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	NCS1916853082
District RP	
Facility ID	
Application ID	

DISTRICT III

## **Release Notification**

AP-139

**Responsible Party** 

Responsible Party Hilcorp Energy Company	OGRID 372171		
Contact Name Jennifer Deal	Contact Telephone 505-801-6517		
Contact email jdeal@hilcorp.com	Incident # NCS 19 168 53082		
Contact mailing address 382 Road 3100, Aztec NM 874	10		

#### Location of Release Source

Latitude 36.721261\_

(NAD 83 in decimal degrees to 5 decimal places)

Site Name Salty Dog Water Gathering System (250 yards east of RPC 18-3)	Site Type Gas Well
Date Release Discovered 4/29/19 2:00pm	API# 30-045-29775

Unit Letter	Section	Township	Range	County	NMOCD
N	18	29N	13W	San Juan	11 IN 1 3 2010

Surface Owner: State Federal Tribal Private (Name: Tres TSE Rocks LLC Et Al\_

#### Nature and Volume of Release

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

Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
Produced Water	Volume Released (bbls) 80	Volume Recovered (bbls) 65
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	Yes No
Condensate	Volume Released (bbls)	Volume Recovered (bbls)
Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

A release of 80 bbls of Produced water was released due to a water line failure from corrosion related to CAD weld connection. Operations isolated and de-energized the pipeline until it can be repaired. 65 bbls of produced water was recovered with a vac truck. The nearest well location is the RPC 18-3, 250 yards to the west.

From:	Smith, Cory, EMNRD
To:	"jdeal@hilcorp.com"
Cc:	"Josh Adams"; "Ashley Ager"; Powell, Brandon, EMNRD
Subject:	RE: Salty Dog Water Gathering System (NCSI1916853082)
Date:	Monday, February 17, 2020 1:39:00 PM
Attachments:	image001.png
	image002.png
	image003.png
	image004.png

Mrs. Deal,

OCD received the Site Characterization and Remediation plan for the Salty Dog Water Gathering System incident# nCS1916853082 on November 18, 2019 and has approved the plan with the following conditions of approval.

• HEC will submit a Stage 1 or Stage 1 &2 Abatement plan per 19.15.30 NMAC no later than April 1, 2020

The incident# has been assigned to AP#139 please include this tracking number in all future submittals/communication along with the incident#.

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410 (505)334-6178 ext 115 cory.smith@state.nm.us

From: Smith, Cory, EMNRD
Sent: Tuesday, October 1, 2019 3:52 PM
To: jdeal@hilcorp.com
Cc: Josh Adams <jadams@ltenv.com>; Ashley Ager <aager@ltenv.com>; Powell, Brandon, EMNRD
<Brandon.Powell@state.nm.us>
Subject: RE: Salty Dog Water Gathering System (NCSI1916853082)

Mrs. Deal,

OCD received the following extension request On July 19, 2019 "...Hilcorp is requesting an extension to the 90-day requirement for site characterization or closure reporting required in 19.15.29.11.A NMAC. The 90-day deadline is July 28th, 2019. Hilcorp requests an extension until September 27th, 2019. **Hilcorp will provide a remediation work plan or closure report by that date**." Communication between HEC and OCD determined the Date of Discovery to be May 29, 2019 making the 90-day deadline to be August 29, 2019.

HEC received the results of delineation drilling on September 9, 2019 and did not contact the OCD to discuss the concern of not meeting the required delineation dead line. It wasn't until September 17, 2019 when OCD contacted HEC about the status of ground water samples, placement of monitor wells and preliminary delineation data that any action was taken from HEC in regards to not meeting the deadline.

Reviewing the provided data, MW 3,5, and 6 without additional monitor wells do not provide reliable data showing ground water impacts. Because the wells have little to no offset and the provided ground water gradient is not reliable it makes it difficult to determine if the ground water sampling results are natural or are a results of impacts from Oil and Gas activities. Since there are no confirmed ground water impacts HEC is not required to abate ground water as is not subject to the requirements of 19.15.30 NMAC.

OCD grants HEC request for additional time to perform site characterization and submit a remediation plan no later than November 18, 2019 with the following conditions of approval:

- HEC must fully delineate all soil impacts per 19.15.29 NMAC both vertically and horizontally.
- Since there is a concern that ground water may be impacted HEC must at a minimum must complete 3 monitor wells, one at/near the source, one cross gradient of the source, one in the suspected up gradient from source( outside of the impact zone is preferable so this well can be used for background data)

IF HEC confirms that ground water impacts are from Oil and Gas activities an acceptable remediation plan in the required report would be to submit a Stage 1 Abatement plan per 19.15.30 NMAC, please include a date in which the Stage 1 plan would be submitted by.

If you have any additional questions please give me a call.

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410 (505)334-6178 ext 115 cory.smith@state.nm.us

From: Ashley Ager <<u>aager@ltenv.com</u>>
Sent: Friday, September 27, 2019 12:18 PM
To: Smith, Cory, EMNRD <<u>Cory.Smith@state.nm.us</u>>
Cc: jdeal@hilcorp.com; Josh Adams <<u>jadams@ltenv.com</u>>
Subject: [EXT] Salty Dog Water Gathering System (NCSI1916853082)

#### Cory,

As I discussed on the phone with you on September 23, 2019, LTE, on behalf of Hilcorp, is requesting an extension for delineation of soil impacts at the Salty Dog Water Gathering System. The release occurred on April 29, 2019. Hilcorp recovered fluids and excavated approximately 925 cubic yards of soil. Based on the size of the excavation, Hilcorp contracted LTE to delineate the site on June 24, 2019 and evaluate alternative remediation options. Due to lack of drill rig availability, Hilcorp requested an extension to the 90-day requirement for site characterization and proposed a new deadline of September 27, 2019 (today). I have attached a report detailing the subsurface investigation activities conducted in August and September for your review. Seven boreholes and three monitoring wells were installed and sampled. Due to auger refusal in cobbles that restricted vertical progress in some borings and access issues to the north (topographical barriers consisting of a dry wash, a berm from a former gravel pit, and lack of road/access on private property), LTE was unable to fully characterize the site during one drilling window. There are elevated chloride concentrations in soil and groundwater and elevated TDS in groundwater samples. Additional delineation of soil is required to complete site characterization, understand background groundwater quality, and determine an appropriate remediation approach.

We have initiated scheduling with drilling contractors who have the ability to penetrate the cobbles. Hilcorp proposes to begin additional site work by the third week of October (no later than October 23, 2019). LTE will notify NMOCD immediately once the work is scheduled and will provide advanced 48-hour notification in writing prior to starting work. LTE will provide a verbal notification of findings to NMOCD and then submit a report (remediation work plan or Stage 1 Abatement Plan) 30 days after receipt of laboratory analytical results. We formally request an extension for full site characterization or Abatement Plan submittal until November 27, 2019.

Thank You, Ashley



Ashley Ager Senior Geologist/Vice President of Regional Offices 970.946.1093 *cell* 970.385.1096 *office* 848 East Second Avenue, Durango, CO 81301 www.ltenv.com



	State of New Mexico	Ĭno	ident ID	NC\$1916853082	
ge 2	Oil Conservation Division		trict RP	11001710055002	
		Fac	ility ID		
		Ар	plication ID		
Was this a major	If YES, for what reason(s) does the respo				
release as defined by	Considered a major release because it was 80bbls				
19.15.29.7(A) NWAC?	Considered a major release occause it wa	15 800015			
🛛 Yes 🗌 No					
If YES, was immediate n	otice given to the OCD? By whom? To w	hom? When and by what	means (phone, e	email, etc)?	
res. Email notification	was made to Cory Simuland Jim Griswold	on Thursday, May 50 @10	<i>.</i>		
<u> </u>	Initial D				
The responsible	Difficult in the following actions immediate	esponse a safe	tv hazard that woul	d result in iniurv	
The source of the rel	ease has been stopped.				
The impacted area ha	as been secured to protect human health and	d the environment.			
Released materials h	ave been contained via the use of berms or	dikes absorbent nads or o	ther containmen	t devices.	
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Form C-141 Page 3

State of New Mexico **Oil Conservation Division** 

Incident ID	NCS1916853082
District RP	
Facility ID	
Application ID	

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### 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>29-32</u> (ft bgs)
Did this release impact groundwater or surface water?	🗌 Yes 🛛 No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	🗌 Yes 🔀 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)?	🗌 Yes 🔀 No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	🗌 Yes 🔀 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?	🗌 Yes 🔀 No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	🗌 Yes 🛛 No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	🗌 Yes 🔀 No
Are the lateral extents of the release within 300 feet of a wetland?	🗌 Yes 🔀 No
Are the lateral extents of the release overlying a subsurface mine?	🗌 Yes 🛛 No
Are the lateral extents of the release overlying an unstable area such as karst geology?	🗌 Yes 🛛 No
Are the lateral extents of the release within a 100-year floodplain?	🗌 Yes 🛛 No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	🗌 Yes 🔀 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 source Determination of water sources and significant watercourses within 1/2-mile of the lateral extents of the release
- Χ Boring or excavation logs
- $\boxtimes$ Photographs including date and GIS information
- X 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.

ceived by OCD: 11/18/20	)19 1:34:59 PM					Page 4 of
Form C-141 State of New Mexic		of New Mexico			Incident ID	NC\$1916853082
Page 4	age 4 Oil Conservation Div	nservation Division	sion	District RP	11001710033002	
					Facility ID	
					Application ID	
regulations all operators a public health or the enviro failed to adequately inves addition, OCD acceptance and/or regulations. Printed Name: Jennifer Signature:jdeal@hi	re required to report and onment. The acceptance tigate and remediate con of a C-141 report does Deal	Deel Telephone:505	Title: En Date:5-801-6517_	ind perform consolered relieve the idwater, surfative for complexity for complexi	orrective actions for refe e operator of liability sh- ice water, human health liance with any other fea l Specialist	ases which may endanger ould their operations have or the environment. In deral, state, or local laws
Received by: OC	D		_ I	Date: 11/1	8/2019	

Received by OCD: 11/18/2019 1:34:59 PM

Form C-141 Page 5 State of New Mexico Oil Conservation Division

Incident ID	NCS1916853082
District RP	
Facility ID	
Application ID	

# **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. Title: Environmental Specialist Printed Name: Jennifer Deal Signature: email: jdeal@hilcorp.com Telephone: 505-801-6517 **OCD Only** Received by: OCD Date: 11/18/19 Approved with Attached Conditions of Approval Approved Denied Deferral Approved long his Date: 2/17/2020 Signature:

From:	Smith, Cory, EMNRD
To:	"jdeal@hilcorp.com"
Cc:	"Josh Adams"; "Ashley Ager"; Powell, Brandon, EMNRD
Subject:	RE: Salty Dog Water Gathering System (NCSI1916853082)
Date:	Monday, February 17, 2020 1:39:00 PM
Attachments:	image001.png
	image002.png
	image003.png
	image004.png

Mrs. Deal,

OCD received the Site Characterization and Remediation plan for the Salty Dog Water Gathering System incident# nCS1916853082 on November 18, 2019 and has approved the plan with the following conditions of approval.

• HEC will submit a Stage 1 or Stage 1 &2 Abatement plan per 19.15.30 NMAC no later than April 1, 2020

The incident# has been assigned to AP#139 please include this tracking number in all future submittals/communication along with the incident#.

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410 (505)334-6178 ext 115 cory.smith@state.nm.us

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If you have any additional questions please give me a call.

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Subject: [EXT] Salty Dog Water Gathering System (NCSI1916853082)

#### Cory,

As I discussed on the phone with you on September 23, 2019, LTE, on behalf of Hilcorp, is requesting an extension for delineation of soil impacts at the Salty Dog Water Gathering System. The release occurred on April 29, 2019. Hilcorp recovered fluids and excavated approximately 925 cubic yards of soil. Based on the size of the excavation, Hilcorp contracted LTE to delineate the site on June 24, 2019 and evaluate alternative remediation options. Due to lack of drill rig availability, Hilcorp requested an extension to the 90-day requirement for site characterization and proposed a new deadline of September 27, 2019 (today). I have attached a report detailing the subsurface investigation activities conducted in August and September for your review. Seven boreholes and three monitoring wells were installed and sampled. Due to auger refusal in cobbles that restricted vertical progress in some borings and access issues to the north (topographical barriers consisting of a dry wash, a berm from a former gravel pit, and lack of road/access on private property), LTE was unable to fully characterize the site during one drilling window. There are elevated chloride concentrations in soil and groundwater and elevated TDS in groundwater samples. Additional delineation of soil is required to complete site characterization, understand background groundwater quality, and determine an appropriate remediation approach.

We have initiated scheduling with drilling contractors who have the ability to penetrate the cobbles. Hilcorp proposes to begin additional site work by the third week of October (no later than October 23, 2019). LTE will notify NMOCD immediately once the work is scheduled and will provide advanced 48-hour notification in writing prior to starting work. LTE will provide a verbal notification of findings to NMOCD and then submit a report (remediation work plan or Stage 1 Abatement Plan) 30 days after receipt of laboratory analytical results. We formally request an extension for full site characterization or Abatement Plan submittal until November 27, 2019.

Thank You, Ashley



Ashley Ager Senior Geologist/Vice President of Regional Offices 970.946.1093 *cell* 970.385.1096 *office* 848 East Second Avenue, Durango, CO 81301 www.ltenv.com





LT Environmental, Inc. Advancing Opportunity

# REMEDIATION WORK PLAN

# SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO

November 2019

Prepared for:

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Prepared by:

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#### **REMEDIATION WORK PLAN**

#### SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO

Project Number: 017819014

Jun Adams

Prepared by:

Josh Adams LTE Staff Geologist November 15, 2019

Date

Ashley L. ager

Reviewed by:

Ashley Åger, M.S., P.G. LTE Senior Geologist November 15, 2019

Date



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#### **REMEDIATION WORK PLAN**

LT Environmental, Inc. (LTE), on behalf of Hilcorp Lower 48 (Hilcorp), presents this Remediation Work Plan associated with subsurface impacts encountered at the Salty Dog Water Transfer Station (Site), incident number NCS1916853082. This plan details the Site description and background, initial response and assessment, and site characterization. The plan presents the findings of soil delineation activities and proposes additional investigation of groundwater with a deadline to submit a Stage 1 Abatement Plan per Title 19, Chapter 15, Part 29 (19.15.29) and 19.15.30 of the New Mexico Administrative Code (NMAC).





#### **1.0 SITE DESCRIPTION AND BACKGROUND**

The Salty Dog Water Transfer Station (Site) is located approximately 1,146 feet south of the San Juan River in Unit N of Section 18 of Township 29 North, Range 13 West, San Juan County, New Mexico (Figure 1). The Site is an active water gathering system located approximately 1.5 miles southwest of Four Corners Regional Airport, north of the Upper Fruitland Highway (Indian Route 36). On April 29, 2019, approximately 80 barrels (bbls) of produced water were released from a pipeline due to corrosion. Upon discovery, Hilcorp Lower 48 (Hilcorp) isolated and de-energized the waterline for repair, dispatched a vacuum truck to the Site for fluid recovery, and submitted an initial C-141 to the New Mexico Oil Conservation Division (NMOCD) on May 13, 2019. The NMOCD assigned incident number NCS1916853082 to the release.

#### 1.1 Site Characterization

The Site is approximately 1,146 feet south of the San Juan River and approximately 25 feet higher in elevation then the San Juan River (Figure 2). Boreholes at the Site indicate groundwater is present between approximately 29 to 32 feet below ground surface (bgs). The closest water well to the Site, SJ-03509, is located approximately 1,800 feet north of the Site (Figure 2); however, no water data is available for this well. The closest water well with reported data is SJ-02635, with a depth to water reported at 11 feet bgs and total depth of the well at 23 feet bgs. That water well is located approximately 3,000 feet north of the Site (Figure 2). The nearest significant watercourse to the Site is an unnamed arroyo located approximately 830 feet to the southeast (Figure 2). The Site is greater than 200 feet from any lakebed, sinkhole, or playa lake, and greater than 300 feet from any wetland.

Surface land use surrounding the Site consists of surface sand and gravel mining of alluvial deposits and natural gas development. No occupied permanent residences, schools, hospitals, institutions, or churches are within 300 feet of the Site. The nearest residence is located approximately 1,600 feet northwest of the Site. The Site is not within the area of a subsurface mine or unstable area and is not within the 100-year floodplain.

Geology at the Site was determined through observations during excavation of impacted soil and a soil boring investigation. Near-surface soil consists mainly of silty sand with gravel and cobbles from ground surface to depths immediately above the saturated zone (22 to 32 feet bgs). Clayey soil is present in a confining layer underlying the silty sand/cobbles, followed by sandy lithologies within the aquifer. Boring Logs are included as Appendix A.

LTE characterized the Site according to Table 1, *Closure Criteria for Soils Impacted by a Release*, of 19.15.29.12 NMAC. Due to the Site having a depth to groundwater of less than 50 feet, the following NMOCD Table 1 closure criteria apply: 10 milligrams per kilogram (mg/kg) benzene; 50 mg/kg total benzene, toluene, ethylbenzene, and total xylenes (BTEX); 100 mg/kg total petroleum hydrocarbons (TPH); and 600 mg/kg chloride.

#### **1.2** Initial Discovery and Response

On April 29, 2019, 80 bbls of produced water were released due to a waterline failure approximately 250 yards east of the natural gas well RPC 18-3. Upon discovery, the waterline was isolated, de-energized, and





repaired. A vacuum truck was dispatched to the Site and recovered approximately 65 bbls of released water. Hilcorp further responded by excavating approximately 160 cubic yards (yds<sup>3</sup>) of impacted soil at the Site. The total extent of the excavation was approximately 45 feet by 85 feet, with an average depth of 8 feet bgs (Figure 3).

On June 24, 2019, Hilcorp retained LTE to delineate the extent of impacted soil and groundwater at the Site. Due to changes in drill rig availability, delineation activities did not begin until August 30, 2019. Because of this delay, Hilcorp requested an extension to the 90-day requirement for Site characterization/closure reporting (as required in 19.15.29.11.A NMAC) and proposed a new deadline of September 27, 2019.

Initial drilling activities took place in August 2019; however, desired depths were not achieved due to shallow refusal of the hollow-stem auger in the cobbles at the Site. Subsequently, full delineation was not achieved during the initial drilling event. LTE submitted a *Site Investigation Report* to the NMOCD on September 27, 2019, in which Hilcorp requested a second extension from the NMOCD to achieve delineation of the impacted soil. The NMOCD granted the extension with the conditions of approval included in Appendix B on October 1, 2019, and instituted a deadline of November 18, 2019, to submit a *Remediation Work Plan*.





#### 2.0 SOIL AND GROUNDWATER SITE INVESTIGATION

After the release, LTE conducted soil and groundwater investigations at the Site to delineate the vertical and lateral extent of the impact. LTE utilized both hollow-stem auger and sonic drilling rigs to advance soil borings and install monitoring wells at the Site. Soil and groundwater samples were collected during these efforts to assess subsurface conditions and potential contaminant concentrations.

#### 2.1 Excavation Samples and Source Characterization

In August and October 2019, LTE collected soil samples for source characterization from the existing open excavation and from stained surface soils in the area of the release. LTE collected a total of three 5-point composite soil samples from the excavation; one from the excavation floor and two from the excavation sidewalls. Composite samples were collected approximately every 800 square feet of the excavation sidewalls and floor. LTE also collected one grab sample of stained surface soils within the release area (sample "Red Surface Soil"). These samples were collected to characterize soil in the source area at the Site, specifically soil within the excavation and surface soil adjacent to the excavation.

Soil samples were submitted for laboratory analysis of BTEX by United States Environmental Protection Agency (EPA) Method 8021, TPH-gasoline range organics (GRO), TPH-diesel range organics (DRO), and TPH-motor oil range organics (MRO) by EPA Method 8015, and Chloride by EPA Method 300.0. All collected samples were placed on ice to maintain a temperature of approximately 4 degrees Celsius (°C) and sealed in a cooler for delivery to Hall Environmental Analysis Laboratory (Hall), of Albuquerque, New Mexico, for analysis. Samples were labeled with the date and time of collection, sample name, sampler's name, and parameters to be analyzed. Strict chain-of-custody (COC) procedures were documented including the date and time sampled, sample number, type of sample, sampler's name and signature, preservative used, and analyses required. Soil sample analytical results from this event are summarized in Table 1.

#### 2.2 Delineation Activities

Between August 28, 2019, and October 22, 2019, LTE conducted soil delineation activities at the Site using a 75 Central Mining Equipment (CME) hollow-stem auger drilling rig and a sonic drilling rig. A total of fifteen boreholes were advanced at the Site ranging from 12 feet to 40 feet bgs. Soil borings were advanced near the release point, then outward from the known impacted area/open excavation. The soil borings were logged by an LTE geologist who observed the soil for visual staining and the presence or absence of odor. The soil was characterized by visually inspecting the soil samples, field screening the soil headspace using a photo-ionization detector (PID) to monitor for the presence of volatile organic vapors and assessing the presence of chloride using Hach<sup>®</sup> Quantab<sup>®</sup> titrator strips. A minimum of two soil samples from each soil boring were submitted for laboratory analysis of BTEX by EPA method 8021, GRO, DRO, and MRO by EPA Method 8015, and chloride by EPA Method 300.0. The sample-handling protocols described in Section 2.1 were repeated for these samples. Soil boring locations are presented on Figures 3 and 4.

Attempts were made to advance all soil borings into the saturated zone in order to install groundwater monitoring wells. Total depths of the soil borings varied based on depth to groundwater and subsurface conditions. Due to cobbly soil, shallow refusal was encountered in several borings advanced using hollow-





stem auger equipment during the August 2019 drilling event. In addition, borehole locations were limited laterally during the August 2019 delineation event due the following conditions: limited access directly north of the excavation due to a berm and steep topography; the minimum set-back distance from subsurface pipelines; the property east of the Site was inaccessible; and the existing open excavation prohibited drilling within the source area. Figure 5 depicts the obstructions to delineation activities and LTE's Boring Logs are included as Appendix A.

#### 2.3 Monitoring Well Installation

Prior to drilling, the New Mexico Office of the State Engineer (NMOSE) approved the application for the installation of groundwater-monitoring wells, on August 6, 2019, and on October 17, 2019. A total of 10 soil borings were advanced into the groundwater table around the known source area and completed as permanent wells (Figure 6). Groundwater-monitoring wells were constructed by installing screened casing across the groundwater interface and solid casing to surface. Wells were constructed out of 2-inch diameter Schedule 40 polyvinyl chloride (PVC) casing and 2-inch Schedule 40 PVC 0.010-inch slotted screen. Wells were completed with 10-20 silica sand pack to at least two feet above the screened interval, then sealed with hydrated bentonite chips, and then grouted to ground surface. Well completion diagrams are included on LTE's Boring Logs (Appendix A).

#### 2.4 Monitoring Well Development and Groundwater Sampling

Following well construction, monitoring wells were developed on September 9, 2019, and October 22, 2019, using a disposable bailer. Measurements of fluid levels were collected using an oil/water interface probe. During well development, 10 well casing volumes of groundwater were removed from each monitoring well or the well was purged dry. Monitoring wells were allowed to recharge for at least 24 hours after development prior to the collection of groundwater samples. LTE's Monitoring Well Development Forms are included as Appendix C.

To accurately determine groundwater elevations, a rotating laser level surveying tool was used to obtain elevation measurements of the top-of-casing for each well. These elevations, along with depth-togroundwater measurements in each well, are used to determine groundwater elevations in feet above mean sea level. Groundwater elevations were used to determine gradients and infer flow direction of groundwater at the Site.

On September 12, 2019 and October 24, 2019, groundwater monitoring wells were sampled by purging a minimum of three casing volumes from each well and collecting water quality parameters of the purged groundwater. The LTE Groundwater Sample Collection Forms are included as Appendix D.

As requested in the conditions of approval by the NMOCD (Appendix B), following notification of groundwater sampling, groundwater samples were submitted for laboratory analysis of volatile organic compounds (VOCs) by EPA Method 8260B, general water chemistry (GWC) parameters including total dissolved solids (TDS) by EPA Standard Method (SM) 2540C, pH by EPA SM4500-H+B/9040C, anions (bromide, chloride, sulfate, fluoride, nitrite-nitrate, and phosphorus) by EPA Method 300.0, and cations (calcium, iron, magnesium, potassium, and sodium) by EPA Method 200.7. All samples were placed on ice to maintain a temperature of approximately 4 °C and sealed in a cooler for delivery to Hall for analysis. Samples were labeled with the date and time of collection, sample name, sampler's name, and





parameters to be analyzed. Strict COC procedures were documented, including the date and time sampled, sample number, type of sample, sampler's name and signature, preservative used, and analysis required. Groundwater sample locations are presented on Figure 6.





#### **3.0 RESULTS**

#### 3.1 Soil Sample Results

Laboratory analytical results of soil samples collected by LTE during excavation and delineation sampling indicate concentrations of benzene and total BTEX were compliant with the NMOCD closure criteria for all soil samples. Two soil samples (MW07@2'-4 and Red Surface Soil) contained TPH values exceeding the NMOCD closure criteria with concentrations of 286 mg/kg and 880 mg/kg, respectively. All other results from collected samples were below laboratory detection limits for TPH values. No PID results from field screening samples indicated the presence of hydrocarbons; the highest PID reading for field screening was 9.1 parts per million (ppm) in soil sample "MW02 @ 2'-4'".

All source-characterization soil samples (Ex Bottom, NE wall of Ex, SW wall of Ex, and Red Surface Soil) exceeded the NMOCD closure criteria for chloride with concentrations ranging from 6,300 mg/kg in the bottom of the excavation to 57,000 in the stained soils near the excavation.

Soil samples collected from borings (MW02, MW06, MW07, MW09, MW10, MW12, MW13, and MW15) contained chloride concentrations exceeding the NMOCD closure criteria of 600 mg/kg. Overall, chloride exceedances ranged from 670 mg/kg in MW10 (at 12.5 feet to 15 feet) to 9,500 mg/kg in MW07 (at 2 feet to 4 feet). Figure 3 shows soil sample results for soils within the vadose zone, which occurs from surface to approximately 20 to 30 feet bgs at the Site depending on the well location. Chloride concentrations in the vadose-zone soils ranged from below the laboratory detection limit at distance in all directions from the release point to 9,500 mg/kg in MW07 at 2 feet to 4 feet bgs (close to the release point). Figure 4 shows soil-sample results for soils within the vadose zone groundwater interface (VZGI), which occurs from approximately 20 to 40 feet bgs at the Site depending on the well location. Chloride concentrations in the soils collected from the VZGI ranged from below the laboratory detection limit in MW03 (west of the release) and MW08 (northeast of the release) to greater than 1,000 mg/kg in all directions from the release (MW06, MW09, MW10, MW12, MW13, and MW15). The soil analytical results, as compared to the NMOCD closure criteria, are presented on Figures 3 and 4 and summarized in Table 1. The laboratory analytical reports are included as Appendix E.

#### 3.2 Groundwater Results

Depth to groundwater ranged from 23.10 feet below top of casing (btoc) in MW08 to 33.98 feet btoc in MW03. Based on measured groundwater elevation data, the groundwater flow direction is to the northwest with an overall change in elevation of 0.43 feet from the most upgradient well (MW15) to the most downgradient well (MW12). The average groundwater gradient between MW15 and MW12 was calculated to be approximately 0.002 feet per foot during the October 24, 2019 monitoring event. Groundwater elevations are summarized in Table 2. Groundwater elevations and inferred flow direction are presented on Figure 6.

Laboratory analytical results of the groundwater samples collected from MW12 on October 24, 2019, indicate that concentrations of benzene exceeded the New Mexico Water Quality Control Commission (NMWQCC) standards with a concentration of 26 micrograms per liter ( $\mu$ g/l). All other groundwater sample concentrations were below the laboratory detection limit for VOCs. The NMWQCC standards for sulfate and chloride were exceeded in all 10 groundwater samples; concentrations of sulfate ranged from 1,600 milligrams per liter (mg/L) in MW03 to 3,100 mg/L in MW08; concentrations of chloride ranged





from 1,500 mg/L in MW08 to 27,000 mg/L in MW12. Fluoride concentrations in MW08 and MW13 also exceeded the NMWQCC standards with values of 2.8 mg/L and 4.4 mg/L, respectively. Analytical results indicated that concentrations exceeding the NMWQCC standard for TDS were detected in all groundwater samples, with concentrations ranging from 6,370 mg/L in MW15 to 57,000 mg/L in MW12. All other analytes from groundwater samples collected during this sampling event were compliant with the NMWQCC standards for groundwater. Groundwater analytical results for benzene, chloride, and TDS are presented in Figure 6 and summarized in Table 3. The complete laboratory report is included in Appendix E.





#### **4.0 CONCLUSIONS**

#### 4.1 Soil

Petroleum hydrocarbon and chloride impacts to soil were delineated by LTE during the 2019 delineation events. Figure 3 presents vadose zone soil sample results, in which all outermost delineation points are compliant with the NMOCD Closure Criteria. However, petroleum-hydrocarbon and chloride-impacted soil still remain at the surface near the pipeline and within and surrounding the excavation at depths ranging from surface to 25 feet bgs. The lateral impact extent of chloride and petroleum-hydrocarbon soils is estimated to be approximately 30 feet by 90 feet. It is estimated that approximately 1,000 cubic yards of impacted soil remain in place at the Site within the vadose zone. This soil was likely impacted as a result of the pipeline release. The vadose-zone soil impacted by the release has been delineated (Figure 3).

Chloride concentrations exceeding Closure Criteria are present deeper within the saturated soil and near the VZGI. Figure 4 depicts the elevated chloride concentrations in the VZGI soil, which are observed in both upgradient and downgradient borings. The elevated chloride concentrations may be naturally occurring or originate from upgradient sources. Groundwater samples collected from upgradient wells (MW08 and MW15) also contain elevated chloride concentrations that likely are contributing to increased concentrations detected in saturated soil samples. Elevated chloride concentrations in the VZGI is not fully delineated laterally, but concentrations detected at elevated levels are within range of concentrations detected upgradient and therefore not likely the result of the release.

#### 4.2 Groundwater

As discussed above, soils within the VZGI contain elevated concentrations of chloride in both upgradient and downgradient areas. Similar results are observed in groundwater samples collected at the Site. Shallow aquifers within the San Juan River valley have been documented to contain elevated chloride and TDS concentrations (Stone, 1983), suggesting the upgradient groundwater data quality may be representative of naturally occurring conditions.

Although there is likely a natural contribution to elevated chloride concentrations at the Site, the data demonstrate an order of magnitude increase of TDS and chloride concentrations between upgradient wells and wells located near the release. Based on the data collected in upgradient wells, background concentrations of chloride and TDS range from 1,500 to 1,600 and 6,370 to 7,700 mg/L, respectively. Groundwater near the release contains chloride and TDS concentrations up to 27,000 and 57,000 mg/L, respectively.

Sulfate concentrations above the NMWQCC standards were observed in every groundwater sample collected at the Site; however, the distribution and similar concentrations detected across the Site suggest that these elevated levels are likely background concentrations. Two wells sampled (MW08 and MW13) contained fluoride concentrations above the NMWQCC standards. Fluoride in these wells is also interpreted to be naturally occurring in the aquifer, as again it is observed both cross- to up- and down-gradient of the release. As such, LTE proposes to eliminate these constituents as contaminants of concern.

Benzene was the only other constituent detected in groundwater at the Site at concentrations exceeding the NMWQCC standard. Benzene was detected in only one monitoring well (MW12). No detectable benzene concentrations were observed in any other groundwater or soil samples collected at the Site.





Although soil samples collected near the release contained TPH concentrations exceeding the Closure Criteria, no detectable BTEX concentrations were observed. The benzene detected in monitoring well MW12 is likely from a different source and is not related to the original pipeline release.

#### 4.2 Historical and Current Land Use

Prior to any oil and gas operations at the Site, the surrounding area was heavily mined for aggregates. A review of the historical imagery from the Site on the San Juan County assessor's maps shows the proximity of the Site to multiple different historical mining operations. During these operations, the surface and subsurface of the Site was affected by excavation, soil stockpiling, construction activities, equipment storage, water storage, and the potential leaching of fluids used at the surface by the mining companies. Mining and water-storage activities continue to this day adjacent to this Site. Previous and current operations may have contributed to elevated background concentrations of chloride, sulfate, fluoride, and TDS at the Site.





#### **5.0 REMEDIATION PLAN**

The impacted soil remaining in the vadose zone at the Site is delineated to an area at the release point. Soil in the saturated zone contains elevated chloride, but lateral distribution and consistency in concentrations suggest the condition is naturally occurring or the result of an upgradient source. Groundwater impacts, consisting of elevated chloride, TDS, and localized benzene, have been identified but remain undelineated. Due to elevated concentrations of chloride, TDS, and benzene in the monitoring wells and the inability to identify a definitive source of groundwater impact, LTE recommends additional groundwater investigation.

Hilcorp will propose a site investigation of groundwater in a Stage 1 Abatement Plan in compliance with 19.15.30.13 NMAC. The Stage 1 Abatement Plan will be accompanied by a draft public participation plan. The Stage 1 Abatement Plan and public participation plan will be submitted to the NMOCD by December 20, 2019. Hilcorp proposes to conduct the groundwater site investigation in January 2020, pending timely approval of the Stage 1 Abatement Plan by the NMOCD. In the event that groundwater impacts are determined to be from the original pipeline release, Hilcorp will submit a Stage 2 Abatement Plan by February 28, 2019, with proposed remediation options for impacted groundwater and soil. Hilcorp will conduct quarterly groundwater monitoring at the existing monitoring wells beginning in March of 2020. Hilcorp reserves the right to modify this timeline based on the time period required by NMOCD to review and approve submitted documents.

LTE appreciates the opportunity to provide this report to the NMOCD. If you have any questions or comments regarding this Remediation Work Plan, do not hesitate to contact Ashley Ager at (970) 385-1096 or via email at <u>aager@ltenv.com</u> or Jennifer Deal at (505)-599-3400 or at <u>jdeal@hilcorp.com</u>.



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FIGURES





P:\Hilcorp\GIS\MXD\017819014\_SALTY\_DOG\_WATER\_TRANSFER\017819014\_FIG01\_SITE\_LOCATION.mxc



P:\Hilcorp\GIS\MXD\017819014\_SALTY\_DOG\_WATER\_TRANSFER\017819014\_FIG02\_RECEPTOR\_MAP.mx



P:\Hilcorp\GIS\MXD\017819014\_SALTY\_DOG\_WATER\_TRANSFER\017819014\_FIG03\_SOIL\_ANALYTICAL\_VADOSE\_OCT\_2019.mxd



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# TABLES

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#### TABLE 1 SOIL ANALYTICAL RESULTS

SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	Field Headspace (ppm)	Chloride (ppm)**	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
Source Characterization Sa	mples							-	-				-
Ex. Bottom	8/28/2019	NA	NA	<0.024	<0.047	<0.047	<0.095	<0.213	14,000	<4.7	<9.0	<45	<58.7
NE Wall of Ex	8/30/2019	NA	NA	<0.023	<0.047	<0.047	< 0.093	<0.210	6,300	<4.7	<9.5	<47	<61.2
SW Wall of Ex	8/30/2019	NA	NA	<0.025	<0.050	<0.050	<0.099	<0.224	7,300	<5.0	<9.6	<48	<62.6
Red Surface Soil	10/21/2019	0.0	6,100	<0.024	<0.047	<0.047	<0.094	<0.212	57,000	<4.7	130	750	880
Soil Boring Samples	Soil Boring Samples												
MW01 @ 0' - 2'	8/30/2019	1.9	NA	<0.023	<0.046	<0.046	<0.093	<0.208	<60	<4.6	<9.2	<46	<59.8
MW01 @ 8' - 10'	8/30/2019	1.0	NA	<0.023	<0.047	<0.047	<0.094	<0.211	75	<4.7	<9.4	<47	<61.1
MW01 @ 10' - 12'	8/30/2019	1.0	NA	<0.024	<0.048	<0.048	<0.096	<0.216	84	<4.8	<9.8	<49	<63.6
MW02 @ 2' - 4'	8/29/2019	9.1	NA	<0.024	<0.048	<0.048	<0.096	<0.216	2,900	<4.8	<9.7	<48	<62.5
MW02 @ 16' - 18'	8/29/2019	4.8	NA	<0.025	<0.050	<0.050	<0.10	<0.225	1,800	<5.0	<8.6	<43	<56.6
MW02 @ 22' - 24'	8/29/2019	1.9	NA	<0.023	<0.047	<0.047	<0.094	<0.212	2,400	<4.7	<9.7	<48	<62.4
MW03 @ 14' - 16'	8/29/2019	7.6	NA	<0.025	<0.049	<0.049	<0.099	<0.222	190	<4.9	<8.7	<44	<57.6
MW03 @ 26' - 28'	8/29/2019	2.7	NA	<0.025	<0.050	<0.050	<0.10	<0.225	<61	<5.0	<8.8	<44	<57.8
MW04 @ 2' - 4'	8/30/2019	0.4	NA	<0.025	<0.049	<0.049	<0.098	<0.221	390	<4.9	<9.7	<48	<62.6
MW04 @ 16' - 18'	8/30/2019	1.1	NA	<0.023	<0.047	<0.047	<0.093	<0.210	160	<4.7	<9.7	<49	<63.4
MW04 @ 18' - 20'	8/30/2019	1.2	NA	<0.025	<0.050	<0.050	<0.099	<0.224	110	<5.0	<9.8	<49	<63.8
MW05 @ 25' - 30'	8/28/2019	5.0	NA	<0.024	<0.047	<0.047	<0.094	<0.212	390	<4.7	<9.8	<49	<63.5
MW05 @ 30' - 35'	8/28/2019	1.9	NA	<0.025	<0.050	<0.050	<0.099	<0.224	110	<5.0	<9.6	<48	<62.6
MW06 @ 25' - 30'	8/28/2019	1.9	NA	<0.024	<0.047	<0.047	<0.095	<0.213	1,700	<4.7	<9.6	<48	<62.3
MW06 @ 30' - 35'	8/28/2019	0.8	NA	<0.023	<0.046	<0.046	< 0.093	<0.208	2,100	<4.6	<9.9	<50	<64.5
MW07 @ 2'- 4'	8/29/2019	5.0	NA	<0.024	<0.049	<0.049	<0.097	<0.219	9,500	<4.9	36	250	286
MW07 @ 22' - 24'	8/29/2019	5.0	NA	<0.024	<0.049	<0.049	<0.097	<0.219	2,200	<4.9	<9.9	<50	<64.8
MW08 @ 2.5 - 5'	10/20/2019	0.2	<128	<0.024	<0.047	<0.047	<0.095	<0.213	<60	<4.7	<8.2	<41	<53.9
MW08 @ 20 - 22.5'	10/20/2019	0.4	<128	<0.025	<0.050	<0.050	<0.10	<0.225	<60	<5.0	<9.2	<46	<60.2
MW08 @ 22.5 - 25'	10/20/2019	0.3	<128	<0.025	<0.050	<0.050	<0.10	<0.225	69	<5.0	<8.4	<42	<55.4
MW08 @ 27.5 - 30'	10/20/2019	0.4	<128	<0.023	<0.047	<0.047	<0.093	<0.210	<60	<4.7	<8.9	<44	<57.6
MW09 @ 7.5 - 10'	10/20/2019	0.2	244	<0.024	<0.048	<0.048	<0.096	<0.216	410	<4.8	<9.0	<45	<58.8
MW09 @ 12.5 - 15'	10/20/2019	0.2	356	<0.025	<0.049	<0.049	<0.099	<0.222	370	<4.9	<9.6	<48	<62.5
MW09 @ 20 - 22.5'	10/23/2019	0.2	<128	<0.025	<0.050	<0.050	<0.10	<0.225	<60	<5.0	<9.6	<48	<62.6
MW09 @ 22.5 - 25'	10/20/2019	0.2	1,148	<0.024	<0.049	<0.049	<0.098	<0.220	1,100	<4.9	<7.2	<36	<48.1
MW09 @ 27.5 - 30'	10/20/2019	0.2	212	<0.023	<0.046	<0.046	<0.092	<0.207	370	<4.6	<9.2	<46	<59.8
MW10 @ 0 - 2.5'	10/21/2019	0.2	<128	<0.023	<0.046	<0.046	<0.092	<0.207	68	<4.6	<10	<50	<64.6
MW10 @ 2.5 - 5'	10/21/2019	0.3	<128	<0.024	<0.048	<0.048	<0.096	<0.216	120	<4.8	<9.3	<47	<61.1
MW10 @ 7.5 - 10'	10/21/2019	0.1	<128	<0.024	<0.048	<0.048	<0.096	<0.216	63	<4.8	<8.5	<42	<55.3
MW10 @ 10 - 12.5'	10/21/2019	0.9	776	<0.025	<0.049	<0.049	<0.099	<0.222	670	<4.9	<9.0	<45	<58.9
MW10 @ 12.5 - 15'	10/21/2019	0.6	<128	<0.025	< 0.050	<0.050	<0.10	<0.225	140	<5.0	<7.7	<39	<51.7



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#### TABLE 1 SOIL ANALYTICAL RESULTS

SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	Field Headspace (ppm)	Chloride (ppm)**	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW10 @ 15 - 17.5'	10/21/2019	0.6	<128	<0.025	<0.050	< 0.050	<0.10	<0.225	79	<5.0	<8.6	<43	<56.6
MW10 @ 17.5 - 20'	10/21/2019	0.4	184	<0.024	<0.048	<0.048	<0.096	<0.216	190	<4.8	<9.1	<45	<58.9
MW10 @ 20 - 22.5'	10/21/2019	0.4	184	<0.024	<0.049	<0.049	<0.098	<0.220	120	<4.9	<8.5	<43	<56.4
MW10 @ 22.5 - 25'	10/21/2019	0.2	<128	<0.024	<0.048	<0.048	<0.096	<0.216	<60	<4.8	<9.5	<48	<62.3
MW10 @ 25 - 27.5'	10/21/2019	0.4	184	<0.024	<0.048	<0.048	<0.096	<0.216	210	<4.8	<8.8	<44	<57.6
MW10 @ 27.5 - 30'	10/21/2019	0.7	988	<0.023	<0.046	<0.046	<0.093	<0.208	350	<4.6	<8.9	<44	<57.5
MW10 @ 30 - 32.5'	10/21/2019	0.2	656	<0.023	<0.046	<0.046	<0.093	<0.208	350	<4.6	<8.8	<44	<57.4
MW10 @ 32.5 - 35'	10/21/2019	0.2	1,148	<0.025	<0.050	<0.050	<0.099	<0.224	2,000	<5.0	<9.5	<48	<62.5
MW10 @ 37.5 - 40'	10/21/2019	0.6	<128	<0.024	<0.047	<0.047	<0.095	<0.213	240	<4.7	<8.4	<42	<55.1
MW11 @ 32.5 - 35'	10/21/2019	1.6	<128	<0.020	< 0.039	<0.039	<0.079	<0.177	130	<3.9	<9.2	<46	<59.1
MW11 @ 37.5 - 40'	10/21/2019	0.7	<128	<0.019	<0.038	<0.0.38	<0.076	<0.171	97	<3.8	<9.4	<47	<60.2
MW12 @ 15 - 17.5'	10/21/2019	0.5	280	<0.019	<0.038	<0.0.38	<0.076	<0.171	80	<3.8	<9.7	<48	<61.5
MW12 @ 20 - 22.5'	10/21/2019	0.3	356	<0.018	<0.036	<0.036	<0.071	<0.161	180	<3.6	<9.8	<49	<62.4
MW12 @ 35 - 37.5'	10/21/2019	0.3	280	<0.014	<0.027	<0.027	<0.055	<0.123	200	<2.7	<9.4	<47	<59.1
MW12 @ 37.5 - 40'	10/21/2019	0.3	5,420	<0.014	<0.028	<0.028	<0.056	<0.126	3,400	<2.8	<9.5	<47	<59.3
MW13 @ 10 - 12.5'	10/21/2019	0.3	212	<0.023	<0.046	<0.046	<0.093	<0.208	210	<4.6	<8.9	<44	<57.5
MW13 @ 25 - 27.5'	10/21/2019	1.0	156	<0.024	<0.047	<0.047	<0.095	<0.213	160	<4.7	<9.8	<49	<63.5
MW13 @ 32.5 - 35'	10/21/2019	0.4	2,472	<0.024	<0.048	<0.048	<0.096	<0.216	3,000	<4.8	<10	<50	<64.8
MW13 @ 37.5 - 40'	10/21/2019	0.3	<128	<0.023	<0.047	<0.047	<0.094	<0.211	<60	<4.7	<9.1	<46	<59.8
MW14 @ 5 - 7.5'	10/22/2019	0.8	<128	<0.024	<0.047	<0.047	<0.094	<0.212	<60	<4.7	<9.2	<46	<59.9
MW14 @ 20 - 22.5'	10/22/2019	1.0	212	<0.024	<0.047	<0.047	<0.094	<0.212	270	<4.7	<9.8	<49	<63.5
MW14 @ 25 - 27.5'	10/22/2019	2.5	184	<0.025	<0.050	<0.050	<0.099	<0.224	75	<5.0	<9.7	<48	<62.7
MW14 @ 27.5 - 30'	10/22/2019	2.2	<128	<0.024	<0.049	<0.049	<0.097	<0.219	<60	<4.9	<9.5	<47	<61.4
MW14 @ 30 - 32.5'	10/22/2019	2.1	128	<0.024	<0.049	<0.049	<0.097	<0.219	230	<4.9	<9.1	<46	<60.0



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#### TABLE 1 SOIL ANALYTICAL RESULTS

SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Soil Sample Identification	Sample Date	Field Headspace (ppm)	Chloride (ppm)**	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
MW15 @ 2.5 - 5'	10/22/2019	0.0	<128	<0.024	<0.048	<0.048	<0.095	<0.215	<60	<4.8	<9.8	<49	<63.6
MW15 @ 22.5 - 25'	10/22/2019	0.0	400	<0.023	<0.047	<0.047	< 0.093	<0.210	1,200	<4.7	<8.9	<44	<57.6
MW15 @ 27.5 - 30'	10/22/2019	0.0	988	<0.025	<0.049	<0.049	<0.099	<0.222	2,000	<4.9	<9.7	<49	<63.6
MW15 @ 30 - 32.5'	10/23/2019	0.1	212	<0.025	<0.050	<0.050	<0.10	<0.225	160	<5.0	<9.4	<47	<61.4
MW15 @ 32.5 - 35'	10/22/2019	0.0	2,472	<0.024	<0.048	<0.048	<0.095	<0.215	2,300	<4.8	<8.5	<42	<55.3
MW15 @ 37.5 - 40'	10/22/2019	0.0	<128	<0.023	<0.046	<0.046	<0.093	<0.208	96	<4.6	<8.7	<43	<56.3
NMOCD Closure	Criteria	NE	NE	10	NE	NE	NE	50	600	NE	NE	NE	100

#### Notes:

BTEX - benzene, toluene, ethylbenzene, and total xylenes analyzed by US EPA Method 8021B

DRO - diesel range organics analyzed by US EPA Method 8015D

GRO - gasoline range organics analyzed by US EPA Method 8015D

mg/kg - milligrams per kilogram

MRO - motor oil range organics analyzed by US EPA method 8015D

NA - not analyzed

NE - not established

NMOCD - New Mexico Oil Conservation Division

ppm - parts per million

TPH - total petroleum hydrocarbons (sum of GRO, DRO, and MRO)

Bold - indicates value exceeds NMOCD closure criteria

< - indicates result is less than the stated laboratory reporting limit

\*\* - chloride concentration using Hach Quantab titration strips



# TABLE 2 GROUNDWATER ELEVATION SUMMARY

# SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Well ID	Sample Date	Top of Casing Elevation (feet AMSL)	Depth to Groundwater (feet BTOC)	Groundwater Elevation (feet AMSL)
	9/12/2019		33.62	5,228.78
MW03	10/22/2019	5,262.40	33.92	5,228.48
	10/24/2019		33.98	5,228.42
	9/12/2019		33.36	5,228.75
MW05	10/22/2019	5,262.11	33.70	5,228.41
	10/24/2019		33.70	5,228.41
	9/12/2019		32.74	5,229.04
MW06	10/22/2019	5,261.78	33.05	5,228.73
	10/24/2019		33.08	5,228.70
	10/22/2019	5 252 50	23.80	5,228.70
1010000	10/24/2019	5,252.50	23.81	5,228.69
M/M/09	10/22/2019	5 252 28	23.94	5,228.44
1010009	10/24/2019	5,252.38	23.93	5,228.45
N4)4/10	10/22/2019	E 2E0 28	30.59	5,228.69
	10/24/2019	3,239.28	30.60	5,228.68
N/1N/1 2	10/22/2019	E 2E0 2E	30.85	5,228.40
	10/24/2019	5,239.25	30.83	5,228.42
N//\\/12	10/22/2019	F 260 22	31.81	5,228.51
MW13	10/24/2019	5,200.32	31.83	5,228.49
MW14	10/22/2019	5 259 67	30.92	5,228.75
	10/24/2019	5,233.07	30.92	5,228.75
N/\\/15	10/22/2019	5 256 00	27.20	5,234.58
MW15	10/24/2019	3,230.00	27.15	5,228.85

# Notes:

AMSL - above mean sea level

BTOC - below top of casing



SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Analyte	NMWQCC	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
Analyte	Standard	Unit	12-Sep	12-Sep	12-Sep	24-Oct						
USEPA Method 8260B - Volatiles												
benzene	10	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	26	<1.0	<1.0	<1.0
toluene	750	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	12	<1.0	<1.0	<1.0
ethylbenzene	750	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.6	<1.0	<1.0	<1.0
methyl tert-butyl ether (MTBE)	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trimethylbenzene	620	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trimethylbenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloroethane (EDC)	10	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromoethane (EDB)	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
naphthalene	NE	μg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1-methylnaphthalene	NE	μg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-methylnaphthalene	NE	μg/L	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
acetone	NE	μg/L	<10	<10	<10	11	<10	<10	<10	<10	<10	<10
bromobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromodichloromethane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromoform	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromomethane	NE	μg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-butanone	NE	μg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
carbon disulfide	NE	μg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
carbon tetrachloride	10	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chlorobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloroethane	NE	μg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
chloroform	100	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
chloromethane	NE	μg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-chlorotoluene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-chlorotoluene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-DCE	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,3-dichloropropene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromo-3-chloropropane	NE	μg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
dibromochloromethane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dibromomethane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-dichlorobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-dichlorobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
dichlorodifluoromethane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethane	25	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-dichloroethene	5	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichloropropane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Analyta	NMWQCC	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
Analyte	Standard	Unit	12-Sep	12-Sep	12-Sep	24-Oct						
1,3-dichloropropane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,2-dichloropropane	NE	μg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-dichloropropene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
hexachlorobutadiene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-hexanone	NE	μg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
isopropylbenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-isopropytoluene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
4-methyl-2-pentanone	NE	μg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
methylene chloride	100	μg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-butylbenzene	NE	μg/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
n-propylbenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
sec-butylbenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
styrene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
tert-butylbenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1,2-tetrachloroethane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-tetrachloroethane	10	μg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
tetrachloroethene (PCE)	20	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-DCE	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichlorobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane	60	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-trichloroethane	10	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichloroethene (TCE)	100	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trichlorofluoromethane	NE	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,3-trichloropropane	NE	μg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
vinyl chloride	1	μg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
xylenes, total	620	μg/L	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	22	<1.5	<1.5	<1.5

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SALTY DOG WATER GATHERING SYSTEM
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Analyta	NMWQCC	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
Analyte	Standard	onit	12-Sep	12-Sep	12-Sep	24-Oct						
USEPA Method 300.0: Anions												
bromide	NE	mg/L	13	15	5.5	2.4	3.9	3.4	35	24	3.9	2.7
chloride	250	mg/L	13,000	15,000	5,300	1,500	3,300	2,700	27,000	19,000	2,900	1,600
sulfate	600	mg/L	1,600	2,300	2,300	3,100	1,900	2,200	2,400	1,600	1,900	1,700
fluoride	1.6	mg/L	<10	<1.0	<1.0	2.8	<0.50	<0.50	<0.50	4.4	<0.50	<0.50
Nitrogen, Nitrite as N	NE	mg/L	19	20	<10	<0.50	<2.0	<2.0	<20	<20	<2.0	<0.50
Nitrogen, Nitrate as N	NE	mg/L	<10	21	1.0	3.0	3.1	3.5	<20	<20	5.8	2.1
phosphorus, orthophosphate (As P)	NE	mg/L	<50	<5.0	<5.0	<10	<2.5	<10	<2.5	<2.5	<2.5	<2.5
USEPA Method 6010B: Dissolved Met	als											
Calcium	NE	mg/L	2,500	2,100	1,100	580	1,100	600	2,800	3,400	960	720
Magnesium	NE	mg/L	390	750	170	200	190	82	400	440	160	130
Potassium	NE	mg/L	27	25	16	9.0	14	9.1	75	37	12	9.5
Sodium	NE	mg/L	6,600	7,800	3,500	1,800	1,600	2,300	18,000	11,000	1,900	1,400
Standard Method 2320B: Alkalinity												
bicarbonate (As CaCO3)	NE	mg/L	137.8	153.9	200.8	NT						
carbonate (As CACO3)	NE	mg/L	<2.000	<2.000	<2.000	NT						
total alkalinity	NE	mg/L	137.8	153.9	200.8	NT						

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SALTY DOG WATER GATHERING SYSTEM SAN JUAN COUNTY, NEW MEXICO HILCORP ENERGY COMPANY

Analyta	NMWQCC	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
Analyte	Standard	onic	12-Sep	12-Sep	12-Sep	24-Oct						
Standard Method 2510B: Specefic Con	nductance											
conductivity	NE	µmhos/c	45,000	54,000	22,000	NT						
USEPA Method SM2540C Modified: To	otal Dissolved So	olids										
total dissolved solids	1,000	mg/L	30,000	34,000	13,600	7,700	8,410	8,040	57,000	40,400	8,860	6,370
USEPA Method SM4500-H+B/9040C:	РН											
рН	6-9	pH units	7.41	7.25	7.49	7.76	7.35	7.24	7.34	7.17	7.29	7.45

Notes:

BOLD - indicates concentration exceeds the NMWQCC standard

µg/L - micrograms per liter

µmhos/c - micro ohms per centimeter

mg/L - milligrams per liter

NE - not established

NMWQCC - New Mexico Water Quality Control Commission

NT - not tested

USEPA - United States Environmental Protection Agency



*Received by OCD: 11/18/2019 1:34:59 PM* 

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Elevation: Gravel Pace Casing Typ Screen Typ	5,258' "NA "NA "NA		Estimate Detector: Quar	Pi D/ Slot:	hloricle	Strip		Boring/Well Date: Logged By: Drilling Met Hollow Seal: Hydrate Diameter: Diameter:	BORING LOG/MONITORING INumber: MWDI 8 30.19 thod: Stem Auger d Bentonite Chips Length: Length:	VELL COMPLETION Project: Salty Project Number: 017819014 Drilled By: Enviro-Drill Sampling Method: Split Spoon G Grout: NA Hole Diameter: St Total Depth:	Depth to Liquid:
tration stance	isture	r (ppm)	aining?	ple #	Depth	Sample	overy	/Rock /pe	l ithology/Ber	12°	Well Completion
Pene Resi	Moi	Vapoi	HC St	Sam	(ft. bgs.)	Run	Rec	Soil/ Ty			Wen completion
	Dry	1.9	No		012	-		SM	Brown fine to m Silty sand. Cl = 22840pp	edium	
	Dry	2.5	No		3 4	2	MUNNIN	SM	5AA cl = < 2840 ppm		
	DN	1.3	No		5	3		5m	57A cl= 22840 ppm		
	Dry	0.8	No		78	4	IN ANNOUND	SM	SIAIA Cl = 22840 ppm		
	Dry	1.0	No		9 10	5	MANAN	SM	SAA C1 = C2840 ppm		
	Dry	1.4	No		11 12	6	<b>LUNIWWWWWWW</b>		SAA Cl=z2840 ppm		
					13 14 15				TD= 12°, stopped a clean samples.	lue to	

Elevation: Gravel Pace Casing Typ Screen Typ	5,258' k: MA e: NP e:		Salloor Detector:	PID/G	Juanta	b		Boring/We Date: Logged By: Drilling Me Hollow Seal: Hydrate Diameter: Diameter:	BORING LOG/MONITORING BORING LOG/MONITORING IN Number: MW02 8:29 19 C M thod: Stem Auger thod: Stem Auger Length: Length:	VELL COMPLETION Project: Salty Project Number: 017819014 Drilled By: Enviro-Drill Sampling Method: Split Spoon	Diagram Dog
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	narks	Well Completion
	Dry	3.3	ND		0	- 1	NUMMIN NUM	sp- sm	Dark brown, poor Sand with SII- gravel CI = 102.0ppm	ty graded. F drig	
	Dry	9.1	NO	MW02	3	2	Un	sp- sm	577A CI= 1370ppm		
	Dri	1.0	No		5	3	Y	SP- SM	SAA cl = 1020		
	DM	3.7	No		7	4		sp. Sm	SAA CI = 910 ppm	-	
	DM	1.5	No		9 10	5		sp- sm	SAA CI=910 ppm	-	
	Dry	3.1	No		11 12	Le		SP- SM	SAA U= 820 ppm		
	Dry	2.8	No		13 14	7	M	sp- sm	SAA Cl=910ppm		
					15						·

1	T	<b>P</b> A	dvanc	ing O	oportur	nity			Boring Pro Pro	;/Well # jject: ject #	MW02 Salty Dog 017819014	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		Litho	logy/Remarks	Well Completion
	DM	1.4	NO		15 16	8	MMMM	SP- SM	SAA	Cl=8	20ppm	Ī
	Dry	4.8	No	16-18	17 18	9	MMMMM	sp- sm	SAA	Cl = (	40ppm	±
	Dry	3.)	No		19 20	10	10 Miles	SP- Sm	SAR	el: 19	500ppm	
	Dry	2.4	No		21 22	- 1)	ANNUAR	SP- SM	SAA	Cl = 9	20ppm	±
	Dry	1.9	No	PC 200	23 24	12	INNANAW	SP- SM	SAR	Cl=	1020ppm	
					25 26 27 28 29 30 31 32 33 34 35 36				TD = Hit	24' refus	al, cobbleo.	

Elevation: 5,258' Gravel Pack: 10-20 Silica San Casing Type: Schedule 40 Screen Type:	ad PVC	Sature Detector:	PIDIO Ide	uanta staps D 0	ь 3'- 35 '-25'		Boring/We Date: Logged By: Drilling Me Hollow Seal: Hydrate Diameter:	BORING LOG/MONITORING BORING LOG/MONITORING Il Number: MW03 8 · 2 9 · 19 CM thod: Stem Auger ed Bentonite Chips 2"	VELL COMPLETION Project: Project Number: 017819014 Drilled By: Enviro-Drill Sampling Method: Split Spoon 24 Grout: Bentonite-Cement Hole Diameter: S	DIAGRAM Dog Slurry Depth to Liquid:
Schedule 40	PVC	_	0.0	010" 3	5'-35	~ ~	Danieter:	2" (D)	35	32
Penetration Resistance Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	marks	Well Completion
Dry	1.5	No		0 - 1 - 2		all lin	Sm	Brown fine silty gravel Cl = 230ppm	sand with	
Dry	2.0	No		3 4	2		Sm	SAA Cl = 230ppm		
Dry	3.7	No		5	3		Sm	SAA Cl = 230ppm		
Dry	4.4	No		7	4	NUCLU	Sm	Brown fine silty CI= 230ppm	sand,	
Dry	4.7	No		9 10	5	Munnin	SM	SAA Cl= 230ppm	-	
Dry	2.4	No		11 12	6	NUM (I)	SM	SAA Cl= L30PPM	-	
Dry	-	-		13 14	7			No recovery, Lob	bles	
				15						

1	<u>i</u> f	PA	dvand	cing O	pportui	nity			Boring/Well # Project: Project # Date	MW03 Salty Dog 017819014 8:29:19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion
	Dry	7.6	No	191 171 5007110	15 16	8		SM	gravel cl.	silty sand with 300ppm	
	Dry	69	No		17 18	9		SM	Brown fine cl = 230pp	silty sand	
	Dny	5.7	No		19 20	10		sm	SAA Cl= 230ppn	0	
	Dry	9.8	No		21	()		รทา	Brown fir Cl= 430ppn	ne silty sand	
	Dry	11.1	No		23	12		SM	Brown.orang sand cl=	e Ane silty 230ppm	
	Dry	7.2	No		25	13		sw-	Black, brown with silt cl = 230ppr	and graded sun	
	Dry	2.7	No	NW03	27	14		SW- SM	5AA (1=2)	30ppm	
	moist	1	No		29	15	23		No recoven	t	
	wet	1.9	No		31 32	10	WW	sw- sm	Dark brown Cl = 430ppm	) 511+	
	wet	4	No		33 34	17		sw. sm	Park brown Cl = 910ppm	silty sand	
	wet	2.6	No		35	18			SAA $CI = L04$	Oppm	
					36 37				TD=35' Gui	0@ 32`	<del>-</del>

= Sand == screen == Bentonite - Cement Slurry = Casing . Ground water

Elevation: Gravel Pace Casing Typ	5,258' k* NP e* NF		Salwo Detector: On 10	PID/O	auent	ab		Boring/Well Date: Logged By: Drilling Met Hollow S Seal: Hydrate Diameter:	BORING LOG/MONITORING INumber: MWO4 & 30 · 19 CM chod: Stem Auger d Bentonite Chips- Length:	Vancing Opp WELL COMPLETION Project: Salty Project Number: 017819014 Drilled By: Enviro-Drill Sampling Method: Split Spoon Grout: NA Hole Diameter: S1	Diagram Dog
Screen Typ	e: NF	7		Slot:				Diameter:	Length:	Total Depth: 21	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	narks	Well Completion
	Dry	0.5	No		0	- - -		SM	Brown very fine Sand W/ grave Cl = 22840	silty 1 Ippm	
	Dry	0.4	No	mulot 2'-4'	3	2		sm	san <sub>Cl=</sub> -284		
	Dry	0.3	No		5	3	1100	SM	Brown silty so Cl= 22840pp	ind .	
	Dry	0.6	No		7	4		Sm	SAR CI = 42840	)ppm	
	Dry	0.6	No		9 10	5		Sm	Brown Silty Sa Cl= 22840pp	nd m	
	Dry	0.4	No		11 12	6		SW	SAA Cl=2284	+Oppm	
	Dry	0.6	No		13 14	7		sm	SAA CI= 22840		
					15						

	-	~					_		Boring/Well #	(M14)04	1
	4		duarra	in a	and a selection	. //			Project:	Salth Doa	
1		A	ovanc	ing U	рропи	וונא			Project #	017819014	
C	/							_	Date	8.30.19	1
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion
	Dry	14	No	2	15 16	8	NUMM		Brown silt	y sound with = 22840ppm	+
	Dry	0.6	No	Muuch 16'-18'	17	9			SAA Cl =	2 2840ppm	÷
	Dry	1.2	No	Murch 8'-20'	19	10			SAA CI=	22840ppm	
	Dry	1			20	11	-		No Recoven	1, cobbies	‡
					22				TD= 21°, H	rit refusal du	
					24	-					
					25 26						
					27						‡
					28 -						±
					30						‡
					32						
					33						‡
					34						1
					36						÷
	-			· · · · ·	37						

Elevation: 5,258' Gravel Pack: 10-20 Silica Sant Casing Type: Schedule 40	d	Detector: Chlov	PID/O	uantab tabs 23	) - 25		Boring/We Date: Logged By: Drilling Me Hollow Seal: Hydrate Diameter:	BORING LOG/MONITORI INumber: MW05 8:28:19 CM thod: Stem Auger d Bentonite Chips	NG WELL COMPLETIC Project: Sa Project Number: 017819014 Drilled By: Enviro-Drill Sampling Method: Split Spoon Grout: Bentonite-Cemer Hole Diameter:	DN DIAGRAM Ity Dog nt Slurry 0-23 Depth to Liquid:
Screen Type:	DVC		Slot:		51.20	,	Diameter:	Length:	Total Depth:	Depth to Water:
Penetration Resistance Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	2" IO Lithology/I	Remarks	29 Well Completion
Dry	3.4	No		0 1 2 3 4 5		物がしている		Brown silty Cl= 230pp	sand	
Dry	_	No		6 7 8 9 10	2			SAA Not Chough re Sample Cl = 490ppn	covery to	
Dry	5.3	No		11 12 13 14 15	3			Brown silty s grawel Cl = 230ppm	sand with	

= Bentonite - Cement-Slurry 2

							-		Boring/Well #	MWD5	
			duand	ina A	nnorte	nih.			Project:	Salty Dog	
1		A	uvanu	ing 0	pportui	шу			Project #	01781914	
9		-		1	-		_		Date	8.28.19	
Penetratior Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
					15 _			SM	Brown silt	1 sand	+///
					16	-			C1= 230pp	n)	
	moist	3.9	NO		17	- 4					I III
					19	-					
					20	-					
				1140 50 -1 -1 -1							
					22	-	Circlust	ing sand with			
	un del	8.8	NO		23	5			y wei.		Ŧ/
	mast				24	-			Cl = 2.30 pf	n n	-1-1-1-1-1-1
					25	-					
				ŝ	26	-			Brown SI	4. 5 1	
	1 - I			1	27	-		SM		sund	
		5	No	S.		.6			a= 340	ppm	
	Wet			С О	28						
				3	29	-	~	~	h	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-
				٤	30		_		GW @ 29		138 - 78
				ŝ	31				C. C.		1
				R	32				aray si	1+, compace.	
-	Dry	[.9	No	30	22	7			C = 120	20000	Tre Third
	Ŭ			6	55	1 1				1-1-11	
				NO NO	34 -						+YES!
				ξ	35						
					36				TD: 35 , 5	topped after	1
		_			37				MITTING G	IW.	†
	1.1	:]=5	and	E		Scre	cr		= Casir	19 27 = Ben	tonite -Ceme

= Ground water

	Levier And	Sallyeig					Boring/Well Date: Logged By:	BORING LOG/MONITORING INUMBER: MWOW 8 · 28 · 19	Vancing Opp WELL COMPLETION Project: Salty Project Number: 017819014 Drilled By:	DIAGRAM Dog
Elevation: 5.258		Detector:	210/0	uanto	eb	1923	Drilling Met	hod: Stem Auger	Sampling Method:	24"
Gravel Pack: 10-20 Silica San	ıd		In the	23	-35		<sub>Seal:</sub> Hydrate	d Bentonite Chips	Grout: Bentonite-Cement	Slurry 0'-23
Casing Type: Schedule 40	PVC			Ø	-25'		Diameter:	Length: 25	Hole Diameter:	Depth to Liquid:
Screen Type: Schedule 40	PVC		Slot: 0.0	10" 2	5'-35	`	Diameter:	Length: 10	Total Depth: 35'	Depth to Water:
Penetration Resistance Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rer	marks	Well Completion
Dry	$\frac{5}{9} \xrightarrow{1}{9} \xrightarrow{1}$						SM	Brown fine si CI = 230ppm	Ity sand -	
maist	30 NO 7 2 8 9 10					WWWWWWWWWWWWWWWWWWWWW	SM	Brown fine : Sand with C Cl = 340ppm	5ilty grovel	
	2.4	No		11 12 13 14 15	3	MUMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM	SM	SAA Cl = 230ppm		

٢	Į,	<b>P</b> A	dvanc	ring O	oportur	nity			Boring/Well # Project: Project # Date	MWD6 Salty Dog 01789014 8.28.19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	logy/Remarks	Well Completion
	maist	1.3	No		15 16 17 18 19 20	4	MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM	SM	5717 Cl = 300pp	CUC.	
	Dry	1.7	No		21 22 23 24 25	5	MANNANAM	SM	SAA CI = 2301	opm	
	wet	1.9	No	OF Se nonn	26 27 28 29	9	NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	SM	Brown Sil Cl=1370p GW029	ty sand pm	
	Dry	D.8	No	M WWOR 30, 32, W	30 31 32 33 34 35	7	MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM		Gray si Cl= 1370	lt.compact )ppm	
					36 37				TO=35' H	+ GW @ 29'	

=Sand = Screen = Casing Z= Bentonik-cement Shurry 2

A Charles	1. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		salt Qu					0	BORING LOG/MONITORING	Vancing Op	DORTUNITY
10.10		sen.		1		Paris .	1	Boring/Wel	Number:	Project: Salt	/ Dog
	1	12	ALC ALC		1		御	Date:	8.29.19	Project Number: 017819014	
Flourier		17.47	Instanton	201	1	1.00	1	Logged By:	cm	Drilled By: Enviro-Drill	
Gravel Pag	5,258'		Chlo	rial	tabs	lb		Hollow S	Stem Auger	Sampling Method: Split Spoon	24"
Casing Typ	NA	~		_				Seal: Hydrate	d Bentonite Chips-	Grout:	1
Screen Typ	NF	f	_	Slot				Diameter:	Length:	Hole Diameter: 8	Depth to Liquid:
	<u>NA</u>			300.				Diameter:	Length:	Total Depth:	Depth to Water:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Re	marks	Well Completion
	pry	1.0	No		012		MANNAN	SM	Dark brown Si Cl = 1500ppm	Ity sand	
	Dry	5.0	No	tomy	3 _	2	INNNNNN	SM	SAA (1= 2100	ppm	
	Dry	1.8	No		5	3	MANANAN	Sm	SAA (1= 1020	ppm	
	Ony	3.4	ND		7	4	ALMAN A	SM	SAA (1=640)	spm	
	Dry	4.0	NO		9 10	5	NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	SM	SHA (1=1130)	mga	
	Ory	2.0	NO		11 12	(4	ACUMUNANA A	SM	SAA CI=820	mga	
	Dny	1.9	NO		13 14	7	MNMMMM	sm	Dark brown silty sand with gravel.		
					15				(1 = 10.	copper .	F

								Boring/Well #	mwoj	
17	A	dvand	cina O	oportu	nitv			Project:	salty Dog	
C			5.1		,			Date	08:29.19	
Penetration Resistance Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion
Pry	0.8	No		15 16	8	WWWW	SM	SHA CI=1	D20ppm	-
Dry	[.0	No		17 18	9	NNNN	SM	SAA CI:	ПЗоррт	÷
Dry	4.5	ND		19 20	ID	MMMMM	SM	SAA U:	= 1250ppm	
Ony	4.3	NO		21	- 11	MMMMM	sm	SAA CI=	1370ppm	
Ony	50	NO	tonin	23	12	MMMMMM	Sipa	Dark brow sand. (1.	n poorly graded = 1500	+
			S C	24 25 26 27 28 29 30 31 32 33 34 35 36				TD = 24, to coloble	Hit refusal s.	

			Salty Dog	- A - A - A	Mil			BORING LOG/MONITORING WELL COMPLETION DIAGRAM					
0.24	-	2			S	and a		Date:	MWOB	Salty Project Number:	' Dog	_	
		Ching .		1	T	and a	AND I	Logged By:	50-20-14	017819014 Drilled By:	017819014 Drilled By:		
levation:		100	Detector:	a a	( lo			Drilling Metl	hod:	Cascade Sampling Method:		-	
Gravel Pack	5,258'	00	PW/	Quan	tal)	C 12	-	Sonic Seal:	19. 11 <sup>1</sup>	Continuous Grout:		_	
Casing Type	10/	205	i lice	Sand	2	2-12	-	Hydrated Diameter:	d Bentonite Chips 🔰 🙌	Hole Diameter:	Depth to Liquid	_	
Screen Type	Scher	1.40	TVC	Slot:			_	2* Diameter:	Length:	G'' Total Depth:	Depth to Water	Depth to Water:	
Set	ved . 40 s	ilorted Pl	<u>۲</u>	0.0	10"			""	10'25-15	55	23	_	
Penetratio Resistance	Moisture Content	Vapor (ppr	HC Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Ren	narks	Well Compl	etion	
	derl	0-1	No	MW08 C 0-2.51 [447	012	0.5	3373	SM	brownsilty sar CI = <128pp	nd v/gravel	Sticku	ANN	
	ded	6.2	NO	MW08 @ 2.5-5 <sup>1</sup> 1449	3 4 5		222/2	5M-	514A (1 = 2128p	pm(ND)	3	3	
	dry	0.5	NØ	NUCB C 5-7.5 1451	6	5	332		SAA CI= 2128	Sppm(ND)		777	
	Moist	0.0	NO		8 9 10	-			SAA, n c1=2	128ppm (ND)		3	
		1	JR	-	11 _ 12 _	-	X		NR			S XXX	
	moist	0.7	NØ		13 14 15	-			SAA c1 = 21	28ppm(ND)		家家	

-	-	2.					_	_	Boring/Well #	MUOS	
1	15	A	avanc	ing Up	portun	ity			Project:	017819014	
C	-								Project #	Sally Dog	
			-				_	_	Date	10-20-19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
	M	0.1	NO		15 - 16 - 17 -	1520	MUM		SI	4A = ×128ppm(ND)	
	m	0.1	No		18 19 20		NNN	SM	<i>چ</i> دا :	= 212810pin (NO)	
	R	0.4 41251	NO	Co R5	9 <sup>121</sup> 22	20	2225	aL	Drown learn	(NO) @ 23 ogs	
	SAT	03 454	NO	NW08	23 24 25	-	2/2/2	ep.sm	poorly gra SATUS Cl= <128pm	decl sund whilt RATED (0.9)	
	m	6.3 cl=<	NO 128pp	m(ND	26 27	75	No the	CL	brown learn	i day w sand	
	M	0.4 cl=	N0 <123	MV08 77530 ppmUN	<sup>28</sup> - <sup>29</sup> -	30	222224	SM	silly san	d "Igrave)	
					30 31 _ 32 _ 33 _ 34 _ 35		/		TD <i>e</i> ba	ckfill to 2B to set well	baddfill
	+				36 37	-					

Elevation: Gravel Pack Casing Type Screen Type	5,258' *** [C e: e:	1/20 <u>s</u>	Salty Do-	PID / Sance	Augenter 1 30 010"	ab -171		Boring/Well Date: Logged By: Drilling Met Sonic Seal: Hydrate Diameter: Diameter:	BORING LOG/MONITORING INumber: MWOA 0-00-19 0-00-19 SA hod: d Bentonite Chips Length: BO Length: BO	WELL COMPLETIC Project: Sa Project Number: 017819014 Drilled By: Cascade Sampling Method: Continuous Grout: Hole Diameter:	DOD DIAGR/ alty Dog	o Liquid:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Ren	narks	Well C	Completion
	Dry	6.2	NO		012		33322	SM	brown Silty sand « el= 2128ppm	av/gravel (ND)	510	drup ZZ
	Dry	02	NO		3 4 5	05	2222	SM	5AA 21= 2128f	npin (ND)		Sws
	Dry	0.3	No		6		12222	SM	SAA 61 = 228	lp(2.1)	-3	332
	M	0.2	NO	MW09 6-10 7-5-10 1720	8 9 10	5-10		SM	5 AA, ma 01=24	575+ 4 (2.4)	NM NS	2323
	M	02	NO		11 12	IA.K	NASS	Sm	SAA, few Cl=<1	gravel d8(ND)		ty xx
	M	0.2	NÐ	MUBA C. 1722	13 14 15	ίο. D	Mar	SM	SAA 61= 356pp	n (2.8)	LXX LXX LXX	xy yxy ty

F /	1	2	ducaa	ina O-	nortur				Boring/Well #	nwoe	t		
1		P A	ovanc	ing Up	ропип	ity			Project:	Sally D	06	-	
-									Project #	017819	014		
ς α									Date	10-20.	-19	1	
Penetratio Resistanco	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks		Well (	Completion
					15 _	-	32		C A	A	e e	tk	XX
	by	6.0	NO		16	-	3		1-79	(24)	- 1	XX	XX
					17	[5-20	JUNE	SM	LI- qu		-	X	XX X X
					18	-	V		SA	A AC	No -	XX	XX
	m	0.3	NO		19		0000		ol-k	24000 (1.8)	22.5	1 de	
					20	-	Lup		21-1	s ippire .			a la constante da la constante
			A)Q		21		3	0	Lean da	y w/sand		1914 1917	1
	Abr	0.7	100		22		5	CI	1000mg	Very noist.	-	10	11.
	AL			Munog	23		5		peorly arous	ed sarel ~/si)	tul -		E 19.
	yni	02	NO	\$5.25	24		3	sp.sn	Satu	ated	Ta -		
				1724	25	25.30	Z		ungers Cl=	1,148 ppm C5	,н)	ie.	1 . 24
			NK)		26	d 5 -	3		brawn silv	y-sand	~		
	VW	0.0	101		27		3	SM	610	156ppm CI.	6)	4	
				muoa	28		5	6	CAA 6	attom An		6 1	
	SAM		No	C 76-30	29		3		Sur	Saturatal			111 1
	N.			1726	30		32		cl	= 212ppm (2	.م) .	100	
					31							-	
_					32				TD 230			-	
					33				·			-	
					34						-	-	
					25	1						-	
					35						-	-	
		14			30			1,18			-	-	
					37		_						-

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Elevation: Gravel Pack Casing Type Screen Type	5,258' ; (0) ; (0)	120 St -	Salty Dog	DJA Slot:	uantal 40-5			Boring/Well Date: Cogged By: Drilling Meth Sonic Seal: Hydrated Diameter: Diameter:	BORING LOG/MONITORING BORING LOG/MONITORING Number: MW10 RI-14 SA/SH SA/SH sod: Length: Bentonite Chips & SS' Length: Boy Length:	WELL COMPLETION Project: Salty Project Number: 017819014 Drilled By: Cascade Sampling Method: Continuous Grout: Sangling Method: Continuous Grout: Sangling Method: Continuous Grout: Sangling Method: Continuous	Depth to Liquid:
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock	Lithology/Rer	narks	Well Completion
	27	0.7 0.3 0.3	NO NO R	A 53-52 352 352 352 352 352	0 2 3 4 5 6 7	0.5	WARNOW NOW	SM	brown silty sand Cl = 2128pp SAA Cl = 2128p VR	lw/grunel m (0.4) ppm (ND)	ST MWWWWW S
				1356	8 9 10	5 ~10		ser	S'AA CI= CI	e Bern (ND)	MWWW
	Dry	69	ND	1356	11 12	-		SM	5AA (1= 77	6pm (4.4)	MMM
	Dry	06	NO	1400	13 14 15	-			SAA CI= CI	28ppm(ND)	- ANA

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Г	-	7.							Boring/Well #	MWID	
1		A	ovanc	ing Up	portun	ny			Project:	Saltypag	
-									Project #	017819014	->
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion
	PA	0.10	NO	[402)	15 - 16 - 17 -	15-20	Server 1	ŚĄ	5 Cl	: AA = 2128pp m (1.0)	MNN
	Dry	0.4	w	1403	18 19 20	-20-25	2 Car	SM	SA Cl=	A 184ppm(1.8)	
	Def	0	Nð	1404	21		Cm a	SM	SA	A = 184 ppm (1.8)	
	M	0,7	NE	1405	23 24 25	-	Sola	SM	SA	A, cobbles $c_1 = c_1 2^8 f^{pm}$	
	for	0,4	NO	1406	26 27	- 	232	SM	SAA 6w@30' C	1=184ppm(1.8)	
	VM	0.7	NO	1408	28 29 30		222	SM	SAA,6 cl=98	etone" Very Reper almost 5.0) SAT	
	SAT	02	NO	140	31 32	-20.52	2222-	CL.	brown oilt cohesilue Some a cl=65	w/sand e saturaid inacej Goom (4.0)	
	ory	62	NÐ	1412	33 34 35		ESZ2	CH	fat chy cl= 1,	~/sana 148ppm(5:4)	
					36 37		X		N	2	
										1992	2

1	_	-	-												_
		1								Boring/We	ell #	AND	_		
	11		A	dvand	ing O	pportu	nity			Project:		Salty Por	1		
16					5		-			Project #	#	0178190	514		
	0				1	-		-	1	Date	_	10-21-	19		
Penetratio	Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type		Litho	logy/Remarks	We	ll Comp	letion
						37	2540	X				NK		. 3	i ya
	_	0-1		ND	DJIS	38 _	-	3		grey	y fait	- claywis and			100
	_	24	0.6	10-	145	39	-	3	CH		( c	kystone)	+		and a
	_			-		40	-	4		4	<1=	<128ppm CNE		E	2.1
_						41				TO	12	40'	+		
-	-					42	-			0	C		+		
_	-					43							1		
	-					44							1		
_	_					45							1		
-	_					46							1		
-	_					47							1		
-	_					48							1		
_	_					49							1		
_	_					50 +							1		
-						51							1		
-	_					52							‡		
	-					53							1		
	-					54							1		
	_					55							1		
	_					56 📕							Ţ		
_						57							1		
	-					58							1		
						59 †							t		

Elevation:			Sally Dog					Boring/Well Date: Logged By:	BORING LOG/MONITORIA Number: MW 11 10 -21 - 19 3A/SH	NG WELL COMPLETIC Project: Sa Project Number: 017819014 Drilled By: Cascade Sampling Method:	DODIE
Gravel Pack	5,258		1	10,	1Quan	tab	_	Sonic		Continuous	
Casine T	"10/2	0 situ	4	-			_	Hydratec	Bentonite Chips	Giout.	Daniel de Martin
Casing Type		RIO	Dorl	10.	WEL	181	K	Diameter:	Length:	Hole Diameter:	Depth to Liquid:
Screen Typ	e: l'	And	124	Słót:	Rad	0-		Diameter:	Length:	Total Depth:	Depth to Water:
Penetration Resistance	Moisture Moisture Moisture Waraning Moisture Waraning Moisture Waraning Moisture Run Moisture Run Moisture Run Moisture Run Moisture Run							Soil/Rock Type	Lithology/F	Remarks	Well Completion
	gerd	0.3	Ng				32417	SM	brown silty sand 21 = 2128	hin I ground Sppm (NO)	
	gry	0.1	NO		3 4 5		ZZZZ	sm	> AA C 1= 212	28ppin (0.6)	
	Jul	0.0	NO		6 _	-	NN V	SM	SATA, Cl=	few gravel <128ppm(ND)	
	924	0.\	NO		8 9 10		2 Car	SM	SAA, cl= cl	No gravel 128 ppm 60 2	
	gul	D.O	NO		11 12	10-15	SUL C	SM	SAA, g cl=2	revel/cobbles 128ppm(NO)	
	924	0.\	NO		13 14 15		404	SM	SAA CI= «I	28ppm (0.4)	

1	Į,	PA	dvanc	ing Op	portun	ity			Boring/Well # Project: Project # Date	MW11 Salty Dog 01781901- 10-21-19	4
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completio
	day	6.3	NO		15 16 17	- 30	3233	Sm	SAA Cl=	<128ppm (0.6	
	day	0.8	wa		18 19 20	15-00	ANN NAN	SM.	SA cl:	1A = Cl28ppm (0.2)	
	dry	F1	NO		21	- - 	WWWWW	CĦ	gray/brow (fait) C high pl	n sandy clay laystone 95, hig cohosion	
	gul	(.).	NO		23 24 25		VANNON	CH	SA C	A 1= 2128 ppm (NC	
	day	0.5	NO		26	257	MANA	CH	5	AA cl = cl28ppmlow	
	gul	1.2	Na		29 30	-	July 1	CH	(	5 AA 1 = <128ppm/0.6	
	DN	Ì,Ĝ	NO		31 32	30-35	3322		S	AA	
	Dry	1.6	NO	225-25 1417	34 35	-	Tur	SM	gray /bro	wn sandston / somesilt l= 2128(0.8)	
	Dry	0,4	AØ		36 37	-	44		S.	ATT 1= <128 Co. LI	+

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L	F	PA	dvanc	ing O	portu	nity			Boring/Well # Project: Project # Date	AWN Silty Pog 017519012 16-21-19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Completion
	<i>b</i> /	6.7	9CL	MW11 CC 5754 1420	37 38 39 40	5.40	2224	SM	SAA Cl=	2128ppm (6.G)	
				140	40         41         42         43         44         45         46         47         48         49         50         51         52         53         54         55         56         57		U		TDE	40' well set due katte	
					58 _ 59	-					+

Elevation: Gravel Pack	5,258' = [0] 5 = 10/5 = 10/5	RO SI	Salty Dog Detector: Iica	tD/ San	Auan d 40	4b		Boring/Well Date: Logged By: Drilling Met Sonic Seal: Hydrate: Diameter:	BORING LOG/MONITORING Number: Mumber:	WELL COMPLETION Project: Project Number: 017819014 Drilled By: Cascade Sampling Method: Continuous Grout: Srout: Sampling Method: Continuous Grout: Sampling Method: Continuous	DIAGRAM y Dog Depth to Liquid: Depth to Victor:
enetration (esistance	Type: Yu							Soil/Rock	Lithology/Ren	narks	Well Completion
	Xet	0.5	т VG		0	-	12222	SM	Brown Silty sandw Cobbles lowpla: Cl= 21	Igravelard 5, Iowcon 28ppm(0.4)	stick-up
	gui	03	No		3 4 5	0-5	Julia	SM	5AA c1= c1	Ц8дрт (1.0)	
	Jul	0.7	NO		6		1 march	Sm	SAA, fe 1 c1= c	w growel No cobbles (128ppm(ND)	33
	dry	D.5	NO		8 _ 9 _ 10	- -	Month &	SM	SAA */ cl = <	(cobbles :128ppm(ND	
	Ary	0.3	NO		11 12	-	233	SM	SAX (1= 21	4 28ppm (ND)	
	R	0.5	No		13 14 15	-	509	Sim	SAA, no CI = LIAS	gravelar bbles 3(0.6)	N

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Γ /	-	7		in n 0 n			_		Boring/Well #	MWIZ		
		A	ovanci	ing op	portun	ny			Project:	Sally Day		
									Project #	017819014		
Ξu									Date	10-01-19		
<sup>D</sup> enetratio Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well Cor	npletion
					15	T	3			٥.٨	-5	2
	DE	0.5	No	AWIZ Ce 15-145	16		7	SM	ی د/	= 280  ppm(2.4)	R	M
		8		1500	17		3			• -	15	3
					18	15-20	4			AA	$\mathbf{P}$	$\leq$
	M	0,2	ND		19	-	3	SM		cl = cl 80 (0.6)	R	3
	-		_		20	-	1				151	S
	M	03	ND	MW12 20-22-7	21	-	37	SM	L.	AA, 1ess suff(1 = 356 (2.8)	3	S
		l v		1502	22 -	-	2				5	
		2	50		23	- 30-32	50	2		SAA	+3	3
	br	0.0	P		24	-	Zz	sn		C1 = 2128(10)	15	M
					25		6				$+\chi\chi$	XX
	W	n.3	NO		26	- 4	シンフ	SM	~	SAA (1=(128/1.0)	Txx Txx	$\chi_{\chi}$
		0.			27		N			Clorente -	T.	$\times$
		Ð.7	NO		28 -		17	SM		AA, very Moist	+~	$\tilde{\cdot}$
	Na				-30		Z			C1 = C128(0.8)		
			~						ь.	10	主生	
		N	12		31	-	$\lambda$	1		) (2		
					32 -	- /	(		1,1025		+ =	
					33		3		GNE	A pormarfl	12+	
	VM	23	61		34		32		5	AH, verymasi, sat	IF	
	41	0.	102		35	-	3		$\checkmark$	C = 156(1.6)	1	
	SAT	03	NO	MWA	36	-		A.M	poorly grade	ed sand w/silt		
				505	37				2410	C1 = 280 ppm(2.4)	1-5-	· ~`

	-		-				_		Boring/Well #	muriz	
	TE		Idvan	oina A	nnortu	aitu			Project:	Selty dog	
	1 k	- r	uvall	ung O	σροιται	шу			Project #	0178190	14
9				_		_	_		Date	10-21-19	
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
		-	T		37		2				14 - 14
	- 45			mwiz	38	- 35-46	335	CDSU	CAA	some black or o anic.	
	SAV	0.3	NP	375.44	39		4mg	210	Shijo	colors and Fetskin	E
-		-			40	-	1		<u> </u>	- 5, 4dULD. Inigr	
					41	-			TDE	40' range	$\frac{1}{4}$
					42 -	-					-
					44	-					
					45	-					-
					46	-					‡
					47						£
					48 -	-					+
_					49 - 50	-					<del> </del>
					51	-					
					52						
					53						+
					54						+
					55						$\frac{1}{1}$
					56						+
					57	-		о́,			+
					58						±
					59						

Elevation: Gravel Pack Casing Type Screen Type	5,258' 5,258' 	-40	Sally Dig Detector Detector Detector	D/Que a 10/2 Slot:	antrah O silico	sard "	io-28	Boring/Well Date: Logged By: Drilling Mett Sonic Seal: Hydrater Diameter:	BORING LOG/MONITORING Number MWB 10-21-19 JA hod: d Bentonite Chips 28-23 Length: 30 Length:	WELL COMPLETION Project: Project Number: 017819014 Drilled By: Cascade Sampling Method: Continuous Grout: Backer: Continuous Grout: Contin	Diagram Dog
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock	ιΟ Lithology/Rer	narks.	Well Completion
	day	0.3	NO		012	-	Mr www	SM	brown silly sand CI= LI28ppn	w/gravel+ 1 (0.25	shik-yp
	dry	0.4	NO		3 4 5	-0-5	Mary Mary	SA	SAA Cl= Cl28	Ppm(0.1)	
	dry	0.3	ND		6	510	SCALLAN	SM	$SAA, tem no \\ Cl = Cl $	cobbles Rppm(1.0)	MMM M
	dry	0.3	NÒ	0	8 _ 9 _ 	6-1	mar al	sm	5AA (1=128)	pm(1.2)	
	day	0.3	NO	E 1 6-12-5 1438	11 12	La la	6222227	9M	SAA groux 21 = 2	el + cobbles 12 pp m (20)	MM
	Jul	0.3	N۵		13 14 15		Norr	SM	SAA CIEI	)8ppm(1.d	Mry

17		duana	ina On	nortur		-		Boring/Well #	MWIJ		
AL		ovanc	ing up	portun	ny			Project:	Salty Poj		
C	_						124	Project #	017819014		
		-				_	_	Date	10-21-19	-	
Penetration Resistance Moisture	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	ology/Remarks	Well C	ompletior
	0.5	No		15 _ 16 _	-	Marrow	SM	SAA,	large cobbles .1= 68(1.5)	MNN/	Inn
- Dry	0.3	Ng		17 18 19	1520	Mary Cran	SM	S	AA = <128ppm(1.1)	NNN N	Juny
dry	6.7	NO	4	20	-	1		S,	AA 1=<128ppm(1.1)	MMM	MNN
- Jary	0.6	NO		22 - 23 - 24 -	20-25			S	AA		NNNXXX
M	1.0	NO	MW13 25-27 1440	25 5 26 27	-			S Cuci <sup>s</sup> O	AA CI=156ppm(1.7)	- Yx - Yx - Xy - Xx	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
- JM	0.7	NO		28 29	-25-30			Guesse Si botho L, Cla	HA Cl= 448(0.8) in G": n creased y/silt and satu	- XX	
SAT	0.4	NO		31 32				poorly g	-idal sond w/		
I A	0.4	NO,	MW13 C 3253	<sup>33</sup> 34	30-3		SP-SM	cl= - cl= 2,4	17480pm(66) (72ppm (76)		
dn	8.8	NO	1442	35 36			- 1×14	dribiun fat Cil	dowy w/sand a ystone)		

											-	
	-								Boring/Well #	MWB		
1	15	A	dvano	cing O	oportui	nity 👘			Project:	Salty Dog	_	
(		E.		•	·				Project #	0114819014	t	
5 0				1	-	-	-	-	Date	10-21-19	1	
Penetratio	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lith	ology/Remarks	Well C	ompletion
			1		37			SM	grey san /heilsoc	dy siltstone		
	pert	0.3	NO	mw13 27.5-1 1444	38 - 39 - 40	-		Sm	SA	CI= C128ppm (01) A		
					41	-			TÇ	e 40'	Ŧ	
					42				-		ŧ	
					43						$\frac{1}{1}$	
					45						Ī	
					46						‡	
					47						ŧ	
					48 _						+	
					50						Ŧ	
					51						Ī	
					52						‡	
					53						Ŧ	
					54						+	
					56						+	
					57						Ī	
					58							
					59 †	111					t	
		and the second	Saity Dog		1	and the second se		٢	BORING LOG/MONITORING	NCING OPPO	D <b>rtunity</b> Diagram	
---------------------------	---------------------	----------------	--------------	-----------------	---------------------	---	----------	-------------------	---	---------------------------------	-----------------------------	
A. H.	1.4			E. F		and in	100	Boring/ Weil	Number: MW14	Project: Salty	Dog	
-	1 -10				TAN			Logged By:	10-22-19	017819014 Drilled By:		
Elevation:		19 - A	Detector:				S.	Drilling Met	-374 hod:	Cascade		
Gravel Pack	5,258'	1	<u> </u>	IP/Qi	<i>iantab</i>		_	Sonic		Continuous		
Casing Turn	<u> </u>	DO.	silico	san	<u>d</u> 3	5-231		Hydrate	d Bentonite Chips 23-20	20-0		
	AHU	OAK	-					Diameter:	Length:	Hole Diameter:	Depth to Liquid:	
Screen Typ	RI I	0100	-	0.01	0"			Diameter:	Length: 10	Total Depth	Depth to Water:	
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rem	arks	Well Completion	
	Yay	0.7	Nø		0 1 2		3737	Sm	trown silty son Cl= 2128pp	d w/gravel . m(0.8)	Spitrap	
	ged	1.0	NO		3 _ 4 _ 5	10:5	うろうろうへ	SM	5 A A CI = <12	8ppm(0.8)		
	dey	03	No	Mw 14 80-7.5	6	5-10	122-2	SM	SAA, no cie	gioue ( = (28ppm (UD) - -		
	geh	J.Z	Ng		8 - 9 - 10		(1734	SM	SAA	(128ppm (100)		
	gel	0.8	NO		11 12		ŧ	54	SAA up cl=	and cobbles (128ppm (ND)-	333	
	gul	0.9	NO		13 14 15			sn	SAA <l=c< td=""><td>(126 ppm(0.8)</td><td></td></l=c<>	(126 ppm(0.8)		

[		2	duare	ina O-	nortur	ih.	-		Boring/Well #	MWIL	
1	11-	A	uvanc	ny Up	φυιωη	ny			Project:	Salty Dog	
C									Project #	017819014	
	·		r						Date	10-22-14	1
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
	dry	1.1	No		15 16 17	-	2 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	SM	S 61=	AA = 2128ppm(0.8)	M.M.
	doy	1.0	No		18 19 20		m m	SM		SAA c1= L128ppm (0.6)	
3	M	1.0	NO	NW14 C 20-225	21 _ 22 _		NNNNNN	SM	S	AA, moist < Cl = 212ppm(2.0)	
	M	0.9	Ng		23 24 25	-	mon	SM	CI= CI28ppm CO	SAA, increased Fines	
	M	2.5	ND	NW14 @ 25-27-5	26 27	- - - -	WWW	Sm		SAA 1= 784ppm (1.3)	
	M	2.2	Ng	MW14 27:5301	28 29 20		rund	Str/CH	SA	A, botton 6'' ;5 fat clayu/san( Cl=c128ppm(0.8)	
	SAT	2.1	ND	MW14 C 30-325	31 32	- mà	Merry	mL	C1=128,pm & C1=128	chy n/sand exectes for the sand	1 1 1 1 1 1
	SAT	.2.2	NO		33 34 35	-	Mary Mary	CH	Cl = D&ppmi grey clau	(1.8) ystone (bedrock	
	1.6				36 	-	7	×	TDE 3		

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Elevation: Gravel Pack Casing Type Screen Type	Elevation: 5,258' Gravel Pack: D/20 si tra Sand 35-22 Casing Type: Screen Type: Screen Type: Casing Type:								Advancing Opportunit         BORING LOG/MONITORING WELL COMPLETION DIAGRAM         Boring/Well Number:       Project:       Salty Dog         Boring/Well Number:       M/IS       Project:       Salty Dog         Date:       10-22-19(       Project Number:       017819014         Logged By:       Drilled By:       Cascade       Cascade         Drilling Method:       Sampling Method:       Continuous         Seal:       Hydrated Bentonite Chips       22-18       Grout:       Bentonite Chips         Diameter:       Length:       Hole Diameter:       Depth to Liq         Diameter:       Length:       Total Depth: 40       Depth to Weight to Weigh					
Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Rem	arks	Well Completion			
	dry	0,0	ND		012	-	MNNNN NW	Su	brown silty sand interbeded (this $C_1 = Z_1^2 Z_{pp}^2$	vlsome )chy n (o,1)	Marge Marge			
	dary	0.0	Nð	MWB 255 <sup>1</sup> 1610	3 4 5		Mannan	₽-SM		ly graded and w/silt (128, ppn(0.1)	MMMM			
	Gad	0,0	NO	a mation, date, approvability Date, Co	67	- - - C-10	ろうろ	92-5A	SAA ci= ci.	28ppin (0.1)				
	gut	0.0	NÖ		8 9 10		MAN NO	sp-sn	SAA Cliz C	128ppm(0.1)				
	gen	0.2	NO		11 12		MMM	SP-91	5 AA c1= 21	28ppm (0.2)	WWW			
	p)	0.3	N0		13 14 15		tell	SM	boown silly ZIZE	ppm(0.2)	MMM			

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$\left[ \right]$	TE	<b>P</b> A	dvanc	ing Op	portun	ity	_		Boring/Well # Project:	MW15 SaltuDog	
C									Project # Date	10/74	319014 19
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithc	ology/Remarks	Well Completion
	M	0.2	ND		15 16 17	-	NNNNN	SA	Ž	SAA 1=<128ppm (0.2)	m
	m	0.2	NO		18 19 20	-1520	LANTE	SM	2	SAA (= <128ppm(0.2)	KK FAT
	M	0.4	Nb		21	-	2220	Sm	2	SAA (1= <128ppm (0.9)	
14. 	M	0.0	NO	Mus 225-35	23 24 25	100	MAN MAN	SM	S/- ci fat cl	14 1=400 (3.1) ay w/sanel	
-	AW	0-0	NG		26 27		or compact	SM	brown si	pmco.1) Ity sance 64031	
	VM	0.0	NO	ANDE CO	28 29 30	455	Congraphico	CIT	-7 CI = 988	sppm(s.o)	
	SÆ	0-1	NO	161	31 32		JAM L	ge.sm	peorly gi - W/ Cl=2	raded sand silt 12 (2.1)	
	SAT	00	NO	NW5 C 32.5-3.	33 34 35		Venulu		SAAu c(=	2,472 (76)	
	gel	D.B	ND	166	36 37	35-40	July	CH	grey clay cla	store (bedrock) 4128 (0.1)	backfill

	~	2							Boring/Well #	mwis	Vari
	15	A	dvanc	ing Oj	oportui	nity			Project: Project #	DIFRIC	1014
C				_			_		Date	10.2	à-19
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Litho	logy/Remarks	Well Completion
			T	-	37	-	3				+
	day	0.0	NO	MWB C IG	38 39 40	3540	Carlan -	CH	SAA <1=	<128 ppm(0.1)	
					41	-			TD 04	0	+ buckfill
					42	-			Backt	ill to 35'	$\frac{1}{2}$
					43	-				up periorance	
					45	-		r			
					46	-					Ī
	5				47	-			(-1		+
					48	-					$\frac{1}{2}$
					49 _ 50 -	-					+
					51	-					Ī
					52	-					‡
					53						‡
					54	-					+
					55 56	-					‡
					57						<u> </u>
					58	-					±
					59						†

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*Received by OCD: 11/18/2019 1:34:59 PM* 

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### Josh Adams

Smith, Cory, EMNRD <cory.smith@state.nm.us></cory.smith@state.nm.us>
Tuesday, September 10, 2019 8:15 AM
Josh Adams
Jennifer Deal; Ashley Ager; Daniel Burns
RE: Salty Dog Groundwater Sampling

Josh,

Please make sure water samples are at a minimum analyzed for Extended list 8026, TDS, pH, Cation/Anions

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410 (505)334-6178 ext 115 cory.smith@state.nm.us

From: Josh Adams <jadams@ltenv.com>
Sent: Monday, September 9, 2019 1:12 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Ashley Ager <aager@ltenv.com>; Daniel Burns <dburns@ltenv.com>
Subject: [EXT] Salty Dog Groundwater Sampling

Hi Cory,

LTE and Hilcorp are going to be on site to collect samples from the newly installed monitoring wells at the Salty Dog Water Gathering System pipeline release (NCS1916853082) on Thursday, September 12<sup>th</sup>. We plan on being site around 10 am. We have results from the soil in the delineation boreholes and monitoring wells, but need groundwater data from the monitoring wells to include in the report, which is due Monday, September 23, 2019.

Thanks and please let us know if this works for you.



Joshua G. Adams Staff Geologist 970.456.5750 *cell* 970.385.1096 *office* 848 East Second Avenue Durango, CO 81301 www.ltenv.com Think before you print. <u>Click for our email disclosure</u>.

### Josh Adams

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53082)

Mrs. Deal,

OCD received the following extension request On July 19, 2019 "...Hilcorp is requesting an extension to the 90-day requirement for site characterization or closure reporting required in 19.15.29.11.A NMAC. The 90-day deadline is July 28th, 2019. Hilcorp requests an extension until September 27th, 2019. Hilcorp will provide a remediation work plan or closure report by that date." Communication between HEC and OCD determined the Date of Discovery to be May 29, 2019 making the 90-day deadline to be August 29, 2019.

HEC received the results of delineation drilling on September 9, 2019 and did not contact the OCD to discuss the concern of not meeting the required delineation dead line. It wasn't until September 17, 2019 when OCD contacted HEC about the status of ground water samples, placement of monitor wells and preliminary delineation data that any action was taken from HEC in regards to not meeting the deadline.

Reviewing the provided data, MW 3,5, and 6 without additional monitor wells do not provide reliable data showing ground water impacts. Because the wells have little to no offset and the provided ground water gradient is not reliable it makes it difficult to determine if the ground water sampling results are natural or are a results of impacts from Oil and Gas activities. Since there are no confirmed ground water impacts HEC is not required to abate ground water as is not subject to the requirements of 19.15.30 NMAC.

OCD grants HEC request for additional time to perform site characterization and submit a remediation plan no later than November 18, 2019 with the following conditions of approval:

- HEC must fully delineate all soil impacts per 19.15.29 NMAC both vertically and horizontally.
- Since there is a concern that ground water may be impacted HEC must at a minimum must complete 3 monitor wells, one at/near the source, one cross gradient of the source, one in the suspected up gradient from source( outside of the impact zone is preferable so this well can be used for background data)

IF HEC confirms that ground water impacts are from Oil and Gas activities an acceptable remediation plan in the required report would be to submit a Stage 1 Abatement plan per 19.15.30 NMAC, please include a date in which the Stage 1 plan would be submitted by.

If you have any additional questions please give me a call.

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410

#### Josh Adams

Smith, Cory, EMNRD <cory.smith@state.nm.us></cory.smith@state.nm.us>
Tuesday, October 22, 2019 1:55 PM
Ashley Ager; Josh Adams; Jennifer Deal
RE: Salty Dog Delineation

Ashley,

Thank you for the update, please make sure the wells are sampled for 8260 Full list, Cation/Anion, TDS, pH

Thanks,

Cory Smith Environmental Specialist Oil Conservation Division Energy, Minerals, & Natural Resources 1000 Rio Brazos, Aztec, NM 87410 (505)334-6178 ext 115 cory.smith@state.nm.us

-----Original Message-----From: Ashley Ager <aager@ltenv.com> Sent: Tuesday, October 22, 2019 12:42 PM To: Josh Adams <jadams@ltenv.com>; Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Jennifer Deal <jdeal@hilcorp.com> Subject: [EXT] RE: Salty Dog Delineation

Cory,

LTE installed seven additional wells at the Salty Dog (NCS1916853082) and completed drilling/well completion today. We are surveying and developing wells today and tomorrow and intend to sample the groundwater monitoring wells on Thursday, October 24, 2019 beginning at 8:30 am.

Thank You, Ashley

Ashley Ager Vice President of Regional Offices

(970) 385-1096 office (970) 946-1093 mobile

-----Original Message-----From: Josh Adams <jadams@ltenv.com> Sent: Thursday, October 17, 2019 7:24 AM To: Smith, Emnrd <cory.smith@state.nm.us>; Jennifer Deal <jdeal@hilcorp.com>; Ashley Ager <aager@ltenv.com> Subject: Salty Dog Delineation

Cory,

*Received by OCD: 11/18/2019 1:34:59 PM* 



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	Monito	ring Well Develop	ment Form	1	<u>II</u>	848 East Second Avenu Durango, Colorado 8130 T 970.385.1090
Proje	oject Name: ect Number:	Salty Dog Water Trna 17819014	asfer Station			
,	Well Name:	Mw03			Sampler: Er	ric Carroll
	Start Date:	9/9/2019			Start Time:	
Dep Casi Method Iethod o	th to Water: Time: ng Volume: of Purging: f Sampling:	33.6/ 10:50 4.7 10 cash Dedicated PVC Bailer Dedicated PVC Bailer	ing <i>polus</i> r	Total D me 5	Depth of Well: epth to Product: (height of water column *	36 56 MA 0.1631 for 2" well or 0.6524 for 4" we
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
10:54	0	G	727	16.23	18 75	
0:56	0.5	05	7.25	16.74	1966	
1.00	0.2	0.7	776	16.24	1967	
- 1 L						
nments: <u>Sheen</u> escribe I	Dry 6 7, no 6	Crom SOP:	Very	turbid,	і і 5:184, light	brown, no
gnature:	head	Carrol		4	Date:	9/9/201

	Monito	ring Well Develop	ment Forn	1		848 East Second Avenu Durango, Colorado 8130 T 970.385.1090
Proje	oject Name: ect Number:	Salty Dog Water Trna 17819014	sfer Station			
	Well Name:	MWOS			Sampler: Er	ic Carroll
	Start Date:	9/9/2019			Start Time: //	1:01
Dep	th to Water: Time:	33.46		Total Do	Depth of Well:	38.41
Casi Method Iethod o	ng Volume: of Purging: f Sampling:	<u><u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>	O casir	g Warnes	(height of water column *	0.1631 for 2" well or 0.6524 for 4" w
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
1:00	0	0	7.76	16.11	18.65	
.03	0,5	0.5	7.58	16.44	18.48	
:06	0.5	1.0	7.42	17.39	16.32	
nments: <u>no 54</u> escribe I	<u>Bailed</u> Can 19 Ma	dry Q   g rom SOP:	911 <b>0n</b> , V mt	ery tu	Irbid, silty	1, It brown
nature:	qu	à larrol			Date:	9/9/2019

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	Monito	ring Well Develop	ment Forn	n	<u>II</u>	848 East Second Avenu Durango, Colorado 8130 T 970.385.109
Proje	oject Name: ect Number:	Salty Dog Water Trna 17819014	asfer Station			
	Well Name:	MWOG			Sampler: En	ric Carroll
	Start Date:	9/9/2019			Start Time:	11:30
Dept	th to Water: Time:	32.77		Total Do	Depth of Well:	38_01 NA
Casin Method Iethod of	ng Volume: of Purging: f Sampling:	<u>8.5</u> Dedicated PVC Bailer Dedicated PVC Bailer	10 Casi	ng voi	(height of water column *	* 0.1631 for 2" well or 0.6524 for 4" w
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
11:32	0.25	0.25	7.50	15.92	34.12	
11:33	0.75	0.50	7.20	15.97	132.90	
36	0.5	1.00	7.19	16.00	23.42	
				-		
nments: <i>Effert</i> escribe D	Dry over control of the second	p 1.3 gallon no sheen / a	5, Ve.	y tur	pid, Silty	, it brown
gnature:	ini	lard	*		Date:	9/9/2019

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					IT	2 LT Environmental, Inc. 848 East Second Avenue
	Monito	oring Well Develop	ment Form			Durango, Colorado 81301 T 970.385.1096
Proje	oject Name: ect Number:	Salty Dog Water Tran 017819014	sfer Station			
	Well Name:	MW- 8			Sampler:	TS
	Start Date:	10/22/19			Start Time:	1675
Dep	th to Water: Time:	23,80		Total De	Depth of Well:	25.20
Casi Method Method o	ng Volume: of Purging: of Sampling:	<u>1.4X0.1631</u> Dedicated PVC Baile Dedicated PVC Baile	0.23X r	10 = 2.2	(height of water colum	n * 0.1631 for 2" well or 0.6524 for 4" well)
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp.	Conductivit y (us or ms)	Comments
1635	0.25	,25	7.08	14.5	8.19	brown tuckid
1640	0.25	.5	7,07	17.9	8.24	
1650	0.25		7.04	14.4	0,60	
1700	0.25	1.25	7.08	14.4	8.24	
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	λ	A day of	150	on la		
omments:	_ baile	a aly w	1.25	9a1/0~5		
Describe l	Deviations f	from SOP:				
ignature:	4	P			Date:	10/22/2019

	Monito	ring Well Develop	ment Form		IE	2 LT Environmental, In 848 East Second Avenu
-	Withitto	ing wen Develop	ment Form		G	Durango, Colorado 8130 T 970.385.1096
Pro Proje	oject Name: ct Number:	Salty Dog Water Tran 017819014	sfer Station			
N.J.	Well Name:	MV -9			Sampler	TC
	Start Date:	10/22/19			- Start Time	17/0
Dept	h to Water:	23.94		Total	Depth of Well:	30.33
Casir	Time.			De	epth to Product:	-
Method of	of Purging: Sampling:	Dedicated PVC Bailer Dedicated PVC Bailer	r		(height of water column *	* 0.1631 for 2" well or 0.6524 for 4" w
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
1710	0,25	0,25	7.06	14.3	8.11	prown turbid
1720	0.5	0, 75	706	14.4	8.70	14
1720	0.5	1.5	7.06	14.4	8.21	1+
17 10	0.5	7.	7.66	14.4	8.19	1.5
	1					
	1					
nments:	bail	ed dry ce	299110	~5		
escribe D	eviations f	rom SOP:				
matures	7	1			Date	10/00/0014
uature.	a	17			Date:	10/22/2019

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	Project Name	. Detechold	itoring Well I	Developme Sa	nt Form	
Pr	oject Number	- ELAS	RADA	C	17819014	
	Well Name	Mwi	0		Sampler:	SA
	Start Date	10-22	-19		Start Time:	1500
D	epth to Water Time	30.60		1	fotal Depth of Well: Depth to Product:	40.37 NO
Ca Meth Iethoo	asing Volume: od of Purging: l of Sampling:	Dedicated PVC Bailer	lens		(height of water colu	mn * 0.1631 for 2" well or 0.6524 for 4" wel
'ime	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F) %	Conductivity (us or ms)	Comments
*	0.25	0.25 Hartist	7.04	16.5	9.27	clear
	0.25	0.75	1.05	15.7	9.14	brown sity, do
	0.35	6.1	7.07	5.8	3.82	u n
	5,0	0.0	7.07	12.1	10.64	brann, claudy, turbic
	3.0	13.0	7.08	5.8	9.55	h 11
			/			
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		-6				
			1			



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P	Project Name roject Number		the Att	Developme	ent Form	
			ALAC ITAL	~	RIGOUL	
	Wall Mana	- Mul-12		Q14	01401-7	<b>F</b> 2
	wen name	1. 102 11	3		Sampler	5
	Start Date		1		Start Time:	
D	epth to Water Time	30.85			Total Depth of Well: Depth to Product:	-
C Meth	asing Volume od of Purging	Bedicated PVC Bailer	1,4x10	= 14	(height of water column	* 0.1631 for 2" well or 0.6524
ïme	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
	1	1	7.03	16.9	26.2	
	1	2	7.03	15.8	22.4	
	5	<u>R</u>				
	Ne	A	-			
_						
					-	
					-	
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	Deletat	The Mon	itoring Well	Developme	ant Form	
P	Project Name oject Number	2173	2000	0178	Indoly	
	Well Name	MW-13			Sampler: 7	5
	Start Date	10/22/19			Start Time:_/	540
D	epth to Water Time			1	Fotal Depth of Well:	10,19
C Meth lethoo	asing Volume od of Purging l of Sampling	: <u>'8,38 x0,1631</u> : Dedicated PVC Bailer : Dedicated PVC Bailer	= 1.36 X 10	=[]3.7	(height of water column * (	0.1631 for 2" well or 0.6524 for
me	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. ПС	Conductivity (us or ms)	Comments
_	0.25	0.25	7.01	16.8	21.5	
	0.15	6.75	7.02	16.7	22,4	
_	025		7.02	16.7	22.1	
	5	10	7.09	16.5	37.6	
-						
					-	
_						



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F	roject Name:	Stacedo	toring Well L	<u>)evelopme</u>	nt Form		
Pro	ject Number:	01781	70006				
	Well Name:	MW -19	10		Sampler:	15	
	Start Date:	10/22/	14		Start Time:		
Depth to Water		20.92		1	Total Depth of Well:	-5.20	
Ca	sing Volume:	4.28×0.165	11= 0,69)	(10=6	- 9 (height of water column *	0.1631 for 2" well or 0.6524 fo	
vletho ethod	d of Purging: of Sampling:	Dedicated PVC Bailer Dedicated PVC Bailer					
me	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp.	Conductivity (us or ms)	Comments	
	1	1	7.09	15.8	10.12		
	<u>_</u>	L	1:08	16:0	10.22		
2.2							
/							
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De	Project Name	Moni	toring Well I	Developme So	nt Form	
PT	oject Number	A 10/-15	1000		<u>217-04017</u>	TC
	Well Name	1.1.1.1.1	0-		Sampler:	1-
	Start Date:	10/22/1	4		Start Time:	2
D	epth to Water Time	27.20		ï	Fotal Depth of Well: Depth to Product:	8,26
Ca Metho	using Volume: and of Purging:	Dedicated PVC Bailer	=1.8×10	= 18	(height of water column *	0.1631 for 2" well or 0.6524 for 4
me	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp.	Conductivity (us or(ms)	Comments
_	1		7.02	14.3	13.19	
		2	7.02	14.2	11,14	
	1		1.04	19.2	11.26	
_						
-						
				1		
-						



*Received by OCD: 11/18/2019 1:34:59 PM* 



	Ground	water Sample Colle	<b>P</b> Adv action Form	vancing Op <sub>l</sub> n	portunity	LT Environmental, Inc. 848 E. 2nd Ave. Durango, Colorado 81301 T 970.385.1096
Pro Proje Sa Dept	oject Name: ect Number: Sample ID: ample Date: Laboratory: Analyses: h to Water:	Semi-Annual Groundwater 017818010 MWD3 9 · 12 · 19 Hall Environmental Extended 1151 33 · 10 2	- 8026	Pr Sh TOS, pH	roject Location: Sampler: Matrix: Sample Time: ipping Method:	Salty Dog Water Transfer Station Caitlin McGinn Groundwater 1433 Hand Delivery /AnionS 37.24
Vol. of Wate Method Method o:	Time: er to Purge: of Purging: f Sampling:	1.7gal Bailing Bailer		De (heig	epth to Product:	1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
	- Igal.	~1ga1	7.35		40.4 mS	Well would not recharge
	1A.)e11 A	id pate rathe		and	2.40015	liber acid leath
Describe I	peviations f	rom SOP:	was not	t abu	to pu	nge 1.7 gallons
Signature:	Catti	Mea:		1	Date:	9.12.11

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		Ľ	PAdv	rancing Opp	portunity	LT Environmental, Inc. 848 E. 2nd Ave.
-	Ground	water Sample Colle	ction Form	1		T 970.385.1096
Pro Proje	oject Name: ct Number:	Semi-Annual Groundwater 017818010	r Monitoring	Pr	oject Location: Sampler:	Salty Dog Water Transfer Station Caitlin McGinn
Sa I	mple Date: aboratory: Analyses:	$\frac{9 \cdot 12 \cdot 19}{\text{Hall Environmental}}$	off Cat	Shi	Matrix: Sample Time: pping Method:	1335 Hand Delivery
Dept	h to Water: Time:	33.36 104		Total De	Depth of Well: pth to Product:	38.40
ol. of Wate Method Method of	er to Purge: of Purging: Sampling:	2.5 gallon Bailing Bailing	S	(heigh	nt of water column * 0.	
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
1335		~1.5gallons	7.29	US.3	18.07ms	Well did not vechange
omments: Doff le	Well ( (Imr),	Sufmic Ac	id Bott	sanipli Le limi	1 t unp	nas, Nitricacia reserved pottu
Describe D	eviations f	rom SOP:	Did no	+ pu	rge 2.	Sgallons.
Signature:	Caiti	- una			Date:	9.12.19

	Ground	water Sample Colle	PAdva ction Form	ncing Opp	ortunity	LT Environmental, Inc. 848 E. 2nd Avc. Durango, Colorado 81301 T 970,385.1096
Pro	oject Name:	Semi-Annual Groundwater 017818010	Monitoring	Pro	oject Location: Sampler:	Salty Dog Water Transfer Station Caitlin McGinn
Sa	Sample ID: imple Date: Laboratory:	MWO 4 9.12.19 Hall Environmental		Shi	Matrix: ( Sample Time: pping Method: ]	Groundwater 1402 Hand Delivery
Dept	Analyses: h to Water: Time:	32.74 1109	H, Carlo	Total De	Depth of Well: pth to Product:	37.94
ol. of Wate Method Method of	er to Purge: of Purging: f Sampling:	2.5 gallons Bailing Builing		(heig	ht of water column * 0.1	631 for 2" well or 0.6524 for 4" well) * 3 well w
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
1402		-Igallon	7.78	69.1	19.97ms	Well recharge SLOW
	-					
					-	
omments: (1ml)	wen Suifu	recharged s	Nowig.	Sam	pud 3v	was, Nitric acid
Describe	Deviations	from SOP:	_Did n	ot pl	Mge 7.5	5 gallons
Signature:	Cait	ina		2	Date	e: 9.12.19

		1		dvancing	<b>Opportunity</b>	LT Environmental, Inc
	Ground	water Sample Colle	ection Form			848 E. 2nd Ave Durango, Colorado 8130 T 970.385.109
Proj Projec	ect Name: t Number:	Salty Dog Water Transfer 017819014	Station	Pr	oject Location: Sampler:	Salty Dog Pipeline
S San	ample ID: nple Date:	<b>Mw08</b> 10/24/2019		Matrix: Groundwater Sample Time: 1005		
L	aboratory: Analyses:	Hall Environmental VOC's, TDS, pH, cati	on/anions	Shi	pping Method:	Hand Delivery
Depth	Time: Depth to Water: A J. 61				Depth of Well: pth to Product:	ND
ol. of Water Method of Method of S	to Purge: f Purging: Sampling:	PVC Bailer PVC Bailer	75 gallons	5 (height of w	ater column * 0.1631 fr	or 2" well or 0.6524 for 4" well) * 3 well vo
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
		$\langle \cap \rangle$	10	(	AA	PI_F
		OK	ţD	, ,	y II.	
mments: _		first	bailer	1/4 F	ull, gr	ab Sampt3
escribe De	eviations f	rom SOP:	grab	Samp	le due-	to insufficient 1/20
gnature:	Ja	le achurz	5		Date:	10/24/2019

		1	P	dvancing	Opportunity	LT Envi	ronmental, In
	Ground	water Sample Colle	ection Form		-	Durango, C	848 E. 2nd Ave Colorado 8130 T 970.385.109
Proje	oject Name: ct Number:	Salty Dog Water Transfer 017819014	Station	Pr	oject Location: Sampler	Salty Dog Pipeli	ine
5	Sample D:	MWOA			Matrice	Constanton	10
Sa	ample Date:	10/24/2019			Sample Time:	1050	
	Laboratory:	Hall Environmental		Shi	pping Method:	Hand Delivery	
	Analyses:	VOC's, TDS, pH, cati	on/anions				
Dept	th to Water:	23.93		Total	Depth of Well:	30.18	
	Time:	1030		De	pth to Product:	00	
ol. of Wat Method Method of	er to Purge: of Purging: f Sampling:	3.0 geelle PVC Bailer PVC Bailer	0NS	(height of w	ater column * 0.1631 fi	òr 2" well or 0.6524 for 4	"well) * 3 well ve
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp.	Conductivit y (us or ms)	Comm	ents
1035	0.25	0.25	6.97	15.7	8.97	slight brow	n cloudy
	0.25	0.50	644	15.4	9.46	brown	· claudi
	DRS	1.0	6.99	16.0	4.07	64	51
	1.0	2.0	7.04	16.0	8.96	'n	<i>F</i> 4
	1.0	3.0	7.02	16.1	8.74	u	71
mments:			Sampled	C 105(	>		
escribe I	Deviations f	rom SOP:					
gnature:	De	de adun	4		Date:		10/24/2019

	Ground	water Sample Colle	Ection Form	ldvancing	Opportunity	<b>LT Environmental, In</b> 848 E. 2nd Av Durango, Colorado 8130 T 970.385.109
Pro Proje	oject Name: ect Number:	Salty Dog Water Transfer 017819014	Station	P	roject Location: Sampler:	Salty Dog Pipeline Stuart Avde
Si	Sample ID: ample Date: Laboratory: Analyses:	MW 10 10/24/2019 Hall Environmental VOC's, TDS, pH, cati	on/anions	Matrix: Groundwater Sample Time: 1040 Shipping Method: Hand Delivery		
Dept	th to Water: Time:	30.60		Total De	Depth of Well: epth to Product:	40.35
ol. of Wat Method Method o	er to Purge: of Purging: f Sampling:	<u>4.9 gal</u> <u>PVC Bailer</u> PVC Bailer	loms	(height of v	vater column * 0.1631 fr	or 2" well or 0.6524 for 4" well) * 3 well vo
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. , (F)	Conductivit y (us or ms)	Comments
1005	0.5	0.5	7.49	56.5	4.85	Slight terbid brown
1015	0.25	0.75	7.49	57.2	9.98	у н
1017	0.25	1.0	7.54	57.7	11.55	A 1
1020	0.25	1.25	7.54	57.2	9.70	med, turbititu
1025	0.75	2.0	7.58	56.8	10.16	11
1027	1.0	2.0	760	66.8	10.97	15
1030	1.0	4.0	7.67	56.7	12.10	. 7
1035	1.0	5.0	7.61	57.2	12.37	e V
Describe I	Deviations f	rom SOP:	ampled C			
bignature:	G	k			Date: _	10/24/2019

		1		dvancing	Opportunity	LT	Environmental, Ind	
	Ground	water Sample Colle	ection Form			Duran	848 E. 2nd Ave Igo, Colorado 8130 T 970.385.109	
Pr Proje	oject Name: ect Number:	Salty Dog Water Transfer 017819014	Station	Pr	oject Location: Sampler:	Salty Dog P	ipeline	
Sample ID: Sample Date: 10/24/2019 Laboratory: Hall Environmental				Matrix: Groundwater Sample Time: 1150 Shipping Method: Hand Delivery				
Dep	Analyses: th to Water: Time:	VOC's, TDS, pH, cati 20.83 1120	on/anions	Total De	Depth of Well: pth to Product:	39.01 ND		
l. of Wat Method /lethod o	er to Purge: of Purging: f Sampling:	4.00 PVC Bailer PVC Bailer		(height of w	ater column * 0.1631 fa	or 2" well or 0.652	24 for 4" well) * 3 well vo	
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp.	Conductivit y (us or ins	Co	omments	
1125	0.25	0.25	7.10	15.7	38.0	brown	cloudy	
_	0.25	0.50	7.06	16.1	32.2	U.	15	
	0.25	0.75	7.09	6.	28.1	n	р	
_	0.25	1.0	4.03	16.1	25.4	UA.		
	1.0	2.0	709	15.9	43.7	u	//	
	1.0	3.0	7.08	16.0	40.8	**	/1	
	1.0	1.0	7.04	16.0	45.4		71	
nments:		Sc	ampled (	2 1150	>			
escribe ]	Deviations f	rom SOP:						
gnature:	Ju	1 aduns	-		Date:		10/24/2019	

		1	TE	Advancing	<b>Opportunity</b>	LT Environmental, Ind
	Ground	water Sample Colle	ection Form	!	-	046 E. 210 Ave Durango, Colorado 8130 T 970.385.109
Pro Proie	oject Name: ct Number:	Salty Dog Water Transfer 017819014	Station	Р	roject Location:	Salty Dog Pipeline
110je	a				Sampler,	Storre HYDE
S	Sample ID:	10/24/2010			Matrix:	Groundwater
50	Laboratory:	Hall Environmental		Sh	inning Method:	Hand Delivery
	Analyses:	VOC's, TDS, pH, cati	ion/anions		apping memour	
Dent	h to Water:	31.83		Total	Donth of Walls	40.40
Dept	Time:	1100		De	epth to Product:	
				2.	opin to rioduou	
. of Wate	er to Purge:	4.1	4 gallon	S (height of y	water column * 0.1631 fc	or 2" well or 0.6524 for 4" well) * 3 well vo
Method	of Purging:	PVC Bailer	)	a (nongar er i		
lethod of	f Sampling:	PVC Bailer				
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments
00	0.5	0.5	7.32	59.4	35.8	slight turbid brown
02	0.5	0.75	7.21	59.5	46.9	35
105	0.25	1.0	7.22	59.9	52.5	11
164	0.25	1.25	7.22	59.7	52.0	63
120	0.75	2.0	7.22	59.9	58.1	11
125	1.0	5.0	7.20	58.5 19.5	60.5	Med tur balt
130	1.0	50	7.32	59.9	60.1	),
aments:		SGI	moleci	@ 1140	)	
			Feel			
scribe I	Deviations f	rom SOP:				
nature:	$\bigcap$	In Kelling	A	_	Date:	10/24/2019

		1	EP.	dvancing	<b>Opportunity</b>	LT Environmental, Inc.	
	Ground	848 E. 2nd Ave Durango, Colorado 8130 T 970.385.109					
Pro Projec	oject Name: ct Number:	Salty Dog Water Transfer 017819014	Station	Pr	oject Location: 2 Sampler:	Salty Dog Pipeline Stuart Hyde	
Sample ID: <u>Mw14</u> Sample Date: <u>10/24/2019</u> Laboratory: <u>Hall Environmental</u> Analyses: <u>VOC's, TDS, pH, cation/anions</u>				Matrix: Groundwater Sample Time: <u>の q 山の</u> Shipping Method: <u>Hand Delivery</u>			
Dept	h to Water: Time:	30.92		Total De	Depth of Well: _ pth to Product: _	35.42	
ol. of Wate Method of Method of	er to Purge: of Purging: Sampling:	2.5 allors PVC Bailer PVC Bailer	>	(height of w	rater column * 0.1631 for	r 2" well or 0.6524 for 4" well) * 3 well vol	
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivit y (us or ms)	Comments	
0920	0.75	0.75	7.30	59.0	9.18	brown turbid	
0925	0.3	1.0	7.50	59.5	4.80	11	
5420	0.25	1.25	1.47	59.3	5.04	44 (1)	
6970	6:25	10	7.40	54.2	5.20		
0937	0.40	2.5	7.40	50.5	5.68	13	
escribe D	)eviations f	from SOP:	npled C	0941	2		
ignature:		A			Date:	10/24/2019	

		1	TE	Advancing	<b>Opportunity</b>	LT Envi	ronmental, In			
	Ground	water Sample Colle	ection Form	1	5	Durango, C	348 E. 2nd Av Colorado 8130 T 970.385.109			
Pr Proje	oject Name: ect Number:	Salty Dog Water Transfer	Station	Pı	roject Location:	Salty Dog Pipel	ine			
					Sampler:	JOST MULL	n>			
Sample ID: MW 15					Matrix:	Groundwater				
Laboratory: Hall Environmental					Sample Time: 0435					
	Analyses:	VOC's, TDS, pH, cati	on/anions	511	ipping monou.	finand Denivery	-			
Den	th to Water:	2715		Total	Donth of Walls	30.73				
Dop	Time:	0900		De	epth to Product:	ND				
ol. of Wat	ter to Purge:	5.5 0	allons	(height of w	vater column * 0.1631 fc	r 2" well or 0.6524 for 4	" well) * 3 well v			
Method	of Purging:	PVC Bailer					,			
Method o	of Sampling:	PVC Bailer								
Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp.	Conductivit y (us or fis)	Comm	ents			
2905	0.25	0.25	7.08	14.5	23.1	brown	Jaudu			
	0.25	0.50	7.06	14.2	8.72		11			
	0.25	0.75	7.04	14.6	8.70	м	11			
	0.25	1.0	7.09	14.3	9.52	ii.	46			
	1.0	2.0	7.05	14.4	9.42					
	1.0	4.0	7.04	14.7	2 27		11			
-	1.0	5.0	7.09	14.7	6.65	4	71			
	0.5	5.5	7.03	14.6	6.51	ч	"			
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mments:		Sa	mpled	C 09	135		_			
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<b>)escribe</b> ]	Deviations f	rom SOP:								
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ignature:	1 h	In alling	5		Date:		10/24/2019			
	1	U			-					

*Received by OCD: 11/18/2019 1:34:59 PM* 

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September 09, 2019

Jennifer Deal HILCORP ENERGY PO Box 4700 Farmington, NM 87499 TEL: (505) 564-0733 FAX Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

RE: Salty Dog

OrderNo.: 1909112

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 20 sample(s) on 9/4/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to <u>www.hallenvironmental.com</u> or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

**Analytical Report** Lab Order 1909112

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019

CLIENT: HILCORP ENERGY		Client	Sample ID:	MW0	5 25'-30'				
<b>Project:</b> Salty Dog		Collection Date: 8/28/2019 12:00:00 PM							
Lab ID: 1909112-001	Matrix: SOIL	Rec	eived Date:	9/4/20	.019 8:00:00 AM				
Analyses	Result	RL Qu	ual Units	DF	Date Analyzed				
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: <b>JME</b>				
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	9/5/2019 4:53:11 PM				
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	9/5/2019 4:53:11 PM				
Surr: DNOP	107	70-130	%Rec	1	9/5/2019 4:53:11 PM				
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB				
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	9/5/2019 12:47:18 PM				
Surr: BFB	97.6	77.4-118	%Rec	1	9/5/2019 12:47:18 PM				
EPA METHOD 8021B: VOLATILES					Analyst: NSB				
Benzene	ND	0.024	mg/Kg	1	9/5/2019 12:47:18 PM				
Toluene	ND	0.047	mg/Kg	1	9/5/2019 12:47:18 PM				
Ethylbenzene	ND	0.047	mg/Kg	1	9/5/2019 12:47:18 PM				
Xylenes, Total	ND	0.094	mg/Kg	1	9/5/2019 12:47:18 PM				
Surr: 4-Bromofluorobenzene	86.2	80-120	%Rec	1	9/5/2019 12:47:18 PM				
EPA METHOD 300.0: ANIONS					Analyst: CJS				
Chloride	390	60	mg/Kg	20	9/5/2019 5:32:32 PM				

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 1 of 25

**CLIENT: HILCORP ENERGY** 

**Analytical Report** Lab Order 1909112

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: MW05 30'-35' Collection Date: 8/28/2019 12:15:00 PM

<b>Project:</b>	Salty Dog		Collection Date: 8/28/2019 12:15:00 PM							
Lab ID:	1909112-002	Matrix: SOIL	Rec	eived Date:	:9/4/2019 8:00:00 AM					
Analyses		Result	RL Q	RL Qual Units		Date Analyzed				
EPA ME	THOD 8015M/D: DIESEL F	ANGE ORGANICS				Analyst: JME				
Diesel F	Range Organics (DRO)	ND	9.6	mg/Kg	1	9/5/2019 6:06:10 PM				
Motor C	il Range Organics (MRO)	ND	48	mg/Kg	1	9/5/2019 6:06:10 PM				
Surr:	DNOP	103	70-130	%Rec	1	9/5/2019 6:06:10 PM				
EPA ME	THOD 8015D: GASOLINE	RANGE				Analyst: NSB				
Gasolin	e Range Organics (GRO)	ND	5.0	mg/Kg	1	9/5/2019 1:55:52 PM				
Surr:	BFB	97.9	77.4-118	%Rec	1	9/5/2019 1:55:52 PM				
EPA ME	THOD 8021B: VOLATILES	;				Analyst: NSB				
Benzen	e	ND	0.025	mg/Kg	1	9/5/2019 1:55:52 PM				
Toluene	9	ND	0.050	mg/Kg	1	9/5/2019 1:55:52 PM				
Ethylbei	nzene	ND	0.050	mg/Kg	1	9/5/2019 1:55:52 PM				
Xylenes	s, Total	ND	0.099	mg/Kg	1	9/5/2019 1:55:52 PM				
Surr:	4-Bromofluorobenzene	87.0	80-120	%Rec	1	9/5/2019 1:55:52 PM				
EPA ME	THOD 300.0: ANIONS					Analyst: CJS				
Chloride	9	110	60	mg/Kg	20	9/5/2019 5:44:57 PM				

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S
- в Analyte detected in the associated Method Blank Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 2 of 25

**Analytical Report** Lab Order 1909112

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: Ex. Bottom

CLIENT: HILCORP ENERGY	Client Sample ID: Ex. Bottom							
<b>Project:</b> Salty Dog	Collection Date: 8/28/2019 1:10:00 PM							
Lab ID: 1909112-003	Matrix: SOIL	Rece	eived Date:	19 8:00:00 AM				
Analyses	Result	RL Qu	al Units	DF	Date Analyzed			
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: <b>JME</b>			
Diesel Range Organics (DRO)	ND	9.0	mg/Kg	1	9/5/2019 6:30:34 PM			
Motor Oil Range Organics (MRO)	ND	45	mg/Kg	1	9/5/2019 6:30:34 PM			
Surr: DNOP	77.2	70-130	%Rec	1	9/5/2019 6:30:34 PM			
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB			
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	9/5/2019 3:04:34 PM			
Surr: BFB	98.3	77.4-118	%Rec	1	9/5/2019 3:04:34 PM			
EPA METHOD 8021B: VOLATILES					Analyst: NSB			
Benzene	ND	0.024	mg/Kg	1	9/5/2019 3:04:34 PM			
Toluene	ND	0.047	mg/Kg	1	9/5/2019 3:04:34 PM			
Ethylbenzene	ND	0.047	mg/Kg	1	9/5/2019 3:04:34 PM			
Xylenes, Total	ND	0.095	mg/Kg	1	9/5/2019 3:04:34 PM			
Surr: 4-Bromofluorobenzene	86.2	80-120	%Rec	1	9/5/2019 3:04:34 PM			
EPA METHOD 300.0: ANIONS					Analyst: MRA			
Chloride	14000	600	mg/Kg	200	9/6/2019 9:58:00 AM			

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 3 of 25
Toluene

Chloride

Ethylbenzene

Xylenes, Total

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

**Analytical Report** Lab Order 1909112

9/5/2019 3:27:30 PM

9/5/2019 3:27:30 PM

9/5/2019 3:27:30 PM

9/5/2019 3:27:30 PM

9/5/2019 6:34:36 PM

Analyst: CJS

### Date Reported: 9/9/2019

## Hall Environmental Analysis Laboratory, Inc.

CLIENT:HILCORP ENERGYProject:Salty DogLab ID:1909112-004	Matrix: SOIL	Client S Collec Rece	Sample ID: ction Date: eived Date:	MW06 8/28/2 9/4/20	5 25'-30' 019 3:15:00 PM 19 8:00:00 AM
Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: JME
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	9/5/2019 6:55:03 PM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	9/5/2019 6:55:03 PM
Surr: DNOP	95.5	70-130	%Rec	1	9/5/2019 6:55:03 PM
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	9/5/2019 3:27:30 PM
Surr: BFB	98.9	77.4-118	%Rec	1	9/5/2019 3:27:30 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	9/5/2019 3:27:30 PM

ND

ND

ND

86.2

1700

0.047

0.047

0.095

80-120

60

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- Practical Quanitative Limit PQL
- % Recovery outside of range due to dilution or matrix S

В Analyte detected in the associated Method Blank

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

20

- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 4 of 25

Toluene

Chloride

Ethylbenzene

Xylenes, Total

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

**Analytical Report** Lab Order 1909112

### Date Reported: 9/9/2019

9/5/2019 3:50:23 PM

9/5/2019 3:50:23 PM

9/5/2019 3:50:23 PM

9/5/2019 3:50:23 PM

9/5/2019 6:47:00 PM

Analyst: CJS

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: Project:	HILCORP ENERGY Salty Dog	Matain SOI	Client Sample ID: MW06 30'-35' Collection Date: 8/28/2019 3:17:00 PM						
Lab ID: Analyses	1909112-005	Result	Rece RL Qu	al Units	9/4/20 DF	Date Analyzed			
EPA MET	HOD 8015M/D: DIESEL RAI	NGE ORGANICS				Analyst: JME			
Diesel Ra	ange Organics (DRO)	ND	9.9	mg/Kg	1	9/5/2019 7:19:20 PM			
Motor Oil	Range Organics (MRO)	ND	50	mg/Kg	1	9/5/2019 7:19:20 PM			
Surr: E	DNOP	96.7	70-130	%Rec	1	9/5/2019 7:19:20 PM			
EPA MET	HOD 8015D: GASOLINE RA	NGE				Analyst: NSB			
Gasoline	Range Organics (GRO)	ND	4.6	mg/Kg	1	9/5/2019 3:50:23 PM			
Surr: E	BFB	98.4	77.4-118	%Rec	1	9/5/2019 3:50:23 PM			
EPA MET	HOD 8021B: VOLATILES					Analyst: NSB			
Benzene		ND	0.023	mg/Kg	1	9/5/2019 3:50:23 PM			

ND

ND

ND

85.2

2100

0.046

0.046

0.093

80-120

60

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- Practical Quanitative Limit PQL
- % Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: MW07 2'-4'

<b>CLIENT:</b> HILCORP ENERGY	Client Sample ID: MW07 2'-4' Collection Date: 8/29/2019 12:20:00 PM						
<b>Project:</b> Salty Dog							
Lab ID: 1909112-006	Matrix: SOIL	Rece	Received Date: 9/4/2019 8:00:00 AM				
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: <b>JME</b>		
Diesel Range Organics (DRO)	36	9.3	mg/Kg	1	9/5/2019 7:43:32 PM		
Motor Oil Range Organics (MRO)	250	47	mg/Kg	1	9/5/2019 7:43:32 PM		
Surr: DNOP	103	70-130	%Rec	1	9/5/2019 7:43:32 PM		
EPA METHOD 8015D: GASOLINE RANG	E				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	9/5/2019 6:30:46 PM		
Surr: BFB	98.3	77.4-118	%Rec	1	9/5/2019 6:30:46 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.024	mg/Kg	1	9/5/2019 6:30:46 PM		
Toluene	ND	0.049	mg/Kg	1	9/5/2019 6:30:46 PM		
Ethylbenzene	ND	0.049	mg/Kg	1	9/5/2019 6:30:46 PM		
Xylenes, Total	ND	0.097	mg/Kg	1	9/5/2019 6:30:46 PM		
Surr: 4-Bromofluorobenzene	85.8	80-120	%Rec	1	9/5/2019 6:30:46 PM		
EPA METHOD 300.0: ANIONS					Analyst: MRA		
Chloride	9600	300	mg/Kg	100	9/6/2019 10:10:25 AM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S
- % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Ethylbenzene

Xylenes, Total

Chloride

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

**Analytical Report** Lab Order 1909112

9/5/2019 6:53:37 PM

9/5/2019 6:53:37 PM

9/5/2019 6:53:37 PM

9/6/2019 10:22:49 AM

Analyst: MRA

#### Date Reported: 9/9/2019

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY	Y Client Sample ID: MW07 22'-24'						
<b>Project:</b> Salty Dog		Collection Date: 8/29/2019 12:22:00 PM					
Lab ID: 1909112-007	Matrix: SOIL	Rece	ived Date:	9/4/20	19 8:00:00 AM		
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: <b>JME</b>		
Diesel Range Organics (DRO)	ND	9.9	mg/Kg	1	9/5/2019 8:07:47 PM		
Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	9/5/2019 8:07:47 PM		
Surr: DNOP	99.0	70-130	%Rec	1	9/5/2019 8:07:47 PM		
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	9/5/2019 6:53:37 PM		
Surr: BFB	99.9	77.4-118	%Rec	1	9/5/2019 6:53:37 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.024	mg/Kg	1	9/5/2019 6:53:37 PM		
Toluene	ND	0.049	mg/Kg	1	9/5/2019 6:53:37 PM		

ND

ND

87.9

2200

0.049

0.097

80-120

150

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

50

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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#### Date Reported: 9/9/2019

9/6/2019 10:35:13 AM

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY	<b>Client Sample ID:</b> MW02 2'-4'						
<b>Project:</b> Salty Dog		<b>Collection Date:</b> 8/29/2019 12:36:00 PM					
Lab ID: 1909112-008	Matrix: SOIL	Matrix: SOIL         Received Date: 9/4/2019 8:00:0					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: <b>JME</b>		
Diesel Range Organics (DRO)	ND	9.7	mg/Kg	1	9/5/2019 8:32:19 PM		
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	9/5/2019 8:32:19 PM		
Surr: DNOP	97.4	70-130	%Rec	1	9/5/2019 8:32:19 PM		
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	9/5/2019 7:16:27 PM		
Surr: BFB	101	77.4-118	%Rec	1	9/5/2019 7:16:27 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.024	mg/Kg	1	9/5/2019 7:16:27 PM		
Toluene	ND	0.048	mg/Kg	1	9/5/2019 7:16:27 PM		
Ethylbenzene	ND	0.048	mg/Kg	1	9/5/2019 7:16:27 PM		
Xylenes, Total	ND	0.096	mg/Kg	1	9/5/2019 7:16:27 PM		
Surr: 4-Bromofluorobenzene	88.5	80-120	%Rec	1	9/5/2019 7:16:27 PM		
EPA METHOD 300.0: ANIONS					Analyst: MRA		

2900

150

mg/Kg

50

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Chloride

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019

CLIENT: HILCORP ENERGY	Client Sample ID: MW02 16'-18' Collection Date: 8/29/2019 12:38:00 PM					
<b>Project:</b> Salty Dog						
Lab ID: 1909112-009	Matrix: SOIL	Rec	19 8:00:00 AM			
Analyses	Result	RL Q	ual Units	DF	Date Analyzed	
EPA METHOD 8015M/D: DIESEL RANGE	E ORGANICS				Analyst: <b>JME</b>	
Diesel Range Organics (DRO)	ND	8.6	mg/Kg	1	9/5/2019 8:57:04 PM	
Motor Oil Range Organics (MRO)	ND	43	mg/Kg	1	9/5/2019 8:57:04 PM	
Surr: DNOP	96.8	70-130	%Rec	1	9/5/2019 8:57:04 PM	
EPA METHOD 8015D: GASOLINE RANG	E				Analyst: NSB	
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	9/5/2019 7:39:17 PM	
Surr: BFB	97.3	77.4-118	%Rec	1	9/5/2019 7:39:17 PM	
EPA METHOD 8021B: VOLATILES					Analyst: NSB	
Benzene	ND	0.025	mg/Kg	1	9/5/2019 7:39:17 PM	
Toluene	ND	0.050	mg/Kg	1	9/5/2019 7:39:17 PM	
Ethylbenzene	ND	0.050	mg/Kg	1	9/5/2019 7:39:17 PM	
Xylenes, Total	ND	0.10	mg/Kg	1	9/5/2019 7:39:17 PM	
Surr: 4-Bromofluorobenzene	84.4	80-120	%Rec	1	9/5/2019 7:39:17 PM	
EPA METHOD 300.0: ANIONS					Analyst: CAS	
Chloride	1800	60	mg/Kg	20	9/5/2019 8:42:10 PM	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: MW03 14'-16'

CLIENT: HILCORP ENERGY	Client Sample ID: MW03 14'-16'						
<b>Project:</b> Salty Dog	Collection Date: 8/29/2019 3:08:00 PM						
Lab ID: 1909112-010	Matrix: SOIL	Re	<b>Received Date:</b> 9/4/2019 8:00:				
Analyses	Result	RL C	RL Qual Units		Date Analyzed		
EPA METHOD 8015M/D: DIESEL RANGE O	RGANICS				Analyst: <b>JME</b>		
Diesel Range Organics (DRO)	ND	8.7	mg/Kg	1	9/5/2019 9:21:51 PM		
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	9/5/2019 9:21:51 PM		
Surr: DNOP	96.1	70-130	%Rec	1	9/5/2019 9:21:51 PM		
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	9/5/2019 8:02:07 PM		
Surr: BFB	97.9	77.4-118	%Rec	1	9/5/2019 8:02:07 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.025	mg/Kg	1	9/5/2019 8:02:07 PM		
Toluene	ND	0.049	mg/Kg	1	9/5/2019 8:02:07 PM		
Ethylbenzene	ND	0.049	mg/Kg	1	9/5/2019 8:02:07 PM		
Xylenes, Total	ND	0.099	mg/Kg	1	9/5/2019 8:02:07 PM		
Surr: 4-Bromofluorobenzene	84.8	80-120	%Rec	1	9/5/2019 8:02:07 PM		
EPA METHOD 300.0: ANIONS					Analyst: CAS		
Chloride	190	60	mg/Kg	20	9/5/2019 8:54:34 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: MW03 26'-28'

CLIENT: HILCORP ENERGY	Client Sample ID: MW03 26'-28' Collection Date: 8/29/2019 3:11:00 PM						
<b>Project:</b> Salty Dog							
Lab ID: 1909112-011	Matrix: SOIL	F	Received Date: 9/4/2019 8:00:00 AM				
Analyses	Result	RL	Qual Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RANGE C	RGANICS				Analyst: <b>JME</b>		
Diesel Range Organics (DRO)	ND	8.8	mg/Kg	1	9/5/2019 9:46:39 PM		
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	9/5/2019 9:46:39 PM		
Surr: DNOP	116	70-130	%Rec	1	9/5/2019 9:46:39 PM		
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB		
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	9/5/2019 8:24:59 PM		
Surr: BFB	99.8	77.4-118	%Rec	1	9/5/2019 8:24:59 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.025	mg/Kg	1	9/5/2019 8:24:59 PM		
Toluene	ND	0.050	mg/Kg	1	9/5/2019 8:24:59 PM		
Ethylbenzene	ND	0.050	mg/Kg	1	9/5/2019 8:24:59 PM		
Xylenes, Total	ND	0.10	mg/Kg	1	9/5/2019 8:24:59 PM		
Surr: 4-Bromofluorobenzene	86.5	80-120	%Rec	1	9/5/2019 8:24:59 PM		
EPA METHOD 300.0: ANIONS					Analyst: CAS		
Chloride	ND	61	mg/Kg	20	9/5/2019 9:06:58 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

**Analytical Report** Lab Order 1909112

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: MW02 22'-24'

Project:	Salty Dog		Collection Date: 8/29/2019 3:16:00 PM						
Lab ID: 1909112-012		Matrix: SOIL	Rec	Received Date: 9/4/2019 8:00:00 AM					
Analyses		Result	RL Qu	al Units	DF	Date Analyzed			
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: <b>JME</b>			
Diesel R	ange Organics (DRO)	ND	9.7	mg/Kg	1	9/5/2019 10:11:17 PM			
Motor O	il Range Organics (MRO)	ND	48	mg/Kg	1	9/5/2019 10:11:17 PM			
Surr:	DNOP	100	70-130	%Rec	1	9/5/2019 10:11:17 PM			
EPA ME	THOD 8015D: GASOLINE R	ANGE				Analyst: NSB			
Gasoline	e Range Organics (GRO)	ND	4.7	mg/Kg	1	9/5/2019 8:47:49 PM			
Surr:	BFB	96.5	77.4-118	%Rec	1	9/5/2019 8:47:49 PM			
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB			
Benzene	9	ND	0.023	mg/Kg	1	9/5/2019 8:47:49 PM			
Toluene		ND	0.047	mg/Kg	1	9/5/2019 8:47:49 PM			
Ethylber	izene	ND	0.047	mg/Kg	1	9/5/2019 8:47:49 PM			
Xylenes,	Total	ND	0.094	mg/Kg	1	9/5/2019 8:47:49 PM			
Surr: 4	4-Bromofluorobenzene	83.7	80-120	%Rec	1	9/5/2019 8:47:49 PM			
EPA ME	THOD 300.0: ANIONS					Analyst: CAS			
Chloride		2400	60	mg/Kg	20	9/5/2019 9:19:22 PM			

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019

CLIENT: HILCORP ENERGY	Client Sample ID: MW01 0'-2'						
<b>Project:</b> Salty Dog	Collection Date: 8/30/2019 5:28:00 PM						
Lab ID: 1909112-013	Matrix: SOIL         Received Date: 9/4/2019 8:00:00 A						
Analyses	Result	RL	Qual Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: <b>JME</b>		
Diesel Range Organics (DRO)	ND	9.2	mg/Kg	1	9/5/2019 10:35:57 PM		
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	9/5/2019 10:35:57 PM		
Surr: DNOP	117	70-130	%Rec	1	9/5/2019 10:35:57 PM		
EPA METHOD 8015D: GASOLINE RANG	E				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.6	mg/Kg	1	9/5/2019 9:10:40 PM		
Surr: BFB	96.3	77.4-118	%Rec	1	9/5/2019 9:10:40 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.023	mg/Kg	1	9/5/2019 9:10:40 PM		
Toluene	ND	0.046	mg/Kg	1	9/5/2019 9:10:40 PM		
Ethylbenzene	ND	0.046	mg/Kg	1	9/5/2019 9:10:40 PM		
Xylenes, Total	ND	0.093	mg/Kg	1	9/5/2019 9:10:40 PM		
Surr: 4-Bromofluorobenzene	82.9	80-120	%Rec	1	9/5/2019 9:10:40 PM		
EPA METHOD 300.0: ANIONS					Analyst: CAS		
Chloride	ND	60	mg/Kg	20	9/5/2019 9:31:47 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019

CLIENT: HILCORP ENERGY	Client Sample ID: MW01 8'-10'						
<b>Project:</b> Salty Dog		Collection Date: 8/30/2019 5:32:00 PM					
Lab ID: 1909112-014	Matrix: SOIL	Matrix: SOIL         Received Date: 9/4/2019 8:00:00 .					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL R	ANGE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)	ND	9.4	mg/Kg	1	9/6/2019 9:16:19 AM		
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	9/6/2019 9:16:19 AM		
Surr: DNOP	70.2	70-130	%Rec	1	9/6/2019 9:16:19 AM		
EPA METHOD 8015D: GASOLINE F	RANGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	9/5/2019 9:33:28 PM		
Surr: BFB	98.8	77.4-118	%Rec	1	9/5/2019 9:33:28 PM		
EPA METHOD 8021B: VOLATILES					Analyst: <b>NSB</b>		
Benzene	ND	0.023	mg/Kg	1	9/5/2019 9:33:28 PM		
Toluene	ND	0.047	mg/Kg	1	9/5/2019 9:33:28 PM		
Ethylbenzene	ND	0.047	mg/Kg	1	9/5/2019 9:33:28 PM		
Xylenes, Total	ND	0.094	mg/Kg	1	9/5/2019 9:33:28 PM		
Surr: 4-Bromofluorobenzene	85.7	80-120	%Rec	1	9/5/2019 9:33:28 PM		
EPA METHOD 300.0: ANIONS					Analyst: CAS		
Chloride	75	60	mg/Kg	20	9/5/2019 9:44:12 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**EPA METHOD 300.0: ANIONS** 

Chloride

**Analytical Report** Lab Order 1909112

#### Date Reported: 9/9/2019

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY	Client Sample ID: MW01 10'-12' Collection Date: 8/30/2019 5:34:00 PM					
<b>Project:</b> Salty Dog						
Lab ID: 1909112-015	Matrix: SOIL	Matrix: SOIL Received Dat			019 8:00:00 AM	
Analyses	Result	RL Qu	al Units	DF	Date Analyzed	
EPA METHOD 8015M/D: DIESEL RANG	SE ORGANICS				Analyst: BRM	
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	9/6/2019 12:50:15 PM	
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	9/6/2019 12:50:15 PM	
Surr: DNOP	95.9	70-130	%Rec	1	9/6/2019 12:50:15 PM	
EPA METHOD 8015D: GASOLINE RAN	GE				Analyst: NSB	
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	9/5/2019 9:56:15 PM	
Surr: BFB	99.7	77.4-118	%Rec	1	9/5/2019 9:56:15 PM	
EPA METHOD 8021B: VOLATILES					Analyst: NSB	
Benzene	ND	0.024	mg/Kg	1	9/5/2019 9:56:15 PM	
Toluene	ND	0.048	mg/Kg	1	9/5/2019 9:56:15 PM	
Ethylbenzene	ND	0.048	mg/Kg	1	9/5/2019 9:56:15 PM	
Xylenes, Total	ND	0.096	mg/Kg	1	9/5/2019 9:56:15 PM	
Surr: 4-Bromofluorobenzene	86.6	80-120	%Rec	1	9/5/2019 9:56:15 PM	

84

60

mg/Kg

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Analyst: CAS

9/5/2019 9:56:36 PM

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019

<b>CLIENT:</b> HILCORP ENERGY		Client S	Sample ID:	MW04	4 2'-4'
<b>Project:</b> Salty Dog		Collec	ction Date:	8/30/2	019 5:43:00 PM
Lab ID: 1909112-016	Matrix: SOIL	Rece	ived Date:	9/4/20	19 8:00:00 AM
Analyses	Result	RL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: JME
Diesel Range Organics (DRO)	ND	9.7	mg/Kg	1	9/5/2019 11:49:59 PM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	9/5/2019 11:49:59 PM
Surr: DNOP	103	70-130	%Rec	1	9/5/2019 11:49:59 PM
EPA METHOD 8015D: GASOLINE RANG	GE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	9/5/2019 11:05:36 PM
Surr: BFB	100	77.4-118	%Rec	1	9/5/2019 11:05:36 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.025	mg/Kg	1	9/5/2019 11:05:36 PM
Toluene	ND	0.049	mg/Kg	1	9/5/2019 11:05:36 PM
Ethylbenzene	ND	0.049	mg/Kg	1	9/5/2019 11:05:36 PM
Xylenes, Total	ND	0.098	mg/Kg	1	9/5/2019 11:05:36 PM
Surr: 4-Bromofluorobenzene	86.9	80-120	%Rec	1	9/5/2019 11:05:36 PM
EPA METHOD 300.0: ANIONS					Analyst: CAS
Chloride	390	60	mg/Kg	20	9/5/2019 10:09:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**Project:** 

Lab ID:

Analyses

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

**CLIENT: HILCORP ENERGY** 

Salty Dog

**EPA METHOD 8015D: GASOLINE RANGE** 

Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

Analyst: NSB

Analyst: NSB

Analyst: CAS

9/5/2019 11:28:39 PM

9/5/2019 10:46:13 PM

**Analytical Report** Lab Order 1909112

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: MW04 16'-18' Collection Date: 8/30/2019 5:44:00 PM

ed Date: 9/4/2019 8:00:00 AM
Units DF Date Analyzed
Analyst: .IME
mg/Kg 1 9/6/2019 12:14:44 AM
mg/Kg 1 9/6/2019 12:14:44 AM mg/Kg 1 9/6/2019 12:14:44 AM
Units DF Date Analyzed

4.7

77.4-118

0.023

0.047

0.047

0.093

59

80-120

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

20

ND

99.8

ND

ND

ND

ND

86.0

160

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

**Analytical Report** Lab Order 1909112

9/5/2019 11:51:43 PM

9/5/2019 10:58:38 PM

Analyst: CAS

### Date Reported: 9/9/2019

Hall Environmental	l Analysis	Laboratory,	, Inc.
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CLIENT: HILCORP ENERGY		Client	Sample ID:	MW04	4 18'-20'
Project: Salty Dog		Colle	ection Date:	8/30/2	019 5:45:00 PM
Lab ID: 1909112-018	Matrix: SOIL	Rec	eived Date:	9/4/20	19 8:00:00 AM
Analyses	Result	RL Qu	ual Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst: JME
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	9/6/2019 12:39:31 AM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	9/6/2019 12:39:31 AM
Surr: DNOP	100	70-130	%Rec	1	9/6/2019 12:39:31 AM
EPA METHOD 8015D: GASOLINE RAM	IGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	9/5/2019 11:51:43 PM
Surr: BFB	102	77.4-118	%Rec	1	9/5/2019 11:51:43 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB

ND

ND

ND

ND

86.1

110

0.025

0.050

0.050

0.099

80-120

60

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

**Analytical Report** Lab Order 1909112

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019 Client Sample ID: NE Wall of Ex.

<b>Project:</b> Salty Dog		Collect	ion Date:	8/30/2	019 5:53:00 PM
Lab ID: 1909112-019	Matrix: SOIL	Receiv	ved Date:	9/4/20	19 8:00:00 AM
Analyses	Result	RL Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: <b>JME</b>
Diesel Range Organics (DRO)	ND	9.5	mg/Kg	1	9/6/2019 1:04:13 AM
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	9/6/2019 1:04:13 AM
Surr: DNOP	130	70-130	%Rec	1	9/6/2019 1:04:13 AM
EPA METHOD 8015D: GASOLINE RANGE	E				Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	9/6/2019 12:14:50 AM
Surr: BFB	99.4	77.4-118	%Rec	1	9/6/2019 12:14:50 AM
EPA METHOD 8021B: VOLATILES					Analyst: <b>NSB</b>
Benzene	ND	0.023	mg/Kg	1	9/6/2019 12:14:50 AM
Toluene	ND	0.047	mg/Kg	1	9/6/2019 12:14:50 AM
Ethylbenzene	ND	0.047	mg/Kg	1	9/6/2019 12:14:50 AM
Xylenes, Total	ND	0.093	mg/Kg	1	9/6/2019 12:14:50 AM
Surr: 4-Bromofluorobenzene	84.7	80-120	%Rec	1	9/6/2019 12:14:50 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	6400	300	mg/Kg	100	9/6/2019 10:47:38 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 9/9/2019

CLIENT: HILCORP ENERGY		Client S	Sample ID:	SW W	all of Ex.
<b>Project:</b> Salty Dog		Colle	ction Date:	8/30/20	019 5:54:00 PM
Lab ID: 1909112-020	Matrix: SOIL	Rece	eived Date:	9/4/202	19 8:00:00 AM
Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE	ORGANICS				Analyst: JME
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	9/6/2019 1:28:53 AM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	9/6/2019 1:28:53 AM
Surr: DNOP	114	70-130	%Rec	1	9/6/2019 1:28:53 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	9/6/2019 12:37:58 AM
Surr: BFB	96.7	77.4-118	%Rec	1	9/6/2019 12:37:58 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.025	mg/Kg	1	9/6/2019 12:37:58 AM
Toluene	ND	0.050	mg/Kg	1	9/6/2019 12:37:58 AM
Ethylbenzene	ND	0.050	mg/Kg	1	9/6/2019 12:37:58 AM
Xylenes, Total	ND	0.099	mg/Kg	1	9/6/2019 12:37:58 AM
Surr: 4-Bromofluorobenzene	83.7	80-120	%Rec	1	9/6/2019 12:37:58 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	7300	300	mg/Kg	100	9/6/2019 11:00:02 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Client:	HILCOR	P ENERGY								
Project:	Salty Dog									
Sample ID:	MB-47308	SampType: I	mblk	Tes	tCode: EP/	A Method	300.0: Anions	5		
Client ID:	PBS	Batch ID:	47308	F	RunNo: 626	662				
Prep Date:	9/5/2019	Analysis Date:	9/5/2019	S	SeqNo: 213	34941	Units: mg/Kg	g		
Analyte		Result PQI	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
			.0							
Sample ID:	LCS-47308	SampType: I	cs	Tes	tCode: EP/	A Method	300.0: Anions	5		
Client ID:	LCSS	Batch ID: 4	47308	F	RunNo: 626	662				
Prep Date:	9/5/2019	Analysis Date:	9/5/2019	5	SeqNo: 213	34942	Units: mg/Kg	9		
Analyte		Result PQI	_ SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		14 1.	.5 15.00	0	96.4	90	110			
Sample ID:	MB-47303	SampType: I	mblk	Tes	tCode: EPA	A Method	300.0: Anions	;		
Client ID:	PBS	Batch ID:	47303	F	RunNo: 626	696				
Prep Date:	9/5/2019	Analysis Date:	9/5/2019	S	SeqNo: 213	35270	Units: mg/K	9		
Analyte		Result PQI	_ SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND 1.	.5							
Sample ID:	LCS-47303	SampType: I	cs	Tes	tCode: EP/	A Method	300.0: Anions	5		
Client ID:	LCSS	Batch ID:	47303	F	RunNo: 626	696				
Prep Date:	9/5/2019	Analysis Date:	9/5/2019	S	SeqNo: 213	35271	Units: mg/K	9		
Analyte		Result PQI	_ SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		16 1	.5 15.00	0	103	90	110			

**Qualifiers:** 

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Holding times for preparation or analysis exceeded Н

Not Detected at the Reporting Limit ND

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

Analyte detected in the associated Method Blank В

Р

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1909112

09-Sep-19

WO#:

Е Value above quantitation range

Analyte detected below quantitation limits J

Sample pH Not In Range

RL Reporting Limit **Client:** 

HILCORP ENERGY

Project:	Salty Dog	3									
Sample ID:	MB-47264	SampT	уре: М	BLK	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	PBS	Batch	n ID: 47	264	F	RunNo: 6	2665				
Prep Date:	9/4/2019	Analysis D	)ate: <b>9</b> /	5/2019	5	SeqNo: 2	134752	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (	Organics (DRO)	ND	10								
Motor Oil Rang	e Organics (MRO)	ND	50								
Surr: DNOP		12		10.00		122	70	130			
Sample ID:	LCS-47264	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	LCSS	Batch	n ID: <b>47</b>	264	F	RunNo: <b>6</b> 2	2665				
Prep Date:	9/4/2019	Analysis D	Date: 9/	5/2019	5	SeqNo: 2	134753	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (	Organics (DRO)	51	10	50.00	0	102	63.9	124			
Surr: DNOP		4.8		5.000		95.7	70	130			
Sample ID:	1909112-001AMS	SampT	ype: MS	6	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	MW05 25'-30'	Batch	n ID: 47	264	F	RunNo: 6	2665				
Prep Date:	9/4/2019	Analysis D	Date: 9/	5/2019	S	SeqNo: 2	134761	Units: mg/H	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (	Organics (DRO)	46	9.6	47.76	0	97.3	57	142			
Surr: DNOP		4.5		4.776		93.8	70	130			
Sample ID:	1909112-001AMSI	<b>)</b> SampT	ype: M	SD	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	MW05 25'-30'	Batch	n ID: <b>47</b>	264	F	RunNo: <b>6</b> 2	2665				
Prep Date:	9/4/2019	Analysis D	Date: 9/	5/2019	S	SeqNo: 2	134763	Units: <b>mg/</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (	Drganics (DRO)	46	9.5	47.53	0	96.9	57	142	0.981	20	
Surr: DNOP		4.4		4.753		93.4	70	130	0	0	
Sample ID:	LCS-47315	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID:	LCSS	Batch	n ID: <b>47</b>	315	F	RunNo: <b>6</b> 2	2698				
Prep Date:	9/6/2019	Analysis D	Date: 9/	6/2019	S	SeqNo: 2	135320	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range (	Organics (DRO)	48	10	50.00	0	96.2	63.9	124			
Surr: DNOP		4.6		5.000		91.9	70	130			

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix Е Value above quantitation range

Analyte detected below quantitation limits J

Р Sample pH Not In Range

Analyte detected in the associated Method Blank

RL

В

Reporting Limit

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1909112

09-Sep-19

WO#:

#### **Qualifiers:**

Н Holding times for preparation or analysis exceeded

Not Detected at the Reporting Limit ND

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

1909112

09-Sep-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: H Project: Sa	ILCORP El alty Dog	NERGY								
Sample ID: MB-47315	5	SampType:	MBLK	Tes	tCode: E	PA Method	8015M/D: Die	esel Range	e Organics	
Client ID: PBS		Batch ID:	47315	F	RunNo: <b>6</b> 2	2698				
Prep Date: 9/6/2019	An	alysis Date:	9/6/2019	Ş	SeqNo: 2	135321	Units: <b>mg/K</b>	g		
Analyte	R	esult PC	QL SPK valu	e SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DR	0)	ND	10							
Motor Oil Range Organics (N	MRO)	ND	50							
Surr: DNOP		9.7	10.0	0	96.5	70	130			

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Client: Project:	HILCOR Salty Dog	P ENERG	Y								
Sample ID:	MB-47263	SampT	Гуре: МЕ	BLK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	PBS	Batcl	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis D	Date: <b>9/</b>	5/2019	S	SeqNo: 2	134562	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	ND	5.0					0			
Surr: BFB		990		1000		99.1	77.4	118			
Sample ID:	LCS-47263	SampT	Гуре: <b>LC</b>	s	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	LCSS	Batcl	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis D	)ate: <b>9/</b>	5/2019	S	SeqNo: 2	134563	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	24	5.0	25.00	0	94.9	80	120			
Surr: BFB		1200		1000		116	77.4	118			
Sample ID:	1909112-001AMS	SampT	Гуре: М\$	6	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	е	
Client ID:	MW05 25'-30'	Batcl	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis D	Date: 9/	5/2019	S	SeqNo: 2	134565	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	25	4.8	24.06	0	103	69.1	142			
Surr: BFB		1100		962.5		115	77.4	118			
Sample ID:	1909112-001AMSI	<b>)</b> SampT	Гуре: М\$	SD	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	е	
Client ID:	MW05 25'-30'	Batcl	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis D	)ate: <b>9/</b>	5/2019	S	SeqNo: 2	134566	Units: mg/k	۲g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	23	4.7	23.39	0	99.6	69.1	142	6.51	20	
Surr: BFB		1100		935.5		119	77.4	118	0	0	S

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

Not Detected at the Reporting Limit ND

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

Analyte detected in the associated Method Blank В

Е Value above quantitation range

Analyte detected below quantitation limits J

Sample pH Not In Range Р

RL Reporting Limit

#### WO#: 1909112 09-Sep-19

**Client:** 

HILCORP ENERGY

Project:	Salty Dog	g									
Sample ID:	MB-47263	Samp	Гуре: МЕ	BLK	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	PBS	Batc	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis E	Date: <b>9/</b>	5/2019	S	SeqNo: 2	134599	Units: mg/ł	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025								
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Bron	nofluorobenzene	0.88		1.000		87.9	80	120			
Sample ID:	LCS-47263	Samp	Type: LC	S	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	LCSS	Batc	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis I	Date: <b>9/</b>	5/2019	S	SeqNo: 2	134600	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.98	0.025	1.000	0	98.1	80	120			
Toluene		1.0	0.050	1.000	0	100	80	120			
Ethylbenzene		1.0	0.050	1.000	0	103	80	120			
Xylenes, Total		3.0	0.10	3.000	0	101	80	120			
Surr: 4-Brom	nofluorobenzene	0.95		1.000		94.7	80	120			
Sample ID:	1909112-002AMS	Samp	Гуре: <b>М</b>	3	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	MW05 30'-35'	Batc	h ID: 47	263	RunNo: 62668						
Prep Date:	9/4/2019	Analysis E	Date: <b>9/</b>	5/2019	SeqNo: 2134603 Units: mg/Kg						
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0	0.023	0.9294	0.004208	110	76	123			
Toluene		1.1	0.046	0.9294	0.004485	118	80.3	127			
Ethylbenzene		1.1	0.046	0.9294	0	121	80.2	131			
Xylenes, Total		3.3	0.093	2.788	0	118	78	133			
Surr: 4-Bron	nofluorobenzene	0.89		0.9294		95.4	80	120			
Sample ID:	1909112-002AMS	D Samp	Type: MS	SD	Tes	tCode: E	PA Method	8021B: Vola	tiles		
Client ID:	MW05 30'-35'	Batc	h ID: 47	263	F	RunNo: 6	2668				
Prep Date:	9/4/2019	Analysis [	Date: 9/	5/2019	S	SeqNo: 2	134604	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0	0.025	0.9940	0.004208	103	76	123	0.423	20	
Toluene		1.1	0.050	0.9940	0.004485	109	80.3	127	1.29	20	
Ethylbenzene		1.1	0.050	0.9940	0	113	80.2	131	0.813	20	
Xylenes, Total		3.2	0.099	2.982	0	109	78	133	1.67	20	
Surr: 4-Bron	nofluorobenzene	0.92		0.9940		92.5	80	120	0	0	

Value exceeds Maximum Contaminant Level. \*

Sample Diluted Due to Matrix

Е Value above quantitation range

Analyte detected below quantitation limits J

Sample pH Not In Range Р

Analyte detected in the associated Method Blank

RL Reporting Limit

В

1909112

09-Sep-19

WO#:

**Qualifiers:** 

D

Н Holding times for preparation or analysis exceeded

Not Detected at the Reporting Limit ND

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

HALL ENVIRONMENTAL ANALYSIS LABORATORY	Hall Environmer TEL: 505-345-3 Website: www	ntal Analysis Labor 4901 Hawkir Albuquerque, NM 8 975 FAX: 505-345- v.hallenvironmenta	atory 18 NE 17109 <b>San</b> 1.4107 1.com	ple Log-In Check	List
Client Name: HILCORP ENERGY	FAR Work Order Num	ber: 1909112		RcptNo: 1	
Received By: Daniel Marquez Completed By: Erin Melendrez Reviewed By: ENM	9/4/2019 8:00:00 A 9/4/2019 9:58:20 A 9/L//C	M	MA	7	
Chain of Custody					
1. Is Chain of Custody complete?		Yes 🗹	No 🗌	Not Present	
2. How was the sample delivered?		Courier			
Log In 3. Was an attempt made to cool the sa	amples?	Yes 🔽	No 🗌	NA 🗌	
4. Were all samples received at a temp	perature of >0° C to 6.0°C	Yes 🗹	No 🗌		
5. Sample(s) in proper container(s)?		Yes 🗸	No 🗌		
6. Sufficient sample volume for indicate	ed test(s)?	Yes 🗹	No 🗌		
7. Are samples (except VOA and ONG	) properly preserved?	Yes 🗹	No 🗌		
8. Was preservative added to bottles?		Yes 🗌	No 🗹	NA 🗌	
9. VOA vials have zero headspace?		Yes	No 🗌	No VOA Vials 🗹	~
10. Were any sample containers receive	ed broken?	Yes 🗌	No 🗹 🛛	# of preserved	·
11. Does paperwork match bottle labels' (Note discrepancies on chain of cust	? ody)	Yes 🗹	No 🗌	for pH: (<2 or >12 unless	s noted)
12. Are matrices correctly identified on C	hain of Custody?	Yes 🖌	No 🗌	Adjusted?	
13. Is it clear what analyses were reques	sted?	Yes 🗹	No 🗌		
<ol> <li>Were all holding times able to be me (If no, notify customer for authorization)</li> </ol>	:t? on.)	Yes 🗹	No 🗌	Checked by: DAD 9/4	1/19
Special Handling (if applicable	2				
15. Was client notified of all discrepanci	es with this order?	Yes 🗌	No 🗌	NA 🗹	
Person Notified:	Date:				
By Whom:	Via:	🗌 eMail 🔄 F	Phone 🗌 Fax	In Person	
Regarding:					
Client Instructions: ]		···			
17. Cooler Information	on Seel Infort Coal No.	Soal Dota	86. AGN 24		
1 0.3 Good	Yes		Signed By		
	1 1		·		

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Page 1 of 1

Thatin-of-Custody Record         Turn-Nound Time:         Jacky Tridy         Anal YSIS LABOR           Hillory         Estimation         Anal YSIS LABOR           Millory         Solution         Solution         Solution         Anal YSIS LABOR           Millory         Solution         Solution         Solution         Anal YSIS LABOR           Millory         Solution         Solution         Solution         Project Name:         Anal YSIS LABOR           Millory         Solution         Solution         Solution         Solution         Solution         Mail           Motions         37.2         Gal 31CO         Solution         Project Name         Mail         Solution           Project Name:         37.2         Gal 31CO         Solution         Project Name         Mail         Solution           Project Name:         37.2         Gal 31CO         Solution         Project Name         Mail         Solution           Project Name:         37.7         Solution         Droject Name         Solution         Droject Name         Solution           Accomplanea         Droject Name         Droject Name         Droject Name         Droject Name         Name           Accomplanea         Droject Name         Droject Na	Trainof Custody Record     Important Time:     Table of Custody Record     Important Time       ThILux D     Constrained and the state of					<u>ار</u>	, I								
Icorp         Istandard         Rush, Martin           Project Name:         Rush, Martin         Mail YSIS LABOR           Project Name:         Rush, Martin         Mail YSIS LABOR           Project Name:         Soll Hu Locg         Soll Hu Locg         Soll Hu Locg           NM R S1'UI         Dirty R 1014         Level 4 (Full Validation)         Joint Res.         Anal YSIS LABOR           NM R S1'UI         Doret #:         Dirty R 1014         Level 4 (Full Validation)         Joint Res.         Anal S1'UI           NM R S1'UI         Doret #:         Dirty R 10014         Level 4 (Full Validation)         Joint Res.         Anal S1'UI           Multi R Project Name:         Dirty R 10014         Level 4 (Full Validation)         Joint Res.         Anal Res (Res No.         Anal Res (Res No.           Minits         Sampler: C. My Citer Manager:         Distribution Resentation         Bampler: C. My Citer Mark         Anal Res (Res No.         Res (Res No.           Multi R Sample Name         Distribution Resentation         Res (Res No.         Res (Res No.         Res (Res No.         Res (Res No.           Multi R Sample Name         Number Solid Res (Res No.         Res (Res No.         Res (Res No.         Res (Res No.           Multi R Sample Name         Nulob Soli Nulve Soli Soli Nulve Solid Res (Res No.	Litty     Distribution     Instruction       Cr     Deal     Number of the state     Number of the state       Cr     Deal     Number of the state     Number of the state       NUM     ST141D     Point if     Cirr / S131C       NUM     ST141D     Point if     Cirr / S14014       Deal     Interview     Deal     Number of the state       NUM     ST141D     Point if     Cirr / S14014       Deal     Deal     Deal     Deal     Deal       Min     S141D     Deal     Deal     Deal       State     Deal     Deal     Deal     Deal	in-of-Cus	tody Record	Turn-Around	Time:	3 day, Fiday 3			I		Z	VTE	NCC	MENTAI	
Cr.         Drait         Project Mane:         Project Mane:         Project Mane:         Num. 87101           ress:         87.1         A 31C0         Sci11-1         DCG         Sci11-1         DCG         Monthalier         Monthalier <t< td=""><td>CC         Drail         Project Name:         Monthalian           105:         32.2         43.3100         Sci1141         Dcg           105:         32.24         5.3100         Sci1141         Dcg           105:         32.24         5.3100         Sci1141         Dcg           105:         32.24         5.32         Project Names         Interfer A           105:         32.24         5.52         Project Names         Interfer A           105:         32.24         5.52         Project Names         Interfer A           105:         105:         Project Names         Project Names         Interfer A           106:         Project Names         Project Names         Project Names         Interfer A           107:         X         X         X         X         X           106:         Project Names         Project Names         Project Names         Project Names           107:         X         X         X         X         X           107:         Project Names         Project Names         Project Names         Project Names           107:         107:         X         X         X         X         X</td><td>Icor D</td><td></td><td>□ Standard</td><td>🖉 Rus</td><td>h Mt + day</td><td></td><td></td><td></td><td>Į</td><td>is S</td><td>S S</td><td>ABC</td><td>RATOR</td><td>.≻</td></t<>	CC         Drail         Project Name:         Monthalian           105:         32.2         43.3100         Sci1141         Dcg           105:         32.24         5.3100         Sci1141         Dcg           105:         32.24         5.3100         Sci1141         Dcg           105:         32.24         5.32         Project Names         Interfer A           105:         32.24         5.52         Project Names         Interfer A           105:         32.24         5.52         Project Names         Interfer A           105:         105:         Project Names         Project Names         Interfer A           106:         Project Names         Project Names         Project Names         Interfer A           107:         X         X         X         X         X           106:         Project Names         Project Names         Project Names         Project Names           107:         X         X         X         X         X           107:         Project Names         Project Names         Project Names         Project Names           107:         107:         X         X         X         X         X	Icor D		□ Standard	🖉 Rus	h Mt + day				Į	is S	S S	ABC	RATOR	.≻
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n □ Az Compliance Container Preservative Dintee: C. M.Ctinn Container Preservative Matrix Sample Name Container Preservative MuUCD 35: -30' 4v2 Method 504.1) FX K K K K K K K K K K K K K K K K K K K	In $\square A_2$ Compliance       Sampler: C. M.Z.In       Image: C. M.Z.In       Image: C. M.Z.In         In $\square Other       Onlos:       e^{-e_{E_{E_{E_{E_{E_{E_{E_{E_{E_{E_{E_{E_{E_$	age:	Level 4 (Full Validation)	hool	Adar	Su	<del>208) e</del>	PCB's O / MR		SIVILO	<del>3.,⊾04</del>		əsdA\ti		
Del         Matrix         Sample Name         #of Coolers: 2         Cooler Temperatures         Preservative         Matrix         Sample Name         Preservative         Matrix         Sample Name         Preservative         Matrix         Sample Name         Preservative         Matrix         Preservative         Matrix         Preservative         Matrix         Preservative         Matrix         Preservative         Preservative         Preservative         Prese	Del Differentiation       # of Goolers: 2       # of Goolers: 2       Multiple Name       # of Goolers: 2         Del Differentiation       Cooler Name       Preservative       # of Goolers: 2       Preservative       # of Goolers: 2         Del Differentiation       Cooler Name       Cooler Name       Preservative       # of Goolers: 2       Preservative       # of Free       Preservative	n: 🗆 Az Comp	oliance	Sampler: C.	Mccinr			/2808 2808 / C	(1.40		<sup>'7</sup> 0N-	(\	-reser		
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ie         Matrix         Sample Name         Container         Preservative         Method         Strate         Method         <	e       Matrix       Sample Name       Container       Preservative       Type and #       Type       Type and #       Type       Type and #       Type       Type and #       Type			Cooler Temp	including CF): $\mathcal{N}$	04-03 3-4-04-30	114- 15'91	astici	oqtəl	a Me	N- 44	-ime:	rofilo		
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IS       MWUC5 $3C \cdot 35$ I $-0073$ X       X <td><math display="block"> \begin{array}{ c c c c c c c c c c c c c c c c c c c</math></td> <td>00 Soil IV</td> <td>1000 25'- 30'</td> <td>402 jar</td> <td>Cool</td> <td>-001</td> <td>X</td> <td>X</td> <td></td> <td></td> <td>) ×</td> <td></td> <td></td> <td></td> <td></td>	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	00 Soil IV	1000 25'- 30'	402 jar	Cool	-001	X	X			) ×				
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17       mulber 30: 35:       1 $-005$ $\times \times$ $\times$ <td>11       multiple       25       -005       <math>\times \times</math> <math>\times</math> <math>\times</math></td> <td>5</td> <td>NWO6 25'- 30'</td> <td></td> <td></td> <td>-004</td> <td>X</td> <td>X</td> <td></td> <td></td> <td>×</td> <td></td> <td></td> <td>*</td> <td></td>	11       multiple       25       -005 $\times \times$ $\times$	5	NWO6 25'- 30'			-004	X	X			×			*	
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K ( MM / MWM / WHU at a/2/10 18457	ssary samples submitted to Hall Environmental may be subdattracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.	E Relinguished	a albury "	Received by:	A.A.	Date Time 9/2/19 1845	0	c: ja	dam	l@s	f L L	ຽ	Ę		

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	LAI ENVIDONMENTAL	ANALYSTS I ABORATORY	www.hallenvironmental.com	1 Hawkins NE - Albuquerque, NM 87109	505-345-3975 Fax 505-345-4107	Analysis Request	,tm	PCB's PPCR'	28082 04.1) 21227( 21656n A) A)	MO MO MO MO MO MO MO MO MO MO MO MO MO M	estic Metho 8 Me 8 Me 70A) 7 7 9 1 1 0 1 1 0	8081 P EDB ( <i>h</i> RCRA 8260 ( <i>f</i> 8270 ( <i>f</i> 10tal C	×	×	X	×	×	×		×			dams Oltenv.com	iy sub-contracted data will be clearly notated on the analytical report.
				490	Tel.		(0	ЯМ / О	<u>ਮਹ</u> / 0	ษย	16D(	08:H9T	X	×	×	X	X	×	X	x		narks:	ic jo	ibility. An
			_ <b></b>				<del>(1</del>	<del>208) e</del>	ANT /	<b>∠∃9</b> ¶ ﷺ		BTEX /	$ \times $	×	×	X	×	X	×	У		Ren	о т—	iis possi
9 <b>b</b>	Turn-Around Time: 3-day Friday-	□ Standard B Rush <u>Auxt to to</u>	Project Name:	Salty Dog	Project #:	01781904	Project Manager:	Josh Adams	Sampler: C. ກາເວົ້າກາ On Ice: ElZes	# of Coolers: 3	Gooler Temp(induding 0=): 0.1-0.4-0.334-0493.07	Container Preservative HEAL No. Type and # Type	4 02 Year (200) -013		-015	-010-	-017	-018	-0Pi	4 ↓ -020		Repetived by Avia Date Time	Acceleration via Date Time	Intracted to other accredited laboratories. This serves as notice of the convertion
	Chain-of-Custody Record	Client: Hilwn0	Jemiter Deal	Mailing Address: 382 Rd 3100	Azke NM 87410	Phone #: 505 . 324 51 28	email or Fax#: jdial@hilcorp.com	QA/QC Package: K Standard	Accreditation:	B EDD (Type) PDF		Date Time Matrix Sample Name	5.30 1728 Soil MWDI 0'-2'	1732 1 mwo1 8'-10'	1734 mwol 10' - 12'	1743 MW04 2'-4'	1744 WW04 113-18	1745 MUDY 18' - 20'	1753 NE Wall of Ex.	V 1754 V SW Wall of Ex.		Date: Time: Relinquished by:	Date: Time: Relinquished by:	9 3 14 24 65 Computed to Hall Environmental may be subcc

.

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October 28, 2019

Josh Adams HILCORP ENERGY PO Box 4700 Farmington, NM 87499 TEL: (505) 564-0733 FAX Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

RE: Salty Dog

OrderNo.: 1909668

Dear Josh Adams:

Hall Environmental Analysis Laboratory received 3 sample(s) on 9/13/2019 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued September 20, 2019.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Hall E	nvironmental Analys	sis Laboratory, Inc	2.				Analytical Report Lab Order 1909668 Date Reported: 10/28/2	:019
CLIENT:	HILCORP ENERGY		Cl	ient Sa	ample ID	: MV	V03	
Project.	Salty Dog			Collect	ion Date	• 9/1′	2/2019 2·33·00 PM	
Lab ID:	1909668-001	Matrix: AQUEOUS		Recei	ved Date	<b>:</b> 9/1	3/2019 8:15:00 AM	
Analyses	3	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA ME	THOD 300.0: ANIONS						Analys	t: MRA
Fluoride		ND	10		mg/L	100	9/13/2019 3:55:24 PM	R62938
Chloride		13000	500	*	mg/L	1E+	9/13/2019 4:07:45 PM	R62938
Nitrogen	n, Nitrite (As N)	19	10	*	mg/L	100	9/13/2019 3:55:24 PM	R62938
Bromide		13	10		mg/L	100	9/13/2019 3:55:24 PM	R62938
Nitrogen	n, Nitrate (As N)	ND	10		mg/L	100	9/13/2019 3:55:24 PM	R62938
Phospho	orus, Orthophosphate (As P)	ND	50		mg/L	100	9/13/2019 3:55:24 PM	R62938
Sulfate		1600	50	*	mg/L	100	9/13/2019 3:55:24 PM	R62938
SM2510	B: SPECIFIC CONDUCTANCE						Analys	t: JRR
Conduct	tivity	45000	50		µmhos/c	10	9/16/2019 2:10:59 PM	R62955
SM23208	<b>3: ALKALINITY</b>						Analys	t: JRR
Bicarbor	nate (As CaCO3)	137.8	20.00		mg/L Ca	1	9/16/2019 11:22:50 AM	1 R62955
Carbona	ate (As CaCO3)	ND	2.000		mg/L Ca	1	9/16/2019 11:22:50 AM	1 R62955
Total All	kalinity (as CaCO3)	137.8	20.00		mg/L Ca	1	9/16/2019 11:22:50 AM	I R62955
SM25400	C MOD: TOTAL DISSOLVED S	SOLIDS					Analys	t: JMT
Total Dis	ssolved Solids	30000	200	*D	mg/L	1	9/16/2019 2:37:00 PM	47473
SM4500-	H+B / 9040C: PH						Analys	t: JRR
pН		7.41		н	pH units	1	9/16/2019 11:22:50 AM	I R62955
EPA ME	THOD 6010B: DISSOLVED ME	ETALS					Analys	t: ELS
Calcium		2500	100		mg/L	100	9/20/2019 9:10:25 AM	A63074
Magnes	ium	390	10		mg/L	10	9/18/2019 3:17:55 PM	A63017
Potassiu	Im	27	1.0		mg/L	1	9/18/2019 3:15:42 PM	A63017
Sodium		6600	100		mg/L	100	9/20/2019 9:10:25 AM	A63074
EPA ME	THOD 8260B: VOLATILES						Analys	t: DJF
Benzene	e	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
Toluene		ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
Ethylber	izene	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
Methyl to	ert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2,4-Tri	imethylbenzene	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,3,5-Tri	imethylbenzene	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2-Dich	loroethane (EDC)	ND	1.0		µq/L	1	9/13/2019 2:08:25 PM	W62926

ND

ND

ND

ND

ND

ND

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix Holding times for preparation or analysis exceeded

Н ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

1,2-Dibromoethane (EDB)

\*

D

S

1-Methylnaphthalene

2-Methylnaphthalene

Naphthalene

Bromobenzene

Acetone

Qualifiers:

% Recovery outside of range due to dilution or matrix

В Analyte detected in the associated Method Blank

Е Value above quantitation range J Analyte detected below quantitation limits

µg/L

µg/L

µg/L

µg/L

µg/L

µg/L

µg/L

1.0

2.0

4.0

4.0

10

1.0

1

1

1

1

1

1

9/13/2019 2:08:25 PM

Sample pH Not In Range

Р RL Reporting Limit

Page 1 of 19

W62926

W62926

W62926

W62926

W62926

W62926

**Analytical Report** Lab Order 1909668

Date Reported: 10/28/2019

CLIENT: HILCORP ENERGY Project: Salty Dog		Client Sa Collect	ample I tion Dat	<b>D: M</b> te: 9/1	W03 12/2019 2:33:00 PM	
Lab ID: 1909668-001	Matrix: AQUEOUS	Recei	ved Dat	te: 9/1	13/2019 8:15:00 AM	
Analyses	Result	RL Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES					Analyst	DJF
Bromodichloromethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Bromoform	ND	1.0	μg/L	1	9/13/2019 2:08:25 PM	W62926
Bromomethane	ND	3.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
2-Butanone	ND	10	µg/L	1	9/13/2019 2:08:25 PM	W62926
Carbon disulfide	ND	10	µg/L	1	9/13/2019 2:08:25 PM	W62926
Carbon Tetrachloride	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Chlorobenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Chloroethane	ND	2.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Chloroform	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Chloromethane	ND	3.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
2-Chlorotoluene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
4-Chlorotoluene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
cis-1,2-DCE	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Dibromochloromethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Dibromomethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2-Dichlorobenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,3-Dichlorobenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,4-Dichlorobenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Dichlorodifluoromethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,1-Dichloroethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,1-Dichloroethene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2-Dichloropropane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,3-Dichloropropane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
2,2-Dichloropropane	ND	2.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,1-Dichloropropene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Hexachlorobutadiene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
2-Hexanone	ND	10	µg/L	1	9/13/2019 2:08:25 PM	W62926
Isopropylbenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
4-Isopropyltoluene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
4-Methyl-2-pentanone	ND	10	µg/L	1	9/13/2019 2:08:25 PM	W62926
Methylene Chloride	ND	3.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
n-Butylbenzene	ND	3.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
n-Propylbenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
sec-Butylbenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Styrene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
tert-Butylbenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

В Analyte detected in the associated Method Blank

Е Value above quantitation range J Analyte detected below quantitation limits

Sample pH Not In Range

Р RL Reporting Limit

Page 2 of 19

**Analytical Report** Lab Order 1909668

Date Reported: 10/28/2019

CLIENT: HILCORP ENERGY		C	lient Sample I	D: M	W03	
<b>Project:</b> Salty Dog		(	Collection Dat	te: 9/	12/2019 2:33:00 PM	
Lab ID: 1909668-001	Matrix: AQUEOUS		Received Dat	te: 9/	13/2019 8:15:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES					Analyst	DJF
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
trans-1,2-DCE	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
trans-1,3-Dichloropropene	ND	1.0	μg/L	1	9/13/2019 2:08:25 PM	W62926
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,1,1-Trichloroethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,1,2-Trichloroethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Trichloroethene (TCE)	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Trichlorofluoromethane	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2,3-Trichloropropane	ND	2.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Vinyl chloride	ND	1.0	µg/L	1	9/13/2019 2:08:25 PM	W62926
Xylenes, Total	ND	1.5	µg/L	1	9/13/2019 2:08:25 PM	W62926
Surr: 1,2-Dichloroethane-d4	109 7	0-130	%Rec	1	9/13/2019 2:08:25 PM	W62926
Surr: 4-Bromofluorobenzene	85.4 7	0-130	%Rec	1	9/13/2019 2:08:25 PM	W62926
Surr: Dibromofluoromethane	110 7	0-130	%Rec	1	9/13/2019 2:08:25 PM	W62926
Surr: Toluene-d8	104 7	0-130	%Rec	1	9/13/2019 2:08:25 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S
- % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range J Analyte detected below quantitation limits
  - Sample pH Not In Range
- Р RL Reporting Limit

Page 3 of 19

**Analytical Report** 

Hall Er	vironmental Analys	is Laboratory, Inc					Lab Order <b>1909668</b> Date Reported: <b>10/28/2</b>	019
CLIENT: Project: Lab ID:	HILCORP ENERGY Salty Dog 1909668-002	Matrix: AQUEOUS	CI (	ient Sa Collect Recei	ample ID ion Date ved Date	: MV : 9/1 : 9/1	V05 2/2019 1:35:00 PM 3/2019 8:15:00 AM	
Analyses		Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA MET	HOD 300.0: ANIONS						Analyst	MRA
Fluoride		ND	1.0		mg/L	10	9/13/2019 4:20:06 PM	R62938
Chloride		15000	1000	*	mg/L	2E+	- 9/18/2019 11:33:04 AM	R63030
Nitrogen,	Nitrite (As N)	20	10	*	mg/L	100	9/13/2019 4:32:27 PM	R62938
Bromide		15	1.0		mg/L	10	9/13/2019 4:20:06 PM	R62938
Nitrogen,	Nitrate (As N)	21	1.0	*	mg/L	10	9/13/2019 4:20:06 PM	R62938
Phospho	rus, Orthophosphate (As P)	ND	5.0		mg/L	10	9/13/2019 4:20:06 PM	R62938
Sulfate		2300	50	*	mg/L	100	9/13/2019 4:32:27 PM	R62938
SM2510B	: SPECIFIC CONDUCTANCE						Analyst	JRR
Conducti	vity	54000	50		µmhos/c	10	9/16/2019 2:15:10 PM	R62955
SM2320B	: ALKALINITY						Analyst	JRR
Bicarbon	ate (As CaCO3)	153.9	20.00		mg/L Ca	1	9/16/2019 11:33:19 AM	R62955
Carbonat	e (As CaCO3)	ND	2.000		mg/L Ca	1	9/16/2019 11:33:19 AM	R62955
Total Alka	alinity (as CaCO3)	153.9	20.00		mg/L Ca	1	9/16/2019 11:33:19 AM	R62955
SM2540C	MOD: TOTAL DISSOLVED S	OLIDS					Analyst	: JMT
Total Dis	solved Solids	34000	200	*D	mg/L	1	9/16/2019 2:37:00 PM	47473
SM4500-ł	H+B / 9040C: PH						Analyst	JRR
pН		7.25		н	pH units	1	9/16/2019 11:33:19 AM	R62955
EPA MET	HOD 6010B: DISSOLVED ME	TALS					Analyst	ELS
Calcium		2100	100		ma/L	100	9/20/2019 9:12:12 AM	A63074
Magnesiu	um	750	10		ma/L	10	9/18/2019 3:21:56 PM	A63017
Potassiu	m	25	1.0		mg/L	1	9/18/2019 3:20:05 PM	A63017
Sodium		7800	100		mg/L	100	9/20/2019 9:12:12 AM	A63074
EPA MET	HOD 8260B: VOLATILES						Analyst	DJF
Benzene		ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Toluene		ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Ethylben	zene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Methyl te	rt-butyl ether (MTBE)	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2,4-Trir	nethylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,3,5-Trir	nethylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dichl	oroethane (EDC)	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dibro	moethane (EDB)	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Naphthal	ene	ND	2.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1-Methylr	naphthalene	ND	4.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
2-Methylr	naphthalene	ND	4.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Acetone		ND	10		µg/L	1	9/13/2019 3:36:58 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

ND

**Qualifiers:** 

Bromobenzene

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL

Е Value above quantitation range J Analyte detected below quantitation limits

µg/L

1

Analyte detected in the associated Method Blank

Р

1.0

В

Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

Sample pH Not In Range

RL Reporting Limit Page 4 of 19

9/13/2019 3:36:58 PM W62926

**Analytical Report** Lab Order 1909668

Date Reported: 10/28/2019

CLIENT: HILCORP ENERGY Project: Salty Dog		Cl	ient Sa Collect	ample I tion Dat	<b>D:</b> M te: 9/1	W05 12/2019 1:35:00 PM	
Lab ID: 1909668-002	Matrix: AQUEOUS		Recei	ved Dat	te: 9/1	3/2019 8:15:00 AM	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst	DJF
Bromodichloromethane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Bromoform	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Bromomethane	ND	3.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
2-Butanone	ND	10		µg/L	1	9/13/2019 3:36:58 PM	W62926
Carbon disulfide	ND	10		µg/L	1	9/13/2019 3:36:58 PM	W62926
Carbon Tetrachloride	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Chlorobenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Chloroethane	ND	2.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Chloroform	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Chloromethane	ND	3.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
2-Chlorotoluene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
4-Chlorotoluene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
cis-1,2-DCE	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Dibromochloromethane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Dibromomethane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,3-Dichlorobenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,1-Dichloroethane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,1-Dichloroethene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dichloropropane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,3-Dichloropropane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
2,2-Dichloropropane	ND	2.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,1-Dichloropropene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Hexachlorobutadiene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
2-Hexanone	ND	10		µg/L	1	9/13/2019 3:36:58 PM	W62926
Isopropylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
4-Isopropyltoluene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
4-Methyl-2-pentanone	ND	10		µg/L	1	9/13/2019 3:36:58 PM	W62926
Methylene Chloride	ND	3.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
n-Butylbenzene	ND	3.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
n-Propylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
sec-Butylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Styrene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
tert-Butylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

В Analyte detected in the associated Method Blank

Е Value above quantitation range J Analyte detected below quantitation limits

Sample pH Not In Range

Р RL Reporting Limit

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**Analytical Report** Lab Order 1909668

Date Reported: 10/28/2019

CLIENT:HILCORP ENERGYProject:Salty DogLab ID:1909668-002	Matrix: AQUEOUS	Cl (	lient Sample I Collection Dat Received Dat	D: M te: 9/1 te: 9/1	W05 12/2019 1:35:00 PM 13/2019 8:15:00 AM	
Analyses	Result	RL	Qual Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES					Analyst	DJF
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
trans-1,2-DCE	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
1,1,1-Trichloroethane	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
1,1,2-Trichloroethane	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
Trichloroethene (TCE)	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
Trichlorofluoromethane	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2,3-Trichloropropane	ND	2.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
Vinyl chloride	ND	1.0	µg/L	1	9/13/2019 3:36:58 PM	W62926
Xylenes, Total	ND	1.5	µg/L	1	9/13/2019 3:36:58 PM	W62926
Surr: 1,2-Dichloroethane-d4	112 7	0-130	%Rec	1	9/13/2019 3:36:58 PM	W62926
Surr: 4-Bromofluorobenzene	82.8 7	0-130	%Rec	1	9/13/2019 3:36:58 PM	W62926
Surr: Dibromofluoromethane	113 7	0-130	%Rec	1	9/13/2019 3:36:58 PM	W62926
Surr: Toluene-d8	104 7	0-130	%Rec	1	9/13/2019 3:36:58 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit
- ND PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S
- в Analyte detected in the associated Method Blank Е Value above quantitation range
- J Analyte detected below quantitation limits
  - Sample pH Not In Range
- Р RL Reporting Limit

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Analytical Report	
Lab Order 1909668	

Date Reported: 10/28/2019

CLIENT: HILCORP ENERGY		Cli	ient Sa	imple ID	: MV	V06	
<b>Project:</b> Salty Dog		(	Collect	ion Date	:9/12	2/2019 2:02:00 PM	
Lab ID: 1909668-003	Matrix: AQUEOUS		Receiv	ved Date	:9/1	3/2019 8:15:00 AM	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	MRA
Fluoride	ND	1.0		mg/L	10	9/13/2019 4:44:48 PM	R62938
Chloride	5300	250	*	mg/L	500	9/17/2019 6:55:35 PM	R62985
Nitrogen, Nitrite (As N)	ND	10	*	mg/L	100	9/13/2019 4:57:09 PM	R62938
Bromide	5.5	1.0		mg/L	10	9/13/2019 4:44:48 PM	R62938
Nitrogen, Nitrate (As N)	1.0	1.0		mg/L	10	9/13/2019 4:44:48 PM	R62938
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	9/13/2019 4:44:48 PM	R62938
Sulfate	2300	50	*	mg/L	100	9/13/2019 4:57:09 PM	R62938
SM2510B: SPECIFIC CONDUCTANCE						Analyst:	JRR
Conductivity	22000	25		µmhos/c	5	9/16/2019 2:19:39 PM	R62955
SM2320B: ALKALINITY						Analyst:	JRR
Bicarbonate (As CaCO3)	200.8	20.00		mg/L Ca	1	9/16/2019 11:44:27 AM	R62955
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	9/16/2019 11:44:27 AM	R62955
Total Alkalinity (as CaCO3)	200.8	20.00		mg/L Ca	1	9/16/2019 11:44:27 AM	R62955
SM2540C MOD: TOTAL DISSOLVED SOLI	DS					Analyst:	JMT
Total Dissolved Solids	13600	200	*D	mg/L	1	9/16/2019 2:37:00 PM	47473
SM4500-H+B / 9040C: PH						Analyst:	JRR
рН	7.49		Н	pH units	1	9/16/2019 11:44:27 AM	R62955
EPA METHOD 6010B: DISSOLVED METAL	.S					Analyst:	ELS
Calcium	1100	50		mg/L	50	9/20/2019 9:19:36 AM	A63074
Magnesium	170	10		mg/L	10	9/18/2019 3:26:18 PM	B63017
Potassium	16	1.0		mg/L	1	9/18/2019 3:24:10 PM	B63017
Sodium	3500	50		mg/L	50	9/20/2019 9:19:36 AM	A63074
EPA METHOD 8260B: VOLATILES						Analyst:	DJF
Benzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Toluene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Ethylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Naphthalene	ND	2.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1-Methylnaphthalene	ND	4.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
2-Methylnaphthalene	ND	4.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Acetone	ND	10		µg/L	1	9/13/2019 4:06:27 PM	W62926
Bromobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

Е Value above quantitation range

Analyte detected in the associated Method Blank

J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit

в

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% Recovery outside of range due to dilution or matrix S

**Analytical Report** Lab Order 1909668

Date Reported: 10/28/2019

CLIENT: HILCORP ENERGY Project: Salty Dog		Cl	lient Sa Collect	ample I tion Dat	<b>D:</b> M te: 9/1	W06 2/2019 2:02:00 PM	
Lab ID: 1909668-003	Matrix: AQUEOUS		Recei	ved Dat	te: 9/1	13/2019 8:15:00 AM	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst	DJF
Bromodichloromethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Bromoform	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Bromomethane	ND	3.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
2-Butanone	ND	10		µg/L	1	9/13/2019 4:06:27 PM	W62926
Carbon disulfide	ND	10		µg/L	1	9/13/2019 4:06:27 PM	W62926
Carbon Tetrachloride	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Chlorobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Chloroethane	ND	2.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Chloroform	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Chloromethane	ND	3.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
2-Chlorotoluene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
4-Chlorotoluene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
cis-1,2-DCE	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Dibromochloromethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Dibromomethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2-Dichlorobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,3-Dichlorobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,4-Dichlorobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Dichlorodifluoromethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,1-Dichloroethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,1-Dichloroethene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2-Dichloropropane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,3-Dichloropropane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
2,2-Dichloropropane	ND	2.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,1-Dichloropropene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Hexachlorobutadiene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
2-Hexanone	ND	10		µg/L	1	9/13/2019 4:06:27 PM	W62926
Isopropylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
4-Isopropyltoluene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
4-Methyl-2-pentanone	ND	10		µg/L	1	9/13/2019 4:06:27 PM	W62926
Methylene Chloride	ND	3.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
n-Butylbenzene	ND	3.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
n-Propylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
sec-Butylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Styrene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
tert-Butylbenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

В Analyte detected in the associated Method Blank

Е Value above quantitation range J Analyte detected below quantitation limits

Sample pH Not In Range

Р RL Reporting Limit

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**Analytical Report** Lab Order 1909668

Date Reported: 10/28/2019

CLIENT: HILCORP ENERGY		C	lient Sa	mple Il	D: M	W06	
<b>Project:</b> Salty Dog		(	Collecti	ion Dat	e: 9/1	12/2019 2:02:00 PM	
Lab ID: 1909668-003	Matrix: AQUEOUS	1	Receiv	ed Dat	e:9/2	13/2019 8:15:00 AM	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst	DJF
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
trans-1,2-DCE	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,1,1-Trichloroethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,1,2-Trichloroethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Trichloroethene (TCE)	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Trichlorofluoromethane	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
1,2,3-Trichloropropane	ND	2.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Vinyl chloride	ND	1.0		µg/L	1	9/13/2019 4:06:27 PM	W62926
Xylenes, Total	ND	1.5		µg/L	1	9/13/2019 4:06:27 PM	W62926
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	9/13/2019 4:06:27 PM	W62926
Surr: 4-Bromofluorobenzene	82.6	70-130		%Rec	1	9/13/2019 4:06:27 PM	W62926
Surr: Dibromofluoromethane	109	70-130		%Rec	1	9/13/2019 4:06:27 PM	W62926
Surr: Toluene-d8	102	70-130		%Rec	1	9/13/2019 4:06:27 PM	W62926

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- % Recovery outside of range due to dilution or matrix S
- в Analyte detected in the associated Method Blank Е Value above quantitation range
- J Analyte detected below quantitation limits
  - Sample pH Not In Range
- Р RL Reporting Limit

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# **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

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ual				

Н

ND

S

\* Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix

Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

Holding times for preparation or analysis exceeded

% Recovery outside of range due to dilution or matrix

Е

Value above quantitation range

Analyte detected in the associated Method Blank

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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1909668

28-Oct-19

WO#:

В
28-Oct-19

WO#:

# **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

Client: Project:		HILCORP ENER Salty Dog	GY								
Sample ID:	MB	Sam	pType:	mblk	Tes	tCode: EF	PA Method	300.0: Anions	5		
Client ID:	PBW	Ba	tch ID:	R63030	F	RunNo: 63	3030				
Prep Date:		Analysis	Date:	9/18/2019	S	SeqNo: 2'	149495	Units: mg/L			
Analyte		Result	PG	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	0.	50							
Sample ID:	LCS	Sam	рТуре:	lcs	Tes	tCode: EF	PA Method	300.0: Anions	6		
Client ID:	LCSW	Ba	tch ID:	R63030	F	RunNo: 6:	3030				
Prep Date:		Analysis	Date:	9/18/2019	S	SeqNo: 2	149496	Units: mg/L			
Analyte		Result	PG	L SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		4.7	0.	50 5.000	0	93.4	90	110			

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL
  - Reporting Limit

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Client:	HILCORP ENERGY
Project:	Salty Dog

Sample ID: rb	SampT	ype: ME	BLK	TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch	n ID: We	2926	F	RunNo: 62	2926					
Prep Date:	Analysis D	ate: 9/	13/2019	S	SeqNo: 2	144410	Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	ND	1.0									
Toluene	ND	1.0									
Ethylbenzene	ND	1.0									
Methyl tert-butyl ether (MTBE)	ND	1.0									
1,2,4-Trimethylbenzene	ND	1.0									
1,3,5-Trimethylbenzene	ND	1.0									
1,2-Dichloroethane (EDC)	ND	1.0									
1,2-Dibromoethane (EDB)	ND	1.0									
Naphthalene	ND	2.0									
1-Methylnaphthalene	ND	4.0									
2-Methylnaphthalene	ND	4.0									
Acetone	ND	10									
Bromobenzene	ND	1.0									
Bromodichloromethane	ND	1.0									
Bromoform	ND	1.0									
Bromomethane	ND	3.0									
2-Butanone	ND	10									
Carbon disulfide	ND	10									
Carbon Tetrachloride	ND	1.0									
Chlorobenzene	ND	1.0									
Chloroethane	ND	2.0									
Chloroform	ND	1.0									
Chloromethane	ND	3.0									
2-Chlorotoluene	ND	1.0									
4-Chlorotoluene	ND	1.0									
cis-1,2-DCE	ND	1.0									
cis-1,3-Dichloropropene	ND	1.0									
1,2-Dibromo-3-chloropropane	ND	2.0									
Dibromochloromethane	ND	1.0									
Dibromomethane	ND	1.0									
1,2-Dichlorobenzene	ND	1.0									
1,3-Dichlorobenzene	ND	1.0									
1,4-Dichlorobenzene	ND	1.0									
Dichlorodifluoromethane	ND	1.0									
1,1-Dichloroethane	ND	1.0									
1.1-Dichloroethene	ND	1.0									
1.2-Dichloropropane	ND	1.0									
1,3-Dichloropropane	ND	1.0									
2.2-Dichloropropane	ND	2.0									

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р

RL Reporting Limit 1909668

28-Oct-19

WO#:

Sample pH Not In Range

**Client:** 

HILCORP ENERGY

Project: Sala	ty Dog									
Sample ID: <b>rb</b>	SampT	уре: <b>МЕ</b>	LK	Tes	TestCode: EPA Method 8260B: VOLATILES					
Client ID: PBW	Batch	ID: W6	2926	RunNo: 62926						
Prep Date:	Analysis D	ate: <b>9/</b>	13/2019	\$	SeqNo: 2	144410	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	8.3		10.00		83.4	70	130			
Surr: Dibromofluoromethane	e 11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		105	70	130			
Sample ID: 100ng Ics	SampT	ype: LC	s	Tes	tCode: E	PA Method	8260B: VOL	ATILES		

Sample ID: 100ng ICS	Sampi	ype: LC	5	TestCode: EPA Method 8260B: VOLATILES						
Client ID: LCSW	Batch	n ID: We	62926	F	RunNo: <b>6</b>	2926				
Prep Date:	Analysis D	ate: 9/	13/2019	5	SeqNo: 2	144411	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Toluene	18	1.0	20.00	0	92.0	70	130			
Chlorobenzene	18	1.0	20.00	0	87.9	70	130			

#### **Qualifiers:**

Н

ND

Value exceeds Maximum Contaminant Level. \* D

Sample Diluted Due to Matrix Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit

Analyte detected in the associated Method Blank Е Value above quantitation range

J Analyte detected below quantitation limits

- Sample pH Not In Range
- RL Reporting Limit

1909668

28-Oct-19

WO#:

Р

В

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

# **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

#### **Client:** HILCORP ENERGY **Project:** Salty Dog

ананананананананананананананананананан										
Sample ID: 100ng Ics	SampT	ype: LC	S	TestCode: EPA Method 8260B: VOLATILES						
Client ID: LCSW	Batcl	h ID: We	62926	F	RunNo: <b>6</b> 2	2926				
Prep Date:	Analysis E	Date: <b>9/</b>	13/2019	5	SeqNo: 2	144411	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	16	1.0	20.00	0	80.8	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	86.5	70	130			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		91.6	70	130			
Surr: 4-Bromofluorobenzene	8.6		10.00		86.3	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.5	70	130			
Surr: Toluene-d8	9.5		10.00		95.3	70	130			
Sample ID: 1909668-001a ms	SampT	уре: М	6	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: MW03	Batcl	h ID: We	62926	F	RunNo: 6	2926				
Prep Date:	Analysis D	Date: 9/	13/2019	S	SeqNo: 2	144421	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	114	70	130			
Toluene	19	1.0	20.00	0	95.0	70	130			
Chlorobenzene	19	1.0	20.00	0	92.8	70	130			
1,1-Dichloroethene	18	1.0	20.00	0	89.2	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	87.3	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		111	70	130			
Surr: 4-Bromofluorobenzene	8.3		10.00		83.4	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		99.9	70	130			
Sample ID: 1909668-001a ms	d SampT	ype: <b>MS</b>	SD	Tes	tCode: El	PA Method	8260B: VOL	ATILES		
Client ID: MW03	Batcl	h ID: W6	62926	F	RunNo: 6	2926				
Prep Date:	Analysis E	Date: <b>9/</b>	13/2019	S	SeqNo: 2	144423	Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	110	70	130	2.83	20	
Toluene	19	1.0	20.00	0	93.2	70	130	1.94	20	
Chlorobenzene	18	1.0	20.00	0	91.5	70	130	1.43	20	
1,1-Dichloroethene	17	1.0	20.00	0	84.3	70	130	5.68	20	
Trichloroethene (TCE)	17	1.0	20.00	0	85.6	70	130	1.90	20	
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130	0	0	
Surr: 4-Bromofluorobenzene	8.4		10.00		84.4	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		104	70	130	0	0	
Surr: Toluene-d8	9.8		10.00		98.4	70	130	0	0	

#### **Qualifiers:**

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix Н

Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

1909668

28-Oct-19

WO#:

28-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	HILCOR Salty Dog	P ENERG	Y								
Sample ID: Ics-1 S Client ID: LCSW	99.8uS eC	SampT Batch	ype: Ics n ID: R6	2955	Tes F	tCode: SI RunNo: 62	M2510B: Sj 2955	pecific Condu	uctance		
Prep Date:		Analysis D	ate: 9/	16/2019	5	SeqNo: 2	146976	Units: µmho	os/cm		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity		99	5.0	99.80	0	99.3	85	115			

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Page 15 of 19

Client: Project:	HILCORP ENERGY Salty Dog	
Sample ID: MB-A	-A SampType: MBLK TestCode: EPA Metho	od 6010B: Dissolved Metals
Client ID: PBW	N Batch ID: A63017 RunNo: 63017	
Prep Date:	Analysis Date: 9/18/2019 SeqNo: 2148716	Units: <b>mg/L</b>
Analyte	Result PQL SPK value SPK Ref Val %REC LowLim	it HighLimit %RPD RPDLimit Qual
Magnesium Potassium	ND 1.0 ND 1.0	
Sample ID: LCS-A	S-A SampType: LCS TestCode: EPA Metho	d 6010B: Dissolved Metals
Client ID: LCSW	SW Batch ID: A63017 RunNo: 63017	
Prep Date:	Analysis Date: 9/18/2019 SeqNo: 2148717	Units: <b>mg/L</b>
Analyte	Result PQL SPK value SPK Ref Val %REC LowLim	it HighLimit %RPD RPDLimit Qual
Magnesium	50 1.0 50.00 0 99.7 8	0 120
Potassium	49 1.0 50.00 0 98.3 8	0 120
Sample ID: MB-B	-B SampType: MBLK TestCode: EPA Metho	od 6010B: Dissolved Metals
Client ID: PBW	N         Batch ID:         B63017         RunNo:         63017	
Prep Date:	Analysis Date: 9/18/2019 SeqNo: 2148719	Units: <b>mg/L</b>
Analyte	Result PQL SPK value SPK Ref Val %REC LowLim	it HighLimit %RPD RPDLimit Qual
Magnesium Potassium	ND 1.0 ND 1.0	
Sample ID: LCS-E	S-B SampType: LCS TestCode: EPA Metho	d 6010B: Dissolved Metals
Client ID: LCSW	SW Batch ID: B63017 RunNo: 63017	
Prep Date:	Analysis Date: 9/18/2019 SeqNo: 2148720	Units: <b>mg/L</b>
Analyte	Result PQL SPK value SPK Ref Val %REC LowLim	it HighLimit %RPD RPDLimit Qual
Magnesium	51 1.0 50.00 0 102 8	0 120
Potassium	50 1.0 50.00 0 101 8	0 120
Sample ID: MB-A	-A SampType: MBLK TestCode: EPA Metho	od 6010B: Dissolved Metals
Client ID: PBW	N         Batch ID:         A63074         RunNo:         63074	
Prep Date:	Analysis Date: 9/20/2019 SeqNo: 2151039	Units: <b>mg/L</b>
Analyte	Result PQL SPK value SPK Ref Val %REC LowLim	it HighLimit %RPD RPDLimit Qual
Calcium	ND 1.0	
Sample ID: LCS-A	S-A SampType: LCS TestCode: EPA Metho	od 6010B: Dissolved Metals
Client ID: LCSW	<b>SW</b> Batch ID: <b>A63074</b> RunNo: <b>63074</b>	
Prep Date:	Analysis Date: 9/20/2019 SeqNo: 2151040	Units: <b>mg/L</b>

**Qualifiers:** 

Н

ND

\* Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix

Not Detected at the Reporting Limit

В Analyte detected in the associated Method Blank Е Value above quantitation range

- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL

S % Recovery outside of range due to dilution or matrix

Holding times for preparation or analysis exceeded

PQL Practical Quanitative Limit

Reporting Limit

Page 16 of 19

28-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	HILCORP ENER Salty Dog	GY								
Sample ID: LCS-A	Sam	oType: LC	S	Tes	tCode: El	PA Method	6010B: Disso	lved Meta	als	
Client ID: LCSW	Bat	ch ID: A6	3074	F	RunNo: <b>6</b>	3074				
Prep Date:	Analysis	Date: 9/	20/2019	S	SeqNo: 2	151040	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	50	1.0	50.00	0	100	80	120			
Sodium	48	1.0	50.00	0	96.8	80	120			

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

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28-Oct-19

WO#:

# **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

Client: Project:	HILCORP Salty Dog	ENERG	Y								
Sample ID: mb-1	alk	SampT	ype: mb	olk	Tes	tCode: SI	M2320B: Al	kalinity			
Client ID: PBW	1	Batcl	h ID: R6	2955	F	RunNo: 62	2955				
Prep Date:		Analysis D	Date: <b>9/</b>	16/2019	5	SeqNo: 2	146955	Units: mg/L	CaCO3		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as Car	CO3)	ND	20.00								
Sample ID: Ics-1	alk	SampT	ype: Ics	;	Tes	tCode: SI	M2320B: AI	kalinity			
Client ID: LCS	N	Batc	h ID: R6	2955	F	RunNo: 62	2955				
Prep Date:		Analysis D	Date: <b>9/</b>	16/2019	5	SeqNo: 2	146956	Units: mg/L	CaCO3		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as Cal	CO3)	78.56	20.00	80.00	0	98.2	90	110			

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL
  - Reporting Limit

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28-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	HILCORP Salty Dog	ENERG	Y								
Sample ID: MB	3-47473	SampT	ype: ME	BLK	Tes	tCode: SI	M2540C MC	DD: Total Diss	olved So	lids	
Client ID: PB	w	Batcl	h ID: 47	473	F	RunNo: <b>6</b> :	2954				
Prep Date: 9/	13/2019	Analysis D	Date: 9/	16/2019	S	SeqNo: 2	145864	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Soli	ids	ND	20.0								
Sample ID: LC	S-47473	SampT	ype: LC	S	Tes	tCode: SI	M2540C MC	DD: Total Diss	olved So	lids	
Client ID: LC:	sw	Batcl	h ID: 47	473	F	RunNo: <b>6</b> :	2954				
Prep Date: 9/	13/2019	Analysis D	Date: 9/	16/2019	5	SeqNo: 2	145865	Units: mg/L			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Soli	ids	1020	20.0	1000	0	102	80	120			

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY	Hall Environmenta Alb TEL: 505-345-397 Website: www.h	Anal 49 uquer 5 FAX allenvi	ysis Labo 01 Hawki que, NM : 505-345 ironmenta	ratory ns NE 87109 <b>Sam</b> -4107 ul.com	Sample Log-In Check List			
Client Name: HILCORP ENERGY FA	R Work Order Number	: 190	9668		RcptNo: 1			
Received By: Leah Baca	9/13/2019 8:15:00 AM	c.		Loop Baca				
Completed By: Yazmine Garduno Reviewed By: 16 01319	9/13/2019 8:44:55 AM			Nogmine leftsdeets				
Chain of Custody								
1. Is Chain of Custody complete?		Yes		No 🗌	Not Present			
2. How was the sample delivered?		Cou	irier					
Log In								
<ol> <li>Was an attempt made to cool the sample is the sample of the</li></ol>	bles?	Yes		No 🗌				
4. Were all samples received at a temperative of the samples received at a temperative of the same set of the	ature of >0° C to 6.0°C	Yes		No 🗌				
5. Sample(s) in proper container(s)?		Yes		No 🗌				
<ol><li>Sufficient sample volume for indicated t</li></ol>	est(s)?	Yes	~	No 🗌				
7. Are samples (except VOA and ONG) pr	operly preserved?	Yes		No 🗌				
8. Was preservative added to bottles?		Yes		No 🔽	NA 🗌			

/. Are	e samples (	except VOA	and ONG) pr	operly preserv	ed?	Yes	V	No		
8. Wa	is preserva	tive added to	bottles?			Yes		No 🗹	NA 🗌	
9. VO	A vials hav	e zero head	space?			Yes		No 🗌	No VOA Vials 🗌	
10. We	ere any san	nple contain	ers received b	roken?		Yes		No 🗹	# of preserved	
11. Doe (No	es paperwo ote discrepa	rk match bo incies on ch	ttle labels? ain of custody	)		Yes		No 🗌	bottles checked for pH:	5 Jor >12 unless noted)
12. Are	matrices c	orrectly ider	tified on Chai	n of Custody?		Yes	$\checkmark$	No 🗌	Adjusted?	NO
13. Is it	clear what	analyses w	ere requested	?		Yes		No 🗌		
14. We (If r	re all holdir no, notify cu	ng times able istomer for a	e to be met? authorization.)			Yes		No 🗌	Checked by:	DAD 9/13/19
<u>Specia</u>	al Handli	ing (if app	olicable)							
15. Wa	as client not	tified of all d	iscrepancies	with this order'	7	Yes		No 🗌	NA 🗹	
	Person	Notified:			Date					
	By Who	m:	1		Via:	eM	ail 🗌	Phone T Fax	In Person	
	Regardi Client In	ng: structions:	1							
16. Ac	ditional rer	narks <sup>.</sup>								
17. <u>Co</u>	oler Inform	mation								
1.1	Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal D	ate	Signed By	1	
1		4.4	Good			1	-			

Received by OCD: 11/18/2019 1	:34:59 PM ———		— Page 149 of
TORY	SOOINA' SOOTA		
	Sa		-
1871 1871	U.S.08 + Sil bobrotx		- Luc
AB AB al.col al.col al.col 345-z	otal Coliform (Present/Absent)		V.C
TIR nent: 505-: Reque	(AOV-im92) 07S	3	-55
NV SIS SIC SIC Nironr Aronu Duqui SIS	(AOV) 092	3	00
Analy Analy	1, F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>		Le la
NLL IAL w.ha NE 3975	slatalls	4	Mco
HA AN ww kins 345-(	MIS0728 or 8270SIMS		
Haw 505	DB (Method 504 1)		3
4901 Tel.		<u>s</u>	- is
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			<u>x</u> V
2 day @ 3pm	nn nn 101 HEAL No.	100-100-	Plate Time all 12/19 160 Date Time all 3/14 08/
Time: Resument Mor Mor Mor Hu Doo T81901	Addu A Addu Archi	Sherrer	Via: Court
Turn-Around Standarc Project Nam Project #:	Project Mana JOS Sampler: C On Ice: # of Coolers: Cooler Temp Cooler Temp	Nahous	Received by: Received by:
1-of-Custody Record (LDVP en buel ss: 382 Rd 3100 12HC NM 87410 12HC NM 87410	e: jd ial@hillarp.com e:	S Aqueeus MW03 MW06 MW06	Relinquished by: Could Me Relinquished by: Montan Unation
hair Address	Fax#: ackage ard ation: <u>Type</u>	1433	ime: ime:
ent: J d liling A	ail or QC P: Stand redite		1 1 1
Pho Clit	A A A A A A A A A A A A A A A A A A A		Date Date



November 01, 2019

Jennifer Deal HILCORP ENERGY PO Box 4700 Farmington, NM 87499 TEL: (505) 564-0733 FAX Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

RE: Salty Dog

OrderNo.: 1910B55

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 31 sample(s) on 10/22/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

Analytical Report	
Lab Order 1910B55	
Date Reported: 11/1/2019	

10/23/2019 7:05:34 PM

10/23/2019 8:46:17 PM

Analyst: NSB

Analyst: MRA

#### Hall Environmental Analysis Laboratory, Inc.

CLIENT: Project: Lab ID:	HILCORP ENERGY Salty Dog 1910B55-002	Client Sample ID: MW08@ 2.5-5'           Collection Date: 10/20/2019 2:49:00 1           Matrix: SOIL         Received Date: 10/22/2019 8:15:00 1					
Analyses		Result	RL Q	ual Units	DF	Date Analyzed	
EPA MET	HOD 8015M/D: DIESEL RAI	NGE ORGANICS				Analyst: BRM	
Diesel Ra	ange Organics (DRO)	ND	8.2	mg/Kg	1	10/24/2019 6:23:33 PM	
Motor Oil	Range Organics (MRO)	ND	41	mg/Kg	1	10/24/2019 6:23:33 PM	
Surr: E	DNOP	124	70-130	%Rec	1	10/24/2019 6:23:33 PM	
EPA MET	HOD 8015D: GASOLINE RA	NGE				Analyst: NSB	
Gasoline	Range Organics (GRO)	ND	4.7	mg/Kg	1	10/23/2019 7:05:34 PM	

92.4

ND

ND

ND

ND

93.3

ND

77.4-118

0.024

0.047

0.047

0.095

80-120

60

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 1 of 38

**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW08@ 20-22.5' Collection Date: 10/20/2010 2:54:00 PM

Project:	Salty Dog		Collection Date: 10/20/2019 2:54:00 PM					
Lab ID:	1910B55-004	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM					
Analyses		Result	RL Qu	al Units	DF	Date Analyzed		
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM		
Diesel R	Range Organics (DRO)	ND	9.2	mg/Kg	1	10/24/2019 4:36:42 AM		
Motor O	il Range Organics (MRO)	ND	46	mg/Kg	1	10/24/2019 4:36:42 AM		
Surr:	DNOP	110	70-130	%Rec	1	10/24/2019 4:36:42 AM		
EPA ME	THOD 8015D: GASOLINE RA	ANGE				Analyst: NSB		
Gasoline	e Range Organics (GRO)	ND	5.0	mg/Kg	1	10/23/2019 8:36:49 PM		
Surr:	BFB	92.9	77.4-118	%Rec	1	10/23/2019 8:36:49 PM		
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB		
Benzene	e	ND	0.025	mg/Kg	1	10/23/2019 8:36:49 PM		
Toluene		ND	0.050	mg/Kg	1	10/23/2019 8:36:49 PM		
Ethylber	nzene	ND	0.050	mg/Kg	1	10/23/2019 8:36:49 PM		
Xylenes	, Total	ND	0.10	mg/Kg	1	10/23/2019 8:36:49 PM		
Surr:	4-Bromofluorobenzene	93.1	80-120	%Rec	1	10/23/2019 8:36:49 PM		
EPA ME	THOD 300.0: ANIONS					Analyst: MRA		
Chloride		ND	60	mg/Kg	20	10/23/2019 9:35:54 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW08@ 22.5-25' Collection Date: 10/20/2019 2:58:00 PM

Project:	Salty Dog	Collection Date: 10/20/2019 2:58:00 PM					
Lab ID:	1910B55-005	Matrix: SOIL	Rece	ived Date:	10/22/	2019 8:15:00 AM	
Analyses		Result	RL Qua	al Units	DF	Date Analyzed	
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM	
Diesel R	ange Organics (DRO)	ND	8.4	mg/Kg	1	10/24/2019 4:58:26 AM	
Motor O	il Range Organics (MRO)	ND	42	mg/Kg	1	10/24/2019 4:58:26 AM	
Surr:	DNOP	94.2	70-130	%Rec	1	10/24/2019 4:58:26 AM	
EPA ME	THOD 8015D: GASOLINE R	ANGE				Analyst: NSB	
Gasoline	e Range Organics (GRO)	ND	5.0	mg/Kg	1	10/23/2019 8:59:43 PM	
Surr:	BFB	90.1	77.4-118	%Rec	1	10/23/2019 8:59:43 PM	
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB	
Benzene	9	ND	0.025	mg/Kg	1	10/23/2019 8:59:43 PM	
Toluene		ND	0.050	mg/Kg	1	10/23/2019 8:59:43 PM	
Ethylber	izene	ND	0.050	mg/Kg	1	10/23/2019 8:59:43 PM	
Xylenes	, Total	ND	0.10	mg/Kg	1	10/23/2019 8:59:43 PM	
Surr:	4-Bromofluorobenzene	90.0	80-120	%Rec	1	10/23/2019 8:59:43 PM	
EPA ME	THOD 300.0: ANIONS					Analyst: MRA	
Chloride		69	60	mg/Kg	20	10/23/2019 9:48:18 PM	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit PQL
- Practical Quanitative Limit S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**Project:** Salty Dog

**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW08@ 27.5-30' Collection Date: 10/20/2019 3:00:00 PM

Lab ID: 1910B55-006	Matrix: SOIL	Rece	ived Date:	10/22/	2019 8:15:00 AM
Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANG	E ORGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9	mg/Kg	1	10/24/2019 5:20:23 AM
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	10/24/2019 5:20:23 AM
Surr: DNOP	98.2	70-130	%Rec	1	10/24/2019 5:20:23 AM
EPA METHOD 8015D: GASOLINE RAN	GE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	10/23/2019 9:22:36 PM
Surr: BFB	89.8	77.4-118	%Rec	1	10/23/2019 9:22:36 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	10/23/2019 9:22:36 PM
Toluene	ND	0.047	mg/Kg	1	10/23/2019 9:22:36 PM
Ethylbenzene	ND	0.047	mg/Kg	1	10/23/2019 9:22:36 PM
Xylenes, Total	ND	0.093	mg/Kg	1	10/23/2019 9:22:36 PM
Surr: 4-Bromofluorobenzene	89.9	80-120	%Rec	1	10/23/2019 9:22:36 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	ND	60	mg/Kg	20	10/23/2019 10:00:43 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit PQL
- Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Analytical Report							
Lab Order 1910B55							
Date Reported: 11/1/2019							

Analyst: NSB

Analyst: NSB

10/23/2019 10:08:25 PM

Analyst: MRA 10/23/2019 10:13:07 PM

#### Hall Environmental Analysis Laboratory, Inc.

**EPA METHOD 8015D: GASOLINE RANGE** 

Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

CLIENT: HILCORP ENERGY	Client Sample ID: MW09@ 7.5-10'					
Project: Salty Dog	Collection Date: 10/20/2019 5:20:00 PM					
Lab ID: 1910B55-007	Matrix: SOIL         Received Date: 10/22/2019 8:15:00 AM					
Analyses	Result	RL Qual	Units	DF	Date Analyzed	
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: BRM	
Diesel Range Organics (DRO)	ND	9.0	mg/Kg	1	10/24/2019 5:42:12 AM	
Motor Oil Range Organics (MRO)	ND	45	mg/Kg	1	10/24/2019 5:42:12 AM	
Surr: DNOP	145	70-130 S	%Rec	1	10/24/2019 5:42:12 AM	

ND

91.7

ND

ND

ND

ND

90.5

410

4.8

77.4-118

0.024

0.048

0.048

0.096

80-120

60

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- в Analyte detected in the associated Method Blank Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**Project:** Salty Dog

**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW09@12.5-15' Collection Date: 10/20/2019 5:22:00 PM

Lab ID: 1910B55-008	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RAM	NGE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	10/24/2019 6:04:06 AM		
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	10/24/2019 6:04:06 AM		
Surr: DNOP	96.6	70-130	%Rec	1	10/24/2019 6:04:06 AM		
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	10/23/2019 11:17:35 PM		
Surr: BFB	99.1	77.4-118	%Rec	1	10/23/2019 11:17:35 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.025	mg/Kg	1	10/23/2019 11:17:35 PM		
Toluene	ND	0.049	mg/Kg	1	10/23/2019 11:17:35 PM		
Ethylbenzene	ND	0.049	mg/Kg	1	10/23/2019 11:17:35 PM		
Xylenes, Total	ND	0.099	mg/Kg	1	10/23/2019 11:17:35 PM		
Surr: 4-Bromofluorobenzene	97.8	80-120	%Rec	1	10/23/2019 11:17:35 PM		
EPA METHOD 300.0: ANIONS					Analyst: MRA		
Chloride	370	60	mg/Kg	20	10/23/2019 10:25:32 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D
- Н Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit PQL
- Practical Quanitative Limit S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank Е
- Value above quantitation range
- J Analyte detected below quantitation limits
  - Р Sample pH Not In Range
- RL Reporting Limit

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Lab ID:

**CLIENT: HILCORP ENERGY** 

Salty Dog

1910B55-009

#### **Analytical Report** Lab Order 1910B55 Date Reported: 11/1/2019

#### Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: MW09@ 22.5-25' Collection Date: 10/20/2019 5:24:00 PM Received Date: 10/22/2019 8:15:00 AM

Analyses	Result	RL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORG	GANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	7.2	mg/Kg	1	10/24/2019 6:25:58 AM
Motor Oil Range Organics (MRO)	ND	36	mg/Kg	1	10/24/2019 6:25:58 AM
Surr: DNOP	92.7	70-130	%Rec	1	10/24/2019 6:25:58 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	10/23/2019 11:40:40 PM
Surr: BFB	98.8	77.4-118	%Rec	1	10/23/2019 11:40:40 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/23/2019 11:40:40 PM
Toluene	ND	0.049	mg/Kg	1	10/23/2019 11:40:40 PM
Ethylbenzene	ND	0.049	mg/Kg	1	10/23/2019 11:40:40 PM
Xylenes, Total	ND	0.098	mg/Kg	1	10/23/2019 11:40:40 PM
Surr: 4-Bromofluorobenzene	97.2	80-120	%Rec	1	10/23/2019 11:40:40 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	1100	60	mg/Kg	20	10/23/2019 10:37:57 PM

Matrix: SOIL

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit PQL
- Practical Quanitative Limit S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW09@ 27.5-30' Collection Date: 10/20/2019 5:26:00 PM

Project:	Salty Dog	Collection Date: 10/20/2019 5:26:00 PM					
Lab ID:	1910B55-010	Matrix: SOIL	Receiv	ved Date:	10/22/	2019 8:15:00 AM	
Analyses		Result	RL Qual	<b>Units</b>	DF	Date Analyzed	
EPA ME	THOD 8015M/D: DIESEL RAI	NGE ORGANICS				Analyst: BRM	
Diesel F	Range Organics (DRO)	ND	9.2	mg/Kg	1	10/24/2019 6:48:02 AM	
Motor O	il Range Organics (MRO)	ND	46	mg/Kg	1	10/24/2019 6:48:02 AM	
Surr:	DNOP	105	70-130	%Rec	1	10/24/2019 6:48:02 AM	
EPA ME	THOD 8015D: GASOLINE RA	NGE				Analyst: NSB	
Gasolin	e Range Organics (GRO)	ND	4.6	mg/Kg	1	10/24/2019 12:03:43 AM	
Surr:	BFB	96.3	77.4-118	%Rec	1	10/24/2019 12:03:43 AM	
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB	
Benzen	e	ND	0.023	mg/Kg	1	10/24/2019 12:03:43 AM	
Toluene		ND	0.046	mg/Kg	1	10/24/2019 12:03:43 AM	
Ethylbei	nzene	ND	0.046	mg/Kg	1	10/24/2019 12:03:43 AM	
Xylenes	, Total	ND	0.092	mg/Kg	1	10/24/2019 12:03:43 AM	
Surr:	4-Bromofluorobenzene	91.8	80-120	%Rec	1	10/24/2019 12:03:43 AM	
EPA ME	THOD 300.0: ANIONS					Analyst: MRA	
Chloride		370	60	mg/Kg	20	10/23/2019 11:15:11 PM	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@ 0-2.5' Collection Date: 10/21/2010 1:52:00 PM

Project:	Salty Dog		Collection Date: 10/21/2019 1:52:00 PM						
Lab ID:	1910B55-011	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM						
Analyses		Result	RL	Qual	Units	DF	Date Analyzed		
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS					Analyst: BRM		
Diesel R	ange Organics (DRO)	ND	10		mg/Kg	1	10/24/2019 7:09:55 AM		
Motor O	il Range Organics (MRO)	ND	50		mg/Kg	1	10/24/2019 7:09:55 AM		
Surr:	DNOP	144	70-130	S	%Rec	1	10/24/2019 7:09:55 AM		
EPA ME	THOD 8015D: GASOLINE R	ANGE					Analyst: NSB		
Gasoline	e Range Organics (GRO)	ND	4.6		mg/Kg	1	10/24/2019 12:26:43 AM		
Surr:	BFB	96.4	77.4-118		%Rec	1	10/24/2019 12:26:43 AM		
EPA ME	THOD 8021B: VOLATILES						Analyst: NSB		
Benzene	9	ND	0.023		mg/Kg	1	10/24/2019 12:26:43 AM		
Toluene		ND	0.046		mg/Kg	1	10/24/2019 12:26:43 AM		
Ethylber	izene	ND	0.046		mg/Kg	1	10/24/2019 12:26:43 AM		
Xylenes	, Total	ND	0.092		mg/Kg	1	10/24/2019 12:26:43 AM		
Surr:	4-Bromofluorobenzene	93.1	80-120		%Rec	1	10/24/2019 12:26:43 AM		
EPA ME	THOD 300.0: ANIONS						Analyst: MRA		
Chloride	9	68	60		mg/Kg	20	10/23/2019 11:27:36 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

10/24/2019 12:49:48 AM

Analyst: MRA 10/23/2019 11:40:00 PM

Analyst: NSB

Analytical Report
Lab Order 1910B55
Date Reported: 11/1/2019

#### Hall Environmental Analysis Laboratory, Inc.

CLIENT: Project: Lab ID:	HILCORP ENERGY Salty Dog 1910B55-012	Client Sample ID: MW10@ 2.5-5'           Collection Date: 10/21/2019 1:50:00 PM           Matrix: SOIL         Received Date: 10/22/2019 8:15:00 AM						
Analyses		Result	RL	Qual	Units	DF	Date Analyzed	
EPA MET	HOD 8015M/D: DIESEL R	ANGE ORGANICS					Analyst: BRM	
Diesel Ra	ange Organics (DRO)	ND	9.3		mg/Kg	1	10/24/2019 7:32:00 AM	
Motor Oil	I Range Organics (MRO)	ND	47		mg/Kg	1	10/24/2019 7:32:00 AM	
Surr: E	DNOP	142	70-130	S	%Rec	1	10/24/2019 7:32:00 AM	
EPA MET	HOD 8015D: GASOLINE	RANGE					Analyst: NSB	

ND

94.2

ND

ND

ND

ND

91.0

120

4.8

77.4-118

0.024

0.048

0.048

0.096

80-120

60

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Lab ID:

Analyses

#### **Analytical Report** Lab Order 1910B55 Date Reported: 11/1/2019

Hall	Environ	mental	Anal	ysis	Labor	atory, ]	Inc.

**CLIENT: HILCORP ENERGY** Client Sample ID: MW10@ 7.5-10' Salty Dog Collection Date: 10/21/2019 1:56:00 PM 1910B55-013 Matrix: SOIL Received Date: 10/22/2019 8:15:00 AM Result **RL** Qual Units DF **Date Analyzed** 

EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	8.5	mg/Kg	1	10/24/2019 7:54:02 AM
Motor Oil Range Organics (MRO)	ND	42	mg/Kg	1	10/24/2019 7:54:02 AM
Surr: DNOP	87.5	70-130	%Rec	1	10/24/2019 7:54:02 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/24/2019 1:12:50 AM
Surr: BFB	94.7	77.4-118	%Rec	1	10/24/2019 1:12:50 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/24/2019 1:12:50 AM
Toluene	ND	0.048	mg/Kg	1	10/24/2019 1:12:50 AM
Ethylbenzene	ND	0.048	mg/Kg	1	10/24/2019 1:12:50 AM
Xylenes, Total	ND	0.096	mg/Kg	1	10/24/2019 1:12:50 AM
Surr: 4-Bromofluorobenzene	92.2	80-120	%Rec	1	10/24/2019 1:12:50 AM
EPA METHOD 300.0: ANIONS					Analyst: CAS
Chloride	63	60	mg/Kg	20	10/23/2019 8:14:48 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit S
  - % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Lab ID:

**CLIENT: HILCORP ENERGY** 

Salty Dog

1910B55-014

#### **Analytical Report** Lab Order 1910B55 Date Reported: 11/1/2019

Hall	Environ	mental	Anal	ysis	Labor	atory, ]	Inc.

Client Sample ID: MW10@ 10-12.5' Collection Date: 10/21/2019 1:58:00 PM Received Date: 10/22/2019 8:15:00 AM

Analyses	Result	RL Q	ual Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.0	mg/Kg	1	10/24/2019 8:16:01 AM
Motor Oil Range Organics (MRO)	ND	45	mg/Kg	1	10/24/2019 8:16:01 AM
Surr: DNOP	115	70-130	%Rec	1	10/24/2019 8:16:01 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9	mg/Kg	1	10/24/2019 1:35:51 AM
Surr: BFB	90.5	77.4-118	%Rec	1	10/24/2019 1:35:51 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.025	mg/Kg	1	10/24/2019 1:35:51 AM
Toluene	ND	0.049	mg/Kg	1	10/24/2019 1:35:51 AM
Ethylbenzene	ND	0.049	mg/Kg	1	10/24/2019 1:35:51 AM
Xylenes, Total	ND	0.099	mg/Kg	1	10/24/2019 1:35:51 AM
Surr: 4-Bromofluorobenzene	87.8	80-120	%Rec	1	10/24/2019 1:35:51 AM
EPA METHOD 300.0: ANIONS					Analyst: CAS
Chloride	670	60	mg/Kg	20	10/23/2019 8:51:50 PM

Matrix: SOIL

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit PQL Practical Quanitative Limit
- S

- в Analyte detected in the associated Method Blank Е
- Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL
  - Reporting Limit

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<sup>%</sup> Recovery outside of range due to dilution or matrix

**CLIENT: HILCORP ENERGY** 

Salty Dog

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@ 12.5-15' Collection Date: 10/21/2019 2:00:00 PM Received Date: 10/22/2019 8:15:00 AM

Lab ID: 1910B55-015	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RAM	NGE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)	ND	7.7	mg/Kg	1	10/25/2019 8:35:03 AM		
Motor Oil Range Organics (MRO)	ND	39	mg/Kg	1	10/25/2019 8:35:03 AM		
Surr: DNOP	92.0	70-130	%Rec	1	10/25/2019 8:35:03 AM		
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	10/24/2019 1:58:53 AM		
Surr: BFB	94.5	77.4-118	%Rec	1	10/24/2019 1:58:53 AM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.025	mg/Kg	1	10/24/2019 1:58:53 AM		
Toluene	ND	0.050	mg/Kg	1	10/24/2019 1:58:53 AM		
Ethylbenzene	ND	0.050	mg/Kg	1	10/24/2019 1:58:53 AM		
Xylenes, Total	ND	0.10	mg/Kg	1	10/24/2019 1:58:53 AM		
Surr: 4-Bromofluorobenzene	90.7	80-120	%Rec	1	10/24/2019 1:58:53 AM		
EPA METHOD 300.0: ANIONS					Analyst: CAS		
Chloride	140	60	mg/Kg	20	10/23/2019 9:28:53 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit PQL Practical Quanitative Limit
- S
- % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

## **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@15-17.5' Collection Date: 10/21/2019 2:02:00 PM

Lab ID: 1910B55-016	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)	ND	8.6	mg/Kg	1	10/24/2019 9:00:09 AM		
Motor Oil Range Organics (MRO)	ND	43	mg/Kg	1	10/24/2019 9:00:09 AM		
Surr: DNOP	93.9	70-130	%Rec	1	10/24/2019 9:00:09 AM		
EPA METHOD 8015D: GASOLINE RAM	NGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	10/24/2019 2:21:57 AM		
Surr: BFB	95.4	77.4-118	%Rec	1	10/24/2019 2:21:57 AM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.025	mg/Kg	1	10/24/2019 2:21:57 AM		
Toluene	ND	0.050	mg/Kg	1	10/24/2019 2:21:57 AM		
Ethylbenzene	ND	0.050	mg/Kg	1	10/24/2019 2:21:57 AM		
Xylenes, Total	ND	0.10	mg/Kg	1	10/24/2019 2:21:57 AM		
Surr: 4-Bromofluorobenzene	92.2	80-120	%Rec	1	10/24/2019 2:21:57 AM		
EPA METHOD 300.0: ANIONS					Analyst: CAS		
Chloride	79	60	mg/Kg	20	10/23/2019 9:41:13 PM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit S
- % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@ 17.5-20' Collection Date: 10/21/2019 2:03:00 PM -

Lab ID: 1910B55-017	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM				
Analyses	Result	RL Qua	al Units	DF	Date Analyzed	
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: BRM	
Diesel Range Organics (DRO)	ND	9.1	mg/Kg	1	10/24/2019 9:22:09 AM	
Motor Oil Range Organics (MRO)	ND	45	mg/Kg	1	10/24/2019 9:22:09 AM	
Surr: DNOP	103	70-130	%Rec	1	10/24/2019 9:22:09 AM	
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB	
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/24/2019 2:45:00 AM	
Surr: BFB	94.6	77.4-118	%Rec	1	10/24/2019 2:45:00 AM	
EPA METHOD 8021B: VOLATILES					Analyst: NSB	
Benzene	ND	0.024	mg/Kg	1	10/24/2019 2:45:00 AM	
Toluene	ND	0.048	mg/Kg	1	10/24/2019 2:45:00 AM	
Ethylbenzene	ND	0.048	mg/Kg	1	10/24/2019 2:45:00 AM	
Xylenes, Total	ND	0.096	mg/Kg	1	10/24/2019 2:45:00 AM	
Surr: 4-Bromofluorobenzene	90.7	80-120	%Rec	1	10/24/2019 2:45:00 AM	
EPA METHOD 300.0: ANIONS					Analyst: CAS	
Chloride	190	60	mg/Kg	20	10/23/2019 9:53:34 PM	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Chloride

10/23/2019 10:05:55 PM

Analytical Report							
Lab Order 1910B55							
Date Reported: 11/1/2019							

#### Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** Client Sample ID: MW10@ 20-22.5 **Project:** Salty Dog Collection Date: 10/21/2019 2:04:00 PM Lab ID: 1910B55-018 Matrix: SOIL Received Date: 10/22/2019 8:15:00 AM Result **RL** Qual Units DF **Date Analyzed** Analyses **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** Analyst: BRM ND 10/24/2019 9:44:21 AM Diesel Range Organics (DRO) 8.5 mg/Kg 1 Motor Oil Ra AM Surr: DN AM

ND	43	mg/Kg	1	10/24/2019 9:44:21 AM
105	70-130	%Rec	1	10/24/2019 9:44:21 AM
				Analyst: NSB
ND	4.9	mg/Kg	1	10/24/2019 3:54:05 AM
94.8	77.4-118	%Rec	1	10/24/2019 3:54:05 AM
				Analyst: NSB
ND	0.024	mg/Kg	1	10/24/2019 3:54:05 AM
ND	0.049	mg/Kg	1	10/24/2019 3:54:05 AM
ND	0.049	mg/Kg	1	10/24/2019 3:54:05 AM
ND	0.098	mg/Kg	1	10/24/2019 3:54:05 AM
92.5	80-120	%Rec	1	10/24/2019 3:54:05 AM
				Analyst: CAS
	ND 105 ND 94.8 ND ND ND ND 92.5	ND         43           105         70-130           ND         4.9           94.8         77.4-118           ND         0.024           ND         0.049           ND         0.049           ND         0.098           92.5         80-120	ND         43         mg/Kg           105         70-130         %Rec           ND         4.9         mg/Kg           94.8         77.4-118         %Rec           ND         0.024         mg/Kg           ND         0.049         mg/Kg           ND         0.049         mg/Kg           ND         0.098         mg/Kg           92.5         80-120         %Rec	ND         43         mg/Kg         1           105         70-130         %Rec         1           ND         4.9         mg/Kg         1           94.8         77.4-118         %Rec         1           ND         0.024         mg/Kg         1           ND         0.049         mg/Kg         1           ND         0.049         mg/Kg         1           ND         0.049         mg/Kg         1           ND         0.098         mg/Kg         1           92.5         80-120         %Rec         1

61

mg/Kg

20

120

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@ 22.5-25' Collection Date: 10/21/2019 2:05:00 PM

Lab ID: 1910B55-019	Matrix: SOIL	<b>Received Date:</b> 10/22/2019 8:15:00 AM				
Analyses	Result	RL Qu	ual Units	DF	Date Analyzed	
EPA METHOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM	
Diesel Range Organics (DRO)	ND	9.5	mg/Kg	1	10/25/2019 8:29:23 AM	
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	10/25/2019 8:29:23 AM	
Surr: DNOP	90.0	70-130	%Rec	1	10/25/2019 8:29:23 AM	
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB	
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/24/2019 4:17:01 AM	
Surr: BFB	94.5	77.4-118	%Rec	1	10/24/2019 4:17:01 AM	
EPA METHOD 8021B: VOLATILES					Analyst: NSB	
Benzene	ND	0.024	mg/Kg	1	10/24/2019 4:17:01 AM	
Toluene	ND	0.048	mg/Kg	1	10/24/2019 4:17:01 AM	
Ethylbenzene	ND	0.048	mg/Kg	1	10/24/2019 4:17:01 AM	
Xylenes, Total	ND	0.096	mg/Kg	1	10/24/2019 4:17:01 AM	
Surr: 4-Bromofluorobenzene	93.8	80-120	%Rec	1	10/24/2019 4:17:01 AM	
EPA METHOD 300.0: ANIONS					Analyst: MRA	
Chloride	ND	60	mg/Kg	20	10/24/2019 7:11:19 PM	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Lab ID:

Analyses

Analytical Report					
Lab Order 1910B55					
Date Reported: 11/1/2019					

#### Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** Client Sample ID: MW10@ 25-27.5' Salty Dog Collection Date: 10/21/2019 2:06:00 PM 1910B55-020 Matrix: SOIL Received Date: 10/22/2019 8:15:00 AM Result **RL** Qual Units DF **Date Analyzed EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** Analyst: BRM

Diesel Range Organics (DRO)	ND	8.8	mg/Kg	1	10/25/2019 8:51:32 AM
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	10/25/2019 8:51:32 AM
Surr: DNOP	104	70-130	%Rec	1	10/25/2019 8:51:32 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/24/2019 4:40:02 AM
Surr: BFB	94.9	77.4-118	%Rec	1	10/24/2019 4:40:02 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/24/2019 4:40:02 AM
Toluene	ND	0.048	mg/Kg	1	10/24/2019 4:40:02 AM
Ethylbenzene	ND	0.048	mg/Kg	1	10/24/2019 4:40:02 AM
Xylenes, Total	ND	0.096	mg/Kg	1	10/24/2019 4:40:02 AM
Surr: 4-Bromofluorobenzene	91.2	80-120	%Rec	1	10/24/2019 4:40:02 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	210	60	mg/Kg	20	10/25/2019 8:52:44 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

Analytic	al Report
Lab Order	1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@ 27.5-30' Collection Data: 10/21/2010 2:08:00 PM

Project:	Salty Dog	Collection Date: 10/21/2019 2:08:00 PM						
Lab ID:	1910B55-021	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM					
Analyses		Result	RL Qu	al Units	DF	Date Analyzed		
EPA MET	HOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: BRM		
Diesel Ra	ange Organics (DRO)	ND	8.9	mg/Kg	1	10/25/2019 9:13:40 AM		
Motor Oil	Range Organics (MRO)	ND	44	mg/Kg	1	10/25/2019 9:13:40 AM		
Surr: D	NOP	93.3	70-130	%Rec	1	10/25/2019 9:13:40 AM		
EPA MET	HOD 8015D: GASOLINE RA	NGE				Analyst: NSB		
Gasoline	Range Organics (GRO)	ND	4.6	mg/Kg	1	10/24/2019 7:50:49 PM		
Surr: B	FB	88.8	77.4-118	%Rec	1	10/24/2019 7:50:49 PM		
EPA MET	HOD 8021B: VOLATILES					Analyst: NSB		
Benzene		ND	0.023	mg/Kg	1	10/24/2019 7:50:49 PM		
Toluene		ND	0.046	mg/Kg	1	10/24/2019 7:50:49 PM		
Ethylbenz	zene	ND	0.046	mg/Kg	1	10/24/2019 7:50:49 PM		
Xylenes,	Total	ND	0.093	mg/Kg	1	10/24/2019 7:50:49 PM		
Surr: 4	-Bromofluorobenzene	90.0	80-120	%Rec	1	10/24/2019 7:50:49 PM		
EPA MET	HOD 300.0: ANIONS					Analyst: MRA		
Chloride		350	60	mg/Kg	20	10/25/2019 9:05:09 AM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Analytical Report						
Lab Order 1910B55						
Date Reported: 11/1/2019						

#### Hall Environmental Analysis Laboratory, Inc.

**CLIENT: HILCORP ENERGY** Client Sample ID: MW10@ 30-32.5 **Project:** Salty Dog Collection Date: 10/21/2019 2:10:00 PM Lab ID: 1910B55-022 Matrix: SOIL Received Date: 10/22/2019 8:15:00 AM Result **RL** Qual Units DF **Date Analyzed** Analyses **EPA METHOD 8015M/D: DIESEL RANGE ORGANICS** Analyst: BRM

					-
Diesel Range Organics (DRO)	ND	8.8	mg/Kg	1	10/25/2019 9:35:45 AM
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	10/25/2019 9:35:45 AM
Surr: DNOP	97.0	70-130	%Rec	1	10/25/2019 9:35:45 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6	mg/Kg	1	10/24/2019 8:13:41 PM
Surr: BFB	93.3	77.4-118	%Rec	1	10/24/2019 8:13:41 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	10/24/2019 8:13:41 PM
Toluene	ND	0.046	mg/Kg	1	10/24/2019 8:13:41 PM
Ethylbenzene	ND	0.046	mg/Kg	1	10/24/2019 8:13:41 PM
Xylenes, Total	ND	0.093	mg/Kg	1	10/24/2019 8:13:41 PM
Surr: 4-Bromofluorobenzene	93.8	80-120	%Rec	1	10/24/2019 8:13:41 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	350	60	mg/Kg	20	10/25/2019 9:17:34 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**CLIENT: HILCORP ENERGY** 

Salty Dog

#### **Analytical Report** Lab Order 1910B55 Date Reported: 11/1/2019

#### Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: MW10@ 32.5-35' Collection Date: 10/21/2019 2:12:00 PM Received Date: 10/22/2019 8:15:00 AM

Lab ID: 1910B55-023	Matrix: SOIL	<b>Received Date:</b> 10/22/2019 8:15:00 AM					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)	ND	9.5	mg/Kg	1	10/25/2019 9:57:41 AM		
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	10/25/2019 9:57:41 AM		
Surr: DNOP	99.4	70-130	%Rec	1	10/25/2019 9:57:41 AM		
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	5.0	mg/Kg	1	10/24/2019 8:36:30 PM		
Surr: BFB	94.6	77.4-118	%Rec	1	10/24/2019 8:36:30 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.025	mg/Kg	1	10/24/2019 8:36:30 PM		
Toluene	ND	0.050	mg/Kg	1	10/24/2019 8:36:30 PM		
Ethylbenzene	ND	0.050	mg/Kg	1	10/24/2019 8:36:30 PM		
Xylenes, Total	ND	0.099	mg/Kg	1	10/24/2019 8:36:30 PM		
Surr: 4-Bromofluorobenzene	95.0	80-120	%Rec	1	10/24/2019 8:36:30 PM		
EPA METHOD 300.0: ANIONS					Analyst: MRA		
Chloride	2000	150	mg/Kg	50	10/25/2019 9:29:59 AM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit PQL
- Practical Quanitative Limit S
- % Recovery outside of range due to dilution or matrix
- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

### **Analytical Report** Lab Order 1910B55

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 11/1/2019 Client Sample ID: MW10@ 37.5-40' Collection Date: 10/21/2019 2:15:00 PM D : ID ( 10/00/0010 0 15 00 A)

Lab ID: 1910B55-024	Matrix: SOIL	Received Date: 10/22/2019 8:15:00 AM					
Analyses	Result	RL Qu	al Units	DF	Date Analyzed		
EPA METHOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)	ND	8.4	mg/Kg	1	10/25/2019 10:19:43 AM		
Motor Oil Range Organics (MRO)	ND	42	mg/Kg	1	10/25/2019 10:19:43 AM		
Surr: DNOP	100	70-130	%Rec	1	10/25/2019 10:19:43 AM		
EPA METHOD 8015D: GASOLINE RA	ANGE				Analyst: NSB		
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	10/24/2019 8:59:23 PM		
Surr: BFB	93.2	77.4-118	%Rec	1	10/24/2019 8:59:23 PM		
EPA METHOD 8021B: VOLATILES					Analyst: NSB		
Benzene	ND	0.024	mg/Kg	1	10/24/2019 8:59:23 PM		
Toluene	ND	0.047	mg/Kg	1	10/24/2019 8:59:23 PM		
Ethylbenzene	ND	0.047	mg/Kg	1	10/24/2019 8:59:23 PM		
Xylenes, Total	ND	0.095	mg/Kg	1	10/24/2019 8:59:23 PM		
Surr: 4-Bromofluorobenzene	93.4	80-120	%Rec	1	10/24/2019 8:59:23 PM		
EPA METHOD 300.0: ANIONS					Analyst: MRA		
Chloride	240	60	mg/Kg	20	10/25/2019 9:42:23 AM		

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Analytical Report
Lab Order 1910B55
Date Reported: 11/1/2019

#### Hall Environmental Analysis Laboratory, Inc.

Analyses		Result R	L Qual U	Units	DF	Date Analyzed	
Lab ID:	1910B55-025	Matrix: MEOH (SOIL)	Received	l Date:	10/22/2	2019 8:15:00 AM	
Project:	Salty Dog		Collection	n Date:	10/21/2	2019 2:17:00 PM	
CLIENT:	HILCORP ENERGY	(	Client Sam	ple ID:	MW11	@ 32.5-35'	

EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2	mg/Kg	1	10/24/2019 2:02:42 AM
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	10/24/2019 2:02:42 AM
Surr: DNOP	88.4	70-130	%Rec	1	10/24/2019 2:02:42 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.9	mg/Kg	1	10/24/2019 2:44:10 PM
Surr: BFB	92.1	77.4-118	%Rec	1	10/24/2019 2:44:10 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.020	mg/Kg	1	10/24/2019 2:44:10 PM
Toluene	ND	0.039	mg/Kg	1	10/24/2019 2:44:10 PM
Ethylbenzene	ND	0.039	mg/Kg	1	10/24/2019 2:44:10 PM
Xylenes, Total	ND	0.079	mg/Kg	1	10/24/2019 2:44:10 PM
Surr: 4-Bromofluorobenzene	96.4	80-120	%Rec	1	10/24/2019 2:44:10 PM
EPA METHOD 300.0: ANIONS					Analyst: CAS
Chloride	130	60	mg/Kg	20	10/24/2019 10:56:39 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Surr: DNOP

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

**EPA METHOD 8015D: GASOLINE RANGE** 

Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

Analytical Report
Lab Order 1910B55
Date Reported: 11/1/2019

10/24/2019 1:40:47 AM

10/24/2019 3:07:29 PM

10/24/2019 11:09:04 AM

Analyst: NSB

Analyst: NSB

Analyst: CAS

#### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	HILCORP ENERGY		Client Sample ID: MW11@ 37.5-40'					
Project:	Salty Dog		Collection Date: 10/21/2019 2:20:00 PM					
Lab ID:	1910B55-026	Matrix: MEOH (SOIL) Received Date: 10/22/2019 8:15:00 AM						
Analyses		Result	RL Qua	al Units	DF	Date Analyzed		
EPA MET	HOD 8015M/D: DIESEL RA	ANGE ORGANICS				Analyst: BRM		
Diesel Range Organics (DRO)		ND	9.4	mg/Kg	1	10/24/2019 1:40:47 AM		
Motor Oil Range Organics (MRO)		ND	47	mg/Kg	1	10/24/2019 1:40:47 AM		

83.4

ND

89.7

ND

ND

ND

ND

93.6

97

70-130

77.4-118

0.019

0.038

0.038

0.076

80-120

60

3.8

%Rec

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- Practical Quanitative Limit
- PQL
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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#### **Analytical Report** Lab Order 1910B55 Date Reported: 11/1/2019

# Hall Environmental Analysis Laboratory, Inc.

Analyses		Result	RL Qual	Units	DF	Date Analyzed
Lab ID:	1910B55-027	Matrix: MEOH (SOIL)	Receiv	ed Date	:10/22/	2019 8:15:00 AM
Project:	Salty Dog		Collecti	on Date	:10/21/	2019 3:00:00 PM
<b>CLIENT</b> :	HILCORP ENERGY		Client Sa	mple ID	: MW1	2@ 15-17.5'

EPA METHOD 8015M/D: DIESEL RANGE OF	RGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.7	mg/Kg	1	10/24/2019 1:18:42 AM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	10/24/2019 1:18:42 AM
Surr: DNOP	93.7	70-130	%Rec	1	10/24/2019 1:18:42 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.8	mg/Kg	1	10/24/2019 3:30:45 PM
Surr: BFB	90.4	77.4-118	%Rec	1	10/24/2019 3:30:45 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.019	mg/Kg	1	10/24/2019 3:30:45 PM
Toluene	ND	0.038	mg/Kg	1	10/24/2019 3:30:45 PM
Ethylbenzene	ND	0.038	mg/Kg	1	10/24/2019 3:30:45 PM
Xylenes, Total	ND	0.076	mg/Kg	1	10/24/2019 3:30:45 PM
Surr: 4-Bromofluorobenzene	95.3	80-120	%Rec	1	10/24/2019 3:30:45 PM
EPA METHOD 300.0: ANIONS					Analyst: CAS
Chloride	80	60	mg/Kg	20	10/24/2019 11:21:29 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Analyst: NSB

Analyst: NSB

Analyst: CAS 10/24/2019 11:33:53 AM

10/25/2019 2:41:54 AM

<b>Analytical Report</b>
Lab Order 1910B55
Date Reported: 11/1/2019

# Hall Environmental Analysis Laboratory, Inc.

**EPA METHOD 8015D: GASOLINE RANGE** 

Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

-									
<b>CLIENT:</b>	HILCORP ENERGY		Client Sample ID: MW12@ 20-22.5'						
Project:	Salty Dog		Collection Date: 10/21/2019 3:02:00 PM						
Lab ID:	1910B55-028	Matrix: MEOH (SOI	L) <b>Reco</b>	eived Date:	10/22	/2019 8:15:00 AM			
Analyses		Result	RL Qu	al Units	DF	Date Analyzed			
EPA MET	HOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM			
Diesel Ra	ange Organics (DRO)	ND	9.8	mg/Kg	1	10/24/2019 12:56:32 AM			
Motor Oil	Range Organics (MRO)	ND	49	mg/Kg	1	10/24/2019 12:56:32 AM			
Surr: D	NOP	94.7	70-130	%Rec	1	10/24/2019 12:56:32 AM			

ND

92.5

ND

ND

ND

ND

91.3

180

3.6

77.4-118

0.018

0.036

0.036

0.071

80-120

59

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Diesel Range Organics (DRO)

Surr: DNOP

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

Motor Oil Range Organics (MRO)

Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

**EPA METHOD 8015D: GASOLINE RANGE** 

Analytical Report
Lab Order 1910B55
Date Reported: 11/1/2019

10/24/2019 12:34:17 AM

10/24/2019 12:34:17 AM

10/24/2019 12:34:17 AM

10/25/2019 3:04:40 AM

10/24/2019 11:46:17 AM

Analyst: NSB 10/25/2019 3:04:40 AM

Analyst: NSB

Analyst: CAS

mg/Kg

mg/Kg

%Rec

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

1

1

1

20

9.4

47

2.7

70-130

77.4-118

0.014

0.027

0.027

0.055

80-120

60

#### Hall Environmental Analysis Laboratory, Inc.

EPA METHOD 8015M/D: DIESEL RANGE ORGANICS Analyst: BRN							
Analyses		Result	RL Qua	l Units	DF	Date Analyzed	
Lab ID:	1910B55-029	Matrix: MEOH (SOIL)	Recei	ved Date	: 10/22/	/2019 8:15:00 AM	
Project:	Salty Dog		Collect	ion Date	: 10/21/	2019 3:05:00 PM	
CLIENT:	HILCORP ENERGY		Client Sa	ample ID	: MW1	2@ 35-37.5'	
-							

ND

ND

93.6

ND

94.0

ND

ND

ND

ND

92.9

200

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Diesel Range Organics (DRO)

Surr: DNOP

Surr: BFB

Benzene

Toluene

Chloride

Ethylbenzene

Xylenes, Total

Motor Oil Range Organics (MRO)

Gasoline Range Organics (GRO)

**EPA METHOD 8021B: VOLATILES** 

Surr: 4-Bromofluorobenzene

**EPA METHOD 300.0: ANIONS** 

**EPA METHOD 8015D: GASOLINE RANGE** 

Analytical Report
Lab Order 1910B55
Date Reported: 11/1/2019

10/25/2019 10:41:34 AM

10/25/2019 10:41:34 AM

10/25/2019 10:41:34 AM

10/25/2019 4:12:54 AM

10/25/2019 9:54:48 AM

Analyst: NSB

Analyst: NSB

Analyst: MRA

mg/Kg

mg/Kg

%Rec

mg/Kg

%Rec

mg/Kg

mg/Kg

mg/Kg

mg/Kg

%Rec

mg/Kg

1

1

1

1

1

1

1

1

1

1

50

9.5

47

2.8

70-130

77.4-118

0.014

0.028

0.028

0.056

80-120

150

#### Hall Environmental Analysis Laboratory, Inc.

EPA METHOD 8015M/D: DIESEL RANGE ORGANICS Analyst: BF							
Analyses		Result	RL Qual Units	DF	Date Analyzed		
Lab ID:	1910B55-030	Matrix: MEOH (SOIL)	<b>Received Date</b>	: 10/22/	2019 8:15:00 AM		
Project:	Salty Dog		<b>Collection Date</b>	: 10/21/	2019 3:07:00 PM		
CLIENT:	HILCORP ENERGY		Client Sample ID	: MW1	2@ 37.5-40'		
-							

ND

ND

99.1

ND

94.2

ND

ND

ND

ND

94.5

3400

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL Reporting Limit

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Diesel Range Organics (DRO)

Analytical Report
Lab Order 1910B55
Date Reported: 11/1/2019

10/25/2019 11:47:04 AM

10/25/2019 10:07:12 AM

### Hall Environmental Analysis Laboratory, Inc.

EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							BRM
Analyses		Result	RI	Qual Units	DF	Date Analyzed	
Lab ID:	1910B55-031	Matrix: MEOH (SOI)	L)	<b>Received Date</b>	: 10/22	/2019 8:15:00 AM	
Project:	Salty Dog		(	Collection Date	: 10/21	/2019 2:21:00 PM	
CLIENT	HILCORP ENERGY		Cl	ient Sample ID	Red S	Surface Oil	

130

92

3000

mg/Kg

10

1000

mg/Kg

Motor Oil Range Organics (MRO)	750	460		mg/Kg	10	10/25/2019 11:47:04 AM
Surr: DNOP	0	70-130	S	%Rec	10	10/25/2019 11:47:04 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/25/2019 4:35:39 AM
Surr: BFB	100	77.4-118		%Rec	1	10/25/2019 4:35:39 AM
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	10/25/2019 4:35:39 AM
Toluene	ND	0.047		mg/Kg	1	10/25/2019 4:35:39 AM
Ethylbenzene	ND	0.047		mg/Kg	1	10/25/2019 4:35:39 AM
Xylenes, Total	ND	0.094		mg/Kg	1	10/25/2019 4:35:39 AM
Surr: 4-Bromofluorobenzene	92.7	80-120		%Rec	1	10/25/2019 4:35:39 AM
EPA METHOD 300.0: ANIONS						Analyst: MRA

57000

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Chloride

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Client: Project:	HILCOR Salty Dog	P ENERG g	Y								
Sample ID:	MB-48334	SampT	ype: mt	olk	Tes	tCode: El	PA Method	300.0: Anion	s		
Client ID:	PBS	Batch	n ID: 48	334	F	RunNo: <b>6</b> :	3893				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/23/2019	S	SeqNo: 2	185870	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	1.5								
Sample ID:	LCS-48334	SampT	ype: Ics	;	Tes	tCode: El	PA Method	300.0: Anion	S		
Client ID:	LCSS	Batch	n ID: <b>48</b> 3	334	F	RunNo: <b>6</b> :	3893				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/23/2019	S	SeqNo: 2	185871	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		16	1.5	15.00	0	103	90	110			
Sample ID:	MB-48348	SampT	ype: mt	olk	Tes	tCode: El	PA Method	300.0: Anion	s		
Client ID:	PBS	Batch	n ID: 48	348	F	RunNo: <b>6</b> :	3930				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/23/2019	S	SeqNo: 2	186249	Units: mg/k	۲g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	1.5								
Sample ID:	LCS-48348	SampT	ype: Ics	;	Tes	tCode: El	PA Method	300.0: Anior	S		
Client ID:	LCSS	Batch	n ID: <b>48</b>	348	F	RunNo: 6	3930				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/23/2019	S	SeqNo: 2	186250	Units: <b>mg/k</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		15	1.5	15.00	0	97.6	90	110			
Sample ID:	MB-48364	SampT	ype: mt	olk	Tes	tCode: El	PA Method	300.0: Anion	S		
Client ID:	PBS	Batch	n ID: <b>48</b>	364	F	RunNo: 6	3938				
Prep Date:	10/24/2019	Analysis D	ate: 10	)/24/2019	5	SeqNo: 2	187704	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND	1.5								
Sample ID:	LCS-48364	SampT	ype: Ics	5	Tes	tCode: El	PA Method	300.0: Anion	S		
Client ID:	LCSS	Batch	n ID: <b>48</b> 3	364	F	RunNo: 6	3938				
Client ID: Prep Date:	LCSS 10/24/2019	Batch Analysis D	n ID: <b>48</b> Date: <b>10</b>	364 )/24/2019	F	RunNo: <b>6</b> SeqNo: <b>2</b>	3938 187705	Units: <b>mg/ł</b>	٢g		
Client ID: Prep Date: Analyte	LCSS 10/24/2019	Batch Analysis D Result	n ID: <b>48</b> Date: <b>1(</b> <u>PQL</u>	364 )/24/2019 SPK value	F S SPK Ref Val	RunNo: 6 SeqNo: 2 %REC	3938 187705 LowLimit	Units: <b>mg/ŀ</b> HighLimit	<b>(g</b> %RPD	RPDLimit	Qual

#### **Qualifiers:**

Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Analyte detected in the associated Method Blank Е Value above quantitation range

J Analyte detected below quantitation limits

- Р Sample pH Not In Range
- RL Reporting Limit

В

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1910B55

01-Nov-19

WO#:

\*

- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

Client: Project:	HILCORP EN	NERGY									
	Salty Dog										
Sample ID: LCS-4	8316	SampTyp	e: LCS	5	Tes	Code: EF	PA Method	8015M/D: Die	sel Range	e Organics	
Client ID: LCSS		Batch ID	): <b>483</b> ′	16	F	tunNo: 6	3888				
Prep Date: 10/22	2 <b>/2019</b> Ana	alysis Date	e: 10/	23/2019	S	eqNo: 2	184751	Units: mg/K	g		
Analyte	Re	esult F	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics	(DRO)	49	10	50.00	0	97.9	63.9	124			
Surr: DNOP		4.7		5.000		94.5	70	130			
Sample ID: MB-48	316	SampTyp	e: MBI	LK	Tes	tCode: EF	PA Method	8015M/D: Die	sel Range	e Organics	
Client ID: PBS		Batch ID	): <b>483</b> ′	16	F	unNo: 63	3888				
Prep Date: 10/22	2 <b>/2019</b> Ana	alysis Date	: 10/	23/2019	S	eqNo: 2	184752	Units: mg/K	g		
Analyte	Re	esult F	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics	(DRO)	ND	10								
Motor Oil Range Organi	ics (MRO)	ND	50	10.00		04.0	70	400			
Suff: DNOP		9.5		10.00		94.6	70	130			
Sample ID: MB-48	332	SampTyp	e: MBI	LK	Tes	tCode: EF	PA Method	8015M/D: Die	sel Range	e Organics	
Client ID: PBS		Batch ID	: 483	32	F	unNo: 63	3890				
Prep Date: 10/23	<b>3/2019</b> Ana	alysis Date	e: 10/	23/2019	S	eqNo: 2	184756	Units: mg/K	g		
Analyte	Re	esult F	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics	(DRO)	ND	10								
Motor Oil Range Organi	ics (MRO)	ND 0.2	50	10.00		02.4	70	120			
Suil. DNOF		9.5		10.00		93.4	70	130			
Sample ID: LCS-4	8332	SampTyp	e: LCS	5	Tes	Code: EF	PA Method	8015M/D: Die	sel Range	e Organics	
Client ID: LCSS		Batch ID	): <b>483</b> ;	32	F	unNo: 63	3890				
Prep Date: 10/23	8/2019 Ana	alysis Date	e: 10/	23/2019	S	eqNo: 2	184768	Units: mg/K	g		
Analyte	Re	esult F	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics	(DRO)	49	10	50.00	0	98.3	63.9	124			
Surr: DNOP		3.9		5.000		77.3	70	130			
Sample ID: LCS-4	8342	SampTyp	e: LCS	5	Tes	tCode: EF	PA Method	8015M/D: Die	sel Range	e Organics	
Client ID: LCSS		Batch ID	: 4834	42	F	unNo: 6	3924				
Prep Date: 10/23	<b>3/2019</b> Ana	alysis Date	e: 10/	24/2019	S	eqNo: 2	186013	Units: mg/K	g		
Analyte	Re	esult F	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics	(DRO)	49	10	50.00	0	97.4	63.9	124			
Surr: DNOP		3.7		5.000		74.5	70	130			

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix В Analyte detected in the associated Method Blank Value above quantitation range

- Р Sample pH Not In Range
- RL Reporting Limit

1910B55

01-Nov-19

WO#:

**Qualifiers:** 

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

- Е
- J Analyte detected below quantitation limits

Client:	HILCORI	P ENERG	Y								
Project:	Salty Dog	Ş									
Sample ID: M	B-48342	SampT	уре: М	BLK	Tes	tCode: El	PA Method	8015M/D: Die	sel Rang	e Organics	
Client ID: PI	BS	Batch	n ID: <b>48</b>	342	F	RunNo: 6	3924				
Prep Date: 1	10/23/2019	Analysis D	ate: 1	0/24/2019	5	SeqNo: 2	186015	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Orga	anics (DRO)	ND	10								
Motor Oil Range C	Organics (MRO)	ND	50								
Surr: DNOP		9.1		10.00		91.5	70	130			
Sample ID: LO	CS-48344	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015M/D: Die	sel Range	e Organics	
Client ID: LO	css	Batch	n ID: 48	344	F	RunNo: 6	3924				
Prep Date: 1	10/23/2019	Analysis D	ate: 1	0/24/2019	S	SeqNo: 2	187663	Units: %Red	;		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		4.8		5.000		95.0	70	130			
Sample ID: M	B-48344	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8015M/D: Die	sel Rang	e Organics	
Client ID: PI	BS	Batch	n ID: 48	344	F	RunNo: 6	3924				
Prep Date:	10/23/2019	Analysis D	ate: 1	0/24/2019	S	SeqNo: 2	187664	Units: %Rec	:		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		11		10.00		109	70	130			

\* Value exceeds Maximum Contaminant Level.

- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

- % Recovery outside of range due to dilution or matrix S
- В Analyte detected in the associated Method Blank
- Е
- J Analyte detected below quantitation limits
- Р

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1910B55

01-Nov-19

WO#:

#### Value above quantitation range

Sample pH Not In Range

RL Reporting Limit

WO#:	1910B55

01-Nov-19

Client: Proiect:	HILCOR Salty Dog	P ENERGY									
	MB-48304	SamoTvi	ne. ME		Tos	tCode: El	PA Method	8015D: Gaso	line Pana		
Client ID:	DRS	Batch	D. 18	304	F		3800	00100.0030	inter tang	6	
Pren Date:	10/22/2010		to: 11	JU <del>4</del> J/22/2010	i c		105201	Linite: ma/K	'a		
Flep Date.	10/22/2019	Allalysis Da	ie. n	JIZ3/2019	,		103204	onits. <b>mg/r</b>	g		
Analyte	0 : (000)	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	ND 920	5.0	1000		92.3	77.4	118			
Sample ID:	LCS-48304	SampTy	pe: LC	S	Tes	tCode: El	PA Method	8015D: Gasc	line Rang	e	
Client ID:	LCSS	Batch I	D: <b>48</b>	304	F	RunNo: <b>6</b>	3899				
Prep Date:	10/22/2019	Analysis Da	te: 10	0/23/2019	S	SeqNo: 2	185285	Units: mg/K	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	25	5.0	25.00	0	100	80	120			
Surr: BFB		1100		1000		105	77.4	118			
Sample ID:	1910B55-001AMS	SampTy	pe: <b>M</b> \$	3	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	6	
Client ID:	MW08@ 0-2.5'	Batch I	D: 48	304	F	RunNo: <b>6</b>	3899				
Prep Date:	10/22/2019	Analysis Da	te: 10	0/23/2019	S	SeqNo: 2	185287	Units: mg/K	(g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	27	4.9	24.44	0	110	69.1	142			
Surr: BFB		1000		977.5		105	77.4	118			
Sample ID:	1910B55-001AMS	D SampTy	pe: MS	SD	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID:	MW08@ 0-2.5'	Batch I	D: 48	304	F	RunNo: <b>6</b>	3899				
Prep Date:	10/22/2019	Analysis Da	te: 10	0/23/2019	S	SeqNo: 2	185288	Units: mg/K	ſg		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	26	5.0	24.93	0	106	69.1	142	2.40	20	
Surr: BFB		1100		997.0		108	77.4	118	0	0	
Sample ID:	RB	SampTy	pe: ME	BLK	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID:	PBS	Batch I	D: <b>G</b> 6	3935	F	RunNo: 6	3935				
Prep Date:		Analysis Da	te: 10	0/24/2019	S	SeqNo: 2	186991	Units: mg/K	ſg		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	ge Organics (GRO)	ND	5.0								
Surr: BFB		940		1000		93.7	77.4	118			
Sample ID:	2.5UG GRO LCS	SampTy	pe: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID:	LCSS	Batch I	D: <b>G</b>	3935	F	RunNo: <b>6</b>	3935				
Prep Date:		Analysis Da	te: 10	0/24/2019	S	SeqNo: 2	186992	Units: mg/K	ſg		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

#### **Qualifiers:**

Н

ND

\* Value exceeds Maximum Contaminant Level. D Sample Diluted Due to Matrix

Е Value above quantitation range

- J Analyte detected below quantitation limits
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

Holding times for preparation or analysis exceeded

- В Analyte detected in the associated Method Blank

- Р Sample pH Not In Range

RL Reporting Limit **Client:** 

# **QC SUMMARY REPORT** Hall Environmental Analysis Laboratory, Inc.

HILCORP ENERGY

Project:	Salty Dog	5										
Sample ID:	2.5UG GRO LCS	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gasc	line Rang	e		
Client ID:	LCSS	Batcl	h ID: Ge	3935	F	RunNo: <b>6</b> :	3935					
Prep Date:		Analysis D	Date: 1	0/24/2019	S	SeqNo: 2'	186992	Units: mg/K	g			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Surr: BFB	e Organics (GRO)	24 1100	5.0	25.00 1000	0	94.5 110	80 77.4	120 118				
Sample ID:	MB-48339	SampT	уре: М	BLK	Tes	tCode: El	PA Method	8015D: Gasc	line Rang	е		
Client ID:	PBS	Batcl	h ID: 48	339	F	RunNo: 6	3935					
Prep Date:	10/23/2019	Analysis D	Date: 1	0/24/2019	S	SeqNo: 2	186999	Units: mg/K	g			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Surr: BFB	e Organics (GRO)	ND 910	5.0	1000		91.5	77.4	118				
Sample ID:	LCS-48339	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	9		
Client ID:	LCSS	Batcl	h ID: 48	339	F	RunNo: 6	3935					
Prep Date:	10/23/2019	Analysis D	Date: 1	0/24/2019	S	SeqNo: 2	187000	Units: mg/K	g			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Surr: BFB	e Organics (GRO)	24 1100	5.0	25.00 1000	0	97.8 110	80 77.4	120 118				
Sample ID:	RB	SampT	уре: М	BLK	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e		
Client ID:	PBS	Batcl	h ID: Ge	63934	F	RunNo: 6	3934					
Prep Date:		Analysis D	Date: 1	0/24/2019	S	SeqNo: 2'	187063	Units: mg/K	g			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Surr: BFB	e Organics (GRO)	ND 930	5.0	1000		93.3	77.4	118				
Sample ID:	2.5UG GRO LCS	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	9		•
Client ID:	LCSS	Batcl	h ID: Ge	3934	F	RunNo: <b>6</b> :	3934					
Prep Date:		Analysis D	Date: 1	0/24/2019	S	SeqNo: 2'	187064	Units: mg/K	g			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Gasoline Range Surr: BFB	e Organics (GRO)	24 1100	5.0	25.00 1000	0	95.0 105	80 77.4	120 118				
Sample ID:	MB-48341	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8015D: Gasc	line Rang	9		-
Client ID:	PBS	Batcl	h ID: 48	341	F	RunNo: 6	3934					
Prep Date:	10/23/2019	Analysis D	Date: 1	0/24/2019	S	SeqNo: 2	187070	Units: %Re	•			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	_

**Qualifiers:** 

ND

Value exceeds Maximum Contaminant Level. \* D

Sample Diluted Due to Matrix Н Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit

J

- Р
- RL

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WO#:

В Analyte detected in the associated Method Blank Е Value above quantitation range

- Analyte detected below quantitation limits
  - Sample pH Not In Range Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

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WO#:

QC SUMMARY REPORT	
Hall Environmental Analysis Laboratory, Ind	c.

Client: Project:	HILCOF Salty Do	RP ENERG	Y								
Sample ID:	MB-48341	SampT	ype: MI	BLK	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID:	PBS	Batch	n ID: 48	341	F	RunNo: 6	3934				
Prep Date:	10/23/2019	Analysis D	ate: 10	0/24/2019	S	SeqNo: 2	187070	Units: %Red	C		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB		930		1000		92.9	77.4	118			
Sample ID:	LCS-48341	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID:	LCSS	Batch	n ID: 48	341	F	RunNo: 6	3934				
Prep Date:	10/23/2019	Analysis D	ate: 10	0/24/2019	5	SeqNo: 2	187071	Units: %Red	C		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB		1000		1000		102	77.4	118			

#### Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Client: Project:	HILCORP Salty Dog	PENERG	Y								
Sample ID: MB	-48304	SampT	уре: МЕ	BLK	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: PBS	S	Batch	n ID: 483	304	F	RunNo: 6	3899				
Prep Date: 10	/22/2019	Analysis D	ate: 10	/23/2019	5	SeqNo: 2	185320	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025								
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Bromofluo	robenzene	0.91		1.000		91.5	80	120			
Sample ID: LCS	S-48304	SampT	ype: LC	S	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: LCS	SS	Batch	n ID: 483	304	F	RunNo: 6	3899				
Prep Date: 10	/22/2019	Analysis D	ate: 10	/23/2019	S	SeqNo: 2	185321	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.88	0.025	1.000	0	88.3	80	120			
Toluene		0.93	0.050	1.000	0	92.5	80	120			
Ethylbenzene		0.93	0.050	1.000	0	93.2	80	120			
Xylenes, Total		2.7	0.10	3.000	0	91.3	80	120			
Surr: 4-Bromofluo	robenzene	0.95		1.000		95.1	80	120			
Sample ID: 191	0B55-002AMS	SampT	уре: <b>МS</b>	5	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: MW	/08@ 2.5-5'	Batch	n ID: 483	304	F	RunNo: 6	3899				
Prep Date: 10	/22/2019	Analysis D	ate: 10	/23/2019	S	SeqNo: 2	185324	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.99	0.024	0.9452	0.01024	104	76	123			
Toluene		1.0	0.047	0.9452	0.009640	109	80.3	127			
Ethylbenzene		1.1	0.047	0.9452	0.01044	111	80.2	131			
Xylenes, Total		3.1	0.095	2.836	0.02878	108	78	133			
Surr: 4-Bromofluo	robenzene	0.93		0.9452		98.5	80	120			
Sample ID: 191	0B55-002AMSD	SampT	ype: MS	5D	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: MW	/08@ 2.5-5'	Batch	n ID: 483	304	F	RunNo: 6	3899				
Prep Date: 10	/22/2019	Analysis D	ate: 10	/23/2019	S	SeqNo: 2	185325	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0	0.024	0.9579	0.01024	105	76	123	2.14	20	
Toluene		1.1	0.048	0.9579	0.009640	110	80.3	127	2.07	20	
Ethylbenzene		1.1	0.048	0.9579	0.01044	111	80.2	131	1.52	20	
Xylenes, Total		3.2	0.096	2.874	0.02878	109	78	133	2.04	20	
Surr: 4-Bromofluo	robenzene	0.94		0.9579		98.3	80	120	0	0	

#### Qualifiers:

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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WO#:

Client:	HILCOR	P ENERG	Ϋ́Υ								
	Salty Dog	\$									
Sample ID: I	RB	Samp	Type: ME	BLK	Tes	tCode: E	PA Method	8021B: Volat	tiles		
Client ID:	PBS	Batc	h ID: <b>B6</b>	3935	F	RunNo: 6	3935				
Prep Date:		Analysis E	Date: 10	)/24/2019	S	SeqNo: 2	187029	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025								
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Bromo	ofluorobenzene	0.95		1.000		95.0	80	120			
Sample ID:	100NG BTEX LCS	Samp	Type: LC	S	Tes	tCode: E	PA Method	8021B: Volat	tiles		
Client ID:	LCSS	Batc	h ID: <b>B6</b>	3935	F	RunNo: 6	3935				
Prep Date:		Analysis E	Date: 10	)/24/2019	S	SeqNo: 2	187030	Units: mg/M	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.93	0.025	1.000	0	92.8	80	120			
Toluene		0.96	0.050	1.000	0	95.7	80	120			
Ethylbenzene		0.95	0.050	1.000	0	94.8	80	120			
Xylenes, Total		2.8	0.10	3.000	0	94.0	80	120			
Surr: 4-Bromo	ofluorobenzene	1.0		1.000		104	80	120			
Sample ID: I	MB-48339	Samp	Type: ME	BLK	Tes	tCode: E	PA Method	8021B: Volat	tiles		
Client ID:	PBS	Batc	h ID: <b>48</b>	339	F	RunNo: <b>6</b>	3935				
Prep Date:	10/23/2019	Analysis I	Date: 10	)/24/2019	S	SeqNo: 2	187037	Units: mg/H	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025								
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Bromo	ofluorobenzene	0.92		1.000		91.8	80	120			
Sample ID: I	LCS-48339	Samp	Гуре: <b>LC</b>	S	Tes	tCode: E	PA Method	8021B: Volat	tiles		
Client ID: I	LCSS	Batc	h ID: <b>48</b> :	339	F	RunNo: 6	3935				
Prep Date:	10/23/2019	Analysis I	Date: 10	)/24/2019	S	SeqNo: 2	187038	Units: mg/H	۲g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.89	0.025	1.000	0	89.0	80	120			
Toluene		0.93	0.050	1.000	0	92.9	80	120			
Ethylbenzene		0.93	0.050	1.000	0	92.9	80	120			
Xylenes, Total		2.8	0.10	3.000	0	91.8	80	120			
Surr: 4-Bromo	ofluorobenzene	0.98		1.000		98.5	80	120			

\* Value exceeds Maximum Contaminant Level.

Sample Diluted Due to Matrix

В Analyte detected in the associated Method Blank Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit 1910B55

01-Nov-19

WO#:

#### **Qualifiers:**

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

Client:	HILCORP E	NERGY									
Project:	Salty Dog										
Sample ID: RB		SampType	MBLK		Test	tCode: EF	PA Method	8021B: Volati	iles		
Client ID: PBS		Batch ID:	B63934		R	unNo: 6	3934				
Prep Date:	An	alysis Date:	10/24/20 <sup>-</sup>	19	S	eqNo: 2	187084	Units: mg/K	g		
Analyte	F	Result P	QL SPK v	alue 3	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND 0.	025								
Toluene		ND 0.	050								
Ethylbenzene		ND 0.	050								
Xylenes, Total		ND C	0.10								
Surr: 4-Bromofluoro	penzene	0.97	1	.000		97.3	80	120			
Sample ID: 100N	G BTEX LCS	SampType	LCS		Test	tCode: EF	PA Method	8021B: Volati	iles		
Client ID: LCSS	3	Batch ID:	B63934		R	unNo: 6	3934				
Prep Date:	An	alysis Date:	10/24/20 <sup>-</sup>	19	S	eqNo: 2	187085	Units: mg/K	g		
Analyte	F	Result P	QL SPK v	alue 3	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		1.0 0.	025 1	.000	0	102	80	120			
Toluene		1.0 0.	050 1	.000	0	102	80	120			
Ethylbenzene		1.0 0.	050 1	.000	0	102	80	120			
Xylenes, Total		3.1 C	.10 3	.000	0	102	80	120			
Surr: 4-Bromofluoro	oenzene	1.0	1	.000		101	80	120			
Sample ID: MB-4	8341	SampType	MBLK		Test	tCode: EF	PA Method	8021B: Volati	iles		
Client ID: PBS		Batch ID:	48341		R	unNo: 6	3934				
Prep Date: 10/2	<b>3/2019</b> An	alysis Date:	10/24/201	19	S	eqNo: 2	187091	Units: %Rec			
Analyte	F	Result P	QL SPK v	alue 3	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluoro	oenzene	0.99	1	.000		98.8	80	120			
Sample ID: LCS-	48341	SampType			Test	tCode: EF	PA Method	8021B: Volati	iles		
Client ID: LCSS	;	Batch ID:	48341		R	unNo: 6:	3934				
Prep Date: 10/2	<b>3/2019</b> An	alysis Date:	10/24/201	19	S	eqNo: 2	187092	Units: %Rec			
Analyte	F	Result P	QL SPK v	alue	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluoro	penzene	0.96	1	.000		95.8	80	120			

**Qualifiers:** 

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit Page 38 of 38

1910B55

01-Nov-19

WO#:

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ENVIRONMENTAL ANALYSIS LABORATORY H	49 Albuquei 2: 505-345-3975 FAX Vebsite: www.halleny	ysis Laboratory 201 Hawkins NE rque, NM 87109 (: 505-345-4107 vironmental.com	Sar	nple Log-In Check List
Client Name: HILCORP ENERGY FAR Work	Order Number: 19	10B55		RcptNo: 1
Received By: JUAN RÓJA) 10/22/20	019 8:15:00 AM			
Completed By;     Yazmine Garduno     10/22/20       Reviewed By:     D     10     22     19	019 8:54:46 AM	ηb	zmini liqtadut	<u>5</u> .
Chain of Custody				
1. Is Chain of Custody complete?	Yes	s 🗸 🕴 M	No 🗌	Not Present
2. How was the sample delivered?	Cou	urier		
Log In				
3. Was an attempt made to cool the samples?	Yes	s 🗹 🛛 N	10 🗌	NA 🗌
<ol><li>Were all samples received at a temperature of &gt;0° C to</li></ol>	o 6.0°C Yes	; 🗹 N	lo 🗌	
5. Sample(s) in proper container(s)?	Yes	· •	10 🗌	
<ol><li>Sufficient sample volume for indicated test(s)?</li></ol>	Yes	✓ N	•	
7. Are samples (except VOA and ONG) properly preserved	d? Yes	✓ N	o 🗆	
3. Was preservative added to bottles?	Yes	<u></u> N	• 🔽	
<ol><li>VOA vials have zero headspace?</li></ol>	Yes	N	o 🗆	No VOA Vials 🗹
0. Were any sample containers received broken?	Yes	; 🗆 🛛 N		
1. Does paperwork match bottle labels?	Yes	<b>⊻</b> N	o 🗆	# of preserved bottles checked for pH:
2 Are matrices correctly identified on Chain of Custody?	Yes	V N	• □	Adjusted?
3. Is it clear what analyses were requested?	Yes	V N	o 🗌	
4. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes	✓ N	o 🗆	Checked by:
pecial Handling (if applicable)				
5. Was client notified of all discrepancies with this order?	Yes	. 🗆 N	lo 🗌	NA 🔽
Person Notified:	Date:			
By Whom:	Via: 🗌 eM	lail 🗌 Phone I	Fax	In Person
Regarding:				(miree 201220)

Cooler No Temp °C Condition Seal Intact Seal No Seal Date Signed By

1 2.2 Good

S S S	Level 4 (Full Validation) Diance ample Name いいのどとうらう	Project Man Sampler: On Ice: # of Coolers Cooler Temj Type and # Type and #	ager: ager: BIFYES TEST Diminuting CF): Type Type	014 60ms 100 100 -002 -003 -002		8081 Pesticides/8082 PCB's	SMI20728 to 0158 by 8449	All	ACM (AOV-imes)   70 60   70 70 <td< th=""><th>mm 4107 4107</th></td<>	mm 4107 4107
ŭ la	Millor @ 20-21,5' Millor @ 27.5-25 Millor @ 27.5-20' Millor @ 27.5-20' Millor @ 27.5-25' Millor @ 2.5-5' Millo @ 2.5-5' Millo @ 2.5-5'	Received by:	Kai kai	-000 -000 -001 -000 -000 -000 -000 -000	E Remark		C. C.	alam rysler	-12	tenvicor

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		11917				4 pp		IIAL
iter Deul	Standard Kush Project Name:	Amo-C		AN	ALY: w.hallen	SIS	LABORA <sup>-</sup> ental.com	TORY
	Salty D	09	4901 H	awkins h	NE - AI	pudnero	que, NM 87109	
	Project #:	1	Tel. 50	5-345-3	975	Fax 50	15-345-4107	
	017819	014			Anal	ysis Re	equest	
@ hilcola.com	Project Manager:		(0) (T		*O\$		(jui	
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		www.hallenvironmental.com	4901 Hawkins NE - Albuquerque, NM 87109	Tel. 505-345-3975 Fax 505-345-4107	Analysis Request	() () ()	SMIS SIMS SIMS	25705 82 P	/ О. s/800 ос 4. ~ б б б б б б б б б б б б б б б б б б б	тт ( 	15D etho etho 8 % 8 % 8 % 8 % 9 % 9 %	PH:80 PH:80 PH:80 PH:80 PH:8 P PH:8 P POB (M S POB (V S POB (C S POB (C C C C C C C C C C C C C C C C C C C						7				narks:	CC: 1 oddins @ Itenvi com	>
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October 28, 2019

Jennifer Deal HILCORP ENERGY PO Box 4700 Farmington, NM 87499 TEL: (505) 564-0733 FAX Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

RE: Salty Dog

OrderNo.: 1910C21

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 14 sample(s) on 10/23/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

**Project:** 

Lab ID:

**CLIENT: HILCORP ENERGY** 

Salty Dog

1910C21-001

# **Analytical Report** Lab Order 1910C21

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW13@ 10-12.5' Collection Date: 10/21/2019 2:38:00 PM Received Date: 10/23/2019 8:20:00 AM

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	8.9	mg/Kg	1	10/25/2019 9:46:10 AM
Motor Oil Range Organics (MRO)	ND	44	mg/Kg	1	10/25/2019 9:46:10 AM
Surr: DNOP	105	70-130	%Rec	1	10/25/2019 9:46:10 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6	mg/Kg	1	10/24/2019 10:07:57 PM
Surr: BFB	90.3	77.4-118	%Rec	1	10/24/2019 10:07:57 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	10/24/2019 10:07:57 PM
Toluene	ND	0.046	mg/Kg	1	10/24/2019 10:07:57 PM
Ethylbenzene	ND	0.046	mg/Kg	1	10/24/2019 10:07:57 PM
Xylenes, Total	ND	0.093	mg/Kg	1	10/24/2019 10:07:57 PM
Surr: 4-Bromofluorobenzene	89.5	80-120	%Rec	1	10/24/2019 10:07:57 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	210	60	mg/Kg	20	10/24/2019 2:13:31 PM

Matrix: SOIL

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL
- Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 1 of 21

Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

# **Analytical Report** Lab Order 1910C21

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW13@ 25-27.5' Collection Date: 10/21/2019 2:40:00 PM Received Date: 10/23/2019 8:20:00 AM

Lab ID: 1910C21-002	Matrix: SOIL	Rece	eived Date:	10/23/	2019 8:20:00 AM
Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAI	NGE ORGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	10/25/2019 10:10:21 AM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	10/25/2019 10:10:21 AM
Surr: DNOP	97.8	70-130	%Rec	1	10/25/2019 10:10:21 AM
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	10/24/2019 10:30:50 PM
Surr: BFB	91.4	77.4-118	%Rec	1	10/24/2019 10:30:50 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/24/2019 10:30:50 PM
Toluene	ND	0.047	mg/Kg	1	10/24/2019 10:30:50 PM
Ethylbenzene	ND	0.047	mg/Kg	1	10/24/2019 10:30:50 PM
Xylenes, Total	ND	0.095	mg/Kg	1	10/24/2019 10:30:50 PM
Surr: 4-Bromofluorobenzene	89.3	80-120	%Rec	1	10/24/2019 10:30:50 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	160	60	mg/Kg	20	10/24/2019 2:50:44 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit S
- % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 2 of 21

Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

# **Analytical Report** Lab Order 1910C21

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW13@ 32.5-35' Collection Date: 10/21/2019 2:42:00 PM Received Date: 10/23/2019 8:20:00 AM

Lab ID: 1910C21-003	Matrix: SOIL	Rece	ived Date:	10/23/	2019 8:20:00 AM
Analyses	Result	RL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	10	mg/Kg	1	10/25/2019 10:34:28 AM
Motor Oil Range Organics (MRO)	ND	50	mg/Kg	1	10/25/2019 10:34:28 AM
Surr: DNOP	108	70-130	%Rec	1	10/25/2019 10:34:28 AM
EPA METHOD 8015D: GASOLINE R	ANGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/24/2019 11:39:26 PM
Surr: BFB	93.7	77.4-118	%Rec	1	10/24/2019 11:39:26 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/24/2019 11:39:26 PM
Toluene	ND	0.048	mg/Kg	1	10/24/2019 11:39:26 PM
Ethylbenzene	ND	0.048	mg/Kg	1	10/24/2019 11:39:26 PM
Xylenes, Total	ND	0.096	mg/Kg	1	10/24/2019 11:39:26 PM
Surr: 4-Bromofluorobenzene	92.9	80-120	%Rec	1	10/24/2019 11:39:26 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	3000	150	mg/Kg	50	10/25/2019 10:50:39 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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# **Analytical Report** Lab Order 1910C21

## Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW13@ 37.5-40' Collection Date: 10/21/2019 2:44:00 PM

<b>Project:</b> Salty Dog		Colle	ction Date:	10/21/	2019 2:44:00 PM
Lab ID: 1910C21-004	Matrix: SOIL	Rece	eived Date:	10/23/	2019 8:20:00 AM
Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAN	IGE ORGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.1	mg/Kg	1	10/25/2019 10:58:42 AM
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	10/25/2019 10:58:42 AM
Surr: DNOP	107	70-130	%Rec	1	10/25/2019 10:58:42 AM
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	10/25/2019 12:02:18 AM
Surr: BFB	92.5	77.4-118	%Rec	1	10/25/2019 12:02:18 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	10/25/2019 12:02:18 AM
Toluene	ND	0.047	mg/Kg	1	10/25/2019 12:02:18 AM
Ethylbenzene	ND	0.047	mg/Kg	1	10/25/2019 12:02:18 AM
Xylenes, Total	ND	0.094	mg/Kg	1	10/25/2019 12:02:18 AM
Surr: 4-Bromofluorobenzene	92.1	80-120	%Rec	1	10/25/2019 12:02:18 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	ND	60	mg/Kg	20	10/24/2019 4:05:11 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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**Project:** 

Lab ID:

**CLIENT: HILCORP ENERGY** 

Salty Dog

1910C21-005

# **Analytical Report** Lab Order 1910C21

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW14@ 5-7.5' Collection Date: 10/22/2019 1:10:00 PM Received Date: 10/23/2019 8:20:00 AM

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.2	mg/Kg	1	10/25/2019 11:22:49 AM
Motor Oil Range Organics (MRO)	ND	46	mg/Kg	1	10/25/2019 11:22:49 AM
Surr: DNOP	109	70-130	%Rec	1	10/25/2019 11:22:49 AM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	10/25/2019 12:25:08 AM
Surr: BFB	92.9	77.4-118	%Rec	1	10/25/2019 12:25:08 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/25/2019 12:25:08 AM
Toluene	ND	0.047	mg/Kg	1	10/25/2019 12:25:08 AM
Ethylbenzene	ND	0.047	mg/Kg	1	10/25/2019 12:25:08 AM
Xylenes, Total	ND	0.094	mg/Kg	1	10/25/2019 12:25:08 AM
Surr: 4-Bromofluorobenzene	92.2	80-120	%Rec	1	10/25/2019 12:25:08 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	ND	60	mg/Kg	20	10/24/2019 4:17:36 PM

Matrix: SOIL

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н
- Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 5 of 21

**Project:** 

Lab ID:

**CLIENT: HILCORP ENERGY** 

Salty Dog

1910C21-006

# **Analytical Report** Lab Order 1910C21

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW14@ 20-22.5' Collection Date: 10/22/2019 1:11:00 PM

Received Date: 10/23/2019 8:20:00 AM

Analyses	Result	RL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE OR	GANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	10/24/2019 6:26:32 PM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	10/24/2019 6:26:32 PM
Surr: DNOP	101	70-130	%Rec	1	10/24/2019 6:26:32 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.7	mg/Kg	1	10/25/2019 12:47:55 AM
Surr: BFB	91.5	77.4-118	%Rec	1	10/25/2019 12:47:55 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/25/2019 12:47:55 AM
Toluene	ND	0.047	mg/Kg	1	10/25/2019 12:47:55 AM
Ethylbenzene	ND	0.047	mg/Kg	1	10/25/2019 12:47:55 AM
Xylenes, Total	ND	0.094	mg/Kg	1	10/25/2019 12:47:55 AM
Surr: 4-Bromofluorobenzene	90.1	80-120	%Rec	1	10/25/2019 12:47:55 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	270	60	mg/Kg	20	10/24/2019 4:30:01 PM

Matrix: SOIL

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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# **Analytical Report** Lab Order 1910C21

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW14@ 25-27.5' Collection Date: 10/22/2019 1:12:00 PM

Project:	Salty Dog		Collec	ction Date:	10/22/	2019 1:12:00 PM
Lab ID:	1910C21-007	Matrix: SOIL	Rece	ived Date:	10/23/	2019 8:20:00 AM
Analyses		Result	RL Qua	al Units	DF	Date Analyzed
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM
Diesel F	Range Organics (DRO)	ND	9.7	mg/Kg	1	10/24/2019 6:50:44 PM
Motor C	il Range Organics (MRO)	ND	48	mg/Kg	1	10/24/2019 6:50:44 PM
Surr:	DNOP	106	70-130	%Rec	1	10/24/2019 6:50:44 PM
EPA ME	THOD 8015D: GASOLINE R	ANGE				Analyst: NSB
Gasolin	e Range Organics (GRO)	ND	5.0	mg/Kg	1	10/25/2019 1:10:47 AM
Surr:	BFB	91.7	77.4-118	%Rec	1	10/25/2019 1:10:47 AM
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB
Benzen	e	ND	0.025	mg/Kg	1	10/25/2019 1:10:47 AM
Toluene	•	ND	0.050	mg/Kg	1	10/25/2019 1:10:47 AM
Ethylbe	nzene	ND	0.050	mg/Kg	1	10/25/2019 1:10:47 AM
Xylenes	, Total	ND	0.099	mg/Kg	1	10/25/2019 1:10:47 AM
Surr:	4-Bromofluorobenzene	91.0	80-120	%Rec	1	10/25/2019 1:10:47 AM
EPA ME	THOD 300.0: ANIONS					Analyst: MRA
Chloride	9	75	60	mg/Kg	20	10/25/2019 10:19:36 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 7 of 21

# **Analytical Report** Lab Order 1910C21

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW14@ 27.5-30' Collection Date: 10/22/2019 1:13:00 PM

Project:	Salty Dog		Collec	ction Date:	10/22/	2019 1:13:00 PM
Lab ID:	1910C21-008	Matrix: SOIL	Rece	ived Date:	10/23/	2019 8:20:00 AM
Analyses		Result	RL Qua	al Units	DF	Date Analyzed
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM
Diesel R	ange Organics (DRO)	ND	9.5	mg/Kg	1	10/24/2019 7:15:02 PM
Motor O	il Range Organics (MRO)	ND	47	mg/Kg	1	10/24/2019 7:15:02 PM
Surr:	DNOP	105	70-130	%Rec	1	10/24/2019 7:15:02 PM
EPA ME	THOD 8015D: GASOLINE RA	ANGE				Analyst: NSB
Gasoline	e Range Organics (GRO)	ND	4.9	mg/Kg	1	10/25/2019 1:33:37 AM
Surr:	BFB	90.5	77.4-118	%Rec	1	10/25/2019 1:33:37 AM
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB
Benzene	)	ND	0.024	mg/Kg	1	10/25/2019 1:33:37 AM
Toluene		ND	0.049	mg/Kg	1	10/25/2019 1:33:37 AM
Ethylber	izene	ND	0.049	mg/Kg	1	10/25/2019 1:33:37 AM
Xylenes	Total	ND	0.097	mg/Kg	1	10/25/2019 1:33:37 AM
Surr:	4-Bromofluorobenzene	89.2	80-120	%Rec	1	10/25/2019 1:33:37 AM
EPA ME	THOD 300.0: ANIONS					Analyst: MRA
Chloride		ND	60	mg/Kg	20	10/24/2019 9:27:49 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Holding times for preparation or analysis exceeded
- Н ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 8 of 21

**Project:** 

Chloride

**CLIENT: HILCORP ENERGY** 

# **Analytical Report** Lab Order 1910C21

10/25/2019 10:32:01 AM

#### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW14@ 30-32.5' Collection Date: 10/22/2019 1:14:00 PM

Salty Dog Lab ID: 1910C21-009 Received Date: 10/23/2019 8:20:00 AM Matrix: SOIL DF Result Analyses **RL** Qual Units **Date Analyzed** EPA METHOD 8015M/D: DIESEL RANGE ORGANICS Analyst: BRM **Diesel Range Organics (DRO)** ND 9.1 mg/Kg 10/24/2019 7:39:05 PM 1 Motor Oil Range Organics (MRO) ND mg/Kg 1 10/24/2019 7:39:05 PM 46 Surr: DNOP 10/24/2019 7:39:05 PM 99.4 70-130 %Rec 1 **EPA METHOD 8015D: GASOLINE RANGE** Analyst: NSB Gasoline Range Organics (GRO) ND 4.9 mg/Kg 1 10/25/2019 1:56:21 AM Surr: BFB 90.8 77.4-118 %Rec 1 10/25/2019 1:56:21 AM **EPA METHOD 8021B: VOLATILES** Analyst: NSB Benzene 10/25/2019 1:56:21 AM ND 0.024 mg/Kg 1 Toluene ND 10/25/2019 1:56:21 AM 0.049 mg/Kg 1 ND Ethylbenzene 0.049 mg/Kg 1 10/25/2019 1:56:21 AM mg/Ka Xylenes, Total 0.097 10/25/2019 1:56:21 AM ND 1 Surr: 4-Bromofluorobenzene 89.5 80-120 %Rec 1 10/25/2019 1:56:21 AM **EPA METHOD 300.0: ANIONS** Analyst: MRA

230

60

mg/Kg

20

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits J
- Р Sample pH Not In Range
- RL Reporting Limit

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Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

# **Analytical Report** Lab Order 1910C21

### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW15@ 2.5-5' Collection Date: 10/22/2019 4:10:00 PM

Lab ID: 1910C21-010	Matrix: SOIL	Rece	ived Date:	10/23/	2019 8:20:00 AM
Analyses	Result	RL Qua	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.8	mg/Kg	1	10/24/2019 8:03:17 PM
Motor Oil Range Organics (MRO)	ND	49	mg/Kg	1	10/24/2019 8:03:17 PM
Surr: DNOP	92.1	70-130	%Rec	1	10/24/2019 8:03:17 PM
EPA METHOD 8015D: GASOLINE RAM	NGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/25/2019 2:19:09 AM
Surr: BFB	89.7	77.4-118	%Rec	1	10/25/2019 2:19:09 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.024	mg/Kg	1	10/25/2019 2:19:09 AM
Toluene	ND	0.048	mg/Kg	1	10/25/2019 2:19:09 AM
Ethylbenzene	ND	0.048	mg/Kg	1	10/25/2019 2:19:09 AM
Xylenes, Total	ND	0.095	mg/Kg	1	10/25/2019 2:19:09 AM
Surr: 4-Bromofluorobenzene	88.2	80-120	%Rec	1	10/25/2019 2:19:09 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	ND	60	mg/Kg	20	10/24/2019 9:52:38 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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# **Analytical Report** Lab Order 1910C21

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW15@ 22.5-25' Collection Date: 10/22/2019 4:12:00 PM

Project:	Salty Dog		Collec	ction Date:	10/22/	2019 4:12:00 PM
Lab ID:	1910C21-011	Matrix: SOIL	Rece	eived Date:	10/23/	2019 8:20:00 AM
Analyses		Result	RL Qu	al Units	DF	Date Analyzed
EPA MET	HOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM
Diesel R	ange Organics (DRO)	ND	8.9	mg/Kg	1	10/24/2019 8:27:20 PM
Motor Oi	Range Organics (MRO)	ND	44	mg/Kg	1	10/24/2019 8:27:20 PM
Surr: [	DNOP	99.5	70-130	%Rec	1	10/24/2019 8:27:20 PM
EPA MET	HOD 8015D: GASOLINE R	ANGE				Analyst: NSB
Gasoline	Range Organics (GRO)	ND	4.7	mg/Kg	1	10/24/2019 5:04:41 PM
Surr: E	3FB	85.8	77.4-118	%Rec	1	10/24/2019 5:04:41 PM
EPA MET	HOD 8021B: VOLATILES					Analyst: NSB
Benzene		ND	0.023	mg/Kg	1	10/24/2019 5:04:41 PM
Toluene		ND	0.047	mg/Kg	1	10/24/2019 5:04:41 PM
Ethylben	zene	ND	0.047	mg/Kg	1	10/24/2019 5:04:41 PM
Xylenes,	Total	ND	0.093	mg/Kg	1	10/24/2019 5:04:41 PM
Surr: 4	I-Bromofluorobenzene	90.0	80-120	%Rec	1	10/24/2019 5:04:41 PM
EPA MET	HOD 300.0: ANIONS					Analyst: MRA
Chloride		1200	60	mg/Kg	20	10/25/2019 10:44:26 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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# **Analytical Report** Lab Order 1910C21

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW15@ 27.5-30' Collection Date: 10/22/2019 4:14:00 PM

Project:	Salty Dog		Collec	ction Date:	10/22/	2019 4:14:00 PM			
Lab ID:	1910C21-012	Matrix: SOIL	Received Date: 10/23/2019 8:20:00 AM						
Analyses		Result	RL Qua	al Units	DF	Date Analyzed			
EPA ME	THOD 8015M/D: DIESEL RA	NGE ORGANICS				Analyst: BRM			
Diesel R	ange Organics (DRO)	ND	9.7	mg/Kg	1	10/24/2019 8:51:33 PM			
Motor O	il Range Organics (MRO)	ND	49	mg/Kg	1	10/24/2019 8:51:33 PM			
Surr:	DNOP	100	70-130	%Rec	1	10/24/2019 8:51:33 PM			
EPA ME	THOD 8015D: GASOLINE R	ANGE				Analyst: NSB			
Gasoline	e Range Organics (GRO)	ND	4.9	mg/Kg	1	10/24/2019 6:14:34 PM			
Surr:	BFB	87.8	77.4-118	%Rec	1	10/24/2019 6:14:34 PM			
EPA ME	THOD 8021B: VOLATILES					Analyst: NSB			
Benzene	9	ND	0.025	mg/Kg	1	10/24/2019 6:14:34 PM			
Toluene		ND	0.049	mg/Kg	1	10/24/2019 6:14:34 PM			
Ethylber	izene	ND	0.049	mg/Kg	1	10/24/2019 6:14:34 PM			
Xylenes	, Total	ND	0.099	mg/Kg	1	10/24/2019 6:14:34 PM			
Surr:	4-Bromofluorobenzene	92.7	80-120	%Rec	1	10/24/2019 6:14:34 PM			
EPA ME	THOD 300.0: ANIONS					Analyst: MRA			
Chloride	•	2000	60	mg/Kg	20	10/24/2019 10:42:16 PM			

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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# **Analytical Report** Lab Order 1910C21

# Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW15@ 32.5-35' Collection Date: 10/22/2019 4:16:00 PM

Project: Salty Dog		Collec	ction Date:	10/22/	2019 4:16:00 PM			
Lab ID: 1910C21-013	Matrix: SOIL	Received Date: 10/23/2019 8:20:00 AM						
Analyses	Result	RL Qu	al Units	DF	Date Analyzed			
EPA METHOD 8015M/D: DIESEL R	ANGE ORGANICS				Analyst: BRM			
Diesel Range Organics (DRO)	ND	8.5	mg/Kg	1	10/24/2019 9:15:36 PM			
Motor Oil Range Organics (MRO)	ND	42	mg/Kg	1	10/24/2019 9:15:36 PM			
Surr: DNOP	100	70-130	%Rec	1	10/24/2019 9:15:36 PM			
EPA METHOD 8015D: GASOLINE	RANGE				Analyst: NSB			
Gasoline Range Organics (GRO)	ND	4.8	mg/Kg	1	10/24/2019 7:24:45 PM			
Surr: BFB	90.2	77.4-118	%Rec	1	10/24/2019 7:24:45 PM			
EPA METHOD 8021B: VOLATILES					Analyst: NSB			
Benzene	ND	0.024	mg/Kg	1	10/24/2019 7:24:45 PM			
Toluene	ND	0.048	mg/Kg	1	10/24/2019 7:24:45 PM			
Ethylbenzene	ND	0.048	mg/Kg	1	10/24/2019 7:24:45 PM			
Xylenes, Total	ND	0.095	mg/Kg	1	10/24/2019 7:24:45 PM			
Surr: 4-Bromofluorobenzene	96.2	80-120	%Rec	1	10/24/2019 7:24:45 PM			
EPA METHOD 300.0: ANIONS					Analyst: MRA			
Chloride	2300	59	mg/Kg	20	10/24/2019 10:54:40 PM			

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Project: Salty Dog

**CLIENT: HILCORP ENERGY** 

# **Analytical Report** Lab Order 1910C21

### Hall Environmental Analysis Laboratory, Inc.

Date Reported: 10/28/2019 Client Sample ID: MW15@ 37.5-40' Collection Date: 10/22/2019 4:18:00 PM . 1.D 10/02/2010 0 20 00 414

Lab ID: 1910C21-014	Matrix: SOIL	Rece	eived Date:	10/23/	2019 8:20:00 AM
Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RAN	GE ORGANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	8.7	mg/Kg	1	10/24/2019 9:39:46 PM
Motor Oil Range Organics (MRO)	ND	43	mg/Kg	1	10/24/2019 9:39:46 PM
Surr: DNOP	93.4	70-130	%Rec	1	10/24/2019 9:39:46 PM
EPA METHOD 8015D: GASOLINE RA	NGE				Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.6	mg/Kg	1	10/24/2019 7:48:11 PM
Surr: BFB	88.8	77.4-118	%Rec	1	10/24/2019 7:48:11 PM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Benzene	ND	0.023	mg/Kg	1	10/24/2019 7:48:11 PM
Toluene	ND	0.046	mg/Kg	1	10/24/2019 7:48:11 PM
Ethylbenzene	ND	0.046	mg/Kg	1	10/24/2019 7:48:11 PM
Xylenes, Total	ND	0.093	mg/Kg	1	10/24/2019 7:48:11 PM
Surr: 4-Bromofluorobenzene	94.6	80-120	%Rec	1	10/24/2019 7:48:11 PM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	96	60	mg/Kg	20	10/24/2019 11:07:04 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit S % Recovery outside of range due to dilution or matrix
- Е Value above quantitation range
  - J Analyte detected below quantitation limits

Analyte detected in the associated Method Blank

Р Sample pH Not In Range

в

RL Reporting Limit

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WO#:	1910C21
	28-Oct-19

Client:	HILCO	RP ENERGY								
Project:	Salty D	og								
Sample ID:	MB-48355	SampType: mblk		Test	Code: EF	PA Method	300.0: Anions			
Client ID:	PBS	Batch ID: 48355		R	unNo: <b>6</b> 3	3938				
Prep Date:	10/24/2019	Analysis Date: 10/24	/2019	S	eqNo: 21	87674	Units: mg/Kg	J		
Analyte		Result PQL SF	YK value S	PK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND 1.5								
Sample ID:	LCS-48355	SampType: Ics		Test	Code: EF	PA Method	300.0: Anions			
Client ID:	LCSS	Batch ID: 48355		R	unNo: 63	3938				
Prep Date:	10/24/2019	Analysis Date: 10/24	/2019	S	eqNo: 21	87675	Units: mg/Kg	J		
Analyte		Result PQL SF	PK value S	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		16 1.5	15.00	0	109	90	110			
Sample ID:	MB-48364	SampType: mblk		Test	Code: EF	PA Method	300.0: Anions			
Client ID:	PBS	Batch ID: 48364		R	unNo: 63	3938				
Prep Date:	10/24/2019	Analysis Date: 10/24	/2019	S	eqNo: <b>2</b> 1	87704	Units: mg/Kg	J		
Analyte		Result PQL SF	K value S	PK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND 1.5								
Sample ID:	LCS-48364	SampType: Ics		Test	Code: EF	PA Method	300.0: Anions	i		
Client ID:	LCSS	Batch ID: 48364		R	unNo: 63	3938				
Prep Date:	10/24/2019	Analysis Date: 10/24	/2019	S	eqNo: 21	187705	Units: mg/Kg	J		
Analyte		Result PQL SP	K value S	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		16 1.5	15.00	0	106	90	110			

**Qualifiers:** 

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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**Client:** 

HILCORP ENERGY

Project: Salty I	Dog			
Sample ID: LCS-48342	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics	
Client ID: LCSS	Batch ID: 48342	RunNo: 63924		
Prep Date: 10/23/2019	Analysis Date: 10/24/2019	SeqNo: 2186013	Units: <b>mg/Kg</b>	
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual
Diesel Range Organics (DRO)	49 10 50.00	0 97.4 63.9	124	
Surr: DNOP	3.7 5.000	74.5 70	130	
Sample ID: MB-48342	SampType: MBLK	TestCode: EPA Method	8015M/D: Diesel Range Organics	
Client ID: PBS	Batch ID: 48342	RunNo: 63924		
Prep Date: 10/23/2019	Analysis Date: 10/24/2019	SeqNo: 2186015	Units: <b>mg/Kg</b>	
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual
Diesel Range Organics (DRO)	ND 10			
Motor Oil Range Organics (MRO)	ND 50	04.5 70	420	
Suit: DNOP	9.1 10.00	91.5 70		
Sample ID: LCS-48344	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics	
Client ID: LCSS	Batch ID: 48344	RunNo: 63924		
Prep Date: 10/23/2019	Analysis Date: 10/24/2019	SeqNo: 2187663	Units: mg/Kg	
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual
Diesel Range Organics (DRO)	51 10 50.00	0 102 63.9	124	
Surr: DNOP	4.8 5.000	95.0 70	130	
Sample ID: MB-48344	SampType: MBLK	TestCode: EPA Method	8015M/D: Diesel Range Organics	
Client ID: PBS	Batch ID: 48344	RunNo: 63924		
Prep Date: 10/23/2019	Analysis Date: 10/24/2019	SeqNo: 2187664	Units: mg/Kg	
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual
Diesel Range Organics (DRO)	ND 10			
Motor Oil Range Organics (MRO)	ND 50			
Surr: DNOP	11 10.00	109 70	130	
Sample ID: LCS-48372	SampType: LCS	TestCode: EPA Method	8015M/D: Diesel Range Organics	
Client ID: LCSS	Batch ID: 48372	RunNo: 63970		
Prep Date: 10/24/2019	Analysis Date: 10/25/2019	SeqNo: 2189206	Units: %Rec	
Analyte	Result PQL SPK value	SPK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit	Qual
Surr: DNOP	4.4 5.000	87.7 70	130	

Analyte detected in the associated Method Blank Е Value above quantitation range

- Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL

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1910C21

28-Oct-19

WO#:

**Qualifiers:** 

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

J

В

Reporting Limit

**Client:** 

HILCORP ENERGY

Project:	Salty Dog									
Sample ID:	MB-48372	SampType:	MBLK	Test	Code: EPA	A Method	8015M/D: Dies	sel Range	e Organics	
Client ID:	PBS	Batch ID:	48372	R	unNo: 639	970				
Prep Date:	10/24/2019	Analysis Date:	10/25/2019	S	eqNo: 218	39207	Units: %Rec			
Analyte		Result PC	QL SPK value	SPK Ref Val	%REC I	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP		9.4	10.00		93.6	70	130			
Sample ID:	LCS-48373	SampType:	LCS	Test	Code: EPA	A Method	8015M/D: Dies	sel Range	e Organics	
Client ID:	LCSS	Batch ID:	48373	R	unNo: 639	969				
Prep Date:	10/24/2019	Analysis Date:	10/25/2019	S	eqNo: 218	39241	Units: %Rec			
Analyte		Result PC	QL SPK value	SPK Ref Val	%REC I	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	)	4.5	5.000		90.2	70	130			
Sample ID:	MB-48373	SampType:	MBLK	Test	Code: EPA	A Method	8015M/D: Dies	sel Range	e Organics	
Client ID:	PBS	Batch ID:	48373	R	unNo: 639	969				
Prep Date:	10/24/2019	Analysis Date:	10/25/2019	S	eqNo: 218	39242	Units: %Rec			
Analyte		Result PC	QL SPK value	SPK Ref Val	%REC I	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	)	10	10.00		102	70	130			

**Qualifiers:** 

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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28-Oct-19

1910C21

WO#:
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UMMAKI KEPUKI	WO#:	1910C21
nvironmental Analysis Laboratory, Inc.		28-Oct-19

Client: Project:	HILCORI Salty Dog	P ENERG	Y								
Sample ID:	MB-48339	 SampT	ype: MI	 3LK	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	PBS	Batch	ו ID: <b>48</b>	339	F	RunNo: <b>6</b> :	3935				
Prep Date:	10/23/2019	Analysis D	)ate: 1(	0/24/2019	ç	3eqNo: <b>2</b> *	186999	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	ND 910	5.0	1000		91.5	77.4	118			
Sample ID:	LCS-48339	SampT	ype: LC	;s	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	LCSS	Batch	ו ID: <b>48</b>	339	F	RunNo: <b>6</b> :	3935				
Prep Date:	10/23/2019	Analysis D	ate: 10	0/24/2019	ç	3eqNo: <b>2</b> '	187000	Units: mg/h	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	24 1100	5.0	25.00 1000	0	97.8 110	80 77.4	120 118			
Sample ID:	MB-48341	SampT	ype: MI	BLK	Tes	stCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	PBS	Batch	ו ID: <b>48</b>	341	F	RunNo: <b>6</b> :	3934				
Prep Date:	10/23/2019	Analysis D	vate: 10	0/24/2019	ç	3eqNo: <b>2</b> '	187070	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	ND 930	5.0	1000		92.9	77.4	118			
Sample ID:	LCS-48341	SampT	ype: LC	;s	Tes	tCode: E	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	LCSS	Batch	ו ID: <b>48</b>	341	F	RunNo: <b>6</b> :	3934				
Prep Date:	10/23/2019	Analysis D	ate: 10	0/24/2019	ç	3eqNo: <b>2</b> '	187071	Units: mg/h	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang	e Organics (GRO)	24	5.0	25.00	0	95.8	80	120			
Surr: BFB		1000		1000		102	77.4	118			
Sample ID:	1910C21-011AMS	SampT	ype: <b>M</b> \$	3	Tes	tCode: EF	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	MW15@ 22.5-25'	Batch	ו ID: <b>48</b> ′	341	F	RunNo: <b>6</b> :	3934				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/24/2019	ç	3eqNo: <b>2</b> '	187073	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Rang Surr: BFB	e Organics (GRO)	26 1000	5.0	24.88 995.0	0	103 104	69.1 77.4	142 118			
Sample ID:	1910C21-011AMS	D SampT	уре: М	3D	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID:	MW15@ 22.5-25'	Batch	ו ID: <b>48</b>	341	F	RunNo: <b>6</b> :	3934				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/24/2019	ç	3eqNo: 2'	187074	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

**Qualifiers:** 

ND

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix Н Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit

В Analyte detected in the associated Method Blank Е Value above quantitation range

- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL Reporting Limit

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- PQL Practical Quanitative Limit S % Recovery outside of range due to dilution or matrix

1910C21

28-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	HILCORI Salty Dog	P ENERG	Y								
Sample ID:	1910C21-011AMSI	<b>)</b> SampT	ype: <b>MS</b>	SD	Tes	tCode: El	PA Method	8015D: Gaso	line Rang	e	
Client ID:	MW15@ 22.5-25'	Batch	ID: 48	341	R	anNo: 6	3934				
Prep Date:	10/23/2019	Analysis D	ate: 10	)/24/2019	S	SeqNo: 2	187074	Units: mg/K	g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range	e Organics (GRO)	28	4.8	23.92	0	119	69.1	142	10.0	20	
Surr: BFB		1000		956.9		106	77.4	118	0	0	

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

**Client:** 

HILCORP ENERGY

Project:	Salty Do	og									
Sample ID:	MB-48339	Samp	Гуре: МЕ	BLK	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID:	PBS	Batc	h ID: 48	339	F	RunNo: 6	3935				
Prep Date:	10/23/2019	Analysis I	Date: 10	)/24/2019	S	SeqNo: 2	187037	Units: mg/M	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025								
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Brom	nofluorobenzene	0.92		1.000		91.8	80	120			
Sample ID:	LCS-48339	Samp	Гуре: <b>LC</b>	S	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID:	LCSS	Batc	h ID: 48	339	F	RunNo: <b>6</b>	3935				
Prep Date:	10/23/2019	Analysis I	Date: 10	)/24/2019	S	SeqNo: 2	187038	Units: mg/M	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.89	0.025	1.000	0	89.0	80	120			
Toluene		0.93	0.050	1.000	0	92.9	80	120			
Ethylbenzene		0.93	0.050	1.000	0	92.9	80	120			
Xylenes, Total		2.8	0.10	3.000	0	91.8	80	120			
Surr: 4-Brom	nofluorobenzene	0.98		1.000		98.5	80	120			
Sample ID:	MB-48341	Samp	Гуре: <b>МЕ</b>	BLK	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID:	PBS	Batc	h ID: 48	341	F	RunNo: 6	3934				
Prep Date:	10/23/2019	Analysis I	Date: 10	)/24/2019	S	SeqNo: 2	187091	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		ND	0.025								
Toluene		ND	0.050								
Ethylbenzene		ND	0.050								
Xylenes, Total		ND	0.10								
Surr: 4-Brom	ofluorobenzene	0.99		1.000		98.8	80	120			
Sample ID:	LCS-48341	Samp	Гуре: <b>LC</b>	S	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID:	LCSS	Batc	h ID: 48	341	F	RunNo: 6	3934				
Prep Date:	10/23/2019	Analysis I	Date: 10	)/24/2019	S	SeqNo: 2	187092	Units: mg/M	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.95	0.025	1.000	0	94.8	80	120			
Toluene		0.99	0.050	1.000	0	98.8	80	120			
Ethylbenzene		0.99	0.050	1.000	0	99.3	80	120			
Xylenes, Total		3.0	0.10	3.000	0	100	80	120			

#### Qualifiers:

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to MatrixH Holding times for preparation or analys

E value

1.000

Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit

0.96

ND Not Detected at the Reporti PQL Practical Quanitative Limit

Surr: 4-Bromofluorobenzene

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

95.8

80

120

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

1910C21

28-Oct-19

WO#:

0.88

0.9276

#### **Client:** HILCORP ENERGY

Project:	Salty Dog	5									
Sample ID:	1910C21-012AMS	Samp	Гуре: М	6	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID:	MW15@ 27.5-30'	Batc	h ID: 48	341	F	RunNo: 6	3934				
Prep Date:	10/23/2019	Analysis [	Date: 10	)/24/2019	S	SeqNo: 2	187095	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.94	0.024	0.9443	0	99.9	76	123			
Toluene		0.99	0.047	0.9443	0.01039	104	80.3	127			
Ethylbenzene		1.0	0.047	0.9443	0	107	80.2	131			
Xylenes, Total		3.1	0.094	2.833	0.01622	107	78	133			
Surr: 4-Bron	nofluorobenzene	0.89		0.9443		93.9	80	120			
Sample ID:	1910C21-012AMS	D Samp	Гуре: М\$	SD	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID:	MW15@ 27.5-30'	Batc	h ID: 48	341	F	RunNo: <b>6</b> :	3934				
Prep Date:	10/23/2019	Analysis [	Date: 10	)/24/2019	S	SeqNo: 2	187096	Units: <b>mg/#</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene		0.93	0.023	0.9276	0	100	76	123	1.20	20	
Toluene		0.99	0.046	0.9276	0.01039	105	80.3	127	0.415	20	
Ethylbenzene		1.0	0.046	0.9276	0	108	80.2	131	1.13	20	
Xylenes, Total		3.0	0.093	2.783	0.01622	109	78	133	0.507	20	

94.7

80

120

0

0

**Qualifiers:** 

Value exceeds Maximum Contaminant Level. \*

D Sample Diluted Due to Matrix

Surr: 4-Bromofluorobenzene

- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

- % Recovery outside of range due to dilution or matrix S
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits J
- Р Sample pH Not In Range
- RL Reporting Limit

28-Oct-19

1910C21

WO#:

ENVIRONMENTAL ANALYSIS LABORATORY Websit	490 Albuquer -345-3975 FAX: e: www.hallenvi	01 Hawkins que, NM 87 505-345-41 ronmental.c	NE 109 <b>San</b> 107 07	ample Log-In Check List				
Client Name: HILCORP ENERGY FAR Work Order	Number: 191	0C21		RcptNo: 1				
Received By: JUAN 40/01 10/23/2019 8:	:20:00 AM							
Completed By: Yazmine Garduno 10/23/2019 8:	37:08 AM		Alazmin Wandart	ŝ				
Reviewed By: 5 - 10/22/19								
Chain of Custody								
1. Is Chain of Custody complete?	Yes	~	No 🗌	Not Present				
2. How was the sample delivered?	Cou	rier						
Log In 3. Was an attempt made to cool the samples?	Yes	~	No 🗌					
4								
<ol> <li>were all samples received at a temperature of &gt;0° C to 6.0°</li> </ol>	C Yes	V						
5. Sample(s) in proper container(s)?	Yes	~	No 🗌					
5. Sufficient sample volume for indicated test(s)?	Yes	~	No 🗌					
7. Are samples (except VOA and ONG) properly preserved?	Yes		No 🗌					
3. Was preservative added to bottles?	Yes		No 🔽	NA 🗌				
9. VOA vials have zero headspace?	Yes		No 🗌	No VOA Vials 🗹				
0. Were any sample containers received broken?	Yes		No 🗹	# of preserved				
1. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes		No 🗌	for pH: (<2 or >12 unless noted)				
2 Are matrices correctly identified on Chain of Custody?	Yes	~	No 🗌	Adjusted?				
3. Is it clear what analyses were requested?	Yes	~	No 🗌					
<ol> <li>Were all holding times able to be met? (If no, notify customer for authorization.)</li> </ol>	Yes		No 🗌	Checked by: DAD 10/23/19				
pecial Handling (if applicable)								
5. Was client notified of all discrepancies with this order?	Yes		No 🗌	NA 🗹				
Person Notified:	Date:							
By Whom:	Via: 🗌 eM	ail 🗌 Pho	one 🗌 Fax	In Person				
Regarding: Client Instructions:								

Page 215 of 264

17. Cooler Information

Received by OCD: 11/18/2019 1:34:59 PM

Cooler No Temp °C Condition Seal Intact Seal No Seal Date Signed By 1 1.8 Good

Received	AL AL	CD:	11/1	8/201	19 1 	:34:	:59 PM	1 -																		age 216	S of
Page 20f2	ANALYSIS LABORATC	www.hallenvironmental.com	wkins NE - Albuquerque, NM 87109	-345-3975 Fax 505-345-4107	Analysis Request	404	SMIS	.ent )2, F ()	04.1 20 82 А) Ргез	10 c 10 c 10 3, 10 (	8 (v 8 (v 8 (v 7 (v 7 (v 7 (v) 8 (v) 9 (v)	EDB (N RCRA 8 8260 (V 8270 (9 704al C	×											<u> </u>		cc: jadamseltenu.c	contracted data will be clearly notated on the analytical report
			4901 Ha	Tel. 505		(0	SCBIS	32 F	308/s	səpi NGB	15D(	08:H9T 9 1808	X											2	arks:		ility. Any sub-
, at						([	(805	8.81		38		X TEX /	X	1		/	/	/						Ż	Rem	0	f this possibl
or popul	3. day			1.	4		Jams	0	I No	2	670.2=1.8	1910 C7A	100-	-001	-603-	hay-	-1055	900-	-00-	-004	-009	010-	110-	- 012	Date Time	Date Time	s. This serves as notice o
Time:	Rush.		y Deg	0 9 0	122121	iger:	Tesh A	1 1 1	Dash /blo		(including CF):  .	Preservative Type	Ce01		/	>				0			1	>	Via: VIA: NO	Via:	ccredited laboratories
Turn-Around	☐ □ Standard	Project Name	Salt Salt	Project #:	CI	Project Mana		-	Sampler: On Ice:	# of Coolers:	Cooler Temp	Container Type and #	207,(1)	/		1				4				1	Received by:	Received by:	ocontracted to other a
stody Record		- Peal	-			Hilep.com	□   aval 4 /Eutl Validation)		npliance			Sample Name	MW13@ 10-12.5'	MW13 C 25-27.51	MW13 C 32.5-35'	MW13 @375 40'	MW14 @ 25 23.35	MWIH CRO-22.5	Mull @ 25-27.5'	MW14 @ 27.5-30'	MW 14 @ 30-325'	MW 15@ 25-5'	M. WES 22.5-25'	MWIGE-STE DEIMM	1 adult		itted to Hall Environmental may be sub
of-Cu	d	znnifer				deal C				PDF		Matrix	, Š			>		-	_		_			5	Relinquished	Relinquished	samples subm
hain-	Hilcor	~	Address:		#:	r Fax#: )	Package:		AC	(Type)		Time	1438	1440	CH+1	1444	1310	1311	1312	1313	1314	(610	1612	1014	Time: 1715	Time:	f necessary s
0	Client:		Mailing		Phone ;	email o	QA/QC			A EDD		Date	A-18-0	-	_	)	p-22-by	-	_					7	Date:	Date: N 12/0	1

Parce 2 of 2 NLL ENVIRONMENTAL IALYSIS LABORATORY w.hallenvironmental.com NE - Albuquerque, NM 87109 8975 Fax 505-345-4107 Analysis Request	RCRA 8 Metals B260 (VOA) 8260 (VOA) 8270 (Semi-VOA) Total Coliform (Present/Absent) (freedent/Absent)		d data will be clearly notated on the analytical report.
AN AN 4901 Hawkins Tel. 505-345-	BTEX / MT <del>BE / TMB's (80</del> 21) TPH:8015D(GRO / DRO / MRO) 8081 Pesticides/8082 PCB's EDB (Method 504.1) PAHs by 8310 or 8270SIMS		(emarks:
Turn-Around Time: 10/a4 Standard A Rush 3- dev Project Name: Suff Org Project #: D178/9014	Project Manager: Sampler: Sampler: On Ice: B Yes No # of Coolers: I to Fo.2 to S Cooler Temp(matuding cF): 1.6 Fo.2 to 1.8 Cooler Temp(matuding cF):	(1) toz caci -013 L L L -014 -014 -014	Received by: Via: Date Time R $O_{12} M_{1} M_{1} M_{1} M_{2} M_{1} M_{1} M_{2} M_{2} M_{1} M_{1} M_{2} M_$
Client:       Hi Lorp         Client:       Hi Lorp         Jannifer Deal         Mailing Address:         Phone #:	email or Fax#: deal Chilcorp. COM aA/QC Package: Candard  Level 4 (Full Validation) Accreditation:  Accreditation:  Accreditation:  Accreditation:  Accompliance NELAC Other Dete Time Matrix Sample Name	1022-19 [bild soil muse 325-35' 1 [bild L Muise 375-40' 1 [bild L Mui	Date: Time: Reinquished by AMW Pate: Time: Relinguished by Date: Time: Relinguished by: 121 (81) (81) Increasary, samples submitted to Hall Environmental may be sub



Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

October 31, 2019

Jennifer Deal Hilcorp San Juan LP/Hilcorp Energy Corp PO Box PO Box 4700 Farmington, NM 84701 TEL: FAX

RE: Salty Dog

OrderNo.: 1910D52

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 2 sample(s) on 10/25/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

#### **Analytical Report** Lab Order 1910D52 Date Reported: 10/31/2019

#### Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor Client Sample ID: MW09@20-22.5' **Project:** Salty Dog Collection Date: 10/23/2019 2:05:00 PM Lab ID: 1910D52-001 Matrix: MEOH (SOIL) Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORG	BANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.6	mg/Kg	1	10/25/2019 12:09:19 PM
Motor Oil Range Organics (MRO)	ND	48	mg/Kg	1	10/25/2019 12:09:19 PM
Surr: DNOP	97.2	70-130	%Rec	1	10/25/2019 12:09:19 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.2	mg/Kg	1	10/25/2019 10:18:57 AM
Surr: BFB	90.8	77.4-118	%Rec	1	10/25/2019 10:18:57 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	0.064	mg/Kg	1	10/25/2019 10:18:57 AM
Benzene	ND	0.016	mg/Kg	1	10/25/2019 10:18:57 AM
Toluene	ND	0.032	mg/Kg	1	10/25/2019 10:18:57 AM
Ethylbenzene	ND	0.032	mg/Kg	1	10/25/2019 10:18:57 AM
Xylenes, Total	ND	0.064	mg/Kg	1	10/25/2019 10:18:57 AM
Surr: 4-Bromofluorobenzene	91.2	80-120	%Rec	1	10/25/2019 10:18:57 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	ND	60	mg/Kg	20	10/25/2019 11:27:39 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н
- Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 1 of 7

#### **Analytical Report** Lab Order 1910D52 Date Reported: 10/31/2019

#### Hall Environmental Analysis Laboratory, Inc.

Client Sample ID: MW15@30-32.5' CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor **Project:** Salty Dog Collection Date: 10/23/2019 2:07:00 PM Lab ID: 1910D52-002 Received Date: 10/25/2019 8:00:00 AM Matrix: MEOH (SOIL)

Analyses	Result	RL Qua	Qual Units		Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORG	ANICS				Analyst: BRM
Diesel Range Organics (DRO)	ND	9.4	mg/Kg	1	10/25/2019 12:31:26 PM
Motor Oil Range Organics (MRO)	ND	47	mg/Kg	1	10/25/2019 12:31:26 PM
Surr: DNOP	95.9	70-130	%Rec	1	10/25/2019 12:31:26 PM
EPA METHOD 8015D: GASOLINE RANGE					Analyst: NSB
Gasoline Range Organics (GRO)	ND	3.2	mg/Kg	1	10/25/2019 10:41:49 AM
Surr: BFB	90.4	77.4-118	%Rec	1	10/25/2019 10:41:49 AM
EPA METHOD 8021B: VOLATILES					Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	0.065	mg/Kg	1	10/25/2019 10:41:49 AM
Benzene	ND	0.016	mg/Kg	1	10/25/2019 10:41:49 AM
Toluene	ND	0.032	mg/Kg	1	10/25/2019 10:41:49 AM
Ethylbenzene	ND	0.032	mg/Kg	1	10/25/2019 10:41:49 AM
Xylenes, Total	ND	0.065	mg/Kg	1	10/25/2019 10:41:49 AM
Surr: 4-Bromofluorobenzene	89.5	80-120	%Rec	1	10/25/2019 10:41:49 AM
EPA METHOD 300.0: ANIONS					Analyst: MRA
Chloride	160	60	mg/Kg	20	10/25/2019 11:39:59 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н
- Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 2 of 7

1910D52

31-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	t:     Hilcorp San Juan LP/Hilcorp Energy Corp       ect:     Salty Dog								
Sample ID:	MB-48381	SampType: mblk		TestCode: EPA	Method	300.0: Anions	;		
Client ID:	PBS	Batch ID: 48381		RunNo: 639	75				
Prep Date:	10/25/2019	Analysis Date: 10/2	5/2019	SeqNo: 218	9535	Units: mg/Kg	9		
Analyte		Result PQL S	PK value SPK R	ef Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		ND 1.5							
Sample ID:	LCS-48381	SampType: Ics		TestCode: EPA	Method	300.0: Anions	;		
Client ID:	LCSS	Batch ID: 48381		RunNo: 639	75				
Prep Date:	10/25/2019	Analysis Date: 10/2	5/2019	SeqNo: 218	9536	Units: mg/Kg	9		
Analyte		Result PQL S	PK value SPK R	ef Val %REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride		15 1.5	15.00	0 100	90	110			

#### Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client:	Hilcorp San Juan L Salty Dog	LP/Hilcon	rp Energy (	Corp						
		T								
Sample ID: LCS-483	80 Samp	Type: LC	5	Ies	tCode: El	PA Method	8015M/D: Di	esel Range	e Organics	
Client ID: LCSS	Bato	ch ID: 483	380	F	RunNo: <b>6</b>	3970				
Prep Date: 10/25/2	019 Analysis	Date: 10	/25/2019	5	SeqNo: 2	188298	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (D	RO) 49	10	50.00	0	98.7	63.9	124			
Surr: DNOP	4.6		5.000		91.9	70	130			
Sample ID: MB-4838	30 Samp	Туре: <b>МВ</b>	BLK	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID: PBS	Bato	ch ID: 483	380	F	RunNo: <b>6</b> :	3970				
Prep Date: 10/25/2	019 Analysis	Date: 10	/25/2019	5	SeqNo: 2	188299	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (D	RO) ND	10								
Motor Oil Range Organics	(MRO) ND	50								
Surr: DNOP	9.5		10.00		95.4	70	130			
Sample ID: 1910D52	2-001AMS Samp	Туре: <b>МS</b>	5	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID: MW09@	20-22.5' Bate	ch ID: 483	380	F	RunNo: <b>6</b> :	3970				
Prep Date: 10/25/2	019 Analysis	Date: 10	/26/2019	5	SeqNo: 2	189204	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (D	RO) 47	9.6	47.85	0	99.1	57	142			
Surr: DNOP	3.8		4.785		79.6	70	130			
Sample ID: 1910D52	2-001AMSD Samp	Туре: <b>МЅ</b>	D	Tes	tCode: El	PA Method	8015M/D: Di	esel Rang	e Organics	
Client ID: MW09@	20-22.5' Bato	ch ID: 483	380	F	RunNo: <b>6</b> :	3970				
Prep Date: 10/25/2	019 Analysis	Date: 10	/26/2019	S	SeqNo: 2	189205	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (D	RO) 46	9.7	48.40	0	95.7	57	142	2.30	20	
Surr: DNOP	3.6		4.840		75.3	70	130	0	0	

#### **Qualifiers:**

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank

E Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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#### WO#: **1910D52** *31-Oct-19*

Client: Project:	Hilcorp S Salty Dog	an Juan Ll <sup>g</sup>	P/Hilco	rp Energy (	Corp						
Sample ID: RB		SampT	SampType: MBLK TestCode: EPA Method 8015D: Gasoline Range								
Client ID: PB	S	Batch	ID: Ge	3981	F	RunNo: <b>6</b> :	3981				
Prep Date:		Analysis D	ate: 10	0/25/2019	5	SeqNo: 2	188840	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Org	ganics (GRO)	ND	5.0								
Surr: BFB		940		1000		94.4	77.4	118			
Sample ID: 2.5	UG GRO LCS	SampT	ype: LC	s	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: LC:	SS	Batch	ID: Ge	3981	F	RunNo: <b>6</b> :	3981				
Prep Date:		Analysis D	ate: 10	0/25/2019	S	SeqNo: 2	188841	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Org	ganics (GRO)	24	5.0	25.00	0	95.5	80	120			
Surr: BFB		1100		1000		113	77.4	118			
Sample ID: 191	0D52-001AMS	SampT	ype: <b>M</b> \$	3	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: MW	V09@20-22.5'	Batch	ID: Ge	3981	F	RunNo: 6	3981				
Prep Date:		Analysis D	ate: 10	0/25/2019	5	SeqNo: 2	188842	Units: <b>mg/ł</b>	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Org	ganics (GRO)	15	3.2	15.93	0	92.0	69.1	142			
Surr: BFB		650		637.3		103	77.4	118			
Sample ID: 191	0D52-001AMS	D SampT	ype: <b>M</b> \$	SD	Tes	tCode: El	PA Method	8015D: Gaso	oline Rang	e	
Client ID: MW	V09@20-22.5'	Batch	ID: Ge	3981	F	RunNo: 6	3981				
Prep Date:		Analysis D	ate: 10	0/25/2019	S	SeqNo: 2	188843	Units: mg/k	٢g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Org	ganics (GRO)	15	3.2	15.93	0	92.2	69.1	142	0.261	20	
Surr: BFB		670		637.3		105	77.4	118	0	0	

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit Page 5 of 7

1910D52

31-Oct-19

WO#:

<b>Project:</b> Salty De	og		1 05	Joip						
	Samo	SamnType: MDLK TestCode: EDA Method 9021B: Volatilos								
	Boto						00210. 0010	liles		
Prep Date:	Analysis [	Date: 10	)/25/2019	S	SeqNo: 2	188870	Units: mg/k	٢g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.10								
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.96		1.000		95.6	80	120			
Sample ID: 100NG BTEX LC	: <b>S</b> Samp⊺	Гуре: <b>LC</b>	S	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Client ID: LCSS	Batc	h ID: <b>B6</b>	3981	R	RunNo: <b>6</b> :	3981				
Prep Date:	Analysis [	Date: 10	)/25/2019	S	SeqNo: 2	188871	Units: mg/k	۲g		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.70	0.10	1.000	0	70.4	65.3	124			
Benzene	0.98	0.025	1.000	0	97.7	80	120			
Toluene	0.96	0.050	1.000	0	96.1	80	120			
Ethylbenzene	0.95	0.050	1.000	0	95.1	80	120			
Xylenes, Total	2.8	0.10	3.000	0	94.4	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		103	80	120			
Sample ID: 1910D52-002AMS SampType: MS TestCode: EPA Method 8021B: Volatiles										
Sample ID: 1910D52-002AM	S Samp	Гуре: <b>МS</b>	6	Tes	tCode: El	PA Method	8021B: Vola	tiles		
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b>	S Samp <sup>⊤</sup> Batc	Гуре: <b>М\$</b> h ID: <b>B6</b>	3981	Tes R	tCode: El RunNo: 6	PA Method 3981	8021B: Vola	tiles		
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b> Prep Date:	S Samp Batc Analysis [	Гуре: <b>М</b> h ID: <b>B6</b> Date: <b>1(</b>	3 3981 0/25/2019	Tes R S	tCode: El RunNo: 6 SeqNo: 2	PA Method 3981 188872	8021B: Vola Units: mg/F	tiles (g		
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b> Prep Date: Analyte	S Samp <sup>¬</sup> Batc Analysis I Result	Гуре: <b>М\$</b> h ID: <b>B6</b> Date: <b>1(</b> PQL	3 3981 )/25/2019 SPK value	Tes F S SPK Ref Val	tCode: <b>El</b> RunNo: <b>6</b> : SeqNo: <b>2</b> %REC	PA Method 3981 188872 LowLimit	8021B: Volar Units: mg/k HighLimit	tiles (g %RPD	RPDLimit	Qual
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b> Prep Date: Analyte Methyl tert-butyl ether (MTBE)	S Samp <sup>¬</sup> Batc Analysis I <u>Result</u> 0.55	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> <u>PQL</u> 0.065	<b>3981</b> <b>)/25/2019</b> SPK value 0.6472	Tes F S SPK Ref Val 0	tCode: El RunNo: 6 SeqNo: 2 <u>%REC</u> 85.4	PA Method 3981 188872 LowLimit 61.1	8021B: Vola Units: mg/k HighLimit 124	tiles (g %RPD	RPDLimit	Qual
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b> Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene	S Samp <sup>-</sup> Batc Analysis I <u>Result</u> 0.55 0.58	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> <u>PQL</u> 0.065 0.016	3981 0/25/2019 SPK value 0.6472 0.6472	Tes F S SPK Ref Val 0 0.006809	tCode: El RunNo: 63 SeqNo: 2 <u>%REC</u> 85.4 87.8	PA Method 3981 188872 LowLimit 61.1 76	8021B: Vola Units: mg/P HighLimit 124 123	tiles (g %RPD	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene	S Samp Batc Analysis I Result 0.55 0.58 0.59	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> <u>PQL</u> 0.065 0.016 0.032	<b>3981</b> <b>)/25/2019</b> SPK value 0.6472 0.6472 0.6472	Tes R S SPK Ref Val 0.006809 0.005249	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1	PA Method 3981 188872 LowLimit 61.1 76 80.3	8021B: Volar Units: mg/k HighLimit 124 123 127	tiles (g %RPD	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59	Type: MS h ID: B6 Date: 10 PQL 0.065 0.016 0.032 0.032	3981 )/25/2019 SPK value 0.6472 0.6472 0.6472 0.6472 0.6472	Tes R SPK Ref Val 0.006809 0.005249 0.007035	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1 90.2	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2	8021B: Volar Units: mg/k HighLimit 124 123 127 131	tiles (g %RPD	RPDLimit	Qual
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b> Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59 1.7	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL 0.065 0.016 0.032 0.032 0.065	3981 5/25/2019 5/25/2019 0.6472 0.6472 0.6472 0.6472 0.6472 1.942	Tes R S SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019	tCode: <b>El</b> RunNo: <b>6</b> SeqNo: <b>2</b> <u>%REC</u> 85.4 87.8 91.1 90.2 89.6	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133	tiles (g %RPD	RPDLimit	Qual
Sample ID: <b>1910D52-002AM</b> Client ID: <b>MW15@30-32.5'</b> Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59 1.7 0.62	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> <u>PQL</u> 0.065 0.016 0.032 0.032 0.065	3981 3981 3981 3PK value 0.6472 0.6472 0.6472 0.6472 1.942 0.6472	Tes R S SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019	tCode: <b>El</b> RunNo: <b>6</b> SeqNo: <b>2</b> <u>%REC</u> 85.4 87.8 91.1 90.2 89.6 96.3	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120	tiles (g %RPD	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59 1.7 0.62 SD Samp	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL 0.065 0.016 0.032 0.032 0.032	3981 3981 575/2019 SPK value 0.6472 0.6472 0.6472 0.6472 1.942 0.6472 1.942 0.6472	Tes SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes	tCode: El RunNo: 6 SeqNo: 2 %REC 85.4 87.8 91.1 90.2 89.6 96.3 tCode: El	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar	tiles (g %RPD	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM Client ID: MW15@30-32.5'	S         Samp           Batc         Analysis I           Analysis I         0.55           0.55         0.58           0.59         0.59           1.7         0.62           SD         Samp	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL 0.065 0.016 0.032 0.032 0.065 Type: <b>MS</b> h ID: <b>B6</b>	3981 )/25/2019 SPK value 0.6472 0.6472 0.6472 0.6472 1.942 0.6472 3981	Tes R S SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes F	tCode: <b>El</b> RunNo: <b>6</b> SeqNo: <b>2</b> <u>%REC</u> 85.4 87.8 91.1 90.2 89.6 96.3 tCode: <b>El</b> RunNo: <b>6</b>	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method 3981	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar	tiles (g %RPD tiles	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date:	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59 1.7 0.62 SD Samp Batc Analysis I	Type: MS h ID: B6 Date: 10 0.065 0.016 0.032 0.032 0.032 0.065 Type: MS h ID: B6 Date: 10	3981 3981 3981 3981 0/25/2019 0.6472 0.6472 0.6472 0.6472 1.942 0.6472 3981 3981 3981	Tes SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes R S	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1 90.2 89.6 96.3 tCode: El RunNo: 6: SeqNo: 2	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method 3981 188873	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar Units: mg/k	tiles (g %RPD tiles (g	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59 1.7 0.62 SD Samp Batc Analysis I Result	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL 0.065 0.016 0.032 0.032 0.065 Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL	3981 )/25/2019 SPK value 0.6472 0.6472 0.6472 0.6472 1.942 0.6472 5D 3981 )/25/2019 SPK value	Tes SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes F SPK Ref Val	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1 90.2 89.6 96.3 tCode: El RunNo: 6: SeqNo: 2 %REC	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method 3981 188873 LowLimit	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar Units: mg/k HighLimit	tiles (g %RPD tiles (g %RPD	RPDLimit	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE)	S         Samp           Batc         Analysis I           Result         0.55           0.58         0.59           0.59         1.7           0.62         SD           SD         Samp           Batc         Analysis I           Result         0.60	Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL 0.065 0.016 0.032 0.032 0.065 Type: <b>MS</b> h ID: <b>B6</b> Date: <b>10</b> PQL 0.065	3981 )/25/2019 SPK value 0.6472 0.6472 0.6472 0.6472 1.942 0.6472 0.6472 5D 3981 )/25/2019 SPK value 0.6472	Tes SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes SPK Ref Val 0	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1 90.2 89.6 96.3 tCode: El RunNo: 6: SeqNo: 2 %REC 92.1	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method 3981 188873 LowLimit 61.1	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar Units: mg/k HighLimit 124	tiles %RPD tiles \$ %RPD 7.56	RPDLimit RPDLimit 20	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene	S         Samp           Batc         Analysis I           Result         0.55           0.58         0.59           0.59         1.7           0.62         SD           SD         Samp           Result         0.60           0.60         0.57	Type: MS h ID: B6 Date: 10 PQL 0.065 0.016 0.032 0.032 0.065 h ID: B6 Date: 10 PQL 0.065 0.016	3981 3981 3981 3981 3987 0.6472 0.6472 0.6472 0.6472 0.6472 0.6472 3981	Tes SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes SPK Ref Val 0 0.006809	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1 90.2 89.6 96.3 tCode: El RunNo: 6: SeqNo: 2 %REC 92.1 86.6	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method 3981 188873 LowLimit 61.1 76	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar Units: mg/k HighLimit 124 123	tiles (g %RPD tiles (g %RPD 7.56 1.38	RPDLimit RPDLimit 20 20	Qual
Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene Ethylbenzene Xylenes, Total Surr: 4-Bromofluorobenzene Sample ID: 1910D52-002AM Client ID: MW15@30-32.5' Prep Date: Analyte Methyl tert-butyl ether (MTBE) Benzene Toluene	S Samp Batc Analysis I Result 0.55 0.58 0.59 0.59 1.7 0.62 SD Samp Batc Analysis I Result 0.60 0.57 0.58	Type: MS h ID: B6 Date: 10 0.065 0.016 0.032 0.032 0.065 Type: MS h ID: B6 Date: 10 PQL 0.065 0.016 0.032	3981 3981 3981 3981 3987 0.6472 0.6472 0.6472 0.6472 0.6472 0.6472 3981	Tes SPK Ref Val 0 0.006809 0.005249 0.007035 0.01019 Tes SPK Ref Val 0 0.006809 0.005249	tCode: El RunNo: 6: SeqNo: 2 %REC 85.4 87.8 91.1 90.2 89.6 96.3 tCode: El RunNo: 6: SeqNo: 2 %REC 92.1 86.6 88.6	PA Method 3981 188872 LowLimit 61.1 76 80.3 80.2 78 80 PA Method 3981 188873 LowLimit 61.1 76 80.3	8021B: Volar Units: mg/k HighLimit 124 123 127 131 133 120 8021B: Volar Units: mg/k HighLimit 124 123 127	tiles (g %RPD tiles (g %RPD 7.56 1.38 2.77	RPDLimit RPDLimit 20 20 20 20	Qual

ND

S

\* Value exceeds Maximum Contaminant Level.

Not Detected at the Reporting Limit

% Recovery outside of range due to dilution or matrix

D Sample Diluted Due to MatrixH Holding times for preparation or analysis exceeded

PQL Practical Quanitative Limit

B Analyte detected in the associated Method BlankE Value above quantitation range

J Analyte detected below quantitation limits

P Sample pH Not In Range

RL Reporting Limit

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1910D52

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WO#:

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31-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	Hilcorp Sa Salty Dog	ın Juan LP	/Hilco	orp Energy (	Corp						
Sample ID: 1910	D52-002AMSD	SampTy	pe: <b>M</b> \$	SD	Tes	tCode: El	PA Method	8021B: Volat	tiles		
Client ID: MW1	nt ID: MW15@30-32.5' Batch ID: B63981 RunNo: 63981										
Prep Date:		Analysis Da	te: 10	0/25/2019	S	SeqNo: 2	188873	Units: <b>mg/K</b>	٤g		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total		1.7	0.065	1.942	0.01019	88.8	78	133	0.848	20	
Surr: 4-Bromofluorol	benzene	0.65		0.6472		100	80	120	0	0	

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

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#### Received by OCD: 11/18/2019 1:34:59 PM

	RONMENT Ysis Ratory	TAL	Ha TE	ll Environm L: 505-345- Website: wv	ental Analy 49( Albuquero -3975 FAX: vw.hallenvi	vsis Labo DI Hawk que, NM 505-34 ronment	oratory tins NE 87109 5-4107 tal.com	Sar	nple Log-In Check List
Client Name:	HILCORP	ENERGY	Work	Order Nur	mber: 191	0D52			RcptNo: 1
Received By:	Then	Rojas	10/25/2	2019 8:00:0	00 AM				
Completed By:	Leah Bad	ca	10/25/2	2019 9:00:2	24 AM		Lau	Bac	a
Reviewed By:	DHD 10	125/19						-	
Chain of Cus	stody								
1. Is Chain of C	custody com	plete?			Yes		N	lo 🗌	Not Present
2. How was the	sample deli	vered?			Cou	rier			
Log In									
3. Was an atter	npt made to	cool the sam	les?		Yes		N	o 🗆	
4. Were all sam	ples receive	d at a tempera	ture of >0° C	to 6.0°C	Yes		N	•	
5. Sample(s) in	proper conta	ainer(s)?			Yes		N	•	
6. Sufficient san	nple volume	for indicated t	est(s)?		Yes	~	N	•	
7. Are samples	(except VOA	and ONG) pr	operly preserve	ed?	Yes		No	<b>b</b>	
8. Was preserva	ative added to	o bottles?			Yes		N		NA 🗌
9. VOA vials hav	ve zero head	space?			Yes		No	<b>b</b>	No VOA Vials 🗹
10. Were any sar	mple contain	ers received b	oroken?		Yes		Ν	o 🔽	# of preserved
11. Does paperwo (Note discrep	ork match bc ancies on ch	ottle labels? ain of custody	)		Yes		No	•	bottles checked for pH: (<2 or >12 unless noted)
12. Are matrices	correctly ider	ntified on Cha	n of Custody?		Yes	~	No		Adjusted?
13. Is it clear wha	t analyses w	ere requested	?		Yes	$\checkmark$	No		F
14. Were all holdi (If no, notify c	ng times abl ustomer for a	e to be met? authorization.)			Yes		No		Checked by: ENM 10/25/19
Special Handl	ing (if ap	plicable)						-	
15. Was client no	otified of all d	liscrepancies	with this order?	, ,	Yes		N	•	
Person	Notified:	ſ		Date	e [				
By Who	om:	l .		Via:	🗌 eMa	ail 🗌	Phone [	Fax	In Person
Regard Client I	ing: nstructions:	[ 							
16. Additional re	marks:	,			_				
17. Cooler Infor	mation								
Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal D	ate	Signer	Bv	
1	0.3	Good	Yes				orgride		
2	0.6	Good	Yes		and a second			******	

TORY		Lebor.
HALL ENVIRONMER ANALYSIS LABORA www.hallenvironmental.com wkins NE - Albuquerque, NM 87109 -345-3975 Fax 505-345-4107 Analysis Request	EDB (Metinod 504, 1)         PAHs by 8310 or 8270SIMS         RCRA 8 Metals         X       X         X       X         SS60 (VOA)         S270 (Semi-VOA)         Intervention         Intervention         S270 (Semi-VOA)         Intervention         Inte	i j colarne clearly notated on the analytical r
4901 Hav	X ×       TPH:8015D(GRO / DRO / MRO)         8081 Pesticides/8082 PCB's	arks:
	XX BIEX/ WHEEN EWER (8051)	this possib
COLD DO	Dams Ino 191002 1910052 -0.6-10-0 -001 -002 -002	Date Time Date Time $\frac{16 \lambda_4 / Ic}{Date}$ Time Date Time
d Time: d Brush ne: DI 78/9	ager: Josh Add Ar Yes : 2 D(including cr): 0.	Via: Via:
Turn-Around Candar Project Nam Project #:	Project Man Sampler: On Ice: # of Coolers Cooler Temy Container Type and #	Received by:
istody Record	Chilcorp Cow Level 4 (Full Validation) mpliance Sample Name MwOod e.20-23.5	yby: Multur In Multur itted to Hall Environmental may be sub
Hilcon Jen Arteu	Az Co Other Soil Soil	Relinquishe
Address.	Package: Package: itation: AC AC AC AC AC AC	Time: IS24 fnecessary, e
Client: Mailing	email c aAvac Accred Date Date	Date: Date:



Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

October 31, 2019

Jennifer Deal Hilcorp San Juan LP/Hilcorp Energy Corp PO Box PO Box 4700 Farmington, NM 84701 TEL: FAX

OrderNo.: 1910D50

RE: Salty Dog

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 7 sample(s) on 10/25/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

andy

Andy Freeman Laboratory Manager 4901 Hawkins NE Albuquerque, NM 87109

Analytical Report					
Lab Order 1910D50					

Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ene	rgy Cor	Client Sample ID: MW15
Project:	Salty Dog		Collection Date: 10/24/2019 9:35:00 AM
Lab ID:	1910D50-001	Matrix: GROUNDWA	<b>Received Date:</b> 10/25/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: MRA
Fluoride	ND	0.50		mg/L	5	10/25/2019 11:58:52 AM
Chloride	1600	100	*	mg/L	200	10/28/2019 2:01:37 PM
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	10/25/2019 11:58:52 AM
Bromide	2.7	2.0		mg/L	20	10/25/2019 12:11:17 PM
Nitrogen, Nitrate (As N)	2.1	2.0		mg/L	20	10/25/2019 12:11:17 PM
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	10/25/2019 11:58:52 AM
Sulfate	1700	100	*	mg/L	200	10/28/2019 2:01:37 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: <b>bcv</b>
Calcium	720	10		mg/L	10	10/25/2019 2:02:09 PM
Magnesium	130	5.0		mg/L	5	10/25/2019 2:46:01 PM
Potassium	9.5	5.0		mg/L	5	10/25/2019 2:46:01 PM
Sodium	1400	20		mg/L	20	10/25/2019 2:48:18 PM
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µq/L	1	10/25/2019 10:44:00 AM
Toluene	ND	1.0		µq/L	1	10/25/2019 10:44:00 AM
Ethylbenzene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Methyl tert-butyl ether (MTBE)	ND	1.0		μg/L	1	10/25/2019 10:44:00 AM
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Naphthalene	ND	2.0		µg/L	1	10/25/2019 10:44:00 AM
1-Methylnaphthalene	ND	4.0		µg/L	1	10/25/2019 10:44:00 AM
2-Methylnaphthalene	ND	4.0		µg/L	1	10/25/2019 10:44:00 AM
Acetone	ND	10		µg/L	1	10/25/2019 10:44:00 AM
Bromobenzene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Bromodichloromethane	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Bromoform	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Bromomethane	ND	3.0		µg/L	1	10/25/2019 10:44:00 AM
2-Butanone	ND	10		µg/L	1	10/25/2019 10:44:00 AM
Carbon disulfide	ND	10		µg/L	1	10/25/2019 10:44:00 AM
Carbon Tetrachloride	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Chlorobenzene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Chloroethane	ND	2.0		µg/L	1	10/25/2019 10:44:00 AM
Chloroform	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
Chloromethane	ND	3.0		µg/L	1	10/25/2019 10:44:00 AM
2-Chlorotoluene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM
4-Chlorotoluene	ND	1.0		µg/L	1	10/25/2019 10:44:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

Page 1 of 28

Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		C	Client Sample ID: MW15
Project:	Salty Dog				Collection Date: 10/24/2019 9:35:00 AM
Lab ID:	1910D50-001	Matrix:	GROUNDWA	ł	<b>Received Date:</b> 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	10/25/2019 10:44:00 AM
Dibromochloromethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
Dibromomethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,2-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,3-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,4-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
Dichlorodifluoromethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,1-Dichloroethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,1-Dichloroethene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,2-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,3-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
2,2-Dichloropropane	ND	2.0	µg/L	1	10/25/2019 10:44:00 AM
1,1-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
Hexachlorobutadiene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
2-Hexanone	ND	10	µg/L	1	10/25/2019 10:44:00 AM
Isopropylbenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
4-Isopropyltoluene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
4-Methyl-2-pentanone	ND	10	µg/L	1	10/25/2019 10:44:00 AM
Methylene Chloride	ND	3.0	µg/L	1	10/25/2019 10:44:00 AM
n-Butylbenzene	ND	3.0	µg/L	1	10/25/2019 10:44:00 AM
n-Propylbenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
sec-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
Styrene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
tert-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/25/2019 10:44:00 AM
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
trans-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
Trichlorofluoromethane	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/25/2019 10:44:00 AM
Vinyl chloride	ND	1.0	µg/L	1	10/25/2019 10:44:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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**Total Dissolved Solids** 

Hall Environmental Analysis Laboratory, Inc.

#### **Analytical Report** Lab Order 1910D50 Date Reported: 10/31/2019

CLIENT: Hilcorp San Juan LP/Hilcorp Ene	rgy Cor	Client Sa	mple ID:	MW15	5
<b>Project:</b> Salty Dog		Collect	ion Date:	10/24/	2019 9:35:00 AM
Lab ID: 1910D50-001	Matrix: GROUNE	WA Receiv	ed Date:	10/25/	2019 8:00:00 AM
Analyses	Result	RL Qua	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
Xylenes, Total	ND	1.5	µg/L	1	10/25/2019 10:44:00 AM
Surr: 1,2-Dichloroethane-d4	101	70-130	%Rec	1	10/25/2019 10:44:00 AM
Surr: 4-Bromofluorobenzene	100	70-130	%Rec	1	10/25/2019 10:44:00 AM
Surr: Dibromofluoromethane	98.4	70-130	%Rec	1	10/25/2019 10:44:00 AM
Surr: Toluene-d8	97.4	70-130	%Rec	1	10/25/2019 10:44:00 AM
SM4500-H+B / 9040C: PH					Analyst: JRR
рН	7.45	Н	pH units	s 1	10/28/2019 10:38:47 AM
SM2540C MOD: TOTAL DISSOLVED SOLI	DS				Analyst: KS

6370

200

\*D

mg/L

1

10/28/2019 4:18:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

Page 3 of 28

#### **Analytical Report** Lab Order 1910D50

Date Reported: 10/31/2019

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		С	Client Sample ID: MW08	
Project:	Salty Dog				Collection Date: 10/24/2019 10:05:00 AM	
Lab ID:	1910D50-002	Matrix:	GROUNDWA	1	<b>Received Date:</b> 10/25/2019 8:00:00 AM	
						1

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: MRA
Fluoride	2.8	2.0		mg/L	20	10/25/2019 12:36:05 PM
Chloride	1500	100	*	mg/L	200	10/28/2019 2:13:58 PM
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	10/25/2019 12:23:41 PM
Bromide	2.4	2.0		mg/L	20	10/25/2019 12:36:05 PM
Nitrogen, Nitrate (As N)	3.0	2.0		mg/L	20	10/25/2019 12:36:05 PM
Phosphorus, Orthophosphate (As P)	ND	10		mg/L	20	10/25/2019 12:36:05 PM
Sulfate	3100	100	*	mg/L	200	10/28/2019 2:13:58 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: <b>bcv</b>
Calcium	580	10		mg/L	10	10/25/2019 2:04:25 PM
Magnesium	200	5.0		mg/L	5	10/25/2019 2:57:05 PM
Potassium	9.0	5.0		mg/L	5	10/25/2019 2:57:05 PM
Sodium	1800	20		mg/L	20	10/25/2019 2:59:12 PM
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Toluene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Ethylbenzene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Naphthalene	ND	2.0		µg/L	1	10/25/2019 11:07:00 AM
1-Methylnaphthalene	ND	4.0		µg/L	1	10/25/2019 11:07:00 AM
2-Methylnaphthalene	ND	4.0		µg/L	1	10/25/2019 11:07:00 AM
Acetone	11	10		µg/L	1	10/25/2019 11:07:00 AM
Bromobenzene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Bromodichloromethane	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Bromoform	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Bromomethane	ND	3.0		µg/L	1	10/25/2019 11:07:00 AM
2-Butanone	ND	10		µg/L	1	10/25/2019 11:07:00 AM
Carbon disulfide	ND	10		µg/L	1	10/25/2019 11:07:00 AM
Carbon Tetrachloride	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Chlorobenzene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Chloroethane	ND	2.0		µg/L	1	10/25/2019 11:07:00 AM
Chloroform	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
Chloromethane	ND	3.0		µg/L	1	10/25/2019 11:07:00 AM
2-Chlorotoluene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM
4-Chlorotoluene	ND	1.0		µg/L	1	10/25/2019 11:07:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit

Page 4 of 28

Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		(	Client Sample ID: MW08
Project:	Salty Dog				Collection Date: 10/24/2019 10:05:00 AM
Lab ID:	1910D50-002	Matrix:	GROUNDWA	4	Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	10/25/2019 11:07:00 AM
Dibromochloromethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
Dibromomethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,2-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,3-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,4-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
Dichlorodifluoromethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,1-Dichloroethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,1-Dichloroethene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,2-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,3-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
2,2-Dichloropropane	ND	2.0	µg/L	1	10/25/2019 11:07:00 AM
1,1-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
Hexachlorobutadiene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
2-Hexanone	ND	10	µg/L	1	10/25/2019 11:07:00 AM
Isopropylbenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
4-Isopropyltoluene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
4-Methyl-2-pentanone	ND	10	µg/L	1	10/25/2019 11:07:00 AM
Methylene Chloride	ND	3.0	µg/L	1	10/25/2019 11:07:00 AM
n-Butylbenzene	ND	3.0	µg/L	1	10/25/2019 11:07:00 AM
n-Propylbenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
sec-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
Styrene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
tert-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/25/2019 11:07:00 AM
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
trans-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
Trichlorofluoromethane	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/25/2019 11:07:00 AM
Vinyl chloride	ND	1.0	µg/L	1	10/25/2019 11:07:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

\*

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits Р

Sample pH Not In Range RL Reporting Limit

Page 5 of 28

Surr: 4-Bromofluorobenzene

Surr: Dibromofluoromethane

SM2540C MOD: TOTAL DISSOLVED SOLIDS

Surr: Toluene-d8

Total Dissolved Solids

pН

SM4500-H+B / 9040C: PH

#### **Analytical Report** Lab Order 1910D50 Date Reported: 10/31/2019

10/25/2019 11:07:00 AM

10/25/2019 11:07:00 AM

10/25/2019 11:07:00 AM

10/28/2019 10:43:18 AM

10/28/2019 4:18:00 PM

Analyst: JRR

Analyst: KS

# Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp E	hergy Cor Client Sample ID: MW08							
Project:	Salty Dog			Collecti	on Date:	: 10/24	/2019 10:05:00 AM		
Lab ID:	1910D50-002	Matrix: GR	OUNDWA	Receiv	ed Date:	: 10/25	/2019 8:00:00 AM		
Analyses		Resu	lt R	L Qual	Units	DF	Date Analyzed		
EPA MET	HOD 8260B: VOLATILES						Analyst: CCM		
Xylenes,	Total	I	ND ·	1.5	µg/L	1	10/25/2019 11:07:00 AM		
Surr: 1	,2-Dichloroethane-d4	1	06 70-1	30	%Rec	1	10/25/2019 11:07:00 AM		

101

98.7

95.7

7.76

7700

70-130

70-130

70-130

200

%Rec

%Rec

%Rec

mg/L

pH units 1

н

\*D

1

1

1

1

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ene	ergy Cor	Client Sample ID: MW09
Project:	Salty Dog		Collection Date: 10/24/2019 10:50:00 AM
Lab ID:	1910D50-003	Matrix: GROUNDWA	<b>Received Date:</b> 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS					Analyst: MRA
Fluoride	ND	0.50	mg/L	5	10/25/2019 12:48:30 PM
Chloride	3300	100 *	mg/L	200	10/28/2019 2:26:18 PM
Nitrogen, Nitrite (As N)	ND	2.0	mg/L	20	10/25/2019 1:00:55 PM
Bromide	3.9	0.50	mg/L	5	10/25/2019 12:48:30 PM
Nitrogen, Nitrate (As N)	3.1	0.50	mg/L	5	10/25/2019 12:48:30 PM
Phosphorus, Orthophosphate (As P)	ND	2.5	mg/L	5	10/25/2019 12:48:30 PM
Sulfate	1900	100 *	mg/L	200	10/28/2019 2:26:18 PM
EPA METHOD 200.7: DISSOLVED METALS					Analyst: <b>bcv</b>
Calcium	1100	20	mg/L	20	10/25/2019 3:01:22 PM
Magnesium	190	10	mg/L	10	10/25/2019 2:06:41 PM
Potassium	14	10	mg/L	10	10/25/2019 2:06:41 PM
Sodium	1600	20	mg/L	20	10/25/2019 3:01:22 PM
EPA METHOD 8260B: VOLATILES					Analyst: CCM
Benzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Toluene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Ethylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2,4-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,3,5-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2-Dichloroethane (EDC)	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Naphthalene	ND	2.0	µg/L	1	10/25/2019 11:31:00 AM
1-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 11:31:00 AM
2-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 11:31:00 AM
Acetone	ND	10	µg/L	1	10/25/2019 11:31:00 AM
Bromobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Bromodichloromethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Bromoform	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Bromomethane	ND	3.0	µg/L	1	10/25/2019 11:31:00 AM
2-Butanone	ND	10	µg/L	1	10/25/2019 11:31:00 AM
Carbon disulfide	ND	10	µg/L	1	10/25/2019 11:31:00 AM
Carbon Tetrachloride	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Chlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Chloroethane	ND	2.0	µg/L	1	10/25/2019 11:31:00 AM
Chloroform	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Chloromethane	ND	3.0	µg/L	1	10/25/2019 11:31:00 AM
2-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
4-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		C	Client Sample ID: MW09
Project:	Salty Dog				Collection Date: 10/24/2019 10:50:00 AM
Lab ID:	1910D50-003	Matrix:	GROUNDWA	A	<b>Received Date:</b> 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	10/25/2019 11:31:00 AM
Dibromochloromethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Dibromomethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,3-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,4-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Dichlorodifluoromethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,1-Dichloroethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,1-Dichloroethene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,3-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
2,2-Dichloropropane	ND	2.0	µg/L	1	10/25/2019 11:31:00 AM
1,1-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Hexachlorobutadiene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
2-Hexanone	ND	10	µg/L	1	10/25/2019 11:31:00 AM
Isopropylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
4-Isopropyltoluene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
4-Methyl-2-pentanone	ND	10	µg/L	1	10/25/2019 11:31:00 AM
Methylene Chloride	ND	3.0	µg/L	1	10/25/2019 11:31:00 AM
n-Butylbenzene	ND	3.0	µg/L	1	10/25/2019 11:31:00 AM
n-Propylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
sec-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Styrene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
tert-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/25/2019 11:31:00 AM
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
trans-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
Trichlorofluoromethane	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/25/2019 11:31:00 AM
Vinyl chloride	ND	1.0	µg/L	1	10/25/2019 11:31:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits Р

Sample pH Not In Range RL Reporting Limit

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Surr: 4-Bromofluorobenzene

Surr: Dibromofluoromethane

SM2540C MOD: TOTAL DISSOLVED SOLIDS

Surr: Toluene-d8

Total Dissolved Solids

pН

SM4500-H+B / 9040C: PH

#### **Analytical Report** Lab Order 1910D50 Date Reported: 10/31/2019

10/25/2019 11:31:00 AM

10/25/2019 11:31:00 AM

10/25/2019 11:31:00 AM

10/28/2019 10:47:42 AM

10/28/2019 4:18:00 PM

Analyst: JRR

Analyst: KS

# Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp E	Energy Cor	ergy Cor Client Sample ID: MW09							
Project:	Salty Dog				Collecti	on Date:	10/24/	/2019 10:50:00 AM		
Lab ID:	1910D50-003	Matrix:	Matrix: GROUNDWA Received Date: 10/25/2019 8:00:00 AM							
Analyses		1	Result	RI	Qual	Units	DF	Date Analyzed		
EPA MET	HOD 8260B: VOLATILES							Analyst: CCM		
Xylenes,	Total		ND	1	.5	µg/L	1	10/25/2019 11:31:00 AM		
Surr: 1	,2-Dichloroethane-d4		104	70-13	30	%Rec	1	10/25/2019 11:31:00 AM		

103

99.7

97.7

7.35

8410

70-130

70-130

70-130

200

%Rec

%Rec

%Rec

mg/L

pH units 1

Н

\*D

1

1

1

1

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н
- Holding times for preparation or analysis exceeded ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ene	ergy Cor	Client Sample ID: MW10
Project:	Salty Dog		Collection Date: 10/24/2019 10:40:00 AM
Lab ID:	1910D50-004	Matrix: GROUNDWA	Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS					Analyst: MRA
Fluoride	ND	0.50	mg/L	5	10/25/2019 1:38:08 PM
Chloride	2700	100 *	mg/L	200	10/28/2019 2:38:39 PM
Nitrogen, Nitrite (As N)	ND	2.0	mg/L	20	10/25/2019 1:50:33 PM
Bromide	3.4	2.0	mg/L	20	10/25/2019 1:50:33 PM
Nitrogen, Nitrate (As N)	3.5	2.0	mg/L	20	10/25/2019 1:50:33 PM
Phosphorus, Orthophosphate (As P)	ND	10	mg/L	20	10/25/2019 1:50:33 PM
Sulfate	2200	100 *	mg/L	200	10/28/2019 2:38:39 PM
EPA METHOD 200.7: DISSOLVED METALS					Analyst: bcv
Calcium	600	10	mg/L	10	10/25/2019 2:09:00 PM
Magnesium	82	5.0	mg/L	5	10/25/2019 3:03:38 PM
Potassium	9.1	5.0	mg/L	5	10/25/2019 3:03:38 PM
Sodium	2300	50	mg/L	50	10/25/2019 3:05:54 PM
EPA METHOD 8260B: VOLATILES					Analyst: CCM
Benzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Toluene	ND	1.0	μg/L	1	10/25/2019 11:55:00 AM
Ethylbenzene	ND	1.0	μg/L	1	10/25/2019 11:55:00 AM
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2,4-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,3,5-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2-Dichloroethane (EDC)	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Naphthalene	ND	2.0	µg/L	1	10/25/2019 11:55:00 AM
1-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 11:55:00 AM
2-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 11:55:00 AM
Acetone	ND	10	µg/L	1	10/25/2019 11:55:00 AM
Bromobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Bromodichloromethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Bromoform	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Bromomethane	ND	3.0	µg/L	1	10/25/2019 11:55:00 AM
2-Butanone	ND	10	µg/L	1	10/25/2019 11:55:00 AM
Carbon disulfide	ND	10	µg/L	1	10/25/2019 11:55:00 AM
Carbon Tetrachloride	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Chlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Chloroethane	ND	2.0	µg/L	1	10/25/2019 11:55:00 AM
Chloroform	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Chloromethane	ND	3.0	µg/L	1	10/25/2019 11:55:00 AM
2-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
4-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		(	Client Sample ID: MW10
Project:	Salty Dog				Collection Date: 10/24/2019 10:40:00 AM
Lab ID:	1910D50-004	Matrix:	GROUNDWA	4	Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	10/25/2019 11:55:00 AM
Dibromochloromethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Dibromomethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,3-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,4-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Dichlorodifluoromethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,1-Dichloroethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,1-Dichloroethene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,3-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
2,2-Dichloropropane	ND	2.0	µg/L	1	10/25/2019 11:55:00 AM
1,1-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Hexachlorobutadiene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
2-Hexanone	ND	10	µg/L	1	10/25/2019 11:55:00 AM
Isopropylbenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
4-Isopropyltoluene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
4-Methyl-2-pentanone	ND	10	µg/L	1	10/25/2019 11:55:00 AM
Methylene Chloride	ND	3.0	µg/L	1	10/25/2019 11:55:00 AM
n-Butylbenzene	ND	3.0	µg/L	1	10/25/2019 11:55:00 AM
n-Propylbenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
sec-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Styrene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
tert-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/25/2019 11:55:00 AM
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
trans-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
Trichlorofluoromethane	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/25/2019 11:55:00 AM
Vinyl chloride	ND	1.0	µg/L	1	10/25/2019 11:55:00 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

Page 11 of 28

Surr: 4-Bromofluorobenzene

Surr: Dibromofluoromethane

SM2540C MOD: TOTAL DISSOLVED SOLIDS

Surr: Toluene-d8

Total Dissolved Solids

pН

SM4500-H+B / 9040C: PH

#### **Analytical Report** Lab Order 1910D50 Date Reported: 10/31/2019

%Rec

%Rec

%Rec

mg/L

pH units 1

Н

\*D

1

1

1

1

10/25/2019 11:55:00 AM

10/25/2019 11:55:00 AM

10/25/2019 11:55:00 AM

10/28/2019 10:52:12 AM

10/28/2019 4:18:00 PM

Analyst: JRR

Analyst: KS

# Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp E	Energy Cor		С	lient Sa	mple ID:	: MW1	0
Project:	Salty Dog				Collecti	on Date:	: 10/24/	/2019 10:40:00 AM
Lab ID:	1910D50-004	Matrix	GROUNI	OWA	Receiv	ed Date:	: 10/25/	/2019 8:00:00 AM
Analyses			Result	R	L Qual	Units	DF	Date Analyzed
EPA MET	HOD 8260B: VOLATILES							Analyst: CCM
Xylenes,	Total		ND	1	.5	µg/L	1	10/25/2019 11:55:00 AM
Surr: 1	,2-Dichloroethane-d4		104	70-1	30	%Rec	1	10/25/2019 11:55:00 AM

101

98.6

96.7

7.24

8040

70-130

70-130

70-130

100

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Date Reported: 10/31/2019

#### Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor Client Sample ID: MW14 **Project:** Salty Dog Collection Date: 10/24/2019 9:40:00 AM Lab ID: 1910D50-005 Received Date: 10/25/2019 8:00:00 AM Matrix: GROUNDWA

Analyses	Result	RL Qu	al Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS					Analyst: MRA
Fluoride	ND	0.50	mg/L	5	10/25/2019 2:02:57 PM
Chloride	2900	250	* mg/L	500	10/28/2019 3:15:40 PM
Nitrogen, Nitrite (As N)	ND	2.0	mg/L	20	10/25/2019 2:15:22 PM
Bromide	3.9	0.50	mg/L	5	10/25/2019 2:02:57 PM
Nitrogen, Nitrate (As N)	5.8	0.50	mg/L	5	10/25/2019 2:02:57 PM
Phosphorus, Orthophosphate (As P)	ND	2.5	mg/L	5	10/25/2019 2:02:57 PM
Sulfate	1900	250	* mg/L	500	10/28/2019 3:15:40 PM
EPA METHOD 200.7: DISSOLVED METALS					Analyst: bcv
Calcium	960	10	mg/L	10	10/25/2019 2:11:17 PM
Magnesium	160	10	mg/L	10	10/25/2019 2:11:17 PM
Potassium	12	10	mg/L	10	10/25/2019 2:11:17 PM
Sodium	1900	50	mg/L	50	10/25/2019 3:08:02 PM
EPA METHOD 8260B: VOLATILES					Analyst: CCM
Benzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Toluene	ND	1.0	μg/L	1	10/25/2019 12:19:00 PM
Ethylbenzene	ND	1.0	μg/L	1	10/25/2019 12:19:00 PM
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2,4-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,3,5-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2-Dichloroethane (EDC)	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Naphthalene	ND	2.0	µg/L	1	10/25/2019 12:19:00 PM
1-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 12:19:00 PM
2-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 12:19:00 PM
Acetone	ND	10	µg/L	1	10/25/2019 12:19:00 PM
Bromobenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Bromodichloromethane	ND	1.0	μg/L	1	10/25/2019 12:19:00 PM
Bromoform	ND	1.0	μg/L	1	10/25/2019 12:19:00 PM
Bromomethane	ND	3.0	µg/L	1	10/25/2019 12:19:00 PM
2-Butanone	ND	10	µg/L	1	10/25/2019 12:19:00 PM
Carbon disulfide	ND	10	µg/L	1	10/25/2019 12:19:00 PM
Carbon Tetrachloride	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Chlorobenzene	ND	1.0	μg/L	1	10/25/2019 12:19:00 PM
Chloroethane	ND	2.0	µg/L	1	10/25/2019 12:19:00 PM
Chloroform	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Chloromethane	ND	3.0	µg/L	1	10/25/2019 12:19:00 PM
2-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
4-Chlorotoluene	ND	1.0	μg/L	1	10/25/2019 12:19:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits Р

Sample pH Not In Range RL Reporting Limit

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Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		C	lient Sample ID: N	/IW14		
Project:	Salty Dog				Collection Date: 1	0/24/2019	9:40:00	) AM
Lab ID:	1910D50-005	Matrix:	GROUNDWA	4	Received Date: 1	0/25/2019	8:00:00	) AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	10/25/2019 12:19:00 PM
Dibromochloromethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Dibromomethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,3-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,4-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Dichlorodifluoromethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,1-Dichloroethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,1-Dichloroethene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,3-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
2,2-Dichloropropane	ND	2.0	µg/L	1	10/25/2019 12:19:00 PM
1,1-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Hexachlorobutadiene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
2-Hexanone	ND	10	µg/L	1	10/25/2019 12:19:00 PM
Isopropylbenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
4-Isopropyltoluene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
4-Methyl-2-pentanone	ND	10	µg/L	1	10/25/2019 12:19:00 PM
Methylene Chloride	ND	3.0	µg/L	1	10/25/2019 12:19:00 PM
n-Butylbenzene	ND	3.0	µg/L	1	10/25/2019 12:19:00 PM
n-Propylbenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
sec-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Styrene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
tert-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/25/2019 12:19:00 PM
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
trans-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
Trichlorofluoromethane	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/25/2019 12:19:00 PM
Vinyl chloride	ND	1.0	µg/L	1	10/25/2019 12:19:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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#### **Analytical Report** Lab Order 1910D50 Date Reported: 10/31/2019

# Hall Environmental Analysis Laboratory, Inc.

<b>CLIENT:</b>	Hilcorp San Juan LP/Hilcorp E	Energy Cor	Client S	ample ID	: MW14	4
Project:	Salty Dog		Collec	tion Date	: 10/24/	2019 9:40:00 AM
Lab ID:	1910D50-005	Matrix: GROUND	WA Rece	ived Date	:10/25/	2019 8:00:00 AM
Analyses		Result	RL Qua	al Units	DF	Date Analyzed
EPA MET	HOD 8260B: VOLATILES					Analyst: CCM
Xvlenes.	Total	ND	1.5	ua/l	1	10/25/2019 12·19·00 PM

Xylenes, Total	ND	1.5		µg/L	1	10/25/2019 12:19:00 PM
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	10/25/2019 12:19:00 PM
Surr: 4-Bromofluorobenzene	99.6	70-130		%Rec	1	10/25/2019 12:19:00 PM
Surr: Dibromofluoromethane	98.4	70-130		%Rec	1	10/25/2019 12:19:00 PM
Surr: Toluene-d8	96.5	70-130		%Rec	1	10/25/2019 12:19:00 PM
SM4500-H+B / 9040C: PH						Analyst: JRR
рН	7.29		н	pH units	1	10/28/2019 10:56:41 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: KS
Total Dissolved Solids	8860	200	*D	mg/L	1	10/28/2019 4:18:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Date Reported: 10/31/2019

Hall	Environmental	Analysis	Laboratory,	Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ene	ergy Cor		Client Sample ID: MW13
Project:	Salty Dog			Collection Date: 10/24/2019 11:40:00 AM
Lab ID:	1910D50-006	Matrix:	GROUNDWA	Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS					Analyst: MRA
Fluoride	4.4	0.50 *	mg/L	5	10/25/2019 2:27:47 PM
Chloride	19000	1000 *	mg/L	2000	10/28/2019 3:28:01 PM
Bromide	24	2.0	mg/L	20	10/25/2019 2:40:11 PM
Phosphorus, Orthophosphate (As P)	ND	2.5	mg/L	5	10/25/2019 2:27:47 PM
Sulfate	1600	1000 *	mg/L	2000	10/28/2019 3:28:01 PM
Nitrate+Nitrite as N	ND	20	mg/L	100	10/28/2019 3:52:42 PM
EPA METHOD 200.7: DISSOLVED METALS					Analyst: <b>bcv</b>
Calcium	3400	100	mg/L	100	10/25/2019 3:10:13 PM
Magnesium	440	10	mg/L	10	10/25/2019 2:13:33 PM
Potassium	37	10	mg/L	10	10/25/2019 2:13:33 PM
Sodium	11000	500	mg/L	500	10/25/2019 3:12:26 PM
EPA METHOD 8260B: VOLATILES					Analyst: CCM
Benzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Toluene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Ethylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2,4-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,3,5-Trimethylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2-Dichloroethane (EDC)	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2-Dibromoethane (EDB)	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Naphthalene	ND	2.0	µg/L	1	10/25/2019 12:42:00 PM
1-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 12:42:00 PM
2-Methylnaphthalene	ND	4.0	µg/L	1	10/25/2019 12:42:00 PM
Acetone	ND	10	µg/L	1	10/25/2019 12:42:00 PM
Bromobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Bromodichloromethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Bromoform	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Bromomethane	ND	3.0	µg/L	1	10/25/2019 12:42:00 PM
2-Butanone	ND	10	µg/L	1	10/25/2019 12:42:00 PM
Carbon disulfide	ND	10	µg/L	1	10/25/2019 12:42:00 PM
Carbon Tetrachloride	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Chlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Chloroethane	ND	2.0	µg/L	1	10/25/2019 12:42:00 PM
Chloroform	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Chloromethane	ND	3.0	µg/L	1	10/25/2019 12:42:00 PM
2-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
4-Chlorotoluene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
cis-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix в Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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Date Reported: 10/31/2019

### Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor	(	Client Sample ID: MW13
Project:	Salty Dog			Collection Date: 10/24/2019 11:40:00 AM
Lab ID:	1910D50-006	Matrix:	GROUNDWA	Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qua	l Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2-Dibromo-3-chloropropane	ND	2.0	µg/L	1	10/25/2019 12:42:00 PM
Dibromochloromethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Dibromomethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,3-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,4-Dichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Dichlorodifluoromethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,1-Dichloroethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,1-Dichloroethene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,3-Dichloropropane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
2,2-Dichloropropane	ND	2.0	µg/L	1	10/25/2019 12:42:00 PM
1,1-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Hexachlorobutadiene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
2-Hexanone	ND	10	µg/L	1	10/25/2019 12:42:00 PM
Isopropylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
4-Isopropyltoluene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
4-Methyl-2-pentanone	ND	10	µg/L	1	10/25/2019 12:42:00 PM
Methylene Chloride	ND	3.0	µg/L	1	10/25/2019 12:42:00 PM
n-Butylbenzene	ND	3.0	µg/L	1	10/25/2019 12:42:00 PM
n-Propylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
sec-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Styrene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
tert-Butylbenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/25/2019 12:42:00 PM
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
trans-1,2-DCE	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Trichlorofluoromethane	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/25/2019 12:42:00 PM
Vinyl chloride	ND	1.0	µg/L	1	10/25/2019 12:42:00 PM
Xylenes, Total	ND	1.5	µg/L	1	10/25/2019 12:42:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits Р

Sample pH Not In Range RL Reporting Limit

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#### **Analytical Report** Lab Order 1910D50 Hall Environmental Analysis Laboratory, Inc. Date Reported: 10/31/2019

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor Client Sample ID: MW13 **Project:** Salty Dog Collection Date: 10/24/2019 11:40:00 AM Lab ID: Received Date: 10/25/2019 8:00:00 AM 1910D50-006 Matrix: GROUNDWA Result DF Analyses **RL** Qual Units **Date Analyzed** EPA METHOD 8260B: VOLATILES Analyst: CCM 10/25/2019 12:42:00 PM Surr: 1.2-Dichloroethane-d4 104 70-130 %Rec 1 Surr: 4-Bromofluorobenzene 99.8 70-130 %Rec 1 10/25/2019 12:42:00 PM Surr: Dibromofluoromethane 10/25/2019 12:42:00 PM 100 70-130 %Rec 1 Surr: Toluene-d8 10/25/2019 12:42:00 PM 97.2 70-130 %Rec 1 SM4500-H+B / 9040C: PH Analyst: JRR pH units 1 10/28/2019 11:01:10 AM pН 7.17 н

40400

40.0

\*D

mg/L

1

#### Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Oualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit

SM2540C MOD: TOTAL DISSOLVED SOLIDS

**Total Dissolved Solids** 

S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- Analyte detected below quantitation limits J
- Р Sample pH Not In Range RL Reporting Limit
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Analyst: KS

10/28/2019 4:18:00 PM
### **Analytical Report** Lab Order 1910D50

Date Reported: 10/31/2019

## Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		Cli	ient Sample ID: MW12
Project:	Salty Dog			C	Collection Date: 10/24/2019 11:50:00 AM
Lab ID:	1910D50-007	Matrix:	GROUNDWA		<b>Received Date:</b> 10/25/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: MRA
Fluoride	ND	0.50		mg/L	5	10/25/2019 2:52:35 PM
Chloride	27000	2500	*	mg/L	5000	10/28/2019 3:40:21 PM
Bromide	35	2.0		mg/L	20	10/25/2019 3:04:59 PM
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	10/25/2019 2:52:35 PM
Sulfate	2400	50	*	mg/L	100	10/29/2019 11:51:46 AM
Nitrate+Nitrite as N	ND	20		mg/L	100	10/28/2019 4:05:03 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: <b>bcv</b>
Calcium	2800	100		mg/L	100	10/25/2019 3:14:46 PM
Magnesium	400	10		mg/L	10	10/25/2019 2:15:52 PM
Potassium	75	10		mg/L	10	10/25/2019 2:15:52 PM
Sodium	18000	500		mg/L	500	10/25/2019 3:17:02 PM
EPA METHOD 8260B: VOLATILES						Analyst: CCM
Benzene	26	2.0		µg/L	2	10/25/2019 1:06:00 PM
Toluene	12	2.0		µg/L	2	10/25/2019 1:06:00 PM
Ethylbenzene	2.6	2.0		µg/L	2	10/25/2019 1:06:00 PM
Methyl tert-butyl ether (MTBE)	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
1,2,4-Trimethylbenzene	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
1,3,5-Trimethylbenzene	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
1,2-Dichloroethane (EDC)	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
1,2-Dibromoethane (EDB)	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Naphthalene	ND	4.0		µg/L	2	10/25/2019 1:06:00 PM
1-Methylnaphthalene	ND	8.0		µg/L	2	10/25/2019 1:06:00 PM
2-Methylnaphthalene	ND	8.0		µg/L	2	10/25/2019 1:06:00 PM
Acetone	ND	20		µg/L	2	10/25/2019 1:06:00 PM
Bromobenzene	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Bromodichloromethane	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Bromoform	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Bromomethane	ND	6.0		µg/L	2	10/25/2019 1:06:00 PM
2-Butanone	ND	20		µg/L	2	10/25/2019 1:06:00 PM
Carbon disulfide	ND	20		µg/L	2	10/25/2019 1:06:00 PM
Carbon Tetrachloride	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Chlorobenzene	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Chloroethane	ND	4.0		µg/L	2	10/25/2019 1:06:00 PM
Chloroform	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
Chloromethane	ND	6.0		µg/L	2	10/25/2019 1:06:00 PM
2-Chlorotoluene	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
4-Chlorotoluene	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM
cis-1,2-DCE	ND	2.0		µg/L	2	10/25/2019 1:06:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits Р

Sample pH Not In Range RL Reporting Limit

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## **Analytical Report** Lab Order 1910D50

Date Reported: 10/31/2019

## Hall Environmental Analysis Laboratory, Inc.

CLIENT:	Hilcorp San Juan LP/Hilcorp Ener	rgy Cor		(	Client Sample ID: MW12
Project:	Salty Dog				Collection Date: 10/24/2019 11:50:00 AM
Lab ID:	1910D50-007	Matrix:	GROUNDWA	ł	Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES					Analyst: CCM
cis-1,3-Dichloropropene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,2-Dibromo-3-chloropropane	ND	4.0	µg/L	2	10/25/2019 1:06:00 PM
Dibromochloromethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Dibromomethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,2-Dichlorobenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,3-Dichlorobenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,4-Dichlorobenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Dichlorodifluoromethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,1-Dichloroethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,1-Dichloroethene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,2-Dichloropropane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,3-Dichloropropane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
2,2-Dichloropropane	ND	4.0	µg/L	2	10/25/2019 1:06:00 PM
1,1-Dichloropropene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Hexachlorobutadiene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
2-Hexanone	ND	20	µg/L	2	10/25/2019 1:06:00 PM
Isopropylbenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
4-Isopropyltoluene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
4-Methyl-2-pentanone	ND	20	µg/L	2	10/25/2019 1:06:00 PM
Methylene Chloride	ND	6.0	µg/L	2	10/25/2019 1:06:00 PM
n-Butylbenzene	ND	6.0	µg/L	2	10/25/2019 1:06:00 PM
n-Propylbenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
sec-Butylbenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Styrene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
tert-Butylbenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,1,1,2-Tetrachloroethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,1,2,2-Tetrachloroethane	ND	4.0	µg/L	2	10/25/2019 1:06:00 PM
Tetrachloroethene (PCE)	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
trans-1,2-DCE	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
trans-1,3-Dichloropropene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,2,3-Trichlorobenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,2,4-Trichlorobenzene	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,1,1-Trichloroethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,1,2-Trichloroethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Trichloroethene (TCE)	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Trichlorofluoromethane	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
1,2,3-Trichloropropane	ND	4.0	µg/L	2	10/25/2019 1:06:00 PM
Vinyl chloride	ND	2.0	µg/L	2	10/25/2019 1:06:00 PM
Xylenes, Total	22	3.0	µg/L	2	10/25/2019 1:06:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

D Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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pН

Total Dissolved Solids

## **Analytical Report** Lab Order 1910D50

## Hall Environmental Analysis Laboratory, Inc.

SM2540C MOD: TOTAL DISSOLVED SOLIDS

Date Reported: 10/31/2019

10/28/2019 11:05:39 AM

10/28/2019 4:18:00 PM

Analyst: KS

<b>CLIENT:</b>	Hilcorp San Juan LP/Hilcorp En	nergy Cor	Client Samp	le ID:	MW1	2
<b>Project:</b>	Salty Dog		Collection	Date:	10/24	/2019 11:50:00 AM
Lab ID:	1910D50-007	Matrix: GROUNDWA	Received	Date:	10/25	/2019 8:00:00 AM
Analyses		Result	RL Qual U	nits	DF	Date Analyzed
EPA MET	HOD 8260B: VOLATILES					Analyst: CCM
Surr: 1	,2-Dichloroethane-d4	106 70	-130 %	6Rec	2	10/25/2019 1:06:00 PM
Surr: 4	I-Bromofluorobenzene	101 70	-130 %	6Rec	2	10/25/2019 1:06:00 PM
Surr: E	Dibromofluoromethane	98.9 70	-130 %	6Rec	2	10/25/2019 1:06:00 PM
Surr: T	Toluene-d8	96.2 70	-130 %	6Rec	2	10/25/2019 1:06:00 PM
SM4500-ł	H+B / 9040C: PH					Analyst: JRR

7.34

57000

Н

\*D

200

pH units 1

mg/L

1

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:** 

\*

- Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix
- D Н Holding times for preparation or analysis exceeded
- ND
- Not Detected at the Reporting Limit PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- в Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range
- RL Reporting Limit

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Client: Project:	Hilcorp San Juan I Salty Dog	LP/Hilco	rp Energy (	Corp						
Sample ID: MB-B	Samp	Type: ME	BLK	Tes	tCode: El	PA Method	200.7: Dissol	ved Meta	ls	
Client ID: PBW	Bate	ch ID: <b>B6</b>	3986	F	RunNo: 6	3986				
Prep Date:	Analysis	Date: 10	)/25/2019	S	SeqNo: 2	188698	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0					-			
Magnesium	ND	1.0								
Potassium	ND	1.0								
Sodium	ND	1.0								
Sample ID: LCS-E	3 Samp	Type: LC	S	Tes	tCode: El	PA Method	200.7: Dissol	ved Meta	ls	
Client ID: LCSW	Bate	ch ID: <b>B6</b>	3986	F	RunNo: 6	3986				
Prep Date:	Analysis	Date: 10	)/25/2019	S	SeqNo: 2	188700	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	51	1.0	50.00	0	102	85	115			
Magnesium	51	1.0	50.00	0	102	85	115			
Potassium	50	1.0	50.00	0	100	85	115			
Sodium	51	1.0	50.00	0	103	85	115			

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

1910D50

31-Oct-19

WO#:

Client:HProject:S	lilcorp San Juan l alty Dog	LP/Hilco	orp Energy (	Corp						
Sample ID: MB	Samp	Type: <b>m</b> l	blk	Tes	tCode: El	PA Method	300.0: Anions	5		
Client ID: PBW	Bat	ch ID: Re	3973	F	RunNo: 6	3973				
Prep Date:	Analysis	Date: 1	0/25/2019	S	SeqNo: 2	189737	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophospha	te (As P ND	0.50								
Sample ID: LCS	Samp	Type: Ics	6	Tes	tCode: El	PA Method	300.0: Anions	;		
Client ID: LCSW	Bat	ch ID: Re	3973	F	RunNo: <b>6</b> :	3973				
Prep Date:	Analysis	Date: 1	0/25/2019	S	SeqNo: 2	189738	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.54	0.10	0.5000	0	107	90	110			
Nitrogen, Nitrite (As N)	0.97	0.10	1.000	0	97.0	90	110			
Bromide	2.5	0.10	2.500	0	98.7	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	101	90	110			
Phosphorus, Orthophospha	te (As P 4.8	0.50	5.000	0	96.7	90	110			
Sample ID: MB	Samp	Type: <b>m</b> l	blk	Tes	tCode: El	PA Method	300.0: Anions	5		
Client ID: PBW	Bat	ch ID: Re	64032	F	RunNo: 6	4032				
Prep Date:	Analysis	Date: 1	0/28/2019	5	SeqNo: 2	190505	Units: <b>mg/L</b>			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								
Nitrate+Nitrite as N	ND	0.20								
Sample ID: LCS	Samp	Type: Ics	5	Tes	tCode: El	PA Method	300.0: Anions	;		
Client ID: LCSW	Bat	ch ID: Re	64032	F	RunNo: 6	4032				
Prep Date:	Analysis	Date: 1	0/28/2019	S	SeqNo: 2	190506	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	98.6	90	110			
Sulfate	10	0.50	10.00	0	100	90	110			
Nitrate+Nitrite as N	3.6	0.20	3.500	0	103	90	110			
Sample ID: MB	Samp	Type: <b>m</b> l	blk	Tes	tCode: El	PA Method	300.0: Anions	5		
Client ID: PBW	Bat	ch ID: R6	64044	F	RunNo: 6	4044				
Prep Date:	Analysis	Date: 1	0/29/2019	S	SeqNo: 2	192065	Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

**Qualifiers:** 

Н

\* Value exceeds Maximum Contaminant Level. D

Sample Diluted Due to Matrix Holding times for preparation or analysis exceeded В Analyte detected in the associated Method Blank Е Value above quantitation range

J

- RL Reporting Limit

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1910D50

31-Oct-19

WO#:

Analyte detected below quantitation limits

Р Sample pH Not In Range

ND Not Detected at the Reporting Limit PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix

1910D50

31-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Project:	Hilcorp San Juan LP/H Salty Dog	ilcorp Energy (	Corp					
Sample ID: MB	SampType	: mblk	Tes	tCode: EPA Me	ethod 300.0:	Anions		
Client ID: PBW	Batch ID:	R64044	F	RunNo: <b>64044</b>				
Prep Date:	Analysis Date:	10/29/2019	S	GeqNo: 219206	65 Units	: mg/L		
Analyte	Result P	QL SPK value	SPK Ref Val	%REC Low	vLimit High	Limit %RPD	RPDLimit	Qual
Sulfate	ND (	).50						
Sample ID: LCS	SampType	: Ics	Tes	tCode: EPA Me	ethod 300.0:	Anions		
Client ID: LCSW	Batch ID:	R64044	F	RunNo: <b>64044</b>				
Prep Date:	Analysis Date:	10/29/2019	S	SeqNo: 219206	66 Units	mg/L		
Analyte	Result P	QL SPK value	SPK Ref Val	%REC Low	vLimit High	Limit %RPD	RPDLimit	Qual
Sulfate	9.8 0	0.50 10.00	0	97.8	90	110		

#### Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix

- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client:	Hilcorp San Juan LP/Hilcorp Energy Corp
Project:	Salty Dog

Sample ID: 100ng Ics	SampT	ype: LC	s	Test	tCode: EF	PA Method	8260B: VOLA	TILES		
Client ID: LCSW	Batch	ו ID: <b>R6</b>	3964	R	tunNo: 63	3964				
Prep Date:	Analysis D	ate: 10	/25/2019	S	SeqNo: 2188165		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	88.7	70	130			
Toluene	17	1.0	20.00	0	87.2	70	130			
Chlorobenzene	18	1.0	20.00	0	90.0	70	130			
1,1-Dichloroethene	16	1.0	20.00	0	77.8	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	86.4	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.5	70	130			
Surr: Toluene-d8	9.8		10.00		97.5	70	130			
Sample ID: rb	SampT	уре: МВ		Test	tCode: EF	A Method	8260B: VOLA	<b>\TILES</b>		
Client ID: PBW	Batch	וD: <b>R6</b>	3964	R	tunNo: 63	3964				
Prep Date:	Analysis D	)ate: 10	/25/2019	S	SeqNo: 2188167					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

\* Value exceeds Maximum Contaminant Level.

D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р RL Page 25 of 28

1910D50

31-Oct-19

WO#:

Sample pH Not In Range Reporting Limit

Project:     Satty Dog       Sampl D: rb     SampType: MBLK     TestCode: EPA Method 8260B; VOLATILES       Client ID:     PBW     Batch ID: R63964     RunNo: 63964       Prep Date:     Analysis Date:     10/25/2019     SeqNo: 2188167     Units: µg/L       Analyse     Result     POL     SPK value     SPK Ref Val     %REC     LowLinit     HighLinit     %RPD     RPDLinit     Qual       4Chloroblane     ND     1.0     dis13.Dichloropropene	Client: Hi	lcorp San Juan L	P/Hilco	orp Energy	Corp									
Sample D: rb     Samplype: MBLK     TestCode: EPA Method 8260B: VOLATLES       Client ID: PBW     Batch ID: R3396 Amiliary Signature     KanNo: 63964     Units: µg/L       Analyte     Res     VPD     N     Gala       Analyte     NO     1.0     SeqNo: 2188167     Units: µg/L     Qual       4Chloroblume     NO     1.0     SeqNo: 2188167     Units: 1000 NO     NO     SeqNo: 2188167     SeqNo: 2188167     Volts: 1000 NO     Qual       4Chloroblume     ND     1.0     SeqNo: 2188167     SeqNo: 21881	Project: Sa	Ity Dog												
Client ID:   PBW   Bath ID:   RBush ID:	Sample ID: rb	SampT	ype: M	BLK	TestCode: EPA Method 8260B: VOLATILES									
Prop Date:     Analysis     Fold     SPK value     SPK Ref Val     % Ref Val     Value     HighLinit     % RPD     RPDLinit     Qual       Analyse     ND     1.0     SPK value     % REf Val     % REf Val     Ker Val     HighLinit     % RPD     RPDLinit     Qual       Achtorobuene     ND     1.0     Second	Client ID: PBW	Batcl	h ID: R	63964	F	RunNo: 6	3964							
Analyte     Result     POL     SPK value     SPK Ref Val     % REC     LowLimit     HighLimit     % RPD     RPDLimit     Qual       4Chlorodbulene     ND     1.0     - <th>Prep Date:</th> <th>Analysis E</th> <th>Date: 1</th> <th>0/25/2019</th> <th>\$</th> <th>SeqNo: 2</th> <th>188167</th> <th>Units: µg/L</th> <th colspan="5">Units: µg/L</th>	Prep Date:	Analysis E	Date: 1	0/25/2019	\$	SeqNo: 2	188167	Units: µg/L	Units: µg/L					
4Chlorotlene     ND     1.0       cis1.2bChCorpopene     ND     1.0       cis1.3bChCorpopene     ND     2.0       Diornon-Schloropopene     ND     1.0       12.bDromo-Schloropopene     ND     1.0       Diornonochloropopene     ND     1.0       12.bChCorpopene     ND     1.0       12.bChCorpopene     ND     1.0       12.bChCorpopene     ND     1.0       12.bChCorpopene     ND     1.0       14.bChCorpopene     ND     1.0       1.1-DichCorpopene     ND     1.0       1.2.bChCorpopene     ND     1.0       1.3.bChCorpopene     ND     1.0       1.4.beachlockLucker     ND     1.0       SteproptiLuene     ND     1.0       SteproptiLuene     ND </th <th>Analyte</th> <th>Result</th> <th>PQL</th> <th>SPK value</th> <th>SPK Ref Val</th> <th>%REC</th> <th>LowLimit</th> <th>HighLimit</th> <th>%RPD</th> <th>RPDLimit</th> <th>Qual</th> <th></th>	Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual			
isial.20CE     ND     1.0       cis.1.3.Dichinopropen     ND     1.0       1.2.Dicrono.3.chinopropane     ND     2.0       Dikromonkhane     ND     1.0       1.2.Dichino.3.chinopropane     ND     1.0       1.2.Dichhoroberzene     ND     1.0       1.3.Dichhoroberzene     ND     1.0       1.3.Dichhoroberzene     ND     1.0       1.4.Dichhoroberzene     ND     1.0       1.1.Dichhoromethane     ND     1.0       1.1.Dichhoromethane     ND     1.0       1.1.Dichhoromethane     ND     1.0       1.2.Dichhoropropane     ND     1.0       1.3.Dichhoropropane     ND     1.0       1.3.Dichhoropropane     ND     1.0       2.2.Dichhoropropane     ND     1.0       2.2.Dichhoropropane     ND     1.0       2.2.Dichhoropropane     ND     1.0       2.4.Barone     ND     1.0       4.BarproyNoluene     ND     1.0       4.BarproyNoluene     ND     1.0	4-Chlorotoluene	ND	1.0											
isi.13-Dichlorogroppene     ND     1.0       12-Dibromo-S-chlorogroppene     ND     2.0       Dibromo-chloromethane     ND     1.0       12-Dichlorobenzene     ND     1.0       12-Dichlorobenzene     ND     1.0       12-Dichlorobenzene     ND     1.0       12-Dichlorobenzene     ND     1.0       11-Dichlorobenzene     ND     1.0       11-Dichlorobenzene     ND     1.0       12-Dichloropropene     ND     1.0       22-Dichloropropene     ND     1.0       22-Dichloropropene     ND     1.0       24-Dichloropropene     ND     1.0       24-Dichloropropene     ND     1.0       24-Dichloropropene     ND     1.0       14-Dichloropropene     ND     1.0       14-Dichloropropene     ND     1.0	cis-1,2-DCE	ND	1.0											
1.2-Diromo-3-chirorgorpane     ND     2.0       Diromo-chiroromethane     ND     1.0       Diromo-chiroromethane     ND     1.0       1.2-Dichlorobenzane     ND     1.0       1.3-Dichlorobenzane     ND     1.0       1.3-Dichlorobenzane     ND     1.0       1.4-Dichlorobenzane     ND     1.0       1.1-Dichlorobenzane     ND     1.0       1.1-Dichlorobenzane     ND     1.0       1.1-Dichlorobenzane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       Hexachtory Dublene     ND     1.0       Hexachtory Dublene     ND     1.0       Helyachtory Dublene     ND     1.0       Helyachtory Dublene     ND     1.0       Helyachtory Dublene     ND     1.0       Helyachty Dublenzene     ND     1.0       Helyachty Dublenzene     ND     1.0 </td <td>cis-1,3-Dichloropropene</td> <td>ND</td> <td>1.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	cis-1,3-Dichloropropene	ND	1.0											
Dibroomethane     ND     1.0       Dibroomethane     ND     1.0       1.2-Diblobrobenzene     ND     1.0       1.3-Diblorobenzene     ND     1.0       1.4-Diblobrobenzene     ND     1.0       Dibroomethane     ND     1.0       1.1-Dibloroethane     ND     1.0       1.2-Dibloropropane     ND     1.0       1.2-Dibloropropane     ND     1.0       2.2-Dibloropropane     ND     1.0       1.3-Dibloropropane     ND     1.0       2.2-Dibloropropane     ND     1.0       1.3-Dibloropropane     ND     1.0       2.4-Baxanone     ND     1.0       Stopropylouzene     ND     1.0       4-Aberby2-pentanone     ND     1.0       Habry2-pentanone     ND <td>1,2-Dibromo-3-chloropropane</td> <td>ND</td> <td>2.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1,2-Dibromo-3-chloropropane	ND	2.0											
Dikromerikane     ND     1.0       1,2-Dichlorobenzene     ND     1.0       1,4-Dichlorobenzene     ND     1.0       1,4-Dichlorobenzene     ND     1.0       1,1-Dichlorobenzene     ND     1.0       1,1-Dichlorobenzene     ND     1.0       1,1-Dichlorobenzene     ND     1.0       1,1-Dichloropropane     ND     1.0       1,2-Dichloropropane     ND     1.0       1,2-Dichloropropane     ND     1.0       1,2-Dichloropropane     ND     1.0       Hexachlorobutadiene     ND     1.0       Holbybenzene     ND     1.0 <td< td=""><td>Dibromochloromethane</td><td>ND</td><td>1.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Dibromochloromethane	ND	1.0											
1.2-Dichlorobenzene     ND     1.0       1.4-Dichlorobenzene     ND     1.0       1.4-Dichlorobenzene     ND     1.0       Dichlorodifluoromethane     ND     1.0       1.1-Dichlorochane     ND     1.0       1.1-Dichlorochane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       1.1-Dichloropropane     ND     1.0       2.2-Dichloropropane     ND     1.0       Hexachlorobutadiene     ND     1.0 <tr< td=""><td>Dibromomethane</td><td>ND</td><td>1.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>	Dibromomethane	ND	1.0											
1.3-Dichlorobenzene     ND     1.0       1.4-Dichlorobenzene     ND     1.0       Dichlorobenzene     ND     1.0       1.1-Dichlorobenzene     ND     1.0       1.1-Dichlorobenzene     ND     1.0       1.2-Dichloropropane     ND     1.0       1.2-Dichloropropane     ND     1.0       2.2-Dichloropropane     ND     1.0       1.4-Dichloropropane     ND     1.0       1.4-Dichloropropane     ND     1.0       Hexachlorobutadiene     ND     1.0       Syrene     ND     1.0       1.1,1.2-Tettachlorobenane     ND     1.0       1.1,2.2-Tettachlorobenane     ND     1.0	1,2-Dichlorobenzene	ND	1.0											
1.4-Dichlorodhuoromethane     ND     1.0       Dichlorodhuoromethane     ND     1.0       1.1-Dichloroethane     ND     1.0       1.1-Dichloroethane     ND     1.0       1.2-Dichloroptopane     ND     1.0       1.2-Dichloroptopane     ND     1.0       1.2-Dichloroptopane     ND     1.0       2.2-Dichloroptopane     ND     1.0       1.1-Dichloroptopane     ND     1.0       2.2-Dichloroptopane     ND     1.0       2-Dichloroptopane     ND     1.0       4-Disoptopitoluene     ND     1.0       4-Disoptopitoluene     ND     3.0       -Propylebraene     ND     1.0       Hottybenzene     ND     1.0       1.1,2-Teitrachloroethane     ND     2.0       trans-1,2-DCE     ND     1.0       1.2.4	1,3-Dichlorobenzene	ND	1.0											
Dicklorodifluoromethane     ND     1.0       1,1-Dickloromethane     ND     1.0       1,1-Dickloromethane     ND     1.0       1,2-Dickloropropane     ND     1.0       1,3-Dickloropropane     ND     1.0       2,2-Dickloropropane     ND     2.0       1,1-Dickloropropane     ND     1.0       2,2-Dickloropropane     ND     1.0       Paschkorobutadiene     ND     1.0       Paschkorobutadiene     ND     1.0       Stopropylbenzene     ND     1.0       Hethyl-penatanone     ND     1.0       Methyl-penatanone     ND     1.0       Styreme     ND     1.0       1,1,2-2-Tetackloromethane     ND     1.0       1,1,2-Tetackloromethane     ND     1.0       1,2-Tetackloromethane     ND     1.0       1,2-Tetackloromethane	1,4-Dichlorobenzene	ND	1.0											
1,1-Dichloroethane   ND   1.0     1,1-Dichloropropane   ND   1.0     1,2-Dichloropropane   ND   1.0     1,3-Dichloropropane   ND   1.0     2,2-Dichloropropane   ND   1.0     2,2-Dichloropropane   ND   1.0     2,2-Dichloropropane   ND   1.0     2,2-Dichloropropane   ND   1.0     1,1-Dichloropropane   ND   1.0     2,2-Dichloropropane   ND   1.0     4-Soproy/Ibuene   ND   1.0     4-Soproy/Ibuene   ND   3.0    Pory/Bonzene   ND   1.0     Soprose   ND   1.0     1,1,1,2-Tercholoroethane   ND   1.0     1,1,2-Tercholoroethane   ND   1.0     1,2,3-Tichloroethane   ND   1.0     1,2,3-Tichloroethane	Dichlorodifluoromethane	ND	1.0											
1,1-Dichloropropane     ND     1.0       1,2-Dichloropropane     ND     1.0       1,3-Dichloropropane     ND     1.0       2,2-Dichloropropane     ND     2.0       1,1-Dichloropropane     ND     1.0       Hexachlorobutadiene     ND     1.0       2-Hexanone     ND     1.0       Isopropylbenzene     ND     1.0       4-Kastnov     ND     3.0       n-Butylbenzene     ND     3.0       n-Butylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       Styrene     ND     1.0       1,1,2-Tetrachloroethane     ND     1.0       1,1,2-Tetrachloroethane     ND     1.0       1,1,2-Tetrachloroethane     ND     1.0       1,2-Tetrachloroethane     ND     1.0       1,2-Tetrachloroethane     ND	1,1-Dichloroethane	ND	1.0											
1.2-Dichloropropane   ND   1.0     1.3-Dichloropropane   ND   1.0     2.2-Dichloropropane   ND   2.0     1.1-Dichloropropane   ND   1.0     Hexachlorobutadiene   ND   1.0     2-Hexanone   ND   1.0     Sepropylbenzene   ND   1.0     4-Hsorpoylbulene   ND   1.0     4-Methyl-2-pentanone   ND   1.0     Methylene Chloride   ND   3.0     n-Butylbenzene   ND   1.0     sec-Butylbenzene   ND   1.0     styrene   ND   1.0     styrene   ND   1.0     styrene   ND   1.0     styrene   ND   1.0     1,1,1_2-Tetrachloroethane   ND   1.0     1,1,2_2-Tetrachloroethane   ND   1.0     1,2_3-Trichloroethane   ND   1.0     1,2_3-Trichloroethane   ND   1.0     1,2_4-Trichloroethane   ND   1.0     1,1_4-Trichloroethane   ND   1.0     1,1_4-Trichloroethane   ND   1.0	1,1-Dichloroethene	ND	1.0											
1.3.Dichloropropane   ND   1.0     2.2.Dichloropropane   ND   2.0     1.1.Dichloropropane   ND   1.0     Hexachlorobutadiene   ND   1.0     Hexachlorobutadiene   ND   1.0     Stopropythenzene   ND   1.0     Hexachlorobutadiene   ND   1.0     Hexachlorobutadiene   ND   1.0     Hexachlorobutadiene   ND   1.0     Hexachlorobutadiene   ND   1.0     Hospropythenzene   ND   1.0     Hotpiczene   ND   3.0     n-Butybenzene   ND   3.0     n-Propythenzene   ND   1.0     Styrene   ND   1.0     Styrene   ND   1.0     1,1,1_2-Tetrachloroethane   ND   1.0     1,1,2_2-Tetrachloroethane   ND   1.0     1,2_2-Tetrachloroethane   ND   1.0     1,3_Trichlorobenzene   ND   1.0     1,2_4-Trichlorobenzene   ND   1.0     1,2_4-Trichlorobenzene   ND   1.0     1,1_2-Trichloroethane   ND	1,2-Dichloropropane	ND	1.0											
2.2-Dichloropropane     ND     2.0       1,1-Dichloropropene     ND     1.0       Hexachlorobutadiene     ND     1.0       2-Hexanone     ND     1.0       Isopropylbenzene     ND     1.0       4-Jospropylbulene     ND     1.0       4-Jospropylbulene     ND     1.0       4-Methyl-2-pentanone     ND     1.0       Methylene Chloride     ND     3.0       n-Burylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       styrene     ND     1.0       1,1,2-Tetrachloroethane     ND     1.0       1,1,1,2-Tetrachloroethane     ND     1.0       1,1,2-Zetrachloroethane     ND     1.0       1,1,2-Zetrachloroethane     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,1,2-Trichlorobenzene     ND     1.0       1,1,2-Trichlorobenzene     ND     1.0	1,3-Dichloropropane	ND	1.0											
1.1-Dichloropropene   ND   1.0     Hexachlorobutadiene   ND   1.0     2-Hexanone   ND   1.0     Stopropythenzene   ND   1.0     4-Isopropythenzene   ND   1.0     4-Stopropythenzene   ND   1.0     4-Methyl-2-pentanone   ND   1.0     Methylene Chloride   ND   3.0     n-Butylbenzene   ND   1.0     sec-Butylbenzene   ND   1.0     Styrene   ND   1.0     Styrene   ND   1.0     Styrene   ND   1.0     1.1,1,2-Tetrachloroethane   ND   1.0     trans-1,2-DCE   ND   1.0     trans-1,3-Dichloropropene   ND   1.0     1,2,4-Trichloroethane   ND   1.0     1,2,4-Trichlorobenzene   ND   1.0     1,2,4-Trichlorobenzene   ND   1.0     1,1,2-Trichloroethane   ND   1.0     1,1,2-Trichloroethane   ND   1.0     1,1,2-Trichloroethane   ND   1.0     1,1,2-Trichloroethane   ND	2,2-Dichloropropane	ND	2.0											
Hexachlorobutadiene     ND     1.0       2-Hexanone     ND     10       Isopropylbenzene     ND     1.0       4-Isopropylbuene     ND     1.0       4-Sopropylbuene     ND     1.0       4-Methyl-2-pentanone     ND     1.0       Methylene Chloride     ND     3.0       n-Propylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       styrene     ND     1.0       tert-Butylbenzene     ND     1.0       1,1,2,2-Tetrachloroethane     ND     1.0       trans-1,2-DCE     ND     1.0       trans-1,3-Dichloroptopene     ND     1.0       1,2,4-Trichloroethane     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloro	1,1-Dichloropropene	ND	1.0											
2-Hexanone     ND     10       Isopropylbenzene     ND     1.0       4-Isopropylbulene     ND     1.0       4-Methyl-2-pentanone     ND     1.0       Methylene Chloride     ND     3.0       n-Butylbenzene     ND     3.0       n-Propylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       syrene     ND     1.0       styrene     ND     1.0       trt-Butylbenzene     ND     1.0       tyrene     ND     1.0       tyrene     ND     1.0       tyrene     ND     1.0       tyrtachloroethane     ND     2.0       Tetrachloroethane     ND     1.0       tyrtachloropropene     ND     1.0       tyrtachlorobenzene     ND     1.0	Hexachlorobutadiene	ND	1.0											
Isopropylbenzene     ND     1.0       4-Isopropylbulene     ND     1.0       4-Methyl-2-pentanone     ND     10       Methylene Chloride     ND     3.0       n-Butylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       syrene     ND     1.0       tert-Butylbenzene     ND     1.0       tyrene     ND     1.0       tert-Butylbenzene     ND     1.0       tyrene     ND     1.0       tyrene     ND     1.0       1,1,2-Zretrachloroethane     ND     2.0       Tetrachloroethane     ND     1.0       trans-1,2-DCE     ND     1.0       trans-1,3-Dichloropropene     ND     1.0       1,2,4-Trichloroethane     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,1,4-Trichlorobenzene     ND     1.0       1,1,1-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND	2-Hexanone	ND	10											
Happropyltoluene   ND   1.0     4-Methyl-2-pentanone   ND   10     Methylene Chloride   ND   3.0     n-Butylbenzene   ND   3.0     n-Propylbenzene   ND   1.0     sec-Butylbenzene   ND   1.0     Styrene   ND   1.0     tert-Butylbenzene   ND   1.0     tyrene   ND   1.0     1,1,2-Tetrachloroethane   ND   2.0     Tetrachloroethane   ND   1.0     trans-1,2-DCE   ND   1.0     1,2,3-Trichlorobenzene   ND   1.0     1,2,4-Trichlorobenzene   ND   1.0     1,2,3-Trichlorobenzene   ND   1.0     1,2,4-Trichlorobenzene   ND   1.0     1,1,1-Trichlorobenzene   ND   1.0     1,1,1-Trichlorobenzene   ND   1.0     1,1,2-Trichlorobenzene   ND   1.0     1,1,2-Trichlorobenzene   ND   1.0     1,1,2-Trichlorobenzene   ND   1.0     1,1,2-Trichlorobenzene   ND   1.0     1,1,2-Trichlorobethane	Isopropylbenzene	ND	1.0											
Attrity-2-pentanone     ND     10       Methylene Chloride     ND     3.0       n-Butylbenzene     ND     3.0       n-Propylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       Styrene     ND     1.0       tert-Butylbenzene     ND     1.0       1,1,2.2-Tetrachloroethane     ND     1.0       1,1,2.2-Tetrachloroethane     ND     2.0       Tetrachloroethane     ND     1.0       trans-1,2-DCE     ND     1.0       trans-1,2-DCE     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,1,1-Trichlorobenzene     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0 <td< td=""><td>4-Isopropyltoluene</td><td>ND</td><td>1.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	4-Isopropyltoluene	ND	1.0											
Methylen Chloride     ND     3.0       n-Butylbenzene     ND     3.0       n-Propylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       Styrene     ND     1.0       tert-Butylbenzene     ND     1.0       ttr-Butylbenzene     ND     1.0       ttr-Butylbenzene     ND     1.0       ttr-Butylbenzene     ND     1.0       1,1,2-Tetrachloroethane     ND     2.0       Tetrachloroethane     ND     1.0       trans-1,2-DCE     ND     1.0       trans-1,3-Dichloropropene     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,2,4-Trichlorobenzene     ND     1.0       1,1,1-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1	4-Methyl-2-pentanone	ND	10											
ND     3.0       n-Propylbenzene     ND     1.0       sec-Butylbenzene     ND     1.0       Styrene     ND     1.0       Styrene     ND     1.0       1,1,2-Tetrachloroethane     ND     1.0       1,1,2-Tetrachloroethane     ND     2.0       Tetrachloroethene (PCE)     ND     1.0       1,2,3-Trichloroptopene     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,1,1-Trichloroethane     ND     1.0       1,2,3-Trichlorobenzene     ND     1.0       1,1,1-Trichloroethane     ND     1.0       1,1,1-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0       1,1,2-Trichloroethane     ND     1.0	Methylene Chloride	ND	3.0											
n-Propylbenzene   ND   1.0     sec-Butylbenzene   ND   1.0     Styrene   ND   1.0     tert-Butylbenzene   ND   1.0     1,1,1,2-Tetrachloroethane   ND   1.0     1,1,2,2-Tetrachloroethane   ND   2.0     Tetrachloroethane   ND   1.0     trans-1,2-DCE   ND   1.0     trans-1,3-Dichloropropene   ND   1.0     1,2,3-Trichloroethane   ND   1.0     1,2,4-Trichloroethane   ND   1.0     1,1,1-Trichloroethane   ND   1.0     1,1,2-Trichloroethane   ND   1.0     Trichloroethane   ND   1.0	n-Butvlbenzene	ND	3.0											
sec-ButylbenzeneND1.0StyreneND1.0tert-ButylbenzeneND1.01,1,1,2-TetrachloroethaneND1.01,1,2,2-TetrachloroethaneND2.0Tetrachloroethene (PCE)ND1.0trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichloroethaneND1.01,2,4-TrichloroethaneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0Trichloroethane </td <td>n-Propylbenzene</td> <td>ND</td> <td>1.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	n-Propylbenzene	ND	1.0											
StyreneND1.0tert-ButylbenzeneND1.01,1,2-TetrachloroethaneND1.01,1,2-TetrachloroethaneND2.0Tetrachloroethene (PCE)ND1.0trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichlorobenzeneND1.01,2,4-TrichloroethaneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0	sec-Butvlbenzene	ND	1.0											
tert-ButylbenzeneND1.01,1,2-TetrachloroethaneND1.01,1,2-TetrachloroethaneND2.0Tetrachloroethene (PCE)ND1.0trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichlorobenzeneND1.01,2,4-TrichloroethaneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0	Styrene	ND	1.0											
InterferenceND1.01,1,2-TetrachloroethaneND2.0Tetrachloroethane (PCE)ND1.0trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichlorobenzeneND1.01,2,4-TrichlorobenzeneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.0	tert-Butvlbenzene	ND	1.0											
InitialInitial1,1,2,2-TetrachloroethaneND2.0Tetrachloroethene (PCE)ND1.0trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichlorobenzeneND1.01,2,4-TrichlorobenzeneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0TrichloroethaneND1.0TrichloroethaneND1.0	1 1 1 2-Tetrachloroethane	ND	1.0											
Tetrachloroethene (PCE)ND1.0trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichlorobenzeneND1.01,2,4-TrichloroethaneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.0	1 1 2 2-Tetrachloroethane	ND	2.0											
trans-1,2-DCEND1.0trans-1,3-DichloropropeneND1.01,2,3-TrichlorobenzeneND1.01,2,4-TrichlorobenzeneND1.01,1,1-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,1,2-TrichloroethaneND1.01,101.01.01,12-TrichloroethaneND1.01,101.01.01,12-TrichloroethaneND1.0	Tetrachloroethene (PCF)	ND	1.0											
trans-1,3-Dichloropropene ND 1.0   1,2,3-Trichlorobenzene ND 1.0   1,2,4-Trichlorobenzene ND 1.0   1,1,1-Trichloroethane ND 1.0   1,1,2-Trichloroethane ND 1.0   1,1,2-Trichloroethane ND 1.0   1,1,2-Trichloroethane ND 1.0   1,1,2-Trichloroethane ND 1.0	trans-1 2-DCF	ND	1.0											
ItemItem1,2,3-TrichlorobenzeneND1,2,4-TrichlorobenzeneND1,1,1-TrichloroethaneND1,2-TrichloroethaneND1,01,1,2-TrichloroethaneND1,0TrichloroethaneND1,0	trans-1.3-Dichloropropene	ND	1.0											
1,2,4-Trichlorobenzene ND 1.0   1,1,1-Trichloroethane ND 1.0   1,1,2-Trichloroethane ND 1.0   Trichloroethane ND 1.0	1 2 3-Trichlorobenzene	ND	1.0											
1,1,1-Trichloroethane ND 1.0   1,1,2-Trichloroethane ND 1.0   Trichloroethane ND 1.0	1 2 4-Trichlorobenzene	ND	1.0											
Instruction Instruction   1,1,2-Trichloroethane ND   1.0   Trichloroethane (TCE) ND   1.0	1 1 1-Trichloroethane	ND	1 0											
Trichloroethene (TCE) ND 1.0	1 1 2-Trichloroethane		1.0											
	Trichloroethene (TCF)		1.0											
	Trichlorofluoromethane		1.0											
123-Trichloropropage ND 2.0	1 2 3-Trichloronronane	ND	20											

Value exceeds Maximum Contaminant Level. \*

D Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of range due to dilution or matrix S

В Analyte detected in the associated Method Blank

Е

J Analyte detected below quantitation limits

Р Sample pH Not In Range RL Reporting Limit

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WO#:

#### Value above quantitation range

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Hilc	orp San Juan	LP/Hilco	rp Energy (	Corp								
Froject: Sany	Dog											
Sample ID: rb	Sam	Type: ME	BLK	TestCode: EPA Method 8260B: VOLATILES								
Client ID: PBW	Bat	ch ID: R6	3964	F	3964							
Prep Date:	Analysis	Date: 10	)/25/2019	5	SeqNo: 2	188167	Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Vinyl chloride	ND	1.0										
Xylenes, Total	ND	1.5										
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130					
Surr: 4-Bromofluorobenzene	10		10.00		99.5	70	130					
Surr: Dibromofluoromethane	9.8		10.00		98.3	70	130					
Surr: Toluene-d8	9.8		10.00		98.0	70	130					
Sample ID: 1910D50-001	ams Samp	Type: MS	3	TestCode: EPA Method 8260B: VOLATILES								
Client ID: MW15	Bat	ch ID: R6	3964	F	RunNo: <b>6</b>	3964						
Prep Date:	Prep Date: Analysis Date: 10/25/2019					188416						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Benzene	18	1.0	20.00	0	90.2	70	130					
Toluene	17	1.0	20.00	0	86.9	70	130					
Chlorobenzene	18	1.0	20.00	0	90.9	70	130					
1,1-Dichloroethene	16	1.0	20.00	0	77.9	70	130					
Trichloroethene (TCE)	18	1.0	20.00	0	88.2	70	130					
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130					
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130					
Surr: Dibromofluoromethane	9.9		10.00		98.8	70	130					
Surr: Toluene-d8	9.6		10.00		96.2	70	130					
Sample ID: 1910D50-001	amsd Samp	Type: MS	SD	Tes	tCode: El	PA Method	8260B: VOL	ATILES				
Client ID: MW15	Bat	ch ID: R6	3964	F	RunNo: 6	3964						
Prep Date:	Analysis	Date: 10	)/25/2019	5	SeqNo: 2	188417	Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual		
Benzene	17	1.0	20.00	0	84.6	70	130	6.42	20			
Toluene	16	1.0	20.00	0	80.2	70	130	7.99	20			
Chlorobenzene	17	1.0	20.00	0	84.5	70	130	7.29	20			
1,1-Dichloroethene	14	1.0	20.00	0	71.2	70	130	8.99	20			
Trichloroethene (TCE)	16	1.0	20.00	0	81.8	70	130	7.46	20			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130	0	0			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130	0	0			
Surr: Dibromofluoromethane	10		10.00		99.8	70	130	0	0			
Surr: Toluene-d8	9.8		10.00		97.7	70	130	0	0			

#### **Qualifiers:**

\* Value exceeds Maximum Contaminant Level. D

Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded

ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

S % Recovery outside of range due to dilution or matrix В Analyte detected in the associated Method Blank

Е Value above quantitation range

J Analyte detected below quantitation limits

Р Sample pH Not In Range

RL Reporting Limit Page 27 of 28

1910D50

31-Oct-19

WO#:

1910D50

31-Oct-19

WO#:

# QC SUMMARY REPORT Hall Environmental Analysis Laboratory, Inc.

Client: Hild Project: Salt	Hilcorp San Juan LP/Hilcorp Energy Corp Salty Dog														
Sample ID: MB-48398	SampType: MBLK	TestCode: SM2540C MOD: Total Dissolved Solids													
Client ID: PBW	Batch ID: 48398	RunNo: 64018													
Prep Date: 10/25/2019	Analysis Date: 10/28/2019	SeqNo: 2190055	Units: mg/L												
Analyte	Result PQL SPK value S	PK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit Qual												
Total Dissolved Solids	ND 20.0														
Sample ID: LCS-48398	SampType: LCS	S TestCode: SM2540C MOD: Total Dissolved Solids													
Client ID: LCSW	Batch ID: 48398	RunNo: 64018													
Prep Date: 10/25/2019	Analysis Date: 10/28/2019	SeqNo: 2190056	Units: <b>mg/L</b>												
Analyte	Result PQL SPK value S	PK Ref Val %REC LowLimit	HighLimit %RPD RPDLimit Qual												
Total Dissolved Solids	1010 20.0 1000	0 101 80	120												

#### **Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- Н Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of range due to dilution or matrix
- В Analyte detected in the associated Method Blank
- Е Value above quantitation range
- J Analyte detected below quantitation limits
- Р Sample pH Not In Range RL
  - Reporting Limit

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### Received by OCD: 11/18/2019 1:34:59 PM

HALL ENVIRONMENTAL ANALYSIS LABORATORY	9 PM Hall TEL. W	Environmenta Alb : 505-345-397 'ebsite: www.hu	l Analysis 1 4901 H ouquerque, 5 FAX: 505 allenvironn	aboratory awkins NE NM 87109 -345-4107 aental.com	Page 257 of Sample Log-In Check List				
Client Name: HILCORP EN	ERGY Work C	Order Number	: 1910D5	0		RcptNo: 1			
Received By: Juan Pojo	as 10/25/20	19 8:00:00 AI	м						
Completed By: Leah Baca	10/25/20	19 8:45:28 AI	м	1 1	R.				
Reviewed By: DAD 10/25	5/19			Leab	June	A			
Chain of Custody									
1. Is Chain of Custody complete	?		Yes 🗸	No		Not Present			
2. How was the sample delivere	d?		Client			a series a construction of a series of a			
Login									
3. Was an attempt made to cool	the samples?		Von 🗐	N1-					
				INC					
4. Were all samples received at	a temperature of >0° C to	6.0°C	Yes 🔽	No					
5 Sample(s) in proper container	(2)2								
o. Sample(s) in proper container	(\$)?		Yes 🗹	No					
6. Sufficient sample volume for ir	ndicated test(s)?		Yes 🗸	No	П				
7. Are samples (except VOA and	ONG) properly preserved	?	Yes 🗸	No					
8. Was preservative added to bot	ttles?		Yes	No	~				
0. 1/04									
9. VOA vials have zero headspac	ce?		Yes 🗹	No		No VOA Vials			
10, were any sample containers r	eceived broken?		Yes 🗆	No		# of preserved			
11. Does paperwork match bottle I	abels?		Vac 🖌	No		bottles checked			
(Note discrepancies on chain c	of custody)		res 🖭	NO		(2) or >12 unless noted)			
2. Are matrices correctly identified	d on Chain of Custody?		Yes 🖌	No		Adjusted? NO			
3. Is it clear what analyses were r	equested?		Yes 🔽	No					
4. Were all holding times able to I	be met?		Yes 🗹	No		Checked by: ENMIDIZE/19			
(If no, notify customer for autho	prization.)								
pecial Handling (if applica	able)								
15. Was client notified of all discre	epancies with this order?		Yes 🗌	No		NA 🔽			
Person Notified:	and the second	Date:	-		-				
By Whom:		Via 🗆	] eMail [	Phone	Fav				
Regarding:					FdX				
Client Instructions:									
16. Additional remarks:									
7 Cooler Information									
Cooler No Temp °C C	ondition Seal Intact	Cal No C	nal Deta	0					
1 0.3 Go	od Yes	Sear NU SE	sai Date	Signed	зу				
2 0.6 Go	od Yes								

	ANALVETS LADORATODY		4901 Hawkins NE - Albuquerque, NM 87109	Tel. 505-345-3975 Fax 505-345-4107	Analysis Request	()u	PCB's PO4, S PO4, S PO4, S PO4, S	V DR0 (8082   V 1/5 V 1/5 V V 1/5 V V V V V V V V V V V V V V V V V V V	ава 2.80 2.90 2.90 2.90 2.90 2.90 2.90 2.90 2.9	5D(( Met Met Met Met Met Met Met Met	2011 81 Pes 11:8012 81 Pes 60 (VC 70 (Se 70 (Se 70)	TP 80 80 82 82 82 82 82 7 82 82 82 7 82 82 82 82 82 82 82 82 82 82 82 82 82	TTTY X		× × × × × × × × × × × × × × × × × × ×	XXX	XXXX			marks: cc: jadamse itenucem	Shyde Iton. Correlation is the stand of the analytical report.
Turn-Around Time:	D Standard Kush Same day	Project Name:	Salty Day	Project #:	012819014	Project Manager:	Josh Adems	Sampler: Josh Adams/ Shuart Ayule	# of Coolers: 7	Cooler Temp(including CF): 0.2-67.0 64 53	Container Preservative HEAL No. 6.6 E	Type and # Type /9/0050 B	100- 13th Chainsteric	-002	-003	- 004	SIN-	1 006	too. A	Received by: Via: Date Time Ret	Received by: Via: Date Time Received by: Via: Date Time
Chain-of-Custody Record	client: Hilcord	Vernifer Day	Mailing Address: 32, 22, 24, 400	ACTEC NM STALIO	Phone #:	email or Fax#: ideale hilcorp.com	QA/QC Package:	Accreditation:	EDD (Type)			Date Time Matrix Sample Name	10-344 0435 GW MWB	80MM 2001	ioso muci	1040 MWIC	octro win 14	[190 Mul3	U 1150 K muia	Date: Time: Relinquished by:	Date: Time: Relinquished by: It July 1874 Muctual Orler

*Received by OCD: 11/18/2019 1:34:59 PM* 

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Photograph 1: Excavation looking southwest.



**Photograph 2:** MW05 completed well, 35 feet.



LE .

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**Photograph 3:** MW06 completed well, 35 feet.



Photograph 4: Excavation looking northwest.



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Photograph 5: MW07, 24 feet, (right) and MW02, 24 feet, (far left).



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Photograph 6: Excavation looking southeast.



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Photograph 7: MW02 (under cones), 24 feet.



Photograph 8: MW03 completed well, 35 feet.

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Photograph 8: Soil berm and diversion channel looking northeast

