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	

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 # NCS1916853082
Contact mailing address 382 Road 3100, Aztec NM 87410	

Location of Release Source

Latitude 36.721261 Longitude -108.247803
(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
N	18	29N	13W	San Juan

NMOCD
JUN 13 2019
DISTRICT III

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.

(2)

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 <aager@ltenv.com>
Sent: Friday, September 27, 2019 12:18 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Cc: jdeal@hilcorp.com; Josh Adams <jadams@ltenv.com>
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

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

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

Form C-141
Page 2

State of New Mexico
Oil Conservation Division

Incident ID	NCS1916853082
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? Considered a major release because it was 80bbls
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Yes. Email notification was made to Cory Smith and Jim Griswold on Thursday, May 30 @10:11am	

Initial Response

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

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

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

Printed Name: Jennifer Deal Title: Environmental Specialist

Signature: Jennifer Deal Date: 6/11/2019

email: jdeal@hilcorp.com Telephone: 505-801-6517

OCD Only

Received by: Date: 6/12/19

Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	NCS1916853082
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	29-32 (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 **not** 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 sources and significant watercourses within ½-mile of the lateral extents of the release
☒ Boring or excavation logs
☒ Photographs including date and GIS information
☒ Topographic/Aerial maps
☒ Laboratory data including chain of custody

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

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	NCS1916853082
District RP	
Facility ID	
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I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Jennifer Deal Title: Environmental Specialist

Signature: Jennifer Deal Date: 11/18/2019

email: jdeal@hilcorp.com Telephone: 505-801-6517

OCD Only

Received by: OCD Date: 11/18/2019

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.

Printed Name: Jennifer Deal Title: Environmental Specialist

Signature: Jennifer Deal Date: 11/18/2019

email: jdeal@hilcorp.com Telephone: 505-801-6517

OCD Only

Received by: OCD Date: 11/18/19

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

Signature: Date: 2/17/2020

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

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

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Thank You,
Ashley

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

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

REMEDIATION WORK PLAN

SALTY DOG WATER GATHERING SYSTEM
SAN JUAN COUNTY, NEW MEXICO

November 2019

Prepared for:

MS. JENNIFER DEAL
HILCORP LOWER 48
382 Road 3100
Aztec, New Mexico 87410

Prepared by:

LT ENVIRONMENTAL, INC.
848 East Second Avenue
Durango, Colorado 81301
970.385.1096

LT Environmental, Inc.
Advancing Opportunity

REMEDIATION WORK PLAN

SALTY DOG WATER GATHERING SYSTEM
SAN JUAN COUNTY, NEW MEXICO

Project Number: 017819014

Prepared by: November 15, 2019

Josh Adams
LTE Staff Geologist
Date

Reviewed by: November 15, 2019

Ashley Ager, M.S., P.G.
LTE Senior Geologist
Date

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

FIGURES

TABLES

APPENDICES

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^3) 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® Quantab® 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-to-groundwater 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 (µg/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 aager@ltenv.com or Jennifer Deal at (505)-599-3400 or at jdeal@hilcorp.com.

FIGURES

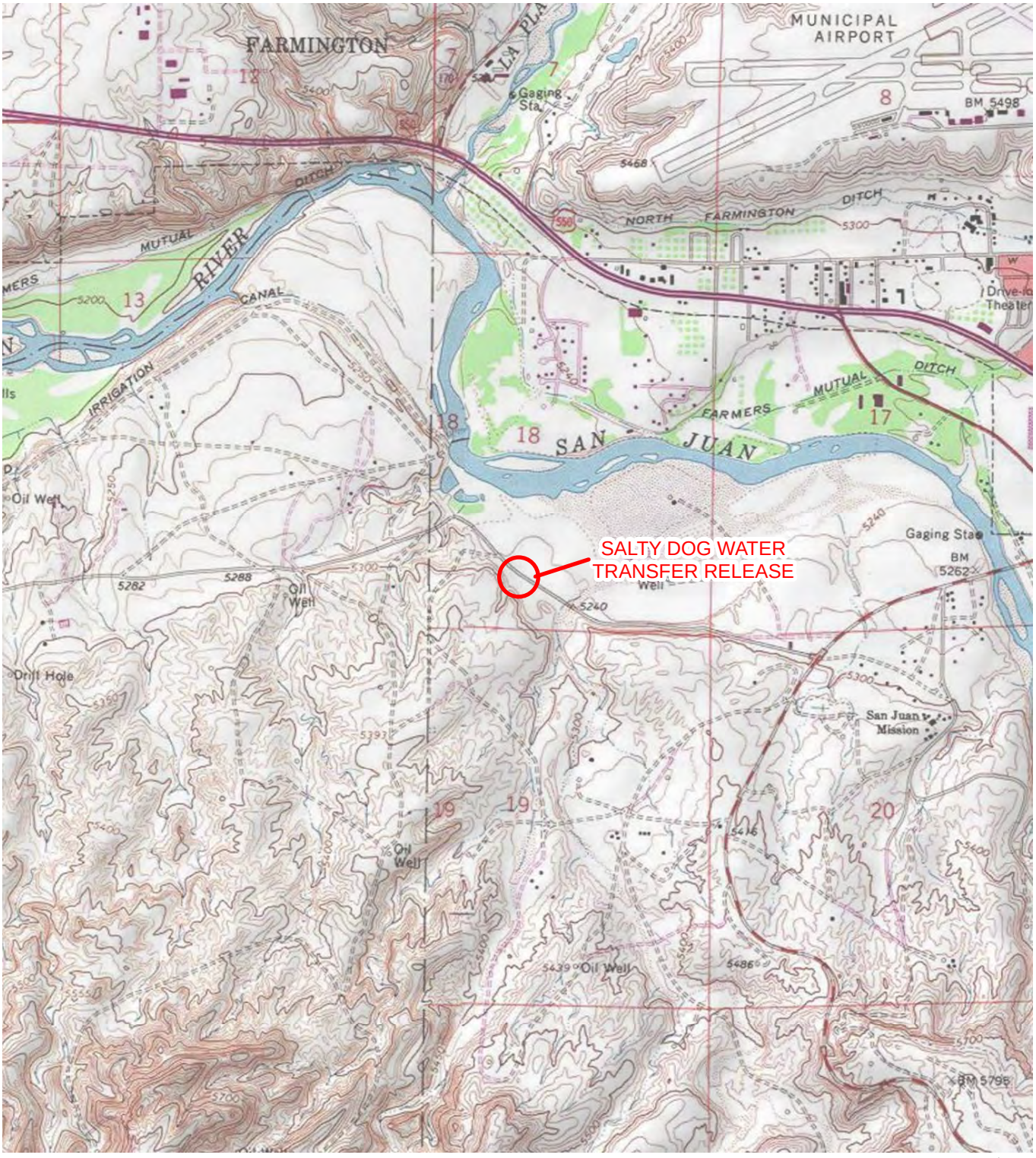

IMAGE COURTESY OF ESRI/USGS

LEGEND

SITE LOCATION

0 2,000 4,000

Feet

N

NEW MEXICO

FIGURE 1
SITE LOCATION MAP
SALTY DOG WATER TRANSFER RELEASE
SESW SEC 18 T29N R13W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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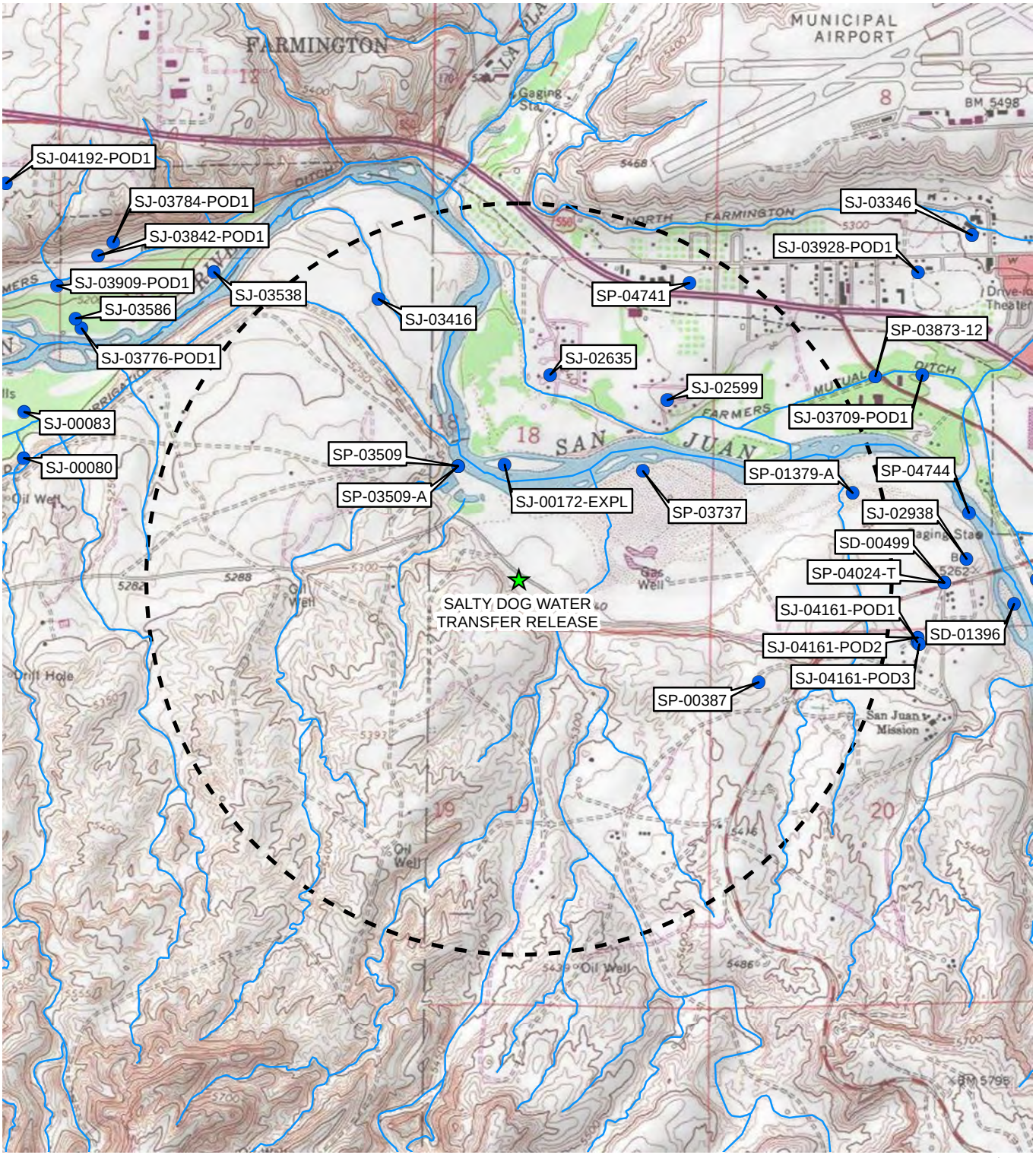

IMAGE COURTESY OF ESRI/USGS

LEGEND

- SITE LOCATION
- WATER WELL
- NATIONAL HYDROGRAPHY DATASET SURFACE WATER FEATURE
- 1 MILE RADIUS

0 2,000 4,000
Feet

N

FIGURE 2
RECEPTOR MAP
SALTY DOG WATER TRANSFER RELEASE
SESW SEC 18 T29N R130W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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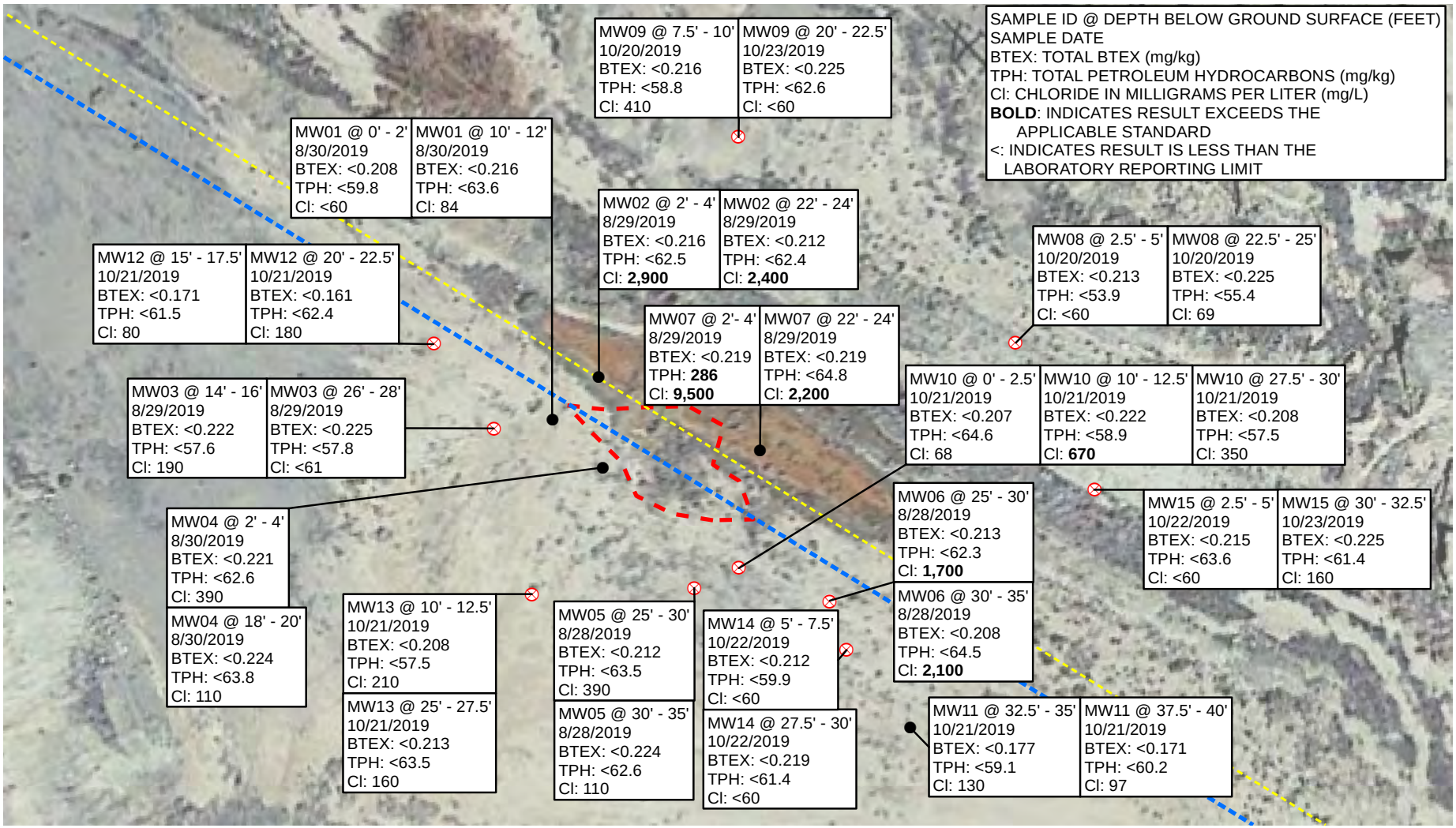

LEGEND

- MONITORING WELL
- SOIL BORING
- SURVEYED GROUNDWATER FLOW DIRECTION
- 4" WATER TRANSFER LINE
- 6" GAS LINE
- EXCAVATION EXTENT

0 40 80
Feet

N

FIGURE 3
SOIL ANALYTICAL RESULTS - VADOSE ZONE
SALTY DOG WATER TRANSFER RELEASE
SESW SEC 18 T29N R130W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

P:\Hilcorp\GIS\MXD\017819014_SALTY_DOG_WATER_TRANSFER\017819014_FIG03_SOIL_ANALYTICAL_VADOSE_OCT_2019.mxd

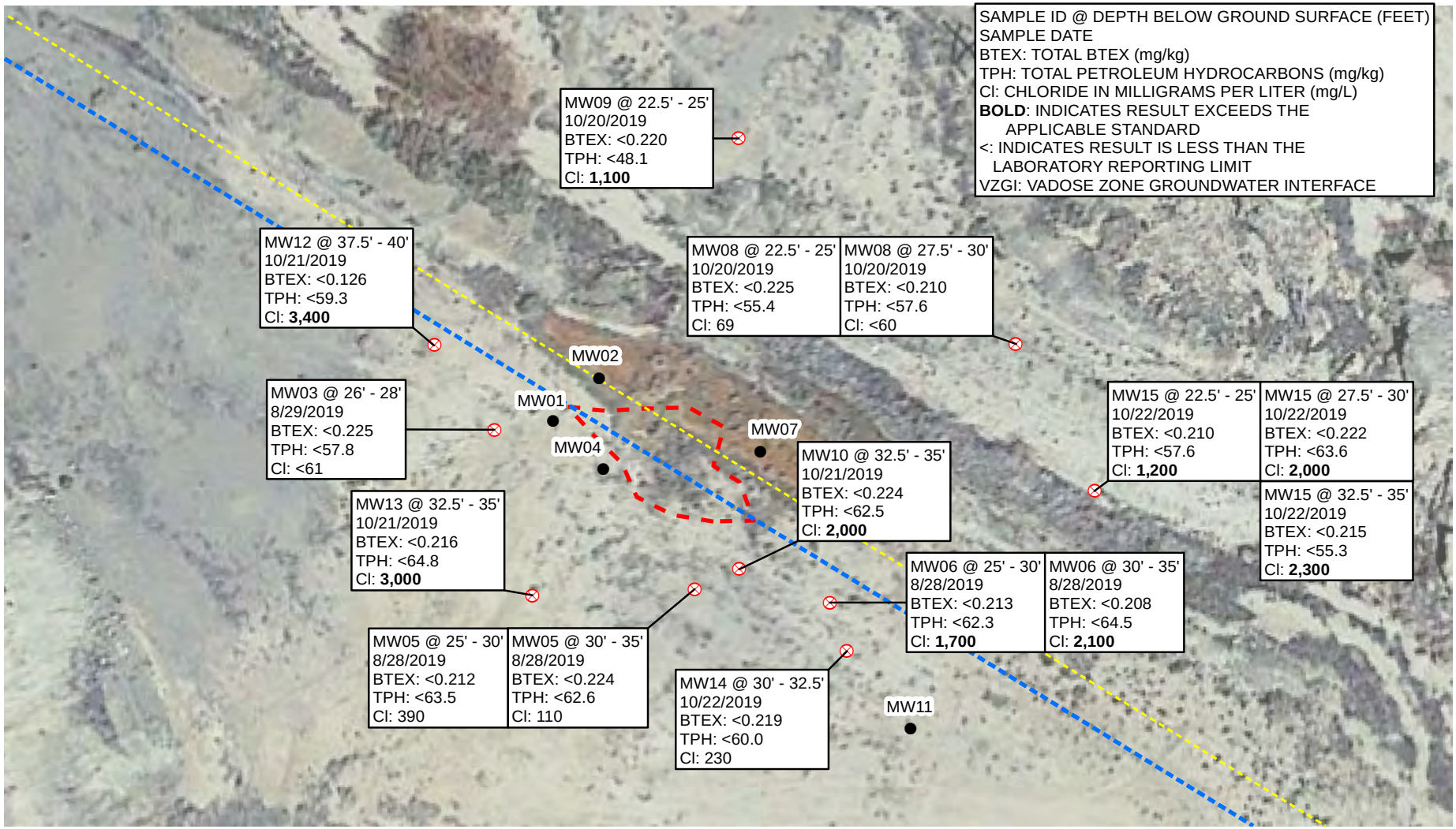

IMAGE COURTESY OF GOOGLE EARTH 2019

LEGEND

- MONITORING WELL
- SOIL BORING
- 4" WATER TRANSFER LINE
- 6" GAS LINE
- EXCAVATION EXTENT

0 40 80

Feet

N

FIGURE 4
SOIL ANALYTICAL RESULTS - VZGI
SALTY DOG WATER TRANSFER RELEASE
SESW SEC 18 T29N R130W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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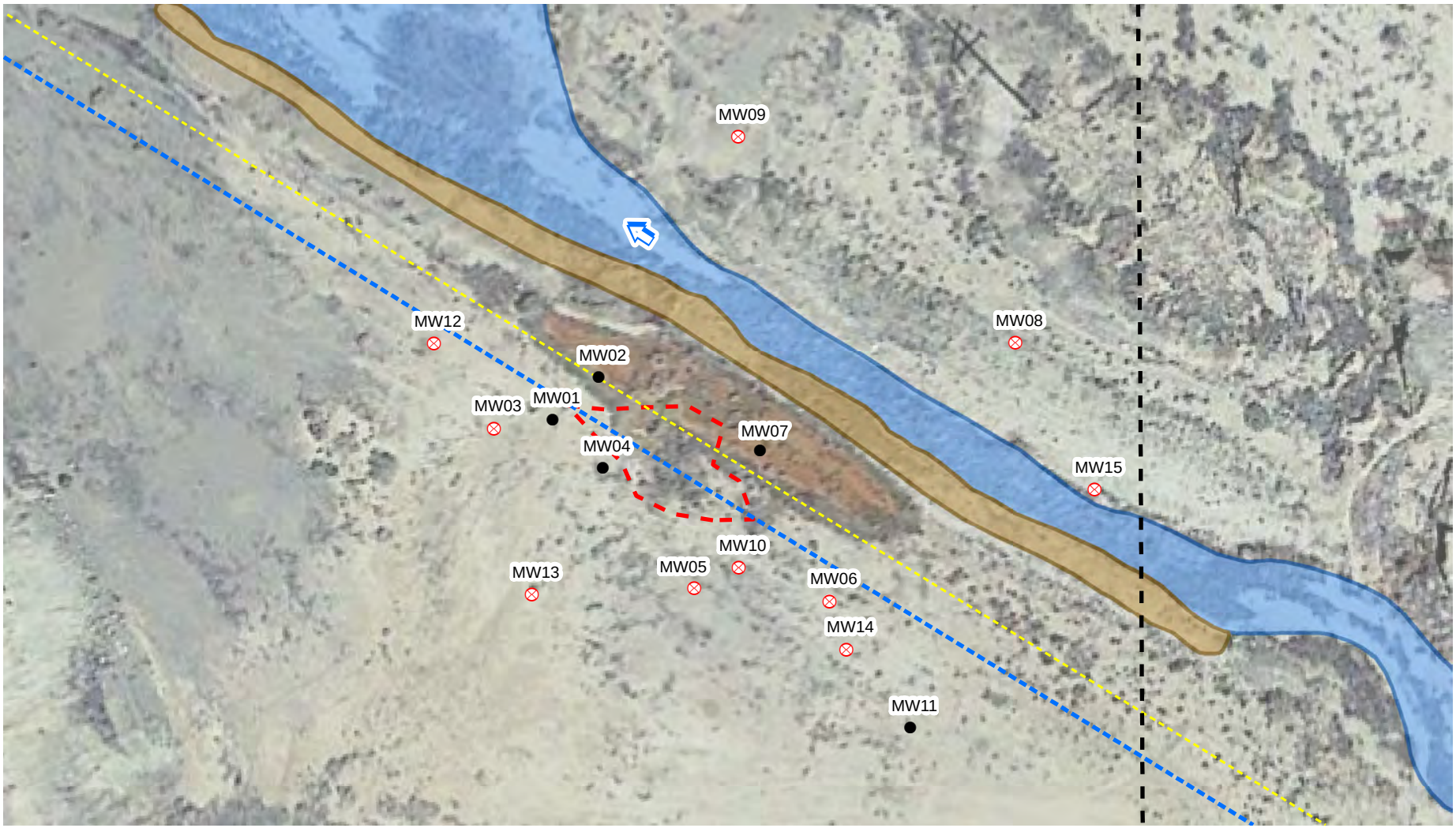

LEGEND

- MONITORING WELL
- SOIL BORING
- 4" WATER TRANSFER LINE
- 6" GAS LINE
- PROPERTY BOUNDARY
- EXCAVATION EXTENT
- DIVERSION CHANNEL
- SOIL BERM

0 40 80
Feet

N

FIGURE 5
OBSTRUCTIONS TO DELINEATION SALTY DOG WATER TRANSFER RELEASE SESW
SEC 18 T29N R130W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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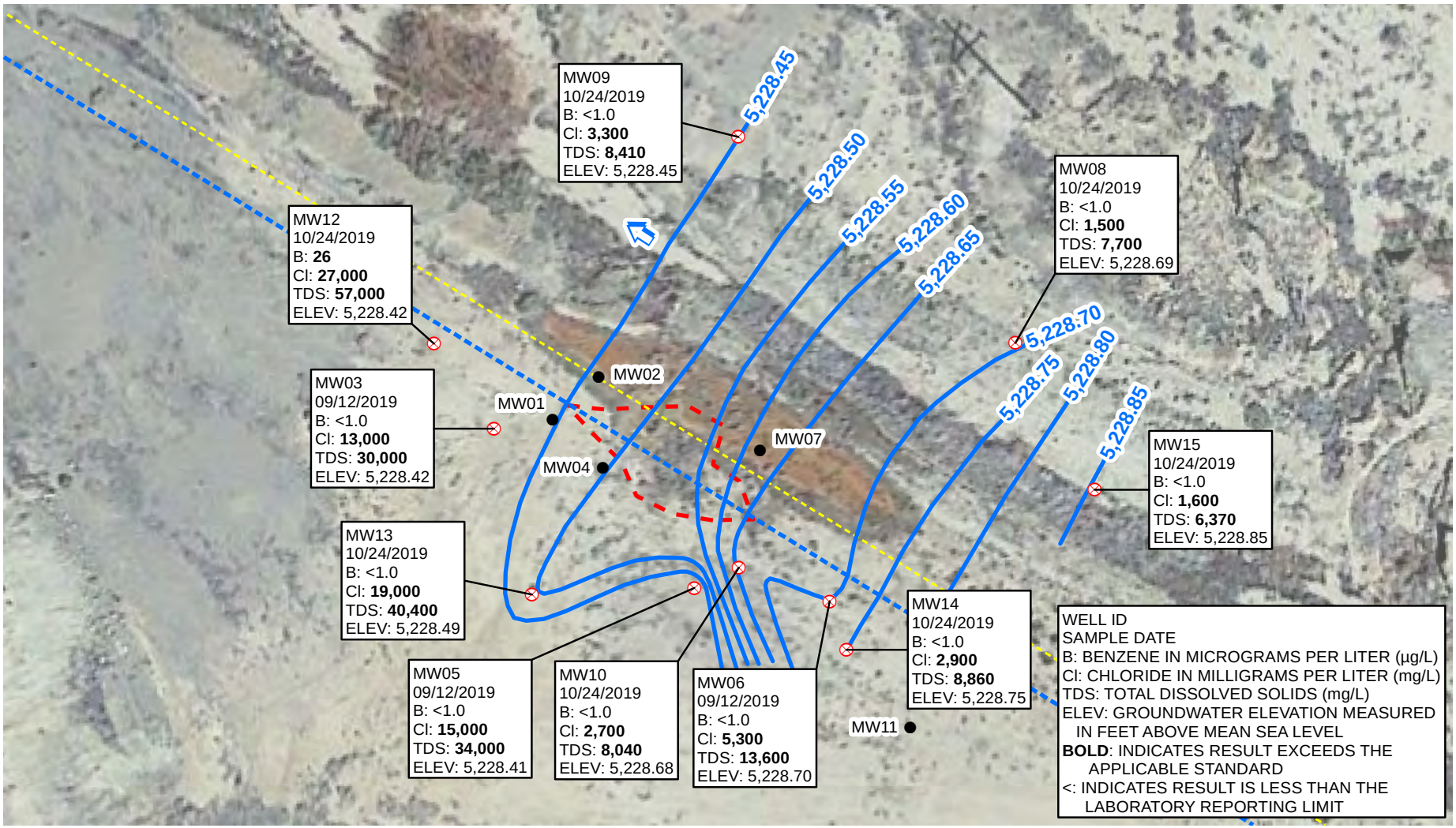

FIGURE 6
GROUNDWATER ELEVATION AND ANALYTICAL RESULTS
SALTY DOG WATER TRANSFER RELEASE
SESW SEC 18 T29N R130W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

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TABLES

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 Samples													
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													
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

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

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)
MW03	9/12/2019	5,262.40	33.62	5,228.78
	10/22/2019		33.92	5,228.48
	10/24/2019		33.98	5,228.42
MW05	9/12/2019	5,262.11	33.36	5,228.75
	10/22/2019		33.70	5,228.41
	10/24/2019		33.70	5,228.41
MW06	9/12/2019	5,261.78	32.74	5,229.04
	10/22/2019		33.05	5,228.73
	10/24/2019		33.08	5,228.70
MW08	10/22/2019	5,252.50	23.80	5,228.70
	10/24/2019		23.81	5,228.69
MW09	10/22/2019	5,252.38	23.94	5,228.44
	10/24/2019		23.93	5,228.45
MW10	10/22/2019	5,259.28	30.59	5,228.69
	10/24/2019		30.60	5,228.68
MW12	10/22/2019	5,259.25	30.85	5,228.40
	10/24/2019		30.83	5,228.42
MW13	10/22/2019	5,260.32	31.81	5,228.51
	10/24/2019		31.83	5,228.49
MW14	10/22/2019	5,259.67	30.92	5,228.75
	10/24/2019		30.92	5,228.75
MW15	10/22/2019	5,256.00	27.20	5,234.58
	10/24/2019		27.15	5,228.85

Notes:

AMSL - above mean sea level

BTOC - below top of casing

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

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

Analyte	NMWQCC Standard	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
			12-Sep	12-Sep	12-Sep	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	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

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

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

Analyte	NMWQCC Standard	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
			12-Sep	12-Sep	12-Sep	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	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

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

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

Analyte	NMWQCC Standard	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
			12-Sep	12-Sep	12-Sep	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	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 Metals												
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	NT	NT	NT	NT	NT	NT
carbonate (As CACO3)	**NE**	mg/L	<2.000	<2.000	<2.000	NT	NT	NT	NT	NT	NT	NT
total alkalinity	**NE**	mg/L	137.8	153.9	200.8	NT	NT	NT	NT	NT	NT	NT

TABLE 3
GROUNDWATER ANALYTICAL RESULTS

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

Analyte	NMWQCC Standard	Unit	MW03	MW05	MW06	MW08	MW09	MW10	MW12	MW13	MW14	MW15
			12-Sep	12-Sep	12-Sep	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct	24-Oct
Standard Method 2510B: Specefic Conductance												
conductivity	NE	µmhos/c	45,000	54,000	22,000	NT	NT	NT	NT	NT	NT	NT
USEPA Method SM2540C Modified: Total Dissolved Solids												
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: PH												
pH	**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

APPENDIX A: LTE BORING LOGS

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW01	Project: Salty Dog
Date: 8 30 19	Project Number: 017819014
Logged By:	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID/ Quantab Chloride Strips
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon 24"
Gravel Pack: NA	Seal: ~~Hydrated Bentonite Chips~~
Grout: NA	
Casing Type: NA	Diameter: Length:
Hole Diameter: 8"	Depth to Liquid:
Screen Type: NA	Slot: Diameter: Length:
Total Depth: 12'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.9	No		0-2	1		SM	Brown fine to medium silty sand. Cl = <2840ppm	
	Dry	2.5	No		3-4	2		SM	SAA Cl = <2840 ppm	
	Dry	1.3	No		5-6	3		SM	SAA Cl = <2840 ppm	
	Dry	0.8	No		7-8	4		SM	SAA Cl = <2840 ppm	
	Dry	1.0	No		9-10	5		SM	SAA Cl = <2840 ppm	
	Dry	1.4	No		11-12	6			SAA Cl = 2840 ppm	
					13-15				TD: 12', stopped due to clean samples.	

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW02	Project: Salty Dog
Date: 8.29.19	Project Number: 017819014
Logged By: CM	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID/Quantab Chloride Strips
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon 24"
Gravel Pack: NA	Seal: ~~Hydrated Bentonite Chips~~
Grout: NA	
Casing Type: NA	Diameter: Length:
Hole Diameter: 8"	Depth to Liquid: —
Screen Type: NA	Slot: Diameter: Length:
Total Depth: 24'	Depth to Water: —

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	3.3	No		0–2	1		SP-SM	Dark brown, poorly graded sand with silt and gravel Cl = 1020ppm	
	Dry	9.1	No	MW02 2'-4'	3–4	2		SP-SM	SAA Cl = 1370ppm	
	Dry	1.0	No		5–6	3		SP-SM	SAA Cl = 1020	
	Dry	3.7	No		7–8	4		SP-SM	SAA Cl = 910ppm	
	Dry	1.5	No		9–10	5		SP-SM	SAA Cl = 910 ppm	
	Dry	3.1	No		11–12	6		SP-SM	SAA Cl = 820 ppm	
	Dry	2.8	No		13–14	7		SP-SM	SAA Cl = 910 ppm	
					15					

Advancing Opportunity

Boring/Well #	MW02
Project:	Salty Dog
Project #	017819014
Date	8-29-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.4	No		15 16	8		SP-SM	SAA Cl = 820ppm	
	Dry	4.8	No	MW02 16'-18'	17 18	9		SP-SM	SAA Cl = 640ppm	
	Dry	3.1	No		19 20	10		SP-SM	SAA Cl = 1500ppm	
	Dry	2.4	No		21 22	11		SP-SM	SAA Cl = 820ppm	
	Dry	1.9	No	MW02 22'-24'	23 24	12		SP-SM	SAA Cl = 1020ppm	
					25 26 27 28 29 30 31 32 33 34 35 36 37				TD = 24' Hit refusal, cobbles.	

LT Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW03	Project: Salty Dog
Date: 8.29.19	Project Number: 017819014
Logged By: CM	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID/Quantab Chloride Strips
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon 24"
Gravel Pack: 10-20 Silica Sand 23'-35'	Seal: Hydrated Bentonite Chips
Grout: Bentonite-Cement Slurry	
Casing Type: Schedule 40 PVC 0'-25'	Diameter: 2" Length: 25'
Hole Diameter: 8"	Depth to Liquid: —
Screen Type: Schedule 40 PVC Slot: 0.010" 25'-35'	Diameter: 2" Length: 10'
Total Depth: 35'	Depth to Water: 32'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
										Stick up
	Dry	1.5	No		0–2	1		Sm	Brown fine silty sand with gravel Cl = <30ppm	
	Dry	2.0	No		3–4	2		Sm	SAA Cl = <30ppm	
	Dry	3.7	No		5–6	3		Sm	SAA Cl = <30ppm	
	Dry	4.4	No		7–8	4		Sm	Brown fine silty sand. Cl = <30ppm	
	Dry	4.7	No		9–10	5		Sm	SAA Cl = <30ppm	
	Dry	2.4	No		11–12	6		Sm	SAA Cl = <30ppm	
	Dry	—	—		13–14	7			No recovery, cobbles	
					15					

Advancing Opportunity

Boring/Well #	MW03
Project:	Salty Dog
Project #	01781901.4
Date	8.29.19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	7.6	No	MW03 14'-16'	15 16	8		SM	Brown fine silty sand with gravel Cl = 300ppm	
	Dry	6.9	No		17 18	9		SM	Brown fine silty sand Cl = <30ppm	
	Dry	5.7	No		19 20	10		SM	SAA Cl = <30ppm	
	Dry	9.8	No		21 22	11		SM	Brown fine silty sand Cl = <30ppm	
	Dry	11.1	No		23 24	12		SM	Brown, orange fine silty sand Cl = <30ppm	
	Dry	7.2	No		25 26	13		SW-SM	Black, brown well graded sand with silt and gravel Cl = <30ppm	
	Dry	2.7	No	MW03 26'-28'	27 28	14		SW-SM	SAA Cl = <30ppm	
	moist	—	No		29 30	15			No recovery	
	wet	1.9	No		31 32	16		SW-SM	Dark brown silt Cl = <30ppm	
	wet	4	No		33 34	17		SW-SM	Dark brown silty sand Cl = 910ppm	
	wet	2.6	No		35	18			SAA Cl = 640ppm	
					36 37				TD = 35' GW@32'	

= Sand = screen = Bentonite-Cement Slurry

= Casing = Ground water

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW04	Project: Salty Dog
Date: 8·30·19	Project Number: 017819014
Logged By: CM	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID/Quantab Chloride Strips
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon
Gravel Pack: NA	Seal: ~~Hydrated Bentonite Chips~~
Grout: NA	
Casing Type: NA	Diameter: Length: —
Hole Diameter: 8"	Depth to Liquid: —
Screen Type: NA	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/Remarks	Well Completion
	Dry	0.5	No		0–2	1		SM	Brown very fine silty Sand w/ gravel Cl = <2840ppm	
	Dry	0.4	No	MW04 2-4'	3–4	2		SM	SAA Cl = <2840ppm	
	Dry	0.3	No		5–6	3		SM	Brown silty sand Cl = <2840ppm	
	Dry	0.6	No		7–8	4		SM	SAA Cl = <2840ppm	
	Dry	0.6	No		9–10	5		Sm	Brown silty sand Cl = <2840ppm	
	Dry	0.4	No		11–12	6		SM	SAA Cl = <2840ppm	
	Dry	0.6	No		13–14	7		SM	SAA Cl = <2840ppm	
					15					

Advancing Opportunity

Boring/Well #	MW04
Project:	Salty Dog
Project #	01781901
Date	8.30.19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.1	No	S	15–16	8			Brown silty sand with gravel Cl = <2840ppm	
	Dry	0.6	No	MW04 16'-18'	17–18	9			SAA Cl = <2840ppm	
	Dry	1.2	No	MW04 18'-20'	19–20	10			SAA Cl = <2840ppm	
	Dry	—			21	11			No Recovery, cobbles	
					22–37				TD = 21', hit refusal due to cobbles.	

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW05	Project: Salty Dog
Date: 8-28-19	Project Number: 017819014
Logged By: CM	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID / Quantab Chloride tabs
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon
Gravel Pack: 10-20 Silica Sand 23'-35'	Seal: Hydrated Bentonite Chips
Grout: Bentonite-Cement Slurry 0'-23'	
Casing Type: Schedule 40 PVC 0'-25'	Diameter: 2" Length: 25'
Hole Diameter: 8"	Depth to Liquid: 29'
Screen Type: Schedule 40 PVC Slot: 0.010" 25'-35'	Diameter: 2" Length: 10'
Total Depth: 35'	Depth to Water: 29'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	3.4	No		0–5	1			Brown silty sand Cl = <30ppm	Stick-up
	Dry	—	No		6–10	2			SAA Not enough recovery to sample Cl = 490ppm	
	Dry	5.3	No		11–15	3			Brown silty sand with gravel Cl = <30ppm	

Advancing Opportunity

Boring/Well #	MW05
Project:	Salty Dog
Project #	01781904
Date	8.28.19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	moist	3.9	No		15–20	4		SM	Brown silty sand Cl = <30ppm	
	moist	8.8	No		21–25	5		SM	Brown silty sand with gravel. Cl = <30ppm	
	Wet	5	No	MW05 25' - 30'	26–30	6		SM	Brown silty sand Cl = 360ppm GW @ 29'	
	Dry	1.9	No	MW05 30'-35'	31–35	7			Gray silt, compact. Cl = <30ppm	
					36–37				TD = 35', stopped after hitting GW.	

: = Sand = Screen = Casing = Bentonite-Cement Slurry

= Ground water

Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW06	Project: Salty Dog
Date: 8.28.19	Project Number: 017819014
Logged By: CM	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID/quantab chloride tabs
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon 24"
Gravel Pack: 10-20 Silica Sand 23'-35'	Seal: Hydrated Bentonite Chips
Grout: Bentonite-Cement Slurry 0'-23'	
Casing Type: Schedule 40 PVC 0'-25'	Diameter: 2" Length: 25'
Hole Diameter: 8"	Depth to Liquid:
Screen Type: Schedule 40 PVC Slot: 0.010" 25'-35'	Diameter: 2" Length: 10'
Total Depth: 35'	Depth to Water: 29'

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	3.6	No		0–5	1		SM	Brown fine silty sand Cl = <30ppm	Stick-up
	moist	30	No		6–10	2		SM	Brown fine silty sand with gravel Cl = 360ppm	
	Dry	2.4	No		11–15	3		SM	SAA Cl = <30ppm	

Advancing Opportunity

Boring/Well #	MW06
Project:	Salty Dog
Project #	017819014
Date	8-28-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	moist	1.3	No		15–20	4		SM	SAA Cl = 300ppm	
	Dry	1.7	No		21–25	5		SM	SAA Cl = 230ppm	
	wet	1.9	No	MW06 25'-30'	26–30	6		SM	Brown silty sand Cl = 1370ppm GW @ 29'	
	Dry	0.8	No	MW06 30'-35'	31–35	7			Gray silt. compact Cl = 1370ppm	
					36–37				TD = 35' HIT GW @ 29'	

= Sand = Screen = Casing = Bentonite-Cement Slurry

= Ground water

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW07	Project: Salty Dog
Date: 8.29.19	Project Number: 017819014
Logged By: CM	Drilled By: Enviro-Drill
Elevation: 5,258'	Detector: PID/Quantab chloride strips
Drilling Method: Hollow Stem Auger	Sampling Method: Split Spoon 24"
Gravel Pack: NA	Seal: ~~Hydrated Bentonite Chips~~
Grout: ~~Bento~~	
Casing Type: NA	Diameter: Length:
Hole Diameter: 8"	Depth to Liquid:
Screen Type: NA	Slot: Diameter: Length:
Total Depth: 24'	Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	1.0	No		0–2	1		SM	Dark brown Silty Sand Cl = 1500ppm	
	Dry	5.0	No	MW07 2.4'	3–4	2		SM	SAA Cl = 2100ppm	
	Dry	1.8	No		5–6	3		SM	SAA Cl = 1020ppm	
	Dry	3.4	No		7–8	4		SM	SAA Cl = 640ppm	
	Dry	4.6	No		9–10	5		SM	SAA Cl = 1130ppm	
	Dry	2.0	No		11–12	6		SM	SAA Cl = 820ppm	
	Dry	1.9	No		13–14	7		SM	Dark brown Silty Sand with gravel. Cl = 1020ppm	
					15					

LTE Advancing Opportunity

Boring/Well #	MW07
Project:	Salty Dog
Project #	017819014
Date	08.29.19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	Dry	0.8	No		15–16	8		SM	SAA Cl = 1020ppm	
	Dry	1.0	No		17–18	9		SM	SAA Cl = 1130ppm	
	Dry	4.5	No		19–20	10		SM	SAA Cl = 1250ppm	
	Dry	4.3	No		21–22	11		SM	SAA Cl = 1310ppm	
	Dry	50	No	MW07 23-24'	23–24	12		SP	Dark brown poorly graded sand. Cl = 1500	
					25–37				TD = 24', Hit refusal to cobbles.	

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW08	Project: Salty Dog
Date: 10-20-19	Project Number: 017819014
Logged By: JA	Drilled By: Cascade
Elevation: 5,258'	Detector: PID / Quantab
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10/20 silica sand 25-13	Seal: Hydrated Bentonite Chips 13-11'	Grout: 11-0
Casing Type: Sched. 40 PVC	Diameter: 2" Length: 15'-5-0'	Hole Diameter: 6"	Depth to Liquid:
Screen Type: Sched. 40 slotted PVC Slot: 0.010"	Diameter: 2" Length: 10' 25-15'	Total Depth: 35	Depth to Water: 23

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.1	NO	MW08 @ 0-2.5' 1447	0 1 2	0-5		SM	Brown silty sand w/gravel Cl = <128 ppm (ND)	Stickup
	dry	0.2	NO	MW08 @ 2.5-5' 1449	3 4 5			SM	SAA Cl = <128 ppm (ND)	
	dry	0.5	NO	MW08 @ 5-7.5 1451	6 7	5 - 10			SAA Cl = <128 ppm (ND)	
	moist	0.0	NO		8 9 10				SAA, moist Cl = <128 ppm (ND)	
		NR			11 12		X		NR	plug
	moist	0.7	NO		13 14 15				SAA Cl = <128 ppm (ND)	sand

Advancing Opportunity

Boring/Well #	MW08
Project:	01781614
Project #	Salty Dog
Date	10-20-17

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	M	0.1	NO		15 16 17	15-20			SAA Cl = <128ppm (ND)	
	M	0.1	NO		18 19 20			SM	SAA Cl = <128ppm (ND)	
	M	0.4	NO	MW08 @ 20-22.5' 1454	21 22	20 - 25			Cl = <128ppm (ND) GW encountered @ 23' bgs	
	SAT	0.3	NO	MW08 @ 22.5-25' 1457	23 24 25			CL	brown lean clay w/ sand	
								SP-SM	poorly graded sand w/ silt SATURATED Cl = <128ppm (0.9)	
	M	0.3	NO		26 27	25 - 30		CL	brown lean clay w sand	TD @ 25
	M	0.4	NO	MW08 @ 27.5-30' 1500	28 29 30			SM	silty sand w/ gravel	
					31 32 33 34 35 36 37				TD @ 30 backfill to 25' to set well	backfill

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW09	Project: Salty Dog
Date: 10-20-19	Project Number: 017819014
Logged By: SA	Drilled By: Cascade
Elevation: 5,258' / Detector: PID/Quantab	Drilling Method: Sonic / Sampling Method: Continuous
Gravel Pack: 10/20 silica Sand 30-17'	Seal: Hydrated Bentonite Chips 10-17' / Grout: 0-10
Casing Type: SCH40 PVC — Diameter: 2 — Length: 20	Hole Diameter: 6" / Depth to Liquid:
Screen Type: — Slot: 0.010" — Diameter: 2 — Length: 10	Total Depth: 30 / Depth to Water: 22.5

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
	Dry	0.2	NO		0 1 2	0-5		SM	brown Silty sand w/ gravel cl = <128ppm (ND)
	Dry	0.2	NO		3 4 5			SM	SAA cl = <128ppm (ND)
	Dry	0.3	NO		6 7	5-10		SM	SAA cl = 228ppm (2.1)
	M	0.2	NO	MW09 @ 7.5-10 1720	8 9 10			SM	SAA, moist cl = 244 (2.4)
	M	0.2	NO		11 12	10-15		SM	SAA, few gravel cl = <128 (ND)
	M	0.2	NO	MW09 @ 12.5-15 1722	13 14 15			SM	SAA cl = 356ppm (2.8)

Stick-up

Advancing Opportunity

Boring/Well #	MW09
Project:	Salty DOG
Project #	01781901A
Date	10-20-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	M	0.2	NO		15 16 17	15-20		SM	SAA Cl = 280ppm (2.4)	
	M	0.3	NO		18 19 20				SAA Cl = 184ppm (1.8) GW @ 22.5'	
	VM	0.2	NO		21 22			Cl	lean clay w/sand brown very moist Cl = <128ppm/ND	
	SAT	0.2	NO	MW09 C 25-25' 1724	23 24 25	25-30		SP-SM	poorly graded sand w/silty saturated Cl = 1,148ppm (5.4)	
	VM	0.2	NO		26 27			SM	brown silty-sand Cl = 156ppm (1.6)	
	SAT/ VM		NO	MW09 C 27.5-30 1726	28 29 30				SAA, bottom 6" saturated Cl = 212ppm (2.0)	
					31 32 33 34 35 36 37				TD @ 30'	

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW10	Project: Salty Dog
Date: 10-21-14	Project Number: 017819014
Logged By: JA/SH	Drilled By: Cascade
Elevation: 5,258'	Detector: PID / Quantan
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10/20 Sand 40-28'	Seal: Hydrated Bentonite Chips 28-25'
Grout: 0-25	
Casing Type: Sch. 40 PVC	Diameter: 2" Length: 30'
Hole Diameter: 6"	Depth to Liquid:
Screen Type: Sch. 40 PVC slotted	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 40	Depth to Water: 32

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
				All samples submitted	0				brown silty sand w/ gravel	Stick-up
	Dry	0.2	NO		1			SM	Cl = <128ppm (0.4)	
				B52	2					
					3	0-5			SAA	
	Dry	0.3	NO	1350	4			SM	Cl = <128ppm (ND)	
					5					
	NR				6				NR	
					7					
					8	5-10'			~~SAA~~	
				1356	9			~~SM~~	SAA Cl = <128ppm (ND)	
					10					
	Dry	0.9	NO	1356	11			SM	SAA Cl = 776ppm (4.4)	
					12					
					13					
	Dry	0.6	NO	1400	14				SAA Cl = <128ppm (ND)	
					15					

Advancing Opportunity

Boring/Well #	MW10
Project:	Salty Dog
Project #	01783.19.014
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	DRY	0.6	NO	1402	15 16 17	15-20		SM	SAA Cl = <128ppm (1.0)	
	Dry	0.4	NO	1403	18 19 20	20-25		SM	SAA Cl = 184 ppm (1.8)	
	Dry	0.4	NO	1404	21 22			SM	SAA Cl = 184 ppm (1.8)	
	M	0.2	NO	1405	23 24 25	25-30		SM	SAA, cobbles Cl = <128ppm	
	M	0.4	NO	1406	26 27			SM	SAA Cl = 184ppm (1.8) GW@30'	
	VM	0.7	NO	1408	28 29 30			SM	SAA, bottom 6" Very moist almost SAT Cl = 988ppm (5.0)	
	SAT	0.2	NO	1410	31 32	30-35		CL	brown silt w/sand cohesive saturated Some gravel Cl = 656ppm (4.0)	
	Dry	0.2	NO	1412	33 34 35			CH	fat clay w/sand Cl = 1,148ppm (5.4)	
					36 37				NR	

Advancing Opportunity

Boring/Well #	MW10
Project:	Salty Dog
Project #	01781901 4
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					37	35'	X		NR	
	Dry	0.6	NO	1415	38			CH	grey fat clay w/ sand (claystone)	
					39				<1 = <128ppm (ND)	
					40					
					41				TDC 40'	
					42					
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

LTE Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW11	Project: Salty Dog
Date: 10-21-19	Project Number: 017819014
Logged By: JA/SH	Drilled By: Cascade
Elevation: 5,258'	Detector: PID/Quantab
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10/20 Silica	Seal: Hydrated Bentonite Chips
Grout:	
Casing Type: ~~SCH 80 PVC~~ NO WELL SET	Diameter: ~~2~~ Length:
Hole Diameter:	Depth to Liquid:
Screen Type: ~~SCH 80 PVC~~ Slot: 0.010	Diameter: ~~2~~ Length: ~~20~~
Total Depth: 40	Depth to Water: NO

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.3	NO		0 1 2			SM	brown silty sand w/ gravel Cl = <128ppm (ND)	
	dry	0.1	NO		3 4 5	0-5		SM	> AA Cl = <128ppm (0.6)	
	dry	0.0	NO		6 7			SM	SAA, few gravel Cl = <128ppm (ND)	
	dry	0.1	NO		8 9 10	5-10		SM	SAA, no gravel Cl = <128ppm (0.2)	
	dry	0.0	NO		11 12 13	10-15		SM	SAA, gravel/cobbles Cl = <128ppm (ND)	
	dry	0.1	NO		14 15			SM	SAA Cl = <128ppm (0.4)	

Advancing Opportunity

Boring/Well #	MW11
Project:	Salty Dog
Project #	01781901 4
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.3	NO		15 16 17	15-20		SM	SAA Cl= <128ppm (0.6)	
	dry	0.8	NO		18 19 20			SM	SAA Cl= <128ppm (0.2)	
	dry	1.1	NO		21 22	20-25		CH	grey/brown sandy clay (fat) claystone high plas, hig cohesion	
	dry	1.1	NO		23 24 25			CH	SAA Cl= <128ppm (ND)	
	dry	0.5	NO		26 27	25-30		CH	SAA Cl= <128ppm (0.6)	
	dry	1.2	NO		28 29 30			CH	SAA Cl= <128ppm (0.6)	
	Dry	1.6	NO		31 32	30-35			SAA	
	Dry	1.6	NO	MW11 @ 32.5-35 1417	33 34 35			SM	grey/brown sandstone w/ some silt Cl= <128 (0.8)	
	Dry	0.4	NO		36 37				SAA Cl= <128 (0.4)	

Advancing Opportunity

Boring/Well #	MW11
Project:	Salty Dog
Project #	01751401L
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					37					
					38					
	Dry	0.7	ND	MW11 @ 35-40 1420	39	35-40		SM	SAA	
					40				Cl = <128ppm (0.G)	
					41				TD @ 40'	
					42				No well set due to lack of H2O	
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

LT Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW-12	Project: Salty Dog
Date: 10-21-19	Project Number: 017819014
Logged By: JA/SH	Drilled By: Cascade
Elevation: 5,258'	Detector: PID/Quantab
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10/20 Silica Sand 40-27	Seal: Hydrated Bentonite Chips 27-25
Grout: 25-0	
Casing Type: Sch. 40 PVC	Diameter: 2" Length: 30'
Hole Diameter: 6"	Depth to Liquid:
Screen Type: Sch. 40 PVC slotted	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 40	Depth to Water: 35

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.5	NO		0 1 2	0-5		SM	Brown silty sand w/ gravel and cobbles low plas, low con Cl = <128ppm (0.4)	stick-up
	dry	0.3	NO		3 4 5			SM	SAA Cl = <128ppm (1.0)	
	dry	0.2	NO		6 7	5-10		Sm	SAA, few gravel no cobbles Cl = <128ppm (ND)	
	dry	0.5	NO		8 9 10			SM	SAA w/ cobbles Cl = <128ppm (ND)	
	dry	0.3	NO		11 12			SM	SAA Cl = <128ppm (ND)	
	M	0.5	NO		13 14 15			SM	SAA, no gravel or cobbles Cl = <128 (0.6)	

Advancing Opportunity

Boring/Well #	MW12
Project:	Salty Dog
Project #	01781901 4
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	M	0.5	NO	MW12 @ 15-17.5 1500	15 16 17	15-20		SM	SAA Cl = 280 ppm (2.4)	
	M	0.4	NO		18 19 20			SM	SAA Cl = <180 (0.6)	
	M	0.3	NO	MW12 @ 20-22.5 1502	21 22	20-25		SM	SAA, less silt Cl = 356 (2.8)	
	M	0.3	NO		23 24 25			SM	SAA Cl = <128 (1.0)	
	M	0.3	NO		26 27			SM	SAA Cl = <128 (1.0)	
	VM	0.2	NO		28 29 30			SM	SAA, very moist Cl = <128 (0.8)	
		NR	R		31 32				NR	
	VM SAT.	0.3	NO		33 34 35				GW@35' ↓ SAA, very moist/ sat Cl = 156 (1.6)	
	SAT	0.3	NO	MW12 @ 35-37.5 1505	36 37			SP-SM	poorly graded sand w/ silt saturated Cl = 280 ppm (2.4)	

Advancing Opportunity

Boring/Well #	MW12
Project:	Salty dog
Project #	01781901A
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
		↑			37	35-40				
	SAT	0.3	NP	MW12 @ 35-40 1507	38 39 40			SP-SM	SAA, some black organic colors and Fe stain <1 = 5,420 (5.4 high range)	
					41				TD @ 40'	
					42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59					

LT Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW13	Project: Salty Dog
Date: 10-21-19	Project Number: 017819014
Logged By: JA	Drilled By: Cascade
Elevation: 5,258'	Detector: PID/Quantab
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: ~~Bentonite Chips~~ 10/20 silica sand 40-28	Seal: Hydrated Bentonite Chips 28-23
Grout: 23-0	
Casing Type: ~~SCH 40 PVC~~	Diameter: 2 Length: 30
Hole Diameter: 6"	Depth to Liquid:
Screen Type: SCH 40 PVC Slot: 0.010"	Diameter: 2 Length: 10
Total Depth: 40	Depth to Water: 30

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.3	NO		0 1 2			SM	brown silty sand w/ gravel + cobbles Cl = <128ppm (0.2)	Stick-up
	dry	0.4	NO		3 4 5	0-5		SM	SAA Cl = <128ppm (0.1)	
	dry	0.3	NO		6 7			SM	SAA, few gravel no cobbles Cl = <128ppm (1.0)	
	dry	0.3	NO		8 9 10	5-10		SM	SAA Cl = 128ppm (1.2)	
	dry	0.3	NO	MW13 @ 10-12.5' 1438	11 12	10-15		SM	SAA gravel + cobbles Cl = 212 ppm (20)	
	dry	0.3	NO		13 14 15			SM	SAA Cl = 128ppm (1.2	

Advancing Opportunity

Boring/Well #	MW13
Project:	Salty Dog
Project #	01781901 4
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.5	NO		15 16 17	15-20		SM	SAA, large cobbles Cl = 128 (1.5)	
	dry	0.3	ND		18 19 20			SM	SAA Cl = <128 ppm (1.1)	
	dry	0.7	NO		21 22	20-25			SAA Cl = <128 ppm (1.1)	
	dry	0.6	NO		23 24 25				SAA Cl = <128 ppm (0.8)	
	M	1.0	NO	MW13 @ 25-27.5 1440	26 27				SAA Cl = 156 ppm (1.7) GW@30'	
	VM SAT	0.7	NO		28 29 30	25-30			SAA Cl = <128 (0.8) bottom 6" increased clay/silt and saturation	
	SAT	0.4	NO		31 32	30-35		SP-SM	poorly graded sand w/ silt, brown, saturated	
	SAT	0.4	NO	MW13 @ 32.5-35 1442	33 34 35				Cl = 1748 ppm (6.6) Cl = 2,472 ppm (7.6) dk brown fat clay w/ sand (claystone)	
	dry	0.8	NO		36 37				grey sandy siltstone Cl = <128 ppm (ND)	

Advancing Opportunity

Boring/Well #	MW13
Project:	Salty Dog
Project #	01781901 4
Date	10-21-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
			↑		37			SM	grey sandy siltstone (bedrock)	
	DRY	0.3	NO	MW13 @ 37.5-40 1444	38					
					39			SM	SAA Cl = <128 ppm (0.1)	
					40					
					41				TD @ 40'	
					42					
					43					
					44					
					45					
					46					
					47					
					48					
					49					
					50					
					51					
					52					
					53					
					54					
					55					
					56					
					57					
					58					
					59					

Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW14	Project: Salty Dog
Date: 10-22-19	Project Number: 017819014
Logged By: JA	Drilled By: Cascade
Elevation: 5,258'	Detector: PID/Quantab
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10/20 silica sand 35-23'	Seal: Hydrated Bentonite Chips 23-20
Grout: 20-0	
Casing Type: SCH40 PVC	Diameter: 2" Length:
Hole Diameter: 6"	Depth to Liquid:
Screen Type:	Slot: 0.010" Diameter: 2" Length: 10'
Total Depth: 35	Depth to Water: 30

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.7	NO		0 1 2			SM	brown silty sand w/gravel Cl = <128ppm (0.8)	Stick up
	dry	1.0	NO		3 4 5	0-5		SM	SAA Cl = <128ppm (0.8)	
	dry	0.8	NO	MW14 @ 5-7.5'	6 7			SM	SAA, no gravel Cl = <128ppm (ND)	
	dry	0.8	NO		8 9 10	5-10		SM	SAA Cl = <128ppm (ND)	
	dry	0.8	NO		11 12	10-15		SM	SAA w/gravel and cobbles Cl = <128ppm (ND)	
	dry	0.9	NO		13 14 15			SM	SAA Cl = <126ppm (0.8	

Advancing Opportunity

Boring/Well #	MW14
Project:	Salty Dog
Project #	01781901 4
Date	10-22-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	1.1	NO		15 16 17	15-20		SM	SAA Cl = <128ppm (0.8)	
	dry	1.0	NO		18 19 20			SM	SAA Cl = <128ppm (0.6)	
	M	1.0	NO	MW14 @ 20-22.5'	21 22	20-25		SM	SAA, moist Cl = 212ppm (2.0)	
	M	0.9	NO		23 24 25			SM	Cl = <128ppm (0.6) SAA, increased Fines GWE 30.5'	
	M	2.5	NO	MW14 @ 25-27.5'	26 27			SM	SAA Cl = 184ppm (1.8)	
	M	2.2	NO	MW14 @ 27.5-30'	28 29 30	25-30		SM/CH	SAA, bottom 6" is fat clay w/sand Cl = <128ppm (0.8)	
	SAT	2.1	NO	MW14 @ 30-32.5'	31 32	30-35		CH	fat clay w/sand	
	SAT	2.2	NO		33 34			ML	Cl = 128ppm (1.8) ~~Cl = 128ppm (1.8)~~ ~~Sandy~~ silt w/sand Cl = 128ppm (1.8)	
	Dry				35			CH	grey claystone (bedrock	
					36 37				TDE 35'	

Advancing Opportunity

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: MW15	Project: Salty Dog
Date: 10-22-19	Project Number: 017819014
Logged By: JA	Drilled By: Cascade
Elevation: 5,258'	Detector: PID / Quantab
Drilling Method: Sonic	Sampling Method: Continuous
Gravel Pack: 10/20 silica sand 35-22	Seal: Hydrated Bentonite Chips 22-18
Grout: 18-0	
Casing Type: SCH40 PVC 0-25	Diameter: 2" Length: 25
Hole Diameter: 6"	Depth to Liquid:
Screen Type: Slot: 0.010"	Diameter: 2" Length: 10
Total Depth: 40	Depth to Water: 30

Penetration Resistance	Moisture Content	Vapor (ppm)	HC Staining?	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	dry	0.0	NO		0 1 2	0-5'		SM	brown silty sand w/some interbeded (thin) clay Cl= <128ppm (0.1)	Stick-up
	dry	0.0	NO	MW15 @ 2.5-5' 1610	3 4 5			SP-SM	poorly graded sand w/silt Cl= <128ppm (0.1)	
	dry	0.0	NO		6 7	5-10		SP-SM	SAA Cl= <128ppm (0.1)	
	dry	0.0	NO		8 9 10			SP-SM	SAA Cl= <128ppm (0.1)	
	dry	0.2	NO		11 12			SP-SM	SAA Cl= <128ppm (0.2)	
	M	0.3	NO		13 14 15	10-15		SM	brown silty sand <128ppm (0.2)	

Advancing Opportunity

Boring/Well #	MW15
Project:	Salty Dog
Project #	01781401A
Date	10-22-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
	M	0.2	NO		15 16 17			SM	SAA Cl=<128ppm (0.2)	
	M	0.2	NO		18 19 20	15-20		SM	SAA Cl=<128ppm (0.2)	
	M	0.4	NO		21 22			SM	SAA Cl=<128ppm (0.9)	
	M/VM	0.0	NO	MW15 @ 22.5-25' 1620	23 24 25	20-25		SM / CH	SAA Cl=400 (3.1) / fat clay w/ sand	
	VM	0.0	NO		26 27			SM	Cl=<128ppm (0.1) / brown silty sand	
	VM	0.0	NO	MW15 @ 27.5-30' 1618	28 29 30	25-30		SM / CH	Cl=988ppm (5.0) / fat clay w/ sand	6WE31
	SAT	0.1	NO		31 32			SP-SM	poorly graded sand w/ silt Cl=212 (2.1)	
	SAT	0.0	NO	MW15 @ 32.5-35' 1612	33 34 35	30-35			SAA w/ few cobbles Cl=2,472 (76)	
	dry	0.8	NO		36 37	35-40		CH	grey claystone (bedrock) Cl=<128 (0.1)	backfill

Advancing Opportunity

Boring/Well #	MW15
Project:	Salty Dog
Project #	01781901H
Date	10-29-19

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks	Well Completion
					37					
	dry	0.0	NO	MW15 C 1645	38	35'		CH	SAA	
					39				Cl = <128 ppm (0.1)	
					40				TD @ 40'	backfill
					41				Backfill to 35' w/ bentonite	
					42					
					43					
					44					
					45					
					46					
					47					
					48					
					49					
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					53					
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					55					
					56					
					57					
					58					
					59					

APPENDIX B: NMOCD CONDITIONS OF APPROVAL

Josh Adams

From: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Sent: Tuesday, September 10, 2019 8:15 AM
To: Josh Adams
Cc: Jennifer Deal; Ashley Ager; Daniel Burns
Subject: 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 12th. 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.

LT Environmental, Inc.
Advancing Opportunity
25 YEARS

Joshua G. Adams
Staff Geologist
970.456.5750 *cell*
970.385.1096 *office*
848 East Second Avenue Durango, CO 81301
www.ltenv.com

Josh Adams

From: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Sent: Tuesday, October 1, 2019 3:52 PM
To: jdeal@hilcorp.com
Cc: Josh Adams; Ashley Ager; Powell, Brandon, EMNRD
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

Josh Adams

From: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Sent: Tuesday, October 22, 2019 1:55 PM
To: Ashley Ager; Josh Adams; Jennifer Deal
Subject: 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,

APPENDIX C: MONITORING WELL DEVELOPMENT FORMS

Monitoring Well Development Form

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
T 970.385.1096

Project Name: Salty Dog Water Trnasfer Station
Project Number: 17819014

Well Name: MW03 Sampler: Eric Carroll

Start Date: 9/9/2019 Start Time:

Depth to Water: 33.61 Total Depth of Well: 36.50
Time: 10:50 Depth to Product: NA

Casing Volume: 4.7 10 casing volumes (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
10:54	0	0	7.27	16.23	18.75	
10:56	0.5	0.5	7.25	16.24	18.66	
11:00	0.2	0.7	7.26	16.24	18.67	

Comments: Dry @ 0.7 gallons Very turbid, silty, light brown, no sheen, no odor

Describe Deviations from SOP:

Signature: Eric Carroll Date: 9/9/2019

Monitoring Well Development Form

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
T 970.385.1096

Project Name: Salty Dog Water Trnasfer Station
Project Number: 17819014

Well Name: MW05 Sampler: Eric Carroll

Start Date: 9/9/2019 Start Time: 11:00

Depth to Water: 33.46 Total Depth of Well: 38.41
Time: Depth to Product:

Casing Volume: 6.0 gal - 10 casing volumes (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
11:00	0	0	7.76	16.11	18.65	
11:03	0.5	0.5	7.58	16.44	18.48	
11:06	0.5	1.0	7.42	17.39	16.32	

Comments: Bailed dry @ 1 gallon, very turbid, silty, lt brown no sheen/odor. Effervescent

Describe Deviations from SOP:

Signature: Eric Carroll Date: 9/9/2019

Monitoring Well Development Form

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
T 970.385.1096

Project Name: Salty Dog Water Trnasfer Station
Project Number: 17819014

Well Name: MW06 Sampler: Eric Carroll

Start Date: 9/9/2019 Start Time: 11:30

Depth to Water: 32.77 Total Depth of Well: 38.01
Time: Depth to Product: NA

Casing Volume: 8.5 is 10 casing vol. (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
11:32	0.25	0.25	7.50	15.92	34.12	
11:33	0.25	0.50	7.20	15.97	32.90	
11:36	0.5	1.00	7.19	16.00	23.42	
11:40	0.30	1.30	7.18	16.03	21.22	

Comments: Dry @ 1.3 gallons, very turbid, silty, lt brown effervescent, no sheen/odor

Describe Deviations from SOP:

Signature: Eric Carroll Date: 9/9/2019

Monitoring Well Development Form

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
T 970.385.1096

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014

Well Name: MW-8 Sampler: TS

Start Date: 10/22/19 Start Time: 1635

Depth to Water: 23.80 Total Depth of Well: 25.20
Time: Depth to Product: —

Casing Volume: 1.4 X 0.1631 = 0.23 X 10 = 2.28 (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F) C	Conductivity (us or ms)	Comments
1635	0.25	.25	7.08	14.5	8.19	Brown turbid
1640	0.25	.5	7.07	14.4	8.29	"
1645	0.25	.75	7.07	14.4	8.62	"
1650	0.25	1	7.08	14.4	8.32	"
1700	0.25	1.25	7.08	14.4	8.24	"

Comments: bailed dry @ 1.25 gallons

Describe Deviations from SOP:

Signature: Date: 10/22/2019

Monitoring Well Development Form

LT Environmental, Inc.
848 East Second Avenue
Durango, Colorado 81301
T 970.385.1096

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014

Well Name: MW-9 Sampler: TS

Start Date: 10/22/19 Start Time: 1710

Depth to Water: 23.94 Total Depth of Well: 30.33
Time: Depth to Product: -

Casing Volume: (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)C	Conductivity (us or ms)	Comments
1710	0.25	0.25	7.06	14.3	8.11	brown, turbid
1715	0.5	0.75	7.07	14.3	8.12	"
1720	0.5	1	7.06	14.4	8.20	"
1730	0.5	1.5	7.06	14.4	8.21	"
1740	0.5	2	7.06	14.4	8.14	"

Comments: bailed dry @ 2 gallons

Describe Deviations from SOP:

Signature: Date: 10/22/2019

LT Environmental, Inc.
~~[illegible]~~ 848 E. 2nd Ave
Durango, Colorado 81301
(970) 385-1096

Monitoring Well Development Form

Project Name: ~~[illegible]~~ Salty Dog
Project Number: ~~[illegible]~~ 01781901 4

Well Name: MW10 Sampler: SA

Start Date: 10-22-19 Start Time: 1500

Depth to Water: 30.60 Total Depth of Well: 40.37
Time: Depth to Product: ND

Casing Volume: 16 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. ~~(F)~~ °C	Conductivity (us or ms)	Comments
~~[illegible]~~	0.25	0.25	7.01	16.5	9.27	clear
	0.25	~~[illegible]~~ 0.5	7.06	15.7	9.14	brown silty, cloudy
	0.25	0.75	7.07	15.8	8.83	" "
	0.25	1.0	7.07	15.8	8.82	" "
	4.0	5.0	7.01	17.1	10.69	brown, cloudy, turbid
	5.0	10.0	7.07	16.6	10.24	" "
	3.0	13.0	7.08	15.8	9.85	" "

Comments: well bailed dry after 13 gallon purg

LT Environmental, Inc.
~~2243 North Main Avenue, Suite #3~~ 848 E. 2nd Ave
Durango, Colorado 81301
(970) 385-1096

Monitoring Well Development Form

Project Name: ~~[illegible]~~ Salty Dog
Project Number: ~~[illegible]~~ 017819014

Well Name: MW-12 Sampler: TS

Start Date: 10/22/19 Start Time:

Depth to Water: 30.85 Total Depth of Well: 39.58
Time: Depth to Product: —

Casing Volume: 8.73x0.1631=1.4x10=14 (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	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	7.02	15.8	22.4	
	~~1~~	~~3~~				
	~~1~~	~~4~~				

Comments: bailed dry @ 2 gallons

LT Environmental, Inc.
~~2243 North Main Avenue, Suite 13~~ 848 E. 2nd Ave
Durango, Colorado 81301
(970) 385-1096

Monitoring Well Development Form

Project Name: ~~Stagecoach AM~~ Salty Dog
Project Number: ~~[illegible]~~ 017814014

Well Name: MW-13 Sampler: TS

Start Date: 10/22/19 Start Time: 1540

Depth to Water: 31.81 Total Depth of Well: 40.19
Time: Depth to Product: —

Casing Volume: 8.38x0.1631=1.36x10=13.7 (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (~~F~~) C	Conductivity (us or ms)	Comments
	0.25	0.25	7.01	16.8	21.5	
	0.25	0.5	7.04	16.7	22.4	
	0.25	0.75	7.02	16.7	21.6	
	0.25	1	7.02	16.7	22.1	
	4	5	7.08	16.5	30.06	
	5	10	7.09	16.5	37.6	

Comments: Bailed dry @ 10 gallons

LT Environmental, Inc.
~~2243 North Main Avenue, Suite 43~~ 848 E. 2nd Ave
Durango, Colorado 81301
(970) 385-1096

Monitoring Well Development Form

Project Name: S[illegible]
Project Number: 0178170006

Well Name: MW-14 Sampler: TS

Start Date: 10/22/19 Start Time:

Depth to Water: 20.92 Total Depth of Well: 25.20
Time: Depth to Product: —

Casing Volume: 4.28x0.1631= 0.69x 10=6.9 (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F/C)	Conductivity (us or ms)	Comments
	1	1	7.09	15.8	10.12	
	1	2	7.08	16.0	10.22	

Comments: bailed dry after 2.0 gallon purg

LT Environmental, Inc.
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Durango, Colorado 81301
(970) 385-1096

Monitoring Well Development Form

Project Name: ~~[illegible]~~ Salty Dog
Project Number: ~~[illegible]~~ 017819014

Well Name: MW-15 Sampler: TS

Start Date: 10/22/19 Start Time:

Depth to Water: 27.20 Total Depth of Well: 38.26
Time: Depth to Product:

Casing Volume: 11.06 x .1631 = 1.8 x 10 = 18 (height of water column * 0.1631 for 2" well or 0.6524 for 4" well)
Method of Purging: Dedicated PVC Bailer
Method of Sampling: Dedicated PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (~~F~~)C	Conductivity (us or ms)	Comments
	1	1	7.02	14.3	13.19	
	1	2	7.02	14.2	11.14	
	1	3	7.04	14.2	11.26	

Comments: bailed dry @ 3 gallons

APPENDIX D: GROUNDWATER SAMPLE COLLECTION FORMS

LTE Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Semi-Annual Groundwater Monitoring
Project Number: 017818010
Project Location: Salty Dog Water Transfer Station
Sampler: Caitlin McGinn

Sample ID: MW03
Sample Date: 9.12.19
Laboratory: Hall Environmental
Analyses: Extended list 8026, TDS, pH, Cations/Anions
Matrix: Groundwater
Sample Time: 1433
Shipping Method: Hand Delivery

Depth to Water: 33.62
Time: 1103
Total Depth of Well: 37.24
Depth to Product: —

Vol. of Water to Purge: 1.7gal (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: Bailing
Method of Sampling: Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
1433	~1gal.	~1gal	7.35	66.7	40.4 mS	Well would not recharge

Comments: Well did not recharge, sampled 3 voas, Nitric acid bottle (1mL), half of unpreserved bottle.

Describe Deviations from SOP: Was not able to purge 1.7 gallons from well.

Signature: Caitlin McGinn. Date: 9.12.19

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Semi-Annual Groundwater Monitoring
Project Number: 017818010
Project Location: Salty Dog Water Transfer Station
Sampler: Caitlin McGinn

Sample ID: MW05
Sample Date: 9.12.19
Laboratory: Hall Environmental
Analyses: 8026, TDS, pH, Cations/Anions
Matrix: Groundwater
Sample Time: 1335
Shipping Method: Hand Delivery

Depth to Water: 33.36
Time: 1104
Total Depth of Well: 38.40
Depth to Product: —

Vol. of Water to Purge: 2.5 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: Bailing
Method of Sampling: Bailing

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
1335		~1.5 gallons	7.29	65.3	18.67ms	Well did not recharge

Comments: Well did not recharge, sampled 3 VOAs, Nitric acid bottle (1mL), Sulfuric Acid Bottle (1ml), & unpreserved bottle.

Describe Deviations from SOP: Did not purge 2.5 gallons.

Signature: Caitlin McGinn Date: 9.12.19

Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Semi-Annual Groundwater Monitoring
Project Number: 017818010
Project Location: Salty Dog Water Transfer Station
Sampler: Caitlin McGinn

Sample ID: MW06
Sample Date: 9.12.19
Laboratory: Hall Environmental
Analyses: 8026, TDS, pH, Cations/Anions
Matrix: Groundwater
Sample Time: 1402
Shipping Method: Hand Delivery

Depth to Water: 32.74
Time: 1109
Total Depth of Well: 37.94
Depth to Product: —

Vol. of Water to Purge: 2.5 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: Bailing
Method of Sampling: Bailing

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
1402		~1 gallon	7.78	69.1	19.97ms	Well recharge SLOW

Comments: Well recharged slowly. Sampled 3 VOAs, Nitric acid (1mL), Sulfuric acid (1mL), unpreserved bottle.

Describe Deviations from SOP: Did not purge 7.5 gallons.

Signature: Caitlin McGinn Date: 9.12.19

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler: Josh Adams

Sample ID: MW08
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 1005
Shipping Method: Hand Delivery

Depth to Water: 23.81
Time: ~~0955~~ 0955
Total Depth of Well: 25.18
Depth to Product: ND

Vol. of Water to Purge: 0.75 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
		GRAB			SAMPLE	

Comments: first bailer 1/4 full, grab sample

Describe Deviations from SOP: grab sample due to inufficent H_2O

Signature: Josh Adams Date: 10/24/2019

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
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Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler: Josh Adams

Sample ID: MW09
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 1050
Shipping Method: Hand Delivery

Depth to Water: 23.93
Time: 1030
Total Depth of Well: 30.18
Depth to Product: NO

Vol. of Water to Purge: 3.0 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (°F) °C	Conductivity (us or ms)	Comments
1035	0.25	0.25	6.97	15.7	8.97	slight brown cloudy
	0.25	0.50	6.97	15.9	9.46	brown cloudy
	0.25	0.75	6.99	16.0	9.64	" "
	0.25	1.0	6.99	15.8	9.37	" "
	1.0	2.0	7.04	16.0	8.96	" "
	1.0	3.0	7.02	16.1	8.74	" "

Comments: Sampled @ 1050

Describe Deviations from SOP:

Signature: Josh Adams Date: 10/24/2019

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler: Stuart Hyde

Sample ID: MW10
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 1040
Shipping Method: Hand Delivery

Depth to Water: 30.60
Time: 1000
Total Depth of Well: 40.35
Depth to Product: —

Vol. of Water to Purge: 4.9 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. , (F)	Conductivity (us or ms)	Comments
1005	0.5	0.5	7.49	56.5	4.85	slight turbid, brown
1015	0.25	0.75	7.49	57.2	7.98	"
1017	0.25	1.0	7.54	57.7	11.55	"
1020	0.25	1.25	7.54	57.2	9.70	med. turbidity
1025	0.75	2.0	7.58	56.8	10.16	"
1027	1.0	3.0	7.60	56.8	10.97	"
1030	1.0	4.0	7.62	56.7	12.10	"
1035	1.0	5.0	7.61	57.2	12.37	"

Comments: Sampled @ 1040

Describe Deviations from SOP:

Signature: [signature] Date: 10/24/2019

Advancing Opportunity

LT Environmental, Inc.
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Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler:

Sample ID: MW12
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 1150
Shipping Method: Hand Delivery

Depth to Water: 30.83
Time: 1120
Total Depth of Well: 39.01
Depth to Product: ND

Vol. of Water to Purge: 4.00 (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. ~~(F)~~ °C	Conductivity (us or ~~ms~~)	Comments
1125	0.25	0.25	7.10	15.7	38.0	brown. cloudy
	0.25	0.50	7.06	16.1	32.2	" "
	0.25	0.75	7.09	16.1	28.1	" "
	0.25	1.0	7.03	16.1	25.4	" "
	1.0	2.0	7.09	15.9	43.7	" "
	1.0	3.0	7.08	16.0	40.8	" "
	1.0	4.0	7.09	16.0	45.4	" "

Comments: Sampled @ 1150

Describe Deviations from SOP:

Signature: Jake Adams Date: 10/24/2019

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler: Stuart Hyde

Sample ID: MW13
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 1140
Shipping Method: Hand Delivery

Depth to Water: 31.83
Time: 1100
Total Depth of Well: 40.40
Depth to Product: -

Vol. of Water to Purge: 4.4 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or ms)	Comments
1100	0.5	0.5	7.32	59.4	35.8	slight turbid brown
1102	0.25	0.75	7.21	59.5	46.9	"
1105	0.25	1.0	7.22	59.9	52.5	"
1107	0.25	1.25	7.22	59.7	52.0	"
1110	0.75	2.0	7.22	59.4	58.1	"
1120	1.0	3.0	7.20	58.5	60.5	med turbidity
1125	1.0	4.0	7.32	59.5	60.2	"
1130	1.0	5.0	7.32	59.9	60.1	"

Comments: Sampled @ 1140

Describe Deviations from SOP:

Signature: Stuart Hyde Date: 10/24/2019

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler: Stuart Hyde

Sample ID: MW 14
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 0940
Shipping Method: Hand Delivery

Depth to Water: 30.92
Time: 0900
Total Depth of Well: 35.42
Depth to Product:

Vol. of Water to Purge: 2.5 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)	Conductivity (us or mis)	Comments
0920	0.75	0.75	7.30	59.0	9.18	brown, turbid
0925	0.25	1.0	7.50	59.5	4.80	"
0930	0.25	1.25	7.47	59.3	5.04	"
0932	0.25	1.50	7.42	59.2	5.20	"
0934	0.50	2.0	7.40	58.3	5.68	"
0937	0.50	2.5	7.40	58.8	5.94	"

Comments: Sampled @ 0940

Describe Deviations from SOP:

Signature: Stuart Hyde Date: 10/24/2019

LT Advancing Opportunity

LT Environmental, Inc.
848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Groundwater Sample Collection Form

Project Name: Salty Dog Water Transfer Station
Project Number: 017819014
Project Location: Salty Dog Pipeline
Sampler: Josh Adams

Sample ID: MW15
Sample Date: 10/24/2019
Laboratory: Hall Environmental
Analyses: VOC's, TDS, pH, cation/anions
Matrix: Groundwater
Sample Time: 0935
Shipping Method: Hand Delivery

Depth to Water: 27.15
Time: 0900
Total Depth of Well: 38.23
Depth to Product: ND

Vol. of Water to Purge: 5.5 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols
Method of Purging: PVC Bailer
Method of Sampling: PVC Bailer

Time	Vol. Removed	Total Vol. Removed (gallons)	pH (std. units)	Temp. (F)°C	Conductivity (us or ms)	Comments
0905	0.25	0.25	7.08	14.5	23.1	brown cloudy
	0.25	0.50	7.06	14.2	8.72	" "
	0.25	0.75	7.01	14.6	8.70	" "
	0.25	1.0	7.09	14.3	9.52	" "
	1.0	2.0	7.05	14.4	9.42	" "
	1.0	3.0	7.04	14.4	8.47	" "
	1.0	4.0	7.06	14.7	8.22	" "
	1.0	5.0	7.09	14.7	6.65	" "
	0.5	5.5	7.05	14.6	6.51	" "

Comments: Sampled @ 0935

Describe Deviations from SOP:

Signature: Josh Adams Date: 10/24/2019

APPENDIX E: LABORATORY ANALYTICAL RESULTS

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

September 09, 2019

Jennifer Deal
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX

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 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 Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-001 **Matrix:** SOIL

Client Sample ID: MW05 25'-30'
Collection Date: 8/28/2019 12:00:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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 RANGE						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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-002 **Matrix:** SOIL

Client Sample ID: MW05 30'-35'
Collection Date: 8/28/2019 12:15:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	9/5/2019 6:06:10 PM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.025		mg/Kg	1	9/5/2019 1:55:52 PM
Toluene	ND	0.050		mg/Kg	1	9/5/2019 1:55:52 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2019 1:55:52 PM
Xylenes, 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 METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-003 **Matrix:** SOIL

Client Sample ID: Ex. Bottom
Collection Date: 8/28/2019 1:10:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-004 **Matrix:** SOIL

Client Sample ID: MW06 25'-30'
Collection Date: 8/28/2019 3:15:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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
Toluene	ND	0.047		mg/Kg	1	9/5/2019 3:27:30 PM
Ethylbenzene	ND	0.047		mg/Kg	1	9/5/2019 3:27:30 PM
Xylenes, Total	ND	0.095		mg/Kg	1	9/5/2019 3:27:30 PM
Surr: 4-Bromofluorobenzene	86.2	80-120		%Rec	1	9/5/2019 3:27:30 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	1700	60		mg/Kg	20	9/5/2019 6:34:36 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-005 **Matrix:** SOIL

Client Sample ID: MW06 30'-35'
Collection Date: 8/28/2019 3:17:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range 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: DNOP	96.7	70-130		%Rec	1	9/5/2019 7:19:20 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	9/5/2019 3:50:23 PM
Surr: BFB	98.4	77.4-118		%Rec	1	9/5/2019 3:50:23 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	9/5/2019 3:50:23 PM
Toluene	ND	0.046		mg/Kg	1	9/5/2019 3:50:23 PM
Ethylbenzene	ND	0.046		mg/Kg	1	9/5/2019 3:50:23 PM
Xylenes, Total	ND	0.093		mg/Kg	1	9/5/2019 3:50:23 PM
Surr: 4-Bromofluorobenzene	85.2	80-120		%Rec	1	9/5/2019 3:50:23 PM
EPA METHOD 300.0: ANIONS						Analyst: **CJS**
Chloride	2100	60		mg/Kg	20	9/5/2019 6:47:00 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
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW07 2'-4'
Project: Salty Dog
Collection Date: 8/29/2019 12:20:00 PM
Lab ID: 1909112-006 **Matrix:** SOIL **Received Date:** 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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 RANGE						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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-007 **Matrix:** SOIL

Client Sample ID: MW07 22'-24'
Collection Date: 8/29/2019 12:22:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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 RANGE						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
Ethylbenzene	ND	0.049		mg/Kg	1	9/5/2019 6:53:37 PM
Xylenes, Total	ND	0.097		mg/Kg	1	9/5/2019 6:53:37 PM
Surr: 4-Bromofluorobenzene	87.9	80-120		%Rec	1	9/5/2019 6:53:37 PM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	2200	150		mg/Kg	50	9/6/2019 10:22:49 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
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW02 2'-4'
Project: Salty Dog
Collection Date: 8/29/2019 12:36:00 PM
Lab ID: 1909112-008 **Matrix:** SOIL **Received Date:** 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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 RANGE						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**
Chloride	2900	150		mg/Kg	50	9/6/2019 10:35:13 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
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-009 **Matrix:** SOIL

Client Sample ID: MW02 16'-18'
Collection Date: 8/29/2019 12:38:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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 RANGE						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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-010 **Matrix:** SOIL

Client Sample ID: MW03 14'-16'
Collection Date: 8/29/2019 3:08:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-011 **Matrix:** SOIL

Client Sample ID: MW03 26'-28'
Collection Date: 8/29/2019 3:11:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-012 **Matrix:** SOIL

Client Sample ID: MW02 22'-24'
Collection Date: 8/29/2019 3:16:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/5/2019 10:11:17 PM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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-Bromofluorobenzene	83.7	80-120		%Rec	1	9/5/2019 8:47:49 PM
EPA METHOD 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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW01 0'-2'
Project: 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 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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 RANGE						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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-014 **Matrix:** SOIL

Client Sample ID: MW01 8'-10'
Collection Date: 8/30/2019 5:32:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 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: **NSB**
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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-015 **Matrix:** SOIL

Client Sample ID: MW01 10'-12'
Collection Date: 8/30/2019 5:34:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	84	60		mg/Kg	20	9/5/2019 9:56:36 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW04 2'-4'
Project: Salty Dog
Collection Date: 8/30/2019 5:43:00 PM
Lab ID: 1909112-016 **Matrix:** SOIL **Received Date:** 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1909112-017 **Matrix:** SOIL

Client Sample ID: MW04 16'-18'
Collection Date: 8/30/2019 5:44:00 PM
Received Date: 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	9/6/2019 12:14:44 AM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	9/6/2019 12:14:44 AM
Surr: DNOP	102	70-130		%Rec	1	9/6/2019 12:14:44 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	9/5/2019 11:28:39 PM
Surr: BFB	99.8	77.4-118		%Rec	1	9/5/2019 11:28:39 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.023		mg/Kg	1	9/5/2019 11:28:39 PM
Toluene	ND	0.047		mg/Kg	1	9/5/2019 11:28:39 PM
Ethylbenzene	ND	0.047		mg/Kg	1	9/5/2019 11:28:39 PM
Xylenes, Total	ND	0.093		mg/Kg	1	9/5/2019 11:28:39 PM
Surr: 4-Bromofluorobenzene	86.0	80-120		%Rec	1	9/5/2019 11:28:39 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	160	59		mg/Kg	20	9/5/2019 10:46:13 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
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW04 18'-20'
Project: Salty Dog
Collection Date: 8/30/2019 5:45:00 PM
Lab ID: 1909112-018 **Matrix:** SOIL **Received Date:** 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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**
Benzene	ND	0.025		mg/Kg	1	9/5/2019 11:51:43 PM
Toluene	ND	0.050		mg/Kg	1	9/5/2019 11:51:43 PM
Ethylbenzene	ND	0.050		mg/Kg	1	9/5/2019 11:51:43 PM
Xylenes, Total	ND	0.099		mg/Kg	1	9/5/2019 11:51:43 PM
Surr: 4-Bromofluorobenzene	86.1	80-120		%Rec	1	9/5/2019 11:51:43 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	110	60		mg/Kg	20	9/5/2019 10:58:38 PM

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: NE Wall of Ex.
Project: Salty Dog
Collection Date: 8/30/2019 5:53:00 PM
Lab ID: 1909112-019 **Matrix:** SOIL **Received Date:** 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **JME**
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						Analyst: **NSB**
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: **NSB**
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.
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

Analytical Report
Lab Order **1909112**
Date Reported: **9/9/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: SW Wall of Ex.
Project: Salty Dog
Collection Date: 8/30/2019 5:54:00 PM
Lab ID: 1909112-020 **Matrix:** SOIL **Received Date:** 9/4/2019 8:00:00 AM

Analyses	Result	RL	Qual	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.
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.

WO#: **1909112**

09-Sep-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-47308**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **47308**	RunNo: **62662**
Prep Date: **9/5/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134941** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-47308**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **47308**	RunNo: **62662**
Prep Date: **9/5/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134942** Units: **mg/Kg**

Analyte	Result	PQL	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: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **47303**	RunNo: **62696**
Prep Date: **9/5/2019**	Analysis Date: **9/5/2019**	SeqNo: **2135270** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-47303**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **47303**	RunNo: **62696**
Prep Date: **9/5/2019**	Analysis Date: **9/5/2019**	SeqNo: **2135271** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909112**

09-Sep-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-47264**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **47264**	RunNo: **62665**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134752** 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	12		10.00		122	70	130			

Sample ID: **LCS-47264**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **47264**	RunNo: **62665**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134753** 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		95.7	70	130			

Sample ID: **1909112-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW05 25'-30'**	Batch ID: **47264**	RunNo: **62665**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134761** Units: **mg/Kg**

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: **1909112-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **MW05 25'-30'**	Batch ID: **47264**	RunNo: **62665**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134763** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (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**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **47315**	RunNo: **62698**
Prep Date: **9/6/2019**	Analysis Date: **9/6/2019**	SeqNo: **2135320** Units: **mg/Kg**

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			

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.

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

Client: HILCORP ENERGY
Project: Salty Dog

Sample ID: **MB-47315** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **47315** RunNo: **62698**
Prep Date: **9/6/2019** Analysis Date: **9/6/2019** SeqNo: **2135321** 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	9.7		10.00		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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909112**

09-Sep-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-47263**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134562** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	990		1000		99.1	77.4	118			

Sample ID: **LCS-47263**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134563** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.9	80	120			
Surr: BFB	1200		1000		116	77.4	118			

Sample ID: **1909112-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **MW05 25'-30'**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134565** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	4.8	24.06	0	103	69.1	142			
Surr: BFB	1100		962.5		115	77.4	118			

Sample ID: **1909112-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **MW05 25'-30'**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134566** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range 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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909112**

09-Sep-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-47263**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134599** Units: **mg/Kg**

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-Bromofluorobenzene	0.88		1.000		87.9	80	120			

Sample ID: **LCS-47263**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134600** Units: **mg/Kg**

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-Bromofluorobenzene	0.95		1.000		94.7	80	120			

Sample ID: **1909112-002AMS**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW05 30'-35'**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	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-Bromofluorobenzene	0.89		0.9294		95.4	80	120			

Sample ID: **1909112-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW05 30'-35'**	Batch ID: **47263**	RunNo: **62668**
Prep Date: **9/4/2019**	Analysis Date: **9/5/2019**	SeqNo: **2134604** Units: **mg/Kg**

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-Bromofluorobenzene	0.92		0.9940		92.5	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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY FAR** Work Order Number: **1909112** RcptNo: 1

Received By: **Daniel Marquez** **9/4/2019 8:00:00 AM**

Completed By: **Erin Melendrez** **9/4/2019 9:58:20 AM**

Reviewed By: ENM 9/4/19

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 samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated 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 received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: DAD 9/4/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.3	Good	Yes			
2	3.0	Good	Yes			

Chain-of-Custody Record

9/6

Client: Hilcorp

Jennifer Deal

Mailing Address: 382 Rd 3100

Aztec, NM 87410

Phone #: 505-324-5128

email or Fax#: jdeal@hilcorp.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☒ EDD (Type) PDF

Turn-Around Time: 3day, Friday 3pm

☐ Standard ● Rush ~~Next day~~

Project Name: Salty Dog

Project #: 01781901 4

Project Manager: Josh Adams

Sampler: C. McGinn

On Ice: ☑ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 0.7-0.2=0.5 / 3.4-0.4=3.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1909112	BTEX / ~~MTBE~~ / ~~TMB's (8021)~~	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(Cl, F, Br, ~~NO_3~~, ~~NO_2~~, ~~PO_4~~, ~~SO_4~~)	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
8.28.19	1200	Soil	MW05 25'-30'	4oz jar	cool	-001	X	X					X			
	1215		MW05 30'-35'			-002	X	X					X			
	1310		Ex. Bottom			-003	X	X					X			
	1515		MW06 25'-30'			-004	X	X					X			
	1517		MW06 30'-35'			-005	X	X					X			
8.29.19	1220		MW07 2'-4'			-006	X	X					X			
	1222		MW07 22'-24'			-007	X	X					X			
	1236		MW02 2'-4'			-008	X	X					X			
	1238		MW02 16'-18'			-009	X	X					X			
	1508		MW03 14'-16'			-010	X	X					X			
	1511		MW03 26'-28'			-011	X	X					X			
	1516		MW02 22'-24'			-012	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9.3.19	8:50	Caitlin Mess				
	1845				9/3/19	1845

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9/3/19	2100			courier	9/4/19	8:00

Remarks:

cc: jadams@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

9/16

Turn-Around Time: 3-day Friday @ 3pm
☐ Standard ☒ Rush ~~next day~~

Client: Hilcorp
Jennifer Deal
Mailing Address: 382 Rd 3100
Aztec, NM 87410
Phone #: 505-324-5128
email or Fax#: jdeal@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Project Name: Salty Dog
Project #: 01781904
Project Manager: Josh Adams
Sampler: C. McGinn
On Ice: ☒ Yes ☐ No
# of Coolers: 2
Cooler Temp (including CF): 0.7-0.4=0.3 / 3.4-0.4=3.0°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1909117	BTEX / ~~MTBE / TMB's (8021)~~	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	(Cl, F, Br, NO_3, NO_2, PO_4, SO_4)	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
8.30.19	1728	Soil	MW01 0'-2'	4oz jar	cool	-013	X	X					X			
	1732		MW01 8'-10'			-014	X	X					X			
	1734		MW01 10'-12'			-015	X	X					X			
	1743		MW04 2'-4'			-016	X	X					X			
	1744		MW04 16-18'			-017	X	X					X			
	1745		MW04 18'-20'			-018	X	X					X			
	1753		NE Wall of Ex.			-019	X	X					X			
	1754		SW Wall of Ex.			-020	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9/3/19	8:55	Caitlin McGinn	[signature]		9-3-19	0855
9-3-19	1845	[signature]	[signature]		9/3/19	1845
9/3/19	2100	[signature]	[signature]	courier	9/4/19	8:00

Remarks:
cc: jadams@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 28, 2019

Josh Adams
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX

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 Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW03
Project: Salty Dog **Collection Date:** 9/12/2019 2:33:00 PM
Lab ID: 1909668-001 **Matrix:** AQUEOUS **Received Date:** 9/13/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **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, 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, Nitrate (As N)	ND	10		mg/L	100	9/13/2019 3:55:24 PM	R62938
Phosphorus, 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
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JRR**	
Conductivity	45000	50		µmhos/c	10	9/16/2019 2:10:59 PM	R62955
SM2320B: ALKALINITY						Analyst: **JRR**	
Bicarbonate (As CaCO3)	137.8	20.00		mg/L Ca	1	9/16/2019 11:22:50 AM	R62955
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	9/16/2019 11:22:50 AM	R62955
Total Alkalinity (as CaCO3)	137.8	20.00		mg/L Ca	1	9/16/2019 11:22:50 AM	R62955
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	30000	200	*D	mg/L	1	9/16/2019 2:37:00 PM	47473
SM4500-H+B / 9040C: PH						Analyst: **JRR**	
pH	7.41		H	pH units	1	9/16/2019 11:22:50 AM	R62955
EPA METHOD 6010B: DISSOLVED METALS						Analyst: **ELS**	
Calcium	2500	100		mg/L	100	9/20/2019 9:10:25 AM	A63074
Magnesium	390	10		mg/L	10	9/18/2019 3:17:55 PM	A63017
Potassium	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 METHOD 8260B: VOLATILES						Analyst: **DJF**	
Benzene	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
Ethylbenzene	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
Naphthalene	ND	2.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
1-Methylnaphthalene	ND	4.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
2-Methylnaphthalene	ND	4.0		µg/L	1	9/13/2019 2:08:25 PM	W62926
Acetone	ND	10		µg/L	1	9/13/2019 2:08:25 PM	W62926
Bromobenzene	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
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

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW03
Project: Salty Dog **Collection Date:** 9/12/2019 2:33:00 PM
Lab ID: 1909668-001 **Matrix:** AQUEOUS **Received Date:** 9/13/2019 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW03
Project: Salty Dog **Collection Date:** 9/12/2019 2:33:00 PM
Lab ID: 1909668-001 **Matrix:** AQUEOUS **Received Date:** 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	70-130		%Rec	1	9/13/2019 2:08:25 PM	W62926
Surr: 4-Bromofluorobenzene	85.4	70-130		%Rec	1	9/13/2019 2:08:25 PM	W62926
Surr: Dibromofluoromethane	110	70-130		%Rec	1	9/13/2019 2:08:25 PM	W62926
Surr: Toluene-d8	104	70-130		%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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW05
Project: Salty Dog **Collection Date:** 9/12/2019 1:35:00 PM
Lab ID: 1909668-002 **Matrix:** AQUEOUS **Received Date:** 9/13/2019 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 4:20:06 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
Phosphorus, 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**
Conductivity	54000	50		µmhos/c	10	9/16/2019 2:15:10 PM	R62955
SM2320B: ALKALINITY						Analyst:	**JRR**
Bicarbonate (As CaCO3)	153.9	20.00		mg/L Ca	1	9/16/2019 11:33:19 AM	R62955
Carbonate (As CaCO3)	ND	2.000		mg/L Ca	1	9/16/2019 11:33:19 AM	R62955
Total Alkalinity (as CaCO3)	153.9	20.00		mg/L Ca	1	9/16/2019 11:33:19 AM	R62955
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst:	**JMT**
Total Dissolved Solids	34000	200	*D	mg/L	1	9/16/2019 2:37:00 PM	47473
SM4500-H+B / 9040C: PH						Analyst:	**JRR**
pH	7.25		H	pH units	1	9/16/2019 11:33:19 AM	R62955
EPA METHOD 6010B: DISSOLVED METALS						Analyst:	**ELS**
Calcium	2100	100		mg/L	100	9/20/2019 9:12:12 AM	A63074
Magnesium	750	10		mg/L	10	9/18/2019 3:21:56 PM	A63017
Potassium	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 METHOD 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
Ethylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
Naphthalene	ND	2.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
1-Methylnaphthalene	ND	4.0		µg/L	1	9/13/2019 3:36:58 PM	W62926
2-Methylnaphthalene	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
Bromobenzene	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW05
Project: Salty Dog
Collection Date: 9/12/2019 1:35:00 PM
Lab ID: 1909668-002 **Matrix:** AQUEOUS **Received Date:** 9/13/2019 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 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW05
Project: Salty Dog **Collection Date:** 9/12/2019 1:35:00 PM
Lab ID: 1909668-002 **Matrix:** AQUEOUS **Received Date:** 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 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	70-130		%Rec	1	9/13/2019 3:36:58 PM	W62926
Surr: 4-Bromofluorobenzene	82.8	70-130		%Rec	1	9/13/2019 3:36:58 PM	W62926
Surr: Dibromofluoromethane	113	70-130		%Rec	1	9/13/2019 3:36:58 PM	W62926
Surr: Toluene-d8	104	70-130		%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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW06
Project: Salty Dog **Collection Date:** 9/12/2019 2:02:00 PM
Lab ID: 1909668-003 **Matrix:** AQUEOUS **Received Date:** 9/13/2019 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 SOLIDS						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**
pH	7.49		H	pH units	1	9/16/2019 11:44:27 AM	R62955
EPA METHOD 6010B: DISSOLVED METALS						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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW06
Project: Salty Dog **Collection Date:** 9/12/2019 2:02:00 PM
Lab ID: 1909668-003 **Matrix:** AQUEOUS **Received Date:** 9/13/2019 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1909668**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW06
Project: Salty Dog **Collection Date:** 9/12/2019 2:02:00 PM
Lab ID: 1909668-003 **Matrix:** AQUEOUS **Received Date:** 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 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**

Client ID: **PBW** Batch ID: **R62938** RunNo: **62938**

Prep Date: Analysis Date: **9/13/2019** SeqNo: **2144630** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								

Sample ID: **LCS** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**

Client ID: **LCSW** Batch ID: **R62938** RunNo: **62938**

Prep Date: Analysis Date: **9/13/2019** SeqNo: **2144631** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.48	0.10	0.5000	0	95.8	90	110			
Chloride	4.8	0.50	5.000	0	95.8	90	110			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	96.0	90	110			
Bromide	2.5	0.10	2.500	0	98.2	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	98.8	90	110			
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	91.7	90	110			
Sulfate	9.8	0.50	10.00	0	97.7	90	110			

Sample ID: **MB** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**

Client ID: **PBW** Batch ID: **R62985** RunNo: **62985**

Prep Date: Analysis Date: **9/17/2019** SeqNo: **2147718** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS-B** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**

Client ID: **LCSW** Batch ID: **R62985** RunNo: **62985**

Prep Date: Analysis Date: **9/17/2019** SeqNo: **2147726** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.7	90	110			

Sample ID: **MB** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**

Client ID: **PBW** Batch ID: **R63030** RunNo: **63030**

Prep Date: Analysis Date: **9/18/2019** SeqNo: **2149495** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R63030**	RunNo: **63030**							
Prep Date:	Analysis Date: **9/18/2019**	SeqNo: **2149495**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R63030**	RunNo: **63030**							
Prep Date:	Analysis Date: **9/18/2019**	SeqNo: **2149496**	Units: **mg/L**						
Analyte	Result	PQL	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
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.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **W62926**	RunNo: **62926**
Prep Date:	Analysis Date: **9/13/2019**	SeqNo: **2144410** 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								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **W62926**	RunNo: **62926**
Prep Date:	Analysis Date: **9/13/2019**	SeqNo: **2144410** 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	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		105	70	130			

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **W62926**	RunNo: **62926**
Prep Date:	Analysis Date: **9/13/2019**	SeqNo: **2144411** 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:

*	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.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **100ng lcs** SampType: **LCS** TestCode: **EPA Method 8260B: VOLATILES**

Client ID: **LCSW** Batch ID: **W62926** RunNo: **62926**

Prep Date: Analysis Date: **9/13/2019** SeqNo: **2144411** 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** SampType: **MS** TestCode: **EPA Method 8260B: VOLATILES**

Client ID: **MW03** Batch ID: **W62926** RunNo: **62926**

Prep Date: Analysis Date: **9/13/2019** SeqNo: **2144421** 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 msd** SampType: **MSD** TestCode: **EPA Method 8260B: VOLATILES**

Client ID: **MW03** Batch ID: **W62926** RunNo: **62926**

Prep Date: Analysis Date: **9/13/2019** SeqNo: **2144423** 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
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.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **lcs-1 99.8uS eC** SampType: **lcs** TestCode: **SM2510B: Specific Conductance**

Client ID: **LCSW** Batch ID: **R62955** RunNo: **62955**

Prep Date: Analysis Date: **9/16/2019** SeqNo: **2146976** Units: **µmhos/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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-A** SampType: **MBLK** TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **PBW** Batch ID: **A63017** RunNo: **63017**
Prep Date: Analysis Date: **9/18/2019** SeqNo: **2148716** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	ND	1.0								
Potassium	ND	1.0								

Sample ID: **LCS-A** SampType: **LCS** TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **LCSW** Batch ID: **A63017** RunNo: **63017**
Prep Date: Analysis Date: **9/18/2019** SeqNo: **2148717** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	50	1.0	50.00	0	99.7	80	120			
Potassium	49	1.0	50.00	0	98.3	80	120			

Sample ID: **MB-B** SampType: **MBLK** TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **PBW** Batch ID: **B63017** RunNo: **63017**
Prep Date: Analysis Date: **9/18/2019** SeqNo: **2148719** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	ND	1.0								
Potassium	ND	1.0								

Sample ID: **LCS-B** SampType: **LCS** TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **LCSW** Batch ID: **B63017** RunNo: **63017**
Prep Date: Analysis Date: **9/18/2019** SeqNo: **2148720** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Magnesium	51	1.0	50.00	0	102	80	120			
Potassium	50	1.0	50.00	0	101	80	120			

Sample ID: **MB-A** SampType: **MBLK** TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **PBW** Batch ID: **A63074** RunNo: **63074**
Prep Date: Analysis Date: **9/20/2019** SeqNo: **2151039** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Sodium	ND	1.0								

Sample ID: **LCS-A** SampType: **LCS** TestCode: **EPA Method 6010B: Dissolved Metals**
Client ID: **LCSW** Batch ID: **A63074** RunNo: **63074**
Prep Date: Analysis Date: **9/20/2019** SeqNo: **2151040** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **LCS-A** SampType: **LCS** TestCode: **EPA Method 6010B: Dissolved Metals**

Client ID: **LCSW** Batch ID: **A63074** RunNo: **63074**

Prep Date: Analysis Date: **9/20/2019** SeqNo: **2151040** 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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **mb-1 alk**	SampType: **mblk**	TestCode: **SM2320B: Alkalinity**							
Client ID: **PBW**	Batch ID: **R62955**	RunNo: **62955**							
Prep Date:	Analysis Date: **9/16/2019**	SeqNo: **2146955**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20.00								

Sample ID: **lcs-1 alk**	SampType: **lcs**	TestCode: **SM2320B: Alkalinity**							
Client ID: **LCSW**	Batch ID: **R62955**	RunNo: **62955**							
Prep Date:	Analysis Date: **9/16/2019**	SeqNo: **2146956**	Units: **mg/L CaCO3**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	78.56	20.00	80.00	0	98.2	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909668**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-47473**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **47473**	RunNo: **62954**
Prep Date: **9/13/2019**	Analysis Date: **9/16/2019**	SeqNo: **2145864** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-47473**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **47473**	RunNo: **62954**
Prep Date: **9/13/2019**	Analysis Date: **9/16/2019**	SeqNo: **2145865** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1020	20.0	1000	0	102	80	120			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY FAR** Work Order Number: **1909668** RcptNo: **1**

Received By: **Leah Baca** **9/13/2019 8:15:00 AM** Leah Baca

Completed By: **Yazmine Garduno** **9/13/2019 8:44:55 AM** Yazmine Garduno

Reviewed By: YG 9/13/19

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 samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated 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 received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 5
(<2 or >12 unless noted)
Adjusted? NO
Checked by: DAD 9/13/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date
By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:
Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.4	Good				

Chain-of-Custody Record

Client: Hilcorp
Jenifer Deal
Mailing Address: 382 Rd 3100
Aztec, NM 87410
Phone #: 505-324-5128
email or Fax#: jdeal@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time: Results by Monday @ 3pm
☐ Standard ☒ Rush 2 day
Project Name: Salty Dog
Project #: 017819014
Project Manager: Josh Adams
Sampler: C. McGinn
On Ice: ☒ Yes ☐ No
# of Coolers: (1)
Cooler Temp(including CF): 4.1 + 0.3 = 4.4C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Extended list 8026	TDS	pH	Cations / Anions		
9-12-19	1433	Aqueous	MW03	various	various	1908468-001											X	X	X	X		
↓	1335	↓	MW05	↓	↓	-002											X	X	X	X		
↓	1402	↓	MW06	↓	↓	-003											X	X	X	X		

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
9-12-19	1603	Caitlin Mooar	Chad Ward		9/12/19	1603
9/12/19	1752	Christine Walters	Keith	courier	9/13/19	0815

Remarks: cc: jadams@ltenv.com
cmcginn@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

November 01, 2019

Jennifer Deal
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX

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 Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW08@ 2.5-5'
Project: Salty Dog
Collection Date: 10/20/2019 2:49:00 PM
Lab ID: 1910B55-002 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range 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: DNOP	124	70-130		%Rec	1	10/24/2019 6:23:33 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/23/2019 7:05:34 PM
Surr: BFB	92.4	77.4-118		%Rec	1	10/23/2019 7:05:34 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	10/23/2019 7:05:34 PM
Toluene	ND	0.047		mg/Kg	1	10/23/2019 7:05:34 PM
Ethylbenzene	ND	0.047		mg/Kg	1	10/23/2019 7:05:34 PM
Xylenes, Total	ND	0.095		mg/Kg	1	10/23/2019 7:05:34 PM
Surr: 4-Bromofluorobenzene	93.3	80-120		%Rec	1	10/23/2019 7:05:34 PM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	ND	60		mg/Kg	20	10/23/2019 8:46:17 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW08@ 20-22.5'
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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/24/2019 4:36:42 AM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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 METHOD 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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW08@ 22.5-25'
Project: Salty Dog
Collection Date: 10/20/2019 2:58:00 PM
Lab ID: 1910B55-005 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	8.4		mg/Kg	1	10/24/2019 4:58:26 AM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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 METHOD 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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW08@ 27.5-30'
Project: Salty Dog
Collection Date: 10/20/2019 3:00:00 PM
Lab ID: 1910B55-006 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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

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

Hall Environmental Analysis Laboratory, Inc.

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 RANGE 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
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/23/2019 10:08:25 PM
Surr: BFB	91.7	77.4-118		%Rec	1	10/23/2019 10:08:25 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	10/23/2019 10:08:25 PM
Toluene	ND	0.048		mg/Kg	1	10/23/2019 10:08:25 PM
Ethylbenzene	ND	0.048		mg/Kg	1	10/23/2019 10:08:25 PM
Xylenes, Total	ND	0.096		mg/Kg	1	10/23/2019 10:08:25 PM
Surr: 4-Bromofluorobenzene	90.5	80-120		%Rec	1	10/23/2019 10:08:25 PM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	410	60		mg/Kg	20	10/23/2019 10:13:07 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW09@12.5-15'
Project: Salty Dog
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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW09@ 22.5-25'
Project: Salty Dog
Collection Date: 10/20/2019 5:24:00 PM
Lab ID: 1910B55-009 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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

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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW09@ 27.5-30'
Project: Salty Dog
Collection Date: 10/20/2019 5:26:00 PM
Lab ID: 1910B55-010 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	10/24/2019 6:48:02 AM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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 METHOD 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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 0-2.5'
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 METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	10/24/2019 7:09:55 AM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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 METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 2.5-5'
Project: Salty Dog
Collection Date: 10/21/2019 1:50:00 PM
Lab ID: 1910B55-012 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	10/24/2019 7:32:00 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/24/2019 7:32:00 AM
Surr: DNOP	142	70-130	S	%Rec	1	10/24/2019 7:32:00 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/24/2019 12:49:48 AM
Surr: BFB	94.2	77.4-118		%Rec	1	10/24/2019 12:49:48 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	10/24/2019 12:49:48 AM
Toluene	ND	0.048		mg/Kg	1	10/24/2019 12:49:48 AM
Ethylbenzene	ND	0.048		mg/Kg	1	10/24/2019 12:49:48 AM
Xylenes, Total	ND	0.096		mg/Kg	1	10/24/2019 12:49:48 AM
Surr: 4-Bromofluorobenzene	91.0	80-120		%Rec	1	10/24/2019 12:49:48 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	120	60		mg/Kg	20	10/23/2019 11:40:00 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
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

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 10-12.5'
Project: Salty Dog
Collection Date: 10/21/2019 1:58:00 PM
Lab ID: 1910B55-014 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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

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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 12.5-15'
Project: Salty Dog
Collection Date: 10/21/2019 2:00:00 PM
Lab ID: 1910B55-015 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@15-17.5'
Project: Salty Dog
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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 17.5-20'
Project: Salty Dog
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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	8.5		mg/Kg	1	10/24/2019 9:44:21 AM
Motor Oil Range Organics (MRO)	ND	43		mg/Kg	1	10/24/2019 9:44:21 AM
Surr: DNOP	105	70-130		%Rec	1	10/24/2019 9:44:21 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/24/2019 3:54:05 AM
Surr: BFB	94.8	77.4-118		%Rec	1	10/24/2019 3:54:05 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.024		mg/Kg	1	10/24/2019 3:54:05 AM
Toluene	ND	0.049		mg/Kg	1	10/24/2019 3:54:05 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/24/2019 3:54:05 AM
Xylenes, Total	ND	0.098		mg/Kg	1	10/24/2019 3:54:05 AM
Surr: 4-Bromofluorobenzene	92.5	80-120		%Rec	1	10/24/2019 3:54:05 AM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	120	61		mg/Kg	20	10/23/2019 10:05:55 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 22.5-25'
Project: Salty Dog
Collection Date: 10/21/2019 2:05:00 PM
Lab ID: 1910B55-019 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

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'
Project: Salty Dog
Collection Date: 10/21/2019 2:06:00 PM
Lab ID: 1910B55-020 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	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.

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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 27.5-30'
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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range 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: DNOP	93.3	70-130		%Rec	1	10/25/2019 9:13:40 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	10/24/2019 7:50:49 PM
Surr: BFB	88.8	77.4-118		%Rec	1	10/24/2019 7:50:49 PM
EPA METHOD 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
Ethylbenzene	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 METHOD 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.
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

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

Analyses	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 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.

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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 32.5-35'
Project: Salty Dog
Collection Date: 10/21/2019 2:12:00 PM
Lab ID: 1910B55-023 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW10@ 37.5-40'
Project: Salty Dog
Collection Date: 10/21/2019 2:15:00 PM
Lab ID: 1910B55-024 **Matrix:** SOIL **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW11@ 32.5-35'
Project: Salty Dog **Collection Date:** 10/21/2019 2:17:00 PM
Lab ID: 1910B55-025 **Matrix:** MEOH (SOIL) **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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
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

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

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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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
Surr: DNOP	83.4	70-130		%Rec	1	10/24/2019 1:40:47 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.8		mg/Kg	1	10/24/2019 3:07:29 PM
Surr: BFB	89.7	77.4-118		%Rec	1	10/24/2019 3:07:29 PM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.019		mg/Kg	1	10/24/2019 3:07:29 PM
Toluene	ND	0.038		mg/Kg	1	10/24/2019 3:07:29 PM
Ethylbenzene	ND	0.038		mg/Kg	1	10/24/2019 3:07:29 PM
Xylenes, Total	ND	0.076		mg/Kg	1	10/24/2019 3:07:29 PM
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	10/24/2019 3:07:29 PM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	97	60		mg/Kg	20	10/24/2019 11:09:04 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW12@ 15-17.5'
Project: Salty Dog **Collection Date:** 10/21/2019 3:00:00 PM
Lab ID: 1910B55-027 **Matrix:** MEOH (SOIL) **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: 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 (SOIL) **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range 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: DNOP	94.7	70-130		%Rec	1	10/24/2019 12:56:32 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	3.6		mg/Kg	1	10/25/2019 2:41:54 AM
Surr: BFB	92.5	77.4-118		%Rec	1	10/25/2019 2:41:54 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.018		mg/Kg	1	10/25/2019 2:41:54 AM
Toluene	ND	0.036		mg/Kg	1	10/25/2019 2:41:54 AM
Ethylbenzene	ND	0.036		mg/Kg	1	10/25/2019 2:41:54 AM
Xylenes, Total	ND	0.071		mg/Kg	1	10/25/2019 2:41:54 AM
Surr: 4-Bromofluorobenzene	91.3	80-120		%Rec	1	10/25/2019 2:41:54 AM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	180	59		mg/Kg	20	10/24/2019 11:33:53 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW12@ 35-37.5'
Project: Salty Dog
Collection Date: 10/21/2019 3:05:00 PM
Lab ID: 1910B55-029
Matrix: MEOH (SOIL)
Received Date: 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/24/2019 12:34:17 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/24/2019 12:34:17 AM
Surr: DNOP	93.6	70-130		%Rec	1	10/24/2019 12:34:17 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	2.7		mg/Kg	1	10/25/2019 3:04:40 AM
Surr: BFB	94.0	77.4-118		%Rec	1	10/25/2019 3:04:40 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.014		mg/Kg	1	10/25/2019 3:04:40 AM
Toluene	ND	0.027		mg/Kg	1	10/25/2019 3:04:40 AM
Ethylbenzene	ND	0.027		mg/Kg	1	10/25/2019 3:04:40 AM
Xylenes, Total	ND	0.055		mg/Kg	1	10/25/2019 3:04:40 AM
Surr: 4-Bromofluorobenzene	92.9	80-120		%Rec	1	10/25/2019 3:04:40 AM
EPA METHOD 300.0: ANIONS						Analyst: **CAS**
Chloride	200	60		mg/Kg	20	10/24/2019 11:46:17 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY **Client Sample ID:** MW12@ 37.5-40'
Project: Salty Dog **Collection Date:** 10/21/2019 3:07:00 PM
Lab ID: 1910B55-030 **Matrix:** MEOH (SOIL) **Received Date:** 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/25/2019 10:41:34 AM
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/25/2019 10:41:34 AM
Surr: DNOP	99.1	70-130		%Rec	1	10/25/2019 10:41:34 AM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	2.8		mg/Kg	1	10/25/2019 4:12:54 AM
Surr: BFB	94.2	77.4-118		%Rec	1	10/25/2019 4:12:54 AM
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.014		mg/Kg	1	10/25/2019 4:12:54 AM
Toluene	ND	0.028		mg/Kg	1	10/25/2019 4:12:54 AM
Ethylbenzene	ND	0.028		mg/Kg	1	10/25/2019 4:12:54 AM
Xylenes, Total	ND	0.056		mg/Kg	1	10/25/2019 4:12:54 AM
Surr: 4-Bromofluorobenzene	94.5	80-120		%Rec	1	10/25/2019 4:12:54 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	3400	150		mg/Kg	50	10/25/2019 9:54:48 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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: Red Surface Oil
Project: Salty Dog
Collection Date: 10/21/2019 2:21:00 PM
Lab ID: 1910B55-031
Matrix: MEOH (SOIL)
Received Date: 10/22/2019 8:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	130	92		mg/Kg	10	10/25/2019 11:47:04 AM
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**
Chloride	57000	3000		mg/Kg	1000	10/25/2019 10:07:12 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
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.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48334** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **48334** RunNo: **63893**
Prep Date: **10/23/2019** Analysis Date: **10/23/2019** SeqNo: **2185870** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48334** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **48334** RunNo: **63893**
Prep Date: **10/23/2019** Analysis Date: **10/23/2019** SeqNo: **2185871** Units: **mg/Kg**

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** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **48348** RunNo: **63930**
Prep Date: **10/23/2019** Analysis Date: **10/23/2019** SeqNo: **2186249** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48348** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **48348** RunNo: **63930**
Prep Date: **10/23/2019** Analysis Date: **10/23/2019** SeqNo: **2186250** Units: **mg/Kg**

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** SampType: **mblk** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **48364** RunNo: **63938**
Prep Date: **10/24/2019** Analysis Date: **10/24/2019** SeqNo: **2187704** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48364** SampType: **lcs** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **48364** RunNo: **63938**
Prep Date: **10/24/2019** Analysis Date: **10/24/2019** SeqNo: **2187705** Units: **mg/Kg**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **LCS-48316** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **48316** RunNo: **63888**

Prep Date: **10/22/2019** Analysis Date: **10/23/2019** SeqNo: **2184751** Units: **mg/Kg**

Analyte	Result	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-48316** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **48316** RunNo: **63888**

Prep Date: **10/22/2019** Analysis Date: **10/23/2019** SeqNo: **2184752** 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	9.5		10.00		94.6	70	130			

Sample ID: **MB-48332** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **48332** RunNo: **63890**

Prep Date: **10/23/2019** Analysis Date: **10/23/2019** SeqNo: **2184756** 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	9.3		10.00		93.4	70	130			

Sample ID: **LCS-48332** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **48332** RunNo: **63890**

Prep Date: **10/23/2019** Analysis Date: **10/23/2019** SeqNo: **2184768** Units: **mg/Kg**

Analyte	Result	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-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: **mg/Kg**

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			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

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: **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	9.1		10.00		91.5	70	130			

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: **%Rec**

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: **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: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	11		10.00		109	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48304**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **48304**	RunNo: **63899**							
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185284**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	920		1000		92.3	77.4	118			

Sample ID: **LCS-48304**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **48304**	RunNo: **63899**							
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185285**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	100	80	120			
Surr: BFB	1100		1000		105	77.4	118			

Sample ID: **1910B55-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **MW08@ 0-2.5'**	Batch ID: **48304**	RunNo: **63899**							
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185287**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	4.9	24.44	0	110	69.1	142			
Surr: BFB	1000		977.5		105	77.4	118			

Sample ID: **1910B55-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **MW08@ 0-2.5'**	Batch ID: **48304**	RunNo: **63899**							
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185288**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range 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**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **PBS**	Batch ID: **G63935**	RunNo: **63935**							
Prep Date:	Analysis Date: **10/24/2019**	SeqNo: **2186991**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		93.7	77.4	118			

Sample ID: **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**							
Client ID: **LCSS**	Batch ID: **G63935**	RunNo: **63935**							
Prep Date:	Analysis Date: **10/24/2019**	SeqNo: **2186992**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **2.5UG GRO LCS** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **G63935** RunNo: **63935**
Prep Date: Analysis Date: **10/24/2019** SeqNo: **2186992** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.5	80	120			
Surr: BFB	1100		1000		110	77.4	118			

Sample ID: **MB-48339** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **48339** RunNo: **63935**
Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2186999** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	910		1000		91.5	77.4	118			

Sample ID: **LCS-48339** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **48339** RunNo: **63935**
Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187000** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.8	80	120			
Surr: BFB	1100		1000		110	77.4	118			

Sample ID: **RB** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **G63934** RunNo: **63934**
Prep Date: Analysis Date: **10/24/2019** SeqNo: **2187063** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		93.3	77.4	118			

Sample ID: **2.5UG GRO LCS** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **G63934** RunNo: **63934**
Prep Date: Analysis Date: **10/24/2019** SeqNo: **2187064** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.0	80	120			
Surr: BFB	1100		1000		105	77.4	118			

Sample ID: **MB-48341** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **48341** RunNo: **63934**
Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187070** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48341**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **48341**	RunNo: **63934**
Prep Date: **10/23/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187070** Units: **%Rec**

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**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **48341**	RunNo: **63934**
Prep Date: **10/23/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187071** Units: **%Rec**

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48304**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **48304**	RunNo: **63899**
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185320** Units: **mg/Kg**

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-Bromofluorobenzene	0.91		1.000		91.5	80	120			

Sample ID: **LCS-48304**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **48304**	RunNo: **63899**
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185321** Units: **mg/Kg**

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-Bromofluorobenzene	0.95		1.000		95.1	80	120			

Sample ID: **1910B55-002AMS**	SampType: **MS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW08@ 2.5-5'**	Batch ID: **48304**	RunNo: **63899**
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185324** Units: **mg/Kg**

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-Bromofluorobenzene	0.93		0.9452		98.5	80	120			

Sample ID: **1910B55-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW08@ 2.5-5'**	Batch ID: **48304**	RunNo: **63899**
Prep Date: **10/22/2019**	Analysis Date: **10/23/2019**	SeqNo: **2185325** Units: **mg/Kg**

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-Bromofluorobenzene	0.94		0.9579		98.3	80	120	0	0	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **B63935**	RunNo: **63935**
Prep Date:	Analysis Date: **10/24/2019**	SeqNo: **2187029** Units: **mg/Kg**

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-Bromofluorobenzene	0.95		1.000		95.0	80	120			

Sample ID: **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **B63935**	RunNo: **63935**
Prep Date:	Analysis Date: **10/24/2019**	SeqNo: **2187030** Units: **mg/Kg**

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-Bromofluorobenzene	1.0		1.000		104	80	120			

Sample ID: **MB-48339**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **48339**	RunNo: **63935**
Prep Date: **10/23/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187037** Units: **mg/Kg**

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-Bromofluorobenzene	0.92		1.000		91.8	80	120			

Sample ID: **LCS-48339**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **48339**	RunNo: **63935**
Prep Date: **10/23/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187038** Units: **mg/Kg**

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-Bromofluorobenzene	0.98		1.000		98.5	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910B55**

01-Nov-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **PBS**	Batch ID: **B63934**	RunNo: **63934**							
Prep Date:	Analysis Date: **10/24/2019**	SeqNo: **2187084**	Units: **mg/Kg**						
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-Bromofluorobenzene	0.97		1.000		97.3	80	120			

Sample ID: **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **LCSS**	Batch ID: **B63934**	RunNo: **63934**							
Prep Date:	Analysis Date: **10/24/2019**	SeqNo: **2187085**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	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	0.10	3.000	0	102	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		101	80	120			

Sample ID: **MB-48341**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **PBS**	Batch ID: **48341**	RunNo: **63934**							
Prep Date: **10/23/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187091**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.99		1.000		98.8	80	120			

Sample ID: **LCS-48341**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**							
Client ID: **LCSS**	Batch ID: **48341**	RunNo: **63934**							
Prep Date: **10/23/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187092**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	0.96		1.000		95.8	80	120			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: HILCORP ENERGY FAR Work Order Number: 1910B55 RcptNo: 1

Received By: Juan Rojas 10/22/2019 8:15:00 AM

Completed By: Yazmine Garduno 10/22/2019 8:54:46 AM

Reviewed By: DM 10/22/19

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 samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated 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 received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? _____
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: _____

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good				

Chain-of-Custody Record

Client: Hilcorp

Jennifer Deal

Mailing Address:

Phone #:

email or Fax#: jdeal@hilcorp.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☒ EDD (Type) PDF

Turn-Around Time:

☐ Standard ☒ Rush 3-day

Project Name: Salty Dog

Project #: 01781901 4

Project Manager: Josh Adams

Sampler: Josh Adams

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 2.6-0.4=2.2 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910355	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/20	1447	S	MW08@0-2.5'	4oz. 1	none	-001	X	X					X			
	1449	S	MW08@2.5-5'			-002										
	1451	S	MW08@5-7.5'			-003										
	1454	S	MW08@10-12.5'			-004										
	1458	S	MW08@12.5-15			-005										
	1500	S	MW08@27.5-30'			-006										
	1720	S	MW09@7.5-10'			-007										
	1722	S	MW09@12.5-15'			-008										
	1724	S	MW09@22.5-25'			-009										
	1726	S	MW09@27.5-30'			-010										
10/21	1352	S	MW10@0-2.5'			-011										
10/21	1350	S	MW10@2.5-5'			-012										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
10-21-19	1730				10/21/19	1730
10/21/19	1814			carrier	10/22/19	8:15

Remarks:

cc: jadams2@hilcorp.com

per Josh Cancel sample -1 and -3. 10/23/19

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Hilcorp
Jennifer Deal
Mailing Address:
Phone #:
email or Fax#: jdeal@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time:
☐ Standard ☒ Rush 3-day
Project Name: Salty Dog
Project #: 01781901.4
Project Manager: Josh Adams
Sampler: Josh Adams
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 2.6-0.4 = 2.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910855	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/21	1356	S	MW10 @ 7.5-10'	4oz, 1	Cool None	-013	X	X					X			
	1358		MW10@ 10-12.5'			-014										
	1400		MW10@12.5-15'			-015										
	1402		MW10@ 15-17.5'			-016										
	1403		MW10@ 17.5-20'			-017										
	1404		MW10@ 20-22.5'			-018										
	1405		MW10@ 22.5-25'			-019										
	1406		MW10@ 25-27.5'			-020										
	1408		MW10@27.5-30'			-021										
	1410		MW10@ 30-32.5'			-022										
	1412		MW10@ 32.5-35'			-023										
	1415		MW10@ 37.5-40'			-024										

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
10.21-19	1730				10/21/19	1730
10/21/19	1814			carrier	10/22/19	8:15

Remarks: CC: jadams@rtenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Hilcorp
Jennifer Deal
Mailing Address: 382 Rd. 3100
~~Farmington~~ Aztec, NM
Phone #:
email or Fax#: jdeal@hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time:
☐ Standard ☒ Rush 3-day
Project Name: Salty Dog
Project #: 0178/9014
Project Manager: Josh Adams
Sampler: Josh Adams
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 2.6-0.4=2.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910855	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10/21	1417	S	MW11 @ 32.5-35'	4oz, 1	none	-025	X	X					X			
	1420		MW11 @ 37.5-40'			-026										
	1500		MW12 @ 15-17.5'			-027										
	1507		MW12 @ 20-22.5'			-028										
	1505		MW12 @ 35-37.5'			-029										
	1507		MW12 @ 37.5-40'			-030										
	1421		Red Surface Soil			-031										

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10-21-19	1730		Chris Watt		10/21/19	17:30
10/21/19	1814			carrier	10/22/19	8:15

Remarks: cc: jadams@hilcorp.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 28, 2019

Jennifer Deal
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX

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 Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW13@ 10-12.5'
Project: Salty Dog
Collection Date: 10/21/2019 2:38:00 PM
Lab ID: 1910C21-001 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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

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
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW13@ 25-27.5'
Project: Salty Dog
Collection Date: 10/21/2019 2:40:00 PM
Lab ID: 1910C21-002 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW13@ 32.5-35'
Project: Salty Dog
Collection Date: 10/21/2019 2:42:00 PM
Lab ID: 1910C21-003 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW13@ 37.5-40'
Project: Salty Dog
Collection Date: 10/21/2019 2:44:00 PM
Lab ID: 1910C21-004 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.

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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW14@ 5-7.5'
Project: Salty Dog
Collection Date: 10/22/2019 1:10:00 PM
Lab ID: 1910C21-005 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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

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
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW14@ 20-22.5'
Project: Salty Dog
Collection Date: 10/22/2019 1:11:00 PM
Lab ID: 1910C21-006 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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

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
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW14@ 25-27.5'
Project: Salty Dog
Collection Date: 10/22/2019 1:12:00 PM
Lab ID: 1910C21-007 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	10/24/2019 6:50:44 PM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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 METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	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.

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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW14@ 27.5-30'
Project: Salty Dog
Collection Date: 10/22/2019 1:13:00 PM
Lab ID: 1910C21-008 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/24/2019 7:15:02 PM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 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
Ethylbenzene	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 METHOD 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.
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1910C21-009 **Matrix:** SOIL

Client Sample ID: MW14@ 30-32.5'
Collection Date: 10/22/2019 1:14:00 PM
Received Date: 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.1		mg/Kg	1	10/24/2019 7:39:05 PM
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	10/24/2019 7:39:05 PM
Surr: DNOP	99.4	70-130		%Rec	1	10/24/2019 7:39:05 PM
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	ND	0.024		mg/Kg	1	10/25/2019 1:56:21 AM
Toluene	ND	0.049		mg/Kg	1	10/25/2019 1:56:21 AM
Ethylbenzene	ND	0.049		mg/Kg	1	10/25/2019 1:56:21 AM
Xylenes, Total	ND	0.097		mg/Kg	1	10/25/2019 1:56:21 AM
Surr: 4-Bromofluorobenzene	89.5	80-120		%Rec	1	10/25/2019 1:56:21 AM
EPA METHOD 300.0: ANIONS						Analyst: **MRA**
Chloride	230	60		mg/Kg	20	10/25/2019 10:32:01 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
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW15@ 2.5-5'
Project: Salty Dog
Collection Date: 10/22/2019 4:10:00 PM
Lab ID: 1910C21-010 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW15@ 22.5-25'
Project: Salty Dog
Collection Date: 10/22/2019 4:12:00 PM
Lab ID: 1910C21-011 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/24/2019 8:27:20 PM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/24/2019 5:04:41 PM
Surr: BFB	85.8	77.4-118		%Rec	1	10/24/2019 5:04:41 PM
EPA METHOD 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
Ethylbenzene	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-Bromofluorobenzene	90.0	80-120		%Rec	1	10/24/2019 5:04:41 PM
EPA METHOD 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.
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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW15@ 27.5-30'
Project: Salty Dog
Collection 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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**
Diesel Range Organics (DRO)	ND	9.7		mg/Kg	1	10/24/2019 8:51:33 PM
Motor Oil 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 METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline 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 METHOD 8021B: VOLATILES						Analyst: **NSB**
Benzene	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
Ethylbenzene	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 METHOD 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.

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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Project: Salty Dog
Lab ID: 1910C21-013 **Matrix:** SOIL

Client Sample ID: MW15@ 32.5-35'
Collection Date: 10/22/2019 4:16:00 PM
Received Date: 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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.

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

Analytical Report
Lab Order **1910C21**
Date Reported: **10/28/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY
Client Sample ID: MW15@ 37.5-40'
Project: Salty Dog
Collection Date: 10/22/2019 4:18:00 PM
Lab ID: 1910C21-014 **Matrix:** SOIL **Received Date:** 10/23/2019 8:20:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE 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 RANGE						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.
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.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48355**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **48355**	RunNo: **63938**							
Prep Date: **10/24/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187674**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48355**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **48355**	RunNo: **63938**							
Prep Date: **10/24/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187675**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	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**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **48364**	RunNo: **63938**							
Prep Date: **10/24/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187704**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48364**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **48364**	RunNo: **63938**							
Prep Date: **10/24/2019**	Analysis Date: **10/24/2019**	SeqNo: **2187705**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty 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: **mg/Kg**

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: **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	9.1		10.00		91.5	70	130			

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			

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.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48372**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **48372**	RunNo: **63970**
Prep Date: **10/24/2019**	Analysis Date: **10/25/2019**	SeqNo: **2189207** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.4		10.00		93.6	70	130			

Sample ID: **LCS-48373**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **48373**	RunNo: **63969**
Prep Date: **10/24/2019**	Analysis Date: **10/25/2019**	SeqNo: **2189241** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.5		5.000		90.2	70	130			

Sample ID: **MB-48373**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **48373**	RunNo: **63969**
Prep Date: **10/24/2019**	Analysis Date: **10/25/2019**	SeqNo: **2189242** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48339** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **48339** RunNo: **63935**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2186999** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	910		1000		91.5	77.4	118			

Sample ID: **LCS-48339** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **LCSS** Batch ID: **48339** RunNo: **63935**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187000** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.8	80	120			
Surr: BFB	1100		1000		110	77.4	118			

Sample ID: **MB-48341** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **PBS** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187070** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	930		1000		92.9	77.4	118			

Sample ID: **LCS-48341** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **LCSS** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187071** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.8	80	120			
Surr: BFB	1000		1000		102	77.4	118			

Sample ID: **1910C21-011AMS** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **MW15@ 22.5-25'** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187073** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	24.88	0	103	69.1	142			
Surr: BFB	1000		995.0		104	77.4	118			

Sample ID: **1910C21-011AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **MW15@ 22.5-25'** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187074** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **1910C21-011AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **MW15@ 22.5-25'** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187074** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **MB-48339** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **48339** RunNo: **63935**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187037** Units: **mg/Kg**

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-Bromofluorobenzene	0.92		1.000		91.8	80	120			

Sample ID: **LCS-48339** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **48339** RunNo: **63935**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187038** Units: **mg/Kg**

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-Bromofluorobenzene	0.98		1.000		98.5	80	120			

Sample ID: **MB-48341** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **PBS** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187091** Units: **mg/Kg**

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-Bromofluorobenzene	0.99		1.000		98.8	80	120			

Sample ID: **LCS-48341** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **LCSS** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187092** Units: **mg/Kg**

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			
Surr: 4-Bromofluorobenzene	0.96		1.000		95.8	80	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910C21**

28-Oct-19

Client: HILCORP ENERGY

Project: Salty Dog

Sample ID: **1910C21-012AMS** SampType: **MS** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW15@ 27.5-30'** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187095** Units: **mg/Kg**

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-Bromofluorobenzene	0.89		0.9443		93.9	80	120			

Sample ID: **1910C21-012AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW15@ 27.5-30'** Batch ID: **48341** RunNo: **63934**

Prep Date: **10/23/2019** Analysis Date: **10/24/2019** SeqNo: **2187096** Units: **mg/Kg**

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	
Surr: 4-Bromofluorobenzene	0.88		0.9276		94.7	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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: HILCORP ENERGY FAR Work Order Number: 1910C21 RcptNo: 1

Received By: Juan Rojas 10/23/2019 8:20:00 AM
Completed By: Yazmine Garduno 10/23/2019 8:37:08 AM
Reviewed By: DM 10/22/19

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 samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated 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 received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: DAD 10/23/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

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

Chain-of-Custody Record

Client: Hilcorp
Jennifer Deal
Mailing Address:
Phone #:
email or Fax#: jdeal@Hilcorp.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time: Friday 10-24
☐ Standard ☒ Rush 3-day
Project Name: Salty Dog
Project #: 017819014
Project Manager: Josh Adams
Sampler: Josh Adams
On Ice: ☒ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 1.6+0.2 = 1.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910C21	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10-21-19	1438	Soil	MW13@10-12.5'	(1) 4oz	cool	-001	X	X					X			
	1440		MW13@25-27.5'			-002										
	1442		MW13@32.5-35'			-003										
	1444		MW13@37.5-40'			-004										
10-22-19	1310		MW14@~~20-22.5'~~ 5-7.5'			-005										
	1311		MW14@20-22.5'			-006										
	1312		MW14@25-27.5'			-007										
	1313		MW14@27.5-30'			-008										
	1314		MW14@30-32.5'			-009										
	1610		MW15@2.5-5'			-010										
	1612		MW15@22.5-25'			-011										
	1614		MW15@27.5-30'			-012										

Date	Time	Relinquished by	Received by	Via	Date	Time
10-22-19	1715		Misty Walker		10/22/19	1715
10/22/19	1811	Misty Walker		carrier	10/23/19	8:20

Remarks: cc: jadams@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Hilcorp

Jennifer Deal

Mailing Address:

Phone #:

email or Fax#: jdeal@hilcorp.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time: 10/24
☐ Standard ☒ Rush 3-day

Project Name: Salty Dog

Project #: 01781901 4

Project Manager: Josh Adams

Sampler: Josh Adams

On Ice: ☒ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 1.6 +0.2 = 1.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10-22-19	1616	soil	MW15@32.5-35'	(1) 4oz	cool	1910C21-013	X	X					X			
↓	1618	↓	MW15@37.5-40'	↓	↓	-014	X	X					X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10-22-19	1715				10/22/19	1715
10/22/19	1841			carrier	10/23/19	8:20

Remarks: cc: jadams@hilcorp.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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 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	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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.

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

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: MW15@30-32.5'
Project: Salty Dog
Collection Date: 10/23/2019 2:07:00 PM
Lab ID: 1910D52-002 **Matrix:** MEOH (SOIL) **Received Date:** 10/25/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						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.

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.

WO#: **1910D52**

31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp

Project: Salty Dog

Sample ID: **MB-48381**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **48381**	RunNo: **63975**							
Prep Date: **10/25/2019**	Analysis Date: **10/25/2019**	SeqNo: **2189535**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48381**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **48381**	RunNo: **63975**							
Prep Date: **10/25/2019**	Analysis Date: **10/25/2019**	SeqNo: **2189536**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref 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.

WO#: **1910D52**

31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp

Project: Salty Dog

Sample ID: **LCS-48380** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **LCSS** Batch ID: **48380** RunNo: **63970**

Prep Date: **10/25/2019** Analysis Date: **10/25/2019** SeqNo: **2188298** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	49	10	50.00	0	98.7	63.9	124			
Surr: DNOP	4.6		5.000		91.9	70	130			

Sample ID: **MB-48380** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **PBS** Batch ID: **48380** RunNo: **63970**

Prep Date: **10/25/2019** Analysis Date: **10/25/2019** SeqNo: **2188299** 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	9.5		10.00		95.4	70	130			

Sample ID: **1910D52-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **MW09@20-22.5'** Batch ID: **48380** RunNo: **63970**

Prep Date: **10/25/2019** Analysis Date: **10/26/2019** SeqNo: **2189204** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	9.6	47.85	0	99.1	57	142			
Surr: DNOP	3.8		4.785		79.6	70	130			

Sample ID: **1910D52-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**

Client ID: **MW09@20-22.5'** Batch ID: **48380** RunNo: **63970**

Prep Date: **10/25/2019** Analysis Date: **10/26/2019** SeqNo: **2189205** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910D52**

31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp

Project: Salty Dog

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **G63981**	RunNo: **63981**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2188840** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		94.4	77.4	118			

Sample ID: **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **G63981**	RunNo: **63981**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2188841** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	95.5	80	120			
Surr: BFB	1100		1000		113	77.4	118			

Sample ID: **1910D52-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **MW09@20-22.5'**	Batch ID: **G63981**	RunNo: **63981**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2188842** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	15	3.2	15.93	0	92.0	69.1	142			
Surr: BFB	650		637.3		103	77.4	118			

Sample ID: **1910D52-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **MW09@20-22.5'**	Batch ID: **G63981**	RunNo: **63981**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2188843** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (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	

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.

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

Client: Hilcorp San Juan LP/Hilcorp Energy Corp
Project: Salty Dog

Sample ID: **RB** SampType: **MBLK** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS** Batch ID: **B63981** RunNo: **63981**
Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188870** Units: **mg/Kg**

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 LCS** SampType: **LCS** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS** Batch ID: **B63981** RunNo: **63981**
Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188871** Units: **mg/Kg**

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**
Client ID: **MW15@30-32.5'** Batch ID: **B63981** RunNo: **63981**
Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188872** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.55	0.065	0.6472	0	85.4	61.1	124			
Benzene	0.58	0.016	0.6472	0.006809	87.8	76	123			
Toluene	0.59	0.032	0.6472	0.005249	91.1	80.3	127			
Ethylbenzene	0.59	0.032	0.6472	0.007035	90.2	80.2	131			
Xylenes, Total	1.7	0.065	1.942	0.01019	89.6	78	133			
Surr: 4-Bromofluorobenzene	0.62		0.6472		96.3	80	120			

Sample ID: **1910D52-002AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**
Client ID: **MW15@30-32.5'** Batch ID: **B63981** RunNo: **63981**
Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188873** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.60	0.065	0.6472	0	92.1	61.1	124	7.56	20	
Benzene	0.57	0.016	0.6472	0.006809	86.6	76	123	1.38	20	
Toluene	0.58	0.032	0.6472	0.005249	88.6	80.3	127	2.77	20	
Ethylbenzene	0.59	0.032	0.6472	0.007035	89.4	80.2	131	0.912	20	

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.

WO#: **1910D52**

31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp

Project: Salty Dog

Sample ID: **1910D52-002AMSD** SampType: **MSD** TestCode: **EPA Method 8021B: Volatiles**

Client ID: **MW15@30-32.5'** Batch ID: **B63981** RunNo: **63981**

Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188873** Units: **mg/Kg**

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-Bromofluorobenzene	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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **1910D52** RcptNo: **1**

Received By: Juan Rojas **10/25/2019 8:00:00 AM**

Completed By: **Leah Baca** **10/25/2019 9:00:24 AM** Leah Baca

Reviewed By: DAD 10/25/19

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 samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated 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 received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: ENM 10/25/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.3	Good	Yes			
2	0.6	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp
Jennifer Deal

Mailing Address: 382 Rd. 3100
Aztec, NM 87410

Phone #:

email or Fax#: jdeal@hilcorp.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☒ EDD (Type) PDF

Turn-Around Time: Friday
☐ Standard ☒ Rush Same Day 10-25

Project Name: Salty Dog

Project #: 017819014

Project Manager: Josh Adams

Sampler: Josh Adams

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 0.3 - 0.2 = 0.1 JRO JR = 0.5
0.6 - 0.2 = 0.4 JR

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910D52 0.6	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10-23-19	1405	soil	MW09@20-22.5'	(1) 4oz.	cool	-001	X	X					X			
↓	1407	↓	MW15@30-32.5'	↓	↓	-002	X	X					X			

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
10-24-19	1257	Josh Adams	Clint Wag		10/24/19	1257
10/24/19	1824	Cristina Walters		carrier	10/25/19	8:00

Remarks: cc: jadams@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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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.: 1910D50

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 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 Energy Cor
Client Sample ID: MW15
Project: Salty Dog
Collection Date: 10/24/2019 9:35:00 AM
Lab ID: 1910D50-001 **Matrix:** GROUNDWA **Received Date:** 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: **bcv**
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		µg/L	1	10/25/2019 10:44:00 AM
Toluene	ND	1.0		µg/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.
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

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
cis-1,2-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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	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**
pH	7.45		H	pH units	1	10/28/2019 10:38:47 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

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

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: **bcv**
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.
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

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
cis-1,2-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.
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

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
Xylenes, Total	ND	1.5		µg/L	1	10/25/2019 11:07:00 AM
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	10/25/2019 11:07:00 AM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/25/2019 11:07:00 AM
Surr: Dibromofluoromethane	98.7	70-130		%Rec	1	10/25/2019 11:07:00 AM
Surr: Toluene-d8	95.7	70-130		%Rec	1	10/25/2019 11:07:00 AM
SM4500-H+B / 9040C: PH						Analyst: **JRR**
pH	7.76		H	pH units	1	10/28/2019 10:43:18 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	7700	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
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor **Client Sample ID:** MW09
Project: Salty Dog **Collection Date:** 10/24/2019 10:50:00 AM
Lab ID: 1910D50-003 **Matrix:** GROUNDWA **Received Date:** 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 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: **bcv**
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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
cis-1,2-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.
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

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

Hall Environmental Analysis Laboratory, Inc.

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

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 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	70-130		%Rec	1	10/25/2019 11:31:00 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	10/25/2019 11:31:00 AM
Surr: Dibromofluoromethane	99.7	70-130		%Rec	1	10/25/2019 11:31:00 AM
Surr: Toluene-d8	97.7	70-130		%Rec	1	10/25/2019 11:31:00 AM
SM4500-H+B / 9040C: PH						Analyst: **JRR**
pH	7.35		H	pH units	1	10/28/2019 10:47:42 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	8410	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy 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	Qual	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy 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	Qual	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy 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	Qual	Units	DF	Date Analyzed
EPA METHOD 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	70-130		%Rec	1	10/25/2019 11:55:00 AM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	10/25/2019 11:55:00 AM
Surr: Dibromofluoromethane	98.6	70-130		%Rec	1	10/25/2019 11:55:00 AM
Surr: Toluene-d8	96.7	70-130		%Rec	1	10/25/2019 11:55:00 AM
SM4500-H+B / 9040C: PH						Analyst: **JRR**
pH	7.24		H	pH units	1	10/28/2019 10:52:12 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	8040	100	*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
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

Analytical Report
Lab Order **1910D50**
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 **Matrix:** GROUNDWA **Received Date:** 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 2:02:57 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.

Qualifiers:

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

Analytical Report
Lab Order **1910D50**
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 **Matrix:** GROUNDWA **Received Date:** 10/25/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
cis-1,2-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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1910D50**
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 **Matrix:** GROUNDWA **Received Date:** 10/25/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
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**
pH	7.29		H	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

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: 1910D50-006 **Matrix:** GROUNDWA **Received Date:** 10/25/2019 8:00:00 AM

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

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

Hall Environmental Analysis Laboratory, Inc.

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: 1910D50-006 **Matrix:** GROUNDWA **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	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

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: 1910D50-006
Matrix: GROUNDWA
Received Date: 10/25/2019 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	10/25/2019 12:42:00 PM
Surr: 4-Bromofluorobenzene	99.8	70-130		%Rec	1	10/25/2019 12:42:00 PM
Surr: Dibromofluoromethane	100	70-130		%Rec	1	10/25/2019 12:42:00 PM
Surr: Toluene-d8	97.2	70-130		%Rec	1	10/25/2019 12:42:00 PM
SM4500-H+B / 9040C: PH						Analyst: **JRR**
pH	7.17		H	pH units	1	10/28/2019 11:01:10 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	40400	40.0	*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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor **Client Sample ID:** MW12
Project: 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	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: **bcv**
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.
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

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor
Client Sample ID: MW12
Project: 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	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp San Juan LP/Hilcorp Energy Cor
Client Sample ID: MW12
Project: 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	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **CCM**
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	2	10/25/2019 1:06:00 PM
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	2	10/25/2019 1:06:00 PM
Surr: Dibromofluoromethane	98.9	70-130		%Rec	2	10/25/2019 1:06:00 PM
Surr: Toluene-d8	96.2	70-130		%Rec	2	10/25/2019 1:06:00 PM
SM4500-H+B / 9040C: PH						Analyst: **JRR**
pH	7.34		H	pH units	1	10/28/2019 11:05:39 AM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**
Total Dissolved Solids	57000	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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910D50**
31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp
Project: Salty Dog

Sample ID: **MB-B**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **B63986**	RunNo: **63986**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2188698** 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-B**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **B63986**	RunNo: **63986**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2188700** 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			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1910D50**

31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp

Project: Salty Dog

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R63973**	RunNo: **63973**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2189737** 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, Orthophosphate (As P	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R63973**	RunNo: **63973**
Prep Date:	Analysis Date: **10/25/2019**	SeqNo: **2189738** 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, Orthophosphate (As P	4.8	0.50	5.000	0	96.7	90	110			

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R64032**	RunNo: **64032**
Prep Date:	Analysis Date: **10/28/2019**	SeqNo: **2190505** Units: **mg/L**

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**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R64032**	RunNo: **64032**
Prep Date:	Analysis Date: **10/28/2019**	SeqNo: **2190506** 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**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R64044**	RunNo: **64044**
Prep Date:	Analysis Date: **10/29/2019**	SeqNo: **2192065** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

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.

WO#: **1910D50**

31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp

Project: Salty Dog

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBW**	Batch ID: **R64044**	RunNo: **64044**							
Prep Date:	Analysis Date: **10/29/2019**	SeqNo: **2192065**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	ND	0.50								

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSW**	Batch ID: **R64044**	RunNo: **64044**							
Prep Date:	Analysis Date: **10/29/2019**	SeqNo: **2192066**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sulfate	9.8	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.

WO#: **1910D50**
31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp
Project: Salty Dog

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R63964**	RunNo: **63964**
Prep Date:	Analysis Date: **10/25/2019**	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**	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**

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								

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910D50**
31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp
Project: Salty Dog

Sample ID: **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**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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								
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								

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.

WO#: **1910D50**
31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp
Project: Salty Dog

Sample ID: **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**

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: **1910D50-001ams** SampType: **MS** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **MW15** Batch ID: **R63964** RunNo: **63964**
Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188416** Units: **µg/L**

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: **1910D50-001amsd** SampType: **MSD** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **MW15** Batch ID: **R63964** RunNo: **63964**
Prep Date: Analysis Date: **10/25/2019** SeqNo: **2188417** 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.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910D50**
31-Oct-19

Client: Hilcorp San Juan LP/Hilcorp Energy Corp
Project: 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	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: **LCS-48398**	SampType: **LCS**	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: **mg/L**						
Analyte	Result	PQL	SPK value	SPK 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
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 Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **HILCORP ENERGY** Work Order Number: **1910D50** RcptNo: **1**

Received By: Juan Rojas **10/25/2019 8:00:00 AM**

Completed By: **Leah Baca** **10/25/2019 8:45:28 AM** Leah Baca

Reviewed By: DAD 10/25/19

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated 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 received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 14 (<2 or >12 unless noted)

Adjusted? NO

Checked by: ENM 10/25/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.3	Good	Yes			
2	0.6	Good	Yes			

Chain-of-Custody Record

Client: Hilcorp
Jennifer Deal

Mailing Address: 382 Rd. 9100
Aztec NM 87410

Phone #:

email or Fax#: jdeal@hilcorp.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☒ EDD (Type) PDF

Turn-Around Time: Friday 10-25
☐ Standard ☒ Rush Same day

Project Name: Salty Dog

Project #: 017819014

Project Manager: Josh Adams

Sampler: Josh Adams/ Stuart Hyde
On Ice: ☒ Yes ☐ No
# of Coolers: 2
Cooler Temp(including CF): 0.3-~~0.2~~ = ~~0.1~~ 0.3
0.6-~~0.2~~ = ~~0.4~~ 0.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910D50	BTEX / ~~MTBE / TMB's~~ (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA) full list	8270 (Semi-VOA)	Total Coliform (Present/Absent)	Cations	Anions	TDS	pH		
10-24-19	0935	GW	MW15	(3) VOAs (1) H... (various)	HNO3 H2SO4 HCl	-001								X			X	X	X	X		
↓	1005	↓	MW08	↓	↓	-002								X			X	X	X	X		
↓	1030	↓	MW09	↓	↓	-003								X			X	X	X	X		
↓	1040	↓	MW10	↓	↓	-004								X			X	X	X	X		
↓	0940	↓	MW14	↓	↓	-005								X			X	X	X	X		
↓	1140	↓	MW13	↓	↓	-006								X			X	X	X	X		
↓	1150	↓	MW12	↓	↓	-007								X			X	X	X	X		

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10-24-19	1257	Josh Adams	Christina Waller		10/24/19	1257
10/24/19	1824	Christina Waller	[signature]	Courier	10/25/19	8:00

Remarks: cc: jadams@ltenv.com
shyde@ltenv.com

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

APPENDIX F: PHOTOGRAPHIC LOG

PHOTOGRAPHIC LOG

Photograph 1: Excavation looking southwest.

Photograph 2: MW05 completed well, 35 feet.

PHOTOGRAPHIC LOG

Photograph 3: MW06 completed well, 35 feet.

Photograph 4: Excavation looking northwest.

PHOTOGRAPHIC LOG

Photograph 5: MW07, 24 feet, (right) and MW02, 24 feet, (far left).

Photograph 6: Excavation looking southeast.

PHOTOGRAPHIC LOG

Photograph 7: MW02 (under cones), 24 feet.

Photograph 8: MW03 completed well, 35 feet.

PHOTOGRAPHIC LOG

Photograph 8: Soil berm and diversion channel looking northeast