	50.0		113	70-130			

Calibration Check (P9K1511-CCV3)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	542	25.0	mg/kg wet	500		108	85-115			
>C12-C28	554	25.0	"	500		111	85-115			
Surrogate: 1-Chlorooctane	116		"	100		116	70-130			
Surrogate: o-Terphenyl	58.4		"	50.0		117	70-130			

Batch P9K1512 - TX 1005

Blank (P9K1512-BLK1)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	118		"	100		118	70-130			
Surrogate: o-Terphenyl	62.2		"	50.0		124	70-130			

LCS (P9K1512-BS1)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	1030	25.0	mg/kg wet	1000		103	75-125			
>C12-C28	1040	25.0	"	1000		104	75-125			
Surrogate: 1-Chlorooctane	126		"	100		126	70-130			
Surrogate: o-Terphenyl	55.5		"	50.0		111	70-130			

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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 P9K1512 - TX 1005

LCS Dup (P9K1512-BSD1)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	985	25.0	mg/kg wet	1000		98.5	75-125	4.28	20	
>C12-C28	1010	25.0	"	1000		101	75-125	3.45	20	
Surrogate: 1-Chlorooctane	107		"	100		107	70-130			
Surrogate: o-Terphenyl	52.2		"	50.0		104	70-130			

Calibration Blank (P9K1512-CCB1)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	15.0		mg/kg wet							
>C12-C28	15.1		"							
Surrogate: 1-Chlorooctane	109		"	100		109	70-130			
Surrogate: o-Terphenyl	58.2		"	50.0		116	70-130			

Calibration Blank (P9K1512-CCB2)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	13.8		mg/kg wet							
>C12-C28	17.5		"							
Surrogate: 1-Chlorooctane	103		"	100		103	70-130			
Surrogate: o-Terphenyl	54.4		"	50.0		109	70-130			

Calibration Check (P9K1512-CCV1)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	515	25.0	mg/kg wet	500		103	85-115			
>C12-C28	555	25.0	"	500		111	85-115			
Surrogate: 1-Chlorooctane	121		"	100		121	70-130			
Surrogate: o-Terphenyl	55.3		"	50.0		111	70-130			

Calibration Check (P9K1512-CCV2)

Prepared: 11/15/19 Analyzed: 11/19/19

C6-C12	514	25.0	mg/kg wet	500		103	85-115			
>C12-C28	546	25.0	"	500		109	85-115			
Surrogate: 1-Chlorooctane	124		"	100		124	70-130			
Surrogate: o-Terphenyl	55.1		"	50.0		110	70-130			

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: Shugart - Legacy
Project Number: 18-0138-05
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 P9K1512 - TX 1005

Matrix Spike (P9K1512-MS1)	Source: 9K14022-11			Prepared: 11/15/19		Analyzed: 11/19/19				
C6-C12	1060	26.6	mg/kg dry	1060	13.8	97.9	75-125			
>C12-C28	1200	26.6	"	1060	123	101	75-125			
Surrogate: 1-Chlorooctane	125		"	106		118	70-130			
Surrogate: o-Terphenyl	52.5		"	53.2		98.7	70-130			

Permian Basin Environmental Lab, L.P.

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

Project: Shugart - Legacy
Project Number: 18-0138-05
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.

ROI Received on Ice

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

QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.

BULK Samples received in Bulk soil containers

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

LCS Laboratory Control Spike

MS Matrix Spike

Dup Duplicate

Report Approved By:



Date:

4/27/2020

Brent Barron, Laboratory Director/Technical Director

Permian Basin Environmental Lab, L.P.

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

Larson & Associates, Inc.

Project: Shugart - Legacy

Fax: (432) 687-0456

P.O. Box 50685

Project Number: 18-0138-05

Midland TX, 79710

Project Manager: Mark Larson

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

Permian Basin Environmental Lab, L.P.

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

Associates, Inc.
Environmental Consultants

Midland, TX 79701
432-687-0901

DATE: 11/14/2019
PO#: _____
PROJECT LOCATION OR NAME: _____
LAI PROJECT #: 18-D138

PAGE 1
9K14020

$$\sin \gamma \neq -\cos \alpha$$

COLLECTOR:

Page 30 of 30

TRRP report? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		S=SOIL W=WATER A=AIR		P=PAINT SL=SLUDGE OT=OTHER	
TIME ZONE: Time zone/State:		FIELD Sample I.D.			
TIME ZONE: Time zone/State:		Lab #		Date	
TIME ZONE: Time zone/State:		Time		Matrix	
TIME ZONE: Time zone/State:		# of Containers		HCl	
TIME ZONE: Time zone/State:		HNO ₃		H ₂ SO ₄ <input type="checkbox"/> NaOH <input type="checkbox"/>	
TIME ZONE: Time zone/State:		ICE		UNPRESERVED	
TIME ZONE: Time zone/State:		ANALYSES			
TIME ZONE: Time zone/State:		BTX <input checked="" type="checkbox"/> MTBE <input type="checkbox"/>			
TIME ZONE: Time zone/State:		TPH 418.1 <input type="checkbox"/> TPH 1005 <input type="checkbox"/> TPH 1006 <input type="checkbox"/>			
TIME ZONE: Time zone/State:		GASOLINE MOD 8015 <input checked="" type="checkbox"/>			
TIME ZONE: Time zone/State:		DIESEL - MOD 8015 <input checked="" type="checkbox"/>			
TIME ZONE: Time zone/State:		OIL - MOD 8015 <input checked="" type="checkbox"/>			
TIME ZONE: Time zone/State:		VOC 8260 <input checked="" type="checkbox"/>			
TIME ZONE: Time zone/State:		SVOC 8270 <input type="checkbox"/> PAH 8270 <input type="checkbox"/> HOLDPAH <input type="checkbox"/>			
TIME ZONE: Time zone/State:		8081 PESTICIDES <input type="checkbox"/> 8151 HERBICIDES <input type="checkbox"/>			
TIME ZONE: Time zone/State:		TBLP - METALS (RCRA) <input type="checkbox"/> TCLP - METALS (RCRA) <input type="checkbox"/>			
TIME ZONE: Time zone/State:		TOTAL METALS (RCRA) <input type="checkbox"/> OTHER LIST <input type="checkbox"/>			
TIME ZONE: Time zone/State:		LEAD - TOTAL <input type="checkbox"/> D.W. 200.8 <input type="checkbox"/> TCLP <input type="checkbox"/>			
TIME ZONE: Time zone/State:		TDS <input type="checkbox"/> TOX <input type="checkbox"/> FLASHPOINT <input type="checkbox"/>			
TIME ZONE: Time zone/State:		PH <input type="checkbox"/> HEXAVALENT CHROMIUM <input type="checkbox"/>			
TIME ZONE: Time zone/State:		EXPLOSIVES <input type="checkbox"/> PECTHLORATE <input type="checkbox"/>			
TIME ZONE: Time zone/State:		CHLORIDES <input type="checkbox"/> ANIONS <input type="checkbox"/> ALKALINITY <input type="checkbox"/>			

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



Analytical Report

Prepared for:

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

Project: Legacy Shugart A State Well #1

Project Number: 18-0138-06

Location: NM

Lab Order Number: 9K20006



NELAP/TCEQ # T104704516-17-8

Report Date: 12/06/19

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

Project: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Bottom 1	9K20006-01	Soil	11/19/19 10:32	11-20-2019 09:30
Bottom 2	9K20006-02	Soil	11/19/19 10:34	11-20-2019 09:30
Bottom 3	9K20006-03	Soil	11/19/19 10:37	11-20-2019 09:30
Bottom 4	9K20006-04	Soil	11/19/19 10:43	11-20-2019 09:30
Bottom 5	9K20006-05	Soil	11/19/19 10:50	11-20-2019 09:30
Bottom 6	9K20006-06	Soil	11/19/19 10:54	11-20-2019 09:30
Bottom 7	9K20006-07	Soil	11/19/19 10:57	11-20-2019 09:30
Bottom 8	9K20006-08	Soil	11/19/19 11:00	11-20-2019 09:30

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

Project: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 1
9K20006-01 (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	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		112 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		104 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	6.75	1.04	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	4.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.0	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	26.9	26.0	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	ND	26.0	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		88.4 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		101 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	26.9	26.0	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 2
9K20006-02 (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	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		119 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		105 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	70.2	1.06	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	93.2	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		89.0 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		103 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	93.2	26.6	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 3
9K20006-03 (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	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		113 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		90.4 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	80.3	1.06	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	321	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	2570	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	320	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		121 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		108 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	3210	26.6	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 4
9K20006-04 (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	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		101 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		90.5 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	22.3	1.05	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	5.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	203	26.3	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	3790	26.3	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	637	26.3	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		102 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		108 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	4630	26.3	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 5
9K20006-05 (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	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		109 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		101 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	260	1.02	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	2.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.5	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	372	25.5	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	69.1	25.5	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		87.3 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		94.3 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	441	25.5	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 6
9K20006-06 (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	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		118 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		113 %	75-125		P9K2205	11/22/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	1210	5.32	mg/kg dry	5	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	6.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	110	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	ND	26.6	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		86.4 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		86.8 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	110	26.6	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 7
9K20006-07 (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	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		114 %	75-125		P9K2301	11/23/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		93.1 %	75-125		P9K2301	11/23/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	51.9	1.02	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	2.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	25.5	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	68.7	25.5	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	32.1	25.5	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		97.5 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		103 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	101	25.5	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

Bottom 8
9K20006-08 (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	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Toluene	ND	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Ethylbenzene	ND	0.00200	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Xylene (p/m)	ND	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Xylene (o)	ND	0.00100	mg/kg dry	1	P9K2301	11/23/19	11/23/19	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		110 %	75-125		P9K2301	11/23/19	11/23/19	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		102 %	75-125		P9K2301	11/23/19	11/23/19	EPA 8021B	

General Chemistry Parameters by EPA / Standard Methods

Chloride	61.2	1.05	mg/kg dry	1	P9L0313	12/03/19	12/04/19	EPA 300.0	
% Moisture	5.0	0.1	%	1	P9K2101	11/21/19	11/21/19	ASTM D2216	

Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M

C6-C12	ND	26.3	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C12-C28	41.3	26.3	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
>C28-C35	ND	26.3	mg/kg dry	1	P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: 1-Chlorooctane		88.0 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Surrogate: o-Terphenyl		93.3 %	70-130		P9K2212	11/22/19	11/25/19	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	41.3	26.3	mg/kg dry	1	[CALC]	11/22/19	11/25/19	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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9K2205 - General Preparation (GC)

Blank (P9K2205-BLK1)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00200	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	0.139		"	0.120		116	75-125			
Surrogate: 1,4-Difluorobenzene	0.113		"	0.120		93.8	75-125			

LCS (P9K2205-BS1)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.109	0.00100	mg/kg wet	0.100		109	80-120			
Toluene	0.116	0.00100	"	0.100		116	80-120			
Ethylbenzene	0.120	0.00200	"	0.100		120	80-120			
Xylene (p/m)	0.227	0.00100	"	0.200		113	80-120			
Xylene (o)	0.119	0.00100	"	0.100		119	80-120			
Surrogate: 4-Bromofluorobenzene	0.139		"	0.120		115	75-125			
Surrogate: 1,4-Difluorobenzene	0.133		"	0.120		111	75-125			

LCS Dup (P9K2205-BSD1)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.109	0.00100	mg/kg wet	0.100		109	80-120	0.0826	20	
Toluene	0.117	0.00100	"	0.100		117	80-120	1.14	20	
Ethylbenzene	0.119	0.00200	"	0.100		119	80-120	0.234	20	
Xylene (p/m)	0.223	0.00100	"	0.200		111	80-120	1.91	20	
Xylene (o)	0.116	0.00100	"	0.100		116	80-120	2.58	20	
Surrogate: 4-Bromofluorobenzene	0.135		"	0.120		113	75-125			
Surrogate: 1,4-Difluorobenzene	0.134		"	0.120		111	75-125			

Calibration Blank (P9K2205-CCB1)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.143		"	0.120		119	75-125			
Surrogate: 1,4-Difluorobenzene	0.105		"	0.120		87.2	75-125			

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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9K2205 - General Preparation (GC)

Calibration Blank (P9K2205-CCB2)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.140		"	0.120		117	75-125			
Surrogate: 1,4-Difluorobenzene	0.112		"	0.120		93.1	75-125			

Calibration Check (P9K2205-CCV1)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.0980	0.00100	mg/kg wet	0.100		98.0	80-120			
Toluene	0.115	0.00100	"	0.100		115	80-120			
Ethylbenzene	0.115	0.00200	"	0.100		115	80-120			
Xylene (p/m)	0.227	0.00100	"	0.200		114	80-120			
Xylene (o)	0.112	0.00100	"	0.100		112	80-120			
Surrogate: 4-Bromofluorobenzene	0.144		"	0.120		120	75-125			
Surrogate: 1,4-Difluorobenzene	0.137		"	0.120		114	75-125			

Calibration Check (P9K2205-CCV2)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.0973	0.00100	mg/kg wet	0.100		97.3	80-120			
Toluene	0.101	0.00100	"	0.100		101	80-120			
Ethylbenzene	0.108	0.00200	"	0.100		108	80-120			
Xylene (p/m)	0.195	0.00100	"	0.200		97.5	80-120			
Xylene (o)	0.106	0.00100	"	0.100		106	80-120			
Surrogate: 4-Bromofluorobenzene	0.130		"	0.120		108	75-125			
Surrogate: 1,4-Difluorobenzene	0.138		"	0.120		115	75-125			

Calibration Check (P9K2205-CCV3)

Prepared: 11/22/19 Analyzed: 11/23/19

Benzene	0.0870	0.00100	mg/kg wet	0.100		87.0	80-120			
Toluene	0.0957	0.00100	"	0.100		95.7	80-120			
Ethylbenzene	0.106	0.00200	"	0.100		106	80-120			
Xylene (p/m)	0.183	0.00100	"	0.200		91.4	80-120			
Xylene (o)	0.103	0.00100	"	0.100		103	80-120			
Surrogate: 4-Bromofluorobenzene	0.135		"	0.120		113	75-125			
Surrogate: 1,4-Difluorobenzene	0.136		"	0.120		113	75-125			

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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9K2205 - General Preparation (GC)

Matrix Spike (P9K2205-MS1)		Source: 9K20003-18		Prepared: 11/22/19		Analyzed: 11/23/19				
Benzene	0.103	0.00100	mg/kg dry	0.115	ND	89.9	80-120			
Toluene	0.108	0.00100	"	0.115	ND	94.0	80-120			
Ethylbenzene	0.128	0.00200	"	0.115	ND	111	80-120			
Xylene (p/m)	0.199	0.00100	"	0.230	ND	86.3	80-120			
Xylene (o)	0.104	0.00100	"	0.115	ND	90.7	80-120			
Surrogate: 4-Bromofluorobenzene	0.153		"	0.138		111	75-125			
Surrogate: 1,4-Difluorobenzene	0.163		"	0.138		118	75-125			

Matrix Spike Dup (P9K2205-MSD1)		Source: 9K20003-18		Prepared: 11/22/19		Analyzed: 11/23/19				
Benzene	0.105	0.00100	mg/kg dry	0.115	ND	91.0	80-120	1.21	20	
Toluene	0.108	0.00100	"	0.115	ND	93.6	80-120	0.416	20	
Ethylbenzene	0.135	0.00200	"	0.115	ND	118	80-120	5.91	20	
Xylene (p/m)	0.205	0.00100	"	0.230	ND	89.2	80-120	3.30	20	
Xylene (o)	0.109	0.00100	"	0.115	ND	95.1	80-120	4.71	20	
Surrogate: 4-Bromofluorobenzene	0.155		"	0.138		113	75-125			
Surrogate: 1,4-Difluorobenzene	0.164		"	0.138		119	75-125			

Batch P9K2301 - General Preparation (GC)

Blank (P9K2301-BLK1)				Prepared & Analyzed: 11/23/19						
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00200	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	0.138		"	0.120		115	75-125			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.4	75-125			

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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9K2301 - General Preparation (GC)

LCS (P9K2301-BS1)		Prepared & Analyzed: 11/23/19								
Benzene	0.105	0.00100	mg/kg wet	0.100		105	80-120			
Toluene	0.112	0.00100	"	0.100		112	80-120			
Ethylbenzene	0.117	0.00200	"	0.100		117	80-120			
Xylene (p/m)	0.220	0.00100	"	0.200		110	80-120			
Xylene (o)	0.114	0.00100	"	0.100		114	80-120			
Surrogate: 4-Bromofluorobenzene	0.137		"	0.120		114	75-125			
Surrogate: 1,4-Difluorobenzene	0.129		"	0.120		107	75-125			

LCS Dup (P9K2301-BS1)		Prepared & Analyzed: 11/23/19								
Benzene	0.104	0.00100	mg/kg wet	0.100		104	80-120	0.852	20	
Toluene	0.114	0.00100	"	0.100		114	80-120	2.19	20	
Ethylbenzene	0.118	0.00200	"	0.100		118	80-120	0.739	20	
Xylene (p/m)	0.224	0.00100	"	0.200		112	80-120	1.91	20	
Xylene (o)	0.120	0.00100	"	0.100		120	80-120	4.99	20	
Surrogate: 4-Bromofluorobenzene	0.137		"	0.120		114	75-125			
Surrogate: 1,4-Difluorobenzene	0.128		"	0.120		107	75-125			

Calibration Blank (P9K2301-CCB1)		Prepared & Analyzed: 11/23/19								
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.140		"	0.120		116	75-125			
Surrogate: 1,4-Difluorobenzene	0.116		"	0.120		96.8	75-125			

Calibration Blank (P9K2301-CCB2)		Prepared: 11/23/19 Analyzed: 11/24/19								
Benzene	0.00		mg/kg wet							
Toluene	0.00		"							
Ethylbenzene	0.00		"							
Xylene (p/m)	0.00		"							
Xylene (o)	0.00		"							
Surrogate: 4-Bromofluorobenzene	0.144		"	0.120		120	75-125			
Surrogate: 1,4-Difluorobenzene	0.117		"	0.120		97.3	75-125			

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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9K2301 - General Preparation (GC)

Calibration Check (P9K2301-CCV1)		Prepared & Analyzed: 11/23/19								
Benzene	0.0870	0.00100	mg/kg wet	0.100		87.0	80-120			
Toluene	0.0957	0.00100	"	0.100		95.7	80-120			
Ethylbenzene	0.106	0.00200	"	0.100		106	80-120			
Xylene (p/m)	0.183	0.00100	"	0.200		91.4	80-120			
Xylene (o)	0.103	0.00100	"	0.100		103	80-120			
Surrogate: 4-Bromofluorobenzene	0.135		"	0.120		113	75-125			
Surrogate: 1,4-Difluorobenzene	0.136		"	0.120		113	75-125			

Calibration Check (P9K2301-CCV2)		Prepared: 11/23/19 Analyzed: 11/24/19								
Benzene	0.110	0.00100	mg/kg wet	0.100		110	80-120			
Toluene	0.120	0.00100	"	0.100		120	80-120			
Ethylbenzene	0.117	0.00200	"	0.100		117	80-120			
Xylene (p/m)	0.236	0.00100	"	0.200		118	80-120			
Xylene (o)	0.119	0.00100	"	0.100		119	80-120			
Surrogate: 4-Bromofluorobenzene	0.133		"	0.120		111	75-125			
Surrogate: 1,4-Difluorobenzene	0.137		"	0.120		114	75-125			

Calibration Check (P9K2301-CCV3)		Prepared: 11/23/19 Analyzed: 11/24/19								
Benzene	0.106	0.00100	mg/kg wet	0.100		106	80-120			
Toluene	0.111	0.00100	"	0.100		111	80-120			
Ethylbenzene	0.112	0.00200	"	0.100		112	80-120			
Xylene (p/m)	0.214	0.00100	"	0.200		107	80-120			
Xylene (o)	0.117	0.00100	"	0.100		117	80-120			
Surrogate: 4-Bromofluorobenzene	0.137		"	0.120		114	75-125			
Surrogate: 1,4-Difluorobenzene	0.137		"	0.120		114	75-125			

Matrix Spike (P9K2301-MS1)		Source: 9K21007-04		Prepared: 11/23/19 Analyzed: 11/24/19						
Benzene	0.0489	0.00100	mg/kg dry	0.119	ND	41.1	80-120			QM-07
Toluene	0.0418	0.00100	"	0.119	ND	35.1	80-120			QM-07
Ethylbenzene	0.0386	0.00200	"	0.119	ND	32.4	80-120			QM-07
Xylene (p/m)	0.0741	0.00100	"	0.238	ND	31.1	80-120			QM-07
Xylene (o)	0.0277	0.00100	"	0.119	ND	23.2	80-120			QM-07
Surrogate: 4-Bromofluorobenzene	0.140		"	0.143		98.3	75-125			
Surrogate: 1,4-Difluorobenzene	0.191		"	0.143		133	75-125			S-GC

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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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 P9K2301 - General Preparation (GC)

Matrix Spike Dup (P9K2301-MSD1)		Source: 9K21007-04		Prepared: 11/23/19		Analyzed: 11/24/19				
Benzene	0.0532	0.00100	mg/kg dry	0.119	ND	44.7	80-120	8.37	20	QM-07
Toluene	0.0389	0.00100	"	0.119	ND	32.7	80-120	7.20	20	QM-07
Ethylbenzene	0.0329	0.00200	"	0.119	ND	27.7	80-120	15.9	20	QM-07
Xylene (p/m)	0.0621	0.00100	"	0.238	ND	26.1	80-120	17.6	20	QM-07
Xylene (o)	0.0226	0.00100	"	0.119	ND	19.0	80-120	19.9	20	QM-07
Surrogate: 4-Bromofluorobenzene	0.159		"	0.143		112	75-125			
Surrogate: 1,4-Difluorobenzene	0.203		"	0.143		142	75-125			S-GC

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: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	--------------------	-------	----------------	------------------	------	----------------	-----	--------------	-------

Batch P9K2101 - * DEFAULT PREP *****

Blank (P9K2101-BLK1)				Prepared & Analyzed: 11/21/19						
% Moisture	ND	0.1	%							
Duplicate (P9K2101-DUP1)				Source: 9K19010-18 Prepared & Analyzed: 11/21/19						
% Moisture	17.0	0.1	%		17.0			0.00	20	
Duplicate (P9K2101-DUP2)				Source: 9K20003-19 Prepared & Analyzed: 11/21/19						
% Moisture	11.0	0.1	%		12.0			8.70	20	
Duplicate (P9K2101-DUP3)				Source: 9K20006-01 Prepared & Analyzed: 11/21/19						
% Moisture	2.0	0.1	%		4.0			66.7	20	
Duplicate (P9K2101-DUP4)				Source: 9K20012-01 Prepared & Analyzed: 11/21/19						
% Moisture	16.0	0.1	%		11.0			37.0	20	

Batch P9L0313 - * DEFAULT PREP *****

Blank (P9L0313-BLK1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	ND	0.100	mg/kg wet							
LCS (P9L0313-BS1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	417	1.00	mg/kg wet	400	104	80-120				
LCS Dup (P9L0313-BSD1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	418	1.00	mg/kg wet	400	105	80-120	0.247	20		
Calibration Blank (P9L0313-CCB1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	0.00		mg/kg wet							

Permian Basin Environmental Lab, L.P.

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Project: Legacy Shugart A State Well #1
Project Number: 18-0138-06
Project Manager: Mark Larson

Fax: (432) 687-0456

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

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P9L0313 - *** DEFAULT PREP ***										
Calibration Blank (P9L0313-CCB2)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	0.00		mg/kg wet							
Calibration Check (P9L0313-CCV1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	20.7		mg/kg	20.0		103	0-200			
Calibration Check (P9L0313-CCV2)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	20.3		mg/kg	20.0		102	0-200			
Calibration Check (P9L0313-CCV3)				Prepared: 12/03/19 Analyzed: 12/04/19						
Chloride	20.4		mg/kg	20.0		102	0-200			
Matrix Spike (P9L0313-MS1)				Source: 9K20002-04		Prepared: 12/03/19 Analyzed: 12/04/19				
Chloride	2420	11.4	mg/kg dry	1140	1280	100	80-120			
Matrix Spike (P9L0313-MS2)				Source: 9K20013-02		Prepared: 12/03/19 Analyzed: 12/04/19				
Chloride	2320	11.0	mg/kg dry	1100	1220	100	80-120			
Matrix Spike Dup (P9L0313-MSD1)				Source: 9K20002-04		Prepared: 12/03/19 Analyzed: 12/04/19				
Chloride	2430	11.4	mg/kg dry	1140	1280	101	80-120	0.192	20	
Matrix Spike Dup (P9L0313-MSD2)				Source: 9K20013-02		Prepared: 12/03/19 Analyzed: 12/04/19				
Chloride	2260	11.0	mg/kg dry	1100	1220	94.7	80-120	2.56	20	

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

Project: Legacy Shugart A State Well #1
Project Number: 18-0138-06
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 P9K2212 - TX 1005

Blank (P9K2212-BLK1)

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	111		"	100		111	70-130			
Surrogate: o-Terphenyl	59.0		"	50.0		118	70-130			

LCS (P9K2212-BS1)

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	1250	25.0	mg/kg wet	1200		104	75-125			
>C12-C28	1200	25.0	"	1200		100	75-125			
Surrogate: 1-Chlorooctane	170		"	140		122	70-130			
Surrogate: o-Terphenyl	89.3		"	70.0		128	70-130			

Calibration Blank (P9K2212-CCB1)

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	11.4		mg/kg wet							
>C12-C28	18.0		"							
Surrogate: 1-Chlorooctane	99.0		"	100		99.0	70-130			
Surrogate: o-Terphenyl	53.6		"	50.0		107	70-130			

Calibration Blank (P9K2212-CCB2)

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	11.4		mg/kg wet							
>C12-C28	44.9		"							
Surrogate: 1-Chlorooctane	97.1		"	100		97.1	70-130			
Surrogate: o-Terphenyl	52.6		"	50.0		105	70-130			

Calibration Check (P9K2212-CCV1)

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	482	25.0	mg/kg wet	500		96.5	85-115			
>C12-C28	561	25.0	"	500		112	85-115			
Surrogate: 1-Chlorooctane	116		"	100		116	70-130			
Surrogate: o-Terphenyl	55.0		"	50.0		110	70-130			

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Midland TX, 79710

Project: Legacy Shugart A State Well #1
Project Number: 18-0138-06
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 P9K2212 - TX 1005

Calibration Check (P9K2212-CCV2)

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	470	25.0	mg/kg wet	500		94.0	85-115			
>C12-C28	565	25.0	"	500		113	85-115			
Surrogate: 1-Chlorooctane	118		"	100		118	70-130			
Surrogate: o-Terphenyl	54.7		"	50.0		109	70-130			

Duplicate (P9K2212-DUP1)

Source: 9K20013-01

Prepared: 11/22/19 Analyzed: 11/25/19

C6-C12	54.5	142	mg/kg dry		ND				20	
>C12-C28	1950	142	"		1730			12.2	20	
Surrogate: 1-Chlorooctane	108		"	114		95.4	70-130			
Surrogate: o-Terphenyl	59.0		"	56.8		104	70-130			

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Notes and Definitions

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

ROI Received on Ice

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:

12/6/2019

Brent Barron, Laboratory Director/Technical Director

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

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P.O. Box 50685

Project Number: 18-0138-06

Midland TX, 79710

Project Manager: Mark Larson

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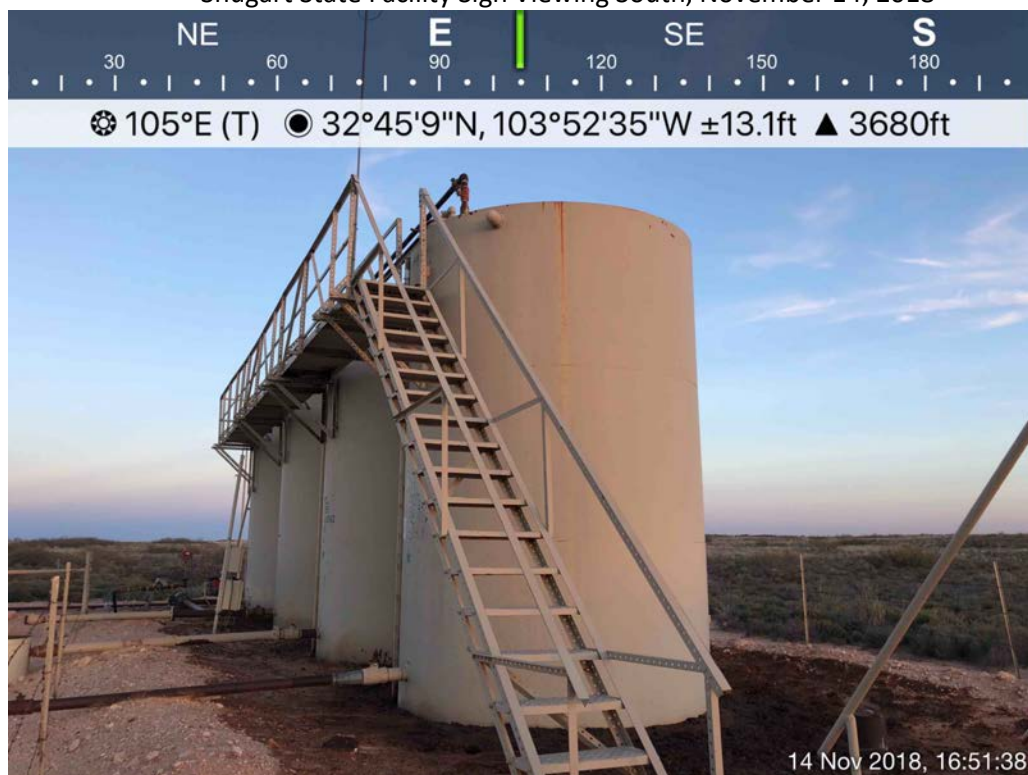
Released to Imaging: 4/21/2021 3:21:57 PM

Appendix F
Photographs

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



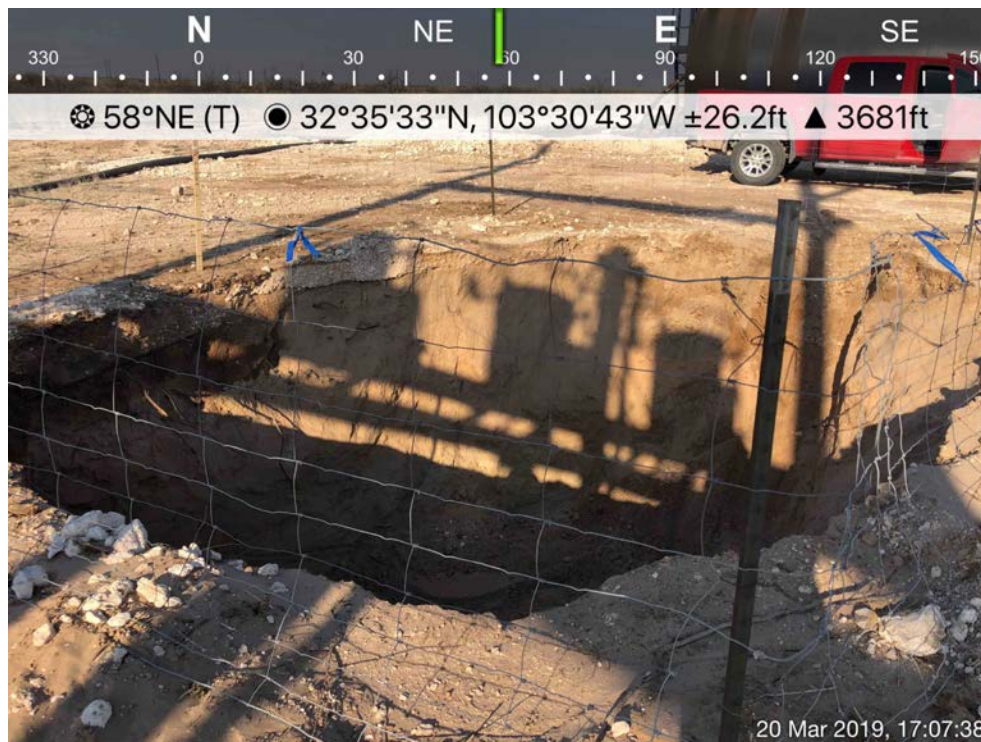
Shugart State Facility Sign Viewing South, November 14, 2018



Spill Area Viewing East, November 14, 2018

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020

Spill Area Viewing Southeast, September 26, 2018

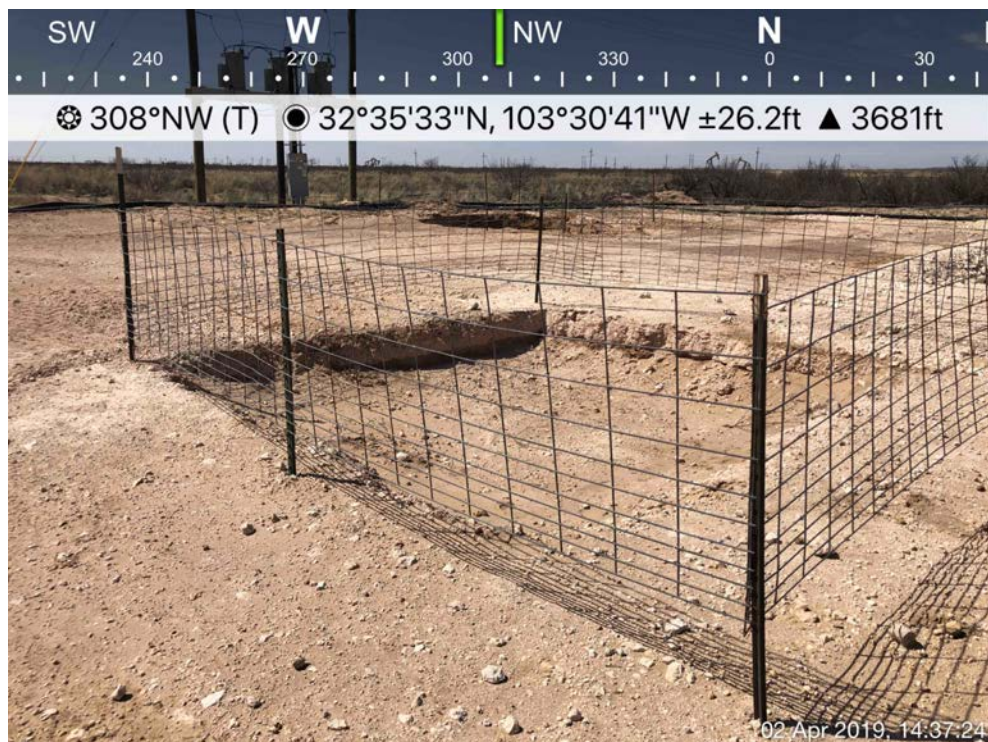


DP-2 Excavation Viewing Northeast, March 20, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



DP-3 Excavation Viewing West, April 2, 2019



DP-4 Excavation viewing Northwest, April 2, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



DP-6 and DP-7 Excavations Viewing North, April 2, 2019

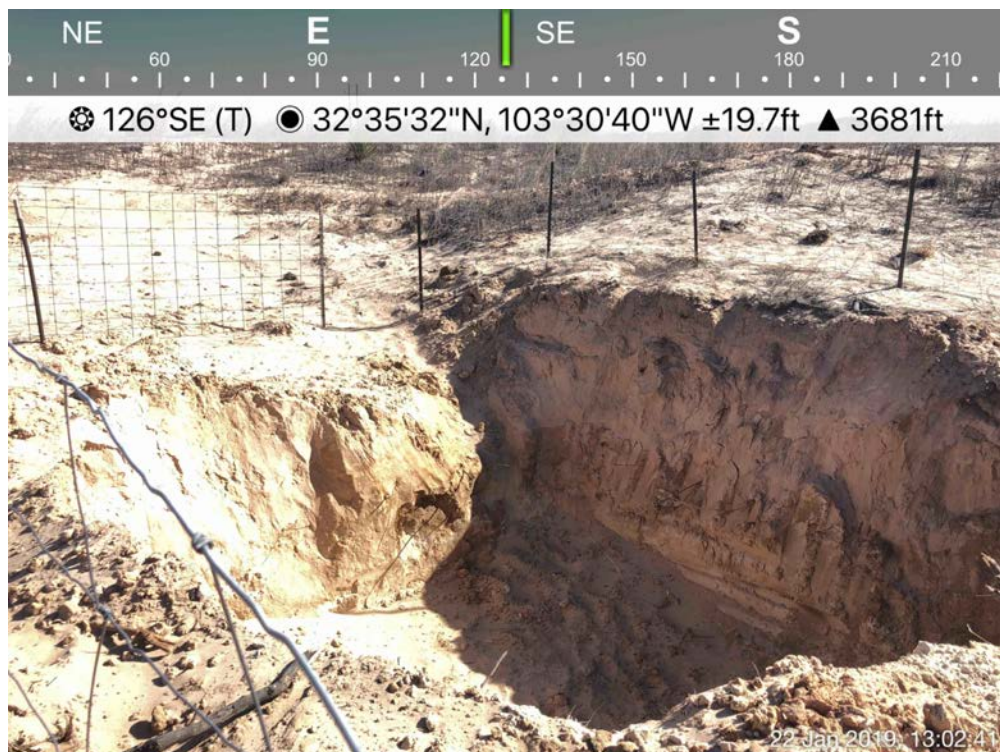


DP-8 Excavation Viewing East, April 2, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



DP-9 Excavation Viewing Northwest, March 20, 2019



DP-12 Excavation Viewing Southeast, January 22, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



Backfilled Area near DP-2 Viewing North, May 31, 2019



Backfilled Area near DP-3 Viewing West, May 31, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



Backfilled Area near DP-4 Viewing North, May 31, 2019



Backfilled Area near DP-6 and DP-7 Viewing West, May 31, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



Backfilled and Seeded Area near DP-8 Viewing Southwest, May 31, 2019



Backfilled Area near DP-9 Viewing West, May 31, 2019

Shugart State
EDDY COUNTY, NEW MEXICO
October 29, 2020



Backfilled and Seeded area near DP-12 Viewing West, May 31, 2019

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 11064

CONDITIONS OF APPROVAL

Operator: LEGACY RESERVES OPERATING, LP Suite 3000 Midland, TX79705	15 Smith Road	OGRID: 240974	Action Number: 11064	Action Type: C-141
OCD Reviewer chensley	Condition None			