SITE CHARACTERIZATION REPORT AND ABATEMENT PLAN

KAUFMAN NO. 1
HILCORP ENERGY COMPANY
SAN JUAN COUNTY, NEW MEXICO

OCD Incident No.: NCS1833331001

30-045-10174

February 21, 2019

NOT APPROVED

Administrative incomplete 4/26/19

NMOCD

MAR 1 1 2019

DISTRICT III

Prepared for:

Hilcorp Energy Company

HILCORP ENERGY COMPANY

382 Road 3100
Aztec, New Mexico 87410
505-599-3400

Prepared by:

TIMBERWOLF ENVIRONMENTAL

TIMBERWOLF ENVIRONMENTAL, LLC

691 CR 233, Suite B4
Durango, Colorado 81301
970-516-8419

Smith, Cory, EMNRD

From: Smith, Cory, EMNRD
Sent: Friday, April 26, 2019 9:46 AM
To: 'Jennifer Deal'
Cc: 'Ryan Mersmann'; 'Abiodun Adeloye'; 'Jim Foster'
Subject: RE: [EXT] Hilcorp Energy, Kaufman No. 1 - Site Characterization Report and Abatement Plan

Jennifer,

As discussed OCD is denying the report received on March 11, 2019 because it was not submitted on a signed C-141, nor does it meet the requirements of 19.15.29.11 NMAC for a site characterization nor does it meet the requirements of 19.15.30 NMAC for a stage 1 abatement plan.

If HEC wants to mange both soils and ground water under a Stage 1 abetment plan please indicate as such and resubmit a complete and correct report that has all the requirement of a Stage 1 Abatement plan per 19.15.30 NMAC.

Please also note, all ground water samples must be sampled for EPA method 8260 Full list, TDS, Cation/Anion

Please review the report and resubmit a complete and correct site characterization and remediation plan per 19.15.29 NMAC or a complete and correct stage 1 abatement plan per 19.15.30 NMAC no later than May 27, 2019.

Thanks you,

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: Friday, March 8, 2019 7:06 AM
To: 'Jim Foster' <jim@teamtimberwolf.com>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Ryan Mersmann <ryan@teamtimberwolf.com>; 'Abiodun Adeloye' <aadeloye@blm.gov>
Subject: RE: [EXT] Hilcorp Energy, Kaufman No. 1 - Site Characterization Report and Abatement Plan

Jim,

I am referencing that only MW-1 had a full 8260, all of the other wells were an 8260 short.

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: Jim Foster <jim@teamtimberwolf.com>
Sent: Thursday, March 7, 2019 4:03 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Ryan Mersmann <ryan@teamtimberwolf.com>; 'Abiodun Adeloye' <aadeloye@blm.gov>
Subject: RE: [EXT] Hilcorp Energy, Kaufman No. 1 - Site Characterization Report and Abatement Plan

Cory,

The full 8260 list was provided in Appendix D, Attached Table D-5.

No LNAPL was observed in any monitoring well.

MW-1 exceeded the domestic water supply standard for TDS and Sulfate, we will add those parameters to the monitoring program.

I'll call you tomorrow afternoon to discuss the last point with you.

Thanks,
Jim

From: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>
Sent: Thursday, March 7, 2019 4:27 PM
To: Jim Foster <jim@teamtimberwolf.com>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Ryan Mersmann <ryan@teamtimberwolf.com>; 'Abiodun Adeloye' <aadeloye@blm.gov>
Subject: RE: [EXT] Hilcorp Energy, Kaufman No. 1 - Site Characterization Report and Abatement Plan

Jim,

I am reviewing this site, Do you have the water analysis reports for the full list of the 8206? Please remember when sampling water the full 8260 report is required. I am sure you can acquire this data from Hall as it was probably logged just not reported.

Was there any LNAPLS present in any of the wells? Please also note TDS, Cation/Anions will need to be sampled in at least one upgradient and possibly down gradient wells as there are contaminates of concern from produce water release.

Also I am a little confused on what HEC is trying to accomplish for this site the report is written to almost conform to almost 29 and almost 30?

Thanks,

Cory Smith

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1000 Rio Brazos, Aztec, NM 87410
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cory.smith@state.nm.us

From: Jim Foster <jim@teamtimberwolf.com>
Sent: Wednesday, March 6, 2019 5:39 PM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Jennifer Deal <jdeal@hilcorp.com>; Ryan Mersmann <ryan@teamtimberwolf.com>; 'Abiodun Adeloye' <aadeloye@blm.gov>
Subject: [EXT] Hilcorp Energy, Kaufman No. 1 - Site Characterization Report and Abatement Plan

Vanessa, Cory, and Emmanuel:

Please find attached the site characterization report and abatement plan for the Kaufman No. 1 (OCD Incident No.: NCS1833331001).

A hard copy will additionally be delivered to NMOCD District 3 office.

Thank you,

Jim Foster
President
TIMBERWOLF ENVIRONMENTAL
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Durango, CO 81301
970-516-8419 (O) 979-324-2139 (C)
Teamtimberwolf.com

SITE CHARACTERIZATION REPORT AND ABATEMENT PLAN

KAUFMAN NO. 1
HILCORP ENERGY COMPANY
SAN JUAN COUNTY, NEW MEXICO

February 21, 2019

At the request of Hilcorp Energy Company (Hilcorp), Timberwolf Environmental, LLC (Timberwolf) presents this site characterization report and abatement plan for the Kaufman No. 1 (Site). This document was prepared by the following Timberwolf personnel:

2/21/19

Preston Kocian
Project Manager

Date

2/21/19

Ryan S. Mersmann, P.G., CPSS
Vice President of Operations

Date

2/21/19

Jim Foster
President

Date

Timberwolf Project No. HEC-180061

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1.0 Overview

1.1 Introduction

At the request of Hilcorp Energy Company (Hilcorp), Timberwolf Environmental, LLC (Timberwolf) presents this site characterization report and abatement plan for the Kaufman No. 1 (Site). The Site is located approximately 9.1 miles north of Farmington in San Juan County, New Mexico (Figures 1 – 3).

The assessment and characterization activities were intended to 1) evaluate the effectiveness of initial response actions, 2) delineate the horizontal and vertical extents of constituents of concern (COCs), 3) determine if groundwater had been impacted and, if necessary, delineate the horizontal extent of groundwater impacts, and 4) collect sufficient geotechnical data from the saturated zone to determine suitable remedial techniques for the Site (if required).

1.2 Site Description

The Site is situated on Federal land (managed by the Bureau of Land Management (BLM)) and is immediately adjacent to the La Plata River (Figures 2 and 3). The Site is comprised of approximately 1 acre, all of which is located within the La Plata River flood plain.

The Site has been temporarily abandoned following a release in November 2018. Most of the equipment has been taken out of service, including: storage tanks, separators, and a glycol dehydrator. Other surface equipment at the Site includes a well head and gas meter.

The Site is situated in a rural area and surrounding land use is predominantly recreational and oil and gas production. According to the U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), the Site soil consists of Walrees loam, 0 to 2 percent slope – texture consists of loam underlain by stratified gravelly sand; native salinity is very slightly saline to moderately saline (2.0 to 8.0 millimhos per centimeter (mmhos/cm)).

The average elevation at the Site is approximately 5,537 feet above mean sea level. Topography across the Site is generally flat but slightly slopes to the west, toward the La Plata River.

1.3 Site History

On 11/16/18, field personnel were on Site conducting routine well operations at the Kaufman No. 1. The well produced a substantial volume of water, causing the produced water tank to overflow. This resulted in a release of approximately 8 barrels (bbls) of oil and 10 bbls of produced water; all released fluids were contained in the facility's secondary containment. The well was shut-in and initial cleanup operations commenced. Released fluids were recovered with a vacuum truck.

At the time of the release, Enervest Operating, LLC was the operator of record; however, Hilcorp assumed operations of the Site on or about December 1, 2018.

After Hilcorp assumed operations, the well was temporarily abandoned. All surface equipment within the tank battery was removed, and impacted soil within the battery was excavated and disposed. The excavated soil was primarily along the eastern and southern portion of the tank battery. A safety fence was constructed along the perimeter of the excavation.

1.4 Initial Soil Assessment

In November 2018 and prior to Hilcorp assuming operations, Timberwolf conducted an initial sampling event to: 1) evaluate the effectiveness of initial response actions, 2) characterize the nature of the release (i.e., identify constituents of concern (COCs)) 3) determine the concentrations of COC at the horizontal and vertical extents of the excavation, and 3) develop recommendations for further action to address remaining impacts.

The initial soil assessment revealed COCs at the Site were petroleum hydrocarbons and that COCs were not delineated horizontally or vertically.

1.5 Site Characterization

In January 2019, Timberwolf returned to the Site collect additional data to better characterize the nature of soil and groundwater. The activity included additional soil sampling, installation of groundwater monitoring wells, and groundwater sampling. Based on the site characterization activities, COCs present in Site soil included the following:

- Total BTEX (i.e., benzene, toluene, ethylbenzene, and xylene)
- Total petroleum hydrocarbons

Soil assessment activities are documented in Sections 3 and 4.

1.6 Groundwater Assessment

The groundwater assessment revealed the following COC present in Site groundwater:

- Benzene

Groundwater assessment activities are documented in Section 5.

1.7 Abatement Plan

An abatement plan to bring the Site to regulatory closure by mitigating source soil areas and impacted groundwater is included in Section 6.

2.0 Regulatory Limits

2.1 Introduction

Regulatory oversight of soil and groundwater remediation associated with oil and gas exploration and production (E&P) activities is under the jurisdiction of the New Mexico Oil Conservation Division (NMOCD).

2.2 Regulatory Limits for Soil

The NMOCD established remedial action levels for soils impacted by oilfield products or wastes which are documented under New Mexico Administrative Code (NMAC) Rule 19.15.29. The Rule was repealed and replaced by *Oil Conservation Commission Order No.: R-14751*, dated June 21, 2018.

Under Rule 19.15.29, soil cleanup criteria is determined primarily based on the distance between the base of impacted soil and the depth to usable groundwater. However, if groundwater is greater than 50 feet (ft) deep then surface water bodies or sensitive features (e.g., playa lakes, wetlands, or public areas) may require a more stringent standard. NMOCD laboratory methodology and soil closure criteria are presented in Table 1.

Table 1. Closure Criteria for Soils Impacted by a Release

Depth to Groundwater[1]	Constituent	Method[2]	Regulatory Limit[3] (mg/kg)
≤ 50 feet	Chloride[4]	EPA 300.0	600
	TPH	EPA SW-846 Method 8015M	100
	Total BTEX	EPA SW-846 Method 8021B or 8260B	50
	Benzene	EPA SW-846 Method 8021B or 8015M	10
51 feet-100 feet	Chloride[4]	EPA 300.0	10,000
	TPH	EPA SW-846 Method 8015M	2,500
	GRO+DRO	EPA SW-846 Method 8015M	1,000
	Total BTEX	EPA SW-846 Method 8021B or 8260B	50
	Benzene	EPA SW-846 Method 8021B or 8260B	10
> 100 feet	Chloride[4]	EPA 300.0	20,000
	TPH	EPA SW-846 Method 8015M	2,500
	GRO+DRO	EPA SW-846 Method 8015M	1,000
	Total BTEX	EPA SW-846 Method 8021B or 8260B	50
	Benzene	EPA SW-846 Method 8021B or 8015M	10

[1]From base of impact to useable groundwater (i.e., less than 10,000 milligrams per liter (mg/L) total dissolved solids (TDS))
[2]Or other test methods approved by the division
[3]Established limits or natural background level, whichever is greater
[4]Applies to produced water releases or other fluids which may contain chloride prior to site abandonment
GRO – gasoline range organics
DRO – diesel range organics
MRO – motor oil range organics
TPH – total petroleum hydrocarbons (TPH = GRO + DRO + MRO)
mg/kg – milligrams per kilograms
Total BTEX = Benzene + Toluene + Ethylbenzene + Xylene

Groundwater at the Kaufman No. 1 is less than 50 ft below ground surface (bgs). The applicable regulatory limits for soil are presented in Table 2.

Table 2. Soil Regulatory Criteria – Kaufman No. 1

Constituents	Chloride mg/kg	GRO + DRO mg/kg	TPH mg/kg	Benzene mg/kg	Total BTEX mg/kg
Regulatory Criteria for Soil	600	100	100	10	50

mg/kg– milligrams per kilogram
GRO – gasoline range organics
DRO – diesel range organics
TPH – total petroleum hydrocarbons (TPH = GRO + DRO + MRO)
Total BTEX = Benzene + Toluene + Ethylbenzene + Xylene

2.3 Regulatory Limits for Groundwater

Human health standards for usable groundwater (i.e., total dissolved solids (TDS) less than 10,000 milligrams per kilograms (mg/L)) are established under NMAC 20.6.2§3103. Additionally, this statute provides standards for domestic water supply. These criteria provide standards for a variety of constituents, including: metals, anions, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), certain radioactive isotopes, salinity, and pH.

Based on process knowledge, a constituent list was prepared for the Site, which included certain VOCs, SVOCs, arsenic, barium, cadmium, chromium, mercury, lead, selenium, and silver (i.e., Resource Conservation and Recovery Act (RCRA)-8 metals), anions, TDS, and pH. The standards for human health or domestic water supply for these constituents are provided in Table 3.

Table 3. Groundwater Regulatory Criteria – Kaufman No. 1

Constituent	Regulatory Criteria (mg/L)
Metals	
Arsenic	0.10[1]
Barium	1.00[1]
Cadmium	0.01[1]
Chromium	0.05[1]
Lead	0.05[1]
Mercury	0.0002[1]
Selenium	0.05[1]
Silver	0.05[1]
VOCs	
Benzene	0.01[1]
Toluene	0.75[1]
Ethylbenzene	0.75[1]
Xylenes	0.62[1]
PAHs (Total Naphthalene)	0.03[1]
SVOCs	
Phenols	0.005[2]
General Water Chemistry	
Total Dissolved Solids	1,000[2]
Chloride	250[2]
Sulfate	600[2]
pH (units – s.u.)	6 – 9[2]

[1]New Mexico human health standard
[2]New Mexico Standard for domestic water supply wells
mg/L – milligrams per liter
s.u. – standard units
VOCs – volatile organic compounds
SVOCs – semi-volatile organic compounds

3.0 Soil Assessment Methodology

3.1 Introduction

Timberwolf conducted two soil assessment events at the Site (i.e., initial assessment and site characterization) in an attempt to 1) verify if soil impacts are present, 2) to identify the COCs at the Site, 3) determine the magnitude and extent of soil impacts, and 4) sufficiently characterize site soil to evaluate various remedial techniques. Information obtained from the assessment activities was used to develop a remedial action plan or abatement plan. Soil assessment methodology is presented below.

3.2 Environmental Soil Sampling Methodology

A total of 26 soil samples were collected from either an excavation, pothole (i.e., narrow excavations dug with a backhoe), or soil boring installed using a rotary rig equipped with a hollow stem auger and split spoon barrel. Excavations and potholes did not extend below 3 ft bgs. Soil borings were advanced to depths ranging from 12 ft to 15 ft bgs. Prior to soil boring installation, clearance requests were submitted to New Mexico 811 (i.e., One Call).

During boring installation, soil samples were continuously logged for morphological characteristics, and field screened for volatile organic compounds (VOCs) using a photoionization detector (PID). Soil boring logs are included in Appendix A; PID readings are recorded on the soil boring logs.

Samples from each boring exhibiting the highest PID reading were selected for chemical analysis along with the groundwater interface and/or boring terminus. Sample locations from the initial assessment are presented in Figure 4; soil borings installed during the site characterization are shown in Figure 5.

Soil samples were placed directly into laboratory provided sample containers, labeled, stored on ice, and transported under proper chain-of-custody protocol to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico for chemical analysis. Selected soil samples were analyzed for one or more of the following using the described method:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by USEPA Method 8021B
- TPH by EPA SW-846 Method 8015M/D
- Chloride by EPA Method 300

Laboratory results, analytical methods, and chain-of-custody documents are included in Appendix B and are discussed in subsequent sections of this report.

3.3 Geotechnical Soil Sampling Methodology

Geotechnical samples were collected into a steel ring tube by driving the tube into the sample interval using a geotechnical hammer. Two soil samples were collected from one boring (i.e., MW4); the depth intervals were 5.5- 6.0 ft and 13.5-14.0 ft. These intervals represent the top of the groundwater sand which appeared highly transmissive and the lower unit of that sand, comprised of silty or clayey sand, and appeared substantially marginally transmissive.

The samples were submitted to Goemat, Inc. for the following geotechnical parameters:

- volumetric water content
- bulk density
- hydraulic conductivity

Testing results and methods are included in Appendix C and are discussed in subsequent sections of this report.

4.0 Soil Analytical Results and Site Characterization Findings

4.1 Introduction

A total of 26 soil samples were collected from the Site for chemical analysis. Two samples were collected for geotechnical evaluation. Analytical results from all soil assessment events are presented in the sections below.

4.2 Initial Assessment (11/29/18)

The initial assessment event was intended to characterize the presence, magnitude, and horizontal extent of potential COCs at the Site. Eleven soil samples were collected from excavation sidewalls or pothole locations (Figure 4). The depths of samples ranged from 1 ft to 3 ft bgs. Laboratory results from the initial assessment are summarized in Table 4.

Table 4. Soil Analytical Results – Initial Assessment (11/29/18)

Sample ID	Volatile Organic Compounds (mg/kg)				Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
	B	T	E	X					
N Sidewall	< 0.016	0.031	0.061	0.37	0.462	17	< 9.8	< 49	17.0
N Sidewall 2	< 0.099	< 0.20	< 0.20	< 0.40	0	< 20	380	< 49	380.0
SW Sidewall	< 0.026	< 0.052	0.08	< 0.10	0.08	15	120	< 48	135.0
SE Sidewall	1.7	29	6.4	85	122.1	1,300	220	< 48	1,520.0
N Pothole	< 0.016	< 0.032	< 0.032	< 0.064	< 0.064	< 3.2	< 9.4	< 47	< 47
NW Pothole	< 0.018	< 0.035	< 0.035	< 0.071	< 0.071	< 3.5	< 9.3	< 49	< 49
W Pothole	< 0.094	< 0.19	2.1	17	19.1	790	210	< 49	1,000.0
W Pothole 2	< 0.02	< 0.039	< 0.039	< 0.079	< 0.079	< 3.9	< 9.6	< 48	< 48
E Pothole	< 0.014	< 0.028	< 0.028	< 0.055	< 0.055	< 2.8	< 9.8	< 49	< 49
SE Pothole	< 0.017	< 0.035	< 0.035	< 0.07	< 0.07	< 3.5	< 9.6	< 48	< 48
River Grab	< 0.017	< 0.033	< 0.033	< 0.067	< 0.067	< 3.3	< 10	< 50	< 50
Regulatory Criteria	**10**	**--**	**--**	**--**	**50**	**--**	**--**	**--**	**100**

TPH – total petroleum hydrocarbons
BTEX – benzene, toluene, ethylbenzene, and xylenes
mg/kg – milligrams per kilogram
– exceeds regulatory criteria

GRO – gasoline range organics
DRO – diesel range organics
MRO – motor oil range organics

4.3 Site Characterization (01/14/19 – 01/15/19)

The purpose of the site characterization was to: 1) characterize Site soil, 2) delineate the horizontal and vertical extents of COCs in the soil, 3) collect sufficient geotechnical data from the saturated and unsaturated zones to determine suitable remedial techniques for the Site (if required).

Fifteen soil samples were collected from 6 soil borings (Figure 5). The depths of samples ranged from 2.5 ft to 15.5 ft bgs. Laboratory results from this assessment are summarized in Table 5.

Table 5. Soil Analytical Results – Site Characterization (01/14/19 and 01/15/19)

Sample ID	Volatile Organic Compounds (mg/kg)				Total BTEX (mg/kg)	Chloride (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (mg/kg)
	B	T	E	X						
MW1 2.5-3.5'	0.96	22	7	92	121.96	< 30	1,200	600	< 49	1,800
MW1 4.5-5.5'	< 0.025	< 0.049	< 0.049	0.12	0.12	< 30	< 4.9	31	< 46	31
MW1 6.5-7.5'	< 0.023	< 0.046	< 0.046	< 0.092	< 0.0092	< 30	4.7	20	48	72.7
MW1 14-15'	< 0.025	< 0.05	< 0.05	< 0.1	< 0.1	< 30	< 5.0	< 9.3	< 47	<47
MW2 5'	< 0.024	< 0.048	< 0.048	< 0.096	< 0.096	< 30	< 4.8	< 9.2	< 46	<46
MW2 6.5-7.5'	< 0.024	< 0.048	< 0.048	< 0.096	< 0.096	< 30	< 4.8	18	< 49	18
MW3 5.0-5.5'	< 0.024	< 0.049	< 0.049	< 0.098	< 0.098	< 30	< 4.9	< 9.8	< 49	< 49
MW3 6.5-7.5'	< 0.024	< 0.049	< 0.049	< 0.097	< 0.097	< 30	< 4.9	< 9.4	< 47	< 47
MW4 5-6'	< 0.024	< 0.048	< 0.048	< 0.096	< 0.096	< 30	< 4.8	< 9.8	< 49	< 49
MW4 8-9'	< 0.024	< 0.047	< 0.047	< 0.094	< 0.094	< 30	< 4.7	130	< 50	130
MW5 4.5-5.5'	< 0.024	< 0.048	< 0.048	< 0.097	< 0.097	< 30	< 4.8	< 9.8	< 49	< 49
MW5 8-9'	< 0.024	< 0.049	< 0.049	< 0.098	< 0.098	< 30	29	86	< 47	115
MW5 14.5-15.5'	< 0.023	< 0.046	< 0.046	< 0.093	< 0.093	< 30	< 4.6	< 9.5	< 47	< 47
MW6 5.0-5.5'	< 0.025	< 0.05	< 0.05	< 0.099	< 0.099	< 30	10	10	< 49	20
MW6 7.5-8.5'	< 0.025	0.057	< 0.05	< 0.1	< 0.1	< 30	120	110	< 49	230
Regulatory Criteria	**10**	**--**	**--**	**--**	**50**	**600**		**--**	**--**	**100**

TPH – total petroleum hydrocarbons (TPH = GRO+DRO+MRO)
BTEX – benzene, toluene, ethylbenzene, and xylenes
mg/kg – milligrams per kilogram
– exceeds regulatory criteria
GRO – gasoline range organics
DRO – diesel range organics
MRO – motor oil range organics

4.4 Geotechnical Data

The collected sample intervals for geotechnical analysis were tested for volumetric water content, bulk density (wet and dry), and hydraulic conductivity. The results are summarized in Table 6.

Table 6. Results of Geotechnical Testing

Sample ID	Volumetric Water Content (%)	Bulk Density-Wet[1] (g/cc)	Bulk Density-Dry[1] (g/cc)	Hydraulic Conductivity (cm/sec)
MW1 5.5-6.0'	9.4	2.09	1.92	1.0 E^{-03}
MW4 13.5-14.0'	15.3	1.91	1.65	2.4 E^{-03}

% - percent
g/cc – grams per cubic centimeter
cm/sec – centimeters per second
[1]Laboratory reports acknowledge a reporting bias due to insufficient sample volume and gravel inclusions in sample

4.5 Soil Assessment Summary

Of the 26 soil samples collected for laboratory analysis, 8 samples exceeded the regulatory criteria for TPH and 2 samples exceeded the regulatory criteria for Total BTEX. All other COCs were below NMOCD regulatory criteria.

The soil assessments revealed that soils at the Site were comprised of interbedded sand, silt, and clay. A typical soil profile for the Site consists of clayey silty from the surface to approximately 0.5 ft, underlain by a firm clay to a depth of approximately 3.5 to 5.0 ft bgs. The clay was underlain by a medium or coarse grain groundwater sand to approximately 10 ft, which was underlain by a clayey or silty sand.

5.0 Groundwater Assessment

5.1 Introduction

Soil assessment activities indicated that the release reached the upper groundwater-bearing unit (GWBU). Therefore, all six soil borings installed at the Site were converted into groundwater monitor wells (i.e., MW1 – MW6). Each monitor well was permitted by the New Mexico Office of State Engineer (Permit No.: SJ-4327 POD1-POD6). Groundwater assessment activities are documented below.

5.2 Monitoring Well Installation

MW1 was situated adjacent and downgradient from the point of release. MW2 – MW6 were installed along the perimeter of the Site for horizontal delineation. Monitor well locations are shown in Figure 6.

Groundwater sand was typically encountered between 4 and 5 ft bgs across the Site. Monitor wells were drilled to depths ranging from 12 ft bgs to 15 ft bgs. Monitoring wells were constructed inside of hollow-stem augers using 2-inch PVC. Each well was constructed with 10-ft of screened pipe at the base of the well. A sand pack consisting of 20/40 silica sand was installed to approximately 1 ft above each well screen. Bentonite seals were installed above each sand pack to ground surface. Surface completions are stick-up with protective casing and 2 ft x 2 ft concrete pads. Each well was fitted with 3 protective bollards.

5.3 Well Development and Groundwater Monitoring

Each well was developed using a submersible stainless-steel pump and dedicated tubing. Water was purged from each well until water clarified (approximately 10 gallons per well; greater than 3 well volumes).

Following well development, wells were sampled using EPA low-flow techniques. Five groundwater samples were collected utilizing the EPA low-flow sampling technique (i.e., MW1, MW2, MW3, MW4 and MW5). Water was produced from wells using low-density polyethylene (LDPE) tubing and a stainless-steel submersible pump. The submersible pump was set in the screened interval of each well. The depth to water was monitored as water was removed. Pump rates were adjusted to maintain a static water level and laminar flow in each well.

Purged water was piped to a flow-through cell equipped with a YSI probe to monitor water quality parameters (i.e., temperature, pH, electrical conductivity, dissolved oxygen, and oxidation-reduction potential). Water was purged until all parameters stabilized. Stabilized parameters for wells that were sampled using EPA low flow methodology are documented in attached Table D-1 (Appendix D).

One well (i.e., MW6) pumped dry. This well was allowed to recharge and was sampled within 24 hours of well development and purging.

All samples were placed directly into laboratory-provided sample containers, stored on ice, and transported under proper chain-of-custody protocol to Hall Environmental Analytical Laboratory in Albuquerque, New Mexico for the following chemical analysis:

- BTEX by EPA SW-846 Method 8260
- TPH by EPA SW-846 Method 8015M/D
- Chloride by EPA Method 300.0

5.4 Groundwater Analytical Results

Groundwater analytical results for chloride and petroleum hydrocarbons are shown in Table 7. Laboratory reports containing analytical methods, results, and chain-of-custody documents are attached.

Table 7. Groundwater Analytical Results

Sample ID	Date	Volatile Organic Compounds (mg/L)				Chloride (mg/L)	GRO (mg/L)	DRO (mg/L)	MRO (mg/L)	TPH (mg/L)
		B	T	E	X					
MW1	01/18/19	0.074	0.35	0.027	0.33	130	2.0	< 1.0	< 5.0	2.0
MW2	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	150	< 0.05	< 1.0	< 5.0	< 5.0
MW3	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	140	< 0.05	< 1.0	< 5.0	< 5.0
MW4	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	140	< 0.05	< 1.0	< 5.0	< 5.0
MW5	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	130	0.32	< 1.0	< 5.0	0.32
MW6	01/18/19	< 0.001	< 0.001	< 0.001	< 0.0015	180	1.1	< 1.0	< 5.0	1.1
Regulatory Criteria		**0.01**	**0.75**	**0.75**	**0.62**	**250**	**--**	**--**	**--**	**--**

TPH – total petroleum hydrocarbons (TPH=GRO+DRO+MRO)
BTEX – benzene, toluene, ethylbenzene, and xylenes
mg/L – milligrams per liter
– exceeds regulatory criteria

GRO – gasoline range organics
DRO – diesel range organics
MRO – motor oil range organics

One groundwater sample (i.e., MW1) was also analyzed for the following additional constituents:

- TDS by Standard Method 2540C
- Anions by EPA Method 300.0
- RCRA 8 Metals by EPA SW-846 Method 6010B and 7470
- VOCs by EPA SW-846 Method 8260B
- SVOCs by EPA SW-846 Method 8270C
- VOCs by EPA SW-846 Method 8260B

Laboratory results as well as applicable standards for human health standards and/or domestic water supply are presented in the attached tables (Tables A-2 through A-5). Analytical results of additional constituents for the MW1 sample are summarized below:

- TDS exceeded the domestic water supply criteria (Table D-2)
- Except for sulfate, all anions were below the domestic water supply criteria (Table D-2)
- All RCRA-8 metals were below human health standards (Table D-3)
- Except for benzene as noted above, all VOCs were below human health standards (Table D-4)
- All SVOC were below standards for human health, domestic water supply or laboratory detection limits (Table D-5)

5.5 Well Gauging and Survey

Each well was gauged to determine the depth to water using an oil-water interface probe capable of measuring to the nearest one-hundredth foot. No phase separated hydrocarbons (PSH) were observed. An elevation survey was conducted on the tops of monitor well casings using a survey rod and laser level transit. Depths to groundwater were subtracted from the corresponding monitor well elevation to determine the depth of groundwater above mean sea level in each well.

Using this data, Timberwolf prepared a potentiometric surface elevation (PSE) map as shown in Figure 7. The PSE map reveals the groundwater gradient to be west-southwesterly across the Site.

5.6 Findings of Groundwater Assessment

The Site is underlain by a confined, yet seasonal, groundwater aquifer. The top of the groundwater sand was encountered between 4.5 and 5.0 ft bgs. However, groundwater was typically encountered a foot below the top of sand. The groundwater sand is characterized as stratified gravelly sand, with medium and coarse grain sand in the upper portion of the unit and silty and clayey sands in the lower portion of the unit. Gravel inclusions ranged in size from 0.25 to 2.0 inches in diameter and were distributed through the groundwater unit.

Benzene was the only COC identified within Site groundwater. Benzene was observed in only 1 well (i.e., MW1) situated adjacent and downgradient of the point of release. Benzene was horizontally delineated. A benzene isoconcentration map is provided in Figure 7.

Groundwater samples collected from MW5 and MW6 exceeded laboratory detection limits for GRO (i.e., 0.32 mg/L and 1.1 mg/L, respectively); however, neither the NMOCD nor NMDEQ has established criteria for petroleum hydrocarbons (i.e., TPH) in groundwater.

The PSE map reveals that the groundwater gradient at the Site is to the west-southwest, toward the La Plata River.

6.0 Abatement Plan

6.1 Introduction

The proposed further actions are based on the subsurface investigations conducted by Timberwolf in 2018 and 2019. The work plan presented below is intended to address impacted source soil within the vadose zone and impacted groundwater.

6.2 Horizontal Delineation

The soil assessment revealed TPH was not horizontally delineated to the south, southwest or west of the point of release. Timberwolf recommends installation of 3 soil borings to approximately 10 ft bgs to achieve horizontal delineation of TPH in soil. The proposed boring locations are shown in Figure 10.

6.3 Vadose Zone Abatement

The soil assessments revealed soil within and adjacent to the former tank battery with elevated Total BTEX and TPH. Further evaluation of impacted soil from the vadose zone (i.e., unsaturated zone) is required to determine if constituents are capable of migrating to the underlying groundwater (as required under NMAC 20.6.2§4103). Note: soil having the potential to leach constituents in concentrations exceeding groundwater criteria are considered "source soils".

The following plan is presented to mitigate impacted soil in the vadose zone:

1. Determine the leachability of impacted soil by analyzing select soil samples, including samples exhibiting the highest concentrations of TPH, for synthetic precipitation leaching procedure (SPLP) by EPA SW-846 Method 1312
2. Mitigate risk to groundwater by excavating soil which has the potential to leach constituents in concentrations exceeding groundwater criteria
3. Transport and dispose of excavated soil at a permitted commercial disposal facility
4. Backfill the excavation with clean fill

6.4 Saturated Zone Abatement

The groundwater assessment revealed a benzene plume in the vicinity of the former tank battery. The plume dimensions are estimated to be approximately 175 ft x 90 ft (Figure &). Benzene is a constituent which is susceptible to air sparging, bioventing, and soil vapor extraction (SVE). Additionally, geotechnical analysis reveal a favorable environment for biovent or air sparge system. Because this groundwater unit is confined, an air sparge system would additionally require SVE or passive wells to facilitate air flow.

The following plan is presented to mitigate impacted groundwater:

1. Install approximately 8 air sparge points constructed of 2-inch PVC
2. Sparge points to be oriented in a manner to provide plume containment
3. Install approximately 4 biovents or passive wells to facilitate air flow
4. Construct a manifold and piping system to serve each sparge point
5. Select an electric single-phase blower to power the air sparge system
6. Run the system on 4 to 6 hour cycles to prevent preferential pathways from developing
7. Monitor Site groundwater until the benzene plume is stable (i.e, stable constituent concentrations in groundwater with a stable or shrinking plume)

6.5 Groundwater Remedial Targets

The remedial target for BTEX in groundwater at the Site are established in Table 8.

Table 8. Remedial Targets for Groundwater

Constituent	Remedial Target (mg/L)
Benzene	0.074
Toluene	0.75
Ethylbenzene	0.75
Xylenes	1.00

mg/L – milligrams per liter

6.6 Groundwater Monitoring Program

Site groundwater will be monitored quarterly to evaluate remediation and mitigation efforts. During each monitoring event, groundwater will be analyzed for BTEX, and the depth to water in each well will be gauged, and a PSE map will be prepared to monitor the direction of groundwater flow.

Once 8 consecutive quarterly monitoring events indicate a stable groundwater plume and samples from all monitor wells during that period do not exceed the remedial target, the monitoring program will terminate, and site abatement will be considered complete.

6.7 Receptor Survey

Conduct a receptor survey to identify all water wells within a one-mile radius of the Site and sensitive features within a one-quarter mile radius of the Site.

Figures

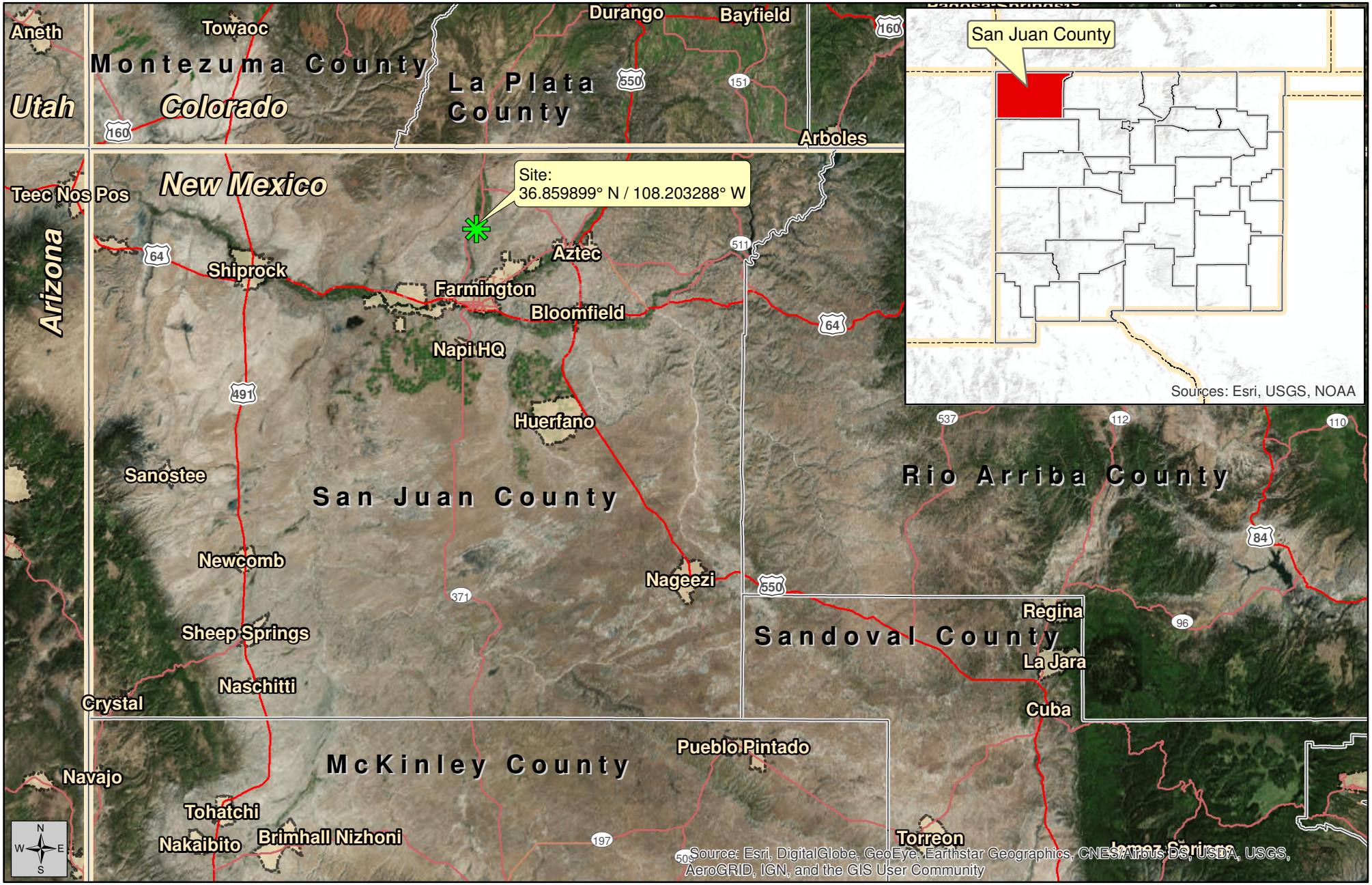


Figure 1 **Site Location Map**	**Site Characterization Report and Abatement Plan**	**January 25, 2019**
TIMBERWOLF ENVIRONMENTAL	1:1,250,000 0 20 40 60 80 100 120 Miles **Kaufman No. 1 Release** **Hilcorp Energy Company** **San Juan County, New Mexico**	✳ Site
Created By: Russell Greer TE Project No.: HEC-180061	Datum: NAD83 Imagery Source: ESRI Vector Source: ESRI and TE	

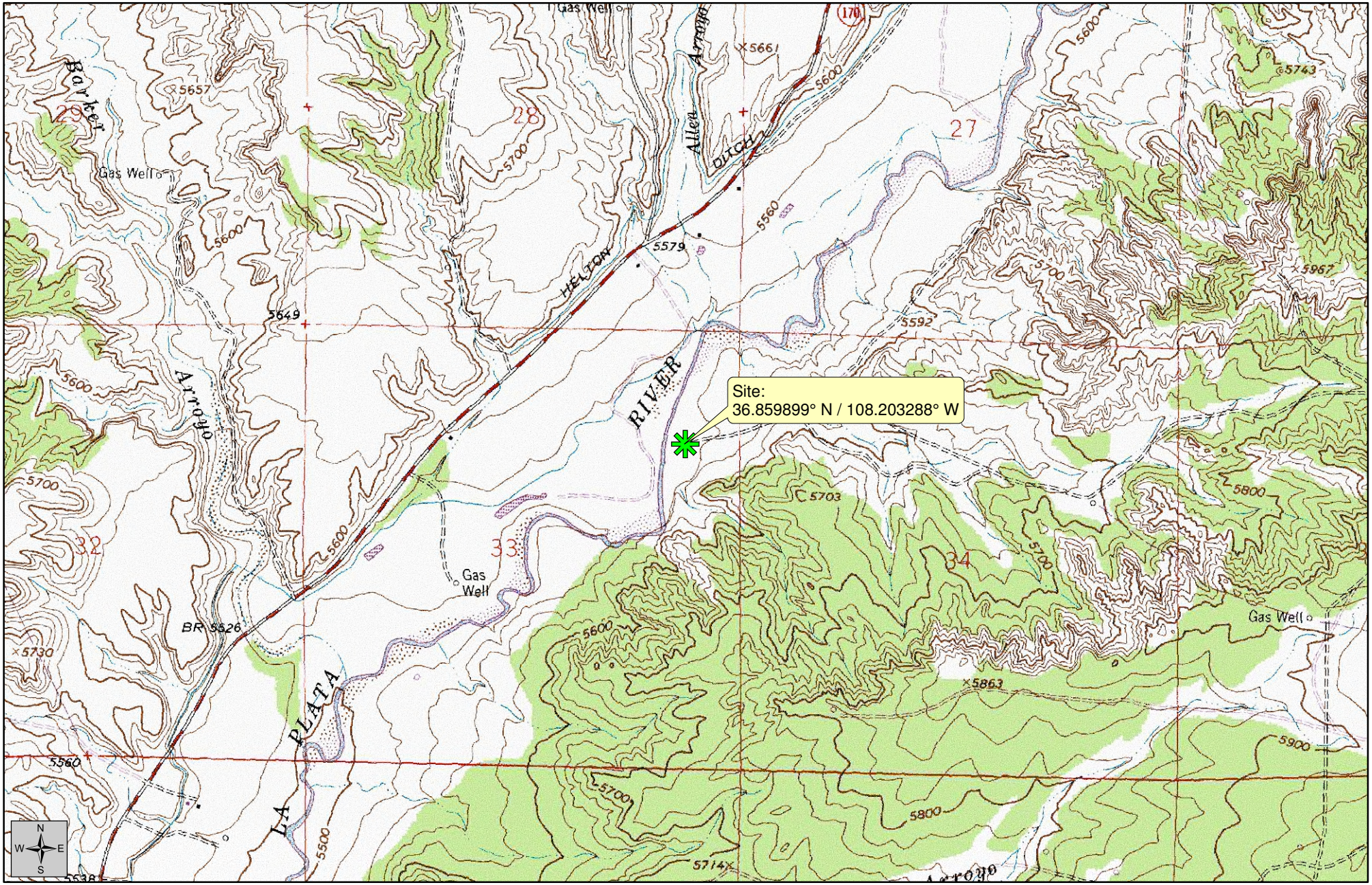


Figure 2 **Topographic Map**	**Site Characterization Report and Abatement Plan**	**January 25, 2019**

TIMBERWOLF ENVIRONMENTAL

1:24,000

0 0.5 1 1.5 2 2.5 Miles

Created By:
Russell Greer
TE Project No.: HEC-180061

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Datum: NAD83
Imagery Source: USGS
Quad: Farmington North
Vector Source: TE

Site

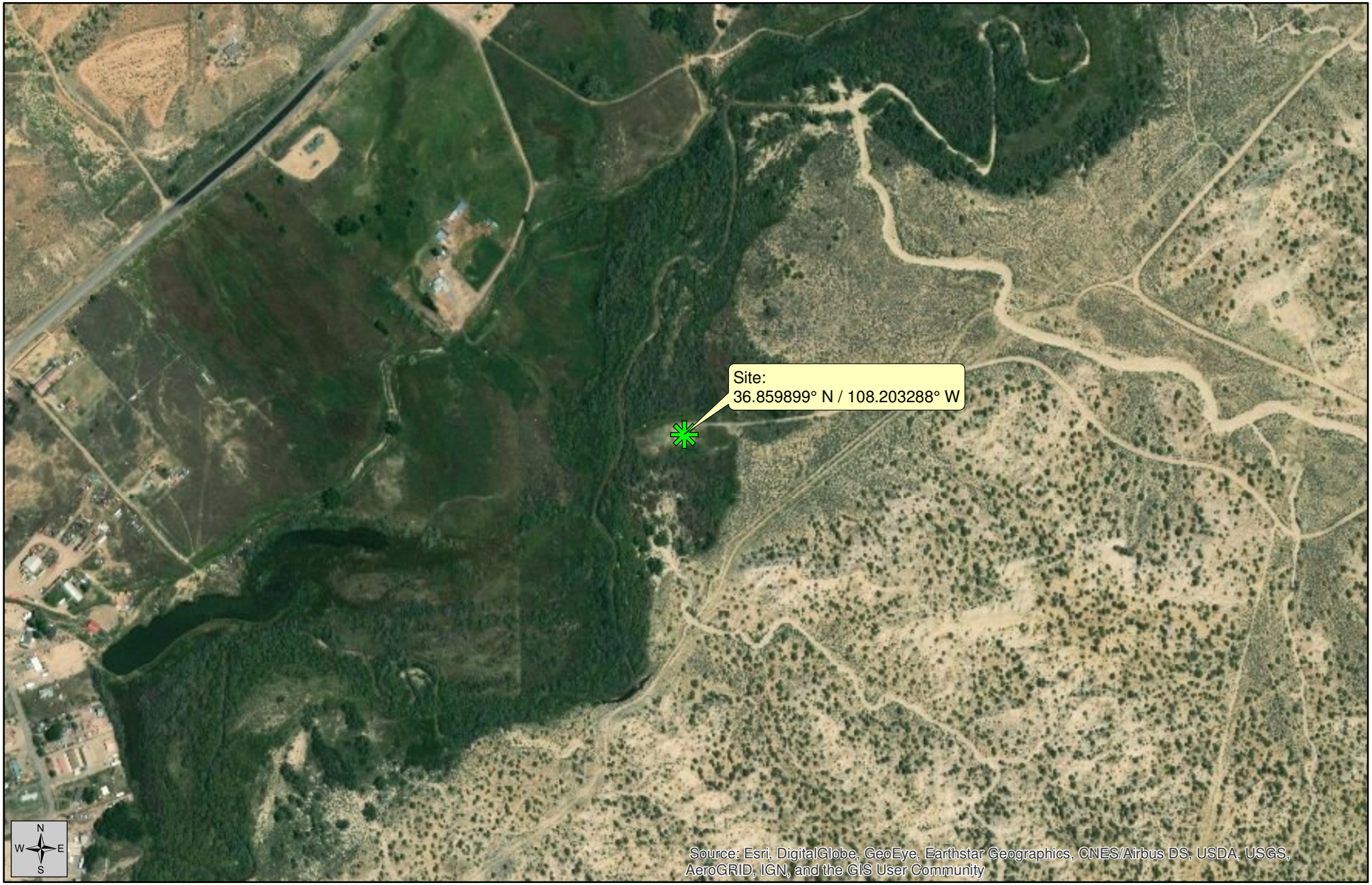


Figure 3
Aerial Map

Site Characterization Report and Abatement Plan

January 25, 2019

TIMBERWOLF ENVIRONMENTAL

1:8,000

0 1,000 2,000 3,000 4,000 Feet

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Created By:
Russell Greer
TE Project No.: HEC-180061

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Site

Sample ID	Volatile Organgic Compounds (mg/kg)				Total BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	Total TPH (mg/kg)
	B	T	E	X					
N Sidewall	< 0.016	0.031	0.061	0.37	0.462	17	< 9.8	< 49	17.0
N Sidewall 2	< 0.099	< 0.20	< 0.20	< 0.40	0	< 20	380	< 49	380.0
SW Sidewall	< 0.026	< 0.052	0.08	< 0.10	0.08	15	120	< 48	135.0
SE Sidewall	1.7	29	6.4	85	122.1	1,300	220	< 48	1,520.0
N Pothole	< 0.016	< 0.032	< 0.032	< 0.064	< 0.064	< 3.2	< 9.4	< 47	< 47
NW Pothole	< 0.018	< 0.035	< 0.035	< 0.071	< 0.071	< 3.5	< 9.3	< 49	< 49
W Pothole	< 0.094	< 0.19	2.1	17	19.1	790	210	< 49	1,000.0
W Pothole 2	< 0.02	< 0.039	< 0.039	< 0.079	< 0.079	< 3.9	< 9.6	< 48	< 48
E Pothole	< 0.014	< 0.028	< 0.028	< 0.055	< 0.055	< 2.8	< 9.8	< 49	< 49
SE Pothole	< 0.017	< 0.035	< 0.035	< 0.07	< 0.07	< 3.5	< 9.6	< 48	< 48
River Grab	< 0.017	< 0.033	< 0.033	< 0.067	< 0.067	< 3.3	< 10	< 50	< 50
Regulatory Criteria	**10**	**--**	**--**	**--**	**50**	**--**	**--**	**--**	**100**

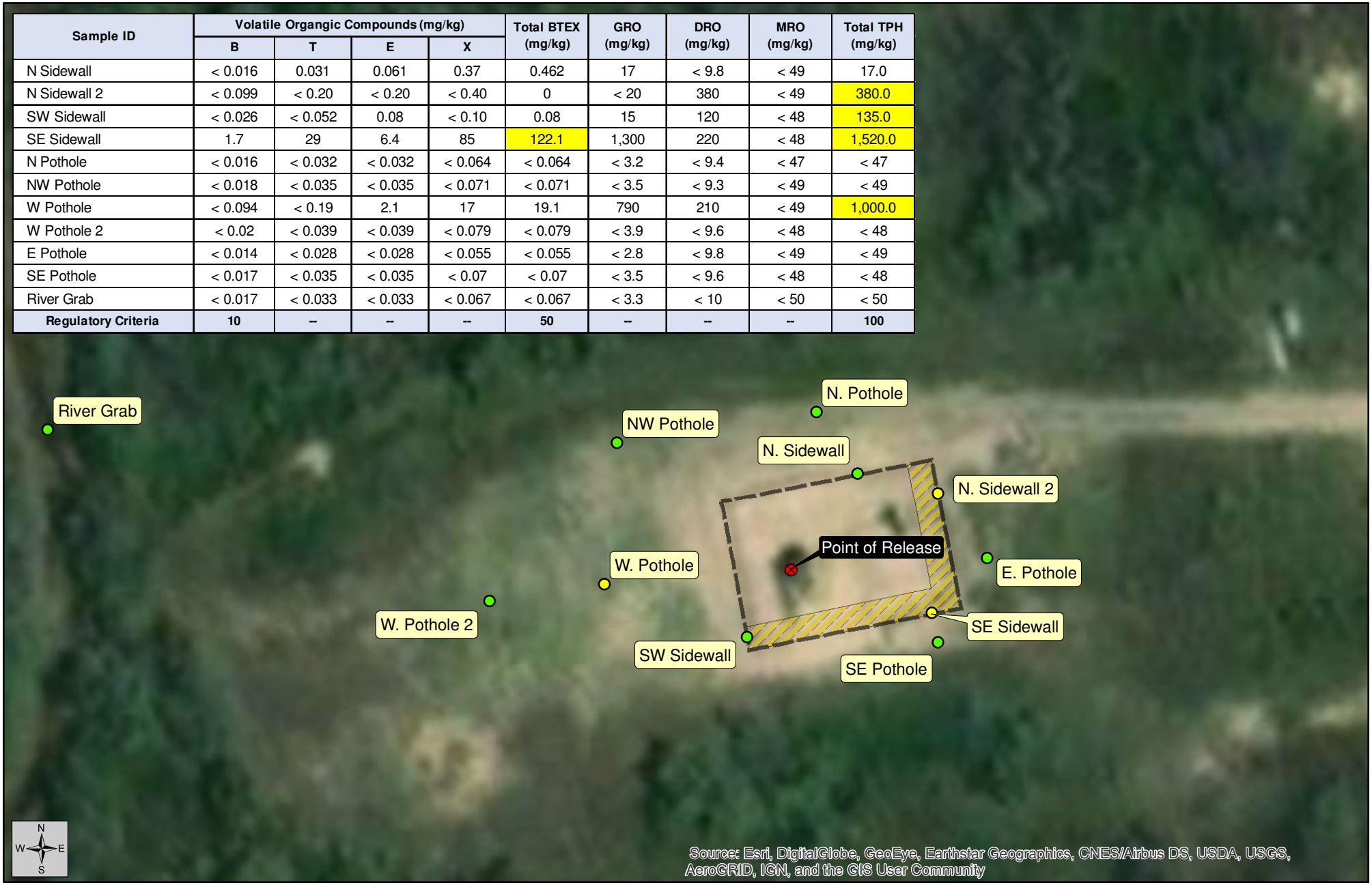


Figure 4
Initial Sample Location Map

Site Characterization Report and Abatement Plan

Sample Date:
November 29, 2018

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Created By:
Kevin Cole
November 30, 2018
TE Project No.: HEC-180061

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

- Point of Release
- Sample Location (clean)
- Sample Location (elevated)
- Excavation - 0.5 ft deep
- Excavation - 3 ft deep

Sample ID	Date	Volatile Orgnic Compounds (mg/kg)				Total BTEX (mg/kg)	Chloride (mg/kg)	TPH-DRO (mg/kg)	TPH-MRO (mg/kg)	TPH-GRO (mg/kg)	Total TPH (mg/kg)
		Benzene	Toluene	Ethylbenzene	Xylenes						
MW1 2.5-3.5'	01/15/19	0.96	22	7	92	121.96	< 30	600	< 49	1,200	1,800
MW1 4.5-5.5'	01/15/19	< 0.025	< 0.049	< 0.049	0.12	0.12	< 30	31	< 46	< 4.9	31
MW1 6.5-7.5'	01/15/19	< 0.023	< 0.046	< 0.046	< 0.092	< 0.0092	< 30	20	48	4.7	72.7
MW1 14-15'	01/15/19	< 0.025	< 0.05	< 0.05	< 0.1	< 0.1	< 30	< 9.3	< 47	< 5.0	<47
MW2 5'	01/14/19	< 0.024	< 0.048	< 0.048	< 0.096	< 0.096	< 30	< 9.2	< 46	< 4.8	<46
MW2 6.5-7.5'	01/14/19	< 0.024	< 0.048	< 0.048	< 0.096	< 0.096	< 30	18	< 49	< 4.8	18
MW3 5.0-5.5'	01/14/19	< 0.024	< 0.049	< 0.049	< 0.098	< 0.098	< 30	< 9.8	< 49	< 4.9	< 49
MW3 6.5-7.5'	01/14/19	< 0.024	< 0.049	< 0.049	< 0.097	< 0.097	< 30	< 9.4	< 47	< 4.9	< 47
MW4 5-6'	01/15/19	< 0.024	< 0.048	< 0.048	< 0.096	< 0.096	< 30	< 9.8	< 49	< 4.8	< 49
MW4 8-9'	01/15/19	< 0.024	< 0.047	< 0.047	< 0.094	< 0.094	< 30	130	< 50	< 4.7	130
MW5 4.5-5.5'	01/15/19	< 0.024	< 0.048	< 0.048	< 0.097	< 0.097	< 30	< 9.8	< 49	< 4.8	< 49
MW5 8-9'	01/15/19	< 0.024	< 0.049	< 0.049	< 0.098	< 0.098	< 30	86	< 47	29	115
MW5 14.5-15.5'	01/15/19	< 0.023	< 0.046	< 0.046	< 0.093	< 0.093	< 30	< 9.5	< 47	< 4.6	< 47
MW6 5.0-5.5'	01/14/19	< 0.025	< 0.05	< 0.05	< 0.099	< 0.099	< 30	10	< 49	10	20
MW6 7.5-8.5'	01/14/19	< 0.025	0.057	< 0.05	< 0.1	< 0.1	< 30	110	< 49	120	230
Regulatory Criteria		**10**	**--**	**--**	**--**	**50**	**600**	**--**	**--**	**--**	**100**

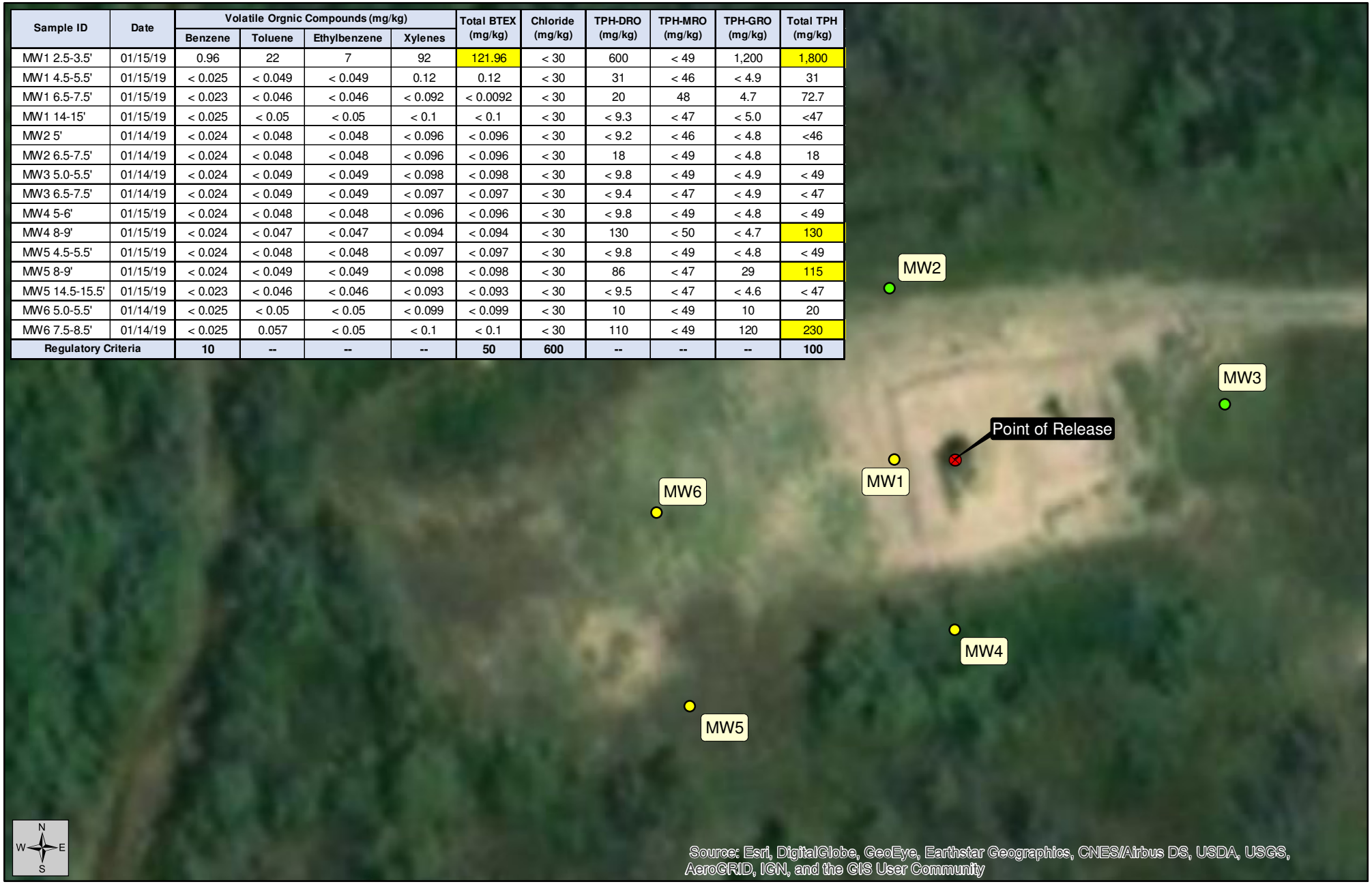


Figure 5
Site Charactorization - Sample Location Map

Site Characterization Report and Abatement Plan

Sample Dates: 01/14/19 and 01/15/19

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Created By:
Kevin Cole
January 25, 2019
TE Project No.: HEC-180061

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

- Point of Release
- Soil Sample (Clean)
- Soil Sample (Elevated)

Sample ID	Date	Volatile Organic Compounds (mg/L)				Chloride (mg/L)	TPH-GRO (mg/L)	TPH-DRO (mg/L)	TPH-MRO (mg/L)	Total TPH (mg/L)
		B	T	E	X					
MW1	01/18/19	0.074	0.35	0.027	0.33	130	2.0	< 1.0	< 5.0	2.0
MW2	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	150	< 0.05	< 1.0	< 5.0	< 5.0
MW3	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	140	< 0.05	< 1.0	< 5.0	< 5.0
MW4	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	140	< 0.05	< 1.0	< 5.0	< 5.0
MW5	01/17/19	< 0.001	< 0.001	< 0.001	< 0.0015	130	0.32	< 1.0	< 5.0	0.32
MW6	01/18/19	< 0.001	< 0.001	< 0.001	< 0.0015	180	1.1	< 1.0	< 5.0	1.1
Regulatory Criteria		**0.01**	**0.75**	**0.75**	**0.62**	**250**	**--**	**--**	**--**	**--**

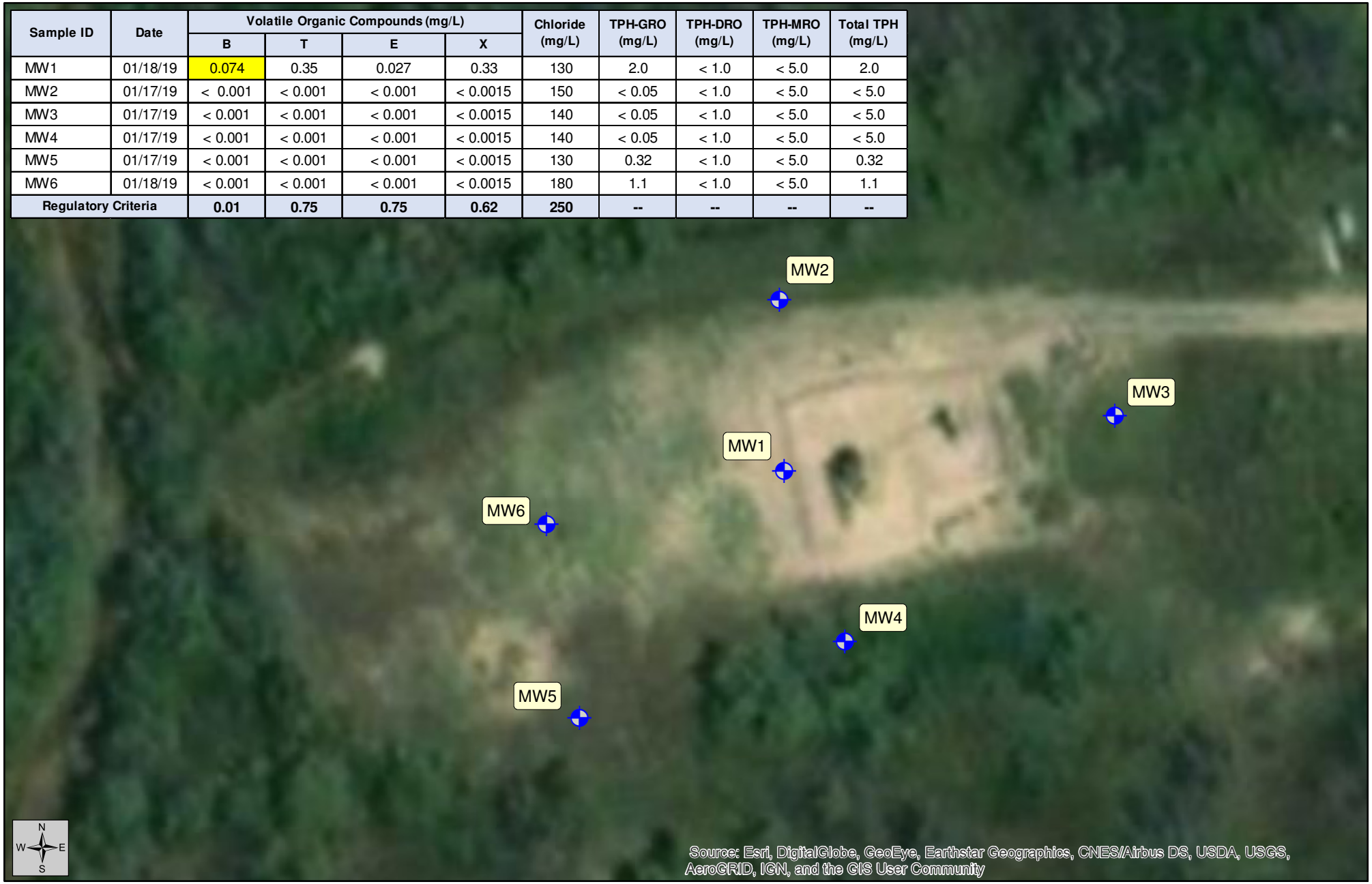


Figure 6
Monitor Well Location Map

Site Characterization Report and Abatement Plan

Sample Dates:
01/17/19 and 01/18/19

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Created By:
Kevin Cole
January 25, 2019
TE Project No.: HEC-180061

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Monitor Well

Figure 7
Bezene Isoconcentration Map

Site Characterization Report and Abatement Plan

Sample Dates:
01/17/19 and 01/18/19

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Created By:
Kevin Cole
January 25, 2019
TE Project No.: HEC-180061

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

- Monitor Well
- Benzene: ≥ 0.01 mg/L
- Benzene: ≥ 0.05 mg/L

Figure 8
Potentiometric Surface Map

Site Characterization Report and Abatement Plan

Sample Dates:
01/17/19 and 01/18/19

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Created By:
Kevin Cole
January 25, 2019
TE Project No.: HEC-180061

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Monitor Well
Groundwater Gradient
Groundwater Flow

Figure 9
Proposed Soil Boring Locations

Site Characterization Report and Abatement Plan

January 25, 2019

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Created By:
Kevin Cole
TE Project No.: HEC-180061

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

- Point of Release
- Monitor Well
- Proposed Soil Boring

Figure 10
Proposed Leachate Study Area

Site Characterization Report and Abatement Plan

January 25, 2019

TIMBERWOLF ENVIRONMENTAL

1:500

0 50 100 150 200 250 Feet

Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Created By:
Kevin Cole
TE Project No.: HEC-180061

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Monitor Well
Current Excavation
Area for Leachate Study
Hilcorp Lines

Appendix A

Soil Boring Logs

MONITORING WELL INSTALLATION REPORT

MW-1

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 01/15/19
Project Name: Kaufman No. 1	Logged By: Jim Foster
Site Location: Farmington, New Mexico	Drilled By: Geomat, Inc.
Project Number: 180061	Drilling Method & Boring Diameter: Hollow Stem Auger 5.5'
Boring Coordinates: 36.85988, -108.20337	Total Depth (ft): 15'
Ground Surface Elevation (ft, msl): 5,537 ft	First Water Encountered (ft): 5'

Depth (feet)	USCS	PID Reading (ppm)	Soil Sample	Soil Description
				Excavated, void
	CH	589		FIRM CLAY
	SC			CLAYEY SAND
	SW			MEDIUM SAND
	CL			SANDY CLAY
	SC			CLAYEY SAND
5	SW	371		QUARTZ SAND, brown; groundwater
	SW	86.4		QUARTZ SAND, grey
10	SW			QUARTZ SAND, brown
15		258		TD = 15'
20				

Well Completion

Notes:

Well Completion: Well Screen: 4-14 ft bgs. Sand packed to 3 ft bgs, sealed to surface with bentonite. Well completed with 2-inch PVC, surface completion is stick up.

- groundwater
- sand pack
- screened interval
- bentonite seal

MONITORING WELL INSTALLATION REPORT

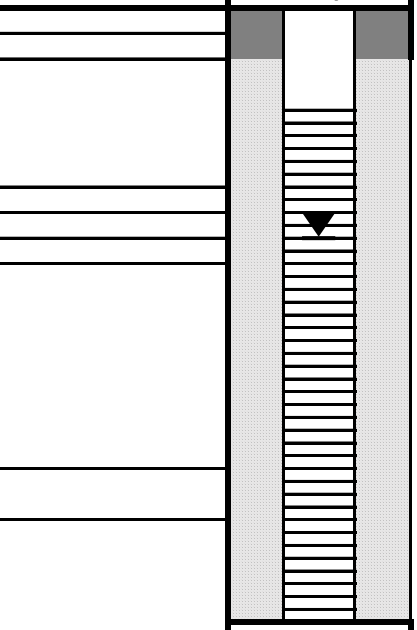
MW-2

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 01/14/19
Project Name: Kaufman No. 1	Logged By: Jim Foster
Site Location: Farmington, New Mexico	Drilled By: Geomat, Inc.
Project Number: 180061	Drilling Method & Boring Diameter: Hollow Stem Auger 5.5"
Boring Coordinates: 36.86007, -108.2034	Total Depth (ft): 13'
Ground Surface Elevation (ft, msl): 5,536ft	First Water Encountered (ft): 4.33'

Depth (feet)	USCS	PID Reading (ppm)	Soil Sample	Soil Description
	ML			CLAYEY SILT
	CH			FIRM CLAY, brown
	CH			CLAY, brown
	SW	0.35		COARSE SAND, brown
	CH			CLAY, highly plastic
	SW	0.4		MEDIUM SAND, groundwater
5	SW			QUARTZ SAND, pea gravel and 1.5" gravel inclusions
				hydrocarbon staining 6-8'
		0.8		
	SM			CLAYEY SILTY FINE SAND
10				NO RETURN
15				TD = 13'
20				

Well Completion



Notes:
Well Completion: Well Screen: 2-12 ft bgs. Sand packed to 1 ft bgs, sealed to surface with bentonite. Well completed with 2-inch PVC, surface completion is stick up.

- groundwater
- sand pack
- screened interval
- bentonite seal

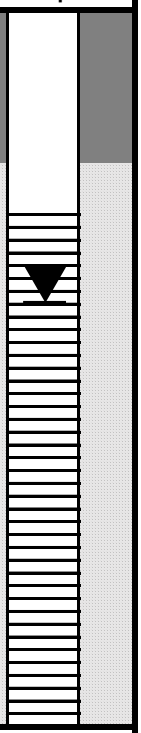
MONITORING WELL INSTALLATION REPORT

MW-3

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 01/14/19
Project Name: Kaufman No. 1	Logged By: Jim Foster
Site Location: Farmington, New Mexico	Drilled By: Geomat, Inc.
Project Number: 180061	Drilling Method & Boring Diameter: Hollow Stem Auger 5.5"
Boring Coordinates: 36.85995, -108.20309	Total Depth (ft): 13'
Ground Surface Elevation (ft, msl): 5,536ft	First Water Encountered (ft): 4.33'

Depth (feet)	USCS	PID Reading (ppm)	Soil Sample	Soil Description
	ML			CLAYEY SILT
	CL			SILTY CLAY
	CH			CLAY, firm brown
	CL	0.45		SANDY CLAY
5		0.5		QUARTZ SAND, pea gravel and 1.5" gravel inclusions - groundwater
	SW	0.55		- sandstone
10				NO RETURN
15				TD = 14'
20				



Notes:
Well Completion: Well Screen: 4-14 ft bgs. Sand packed to 3 ft bgs, sealed to surface with bentonite. Well completed with 2-inch PVC, surface completion is stick up.

- groundwater
- sand pack
- screened interval
- bentonite seal

MONITORING WELL INSTALLATION REPORT

MW-4

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 01/15/19
Project Name: Kaufman No. 1	Logged By: Jim Foster
Site Location: Farmington, New Mexico	Drilled By: Geomat, Inc.
Project Number: 180061	Drilling Method & Boring Diameter: Hollow Stem Auger 5.5"
Boring Coordinates: 36.85973, -108.20333	Total Depth (ft): 14'
Ground Surface Elevation (ft, msl): 5,539ft	First Water Encountered (ft): 5

Depth (feet)	USCS	PID Reading (ppm)	Soil Sample	Soil Description	Well Completion
	CH	ML		FIRM CLAY, brown	
	SC			CLAYEY SANDY SILT	
	CH			FIRM CLAY, brown	
	CL	SW		SILTY CLAY	
	CL			SANDY SILTY CLAY	
5	SW	340		QUARTZ SAND, pea gravel and 1.5" gravel inclusions	
		249		- possible hydrocarbon staining	
10				NO RETURN	
15				TD = 14'	
20					

Notes:
Well Completion: Well Screen: 4-14 ft bgs. Sand packed to 3 ft bgs, sealed to surface with bentonite. Well completed with 2-inch PVC, surface completion is stick up.

- groundwater
- sand pack
- screened interval
- bentonite seal

MONITORING WELL INSTALLATION REPORT

MW-5

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 01/15/18
Project Name: Kaufman No. 1	Logged By: Jim Foster
Site Location: Farmington, New Mexico	Drilled By: Geomat, Inc.
Project Number: 180061	Drilling Method & Boring Diameter: Hollow Stem Auger 5.5"
Boring Coordinates: 36.85966, -108.20358	Total Depth (ft): 15'
Ground Surface Elevation (ft, msl): 5,536ft	First Water Encountered (ft): 4.5'

Depth (feet)	USCS	PID Reading (ppm)	Soil Sample	Soil Description	Well Completion
	CH	SC		FIRM CLAY, brown with calcarious inclusions — CLAYEY SAND	
	SW			MEDIUM SAND, brown	
	SC			CLAYEY SAND	
	SW			MEDIUM SAND, brown	
	CL			SANDY CLAY	
	SW			MEDIUM SAND, groundwater	
5	SW	363		QUARTZ SAND, saturated with 1.5" gravel inclusion	
	SW	16.3		MEDIUM SAND, with 1.5" gravel inclusions - hydrocarbon stainig	
10	SC	342		CLAYEY QUARTZ SAND, hydrocarbon odor	
	SC	CL		CLAYEY QUARTZ SAND — SANDY CLAY	
	CL			SILTY CLAY	
	CH			CLAY, highly plastic	
15	SC	8.05		CLAYEY SAND	
				TD = 15'	
20					

Notes:
Well Completion: Well Screen: 4-14 ft bgs. Sand packed to 3 ft bgs, sealed to surface with bentonite. Well completed with 2-inch PVC, surface completion is stick up.

- groundwater
- sand pack
- screened interval
- bentonite seal

MONITORING WELL INSTALLATION REPORT

MW-6

TIMBERWOLF ENVIRONMENTAL

Client: Hilcorp Energy Company	Completion Date: 01/14/19
Project Name: Kaufman No. 1	Logged By: Jim Foster
Site Location: Farmington, New Mexico	Drilled By: Geomat, Inc.
Project Number: 180061	Drilling Method & Boring Diameter: Hollow Stem Auger
Boring Coordinates: 36.85984, -108.20366	Total Depth (ft): 13'
Ground Surface Elevation (ft, msl): 5,536ft	First Water Encountered (ft): 4.5'

Depth (feet)	USCS	PID Reading (ppm)	Soil Sample	Soil Description
	ML			CLAYEY SILT
	CH	3.15		FIRM CLAY, brown
	CH			
				FIRM CLAY, brown
	CH	ML		SILT / CLAY STONE
	ML	2.1		CLAYEY SILT, groundwater
				NO RETURN
5				
	SW			QUARTZ SAND, pea gravel and 1-2" gravel inclusions
		9.7		
		183		MEDIUM SAND
	SP			- 1-2" gravel inclusions
10				NO RETURN
15				TD = 13'
20				

Well Completion

Notes:
Well Completion: Well Screen: 2-12 ft bgs. Sand packed to 1 ft bgs, sealed to surface with bentonite. Well completed with 2-inch PVC, surface completion is stick up.

- groundwater
- sand pack
- screened interval
- bentonite seal

Appendix B

Laboratory Reports and Chain-of-Custody Documents

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

February 01, 2019

Jim Foster

Timberwolf Environmental
1920 W Villa Maria Ste 205
Bryan, TX 77807
TEL: (979) 324-2139
FAX

RE: Kaufman No1 OrderNo.: 1901789

Dear Jim Foster:

Hall Environmental Analysis Laboratory received 6 sample(s) on 1/19/2019 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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW2
Project: Kaufman No1
Collection Date: 1/17/2019 10:26:00 AM
Lab ID: 1901789-001 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	150	5.0		mg/L	10	1/21/2019 9:47:54 PM	R57149
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/22/2019 11:56:31 AM	R57171
Surr: BFB	98.6	70-130		%Rec	1	1/22/2019 11:56:31 AM	R57171
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/23/2019 9:58:20 AM	42745
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/23/2019 9:58:20 AM	42745
Surr: DNOP	110	70-130		%Rec	1	1/23/2019 9:58:20 AM	42745
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/22/2019 11:56:31 AM	A57171
Toluene	ND	1.0		µg/L	1	1/22/2019 11:56:31 AM	A57171
Ethylbenzene	ND	1.0		µg/L	1	1/22/2019 11:56:31 AM	A57171
Xylenes, Total	ND	1.5		µg/L	1	1/22/2019 11:56:31 AM	A57171
Surr: 4-Bromofluorobenzene	108	70-130		%Rec	1	1/22/2019 11:56:31 AM	A57171
Surr: Toluene-d8	103	70-130		%Rec	1	1/22/2019 11:56:31 AM	A57171

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW3
Project: Kaufman No1
Collection Date: 1/17/2019 12:15:00 PM
Lab ID: 1901789-002 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	140	5.0		mg/L	10	1/21/2019 10:13:38 PM	R57149
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/22/2019 1:22:09 PM	R57171
Surr: BFB	97.0	70-130		%Rec	1	1/22/2019 1:22:09 PM	R57171
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/23/2019 11:04:31 AM	42745
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/23/2019 11:04:31 AM	42745
Surr: DNOP	102	70-130		%Rec	1	1/23/2019 11:04:31 AM	42745
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/22/2019 1:22:09 PM	A57171
Toluene	ND	1.0		µg/L	1	1/22/2019 1:22:09 PM	A57171
Ethylbenzene	ND	1.0		µg/L	1	1/22/2019 1:22:09 PM	A57171
Xylenes, Total	ND	1.5		µg/L	1	1/22/2019 1:22:09 PM	A57171
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	1	1/22/2019 1:22:09 PM	A57171
Surr: Toluene-d8	101	70-130		%Rec	1	1/22/2019 1:22:09 PM	A57171

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW4
Project: Kaufman No1
Collection Date: 1/17/2019 1:30:00 PM
Lab ID: 1901789-003 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	140	5.0		mg/L	10	1/21/2019 10:39:21 PM	R57149
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/22/2019 2:47:49 PM	R57171
Surr: BFB	97.8	70-130		%Rec	1	1/22/2019 2:47:49 PM	R57171
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/23/2019 11:26:23 AM	42745
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/23/2019 11:26:23 AM	42745
Surr: DNOP	106	70-130		%Rec	1	1/23/2019 11:26:23 AM	42745
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/22/2019 2:47:49 PM	A57171
Toluene	ND	1.0		µg/L	1	1/22/2019 2:47:49 PM	A57171
Ethylbenzene	ND	1.0		µg/L	1	1/22/2019 2:47:49 PM	A57171
Xylenes, Total	ND	1.5		µg/L	1	1/22/2019 2:47:49 PM	A57171
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	1/22/2019 2:47:49 PM	A57171
Surr: Toluene-d8	104	70-130		%Rec	1	1/22/2019 2:47:49 PM	A57171

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW5
Project: Kaufman No1
Collection Date: 1/17/2019 2:45:00 PM
Lab ID: 1901789-004 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	130	5.0		mg/L	10	1/21/2019 11:05:04 PM	R57149
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	0.32	0.050		mg/L	1	1/22/2019 3:16:21 PM	R57171
Surr: BFB	95.8	70-130		%Rec	1	1/22/2019 3:16:21 PM	R57171
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/23/2019 11:48:26 AM	42745
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/23/2019 11:48:26 AM	42745
Surr: DNOP	107	70-130		%Rec	1	1/23/2019 11:48:26 AM	42745
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/22/2019 3:16:21 PM	A57171
Toluene	ND	1.0		µg/L	1	1/22/2019 3:16:21 PM	A57171
Ethylbenzene	ND	1.0		µg/L	1	1/22/2019 3:16:21 PM	A57171
Xylenes, Total	ND	1.5		µg/L	1	1/22/2019 3:16:21 PM	A57171
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	1/22/2019 3:16:21 PM	A57171
Surr: Toluene-d8	99.5	70-130		%Rec	1	1/22/2019 3:16:21 PM	A57171

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW6
Project: Kaufman No1
Collection Date: 1/18/2019 1:35:00 PM
Lab ID: 1901789-005 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	180	5.0		mg/L	10	1/21/2019 11:30:46 PM	R57149
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	1.1	0.050		mg/L	1	1/22/2019 3:44:54 PM	R57171
Surr: BFB	95.5	70-130		%Rec	1	1/22/2019 3:44:54 PM	R57171
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/23/2019 12:10:26 PM	42745
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/23/2019 12:10:26 PM	42745
Surr: DNOP	103	70-130		%Rec	1	1/23/2019 12:10:26 PM	42745
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/22/2019 3:44:54 PM	A57171
Toluene	ND	1.0		µg/L	1	1/22/2019 3:44:54 PM	A57171
Ethylbenzene	ND	1.0		µg/L	1	1/22/2019 3:44:54 PM	A57171
Xylenes, Total	ND	1.5		µg/L	1	1/22/2019 3:44:54 PM	A57171
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	1/22/2019 3:44:54 PM	A57171
Surr: Toluene-d8	96.1	70-130		%Rec	1	1/22/2019 3:44:54 PM	A57171

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1
Project: Kaufman No1
Collection Date: 1/18/2019 3:15:00 PM
Lab ID: 1901789-006
Matrix: AQUEOUS
Received Date: 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Fluoride	ND	1.0		mg/L	10	1/22/2019 12:22:13 AM	R57149
Chloride	130	5.0		mg/L	10	1/22/2019 12:22:13 AM	R57149
Nitrogen, Nitrite (As N)	ND	1.0	H	mg/L	10	1/22/2019 12:22:13 AM	R57149
Bromide	ND	1.0		mg/L	10	1/22/2019 12:22:13 AM	R57149
Nitrogen, Nitrate (As N)	ND	1.0	H	mg/L	10	1/22/2019 12:22:13 AM	R57149
Phosphorus, Orthophosphate (As P)	ND	5.0	H	mg/L	10	1/22/2019 12:22:13 AM	R57149
Sulfate	1700	50	*	mg/L	100	1/22/2019 12:35:04 AM	R57149
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **MRA**	
Conductivity	3600	5.0		µmhos/c	1	1/21/2019 9:31:21 PM	R57160
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	3130	40.0	*D	mg/L	1	1/23/2019 3:44:00 PM	42739
EPA METHOD 7470: MERCURY						Analyst: **pmf**	
Mercury	ND	0.00020		mg/L	1	1/23/2019 5:51:24 PM	42731
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **rde**	
Arsenic	ND	0.020		mg/L	1	1/29/2019 2:53:21 PM	42806
Barium	0.079	0.020		mg/L	1	1/28/2019 5:31:55 PM	42806
Cadmium	ND	0.0020		mg/L	1	1/28/2019 5:31:55 PM	42806
Calcium	430	5.0		mg/L	5	1/28/2019 6:52:17 PM	42806
Chromium	ND	0.0060		mg/L	1	1/28/2019 5:31:55 PM	42806
Lead	ND	0.0050		mg/L	1	1/28/2019 6:47:08 PM	42806
Magnesium	88	1.0		mg/L	1	1/28/2019 5:31:55 PM	42806
Potassium	3.3	1.0		mg/L	1	1/28/2019 5:31:55 PM	42806
Selenium	ND	0.050		mg/L	1	1/28/2019 5:31:55 PM	42806
Silver	0.0068	0.0050		mg/L	1	1/28/2019 5:31:55 PM	42806
Sodium	370	5.0		mg/L	5	1/28/2019 6:52:17 PM	42806
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	2.4	0.050		mg/L	1	1/22/2019 4:13:29 PM	R57171
Surr: BFB	98.5	70-130		%Rec	1	1/22/2019 4:13:29 PM	R57171
EPA METHOD 8015M/D: DIESEL RANGE						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	1.0		mg/L	1	1/23/2019 12:32:30 PM	42745
Motor Oil Range Organics (MRO)	ND	5.0		mg/L	1	1/23/2019 12:32:30 PM	42745
Surr: DNOP	111	70-130		%Rec	1	1/23/2019 12:32:30 PM	42745
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Acenaphthene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Acenaphthylene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Aniline	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1
Project: Kaufman No1
Collection Date: 1/18/2019 3:15:00 PM
Lab ID: 1901789-006 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Anthracene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Azobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Benz(a)anthracene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Benzo(a)pyrene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Benzo(b)fluoranthene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Benzo(g,h,i)perylene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Benzo(k)fluoranthene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Benzoic acid	ND	20		µg/L	1	1/28/2019 4:34:16 PM	42755
Benzyl alcohol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Bis(2-chloroethoxy)methane	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Bis(2-chloroethyl)ether	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Bis(2-chloroisopropyl)ether	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Bis(2-ethylhexyl)phthalate	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4-Bromophenyl phenyl ether	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Butyl benzyl phthalate	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Carbazole	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4-Chloro-3-methylphenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4-Chloroaniline	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2-Chloronaphthalene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2-Chlorophenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4-Chlorophenyl phenyl ether	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Chrysene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Di-n-butyl phthalate	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Di-n-octyl phthalate	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Dibenz(a,h)anthracene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Dibenzofuran	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
1,2-Dichlorobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
1,3-Dichlorobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
1,4-Dichlorobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
3,3´-Dichlorobenzidine	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Diethyl phthalate	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Dimethyl phthalate	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2,4-Dichlorophenol	ND	20		µg/L	1	1/28/2019 4:34:16 PM	42755
2,4-Dimethylphenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4,6-Dinitro-2-methylphenol	ND	20		µg/L	1	1/28/2019 4:34:16 PM	42755
2,4-Dinitrophenol	ND	20		µg/L	1	1/28/2019 4:34:16 PM	42755
2,4-Dinitrotoluene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2,6-Dinitrotoluene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Fluoranthene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755

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Qualifiers:

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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
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PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1
Project: Kaufman No1
Collection Date: 1/18/2019 3:15:00 PM
Lab ID: 1901789-006 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C: SEMIVOLATILES						Analyst: **DAM**	
Fluorene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Hexachlorobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Hexachlorobutadiene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Hexachlorocyclopentadiene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Hexachloroethane	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Indeno(1,2,3-cd)pyrene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Isophorone	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
1-Methylnaphthalene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2-Methylnaphthalene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2-Methylphenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
3+4-Methylphenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
N-Nitrosodi-n-propylamine	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
N-Nitrosodimethylamine	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
N-Nitrosodiphenylamine	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Naphthalene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2-Nitroaniline	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
3-Nitroaniline	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4-Nitroaniline	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Nitrobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2-Nitrophenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
4-Nitrophenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Pentachlorophenol	ND	20		µg/L	1	1/28/2019 4:34:16 PM	42755
Phenanthrene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Phenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Pyrene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Pyridine	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
1,2,4-Trichlorobenzene	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2,4,5-Trichlorophenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
2,4,6-Trichlorophenol	ND	10		µg/L	1	1/28/2019 4:34:16 PM	42755
Surr: 2-Fluorophenol	32.4	15-74.1		%Rec	1	1/28/2019 4:34:16 PM	42755
Surr: Phenol-d5	30.0	15-59.8		%Rec	1	1/28/2019 4:34:16 PM	42755
Surr: 2,4,6-Tribromophenol	52.1	22.1-112		%Rec	1	1/28/2019 4:34:16 PM	42755
Surr: Nitrobenzene-d5	47.5	33.2-94		%Rec	1	1/28/2019 4:34:16 PM	42755
Surr: 2-Fluorobiphenyl	39.3	34-90.9		%Rec	1	1/28/2019 4:34:16 PM	42755
Surr: 4-Terphenyl-d14	44.3	15-149		%Rec	1	1/28/2019 4:34:16 PM	42755
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Benzene	74	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Toluene	350	10		µg/L	10	1/23/2019 4:08:15 PM	R57206
Ethylbenzene	27	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171

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

Qualifiers:

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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
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PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1
Project: Kaufman No1
Collection Date: 1/18/2019 3:15:00 PM
Lab ID: 1901789-006 **Matrix:** AQUEOUS **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2,4-Trimethylbenzene	32	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,3,5-Trimethylbenzene	15	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Naphthalene	3.2	2.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1-Methylnaphthalene	ND	4.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
2-Methylnaphthalene	ND	4.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Acetone	ND	10		µg/L	1	1/22/2019 4:13:29 PM	B57171
Bromobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Bromodichloromethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Bromoform	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Bromomethane	ND	3.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
2-Butanone	ND	10		µg/L	1	1/22/2019 4:13:29 PM	B57171
Carbon disulfide	ND	10		µg/L	1	1/22/2019 4:13:29 PM	B57171
Carbon Tetrachloride	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Chlorobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Chloroethane	ND	2.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Chloroform	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Chloromethane	ND	3.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
2-Chlorotoluene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
4-Chlorotoluene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
cis-1,2-DCE	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Dibromochloromethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Dibromomethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1-Dichloroethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1-Dichloroethene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2-Dichloropropane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,3-Dichloropropane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
2,2-Dichloropropane	ND	2.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1-Dichloropropene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Hexachlorobutadiene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
2-Hexanone	ND	10		µg/L	1	1/22/2019 4:13:29 PM	B57171

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Qualifiers:

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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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1
Project: Kaufman No1
Collection Date: 1/18/2019 3:15:00 PM
Lab ID: 1901789-006
Matrix: AQUEOUS
Received Date: 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES						Analyst: **AG**	
Isopropylbenzene	3.1	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
4-Isopropyltoluene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
4-Methyl-2-pentanone	ND	10		µg/L	1	1/22/2019 4:13:29 PM	B57171
Methylene Chloride	ND	3.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
n-Butylbenzene	ND	3.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
n-Propylbenzene	3.9	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
sec-Butylbenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Styrene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
tert-Butylbenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
trans-1,2-DCE	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Trichlorofluoromethane	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Vinyl chloride	ND	1.0		µg/L	1	1/22/2019 4:13:29 PM	B57171
Xylenes, Total	330	15		µg/L	10	1/23/2019 4:08:15 PM	R57206
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	1/22/2019 4:13:29 PM	B57171
Surr: 4-Bromofluorobenzene	98.0	70-130		%Rec	1	1/22/2019 4:13:29 PM	B57171
Surr: Dibromofluoromethane	108	70-130		%Rec	1	1/22/2019 4:13:29 PM	B57171
Surr: Toluene-d8	104	70-130		%Rec	1	1/22/2019 4:13:29 PM	B57171

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

Qualifiers:

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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R57149**	RunNo: **57149**
Prep Date:	Analysis Date: **1/21/2019**	SeqNo: **1911765** 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: **R57149**	RunNo: **57149**
Prep Date:	Analysis Date: **1/21/2019**	SeqNo: **1911766** 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	96.4	90	110			
Chloride	4.8	0.50	5.000	0	95.5	90	110			
Nitrogen, Nitrite (As N)	0.96	0.10	1.000	0	95.9	90	110			
Bromide	2.4	0.10	2.500	0	96.5	90	110			
Nitrogen, Nitrate (As N)	2.5	0.10	2.500	0	100	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	95.7	90	110			
Sulfate	9.7	0.50	10.00	0	96.8	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 Detection Limit
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QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**MB-42745**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
Client ID:	**PBW**	Batch ID:	**42745**		RunNo:	**57173**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913176**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	0.98		1.000		98.2	70	130			

Sample ID	**LCS-42745**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
Client ID:	**LCSW**	Batch ID:	**42745**		RunNo:	**57173**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913177**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.6	1.0	5.000	0	112	71.8	135			
Surr: DNOP	0.50		0.5000		99.8	70	130			

Sample ID	**1901789-001BMS**	SampType:	**MS**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
Client ID:	**MW2**	Batch ID:	**42745**		RunNo:	**57173**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913184**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.6	1.0	5.000	0	112	68.1	137			
Surr: DNOP	0.50		0.5000		99.3	70	130			

Sample ID	**1901789-001BMSD**	SampType:	**MSD**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
Client ID:	**MW2**	Batch ID:	**42745**		RunNo:	**57173**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913185**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	114	68.1	137	2.02	20	
Surr: DNOP	0.50		0.5000		99.4	70	130	0	0	

Qualifiers:

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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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**100ng lcs**	SampType:	**LCS**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**LCSW**	Batch ID:	**A57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912430**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Toluene	20	1.0	20.00	0	99.3	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID	**1901789-001ams**	SampType:	**MS**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**MW2**	Batch ID:	**A57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912432**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	70	130			
Toluene	20	1.0	20.00	0	99.8	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		111	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	10		10.00		99.6	70	130			

Sample ID	**1901789-001amsd**	SampType:	**MSD**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**MW2**	Batch ID:	**A57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912433**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	70	130	2.37	20	
Toluene	19	1.0	20.00	0	93.6	70	130	6.39	20	
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130	0	0	
Surr: 4-Bromofluorobenzene	11		10.00		108	70	130	0	0	
Surr: Dibromofluoromethane	11		10.00		109	70	130	0	0	
Surr: Toluene-d8	9.8		10.00		97.7	70	130	0	0	

Sample ID	**rb**	SampType:	**MBLK**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**PBW**	Batch ID:	**A57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912439**	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								
Xylenes, Total	ND	1.5								

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A57171**	RunNo: **57171**
Prep Date:	Analysis Date: **1/22/2019**	SeqNo: **1912439** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	10		10.00		100	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **B57171**	RunNo: **57171**
Prep Date:	Analysis Date: **1/22/2019**	SeqNo: **1912422** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	104	70	130			
Chlorobenzene	21	1.0	20.00	0	104	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	101	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	93.1	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B57171**	RunNo: **57171**
Prep Date:	Analysis Date: **1/22/2019**	SeqNo: **1912429** Units: **µg/L**

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

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B57171**	RunNo: **57171**
Prep Date:	Analysis Date: **1/22/2019**	SeqNo: **1912429** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
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								
Vinyl chloride	ND	1.0								
Surr: 1,2-Dichloroethane-d4	11		10.00		107	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **B57171**	RunNo: **57171**
Prep Date:	Analysis Date: **1/22/2019**	SeqNo: **1912429** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R57206**	RunNo: **57206**
Prep Date:	Analysis Date: **1/23/2019**	SeqNo: **1913462** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	19	1.0	20.00	0	93.0	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		108	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	9.8		10.00		97.8	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R57206**	RunNo: **57206**
Prep Date:	Analysis Date: **1/23/2019**	SeqNo: **1913486** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		109	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		103	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**MB-42755**	SampType:	**MBLK**	TestCode:	**EPA Method 8270C: Semivolatiles**
Client ID:	**PBW**	Batch ID:	**42755**	RunNo:	**57311**
Prep Date:	**1/23/2019**	Analysis Date:	**1/28/2019**	SeqNo:	**1917305** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	10								
Acenaphthylene	ND	10								
Aniline	ND	10								
Anthracene	ND	10								
Azobenzene	ND	10								
Benz(a)anthracene	ND	10								
Benzo(a)pyrene	ND	10								
Benzo(b)fluoranthene	ND	10								
Benzo(g,h,i)perylene	ND	10								
Benzo(k)fluoranthene	ND	10								
Benzoic acid	ND	20								
Benzyl alcohol	ND	10								
Bis(2-chloroethoxy)methane	ND	10								
Bis(2-chloroethyl)ether	ND	10								
Bis(2-chloroisopropyl)ether	ND	10								
Bis(2-ethylhexyl)phthalate	ND	10								
4-Bromophenyl phenyl ether	ND	10								
Butyl benzyl phthalate	ND	10								
Carbazole	ND	10								
4-Chloro-3-methylphenol	ND	10								
4-Chloroaniline	ND	10								
2-Chloronaphthalene	ND	10								
2-Chlorophenol	ND	10								
4-Chlorophenyl phenyl ether	ND	10								
Chrysene	ND	10								
Di-n-butyl phthalate	ND	10								
Di-n-octyl phthalate	ND	10								
Dibenz(a,h)anthracene	ND	10								
Dibenzofuran	ND	10								
1,2-Dichlorobenzene	ND	10								
1,3-Dichlorobenzene	ND	10								
1,4-Dichlorobenzene	ND	10								
3,3´-Dichlorobenzidine	ND	10								
Diethyl phthalate	ND	10								
Dimethyl phthalate	ND	10								
2,4-Dichlorophenol	ND	20								
2,4-Dimethylphenol	ND	10								
4,6-Dinitro-2-methylphenol	ND	20								
2,4-Dinitrophenol	ND	20								

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID **MB-42755**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBW**	Batch ID: **42755**	RunNo: **57311**
Prep Date: **1/23/2019**	Analysis Date: **1/28/2019**	SeqNo: **1917305** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	10								
2,6-Dinitrotoluene	ND	10								
Fluoranthene	ND	10								
Fluorene	ND	10								
Hexachlorobenzene	ND	10								
Hexachlorobutadiene	ND	10								
Hexachlorocyclopentadiene	ND	10								
Hexachloroethane	ND	10								
Indeno(1,2,3-cd)pyrene	ND	10								
Isophorone	ND	10								
1-Methylnaphthalene	ND	10								
2-Methylnaphthalene	ND	10								
2-Methylphenol	ND	10								
3+4-Methylphenol	ND	10								
N-Nitrosodi-n-propylamine	ND	10								
N-Nitrosodimethylamine	ND	10								
N-Nitrosodiphenylamine	ND	10								
Naphthalene	ND	10								
2-Nitroaniline	ND	10								
3-Nitroaniline	ND	10								
4-Nitroaniline	ND	10								
Nitrobenzene	ND	10								
2-Nitrophenol	ND	10								
4-Nitrophenol	ND	10								
Pentachlorophenol	ND	20								
Phenanthrene	ND	10								
Phenol	ND	10								
Pyrene	ND	10								
Pyridine	ND	10								
1,2,4-Trichlorobenzene	ND	10								
2,4,5-Trichlorophenol	ND	10								
2,4,6-Trichlorophenol	ND	10								
Surr: 2-Fluorophenol	180		200.0		91.9	15	74.1			S
Surr: Phenol-d5	150		200.0		75.8	15	59.8			S
Surr: 2,4,6-Tribromophenol	190		200.0		97.3	22.1	112			
Surr: Nitrobenzene-d5	99		100.0		99.4	33.2	94			S
Surr: 2-Fluorobiphenyl	91		100.0		91.4	34	90.9			S
Surr: 4-Terphenyl-d14	97		100.0		97.5	15	149			

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**
01-Feb-19

Client: Timberwolf Environmental
Project: Kaufman No1

Sample ID **LCS-42755**	SampType: **LCS**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSW**	Batch ID: **42755**	RunNo: **57311**
Prep Date: **1/23/2019**	Analysis Date: **1/28/2019**	SeqNo: **1917306** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	81	10	100.0	0	80.8	55.1	104			
4-Chloro-3-methylphenol	200	10	200.0	0	101	57	115			
2-Chlorophenol	180	10	200.0	0	89.2	43.4	112			
1,4-Dichlorobenzene	80	10	100.0	0	79.7	38	95.2			
2,4-Dinitrotoluene	75	10	100.0	0	74.7	55.1	96.7			
N-Nitrosodi-n-propylamine	95	10	100.0	0	94.6	55	112			
4-Nitrophenol	170	10	200.0	0	84.3	16.6	93			
Pentachlorophenol	160	20	200.0	0	79.3	43.2	104			
Phenol	160	10	200.0	0	78.6	21.3	85.7			
Pyrene	87	10	100.0	0	86.8	64.9	105			
1,2,4-Trichlorobenzene	84	10	100.0	0	84.2	42.6	107			
Surr: 2-Fluorophenol	160		200.0		81.7	15	74.1			S
Surr: Phenol-d5	150		200.0		74.6	15	59.8			S
Surr: 2,4,6-Tribromophenol	190		200.0		93.5	22.1	112			
Surr: Nitrobenzene-d5	89		100.0		89.2	33.2	94			
Surr: 2-Fluorobiphenyl	76		100.0		76.0	34	90.9			
Surr: 4-Terphenyl-d14	95		100.0		94.8	15	149			

Sample ID **lcsd-42755**	SampType: **LCSD**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS02**	Batch ID: **42755**	RunNo: **57332**
Prep Date: **1/23/2019**	Analysis Date: **1/29/2019**	SeqNo: **1918063** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	64	10	100.0	0	63.8	55.1	104	23.5	34.9	
4-Chloro-3-methylphenol	160	10	200.0	0	81.2	57	115	22.0	30.2	
2-Chlorophenol	140	10	200.0	0	72.4	43.4	112	20.7	49.5	
1,4-Dichlorobenzene	58	10	100.0	0	58.3	38	95.2	31.0	43.2	
2,4-Dinitrotoluene	61	10	100.0	0	61.1	55.1	96.7	20.1	49.9	
N-Nitrosodi-n-propylamine	73	10	100.0	0	73.1	55	112	25.5	42.1	
4-Nitrophenol	100	10	200.0	0	50.8	16.6	93	49.5	31.5	R
Pentachlorophenol	120	20	200.0	0	58.0	43.2	104	31.1	52.5	
Phenol	120	10	200.0	0	60.3	21.3	85.7	26.5	54.4	
Pyrene	70	10	100.0	0	70.1	64.9	105	21.3	30.7	
1,2,4-Trichlorobenzene	68	10	100.0	0	67.6	42.6	107	22.0	48.1	
Surr: 2-Fluorophenol	98		200.0		48.8	15	74.1	0	0	
Surr: Phenol-d5	92		200.0		46.0	15	59.8	0	0	
Surr: 2,4,6-Tribromophenol	120		200.0		62.3	22.1	112	0	0	
Surr: Nitrobenzene-d5	60		100.0		59.7	33.2	94	0	0	
Surr: 2-Fluorobiphenyl	50		100.0		49.6	34	90.9	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**lcsd-42755**	SampType:	**LCSD**	TestCode:	**EPA Method 8270C: Semivolatiles**					
Client ID:	**LCSS02**	Batch ID:	**42755**	RunNo:	**57332**					
Prep Date:	**1/23/2019**	Analysis Date:	**1/29/2019**	SeqNo:	**1918063**	Units:	**µg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	57		100.0		56.5	15	149	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**lcs-1 99.0uS eC**	SampType:	**lcs**		TestCode:	**SM2510B: Specific Conductance**				
Client ID:	**LCSW**	Batch ID:	**R57160**		RunNo:	**57160**				
Prep Date:		Analysis Date:	**1/21/2019**		SeqNo:	**1911988**	Units:	**µmhos/cm**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Conductivity	98	5.0	99.00	0	98.9	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**MB-42731**	SampType: **MBLK**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**PBW**	Batch ID: **42731**			RunNo: **57210**					
Prep Date:	**1/21/2019**	Analysis Date: **1/23/2019**			SeqNo: **1913735**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-42731**	SampType: **LCS**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**LCSW**	Batch ID: **42731**			RunNo: **57210**					
Prep Date:	**1/21/2019**	Analysis Date: **1/23/2019**			SeqNo: **1913736**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0053	0.00020	0.005000	0	106	80	120			

Sample ID	**1901789-006EMS**	SampType: **MS**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**MW1**	Batch ID: **42731**			RunNo: **57210**					
Prep Date:	**1/21/2019**	Analysis Date: **1/23/2019**			SeqNo: **1913738**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0057	0.00020	0.005000	.00006954	113	75	125			

Sample ID	**1901789-006EMSD**	SampType: **MSD**			TestCode: **EPA Method 7470: Mercury**					
Client ID:	**MW1**	Batch ID: **42731**			RunNo: **57210**					
Prep Date:	**1/21/2019**	Analysis Date: **1/23/2019**			SeqNo: **1913739**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0059	0.00020	0.005000	.00006954	116	75	125	2.56	20	

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**MB-42806**	SampType:	**MBLK**	TestCode:	**EPA 6010B: Total Recoverable Metals**
Client ID:	**PBW**	Batch ID:	**42806**	RunNo:	**57316**
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**	SeqNo:	**1917487** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Magnesium	ND	1.0								
Potassium	ND	1.0								
Selenium	ND	0.050								
Silver	ND	0.0050								
Sodium	ND	1.0								

Sample ID	**LCS-42806**	SampType:	**LCS**	TestCode:	**EPA 6010B: Total Recoverable Metals**
Client ID:	**LCSW**	Batch ID:	**42806**	RunNo:	**57316**
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**	SeqNo:	**1917488** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.50	0.020	0.5000	0	99.6	80	120			
Cadmium	0.51	0.0020	0.5000	0	102	80	120			
Calcium	50	1.0	50.00	0	99.7	80	120			
Chromium	0.51	0.0060	0.5000	0	101	80	120			
Magnesium	50	1.0	50.00	0	99.3	80	120			
Potassium	49	1.0	50.00	0	98.2	80	120			
Selenium	0.48	0.050	0.5000	0	96.8	80	120			
Silver	0.10	0.0050	0.1000	0	101	80	120			
Sodium	49	1.0	50.00	0	98.7	80	120			

Sample ID	**1901789-006EMS**	SampType:	**MS**	TestCode:	**EPA 6010B: Total Recoverable Metals**
Client ID:	**MW1**	Batch ID:	**42806**	RunNo:	**57316**
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**	SeqNo:	**1917493** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.55	0.020	0.5000	0.07931	93.9	75	125			
Cadmium	0.50	0.0020	0.5000	0	101	75	125			
Chromium	0.49	0.0060	0.5000	0.001728	97.0	75	125			
Potassium	54	1.0	50.00	3.337	101	75	125			
Selenium	0.48	0.050	0.5000	0	96.6	75	125			
Silver	0.11	0.0050	0.1000	0.006835	103	75	125			

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**1901789-006EMSD**	SampType:	**MSD**		TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**MW1**	Batch ID:	**42806**		RunNo:	**57316**				
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**		SeqNo:	**1917494**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.54	0.020	0.5000	0.07931	92.9	75	125	0.888	20	
Cadmium	0.50	0.0020	0.5000	0	100	75	125	0.552	20	
Chromium	0.48	0.0060	0.5000	0.001728	96.3	75	125	0.713	20	
Potassium	54	1.0	50.00	3.337	102	75	125	0.989	20	
Selenium	0.53	0.050	0.5000	0	106	75	125	9.27	20	
Silver	0.11	0.0050	0.1000	0.006835	102	75	125	1.70	20	

Sample ID	**MB-42806**	SampType:	**MBLK**		TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**PBW**	Batch ID:	**42806**		RunNo:	**57316**				
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**		SeqNo:	**1917519**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	ND	1.0								
Lead	ND	0.0050								
Sodium	ND	1.0								

Sample ID	**LCS-42806**	SampType:	**LCS**		TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**LCSW**	Batch ID:	**42806**		RunNo:	**57316**				
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**		SeqNo:	**1917520**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Calcium	49	1.0	50.00	0	97.7	80	120			
Lead	0.48	0.0050	0.5000	0	95.1	80	120			
Sodium	50	1.0	50.00	0	99.2	80	120			

Sample ID	**1901789-006EMS**	SampType:	**MS**		TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**MW1**	Batch ID:	**42806**		RunNo:	**57316**				
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**		SeqNo:	**1917523**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.46	0.0050	0.5000	0	91.7	75	125			

Sample ID	**1901789-006EMSD**	SampType:	**MSD**		TestCode:	**EPA 6010B: Total Recoverable Metals**				
Client ID:	**MW1**	Batch ID:	**42806**		RunNo:	**57316**				
Prep Date:	**1/24/2019**	Analysis Date:	**1/28/2019**		SeqNo:	**1917524**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.46	0.0050	0.5000	0	92.2	75	125	0.519	20	

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**MB-42806**	SampType: **MBLK**			TestCode: **EPA 6010B: Total Recoverable Metals**				
Client ID:	**PBW**	Batch ID: **42806**			RunNo: **57326**				
Prep Date:	**1/24/2019**	Analysis Date: **1/29/2019**			SeqNo: **1917932**	Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.020								

Sample ID	**LCS-42806**	SampType: **LCS**			TestCode: **EPA 6010B: Total Recoverable Metals**				
Client ID:	**LCSW**	Batch ID: **42806**			RunNo: **57326**				
Prep Date:	**1/24/2019**	Analysis Date: **1/29/2019**			SeqNo: **1917933**	Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.47	0.020	0.5000	0	93.6	80	120			

Sample ID	**1901789-006EMS**	SampType: **MS**			TestCode: **EPA 6010B: Total Recoverable Metals**				
Client ID:	**MW1**	Batch ID: **42806**			RunNo: **57326**				
Prep Date:	**1/24/2019**	Analysis Date: **1/29/2019**			SeqNo: **1917936**	Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.49	0.020	0.5000	0	99.0	75	125			

Sample ID	**1901789-006EMSD**	SampType: **MSD**			TestCode: **EPA 6010B: Total Recoverable Metals**				
Client ID:	**MW1**	Batch ID: **42806**			RunNo: **57326**				
Prep Date:	**1/24/2019**	Analysis Date: **1/29/2019**			SeqNo: **1917937**	Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.49	0.020	0.5000	0	98.0	75	125	0.972	20	

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**
01-Feb-19

Client: Timberwolf Environmental
Project: Kaufman No1

Sample ID	**1901789-002ams**	SampType:	**MS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**MW3**	Batch ID:	**R57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912400**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	104	63.4	130			
Surr: BFB	9.8		10.00		97.7	70	130			

Sample ID	**1901789-002amsd**	SampType:	**MSD**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**MW3**	Batch ID:	**R57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912401**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.49	0.050	0.5000	0	98.2	63.4	130	5.62	20	
Surr: BFB	9.7		10.00		96.8	70	130	0	0	

Sample ID	**2.5ug gro lcs**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSW**	Batch ID:	**R57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912406**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.53	0.050	0.5000	0	106	70	130			
Surr: BFB	9.8		10.00		98.0	70	130			

Sample ID	**rb**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBW**	Batch ID:	**R57171**		RunNo:	**57171**				
Prep Date:		Analysis Date:	**1/22/2019**		SeqNo:	**1912407**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	9.7		10.00		96.6	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901789**

01-Feb-19

Client: Timberwolf Environmental

Project: Kaufman No1

Sample ID	**MB-42739**	SampType:	**MBLK**		TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**PBW**	Batch ID:	**42739**		RunNo:	**57198**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913205**	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-42739**	SampType:	**LCS**		TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**LCSW**	Batch ID:	**42739**		RunNo:	**57198**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913206**	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.	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **TIMBERWOLF ENVIRON** Work Order Number: **1901789** RcptNo: **1**

Received By: **Victoria Zellar** **1/19/2019 11:10:00 AM** Victoria Zellar

Completed By: **Leah Baca** **1/21/2019 10:24:02 AM** Leah Baca

Reviewed By: ENM 1/21/19

Labeled by WZ 1/21/19

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: 1

(<2 or >12 unless noted)

Adjusted? NO

Checked by: WZ 1/21/19

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	3.7	Good	Yes			
2	4.3	Good	Yes			

Chain-of-Custody Record

Client: Timberwolf Env

Mailing Address:

Phone #: 979 324-2139

email or Fax#: jim@teamtimberwolf.com

QA/QC Package:

☒ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance

☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: ☒ Standard ☐ Rush

Project Name: Kaufman No1

Project #: 180061

Project Manager:

Sampler: J. Foster

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp (including CF): 3.7°C, 4.3°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. 1901789	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)	BTEX only	Cl	TDS, Conductivity	Ca, Mg, K, Na		
1/17/19	1026	W	MW2	Various	Various	-001		✓	[struck]								✓	✓	[struck]			
1/17/19	1215	W	MW3	↓	↓	-002		✓									✓	✓	[struck]			
1/17/19	1330	W	MW4	↓	↓	-003		✓									✓	✓	[struck]			
1/17/19	1445	W	MW5	↓	↓	-004		✓									✓	✓	[struck]			
1/18/19	1335	W	MW6	↓	↓	-005		✓									✓	✓	[struck]	✓		
1/18/19	1515	W	MW1	↓	↓	-006		✓				✓	✓	✓	✓				✓	✓		

Date	Time	Relinquished by	Received by	Via	Date	Time
1/18/19	1800	[signature]	[signature]		1/18/19	1800
1/18/19	1841	[signature]	Victoria Bellar	Courier	1/19/19	1110

Remarks: Hold MW-1 for additional analysis per J Foster

~~MW1 did not receive VOAs cannot run GRO or MRO~~ [illegible] 1/21/19

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.

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

January 25, 2019

Jim Foster

Timberwolf Environmental
1920 W Villa Maria Ste 205
Bryan, TX 77807
TEL: (979) 324-2139
FAX

RE: Kaufman #1 OrderNo.: 1901788

Dear Jim Foster:

Hall Environmental Analysis Laboratory received 4 sample(s) on 1/19/2019 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

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1901788**
Date Reported: **1/25/2019**

CLIENT: Timberwolf Environmental
Client Sample ID: MW1 2.5-3.5'
Project: Kaufman #1
Collection Date: 1/15/2019 11:30:00 AM
Lab ID: 1901788-001 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 1:49:31 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	600	9.8		mg/Kg	1	1/23/2019 12:54:33 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/23/2019 12:54:33 PM	42722
Surr: DNOP	105	50.6-138		%Rec	1	1/23/2019 12:54:33 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1200	99		mg/Kg	20	1/22/2019 7:41:28 PM	42717
Surr: BFB	298	73.8-119	S	%Rec	20	1/22/2019 7:41:28 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	0.96	0.50		mg/Kg	20	1/22/2019 7:41:28 PM	42717
Toluene	22	0.99		mg/Kg	20	1/22/2019 7:41:28 PM	42717
Ethylbenzene	7.0	0.99		mg/Kg	20	1/22/2019 7:41:28 PM	42717
Xylenes, Total	92	2.0		mg/Kg	20	1/22/2019 7:41:28 PM	42717
Surr: 4-Bromofluorobenzene	117	80-120		%Rec	20	1/22/2019 7:41:28 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1 4.5-5.5'
Project: Kaufman #1
Collection Date: 1/15/2019 11:40:00 AM
Lab ID: 1901788-002 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 2:26:45 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	31	9.3		mg/Kg	1	1/23/2019 1:16:42 PM	42722
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	1/23/2019 1:16:42 PM	42722
Surr: DNOP	104	50.6-138		%Rec	1	1/23/2019 1:16:42 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/22/2019 8:28:12 PM	42717
Surr: BFB	114	73.8-119		%Rec	1	1/22/2019 8:28:12 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	1/22/2019 8:28:12 PM	42717
Toluene	ND	0.049		mg/Kg	1	1/22/2019 8:28:12 PM	42717
Ethylbenzene	ND	0.049		mg/Kg	1	1/22/2019 8:28:12 PM	42717
Xylenes, Total	0.12	0.099		mg/Kg	1	1/22/2019 8:28:12 PM	42717
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	1/22/2019 8:28:12 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1 6.5-7.5'
Project: Kaufman #1
Collection Date: 1/15/2019 11:50:00 AM
Lab ID: 1901788-003 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 2:39:10 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	200	9.6		mg/Kg	1	1/23/2019 2:22:37 PM	42722
Motor Oil Range Organics (MRO)	48	48		mg/Kg	1	1/23/2019 2:22:37 PM	42722
Surr: DNOP	105	50.6-138		%Rec	1	1/23/2019 2:22:37 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	4.7	4.6		mg/Kg	1	1/22/2019 9:14:43 PM	42717
Surr: BFB	125	73.8-119	S	%Rec	1	1/22/2019 9:14:43 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	1/22/2019 9:14:43 PM	42717
Toluene	ND	0.046		mg/Kg	1	1/22/2019 9:14:43 PM	42717
Ethylbenzene	ND	0.046		mg/Kg	1	1/22/2019 9:14:43 PM	42717
Xylenes, Total	ND	0.092		mg/Kg	1	1/22/2019 9:14:43 PM	42717
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	1/22/2019 9:14:43 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW1 14-15'
Project: Kaufman #1
Collection Date: 1/15/2019 12:25:00 PM
Lab ID: 1901788-004 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 2:51:34 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	1/22/2019 6:18:59 PM	42722
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	1/22/2019 6:18:59 PM	42722
Surr: DNOP	105	50.6-138		%Rec	1	1/22/2019 6:18:59 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	1/22/2019 10:01:13 PM	42717
Surr: BFB	99.0	73.8-119		%Rec	1	1/22/2019 10:01:13 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	1/22/2019 10:01:13 PM	42717
Toluene	ND	0.050		mg/Kg	1	1/22/2019 10:01:13 PM	42717
Ethylbenzene	ND	0.050		mg/Kg	1	1/22/2019 10:01:13 PM	42717
Xylenes, Total	ND	0.10		mg/Kg	1	1/22/2019 10:01:13 PM	42717
Surr: 4-Bromofluorobenzene	94.3	80-120		%Rec	1	1/22/2019 10:01:13 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901788**

25-Jan-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42757**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**42757**	RunNo:	**57220**					
Prep Date:	**1/23/2019**	Analysis Date:	**1/23/2019**	SeqNo:	**1914002**	Units:	**mg/Kg**			

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

Sample ID	**LCS-42757**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**42757**	RunNo:	**57220**					
Prep Date:	**1/23/2019**	Analysis Date:	**1/23/2019**	SeqNo:	**1914003**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.5	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901788**

25-Jan-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42722**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**42722**		RunNo:	**57155**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912133**	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	10		10.00		101	50.6	138			

Sample ID	**LCS-42722**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**42722**		RunNo:	**57155**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912134**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	107	63.9	124			
Surr: DNOP	4.8		5.000		96.4	50.6	138			

Sample ID	**1901788-004AMS**	SampType:	**MS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**MW1 14-15'**	Batch ID:	**42722**		RunNo:	**57173**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913196**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.6	48.17	0	104	53.5	126			
Surr: DNOP	4.6		4.817		96.5	50.6	138			

Sample ID	**1901788-004AMSD**	SampType:	**MSD**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**MW1 14-15'**	Batch ID:	**42722**		RunNo:	**57173**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1913238**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	9.7	48.73	0	104	53.5	126	1.09	21.7	
Surr: DNOP	4.6		4.873		95.0	50.6	138	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901788**

25-Jan-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42717**	SampType: **MBLK**		TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID:	**PBS**	Batch ID: **42717**		RunNo: **57168**					
Prep Date:	**1/21/2019**	Analysis Date: **1/22/2019**		SeqNo: **1912285**		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	1100		1000		106	73.8	119			

Sample ID	**LCS-42717**	SampType: **LCS**		TestCode: **EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSS**	Batch ID: **42717**		RunNo: **57168**					
Prep Date:	**1/21/2019**	Analysis Date: **1/22/2019**		SeqNo: **1912286**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	114	80.1	123			
Surr: BFB	1200		1000		120	73.8	119			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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901788**

25-Jan-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42717**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBS**	Batch ID:	**42717**	RunNo:	**57168**					
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**	SeqNo:	**1912310**	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	1.0		1.000		105	80	120			

Sample ID	**LCS-42717**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSS**	Batch ID:	**42717**	RunNo:	**57168**					
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**	SeqNo:	**1912311**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	92.2	80	120			
Toluene	0.95	0.050	1.000	0	95.0	80	120			
Ethylbenzene	0.96	0.050	1.000	0	95.8	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.6	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		107	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **TIMBERWOLF ENVIRON** Work Order Number: **1901788** RcptNo: **1**

Received By: **Victoria Zellar** **1/19/2019 11:10:00 AM** Victoria Zellar

Completed By: **Leah Baca** **1/21/2019 10:02:30 AM** Leah Baca

Reviewed By: VV 1/21/19

Labeled by DAD 1/21/19

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 1/21/19

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	3.7	Good	Yes			
2	4.3	Good	Yes			

Chain-of-Custody Record

Client: Timberwolf Env

Mailing Address:

Phone #:

email or Fax#:

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Kaufman #1

Project #: 180061

Project Manager:

Sampler:

On Ice: ☒ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 3.7, 4.3 °C

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. 1901789
1/15/19	1130	S	MW1 2.5-3.5'	Varius	Varius	-001
1/15/19	1140	S	MW1 4.5-5.5'			-002
1/15/19	1150	S	MW1 6.5-7.5'			-003
1/15/19	1225	S	MW2 14-15'			-004

Analysis Request

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)						
	✓									BTEX	✓				
	✓										✓				
	✓										✓				
	✓										✓				

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
1/18/19	1800				1/18/19	1600
1/18/19	1841			Courier	1/19/19	1110

Remarks:

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

February 05, 2019

Jim Foster

Timberwolf Environmental
1920 W Villa Maria Ste 205
Bryan, TX 77807
TEL: (979) 324-2139
FAX

RE: Kaufman #1 OrderNo.: 1901785

Dear Jim Foster:

Hall Environmental Analysis Laboratory received 11 sample(s) on 1/19/2019 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 **1901785**
Date Reported: **2/5/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW-2 5'
Project: Kaufman #1
Collection Date: 1/14/2019 1:45:00 PM
Lab ID: 1901785-001 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
WALKLEY BLACK TOC/FOC/OM						Analyst: **JRR**	
TOC	ND	0.13		% C	1	2/1/2019 9:10:00 AM	42930
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/22/2019 10:01:27 PM	42748
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	1/22/2019 12:25:59 PM	42722
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	1/22/2019 12:25:59 PM	42722
Surr: DNOP	100	50.6-138		%Rec	1	1/22/2019 12:25:59 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	1/22/2019 11:05:56 AM	42717
Surr: BFB	103	73.8-119		%Rec	1	1/22/2019 11:05:56 AM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 11:05:56 AM	42717
Toluene	ND	0.048		mg/Kg	1	1/22/2019 11:05:56 AM	42717
Ethylbenzene	ND	0.048		mg/Kg	1	1/22/2019 11:05:56 AM	42717
Xylenes, Total	ND	0.096		mg/Kg	1	1/22/2019 11:05:56 AM	42717
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	1/22/2019 11:05:56 AM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW2 6.5-7.5'
Project: Kaufman #1
Collection Date: 1/14/2019 1:50:00 PM
Lab ID: 1901785-002 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/22/2019 10:13:52 PM	42748
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	18	9.7		mg/Kg	1	1/22/2019 12:48:09 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/22/2019 12:48:09 PM	42722
Surr: DNOP	104	50.6-138		%Rec	1	1/22/2019 12:48:09 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	1/22/2019 12:16:18 PM	42717
Surr: BFB	103	73.8-119		%Rec	1	1/22/2019 12:16:18 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 12:16:18 PM	42717
Toluene	ND	0.048		mg/Kg	1	1/22/2019 12:16:18 PM	42717
Ethylbenzene	ND	0.048		mg/Kg	1	1/22/2019 12:16:18 PM	42717
Xylenes, Total	ND	0.096		mg/Kg	1	1/22/2019 12:16:18 PM	42717
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	1/22/2019 12:16:18 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW3 5.0-5.5'
Project: Kaufman #1
Collection Date: 1/14/2019 3:30:00 PM
Lab ID: 1901785-003 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 11:32:59 AM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	1/22/2019 1:10:09 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/22/2019 1:10:09 PM	42722
Surr: DNOP	101	50.6-138		%Rec	1	1/22/2019 1:10:09 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/22/2019 1:26:40 PM	42717
Surr: BFB	103	73.8-119		%Rec	1	1/22/2019 1:26:40 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 1:26:40 PM	42717
Toluene	ND	0.049		mg/Kg	1	1/22/2019 1:26:40 PM	42717
Ethylbenzene	ND	0.049		mg/Kg	1	1/22/2019 1:26:40 PM	42717
Xylenes, Total	ND	0.098		mg/Kg	1	1/22/2019 1:26:40 PM	42717
Surr: 4-Bromofluorobenzene	105	80-120		%Rec	1	1/22/2019 1:26:40 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW3 6.5-7.5'
Project: Kaufman #1
Collection Date: 1/14/2019 3:45:00 PM
Lab ID: 1901785-004 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 11:45:24 AM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	1/22/2019 1:54:46 PM	42722
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	1/22/2019 1:54:46 PM	42722
Surr: DNOP	105	50.6-138		%Rec	1	1/22/2019 1:54:46 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/22/2019 1:50:11 PM	42717
Surr: BFB	100	73.8-119		%Rec	1	1/22/2019 1:50:11 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 1:50:11 PM	42717
Toluene	ND	0.049		mg/Kg	1	1/22/2019 1:50:11 PM	42717
Ethylbenzene	ND	0.049		mg/Kg	1	1/22/2019 1:50:11 PM	42717
Xylenes, Total	ND	0.097		mg/Kg	1	1/22/2019 1:50:11 PM	42717
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	1/22/2019 1:50:11 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW6 5.0 5.5'
Project: Kaufman #1
Collection Date: 1/14/2019 12:00:00 PM
Lab ID: 1901785-005 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 11:57:49 AM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	10	9.8		mg/Kg	1	1/22/2019 2:16:40 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/22/2019 2:16:40 PM	42722
Surr: DNOP	103	50.6-138		%Rec	1	1/22/2019 2:16:40 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	10	5.0		mg/Kg	1	1/22/2019 2:13:35 PM	42717
Surr: BFB	49.3	73.8-119	S	%Rec	1	1/22/2019 2:13:35 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	1/22/2019 2:13:35 PM	42717
Toluene	ND	0.050		mg/Kg	1	1/22/2019 2:13:35 PM	42717
Ethylbenzene	ND	0.050		mg/Kg	1	1/22/2019 2:13:35 PM	42717
Xylenes, Total	ND	0.099		mg/Kg	1	1/22/2019 2:13:35 PM	42717
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	1/22/2019 2:13:35 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW6 7.5-8.5'
Project: Kaufman #1
Collection Date: 1/14/2019 12:10:00 PM
Lab ID: 1901785-006 **Matrix:** SOIL
Received Date: 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 12:10:13 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	110	9.8		mg/Kg	1	1/22/2019 2:38:42 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/22/2019 2:38:42 PM	42722
Surr: DNOP	105	50.6-138		%Rec	1	1/22/2019 2:38:42 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	120	5.0		mg/Kg	1	1/22/2019 3:00:28 PM	42717
Surr: BFB	382	73.8-119	S	%Rec	1	1/22/2019 3:00:28 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	1/22/2019 3:00:28 PM	42717
Toluene	0.057	0.050		mg/Kg	1	1/22/2019 3:00:28 PM	42717
Ethylbenzene	ND	0.050		mg/Kg	1	1/22/2019 3:00:28 PM	42717
Xylenes, Total	ND	0.10		mg/Kg	1	1/22/2019 3:00:28 PM	42717
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	1/22/2019 3:00:28 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW5 4.5-5.5'
Project: Kaufman #1
Collection Date: 1/15/2019 9:10:00 AM
Lab ID: 1901785-007 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 12:22:38 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	1/22/2019 3:00:56 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/22/2019 3:00:56 PM	42722
Surr: DNOP	101	50.6-138		%Rec	1	1/22/2019 3:00:56 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	1/22/2019 3:47:29 PM	42717
Surr: BFB	102	73.8-119		%Rec	1	1/22/2019 3:47:29 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 3:47:29 PM	42717
Toluene	ND	0.048		mg/Kg	1	1/22/2019 3:47:29 PM	42717
Ethylbenzene	ND	0.048		mg/Kg	1	1/22/2019 3:47:29 PM	42717
Xylenes, Total	ND	0.097		mg/Kg	1	1/22/2019 3:47:29 PM	42717
Surr: 4-Bromofluorobenzene	104	80-120		%Rec	1	1/22/2019 3:47:29 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW5 8-9'
Project: Kaufman #1
Collection Date: 1/15/2019 9:30:00 AM
Lab ID: 1901785-008 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 12:35:02 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	86	9.5		mg/Kg	1	1/22/2019 3:23:04 PM	42722
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	1/22/2019 3:23:04 PM	42722
Surr: DNOP	103	50.6-138		%Rec	1	1/22/2019 3:23:04 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	29	4.9		mg/Kg	1	1/22/2019 4:11:02 PM	42717
Surr: BFB	79.9	73.8-119		%Rec	1	1/22/2019 4:11:02 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 4:11:02 PM	42717
Toluene	ND	0.049		mg/Kg	1	1/22/2019 4:11:02 PM	42717
Ethylbenzene	ND	0.049		mg/Kg	1	1/22/2019 4:11:02 PM	42717
Xylenes, Total	ND	0.098		mg/Kg	1	1/22/2019 4:11:02 PM	42717
Surr: 4-Bromofluorobenzene	106	80-120		%Rec	1	1/22/2019 4:11:02 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW5 14.5-15.5'
Project: Kaufman #1
Collection Date: 1/15/2019 10:05:00 AM
Lab ID: 1901785-009 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 12:47:27 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	1/22/2019 3:45:02 PM	42722
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	1/22/2019 3:45:02 PM	42722
Surr: DNOP	99.5	50.6-138		%Rec	1	1/22/2019 3:45:02 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	1/22/2019 4:57:52 PM	42717
Surr: BFB	99.8	73.8-119		%Rec	1	1/22/2019 4:57:52 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	1/22/2019 4:57:52 PM	42717
Toluene	ND	0.046		mg/Kg	1	1/22/2019 4:57:52 PM	42717
Ethylbenzene	ND	0.046		mg/Kg	1	1/22/2019 4:57:52 PM	42717
Xylenes, Total	ND	0.093		mg/Kg	1	1/22/2019 4:57:52 PM	42717
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	1/22/2019 4:57:52 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW4 5-6'
Project: Kaufman #1
Collection Date: 1/15/2019 1:35:00 PM
Lab ID: 1901785-010 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 12:59:52 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	1/22/2019 4:07:07 PM	42722
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/22/2019 4:07:07 PM	42722
Surr: DNOP	99.1	50.6-138		%Rec	1	1/22/2019 4:07:07 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	1/22/2019 6:54:48 PM	42717
Surr: BFB	98.2	73.8-119		%Rec	1	1/22/2019 6:54:48 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 6:54:48 PM	42717
Toluene	ND	0.048		mg/Kg	1	1/22/2019 6:54:48 PM	42717
Ethylbenzene	ND	0.048		mg/Kg	1	1/22/2019 6:54:48 PM	42717
Xylenes, Total	ND	0.096		mg/Kg	1	1/22/2019 6:54:48 PM	42717
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	1/22/2019 6:54:48 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Timberwolf Environmental
Client Sample ID: MW4 8-9'
Project: Kaufman #1
Collection Date: 1/15/2019 1:45:00 PM
Lab ID: 1901785-011 **Matrix:** SOIL **Received Date:** 1/19/2019 11:10:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	ND	30		mg/Kg	20	1/23/2019 1:37:06 PM	42757
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **CLP**	
Diesel Range Organics (DRO)	130	9.9		mg/Kg	1	1/22/2019 4:28:57 PM	42722
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	1/22/2019 4:28:57 PM	42722
Surr: DNOP	103	50.6-138		%Rec	1	1/22/2019 4:28:57 PM	42722
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	1/22/2019 7:18:06 PM	42717
Surr: BFB	99.4	73.8-119		%Rec	1	1/22/2019 7:18:06 PM	42717
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	1/22/2019 7:18:06 PM	42717
Toluene	ND	0.047		mg/Kg	1	1/22/2019 7:18:06 PM	42717
Ethylbenzene	ND	0.047		mg/Kg	1	1/22/2019 7:18:06 PM	42717
Xylenes, Total	ND	0.094		mg/Kg	1	1/22/2019 7:18:06 PM	42717
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	1/22/2019 7:18:06 PM	42717

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901785**

05-Feb-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42748**	SampType:	**MBLK**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**42748**		RunNo:	**57179**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912654**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-42748**	SampType:	**LCS**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**42748**		RunNo:	**57179**				
Prep Date:	**1/22/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912655**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.2	90	110			

Sample ID	**MB-42757**	SampType:	**MBLK**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**42757**		RunNo:	**57220**				
Prep Date:	**1/23/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1914002**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-42757**	SampType:	**LCS**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**42757**		RunNo:	**57220**				
Prep Date:	**1/23/2019**	Analysis Date:	**1/23/2019**		SeqNo:	**1914003**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.5	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901785**

05-Feb-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42722**	SampType:	**MBLK**	TestCode:	**EPA Method 8015M/D: Diesel Range Organics**					
Client ID:	**PBS**	Batch ID:	**42722**	RunNo:	**57155**					
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**	SeqNo:	**1912133**	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	10		10.00		101	50.6	138			

Sample ID	**LCS-42722**	SampType:	**LCS**	TestCode:	**EPA Method 8015M/D: Diesel Range Organics**					
Client ID:	**LCSS**	Batch ID:	**42722**	RunNo:	**57155**					
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**	SeqNo:	**1912134**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	107	63.9	124			
Surr: DNOP	4.8		5.000		96.4	50.6	138			

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901785**

05-Feb-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42717**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBS**	Batch ID:	**42717**		RunNo:	**57168**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912285**	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	1100		1000		106	73.8	119			

Sample ID	**LCS-42717**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSS**	Batch ID:	**42717**		RunNo:	**57168**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912286**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	114	80.1	123			
Surr: BFB	1200		1000		120	73.8	119			S

Sample ID	**1901785-001AMS**	SampType:	**MS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**MW-2 5'**	Batch ID:	**42717**		RunNo:	**57168**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912289**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	24.93	0	99.1	69.1	142			
Surr: BFB	1200		997.0		116	73.8	119			

Sample ID	**1901785-001AMSD**	SampType:	**MSD**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**MW-2 5'**	Batch ID:	**42717**		RunNo:	**57168**				
Prep Date:	**1/21/2019**	Analysis Date:	**1/22/2019**		SeqNo:	**1912290**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	4.7	23.47	0	96.2	69.1	142	9.02	20	
Surr: BFB	1100		939.0		116	73.8	119	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901785**

05-Feb-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42717**	SampType: **MBLK**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**PBS**	Batch ID: **42717**		RunNo: **57168**					
Prep Date:	**1/21/2019**	Analysis Date: **1/22/2019**		SeqNo: **1912310**		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	1.0		1.000		105	80	120			

Sample ID	**LCS-42717**	SampType: **LCS**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**LCSS**	Batch ID: **42717**		RunNo: **57168**					
Prep Date:	**1/21/2019**	Analysis Date: **1/22/2019**		SeqNo: **1912311**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.025	1.000	0	92.2	80	120			
Toluene	0.95	0.050	1.000	0	95.0	80	120			
Ethylbenzene	0.96	0.050	1.000	0	95.8	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.6	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		107	80	120			

Sample ID	**1901785-002AMS**	SampType: **MS**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**MW2 6.5-7.5'**	Batch ID: **42717**		RunNo: **57168**					
Prep Date:	**1/21/2019**	Analysis Date: **1/22/2019**		SeqNo: **1912314**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.023	0.9363	0	89.2	63.9	127			
Toluene	0.88	0.047	0.9363	0.009693	92.9	69.9	131			
Ethylbenzene	0.89	0.047	0.9363	0	95.6	71	132			
Xylenes, Total	2.7	0.094	2.809	0	96.1	71.8	131			
Surr: 4-Bromofluorobenzene	0.99		0.9363		106	80	120			

Sample ID	**1901785-002AMSD**	SampType: **MSD**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**MW2 6.5-7.5'**	Batch ID: **42717**		RunNo: **57168**					
Prep Date:	**1/21/2019**	Analysis Date: **1/22/2019**		SeqNo: **1912315**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.79	0.024	0.9497	0	82.8	63.9	127	5.94	20	
Toluene	0.82	0.047	0.9497	0.009693	85.5	69.9	131	6.82	20	
Ethylbenzene	0.84	0.047	0.9497	0	88.0	71	132	6.87	20	
Xylenes, Total	2.5	0.095	2.849	0	89.0	71.8	131	6.24	20	
Surr: 4-Bromofluorobenzene	1.0		0.9497		105	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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1901785**

05-Feb-19

Client: Timberwolf Environmental

Project: Kaufman #1

Sample ID	**MB-42930**	SampType:	**MBLK**		TestCode:	**Walkley Black TOC/FOC/OM**				
Client ID:	**PBS**	Batch ID:	**42930**		RunNo:	**57408**				
Prep Date:	**2/1/2019**	Analysis Date:	**2/1/2019**		SeqNo:	**1920834**	Units:	**% C**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TOC	ND	0.14								

Sample ID	**LCS-42930**	SampType:	**LCS**		TestCode:	**Walkley Black TOC/FOC/OM**				
Client ID:	**LCSS**	Batch ID:	**42930**		RunNo:	**57408**				
Prep Date:	**2/1/2019**	Analysis Date:	**2/1/2019**		SeqNo:	**1920835**	Units:	**% C**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TOC	3.2	0.13	2.740	0	118	80	120			

Sample ID	**1901785-001AMS**	SampType:	**MS**		TestCode:	**Walkley Black TOC/FOC/OM**				
Client ID:	**MW-2 5'**	Batch ID:	**42930**		RunNo:	**57408**				
Prep Date:	**2/1/2019**	Analysis Date:	**2/1/2019**		SeqNo:	**1920837**	Units:	**% C**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TOC	3.3	0.13	2.740	0	119	75	125			

Sample ID	**1901785-001AMSD**	SampType:	**MSD**		TestCode:	**Walkley Black TOC/FOC/OM**				
Client ID:	**MW-2 5'**	Batch ID:	**42930**		RunNo:	**57408**				
Prep Date:	**2/1/2019**	Analysis Date:	**2/1/2019**		SeqNo:	**1920838**	Units:	**% C**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
TOC	3.2	0.13	2.740	0	118	75	125	0.924	20	

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 Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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: **TIMBERWOLF ENVIRON** Work Order Number: **1901785** RcptNo: **1**

Received By: **Victoria Zellar** **1/19/2019 11:10:00 AM** Victoria Zellar

Completed By: **Leah Baca** **1/21/2019 9:01:44 AM** Leah Baca

Reviewed By: VV 1/21/19

LB : DAD 1/21/19

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 1/21/19

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	3.7	Good	Yes			
2	4.3	Good	Yes			

Chain-of-Custody Record

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

Client: Timberwolf Environmental

Mailing Address:

Phone #: 979-324-2139

email or Fax#:

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

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

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: Kaufman #1

Project #: 180061

Project Manager:

Sampler:
On Ice: ☒ Yes ☐ No
# of Coolers: 2
Cooler Temp (including CF): 3.7°C, 4.3°C

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1901785	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)	BTEX	Cl	Total Organic Carbon
1/14/19	1345	S	BMW2 5'	Various	Various	-001		✓									✓	✓	✓
1/14/19	1350	S	MW2 6.5-7.5'	↓	↓	-002		✓									✓	✓	
1/14/19	1530	S	MW3 5.0-5.5'	↓	↓	-003		✓									✓	✓	
1/14/19	1545	S	MW3 6.5-7.5'	↓	↓	-004		✓									✓	✓	
1/14/19	1200	S	MW6 5.0-5.5'	↓	↓	-005		✓									✓	✓	
1/14/19	1210	S	MW6 7.5-8.5'	↓	↓	-006		✓									✓	✓	
1/15/19	0910	S	MW5 4.5-5.5'	↓	↓	-007		✓									✓	✓	
1/15/19	0930	S	MW5 8-9'	↓	↓	-008		✓									✓	✓	
1/15/19	1005	S	MW5 14.5-15.5'	↓	↓	-009		✓									✓	✓	
1/15/19	1335	S	MW4 5-6'	↓	↓	-010		✓									✓	✓	
	1345	S	MW4 8-9'	↓	↓	-011		✓									✓	✓	

Date	Time	Relinquished by	Received by	Via	Date	Time
1/18/19	1800	[signature]	[signature]		1/18/19	1800
1/18/19	1841	[signature]	[signature]	Courier	1/19/19	1110

Remarks:

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 C

Geotechnical Reports

GEOMAT INC
915 Malta Avenue ◆ Farmington, NM 87401 ◆ Tel (505) 327-7928 ◆ Fax (505) 326-5721

February 11, 2019

Jim Foster, President
Timberwolf Environmental
691 CR233, Suite B-4
Durango, Colorado 81301

RE: Kaufman #1 - Laboratory Results
San Juan County, New Mexico
GEOMAT Project No. 185-3187

Dear Mr. Foster,

GEOMAT Inc. (GEOMAT) has completed the laboratory testing services for the Kaufman #1 environmental exploration work performed on January 18, 2019. As requested, after installing six (6) monitor wells at the site, GEOMAT collected two (2) ring samples, Lab Nos. 7698 and 7699 from 5.5'-6' and 13.5'-14' below ground surface, respectively.

The single test boring sampled, MW-04-D, is the twin of MW-04 and presented minor difficulties with respect to recovery due to site conditions. However, sufficient sample was retrieved such that we were able to perform moisture-density analysis locally at our lab while conveying the majority of the sample recovered by the rings to an outside laboratory for the hydraulic conductivity (ASTM D5084) and specific gravity analysis. Results from both of these analyses are attached for your use.

Thank you for the opportunity to be of service to you on this project. We appreciate your business and look forward to assisting you further in the future. Should you have any questions regarding the attached data, please do not hesitate to contact us.

Sincerely yours,
GEOMAT Inc.

Robert "Bob" Flegal, P.E.
Senior Engineer/Drilling Manager

Copies to: Addressee (1) via email.

GEOMAT INC.
915 Malta Avenue ◆ Farmington, NM 87401 ◆ Tel (505) 327-7928 ◆ Fax (505) 326-5721

MOISTURE - DENSITY WORKSHEET

Project Number: 185-3187 **Project Name: La Plata Delineation - Timberwolf**

Lab Number	Borehole No.	Sample Depth (ft.)	Density		Moisture			Moisture (%)	Soil Wet Density (pcf)	Soil Dry Density (pcf)
			# of Rings	Wt of Rings + Soil (gm)	Tare	Tare & Wet Soil	Tare & Dry Soil			
7698	B-1	5.5 - 6.0	6	1224.8	178.98	315.08	303.37	9.4%	131.0	119.7
7699	B-1	13.5 - 14.0	6	1138.52	190.64	289.06	276.02	15.3%	119.1	103.3
NOTE: Densities are understated due to rings not being completely full										
Samples contain gravel thus unable to trim ends flush										

wood.

Client:	GEOMAT, Inc. 915 Malta Avenue Farmington, NM 87401-	**Report Date:**	February 05, 2019
		Project #:	18-519-01996
		Work Order #:	13
Attn:	Nathan Compton	**Lab #:**	19-0030-01
Project Name:	2018-19 Geomat Inc. Misc. Testing	**Sampled By:**	Client - F. Enriquez
		Date Sampled:	1/17/2019
	Albuquerque, NM	**Visual Description of Material:**	GEOMAT Lab # 7698
		Sample Source:	B-1 @ 5.5-6.0
Project Manager:	Jesse Boam	**SOILS / AGGREGATES**	

Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter (ASTM D5084-16)

Method: C

Sample Preparation: Ring Sample
Compaction Method: Insitu

Initial Diameter (cm):	6.07	**Final Diameter (cm):**	6.07
Initial Length (cm):	7.75	**Final Length (cm):**	7.67
Initial Moisture:	5.4%	**Final Moisture:**	11.1%
Initial Unit Weight (pcf):	127.0	**Final Unit Weight (pcf):**	128.3
Initial Volume (in³):	13.7	**Final Volume (in³):**	13.5
Initial Degree of Saturation:	46%	**Final Degree of Saturation:**	97%

Permeant Liquid: City Water
Magnitude of Total Backpressure: 18.0
Effective Stress: 2.0
Range of Hydraulic Gradient Used: 1.85 **To** 2.44
Specific Gravity(ASTM D854): 2.686

Time Interval (sec)	Corrected Hydraulic Conductivity (cm/sec)
8	1.04E-03
6	1.07E-03
7	1.03E-03
9	9.98E-04
Average:	1.0E-03

Note: All final sample dimensions are subject to sample deformation caused by exsolution of air in pore water and handling during removal from cell.

Reviewed By:_____

Distribution: **Client:** ☐ **File:** ☐ **Supplier:** ☐ **Email:** ☐ **Other:**

AMEC Environment & Infrastructure, Inc.
8519 Jefferson NE
Albuquerque, NM 87113
Tel 5058211801
Fax 5058217371 www.amec.com

wood.

Client:	GEOMAT, Inc. 915 Malta Avenue Farmington, NM 87401-	**Report Date:**	February 06, 2019
		Project #:	18-519-01996
		Work Order #:	13
Attn:	Nathan Compton	**Lab #:**	19-0030-02
Project Name:	2018-19 Geomat Inc. Misc. Testing	**Sampled By:**	Client - F. Enriquez
		Date Sampled:	1/17/2019
	Albuquerque, NM	**Visual Description of Material:**	GEOMAT Lab # 7699
		Sample Source:	B-1 @ 13.5-14.0
Project Manager:	Jesse Boam	**SOILS / AGGREGATES**	

Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter (ASTM D5084-16)

Method: C

Sample Preparation: Ring Sample
Compaction Method: Insitu

Initial Diameter (cm):	6.13	**Final Diameter (cm):**	6.13
Initial Length (cm):	7.71	**Final Length (cm):**	7.71
Initial Moisture:	16.5%	**Final Moisture:**	18.8%
Initial Unit Weight (pcf):	109.2	**Final Unit Weight (pcf):**	109.2
Initial Volume (in³):	13.9	**Final Volume (in³):**	13.9
Initial Degree of Saturation:	85%	**Final Degree of Saturation:**	97%

Permeant Liquid:	City Water
Magnitude of Total Backpressure:	33.0
Effective Stress:	2.0
Range of Hydraulic Gradient Used:	1.70 **To** 2.10
Specific Gravity(ASTM D854):	2.643

Time Interval (sec)	Corrected Hydraulic Conductivity (cm/sec)
6	2.41E-03
8	2.44E-03
6	2.34E-03
6	2.25E-03
Average:	2.4E-03

Note: All final sample dimensions are subject to sample deformation caused by exsolution of air in pore water and handling during removal from cell.

Reviewed By:_____

Distribution: **Client:** ☐ **File:** ☐ **Supplier:** ☐ **Email:** ☐ **Other:**

AMEC Environment & Infrastructure, Inc.
8519 Jefferson NE
Albuquerque, NM 87113
Tel 5058211801
Fax 5058217371 www.amec.com

Appendix D

Attached Tables

Table D-1. Groundwater Stabilization Parameters
Table D-2. Groundwater Analytical Results – General Chemistry
Table D-3. Groundwater Analytical Results – RCRA-8 Metals
Table D-4. Groundwater Analytical Results – Volatile Organic Compounds
Table D-5. Groundwater Analytical Results – Semi-volatile Organic Compounds

Table D-1. Groundwater Stabilization Parameters
Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Well ID	Amount Purged (gallons) *	Depth to Water (ft bgs)	Temperature (˚C)	Disolved Oxygen (mg/L)	Electric Conductivity (mS/cm)	pH	Oxidation Reduction Potential (mV)
MW1	25	4.74	12.2	0.21	3.84	6.91	74.8
	26	4.68	12.2	0.2	3.84	6.92	74.4
	27	4.68	12.2	0.21	3.85	6.9	74
MW2	21	5.95	6.8	0.84	4.49	6.92	104.1
	22	5.94	6.8	0.86	4.49	6.92	103.3
	23	5.95	6.8	0.88	4.49	6.92	102.2
MW3	22	5.58	9.4	0.28	4.63	7.14	-24.8
	23	5.58	9.5	0.25	4.62	7.13	-28.4
	24	5.58	9.5	0.24	4.62	7.13	-31.6
MW4	16	6.45	9.6	0.31	4.01	6.96	37
	17	6.46	9.6	0.28	4	6.96	34
	18	6.46	9.6	0.27	4	6.96	32.1
MW5	13	6.78	9.2	0.26	3.94	7.13	-2.7
	14	6.78	8.7	0.22	3.94	7.12	-4.6
	15	6.74	8.6	0.21	3.94	7.11	-5.6
MW6	Initial DTW: 5.34 ft; Well pumped dry at 11.5 gallons, allowed to recharge to 5.82 ft and sampled @ 1335.						

* - 10 gallons were purged prior to low flow to develop the monitor wells

ft bgs - feet below ground surface

˚C - degrees celsius

mg/L - milligrams per liter

mS/cm - millisiemens per centimeter

mV - millivolts

Table D-2. Groundwater Analytical Results - General Chemistry
Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Sample ID	Date	Total Disolved Solids (mg/kg)	Specific Conductance (mmhos/cm)	Anions						
				Fluoride	Chloride	Nitrate	Bromide	Nitrogen	Phosphorus	Sulfate
MW1	01/18/19	3,130	3.6	< 1.0	130	< 1.0[H]	< 1.0	< 1.0[H]	< 5.0[H]	1,700
Regulatory Criteria*		**1,000[2]**	**--**	**1.6[1]**	**--**	**10[1]**	**--**	**--**	**--**	**600[2]**

[1] Human health standard

[2] Domestic Water Suppy Standard

[H] Sample analyzed out of hold time

-- no applicable criteria

Table D-3. Groundwater Analytical Data - RCRA 8 Metals
Kaufman No. 1 Release
Hilcorp Energy Company
San Juan County, New Mexico

Sample ID	Date	RCRA-8 (mg/L)							
		Arsenic	Barium	Cadium	Chromium	Lead	Mercury	Selenium	Silver
MW1	01/18/19	< 0.02	0.079	< 0.002	< 0.006	< 0.005	< 0.0002	< 0.05	0.0068
Regulatory Criteria[1]		**0.10**	**1.00**	**0.01**	**0.05**	**0.05**	**0.002**	**0.05**	**0.05**

RCRA - Resouce Conservation and Recovery Act
mg/L - milligrams per liter
[1] Human health standard

Table D-4. Groundwater Analytical Data - Volatile Organic Compounds
Kaufman No. 1
Hilcorp Energy Company
San Juan County, New Mexico

Volatile Organic Compounds	MW-1 (mg/L)	Regulatory Criteria[1] (mg/L)
Benzene	0.074	0.01
Toluene	0.35	0.75
Ethylbenzene	0.027	0.75
Methyl tert-butyl ether (MTBE)	< 0.001	--
1,2,4-Trimethylbenzene	0.032	--
1,3,5,-Trimethylbenzene	0.015	--
1,2-Dichloroethane (EDC)	< 0.001	0.01
1,2-Dibromoethane (EDB)	< 0.001	--
Naphthalene	0.0032	--
1-Methylnaphthalene	< 0.004	--
2-Methylnaphthalene	< 0.004	--
Acetone	< 0.01	--
Bromobenzene	< 0.001	--
Bromodichloromethane	< 0.001	--
Bromoform	< 0.001	--
Bromomethane	< 0.003	--
2-Butanone	< 0.01	--
Carbon disulfide	< 0.01	--
Carbon Tetrachloride	< 0.001	0.01
Chlorobenzene	< 0.001	--
Chloroethane	< 0.002	--
Chloroform	< 0.001	0.1
Chloromethane	< 0.003	--
2-Chlorotoluene	< 0.001	--
4-Chlorotoluene	< 0.001	--
cis-1,2-DCE	< 0.001	--
cis-1,3- Dichloropropene	< 0.001	--
1,2-Dibromo-3-chloropropane	< 0.002	--
Dibromochloromethane	< 0.001	--
Dibromomethane	< 0.001	--
1,2-Dichlorobenzene	< 0.001	--

Table D-4. Groundwater Analytical Data - Volatile Organic Compounds
Kaufman No. 1
Hilcorp Energy Company
San Juan County, New Mexico

Volatile Organic Compounds	MW-1 (mg/L)	Regulatory Criteria[1] (mg/L)
1,3-Dichlorobenzene	< 0.001	--
1,4-Dichlorobenzene	< 0.001	--
Dichlorodifluoromethane	< 0.001	--
1,1-Dichloroethane	< 0.001	0.025
1,1-Dichloroethene	< 0.001	--
1,2-Dichloropropane	< 0.001	--
1,3-Dichloropropane	< 0.001	--
2,2-Dichloropropane	< 0.002	--
1,1-Dichloropropene	< 0.001	--
Hexachlorobutadiene	< 0.001	--
2-Hexanone	< 0.01	--
Isopropylbenzene	0.0031	--
4-Isopropyltoluene	< 0.001	--
4-Methyl-2-pentanone	< 0.01	--
Methylene Chloride	< 0.003	0.1
n-Butylbenzene	< 0.003	--
n-Propylbenzene	0.0039	--
sec-Butylbenzene	< 0.001	--
Styrene	< 0.001	--
tert-Butylbenzene	< 0.001	--
1,1,1,2-Tetrachloroethane	< 0.001	--
1,1,2,2-Tetrachloroethane	< 0.002	0.01
Tetrachloroethene (PCE)	< 0.001	0.02
trans-1,2- DCE	< 0.001	--
trans-1,3-Dichloropropene	< 0.001	--
1,2,3-Trichlorobenzene	< 0.001	--
1,2,4-Trichlorobenzene	< 0.001	--
1,1,1-Trichloroethane	< 0.001	0.06
1,1,2-Trichloroethane	< 0.001	0.01
Trichloroethene	< 0.001	--
Trichlorofluoromethane	< 0.001	--
1,2,3-Trichloropropane	< 0.002	--
Vinyl Chloride	< 0.001	0.001
Xylenes, Total	0.33	0.62

mg/L - milligrams per liter

[1] Human health standard

Table D-5. Groundwater Analytical Data - Semi-volatile Organic Compounds
Kaufman No. 1
Hilcorp Energy Company
San Juan County, New Mexico

Semi-Volatile Organic Compounds	MW-1 (mg/L)	Regulatory Criteria
Acenaphthene	< 0.01	--
Acenaphthylene	< 0.01	--
Aniline	< 0.01	--
Anthracene	< 0.01	--
Azobenzene	< 0.01	--
Benz(a)anthracene	< 0.01	--
Benzo(a)pyrene	< 0.01	0.0007[1]
Benzo(b)fluoranthene	< 0.01	--
Benzo(g,h,i)perylene	< 0.01	--
Benzo(k)fluoranthene	< 0.01	--
Benzoic acid	< 0.02	--
Benzyl alcohol	< 0.01	--
Bis(2-chloroethoxy)methane	< 0.01	--
Bis(2-chloroethyl)ether	< 0.01	--
Bis(2-chloroisopropyl)ether	< 0.01	--
Bis(2-ethylhexyl)phthalate	< 0.01	--
4-Bromophenyl phenyl ether	< 0.01	--
Butyl benzyl phthalate	< 0.01	--
Carbazole	< 0.01	--
4-Chloro-3-methylphenol	< 0.01	--
4-Chloraniline	< 0.01	--
2-Chloronaphthalene	< 0.01	--
2-Chlorophenol	< 0.01	--
4-Chlorophenyl phenyl ether	< 0.01	--
Chrysene	< 0.01	--
Di-n-butyl phthalate	< 0.01	--
Di-n-octyl phthalate	< 0.01	--
Dibenz(a,h)anthracene	< 0.01	--
Dibezofuran	< 0.01	--
1,2-Dichlorobenzene	< 0.01	--
1,3-Dichlorobenzene	< 0.01	--
1,4-Dichlorobenzene	< 0.01	--
3,3'-Dichlorobenzidine	< 0.01	--
Diethyl phthalate	< 0.01	--
Dimethyl phthalate	< 0.01	--
2,4-Dichlorophenol	< 0.02	--
2,4-Dimethylphenol	< 0.01	--
4,6-Dinitro-2-methylphenol	< 0.02	--

Table D-5. Groundwater Analytical Data - Semi-volatile Organic Compounds
Kaufman No. 1
Hilcorp Energy Company
San Juan County, New Mexico

Semi-Volatile Organic Compounds	MW-1 (mg/L)	Regulatory Criteria
2,4-Dinitrophenol	< 0.02	--
2,4-Dinitrotoluene	< 0.01	--
2,6-Dinitrotoluene	< 0.01	--
Fluoranthene	< 0.01	--
Fluorene	< 0.01	--
Hexachlorobenzene	< 0.01	--
Hexachlorobutadiene	< 0.01	--
Hexachlorocyclopentadiene	< 0.01	--
Hexachloroethane	< 0.01	--
Indeno(1,2,3-cd)pyrene	< 0.01	--
Isophorone	< 0.01	--
1-Methylnaphthalene	< 0.01	--
2-Methylnaphthalene	< 0.01	--
2-Methylphenol	< 0.01	--
3+4-Methylphenol	< 0.01	--
N-Nitrosodi-n-propylamine	< 0.01	--
N-Nitrosodimethylamine	< 0.01	--
N-Nitrosodiphenylamine	< 0.01	--
Naphthalene	< 0.01	--
2-Nitroaniline	< 0.01	--
3-Nitroaniline	< 0.01	--
4Nitroaniline	< 0.01	--
Nitrobenzene	< 0.01	--
2-Nitrophenol	< 0.01	--
4-Nitrophenol	< 0.01	--
Pentachlorophenol	< 0.02	--
Phenanthrene	< 0.01	--
Phenol	< 0.01	0.005[2]
Pyrnen	< 0.01	--
Pyridine	< 0.01	--
1,2,4-Trichlorobenzene	< 0.01	--
2,4,5-Tricholrophenol	< 0.01	--
2,4,6-Trichlorophenol	< 0.01	--

mg/L - milligrams per liter

[1] Human health standard

[2] Domestic water suppy santdard