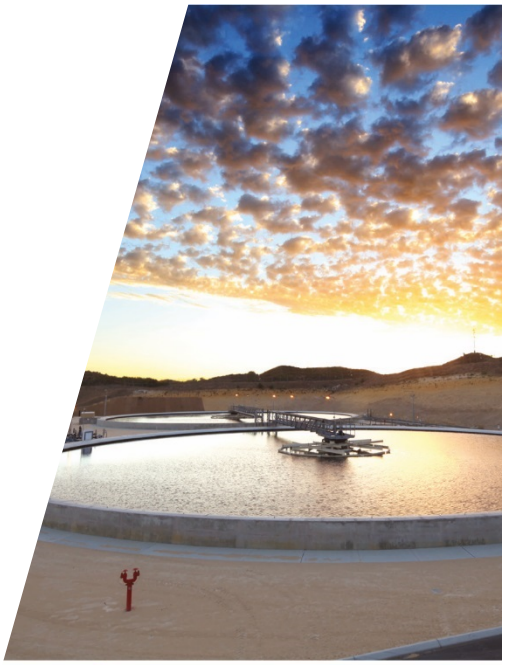
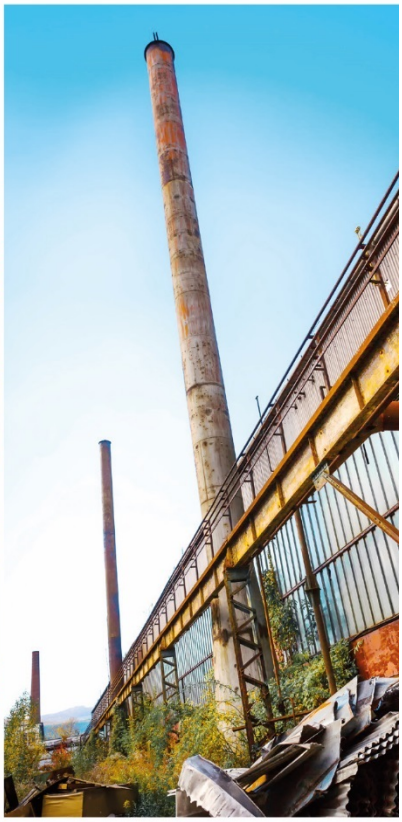


2019 Annual Groundwater Monitoring Report and 2020 Work Scope

O-6-1 4”
Lea County, New Mexico
1RP-4643

ETC Texas Pipeline, Ltd.



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1. Introduction

This report presents the results of the 2019 groundwater monitoring events performed quarterly at the ETC Texas Pipeline, Ltd. (ETC), O-6-1 4" pipeline release (Site). The Site is located within Unit J, Section 20, Township 20 South, Range 37 East, in Lea County, New Mexico (**Figure 1**). The property is owned by the New Mexico State Land Office (NMSLO). Site details can be seen on **Figure 2**.

1.1 Background

On March 13, 2017, a release of approximately 150 barrels (bbls) of natural gas liquids/oil was reported to the State of New Mexico Oil Conservation Division (NMOCD) via Form C-141. The NMOCD then notified the NMSLO. External corrosion caused an approximate 1-inch hole to develop on a section of pipeline segment of 0-6-1 and was the cause of the release. Approximately 50 bbls of the fluids were recovered. Impacted soils were excavated and stockpiled on-site and the excavation backfilled. NMOCD release number 1RP-4643 was assigned.

The impacted area had been initially excavated to a depth of approximately 15 feet below ground surface (ft bgs) and soil samples were collected by ETC from two locations within the base of the excavation. Concentrations of total petroleum hydrocarbons (TPH) exceeded 100 mg/Kg, the Recommended Remedial Action Limit (RRAL) for the Site (based on depth to groundwater of less than 50 ft bgs) at the time of assessment.

Vertical and horizontal assessment at the Site was performed on August 29 and 30, 2017 and included the advancement of six soil borings and the installation of one groundwater monitoring well (MW). Soil samples collected at depth from the six soil borings near the release point were found to be at concentrations below laboratory reporting limits for benzene, toluene, ethylbenzene, xylenes (BTEX) and TPH. Concentrations of TPH above RRAL were recorded in borings at the following depths: MW-1 from 5-22 ft bgs, BN-1 from 10-15 ft bgs, and BE-1 and BE-2 at 10 ft bgs. Additionally the sample collected from soil boring MW-1 from 15-17 ft bgs returned a chloride concentration of 1,100 mg/Kg, above the RRAL of 600 mg/kg for the Site.

One soil boring advanced near the release point was converted to a groundwater monitoring well, MW-1. A groundwater sample was collected from MW-1 on September 20, 2017 and analyzed for BTEX, TPH, chloride and total dissolved solids (TDS). Benzene, chloride, and TDS were detected at concentrations in excess of New Mexico Water Quality Control Commission (NMWQCC) standards. A second groundwater sample was collected from MW-1 on October 17, 2017 with similar findings of above standard concentrations for these constituents.

As a result, GHD installed four additional monitoring wells and two air sparge (AS) wells at the Site between December 18, 2017 and January 31, 2018. MW-2 was installed to the north, MW-3 to the southeast, MW-4 to the south, and MW-5 to the west of MW-1. The air sparge wells were installed north and south of the 0-6-1 line to the west of MW-1.

Soil vapor extraction (SVE) and AS pilot studies were performed at the Site on January 30 and 31, 2018. The data and observations from the pilot studies indicate that AS/SVE is capable of removing petroleum hydrocarbons from the impacted subsurface. Based on vapor concentrations extracted

during the pilot test and using conservative operating parameters, it was estimated that 75 to 90 percent of the mass currently present would be removed in less than a year of operation. However, due to difficulties accessing electricity the system was not installed in and no additional SVE or AS efforts were completed in 2018.

Throughout 2019 mobile dual phase extraction (MDPE) events were performed at the Site in place of SVE and AS. One event was performed on MW-1 and two events on MW-2. Each event consisted of 8 hours where vacuum was applied to the selected well and vapors and liquids were pulled from the subsurface.

Groundwater monitoring was performed quarterly by GHD in March, June, September, and December 2019. Additionally, MDPE events were overseen by GHD in June, September, and December 2019. Details of 2019 field activities are discussed further in this report.

2. Groundwater Monitoring Summary, Methodology, and Analytical Results

2.1 Groundwater Monitoring Summary

Quarterly groundwater monitoring events of 2019 were performed in March, June, September, and December. During each monitoring event, an oil/water interface probe was used to measure depth to groundwater and check for the presence of LNAPL, if any. Before and after each use, the oil/water interface probe was cleaned with an Alconox®/deionized water solution and rinsed with deionized water. Groundwater level gauging data elevations for the Site are presented in **Table 1**.

Groundwater flow direction during 2019 was towards the southeast, with a slightly more southward flow in September. Groundwater gradient calculated for each monitoring period was approximately 0.0027 in March, 0.0022 in June, 0.0061 in September, and 0.0018 feet per foot (ft/ft) December, 2019. A groundwater gradient map has been prepared for each groundwater monitoring event and are included as **Figures 3**, **4**, **5**, and **6**.

2.2 Groundwater Monitoring Methodology

During the 2019 quarterly groundwater monitoring events, monitoring wells were purged of at least three well casing volumes of water or until dry using a dedicated, polyethylene bailer prior to sampling. Groundwater quality parameters including pH, temperature, oxidation reduction potential, and conductivity were collected using a calibrated multi-parameter groundwater quality meter and were recorded on groundwater sampling field forms. A summary of field parameters is presented as **Table 2**.

Groundwater samples were placed in laboratory prepared bottles, packed on ice and shipped under chain-of-custody documentation to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico. Groundwater samples were analyzed for BTEX by Environmental Protection Agency (EPA) Method 8260, chloride by EPA Method 300.0, and TDS by Standard Method 2540.

2.3 Groundwater Monitoring Analytical Results

Groundwater samples collected from all Site wells were below the NMWQCC standard for BTEX constituents for all of the 2019 sampling events. Groundwater samples collected from MW-1 through MW-5 have consistently exceeded the NMWQCC standard for chloride of 250 mg/L. During the most recent sampling event in December 2019, chloride concentrations in Site wells ranged between 530 mg/L (MW-4) and 630 mg/L (MW-3). Concentrations of TDS have also consistently been above the NMWQCC standard of 1,000 mg/L with most recent concentrations ranging from 1,700 mg/L (MW-1) to 2,000 mg/L (MW-4) in December 2019.

A summary of groundwater laboratory analytical results is presented in **Table 3** and shown on **Figure 7**. Corresponding laboratory analytical reports are included as **Appendix A**.

3. Mobile Dual Phase Extraction

Three 8-hour MDPE events were conducted at the Site in 2019. The events use a combination of high vacuum extraction combined with simultaneous groundwater depression to attempt to remove petroleum hydrocarbons in the liquid and vapor phase from the subsurface. MW-1 was used as the extraction well during the June 2019 event, and MW-2 was used as the extraction well for both the September and December 2019 events. The MDPE events were conducted by Talon LPE (Talon) and overseen by GHD. A high vacuum extraction pump was used to extract hydrocarbon vapors to then be destroyed by a thermal oxidizer. The MDPE equipment destroyed approximately 1.97 equivalent gallons of hydrocarbons as vapors and removed 1,622 gallons of impacted groundwater. No liquid phase hydrocarbons were observed during the MDPE events. The extracted groundwater was disposed of at a permitted disposal facility and was overseen by ETC.

Talon provided a report summarizing the activities performed and the results achieved for the MDPE events. The report is included as **Appendix B**.

4. Conclusions and 2020 Recommendations

4.1 Conclusions

Based on the above-referenced information, GHD makes the following conclusions:

- Groundwater sampled from MW-1 through MW-5, exceeds the NMWQCC standard for chlorides and TDS.
- Groundwater collected from Site wells no longer exceeds the NMWQCC standard for Benzene.
- Other than benzene, which is now below standard, no concentrations of BTEX constituents in groundwater at the Site have ever exceeded the NMWQCC standards.
- With the use of MDPE in 2019 it is likely that low levels of TPH in shallow soil at the Site have been addressed.

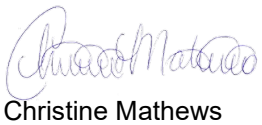
4.2 Conclusions

Based on the above conclusions, GHD recommends:

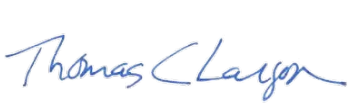
- The continuation of quarterly groundwater monitoring (refer to sampling methodology in Section 2 above).
- Discontinue MDPE due to minimal recovery of hydrocarbons.
- Soil sampling by direct push technology (DPT) to determine if TPH and chloride are below the Site cleanup standards of 100 mg/kg and 600 mg/kg, respectively.
  - Discreet soil samples will be collected during a 1-day event by DPT in order to assess if current Site soil concentrations are below 100 mg/Kg TPH and 600 mg/Kg chloride, the Site specific cleanup standards as described in the New Mexico Administrative Code (NMAC), Title 19, Chapter 15, Part 29 (19.15.29), Table 1 – Closure Criteria for Soils Impacted by a Release, for a site with groundwater less than 50 ft bgs.
  - Soil samples will be collected at 5-foot intervals to a total depth of 20 ft in borings in the general area of the release, MW-1, and soil boring BN-1 where concentrations of TPH above 100 mg/Kg of TPH have been observed (**Table 4**). Soil samples will be analyzed for TPH by EPA method 8015 and chloride by EPA Method 300.0. Analytical data will be assessed to determine the need for further remedial efforts at the Site, if any.
  - If soil concentrations from the DTP sampling event are below the Site closure standards from NMAC 19.15.29 Table 1, GHD on behalf of ETC, requests NMOCD concurrence that soil remediation is complete.
- Completion of a 2020 Annual Report summarizing field activities completed throughout the year. The annual report will include tabulated soil and groundwater analytical data, monitoring well gauging data, groundwater potentiometric surface maps, and concentration maps for constituents of concern in both soil and groundwater. An evaluation of the data will be presented with recommendations for future remedial activities at the Site or site closure if warranted.

All of Which is Respectfully Submitted,

GHD

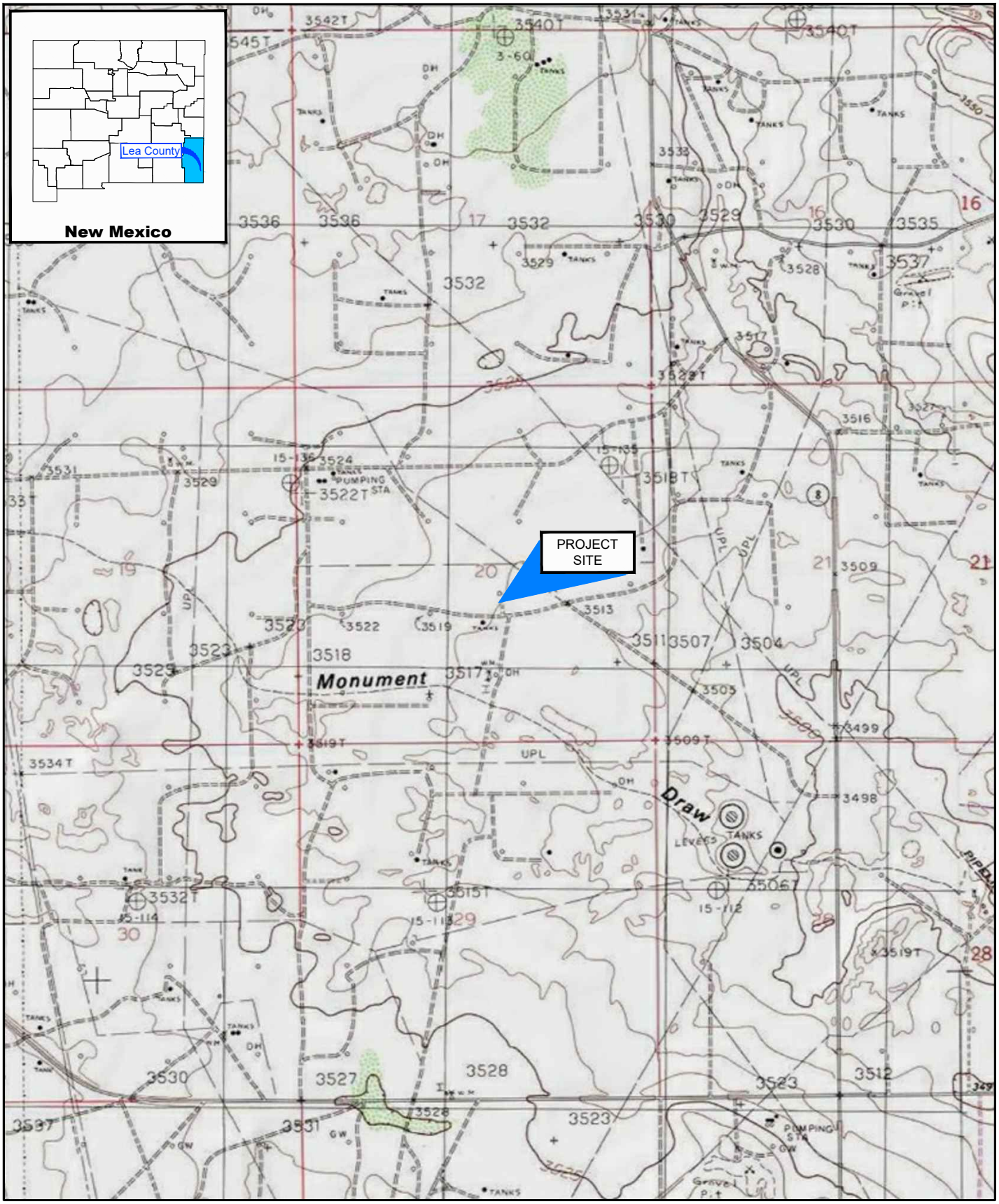


Christine Mathews
Project Manager



Tom Larson
Senior Project Manager

Figures



Source: USGS 7.5 Minute Quad "Monument South and Hobbs SW, New Mexico"

Lat/Long: 32.557054° North, 103.27255° West

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Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

11209235-01

Mar 2, 2020

SITE LOCATION MAP

FIGURE 1

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Source: Image © 2016 Google - Imagery Date: November 2, 2017

Lat/Long: 32.557054° North, 103.27255° West

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Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

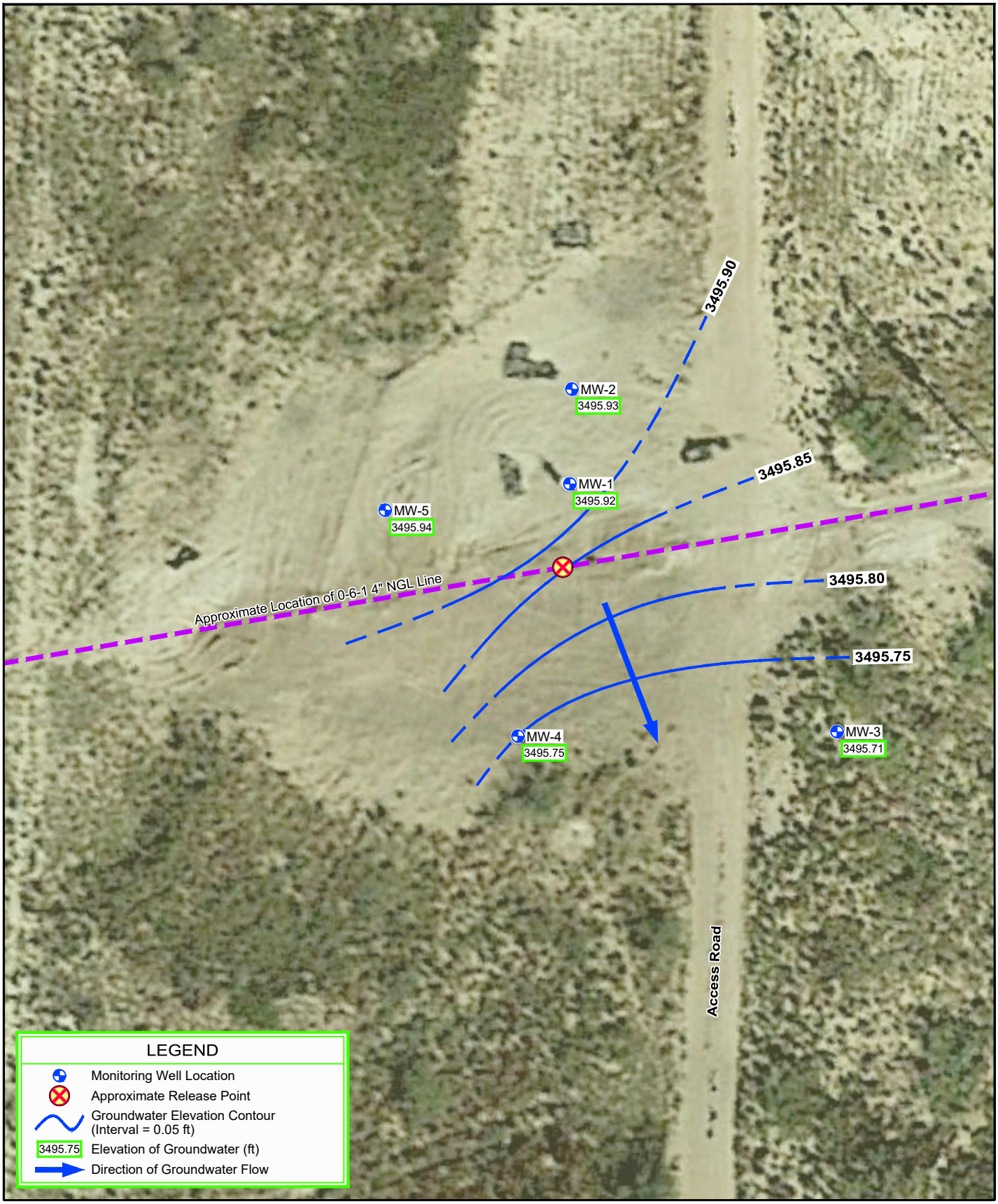
SOIL BORING AND MONITORING WELL LOCATIONS

11209235-01

Mar 5, 2020

FIGURE 2

CAD File: \\ghdnet\ghd\US\Albuquerque\Projects\562\11209235\Digital_Design\ACAD 2017\Figures\11209235-01\11209235-01(001)\11209235-01(001)GN-DL001.dwg



Source: Image © 2016 Google - Imagery Date: November 2, 2017

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Coordinate System:
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New Mexico East (US Feet)

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LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

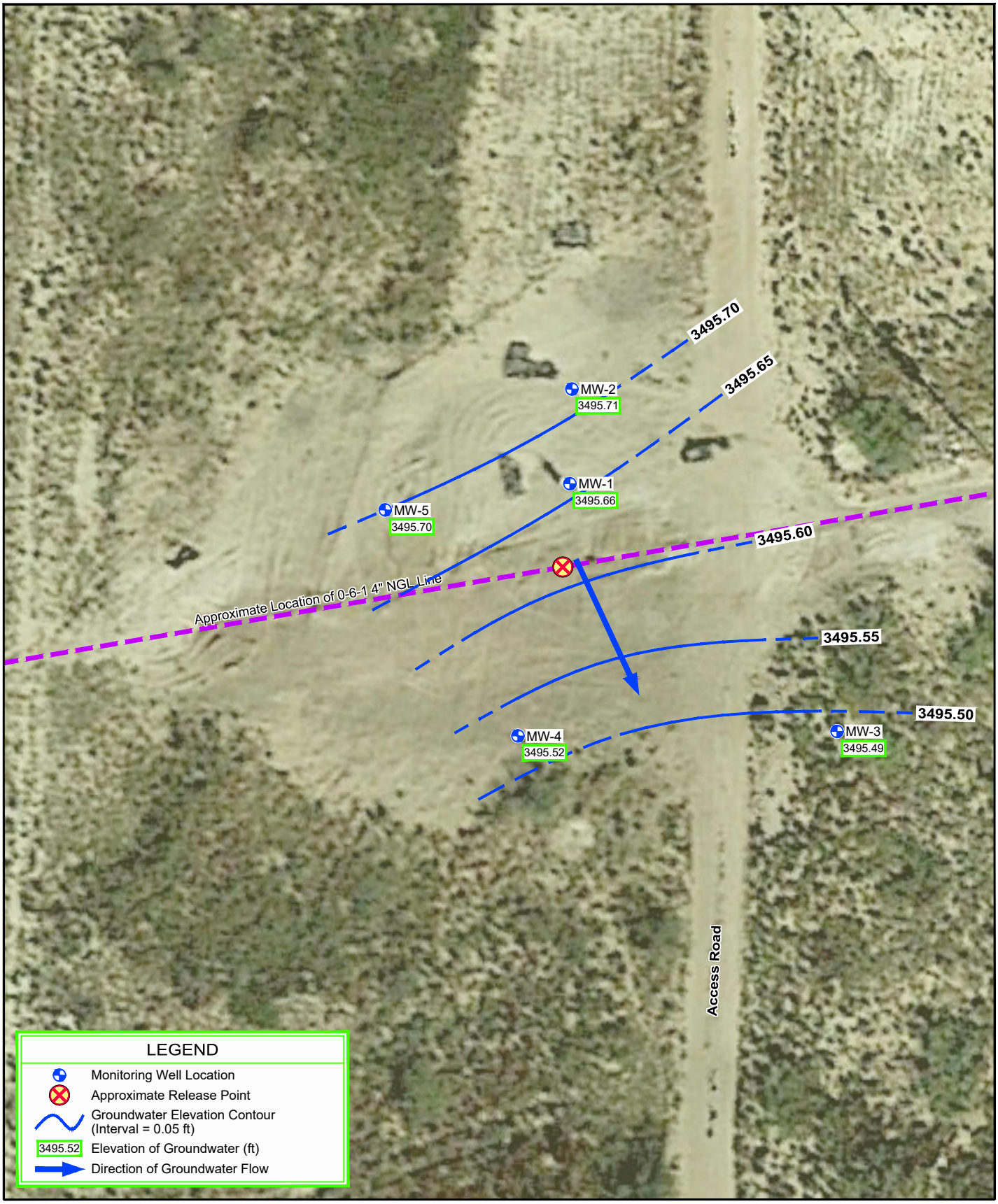
MARCH 2019 GROUNDWATER POTENTIOMETRIC SURFACE MAP

11209235-01

Mar 5, 2020

FIGURE 3

CAD File: \\ghdnet\ghd\US\Albuquerque\Projects\562\11209235\Digital_Design\ACAD 2017\Figures\11209235-01\11209235-01(001)\11209235-01(001)GN-DL001.dwg



Source: Image © 2016 Google - Imagery Date: November 2, 2017

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Coordinate System:
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New Mexico East (US Feet)

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LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

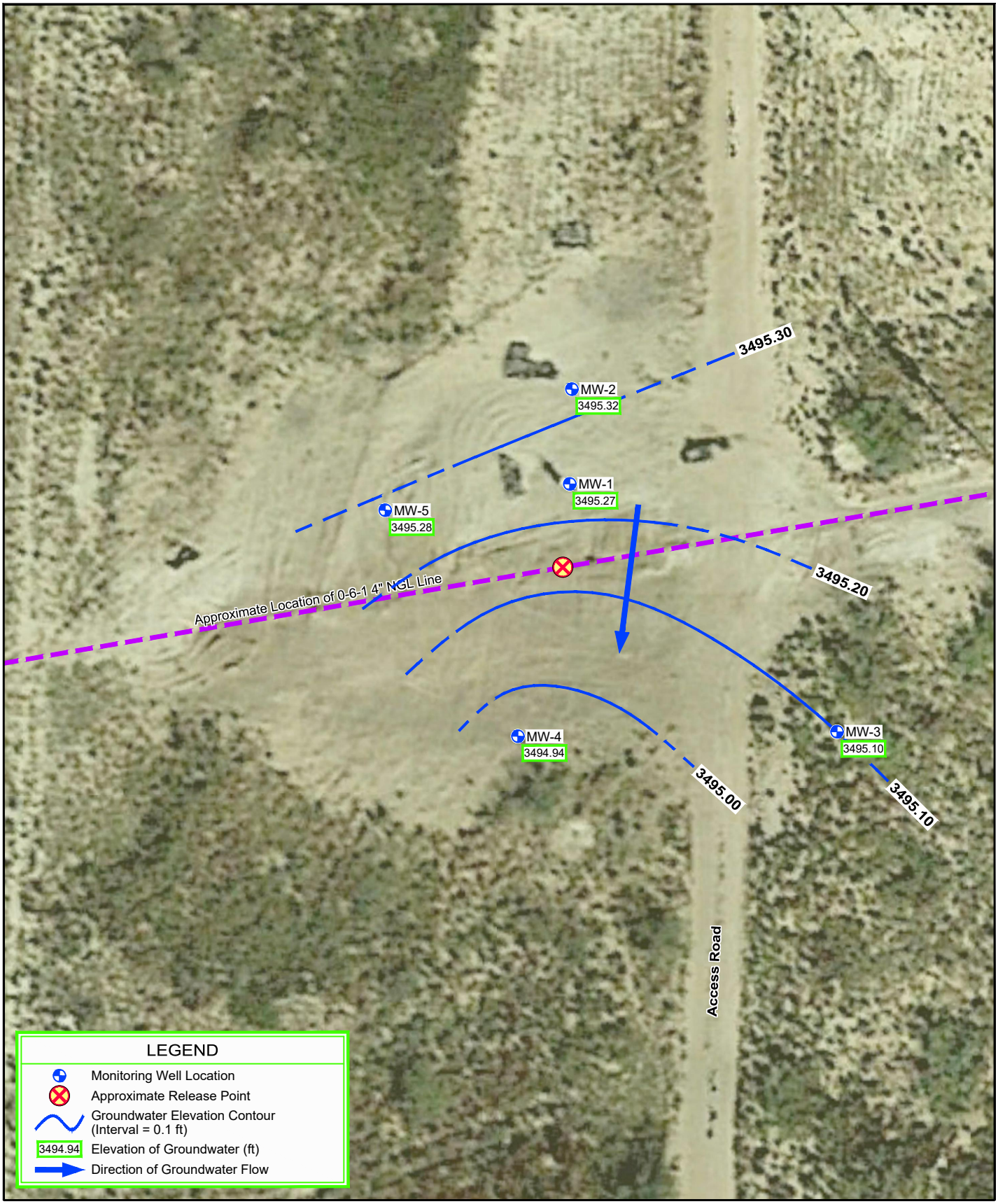
JUNE 2019 GROUNDWATER POTENTIOMETRIC SURFACE MAP

11209235-01

Mar 5, 2020

FIGURE 4

CAD File: \\ghdnet\ghd\US\Albuquerque\Projects\562\11209235\Digital_Design\ACAD 2017\Figures\11209235-01\11209235-01(001)\11209235-01(001)GN-DL001.dwg



Source: Image © 2016 Google - Imagery Date: November 2, 2017

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Coordinate System:
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New Mexico East (US Feet)

ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

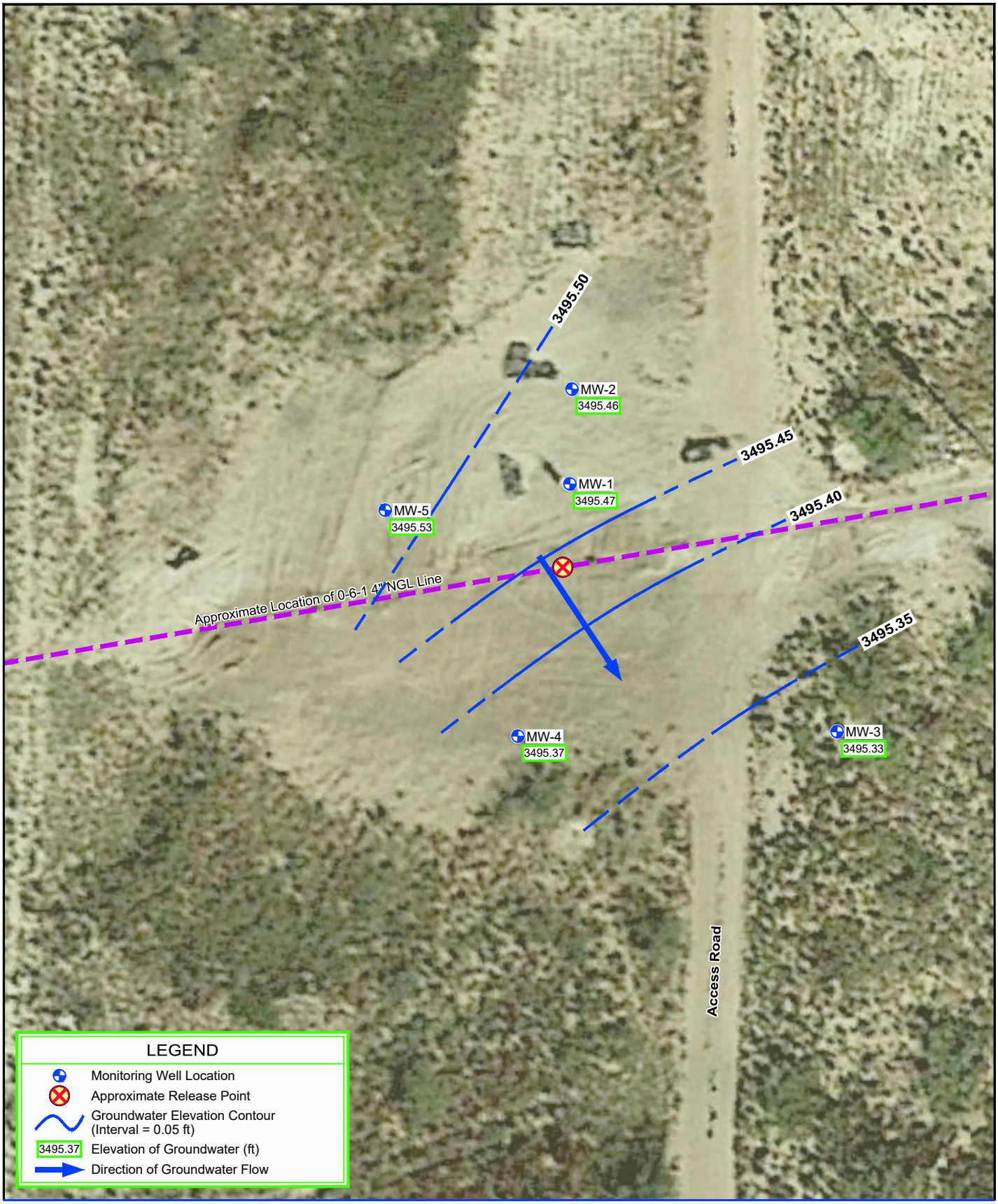
SEPTEMBER 2019 GROUNDWATER POTENTIOMETRIC SURFACE MAP

11209235-01

Mar 5, 2020

FIGURE 5

CAD File: \\ghdnet\ghd\US\Albuquerque\Projects\562\11209235\Digital_Design\ACAD 2017\Figures\11209235-01\11209235-01(001)\11209235-01(001)GN-DL001.dwg



Source: Image © 2016 Google - Imagery Date: November 2, 2017

Lat/Long: 32.557054° North, 103.27255° West

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Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

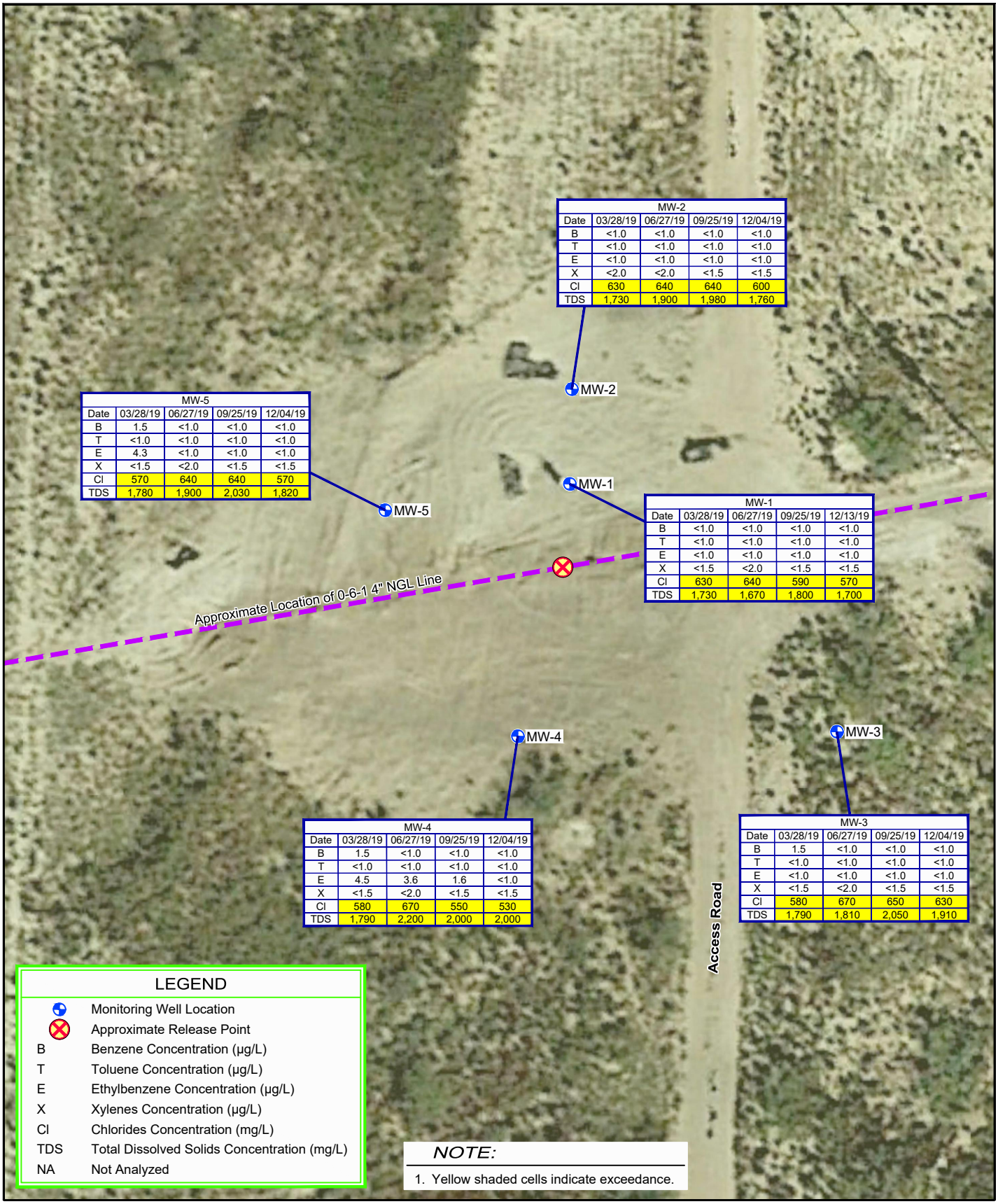
DECEMBER 2019 GROUNDWATER POTENTIOMETRIC SURFACE MAP

11209235-01

Mar 5, 2020

FIGURE 6

CAD File: \\ghdnet\ghd\US\Albuquerque\Projects\562\11209235\Digital_Design\ACAD 2017\Figures\11209235-01\11209235-01(001)\11209235-01(001)GN-DL001.dwg



MW-2				
Date	03/28/19	06/27/19	09/25/19	12/04/19
B	<1.0	<1.0	<1.0	<1.0
T	<1.0	<1.0	<1.0	<1.0
E	<1.0	<1.0	<1.0	<1.0
X	<2.0	<2.0	<1.5	<1.5
Cl	630	640	640	600
TDS	1,730	1,900	1,980	1,760

MW-5				
Date	03/28/19	06/27/19	09/25/19	12/04/19
B	1.5	<1.0	<1.0	<1.0
T	<1.0	<1.0	<1.0	<1.0
E	4.3	<1.0	<1.0	<1.0
X	<1.5	<2.0	<1.5	<1.5
Cl	570	640	640	570
TDS	1,780	1,900	2,030	1,820

MW-1				
Date	03/28/19	06/27/19	09/25/19	12/13/19
B	<1.0	<1.0	<1.0	<1.0
T	<1.0	<1.0	<1.0	<1.0
E	<1.0	<1.0	<1.0	<1.0
X	<1.5	<2.0	<1.5	<1.5
Cl	630	640	590	570
TDS	1,730	1,670	1,800	1,700

MW-4				
Date	03/28/19	06/27/19	09/25/19	12/04/19
B	1.5	<1.0	<1.0	<1.0
T	<1.0	<1.0	<1.0	<1.0
E	4.5	3.6	1.6	<1.0
X	<1.5	<2.0	<1.5	<1.5
Cl	580	670	550	530
TDS	1,790	2,200	2,000	2,000

MW-3				
Date	03/28/19	06/27/19	09/25/19	12/04/19
B	1.5	<1.0	<1.0	<1.0
T	<1.0	<1.0	<1.0	<1.0
E	<1.0	<1.0	<1.0	<1.0
X	<1.5	<2.0	<1.5	<1.5
Cl	580	670	650	630
TDS	1,790	1,810	2,050	1,910

LEGEND

	Monitoring Well Location
	Approximate Release Point
B	Benzene Concentration (µg/L)
T	Toluene Concentration (µg/L)
E	Ethylbenzene Concentration (µg/L)
X	Xylenes Concentration (µg/L)
Cl	Chlorides Concentration (mg/L)
TDS	Total Dissolved Solids Concentration (mg/L)
NA	Not Analyzed

NOTE:

1. Yellow shaded cells indicate exceedance.

Source: Image © 2016 Google - Imagery Date: February 1, 2017

Lat/Long: 32.557054° North, 103.27255° West

0 10 30ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

ETC TEXAS PIPELINE, LTD.
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

2019 GROUNDWATER CONCENTRATION MAP

11209235-01

Mar 5, 2020

FIGURE 7

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Tables

Table 1
Monitoring Well Specifications and Groundwater Elevations
O-6-1 4”
Lea County, New Mexico
ETC Texas Pipeline, Ltd.

Well	Date	TOC Elevation (ft AMSL)	Depth to Water (ft below TOC)	GW Elevation (ft AMSL)
MW-1	9/20/2017	3520.293	24.70	3495.59
	10/17/2017		24.60	3495.69
	1/4/2018		24.43	3495.86
	4/2/2018		24.34	3495.95
	4/12/2018		24.33	3495.96
	4/26/2018		24.64	3495.65
	7/24/2018		24.96	3495.33
	10/1/2018		25.03	3495.26
	3/28/2019		24.37	3495.92
	6/27/2019		24.63	3495.66
	9/25/2019		25.02	3495.27
	12/4/2019		24.82	3495.47
MW-2	1/4/2018	3520.422	24.53	3495.76
	4/2/2018		24.41	3495.88
	4/12/2018		24.40	3496.02
	4/26/2018		24.53	3495.89
	7/24/2018		24.86	3495.56
	10/1/2018		25.13	3495.29
	3/28/2019		24.49	3495.93
	6/27/2019		24.71	3495.71
	9/25/2019		25.10	3495.32
	12/4/2019		24.96	3495.46
MW-3	1/4/2018	3520.451	24.79	3495.66
	4/2/2018		24.34	3496.11
	4/12/2018		24.34	3496.11
	4/26/2018		24.77	3495.68
	7/24/2018		25.24	3495.21
	10/1/2018		25.40	3495.05
	3/28/2019		24.74	3495.71
	6/27/2019		24.96	3495.49
	9/25/2019		25.35	3495.10
	12/4/2019		25.12	3495.33
MW-4	1/4/2018	3520.350	24.65	3495.70
	4/2/2018		24.54	3495.81
	4/12/2018		24.50	3495.85
	4/26/2018		24.42	3495.93
	7/24/2018		25.09	3495.26
	10/1/2018		25.25	3495.10
	3/28/2019		24.60	3495.75
	6/27/2019		24.83	3495.52
	9/25/2019		25.41	3494.94
	12/4/2019		24.98	3495.37
MW-5	1/4/2018	3520.572	24.70	3495.87
	4/2/2018		24.58	3495.99
	4/12/2018		24.56	3496.01
	4/26/2018		24.68	3495.89
	7/24/2018		25.13	3495.44
	10/1/2018		25.31	3495.26
	3/28/2019		24.63	3495.94
	6/27/2019		24.87	3495.70
	9/25/2019		25.29	3495.28
	12/4/2019		25.04	3495.53

Table 2
Field Parameters Summary
O-6-1 4”
Lea County, New Mexico
ETC Texas Pipeline, Ltd.

Well ID	Sample Date	Temperature (°C)	pH	Conductivity (µS/cm)	DO (mg/L)	ORP (mV)
MW-1	9/20/2017	19.79	6.83	2302	0.42	-151.5
	10/17/2017	19.66	7.11	2587	1.88	-192.3
	1/4/2018	19.11	6.75	2605	2.59	-241.3
	4/12/2018	18.8	7.32	2841	9.37	15.8
	4/26/2018	17.86	7.18	3639	--	--
	7/24/2018	17.62	7.06	2594	2.95	--
	10/1/2018	22.01	7.51	2336	0.86	11.4
	3/28/2019	17.27	7.03	5152	1.84	-48.3
	6/27/2019	19.4	7.14	2801	--	--
	9/25/2019	17.36	7.23	--	--	-73
	12/4/2019	18.71	7.03	2901	1.93	-260.3
MW-2	1/4/2018	19.07	7.08	2627	2.9	-191.8
	4/12/2018	18.08	7.34	2955	6.98	-50.6
	4/26/2018	17.58	7.27	3729	--	--
	7/24/2018	18.15	6.63	2560	3.13	--
	10/1/2018	23.29	7.68	2328	1.32	59.8
	3/28/2019	16.89	7	5066	2.54	-29.9
	6/27/2019	19	7.09	2715	--	66
	9/25/2019	17.93	7.24	--	--	-40.6
	12/4/2019	--	--	--	--	--
MW-3	1/4/2018	19.2	7.23	2638	3.67	-138
	4/12/2018	18.36	7.31	2979	10.99	-61.6
	4/26/2018	18	7.26	3880	--	--
	7/24/2018	17.9	7.12	2745	2.22	--
	10/1/2018	21..82	7.66	2572	1.85	54.5
	3/28/2019	17.6	7.03	5489	2.26	37.4
	6/27/2019	19.8	7.13	2922	--	310
	9/25/2019	17.17	6.99	--	--	-96
	12/4/2019	18.95	6.91	3214	1.52	-220.1
MW-4	1/4/2018	19.75	7.04	3081	2.15	-277.2
	4/12/2018	18.37	7.16	3688	3.78	-219.5
	4/26/2018	18.2	7.06	4750	--	--
	7/24/2018	18.6	7.01	3632	2.55	--
	10/1/2018	22.68	7.42	3213	1.09	-183.4
	3/28/2019	7.85	7	5537	2.71	-99.6
	6/27/2019	20.02	7	3376	--	345
	9/25/2019	18.17	6.71	--	--	-122.1
	12/4/2019	19.81	7.01	3151	1.45	-261.5
MW-5	1/4/2018	19.45	7.04	2955	2.06	-275.2
	4/12/2018	18.31	7.29	3131	8.93	-161.1
	4/26/2018	17.99	7.29	4024	--	--
	7/24/2018	18.31	7.06	2953	6.17	--
	10/1/2018	21.59	7.39	2636	1.35	-60.4
	3/28/2019	17.3	6.7	5726	2.49	-85.5
	6/27/2019	19.4	6.96	3060	--	379
	9/25/2019	17.51	6.8	--	--	-121.2
	12/4/2019	19.15	6.96	3027	1.42	-271.3

Notes:
ºC = degress celcius
uS/cm = microsiemens per centimeter
mg/L = milligrams per liter
mV = millivolts
DO = dissolved oxygen
ORP = oxitation reduction potential

Table 3
Groundwater Analytical Results Summary
O-6-1 4”
Lea County, New Mexico
ETC Texas Pipeline, Ltd.

Monitoring Well	Date	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Chlorides (mg/L)	TDS (mg/L)
NMWQCC Standards		**5**	**1000**	**700**	**620**	**250**	**1000**
MW-1	9/20/2017	**200**	77	87	87	**580**	**2010**
	10/17/2017	**150**	50	62	68	**560**	**1620**
	1/4/2018	**130**	<5.0	56	30	**620**	**1720**
	4/26/2018	**23**	<1.0	6.9	1.6	**560**	NA
	7/24/2018	<1.0	<1.0	<1.0	<1.5	**580**	**1770**
	10/1/2018	<1.0	<1.0	<1.0	< 2.0	**630**	**1640**
	3/28/2019	<1.0	<1.0	<1.0	<1.5	**630**	**1730**
	6/27/2019	<1.0	<1.0	<1.0	<2.0	**640**	**1670**
	9/25/2019	<1.0	<1.0	<1.0	<1.5	**590**	**1800**
	12/13/2019	<1.0	<1.0	<1.0	<1.5	**570**	**1700**
MW-2	1/4/2018	<1.0	<1.0	<1.0	<1.5	**710**	**1840**
	4/26/2018	<1.0	<1.0	<1.0	<1.5	**590**	**NA**
	7/24/2018	6.7	<1.0	<1.0	<1.5	**540**	**1770**
	10/1/2018	<1.0	<1.0	<1.0	< 2.0	**630**	**1690**
	3/28/2019	<1.0	<1.0	<1.0	< 2.0	**630**	**1730**
	6/27/2019	<1.0	<1.0	<1.0	<2.0	**640**	**1900**
	9/25/2019	<1.0	<1.0	<1.0	<1.5	**640**	**1980**
	12/4/2019	<1.0	<1.0	<1.0	<1.5	**600**	**1760**
MW-3	1/4/2018	<1.0	<1.0	<1.0	<1.5	**670**	**1930**
	4/26/2018	<1.0	<1.0	<1.0	<1.5	**280**	NA
	7/24/2018	<1.0	<1.0	<1.0	<1.5	**640**	**1980**
	10/1/2018	<1.0	<1.0	<1.0	< 2.0	**740**	**1880**
	3/28/2019	1.5	<1.0	4.5	<1.5	**580**	**1790**
	6/27/2019	<1.0	<1.0	<1.0	<2.0	**670**	**1810**
	9/25/2019	<1.0	<1.0	<1.0	<1.5	**650**	**2050**
	12/4/2019	<1.0	<1.0	<1.0	<1.5	**630**	**1910**
MW-4	1/4/2018	**320**	<1.0	140	8.9	**670**	**2010**
	4/26/2018	**170**	<1.0	160	<1.5	**600**	NA
	7/24/2018	**130**	<1.0	130	<1.5	**670**	**2430**
	10/1/2018	**40**	<1.0	49	< 2.0	**750**	**2430**
	3/28/2019	1.5	<1.0	4.5	<1.5	**580**	**1790**
	6/27/2019	<1.0	<1.0	3.6	<2.0	**670**	**2200**
	9/25/2019	<1.0	<1.0	1.6	<1.5	**550**	**2000**
	12/4/2019	<1.0	<1.0	<1.0	<1.5	**530**	**2000**
MW-5	1/4/2018	**130**	15	77	47	**690**	**1920**
	4/26/2018	**28**	<1.0	26	20	**590**	NA
	7/24/2018	**6**	<1.0	5.5	<1.5	**610**	**2080**
	10/1/2018	1.2	<1.0	1.4	< 2.0	**680**	**1950**
	3/28/2019	1.5	<1.0	4.3	<1.5	**570**	**1780**
	6/27/2019	<1.0	<1.0	<1.0	<2.0	**640**	**1900**
	9/25/2019	<1.0	<1.0	<1.0	<1.5	**640**	**2030**
	12/4/2019	<1.0	<1.0	<1.0	<1.5	**570**	**1820**

Notes:
TDS = Total dissolved solids
NE = Not established
NMWQCC = New Mexico Water Quality Control Commission
NA = Not analyzed
BOLD = Concentrations that exceed the NMWQCC groundwater quality standard
mg/L = Milligrams per liter (parts per million)
ug/L = Micrograms per liter (parts per billion)

Table 4
Soil Analytical Results Summary
O-6-1 4"
Lea County, New Mexico
ETC Texas Pipeline, Ltd.

Sample ID	Date	Sample Depth (ft.)	Chlorides (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH GRO (C6-C10) (mg/kg)	TPH DRO (C10-C28) (mg/kg)	TPH DRO (C28-C36) (mg/kg)	Total TPH (C6-C36) (mg/kg)	Field Screen - Hydrocarbons (ppm)
NMOCD Remediation Action Levels			**600**	**10**		**NE**		**50**		**NE**		**100**	**NE**
Floor 15.5*	3/7/2017	15.5	32	0.084	0.570	0.974	2.62	4.248	45.6	96.2	71.5	**213.3**	NA
Floor Middle Hole 15.5'*	3/8/2017	15.5	16	<0.050	0.076	0.21	0.692	0.978	12.1	51.7	68.4	**132.2**	NA
MW-1	8/29/2017	5-7											1883
MW-1	8/29/2017	10-12											690
S-11135241-082917-MG-MW-1-15-17	8/29/2017	15-17	**1,100**	0.032	<0.048	<0.048	<0.096	0.032	<4.8	<9.8	<49	<63.6	0.0
S-11135241-082917-MG-MW-1-20-22	8/29/2017	20-22	170	<0.025	<0.050	<0.050	<0.099	<0.224	<5.0	<9.4	<47	<61.4	111
S-11135241-082917-MG-MW-1-25-27	8/29/2017	25-27	81	<0.024	<0.047	<0.047	<0.094	<0.212	<4.7	<9.7	<46	<62.4	19
BN-1	8/29/2017	10											398.6
BN-1	8/29/2017	15											124.6
BN-1	8/29/2017	20											7.0
BN-2	8/29/2017	5											0.5
BN-2	8/29/2017	10											1.5
S-11135241-082917-MG-BN-2-15	8/29/2017	15	210	<0.023	<0.047	<0.047	<0.093	<0.210	<4.7	<9.2	<46	<59.9	1.7
S-11135241-082917-MG-BN2-20	8/29/2017	20	130	<0.024	<0.047	<0.047	<0.094	<0.212	<4.7	<9.4	<47	<61.1	2.3
BW	8/29/2017	5											0.9
BW	8/29/2017	10											2.1
S-11135241-082917-MG-BW-15	8/29/2017	15	430	<0.024	<0.048	<0.048	<0.097	<0.217	<4.8	<9.3	<47	<61.1	9.7
S-11135241-082917-MG-BW-20	8/29/2017	20	54	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.5	<48	<62.3	7.4
BS	8/30/2017	5											42
BS	8/30/2017	10											72
S-11135241-083017-MG-BS-15	8/30/2017	15	360	<0.024	<0.049	<0.049	<0.098	<0.220	<4.9	<9.5	<47	<61.4	27
S-11135241-083017-MG-BS-20	8/30/2017	20	140	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<9.1	<46	<59.8	63
BE-1	8/30/2017	5											195
BE-2	8/30/2017	5											228
BE-2	8/30/2017	10											60
S-11135241-083017-MG-BE2-15	8/30/2017	15	75	<0.025	<0.049	<0.049	<0.098	<0.221	<4.9	<9.7	<48	<62.6	72
S-11135241-083017-MG-BE2-20	8/30/2017	20	72	<0.023	<0.046	<0.046	<0.091	<0.206	<4.6	<9.5	<48	<62.1	28
S-11135241-121817-MG-MW-2-5	12/18/2017	5	36	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<9.8	<49	<63.5	--
S-11135241-121817-MG-MW-2-10	12/18/2017	10	86	<0.023	<0.046	<0.046	<0.092	<0.207	<4.6	<9.0	<45	<58.6	--
S-11135241-121817-MG-MW-2-20	12/18/2017	20	57	<0.024	<0.047	<0.047	<0.094	<0.212	<4.7	<9.8	<48	<62.5	--
S-11135241-121917-MG-MW-3-15	12/19/2017	15	140	<0.023	<0.047	<0.047	<0.094	<0.211	<4.6	<9.6	<48	<62.2	--
S-11135241-121917-MG-MW-3-20	12/19/2017	20	120	<0.024	<0.048	<0.048	<0.097	<0.217	<4.8	<10	<50	<64.8	--
S-11135241-121917-MG-MW-3-35	12/19/2017	35	90	<0.025	<0.050	<0.050	<0.010	<0.225	<5.0	<9.6	<48	<62.6	--
S-11135241-121917-MG-MW-4-10	12/19/2017	10	46	<0.024	<0.048	<0.048	<0.095	<0.215	<4.8	<9.8	<49	<63.6	359
S-11135241-121917-MG-MW-4-15	12/19/2017	15	35	<0.023	<0.047	<0.047	<0.093	<0.210	<4.7	<9.8	<49	<63.5	128
S-11135241-121917-MG-MW-4-20	12/19/2017	20	130	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.9	<49	<63.7	292
S-11135241-122017-MG-MW-5-10	12/20/2017	10	<30	<0.025	<0.050	<0.050	<0.010	<0.225	<5.0	<9.5	<48	<62.5	199
S-11135241-122017-MG-MW-5-20	12/20/2017	20	<30	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.5	<48	<62.3	99
S-11135241-122017-MG-MW-5-25	12/20/2017	25	73	<0.023	<0.047	<0.047	<0.093	<0.210	<4.7	<9.4	<47	<61.1	104
S-11135241-122017-MG-AS-1-10	12/20/2017	10	46	<0.024	<0.048	<0.048	<0.096	<0.216	<4.8	<9.9	<50	<64.7	159
S-11135241-122017-MG-AS-1-15	12/20/2017	15	50	<0.023	<0.046	<0.046	<0.093	<0.208	<4.6	<9.3	<46	<59.9	81
S-11135241-122017-MG-AS-1-20	12/20/2017	20	97	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<9.5	<47	<61.2	70
S-11135241-122117-MG-AS-2-10	12/21/2017	10	<30	<0.025	<0.049	<0.049	<0.098	<0.221	<4.9	<9.8	<49	<63.7	102
S-11135241-122117-MG-AS-2-15	12/21/2017	15	<30	<0.023	<0.046	<0.046	<0.092	<0.207	<4.6	<9.3	<47	<60.9	292
S-11135241-122117-MG-AS-2-20	12/21/2017	20	<30	<0.024	<0.049	<0.049	<0.097	<0.220	<4.9	<9.5	<48	<62.4	188

Note: Concentrations that are bold exceed the NMOCD Remediation Action Level
** Sample taken by ETC Field Services*
NE = Not Established
mg/Kg = milligrams per Kilogram
-- = Not Applicable
NA = Not Analyzed
Field screening only

Appendices

Appendix A
Groundwater Laboratory Analytical Reports

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

January 11, 2018

Bernie Bockisch

GHD
6121 Indian School Road, NE #200
Albuquerque, NM 87110
TEL: (505) 884-0672
FAX

RE: SUG 0 6 1 4inch OrderNo.: 1712D91

Dear Bernie Bockisch:

Hall Environmental Analysis Laboratory received 18 sample(s) on 12/22/2017 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-001 **Collection Date:** 12/18/2017 4:10:00 PM
Client Sample ID: S-11135241-121817-MG-MW-2-5 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	36	30		mg/Kg	20	1/7/2018 7:19:01 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	12/28/2017 1:50:19 PM	35723
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/28/2017 1:50:19 PM	35723
Surr: DNOP	87.0	70-130		%Rec	1	12/28/2017 1:50:19 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/27/2017 12:35:10 PM	35701
Surr: BFB	113	15-316		%Rec	1	12/27/2017 12:35:10 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/27/2017 12:35:10 PM	35701
Toluene	ND	0.047		mg/Kg	1	12/27/2017 12:35:10 PM	35701
Ethylbenzene	ND	0.047		mg/Kg	1	12/27/2017 12:35:10 PM	35701
Xylenes, Total	ND	0.094		mg/Kg	1	12/27/2017 12:35:10 PM	35701
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	12/27/2017 12:35:10 PM	35701

Lab ID: 1712D91-002 **Collection Date:** 12/18/2017 4:15:00 PM
Client Sample ID: S-11135241-121817-MG-MW-2-10 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	86	30		mg/Kg	20	1/7/2018 7:56:15 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	12/28/2017 2:12:23 PM	35723
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	12/28/2017 2:12:23 PM	35723
Surr: DNOP	88.3	70-130		%Rec	1	12/28/2017 2:12:23 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	12/27/2017 1:47:25 PM	35701
Surr: BFB	113	15-316		%Rec	1	12/27/2017 1:47:25 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/27/2017 1:47:25 PM	35701
Toluene	ND	0.046		mg/Kg	1	12/27/2017 1:47:25 PM	35701
Ethylbenzene	ND	0.046		mg/Kg	1	12/27/2017 1:47:25 PM	35701
Xylenes, Total	ND	0.092		mg/Kg	1	12/27/2017 1:47:25 PM	35701
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	12/27/2017 1:47:25 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-003 **Collection Date:** 12/18/2017 4:20:00 PM
Client Sample ID: S-11135241-121817-MG-MW-2-20 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	57	30		mg/Kg	20	1/7/2018 8:08:39 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/28/2017 2:34:35 PM	35723
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/28/2017 2:34:35 PM	35723
Surr: DNOP	89.0	70-130		%Rec	1	12/28/2017 2:34:35 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/27/2017 2:11:07 PM	35701
Surr: BFB	109	15-316		%Rec	1	12/27/2017 2:11:07 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/27/2017 2:11:07 PM	35701
Toluene	ND	0.047		mg/Kg	1	12/27/2017 2:11:07 PM	35701
Ethylbenzene	ND	0.047		mg/Kg	1	12/27/2017 2:11:07 PM	35701
Xylenes, Total	ND	0.094		mg/Kg	1	12/27/2017 2:11:07 PM	35701
Surr: 4-Bromofluorobenzene	96.5	80-120		%Rec	1	12/27/2017 2:11:07 PM	35701

Lab ID: 1712D91-004 **Collection Date:** 12/19/2017 10:50:00 AM
Client Sample ID: S-11135241-121917-MG-MW-3-15 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	140	30		mg/Kg	20	1/7/2018 8:21:04 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/28/2017 3:18:51 PM	35723
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/28/2017 3:18:51 PM	35723
Surr: DNOP	81.3	70-130		%Rec	1	12/28/2017 3:18:51 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/27/2017 2:34:53 PM	35701
Surr: BFB	109	15-316		%Rec	1	12/27/2017 2:34:53 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/27/2017 2:34:53 PM	35701
Toluene	ND	0.047		mg/Kg	1	12/27/2017 2:34:53 PM	35701
Ethylbenzene	ND	0.047		mg/Kg	1	12/27/2017 2:34:53 PM	35701
Xylenes, Total	ND	0.094		mg/Kg	1	12/27/2017 2:34:53 PM	35701
Surr: 4-Bromofluorobenzene	97.8	80-120		%Rec	1	12/27/2017 2:34:53 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-005 **Collection Date:** 12/19/2017 10:55:00 AM
Client Sample ID: S-11135241-121917-MG-MW-3-20 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	120	30		mg/Kg	20	1/10/2018 4:16:31 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	12/28/2017 3:40:53 PM	35723
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/28/2017 3:40:53 PM	35723
Surr: DNOP	86.1	70-130		%Rec	1	12/28/2017 3:40:53 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/27/2017 3:22:25 PM	35701
Surr: BFB	111	15-316		%Rec	1	12/27/2017 3:22:25 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/27/2017 3:22:25 PM	35701
Toluene	ND	0.048		mg/Kg	1	12/27/2017 3:22:25 PM	35701
Ethylbenzene	ND	0.048		mg/Kg	1	12/27/2017 3:22:25 PM	35701
Xylenes, Total	ND	0.097		mg/Kg	1	12/27/2017 3:22:25 PM	35701
Surr: 4-Bromofluorobenzene	99.9	80-120		%Rec	1	12/27/2017 3:22:25 PM	35701

Lab ID: 1712D91-006 **Collection Date:** 12/19/2017 11:00:00 AM
Client Sample ID: S-11135241-121917-MG-MW-3-35 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	90	30		mg/Kg	20	1/10/2018 4:53:46 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/28/2017 4:03:24 PM	35723
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/28/2017 4:03:24 PM	35723
Surr: DNOP	84.4	70-130		%Rec	1	12/28/2017 4:03:24 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/27/2017 3:46:15 PM	35701
Surr: BFB	110	15-316		%Rec	1	12/27/2017 3:46:15 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	12/27/2017 3:46:15 PM	35701
Toluene	ND	0.050		mg/Kg	1	12/27/2017 3:46:15 PM	35701
Ethylbenzene	ND	0.050		mg/Kg	1	12/27/2017 3:46:15 PM	35701
Xylenes, Total	ND	0.10		mg/Kg	1	12/27/2017 3:46:15 PM	35701
Surr: 4-Bromofluorobenzene	99.0	80-120		%Rec	1	12/27/2017 3:46:15 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-007 **Collection Date:** 12/19/2017 2:25:00 PM
Client Sample ID: S-11135241-121917-MG-MW-4-10 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	46	30		mg/Kg	20	1/10/2018 5:06:11 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	12/28/2017 4:25:31 PM	35723
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/28/2017 4:25:31 PM	35723
Surr: DNOP	80.9	70-130		%Rec	1	12/28/2017 4:25:31 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/27/2017 4:09:56 PM	35701
Surr: BFB	111	15-316		%Rec	1	12/27/2017 4:09:56 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/27/2017 4:09:56 PM	35701
Toluene	ND	0.048		mg/Kg	1	12/27/2017 4:09:56 PM	35701
Ethylbenzene	ND	0.048		mg/Kg	1	12/27/2017 4:09:56 PM	35701
Xylenes, Total	ND	0.095		mg/Kg	1	12/27/2017 4:09:56 PM	35701
Surr: 4-Bromofluorobenzene	99.6	80-120		%Rec	1	12/27/2017 4:09:56 PM	35701

Lab ID: 1712D91-008 **Collection Date:** 12/19/2017 2:30:00 PM
Client Sample ID: S-11135241-121917-MG-MW-4-15 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	35	30		mg/Kg	20	1/10/2018 5:18:36 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	12/28/2017 4:47:45 PM	35723
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/28/2017 4:47:45 PM	35723
Surr: DNOP	80.8	70-130		%Rec	1	12/28/2017 4:47:45 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/27/2017 4:33:38 PM	35701
Surr: BFB	112	15-316		%Rec	1	12/27/2017 4:33:38 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/27/2017 4:33:38 PM	35701
Toluene	ND	0.047		mg/Kg	1	12/27/2017 4:33:38 PM	35701
Ethylbenzene	ND	0.047		mg/Kg	1	12/27/2017 4:33:38 PM	35701
Xylenes, Total	ND	0.093		mg/Kg	1	12/27/2017 4:33:38 PM	35701
Surr: 4-Bromofluorobenzene	99.9	80-120		%Rec	1	12/27/2017 4:33:38 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-009 **Collection Date:** 12/19/2017 2:35:00 PM
Client Sample ID: S-11135241-121917-MG-MW-4-20 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	130	30		mg/Kg	20	1/10/2018 5:55:50 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	12/28/2017 5:09:49 PM	35723
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/28/2017 5:09:49 PM	35723
Surr: DNOP	83.2	70-130		%Rec	1	12/28/2017 5:09:49 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/29/2017 1:55:25 PM	35701
Surr: BFB	89.0	15-316		%Rec	1	12/29/2017 1:55:25 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/29/2017 1:55:25 PM	35701
Toluene	ND	0.048		mg/Kg	1	12/29/2017 1:55:25 PM	35701
Ethylbenzene	ND	0.048		mg/Kg	1	12/29/2017 1:55:25 PM	35701
Xylenes, Total	ND	0.096		mg/Kg	1	12/29/2017 1:55:25 PM	35701
Surr: 4-Bromofluorobenzene	100	80-120		%Rec	1	12/29/2017 1:55:25 PM	35701

Lab ID: 1712D91-010 **Collection Date:** 12/20/2017 9:20:00 AM
Client Sample ID: S-11135241-122017-MG-MW-5-10 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	1/10/2018 6:08:14 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	12/28/2017 5:31:54 PM	35723
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/28/2017 5:31:54 PM	35723
Surr: DNOP	86.8	70-130		%Rec	1	12/28/2017 5:31:54 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	12/29/2017 2:18:55 PM	35701
Surr: BFB	85.0	15-316		%Rec	1	12/29/2017 2:18:55 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	12/29/2017 2:18:55 PM	35701
Toluene	ND	0.050		mg/Kg	1	12/29/2017 2:18:55 PM	35701
Ethylbenzene	ND	0.050		mg/Kg	1	12/29/2017 2:18:55 PM	35701
Xylenes, Total	ND	0.10		mg/Kg	1	12/29/2017 2:18:55 PM	35701
Surr: 4-Bromofluorobenzene	97.2	80-120		%Rec	1	12/29/2017 2:18:55 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-011 **Collection Date:** 12/20/2017 9:25:00 AM
Client Sample ID: S-11135241-122017-MG-MW-5-20 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	1/10/2018 6:20:39 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	12/28/2017 5:53:49 PM	35723
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/28/2017 5:53:49 PM	35723
Surr: DNOP	87.0	70-130		%Rec	1	12/28/2017 5:53:49 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/29/2017 2:42:26 PM	35701
Surr: BFB	84.6	15-316		%Rec	1	12/29/2017 2:42:26 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/29/2017 2:42:26 PM	35701
Toluene	ND	0.048		mg/Kg	1	12/29/2017 2:42:26 PM	35701
Ethylbenzene	ND	0.048		mg/Kg	1	12/29/2017 2:42:26 PM	35701
Xylenes, Total	ND	0.096		mg/Kg	1	12/29/2017 2:42:26 PM	35701
Surr: 4-Bromofluorobenzene	95.5	80-120		%Rec	1	12/29/2017 2:42:26 PM	35701

Lab ID: 1712D91-012 **Collection Date:** 12/20/2017 9:30:00 AM
Client Sample ID: S-11135241-122017-MG-MW-5-25 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	73	30		mg/Kg	20	1/9/2018 12:17:16 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	12/28/2017 6:15:54 PM	35723
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/28/2017 6:15:54 PM	35723
Surr: DNOP	87.7	70-130		%Rec	1	12/28/2017 6:15:54 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/29/2017 3:06:01 PM	35701
Surr: BFB	86.8	15-316		%Rec	1	12/29/2017 3:06:01 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/29/2017 3:06:01 PM	35701
Toluene	ND	0.047		mg/Kg	1	12/29/2017 3:06:01 PM	35701
Ethylbenzene	ND	0.047		mg/Kg	1	12/29/2017 3:06:01 PM	35701
Xylenes, Total	ND	0.093		mg/Kg	1	12/29/2017 3:06:01 PM	35701
Surr: 4-Bromofluorobenzene	96.7	80-120		%Rec	1	12/29/2017 3:06:01 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-013 **Collection Date:** 12/20/2017 11:30:00 AM
Client Sample ID: S-11135241-122017-MG-AS-1-10 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	46	30		mg/Kg	20	1/9/2018 12:42:05 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	12/28/2017 6:37:47 PM	35723
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	12/28/2017 6:37:47 PM	35723
Surr: DNOP	89.3	70-130		%Rec	1	12/28/2017 6:37:47 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/29/2017 3:29:31 PM	35701
Surr: BFB	90.6	15-316		%Rec	1	12/29/2017 3:29:31 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/29/2017 3:29:31 PM	35701
Toluene	ND	0.048		mg/Kg	1	12/29/2017 3:29:31 PM	35701
Ethylbenzene	ND	0.048		mg/Kg	1	12/29/2017 3:29:31 PM	35701
Xylenes, Total	ND	0.096		mg/Kg	1	12/29/2017 3:29:31 PM	35701
Surr: 4-Bromofluorobenzene	92.4	80-120		%Rec	1	12/29/2017 3:29:31 PM	35701

Lab ID: 1712D91-014 **Collection Date:** 12/20/2017 11:35:00 AM
Client Sample ID: S-11135241-122017-MG-AS-1-15 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	50	30		mg/Kg	20	1/9/2018 1:19:19 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	12/28/2017 6:59:46 PM	35723
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	12/28/2017 6:59:46 PM	35723
Surr: DNOP	87.8	70-130		%Rec	1	12/28/2017 6:59:46 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	12/29/2017 6:12:30 PM	35701
Surr: BFB	80.8	15-316		%Rec	1	12/29/2017 6:12:30 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/29/2017 6:12:30 PM	35701
Toluene	ND	0.046		mg/Kg	1	12/29/2017 6:12:30 PM	35701
Ethylbenzene	ND	0.046		mg/Kg	1	12/29/2017 6:12:30 PM	35701
Xylenes, Total	ND	0.093		mg/Kg	1	12/29/2017 6:12:30 PM	35701
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	1	12/29/2017 6:12:30 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-015 **Collection Date:** 12/20/2017 11:40:00 AM
Client Sample ID: S-11135241-122017-MG-AS-1-20 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	97	30		mg/Kg	20	1/9/2018 1:31:44 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	12/28/2017 7:21:37 PM	35723
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/28/2017 7:21:37 PM	35723
Surr: DNOP	84.2	70-130		%Rec	1	12/28/2017 7:21:37 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/29/2017 6:35:40 PM	35701
Surr: BFB	80.2	15-316		%Rec	1	12/29/2017 6:35:40 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/29/2017 6:35:40 PM	35701
Toluene	ND	0.047		mg/Kg	1	12/29/2017 6:35:40 PM	35701
Ethylbenzene	ND	0.047		mg/Kg	1	12/29/2017 6:35:40 PM	35701
Xylenes, Total	ND	0.094		mg/Kg	1	12/29/2017 6:35:40 PM	35701
Surr: 4-Bromofluorobenzene	90.9	80-120		%Rec	1	12/29/2017 6:35:40 PM	35701

Lab ID: 1712D91-016 **Collection Date:** 12/21/2017 9:20:00 AM
Client Sample ID: S-11135241-122117-MG-AS-2-10 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	1/9/2018 1:44:09 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	12/28/2017 7:43:36 PM	35723
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	12/28/2017 7:43:36 PM	35723
Surr: DNOP	87.3	70-130		%Rec	1	12/28/2017 7:43:36 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/29/2017 6:59:07 PM	35701
Surr: BFB	82.1	15-316		%Rec	1	12/29/2017 6:59:07 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.025		mg/Kg	1	12/29/2017 6:59:07 PM	35701
Toluene	ND	0.049		mg/Kg	1	12/29/2017 6:59:07 PM	35701
Ethylbenzene	ND	0.049		mg/Kg	1	12/29/2017 6:59:07 PM	35701
Xylenes, Total	ND	0.098		mg/Kg	1	12/29/2017 6:59:07 PM	35701
Surr: 4-Bromofluorobenzene	93.8	80-120		%Rec	1	12/29/2017 6:59:07 PM	35701

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: GHD
Project: SUG 0 6 1 4inch
Lab Order: 1712D91

Lab ID: 1712D91-017 **Collection Date:** 12/21/2017 9:25:00 AM
Client Sample ID: S-11135241-122117-MG-AS-2-15 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	1/9/2018 1:56:34 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.3		mg/Kg	1	12/28/2017 8:05:21 PM	35723
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/28/2017 8:05:21 PM	35723
Surr: DNOP	92.6	70-130		%Rec	1	12/28/2017 8:05:21 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	12/29/2017 7:22:26 PM	35701
Surr: BFB	82.5	15-316		%Rec	1	12/29/2017 7:22:26 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/29/2017 7:22:26 PM	35701
Toluene	ND	0.046		mg/Kg	1	12/29/2017 7:22:26 PM	35701
Ethylbenzene	ND	0.046		mg/Kg	1	12/29/2017 7:22:26 PM	35701
Xylenes, Total	ND	0.092		mg/Kg	1	12/29/2017 7:22:26 PM	35701
Surr: 4-Bromofluorobenzene	93.2	80-120		%Rec	1	12/29/2017 7:22:26 PM	35701

Lab ID: 1712D91-018 **Collection Date:** 12/21/2017 9:30:00 AM
Client Sample ID: S-11135241-122117-MG-AS-2-20 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	1/9/2018 2:08:59 PM	35887
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	12/28/2017 8:27:09 PM	35723
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/28/2017 8:27:09 PM	35723
Surr: DNOP	88.2	70-130		%Rec	1	12/28/2017 8:27:09 PM	35723
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	12/29/2017 7:45:48 PM	35701
Surr: BFB	81.3	15-316		%Rec	1	12/29/2017 7:45:48 PM	35701
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/29/2017 7:45:48 PM	35701
Toluene	ND	0.049		mg/Kg	1	12/29/2017 7:45:48 PM	35701
Ethylbenzene	ND	0.049		mg/Kg	1	12/29/2017 7:45:48 PM	35701
Xylenes, Total	ND	0.097		mg/Kg	1	12/29/2017 7:45:48 PM	35701
Surr: 4-Bromofluorobenzene	95.8	80-120		%Rec	1	12/29/2017 7:45:48 PM	35701

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#: **1712D91**

11-Jan-18

Client: GHD

Project: SUG 0 6 1 4inch

Sample ID	**MB-35887**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**35887**	RunNo:	**48295**					
Prep Date:	**1/6/2018**	Analysis Date:	**1/7/2018**	SeqNo:	**1551034**	Units:	**mg/Kg**			

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

Sample ID	**LCS-35887**	SampType:	**lcs**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**35887**	RunNo:	**48295**					
Prep Date:	**1/6/2018**	Analysis Date:	**1/7/2018**	SeqNo:	**1551035**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	96.7	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#: **1712D91**

11-Jan-18

Client: GHD

Project: SUG 0 6 1 4inch

Sample ID	**LCS-35723**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**35723**		RunNo:	**48061**				
Prep Date:	**12/27/2017**	Analysis Date:	**12/28/2017**		SeqNo:	**1540950**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	95.6	73.2	114			
Surr: DNOP	4.4		5.000		87.5	70	130			

Sample ID	**MB-35723**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**35723**		RunNo:	**48061**				
Prep Date:	**12/27/2017**	Analysis Date:	**12/28/2017**		SeqNo:	**1540955**	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	8.9		10.00		88.7	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#: **1712D91**

11-Jan-18

Client: GHD

Project: SUG 0 6 1 4inch

Sample ID	**MB-35701**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBS**	Batch ID:	**35701**	RunNo:	**48032**					
Prep Date:	**12/26/2017**	Analysis Date:	**12/27/2017**	SeqNo:	**1539809**	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		114	15	316			

Sample ID	**LCS-35701**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSS**	Batch ID:	**35701**	RunNo:	**48032**					
Prep Date:	**12/26/2017**	Analysis Date:	**12/27/2017**	SeqNo:	**1539810**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	109	75.9	131			
Surr: BFB	1200		1000		124	15	316			

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#: **1712D91**

11-Jan-18

Client: GHD

Project: SUG 0 6 1 4inch

Sample ID	**MB-35701**	SampType: **MBLK**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**PBS**	Batch ID: **35701**		RunNo: **48032**					
Prep Date:	**12/26/2017**	Analysis Date: **12/27/2017**		SeqNo: **1539826**		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	**1712D91-001AMS**	SampType: **MS**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**S-11135241-121817-**	Batch ID: **35701**		RunNo: **48032**					
Prep Date:	**12/26/2017**	Analysis Date: **12/27/2017**		SeqNo: **1539829**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.024	0.9588	0	120	80.9	132			
Toluene	1.2	0.048	0.9588	0.01502	120	79.8	136			
Ethylbenzene	1.1	0.048	0.9588	0	119	79.4	140			
Xylenes, Total	3.4	0.096	2.876	0	118	78.5	142			
Surr: 4-Bromofluorobenzene	1.0		0.9588		104	80	120			

Sample ID	**1712D91-001AMSD**	SampType: **MSD**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**S-11135241-121817-**	Batch ID: **35701**		RunNo: **48032**					
Prep Date:	**12/26/2017**	Analysis Date: **12/27/2017**		SeqNo: **1539830**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	0.9901	0	107	80.9	132	8.09	20	
Toluene	1.1	0.050	0.9901	0.01502	109	79.8	136	6.58	20	
Ethylbenzene	1.1	0.050	0.9901	0	109	79.4	140	6.12	20	
Xylenes, Total	3.2	0.099	2.970	0	108	78.5	142	5.95	20	
Surr: 4-Bromofluorobenzene	1.0		0.9901		105	80	120	0	0	

Sample ID	**LCS-35701**	SampType: **LCS**		TestCode: **EPA Method 8021B: Volatiles**					
Client ID:	**LCSS**	Batch ID: **35701**		RunNo: **48085**					
Prep Date:	**12/26/2017**	Analysis Date: **12/28/2017**		SeqNo: **1541205**		Units: **mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.83	0.025	1.000	0	83.0	77.3	128			
Toluene	0.86	0.050	1.000	0	86.3	79.2	125			
Ethylbenzene	0.87	0.050	1.000	0	86.7	80.7	127			
Xylenes, Total	2.6	0.10	3.000	0	86.4	81.6	129			
Surr: 4-Bromofluorobenzene	1.0		1.000		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: GHD | Work Order Number: 1712D91 | RcptNo: 1

Received By: Erin Melendrez 12/22/2017 9:40:00 AM

Completed By: Sophia Campuzano 12/22/2017 2:17:28 PM

Reviewed By: DPS 12/26/17

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted? _____
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by: _____

Special Handling (if applicable)

16. 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: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.6	Good	Yes			

Chain-of-Custody Record

Client: GHD Services Inc.

Mailing Address: 6121 Indian School Rd Ste 200 NE Albuquerque, NM 87110

Phone #: 505 884 0672

email or Fax#: Bernard.Backisch@ghd.com

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name:
(506) O-6-1 4inch

Project #:
111352411.

Project Manager:
Bernard Backisch

Sampler: Michael Gant

On Ice: ☒ Yes ☐ No

Sample Temperature: 5.1-0.5(CF)=4.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1712D91	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride 300				Air Bubbles (Y or N)
12/18/17	1610	S	S-111352411-121817-MG-MW2-5	4oz Soil Jar	ICE	-001	X		X									X				
12/18/17	1615		S-111352411-121817-MG-MW2-10			-002	X		X									X				
12/18/17	1620		S-111352411-121817-MG-MW-2-20			-003	X		X									X				
12/19/17	1050		S-111352411-121917-MG-MW-3-15			-004	X		X									X				
12/19/17	1055		S-111352411-121917-MG-MW-3-20			-005	X		X									X				
12/19/17	1100		S-111352411-121917-MG-MW3-35			-006	X		X									X				
12/19/17	1425		S-111352411-121917-MG-MW-4-10			-007	X		X									X				
12/19/17	1430		S-111352411-121917-MG-MW-4-15			-008	X		X									X				
12/19/17	1435		S-111352411-121917-MG-MW-4-20			-009	X		X									X				
12/20/17	0920		S-111352411-122017-MG-MW-5-10			-010	X		X									X				
12/20/17	0925		S-111352411-122017-MG-MW-5-20			-011	X		X									X				
12/20/17	0930		S-111352411-122017-MG-MW-5-25			-012	X		X									X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
12/21/17	1322			12/21/17	1322
12/21/17	1900			12/22/17	0840

Remarks:

Courier

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

Chain-of-Custody Record

Client: GHD Services Inc.

Mailing Address: 6121 Indian School Rd Ste 200 NE Albuquerque, NM 87110

Phone #: 505 884 0672

email or Fax#: Bernard.Bockisch@ghd.com

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: (SWG) 0-6-1 4inch

Project #: 11135241

Project Manager: Bernard Bockisch

Sampler: Michael Gant

On Ice: ☒ Yes ☐ No

Sample Temperature: 5.1-0.5(CF) = 4.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1712D08191	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride 300				Air Bubbles (Y or N)
12/20/17	1130	S	S-11135241-122017-MG-AS-1-10	4oz Soil Jar	ICE	-0013	X		X									X				
12/20/17	1135		S-11135241-122017-MG-AS-1-15			-0014	X		X									X				
12/20/17	1140		S-11135241-122017-MG-AS-1-20			-0015	X		X									X				
12/21/17	0920		S-11135241-122017-MG-AS-2-10			-0016	X		X									X				
12/21/17	0925		S-11135241-122017-MG-AS-2-15			-0017	X		X									X				
12/21/17	0930		S-11135241-122017-MG-AS-2-20			-0018	X		X									X				

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
12/21/17	1322			12/21/17	1322	
12/21/17	1902			12/22/17	0940	

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.

courier

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

April 08, 2019

Christine Mathews
GHD
6121 Indian School Road, NE #200
Albuquerque, NM 87110
TEL: (505) 884-0672
FAX

RE: ETC 0 6 1 4 inch Line Release OrderNo.: 1903E36

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 7 sample(s) on 3/29/2019 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: GHD **Lab Order:** 1903E36
Project: ETC 0 6 1 4 inch Line Release

Lab ID: 1903E36-001 **Collection Date:** 3/28/2019 10:20:00 AM
Client Sample ID: GW-11135241-2019-032819-PL-MW-1 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	580	50	*	mg/L	100	4/3/2019 3:06:54 PM	R58889
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1640	20.0	*	mg/L	1	4/2/2019 1:45:00 PM	43993
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	4/4/2019 12:20:00 AM	R58887
Toluene	ND	1.0		µg/L	1	4/4/2019 12:20:00 AM	R58887
Ethylbenzene	ND	1.0		µg/L	1	4/4/2019 12:20:00 AM	R58887
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 12:20:00 AM	R58887
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	4/4/2019 12:20:00 AM	R58887
Surr: 4-Bromofluorobenzene	96.7	70-130		%Rec	1	4/4/2019 12:20:00 AM	R58887
Surr: Dibromofluoromethane	99.0	70-130		%Rec	1	4/4/2019 12:20:00 AM	R58887
Surr: Toluene-d8	97.8	70-130		%Rec	1	4/4/2019 12:20:00 AM	R58887

Lab ID: 1903E36-002 **Collection Date:** 3/28/2019 10:43:00 AM
Client Sample ID: GW-11135241-2019-032819-PL-MW-2 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	630	50	*	mg/L	100	4/3/2019 3:32:37 PM	R58889
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1730	40.0	*D	mg/L	1	4/2/2019 1:45:00 PM	43993
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	4/4/2019 2:54:00 PM	SL5889
Toluene	ND	1.0		µg/L	1	4/4/2019 2:54:00 PM	SL5889
Ethylbenzene	ND	1.0		µg/L	1	4/4/2019 2:54:00 PM	SL5889
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 2:54:00 PM	SL5889
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	4/4/2019 2:54:00 PM	SL5889
Surr: 4-Bromofluorobenzene	98.1	70-130		%Rec	1	4/4/2019 2:54:00 PM	SL5889
Surr: Dibromofluoromethane	100	70-130		%Rec	1	4/4/2019 2:54:00 PM	SL5889
Surr: Toluene-d8	95.7	70-130		%Rec	1	4/4/2019 2:54:00 PM	SL5889

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	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 at testcode		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD **Lab Order:** 1903E36
Project: ETC 0 6 1 4 inch Line Release

Lab ID: 1903E36-003 **Collection Date:** 3/28/2019 11:20:00 AM
Client Sample ID: GW-11135241-2019-032819-PL-MW-3 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	650	50	*	mg/L	100	4/3/2019 3:58:21 PM	R58889
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1690	40.0	*D	mg/L	1	4/2/2019 1:45:00 PM	43993
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	4/4/2019 1:07:00 AM	R58887
Toluene	ND	1.0		µg/L	1	4/4/2019 1:07:00 AM	R58887
Ethylbenzene	ND	1.0		µg/L	1	4/4/2019 1:07:00 AM	R58887
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 1:07:00 AM	R58887
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	4/4/2019 1:07:00 AM	R58887
Surr: 4-Bromofluorobenzene	99.1	70-130		%Rec	1	4/4/2019 1:07:00 AM	R58887
Surr: Dibromofluoromethane	98.9	70-130		%Rec	1	4/4/2019 1:07:00 AM	R58887
Surr: Toluene-d8	95.3	70-130		%Rec	1	4/4/2019 1:07:00 AM	R58887

Lab ID: 1903E36-004 **Collection Date:** 3/28/2019 12:10:00 PM
Client Sample ID: GW-11135241-2019-032819-PL-MW-4 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	580	50	*	mg/L	100	4/3/2019 4:49:52 PM	R58889
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1790	40.0	*D	mg/L	1	4/2/2019 1:45:00 PM	43993
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	1.5	1.0		µg/L	1	4/4/2019 3:18:00 PM	SL5889
Toluene	ND	1.0		µg/L	1	4/4/2019 3:18:00 PM	SL5889
Ethylbenzene	4.5	1.0		µg/L	1	4/4/2019 3:18:00 PM	SL5889
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 3:18:00 PM	SL5889
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	4/4/2019 3:18:00 PM	SL5889
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	4/4/2019 3:18:00 PM	SL5889
Surr: Dibromofluoromethane	98.5	70-130		%Rec	1	4/4/2019 3:18:00 PM	SL5889
Surr: Toluene-d8	96.7	70-130		%Rec	1	4/4/2019 3:18:00 PM	SL5889

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode
H	Holding times for preparation or analysis exceeded
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD **Lab Order:** 1903E36
Project: ETC 0 6 1 4 inch Line Release

Lab ID: 1903E36-005 **Collection Date:** 3/28/2019 12:57:00 PM
Client Sample ID: GW-11135241-2019-032819-PL-MW-5 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	620	50	*	mg/L	100	4/3/2019 5:15:36 PM	R58889
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1770	40.0	*D	mg/L	1	4/2/2019 1:45:00 PM	43993
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	4/4/2019 1:55:00 AM	R58887
Toluene	ND	1.0		µg/L	1	4/4/2019 1:55:00 AM	R58887
Ethylbenzene	ND	1.0		µg/L	1	4/4/2019 1:55:00 AM	R58887
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 1:55:00 AM	R58887
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	4/4/2019 1:55:00 AM	R58887
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	4/4/2019 1:55:00 AM	R58887
Surr: Dibromofluoromethane	99.0	70-130		%Rec	1	4/4/2019 1:55:00 AM	R58887
Surr: Toluene-d8	94.5	70-130		%Rec	1	4/4/2019 1:55:00 AM	R58887

Lab ID: 1903E36-006 **Collection Date:** 3/28/2019
Client Sample ID: GW-11135241-2019-032819-PL-DUP **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	570	50	*	mg/L	100	4/3/2019 5:41:19 PM	R58889
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1780	40.0	*D	mg/L	1	4/2/2019 1:45:00 PM	43993
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	1.5	1.0		µg/L	1	4/4/2019 3:42:00 PM	SL5889
Toluene	ND	1.0		µg/L	1	4/4/2019 3:42:00 PM	SL5889
Ethylbenzene	4.3	1.0		µg/L	1	4/4/2019 3:42:00 PM	SL5889
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 3:42:00 PM	SL5889
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	4/4/2019 3:42:00 PM	SL5889
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	4/4/2019 3:42:00 PM	SL5889
Surr: Dibromofluoromethane	98.6	70-130		%Rec	1	4/4/2019 3:42:00 PM	SL5889
Surr: Toluene-d8	96.1	70-130		%Rec	1	4/4/2019 3:42:00 PM	SL5889

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	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 at testcode		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD **Lab Order:** 1903E36
Project: ETC 0 6 1 4 inch Line Release

Lab ID: 1903E36-007 **Collection Date:**
Client Sample ID: Trip Blank **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	4/4/2019 2:43:00 AM	R58887
Toluene	ND	1.0		µg/L	1	4/4/2019 2:43:00 AM	R58887
Ethylbenzene	ND	1.0		µg/L	1	4/4/2019 2:43:00 AM	R58887
Xylenes, Total	ND	1.5		µg/L	1	4/4/2019 2:43:00 AM	R58887
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	4/4/2019 2:43:00 AM	R58887
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	4/4/2019 2:43:00 AM	R58887
Surr: Dibromofluoromethane	97.3	70-130		%Rec	1	4/4/2019 2:43:00 AM	R58887
Surr: Toluene-d8	97.0	70-130		%Rec	1	4/4/2019 2:43:00 AM	R58887

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode
H	Holding times for preparation or analysis exceeded
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1903E36**

08-Apr-19

Client: GHD

Project: ETC 0 6 1 4 inch Line Release

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R58889**	RunNo: **58889**
Prep Date:	Analysis Date: **4/3/2019**	SeqNo: **1979762** Units: **mg/L**

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

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R58889**	RunNo: **58889**
Prep Date:	Analysis Date: **4/3/2019**	SeqNo: **1979763** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode
H	Holding times for preparation or analysis exceeded
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1903E36**

08-Apr-19

Client: GHD

Project: ETC 0 6 1 4 inch Line Release

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R58887**	RunNo: **58887**
Prep Date:	Analysis Date: **4/3/2019**	SeqNo: **1979598** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	21	1.0	20.00	0	104	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.6	70	130			
Surr: Toluene-d8	9.5		10.00		95.5	70	130			

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R58887**	RunNo: **58887**
Prep Date:	Analysis Date: **4/3/2019**	SeqNo: **1979599** 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								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		97.3	70	130			
Surr: Dibromofluoromethane	9.9		10.00		99.2	70	130			
Surr: Toluene-d8	9.5		10.00		95.4	70	130			

Sample ID: **100NG LCS**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL58891**	RunNo: **58891**
Prep Date:	Analysis Date: **4/4/2019**	SeqNo: **1982339** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	20	1.0	20.00	0	102	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.6	70	130			
Surr: Toluene-d8	9.6		10.00		96.1	70	130			

Sample ID: **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL58891**	RunNo: **58891**
Prep Date:	Analysis Date: **4/4/2019**	SeqNo: **1982340** 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								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode
H	Holding times for preparation or analysis exceeded
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1903E36**
08-Apr-19

Client: GHD
Project: ETC 0 6 1 4 inch Line Release

Sample ID: **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL58891**	RunNo: **58891**
Prep Date:	Analysis Date: **4/4/2019**	SeqNo: **1982340** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		106	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.1	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.6		10.00		95.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode
H	Holding times for preparation or analysis exceeded
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1903E36**

08-Apr-19

Client: GHD

Project: ETC 0 6 1 4 inch Line Release

Sample ID: **MB-43993**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **43993**	RunNo: **58818**
Prep Date: **3/30/2019**	Analysis Date: **4/2/2019**	SeqNo: **1976833** 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-43993**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **43993**	RunNo: **58818**
Prep Date: **3/30/2019**	Analysis Date: **4/2/2019**	SeqNo: **1976834** Units: **mg/L**

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

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified at testcode
H	Holding times for preparation or analysis exceeded
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **GHD** Work Order Number: **1903E36** RcptNo: **1**

Received By: **Leah Baca** **3/29/2019 8:40:00 AM** Leah S Baca

Completed By: **Erin Melendrez** **3/29/2019 10:39:40 AM**

Reviewed By: DAD 3/29/19
LB: MA 03/29/19

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered?

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 ☑

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

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 ☐

Special Handling (if applicable)

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

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

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.4	Good	Yes			
2	1.7	Good	Yes			
3	1.6	Good	Yes			
4	2.0	Good	Yes			

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: **GHD** Work Order Number: **1903E36** RcptNo: **1**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
5	3.3	Good	Yes			
6	5.7	Good	Yes			

Chain-of-Custody Record

Client: GHD Services, Inc

Mailing Address: 6121 Indian School Rd. NE Ste 200 Albuquerque, NM 87110

Phone #: 505-269-0088

email or Fax#: Christine.Mathews@ghd.com

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: ETC 0-6-1 4" Line Release

Project #: 01113524 1-2019

Project Manager: Christine Mathews

Sampler: Phil Lorang

On Ice: ☑ Yes ☐ No

# of Coolers: (6)

Cooler Temp (including CF): 4.4, 1.7, 1.6, 2.0, 3.3 C 5.7

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. 1903E36	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) BTEX	8270 (Semi-VOA)	Total Coliform (Present/Absent)	TDS SM 2540
3-28-19	10:20	GW	GW-111352 41-2019-032819-PL-MW-1	Bottle -1 VOA -3	HCL/Ice	-001							X	X			X
	10:43		GW-111352 41-2019-032819-PL-MW-2			-002							X	X			X
	11:20		GW-111352 41-2019-032819-PL-MW-3			-003							X	X			X
	12:10		GW-111352 41-2019-032819-PL-MW-4			-004							X	X			X
	12:57		GW-111352 41-2019-032819-PL-MW-5			-005							X	X			X
	—		GW-111352 41-2019-032819-PL-DUP			-006							X	X			X
			Trip Blank 1M 03/29			-007											

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
3-28-19	16:30				3/28/19	1630
3/28/19	1900			Courier	3/29/19	0810

Remarks:

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

July 10, 2019

Christine Mathews
GHD
6121 Indian School Road, NE #200
Albuquerque, NM 87110
TEL: (505) 884-0672
FAX:

RE: 0 6 1 OrderNo.: 1906G49

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 6 sample(s) on 6/29/2019 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: GHD
Project: 0 6 1

Lab Order: 1906G49

Lab ID: 1906G49-001 **Collection Date:** 6/27/2019 11:10:00 AM
Client Sample ID: GW-11135241-062719-JW-MW2 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	650	50	*	mg/L	100	7/3/2019 8:56:42 PM	R61167
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1700	20.0	*	mg/L	1	7/9/2019 2:54:00 PM	45992
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 1:11:38 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 1:11:38 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 1:11:38 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 1:11:38 PM	B61223
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	1	7/8/2019 1:11:38 PM	B61223

Lab ID: 1906G49-002 **Collection Date:** 6/27/2019 11:45:00 AM
Client Sample ID: GW-11135241-062719-JW-MW5 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **smb**	
Chloride	640	50	*	mg/L	100	7/5/2019 10:07:20 PM	R61176
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1900	40.0	*D	mg/L	1	7/9/2019 2:54:00 PM	45992
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 2:42:35 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 2:42:35 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 2:42:35 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 2:42:35 PM	B61223
Surr: 4-Bromofluorobenzene	94.2	80-120		%Rec	1	7/8/2019 2:42:35 PM	B61223

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0 6 1

Lab Order: 1906G49

Lab ID: 1906G49-003 **Collection Date:** 6/27/2019 12:20:00 PM
Client Sample ID: GW-11135241-062719-JW-MW3 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	670	50	*	mg/L	100	7/3/2019 9:48:09 PM	R61167
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1810	100	*D	mg/L	1	7/9/2019 2:54:00 PM	45992
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 3:05:20 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 3:05:20 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 3:05:20 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 3:05:20 PM	B61223
Surr: 4-Bromofluorobenzene	95.0	80-120		%Rec	1	7/8/2019 3:05:20 PM	B61223

Lab ID: 1906G49-004 **Collection Date:** 6/27/2019 1:00:00 PM
Client Sample ID: GW-11135241-062719-JW-MW4 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	670	50	*	mg/L	100	7/3/2019 10:13:52 PM	R61167
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	2200	100	*D	mg/L	1	7/9/2019 2:54:00 PM	45992
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 3:28:02 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 3:28:02 PM	B61223
Ethylbenzene	3.6	1.0		µg/L	1	7/8/2019 3:28:02 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 3:28:02 PM	B61223
Surr: 4-Bromofluorobenzene	102	80-120		%Rec	1	7/8/2019 3:28:02 PM	B61223

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0 6 1

Lab Order: 1906G49

Lab ID: 1906G49-005 **Collection Date:** 6/27/2019 5:00:00 PM
Client Sample ID: GW-11135241-062719-JW-MW1 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	640	50	*	mg/L	100	7/3/2019 10:39:35 PM	R61167
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **CJS**	
Total Dissolved Solids	1670	40.0	*D	mg/L	1	7/9/2019 2:54:00 PM	45992
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 3:50:49 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 3:50:49 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 3:50:49 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 3:50:49 PM	B61223
Surr: 4-Bromofluorobenzene	97.5	80-120		%Rec	1	7/8/2019 3:50:49 PM	B61223

Lab ID: 1906G49-006 **Collection Date:**
Client Sample ID: Trip Blank **Matrix:** TRIP BLANK

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	1.0		µg/L	1	7/8/2019 4:13:29 PM	B61223
Toluene	ND	1.0		µg/L	1	7/8/2019 4:13:29 PM	B61223
Ethylbenzene	ND	1.0		µg/L	1	7/8/2019 4:13:29 PM	B61223
Xylenes, Total	ND	2.0		µg/L	1	7/8/2019 4:13:29 PM	B61223
Surr: 4-Bromofluorobenzene	95.1	80-120		%Rec	1	7/8/2019 4:13:29 PM	B61223

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906G49**

10-Jul-19

Client: GHD

Project: 0 6 1

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R61167**	RunNo: **61167**
Prep Date:	Analysis Date: **7/3/2019**	SeqNo: **2073207** Units: **mg/L**

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

Sample ID: **LCS-b**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R61167**	RunNo: **61167**
Prep Date:	Analysis Date: **7/3/2019**	SeqNo: **2073209** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5.0	0.50	5.000	0	99.1	90	110			

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R61176**	RunNo: **61176**
Prep Date:	Analysis Date: **7/5/2019**	SeqNo: **2074459** Units: **mg/L**

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

Sample ID: **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R61176**	RunNo: **61176**
Prep Date:	Analysis Date: **7/5/2019**	SeqNo: **2074460** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	96.0	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906G49**

10-Jul-19

Client: GHD

Project: 0 6 1

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBW**	Batch ID: **B61223**	RunNo: **61223**
Prep Date:	Analysis Date: **7/8/2019**	SeqNo: **2075449** 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	2.0								
Surr: 4-Bromofluorobenzene	19		20.00		96.9	80	120			

Sample ID: **100NG BTEX LCS**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSW**	Batch ID: **B61223**	RunNo: **61223**
Prep Date:	Analysis Date: **7/8/2019**	SeqNo: **2075450** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	92.1	80	120			
Toluene	18	1.0	20.00	0	91.0	80	120			
Ethylbenzene	18	1.0	20.00	0	90.7	80	120			
Xylenes, Total	54	2.0	60.00	0	90.2	80	120			
Surr: 4-Bromofluorobenzene	20		20.00		102	80	120			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1906G49**

10-Jul-19

Client: GHD

Project: 0 6 1

Sample ID: **MB-45992**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **45992**	RunNo: **61248**
Prep Date: **7/3/2019**	Analysis Date: **7/9/2019**	SeqNo: **2076089** 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-45992**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **45992**	RunNo: **61248**
Prep Date: **7/3/2019**	Analysis Date: **7/9/2019**	SeqNo: **2076090** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	988	20.0	1000	0	98.8	80	120			

Sample ID: **1906G49-001BDUP**	SampType: **DUP**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **GW-11135241-06271**	Batch ID: **45992**	RunNo: **61248**
Prep Date: **7/3/2019**	Analysis Date: **7/9/2019**	SeqNo: **2076106** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1700	20.0						0.236	10	*

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **GHD** Work Order Number: **1906G49** RcptNo: **1**

Received By: **Erin Melendrez** **6/29/2019 9:30:00 AM**

Completed By: **Erin Melendrez** **6/29/2019 10:58:10 AM**

Reviewed By: DAD 7/1/19
DAD 7/1/19

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: YG 7/1/19

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	2.4	Good	Yes			
2	4.8	Good	Yes			

Chain-of-Custody Record

Client: GHD

Mailing Address: 6121 Indian Sch Ste 200 ABQ, NM 87110

Phone #: 505-884-0672

email or Fax#: christine.matheus@ghd.com

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

Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time: ☑ Standard ☐ Rush

Project Name: O-6-1

Project #: 11135241

Project Manager: Christine Matheus

Sampler: J Walker

On Ice: ☑ Yes ☐ No

# of Coolers: 2

Cooler Temp(including CF): 2.4°C +0.0(CF)=2.4(°C) 4.8°C +0.0(CF)=4.8°C

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.
6/27/19	1110	AQ	GW-11135241-062719-JW-MW2	3 40ml 1 500ml	HCl —	1906G49 -001
	1145		GW-11135241-062719-JW-MW5	"	"	-002
	1220		GW-11135241-062719-JW-MW3	"	"	-003
	1300		GW-11135241-062719-JW-MW4	"	"	-004
	1700		GW-11135241-062719-JW-MW1	"	"	-005

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)	TDS	Chloride
X										X	X
X										X	X
X										X	X
X										X	X
X										X	X

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
6/28/19	0920	J Walker			6/28/19	0930
6/28/19	1900			Courier	6/28/19	0930

Remarks:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

October 11, 2019

Christine Mathews
GHD
6121 Indian School Road, NE #200
Albuquerque, NM 87110
TEL: (505) 884-0672
FAX

RE: 0 6 1 OrderNo.: 1909G26

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 7 sample(s) on 9/27/2019 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: GHD
Project: 0 6 1

Lab Order: 1909G26

Lab ID: 1909G26-001 **Collection Date:** 9/25/2019 1:30:00 PM
Client Sample ID: GW-11135241-092519-JP-MW-1 **Matrix:** GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	590	50	*	mg/L	100	10/1/2019 12:39:49 AM	A63318
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	1800	20.0	*	mg/L	1	10/3/2019 2:46:00 PM	47880
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 2:22:04 AM	SL6335
Toluene	ND	1.0		µg/L	1	10/1/2019 2:22:04 AM	SL6335
Ethylbenzene	ND	1.0		µg/L	1	10/1/2019 2:22:04 AM	SL6335
Xylenes, Total	ND	1.5		µg/L	1	10/1/2019 2:22:04 AM	SL6335
Surr: 1,2-Dichloroethane-d4	94.1	70-130		%Rec	1	10/1/2019 2:22:04 AM	SL6335
Surr: 4-Bromofluorobenzene	92.6	70-130		%Rec	1	10/1/2019 2:22:04 AM	SL6335
Surr: Dibromofluoromethane	106	70-130		%Rec	1	10/1/2019 2:22:04 AM	SL6335
Surr: Toluene-d8	102	70-130		%Rec	1	10/1/2019 2:22:04 AM	SL6335

Lab ID: 1909G26-002 **Collection Date:** 9/25/2019 3:30:00 PM
Client Sample ID: GW-11135241-092519-JP-MW-2 **Matrix:** GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	640	50	*	mg/L	100	10/1/2019 1:05:32 AM	A63318
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	1980	20.0	*	mg/L	1	10/3/2019 2:46:00 PM	47880
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 2:51:02 AM	SL6335
Toluene	ND	1.0		µg/L	1	10/1/2019 2:51:02 AM	SL6335
Ethylbenzene	ND	1.0		µg/L	1	10/1/2019 2:51:02 AM	SL6335
Xylenes, Total	ND	1.5		µg/L	1	10/1/2019 2:51:02 AM	SL6335
Surr: 1,2-Dichloroethane-d4	98.6	70-130		%Rec	1	10/1/2019 2:51:02 AM	SL6335
Surr: 4-Bromofluorobenzene	92.2	70-130		%Rec	1	10/1/2019 2:51:02 AM	SL6335
Surr: Dibromofluoromethane	105	70-130		%Rec	1	10/1/2019 2:51:02 AM	SL6335
Surr: Toluene-d8	105	70-130		%Rec	1	10/1/2019 2:51:02 AM	SL6335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0 6 1

Lab Order: 1909G26

Lab ID: 1909G26-003 **Collection Date:** 9/25/2019 2:00:00 PM
Client Sample ID: GW-11135241-092519-JP-MW-3 **Matrix:** GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	650	50	*	mg/L	100	10/1/2019 1:31:15 AM	A63318
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	2050	40.0	*D	mg/L	1	10/3/2019 2:46:00 PM	47880
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 3:19:57 AM	SL6335
Toluene	ND	1.0		µg/L	1	10/1/2019 3:19:57 AM	SL6335
Ethylbenzene	ND	1.0		µg/L	1	10/1/2019 3:19:57 AM	SL6335
Xylenes, Total	ND	1.5		µg/L	1	10/1/2019 3:19:57 AM	SL6335
Surr: 1,2-Dichloroethane-d4	97.0	70-130		%Rec	1	10/1/2019 3:19:57 AM	SL6335
Surr: 4-Bromofluorobenzene	96.0	70-130		%Rec	1	10/1/2019 3:19:57 AM	SL6335
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/1/2019 3:19:57 AM	SL6335
Surr: Toluene-d8	106	70-130		%Rec	1	10/1/2019 3:19:57 AM	SL6335

Lab ID: 1909G26-004 **Collection Date:** 9/25/2019 11:35:00 AM
Client Sample ID: GW-11135241-092519-JP-MW-4 **Matrix:** GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	550	50	*	mg/L	100	10/2/2019 5:29:15 AM	A63357
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	2000	100	*D	mg/L	1	10/3/2019 2:46:00 PM	47880
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 3:48:55 AM	SL6335
Toluene	ND	1.0		µg/L	1	10/1/2019 3:48:55 AM	SL6335
Ethylbenzene	1.6	1.0		µg/L	1	10/1/2019 3:48:55 AM	SL6335
Xylenes, Total	ND	1.5		µg/L	1	10/1/2019 3:48:55 AM	SL6335
Surr: 1,2-Dichloroethane-d4	96.1	70-130		%Rec	1	10/1/2019 3:48:55 AM	SL6335
Surr: 4-Bromofluorobenzene	89.9	70-130		%Rec	1	10/1/2019 3:48:55 AM	SL6335
Surr: Dibromofluoromethane	109	70-130		%Rec	1	10/1/2019 3:48:55 AM	SL6335
Surr: Toluene-d8	108	70-130		%Rec	1	10/1/2019 3:48:55 AM	SL6335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0 6 1

Lab Order: 1909G26

Lab ID: 1909G26-005 **Collection Date:** 9/25/2019 12:20:00 PM
Client Sample ID: GW-11135241-092519-JP-MW-5 **Matrix:** GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	640	50	*	mg/L	100	10/2/2019 5:53:55 AM	A63357
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	2030	40.0	*D	mg/L	1	10/3/2019 2:46:00 PM	47880
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 4:17:54 AM	SL6335
Toluene	ND	1.0		µg/L	1	10/1/2019 4:17:54 AM	SL6335
Ethylbenzene	ND	1.0		µg/L	1	10/1/2019 4:17:54 AM	SL6335
Xylenes, Total	ND	1.5		µg/L	1	10/1/2019 4:17:54 AM	SL6335
Surr: 1,2-Dichloroethane-d4	94.0	70-130		%Rec	1	10/1/2019 4:17:54 AM	SL6335
Surr: 4-Bromofluorobenzene	93.2	70-130		%Rec	1	10/1/2019 4:17:54 AM	SL6335
Surr: Dibromofluoromethane	109	70-130		%Rec	1	10/1/2019 4:17:54 AM	SL6335
Surr: Toluene-d8	106	70-130		%Rec	1	10/1/2019 4:17:54 AM	SL6335

Lab ID: 1909G26-006 **Collection Date:** 9/25/2019
Client Sample ID: GW-11135241-092519-JP-Dup-1 **Matrix:** GROUNDWATER

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CJS**	
Chloride	550	50	*	mg/L	100	10/2/2019 6:26:11 PM	A63395
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **JMT**	
Total Dissolved Solids	2040	40.0	*D	mg/L	1	10/3/2019 2:46:00 PM	47880
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 4:46:58 AM	SL6335
Toluene	ND	1.0		µg/L	1	10/1/2019 4:46:58 AM	SL6335
Ethylbenzene	1.5	1.0		µg/L	1	10/1/2019 4:46:58 AM	SL6335
Xylenes, Total	ND	1.5		µg/L	1	10/1/2019 4:46:58 AM	SL6335
Surr: 1,2-Dichloroethane-d4	93.7	70-130		%Rec	1	10/1/2019 4:46:58 AM	SL6335
Surr: 4-Bromofluorobenzene	96.3	70-130		%Rec	1	10/1/2019 4:46:58 AM	SL6335
Surr: Dibromofluoromethane	103	70-130		%Rec	1	10/1/2019 4:46:58 AM	SL6335
Surr: Toluene-d8	104	70-130		%Rec	1	10/1/2019 4:46:58 AM	SL6335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0 6 1

Lab Order: 1909G26

Lab ID: 1909G26-007
Collection Date:
Client Sample ID: Trip Blank
Matrix: TRIP BLANK

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES						Analyst: **JMR**	
Benzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Toluene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Ethylbenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Naphthalene	ND	2.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1-Methylnaphthalene	ND	4.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
2-Methylnaphthalene	ND	4.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Acetone	ND	10		µg/L	1	10/1/2019 6:13:32 AM	A63356
Bromobenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Bromodichloromethane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Bromoform	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Bromomethane	ND	3.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
2-Butanone	ND	10		µg/L	1	10/1/2019 6:13:32 AM	A63356
Carbon disulfide	ND	10		µg/L	1	10/1/2019 6:13:32 AM	A63356
Carbon Tetrachloride	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Chlorobenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Chloroethane	ND	2.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Chloroform	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Chloromethane	ND	3.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
2-Chlorotoluene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
4-Chlorotoluene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
cis-1,2-DCE	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Dibromochloromethane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Dibromomethane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2-Dichlorobenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,3-Dichlorobenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,4-Dichlorobenzene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
Dichlorodifluoromethane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1-Dichloroethane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1-Dichloroethene	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2-Dichloropropane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356
1,3-Dichloropropane	ND	1.0		µg/L	1	10/1/2019 6:13:32 AM	A63356

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0 6 1

Lab Order: 1909G26

EPA METHOD 8260B: VOLATILES

Analyst: **JMR**

2,2-Dichloropropane	ND	2.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1-Dichloropropene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Hexachlorobutadiene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
2-Hexanone	ND	10	µg/L	1	10/1/2019 6:13:32 AM	A63356
Isopropylbenzene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
4-Isopropyltoluene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
4-Methyl-2-pentanone	ND	10	µg/L	1	10/1/2019 6:13:32 AM	A63356
Methylene Chloride	ND	3.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
n-Butylbenzene	ND	3.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
n-Propylbenzene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
sec-Butylbenzene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Styrene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
tert-Butylbenzene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1,2,2-Tetrachloroethane	ND	2.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Tetrachloroethene (PCE)	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
trans-1,2-DCE	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
trans-1,3-Dichloropropene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2,3-Trichlorobenzene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1,1-Trichloroethane	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,1,2-Trichloroethane	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Trichloroethene (TCE)	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Trichlorofluoromethane	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
1,2,3-Trichloropropane	ND	2.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Vinyl chloride	ND	1.0	µg/L	1	10/1/2019 6:13:32 AM	A63356
Xylenes, Total	ND	1.5	µg/L	1	10/1/2019 6:13:32 AM	A63356
Surr: 1,2-Dichloroethane-d4	94.1	70-130	%Rec	1	10/1/2019 6:13:32 AM	A63356
Surr: 4-Bromofluorobenzene	98.7	70-130	%Rec	1	10/1/2019 6:13:32 AM	A63356
Surr: Dibromofluoromethane	103	70-130	%Rec	1	10/1/2019 6:13:32 AM	A63356
Surr: Toluene-d8	100	70-130	%Rec	1	10/1/2019 6:13:32 AM	A63356

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**

11-Oct-19

Client: GHD

Project: 0 6 1

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A63318**	RunNo: **63318**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2161151** Units: **mg/L**

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

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A63318**	RunNo: **63318**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2161152** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5.1	0.50	5.000	0	101	90	110			

Sample ID: **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A63357**	RunNo: **63357**
Prep Date:	Analysis Date: **10/2/2019**	SeqNo: **2162811** Units: **mg/L**

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

Sample ID: **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A63357**	RunNo: **63357**
Prep Date:	Analysis Date: **10/2/2019**	SeqNo: **2162812** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.8	0.50	5.000	0	95.8	90	110			

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **A63395**	RunNo: **63395**
Prep Date:	Analysis Date: **10/2/2019**	SeqNo: **2164296** Units: **mg/L**

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

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **A63395**	RunNo: **63395**
Prep Date:	Analysis Date: **10/2/2019**	SeqNo: **2164297** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.9	0.50	5.000	0	98.8	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**

11-Oct-19

Client: GHD

Project: 0 6 1

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163261** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Toluene	20	1.0	20.00	0	98.1	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.0	70	130			
Surr: 4-Bromofluorobenzene	9.1		10.00		90.6	70	130			
Surr: Dibromofluoromethane	11		10.00		111	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: **1909g26-006a ms**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GW-11135241-09251**	Batch ID: **SL63356**	RunNo: **63356**
Prep Date:	Analysis Date: **10/1/2019**	SeqNo: **2163268** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0.2178	96.3	70	130			
Toluene	19	1.0	20.00	0	94.2	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		94.8	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.6	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID: **1909g26-006a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GW-11135241-09251**	Batch ID: **SL63356**	RunNo: **63356**
Prep Date:	Analysis Date: **10/1/2019**	SeqNo: **2163269** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0.2178	94.4	70	130	1.95	20	
Toluene	18	1.0	20.00	0	91.0	70	130	3.47	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		103	70	130	0	0	
Surr: Toluene-d8	9.9		10.00		99.1	70	130	0	0	

Sample ID: **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163271** 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.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**

11-Oct-19

Client: GHD

Project: 0 6 1

Sample ID: **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163271** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		99.9	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**

11-Oct-19

Client: GHD

Project: 0 6 1

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **A63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163272** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Toluene	20	1.0	20.00	0	98.1	70	130			
Chlorobenzene	21	1.0	20.00	0	103	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	93.0	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	96.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.0	70	130			
Surr: 4-Bromofluorobenzene	9.1		10.00		90.6	70	130			
Surr: Dibromofluoromethane	11		10.00		111	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163274** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**
11-Oct-19

Client: GHD
Project: 0 6 1

Sample ID: **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163274** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**

11-Oct-19

Client: GHD

Project: 0 6 1

Sample ID: **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A63356**	RunNo: **63356**
Prep Date:	Analysis Date: **9/30/2019**	SeqNo: **2163274** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		93.5	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.9	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		99.9	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1909G26**

11-Oct-19

Client: GHD

Project: 0 6 1

Sample ID: **MB-47880**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **47880**	RunNo: **63404**
Prep Date: **10/2/2019**	Analysis Date: **10/3/2019**	SeqNo: **2164878** 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-47880**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **47880**	RunNo: **63404**
Prep Date: **10/2/2019**	Analysis Date: **10/3/2019**	SeqNo: **2164879** Units: **mg/L**

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

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: GHD | Work Order Number: 1909G26 | RcptNo: 1

Received By: **Isaiah Ortiz** 9/27/2019 9:30:00 AM

Completed By: **Anne Thorne** 9/27/2019 1:47:15 PM

Reviewed By: 09/30/19

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Courier		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

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

Adjusted? _____

Checked by: DAD 9/30/19

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	2.0	Good	Yes			
2	0.4	Good	Yes			
3	0.1	Good	Yes			

Chain-of-Custody Record

Client: GHD

Mailing Address: 6121 Indian School Rd NE
Suite 200, Albuquerque, NM 87110

Phone #: (505) 884-0672

email or Fax#: christine.mathews@ghd.com

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: 0-6-1

Project #: 11135241

Project Manager: Christine Mathews

Sampler: Joshua Pigg

On Ice: ☑ Yes ☐ No

# of Coolers: 3

Cooler Temp(including CF): Remarks

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. 1909626	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 8260	Chloride 300	TDS 2540			
9/25	1330	GW	GW-11135241-092519-JP-MW-1	VOA, 1 bottle	HCL, ICE	001											X	X	X			
	1530		GW-11135241-092519-JP-MW-2			002											X	X	X			
	1400		GW-11135241-092519-JP-MW-3			003											X	X	X			
	1135		GW-11135241-092519-JP-MW-4			004											X	X	X			
	1220		GW-11135241-092519-JP-MW-5			005											X	X	X			
			GW-11135241-092519-JP-Dup-1			006											X	X	X			
			Trip Blank DAD 9/30/19			007																

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9-26-19	1145				9/26/19	1145
9/26/19	1900			courier	09/27/19	0930

Remarks: 2.5 - 0.5 (CF) 2.0 °C
0.9 - 0.5 (CF) 0.4 °C
0.6 - 0.5 (CF) 0.1 °C

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

December 13, 2019

Christine Mathews
GHD
6121 Indian School Road, NE #200
Albuquerque, NM 87110
TEL: (505) 884-0672
FAX:

RE: O 6 1 OrderNo.: 1912270

Dear Christine Mathews:

Hall Environmental Analysis Laboratory received 7 sample(s) on 12/6/2019 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: GHD
Project: O 6 1

Lab Order: 1912270

Lab ID: 1912270-001 **Collection Date:** 12/4/2019 3:55:00 PM
Client Sample ID: GW-11135241-120419-JP-MW-1 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	570	50	*	mg/L	100	12/6/2019 3:02:16 PM	R65020
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1700	20.0	*	mg/L	1	12/9/2019 2:58:00 PM	49207
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 3:32:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 3:32:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 3:32:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 3:32:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	12/9/2019 3:32:00 PM	SL6502
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	12/9/2019 3:32:00 PM	SL6502
Surr: Dibromofluoromethane	100	70-130		%Rec	1	12/9/2019 3:32:00 PM	SL6502
Surr: Toluene-d8	98.9	70-130		%Rec	1	12/9/2019 3:32:00 PM	SL6502

Lab ID: 1912270-002 **Collection Date:** 12/4/2019 5:18:00 PM
Client Sample ID: GW-11135241-120419-JP-MW-2 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	600	50	*	mg/L	100	12/6/2019 3:51:55 PM	R65020
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1760	20.0	*	mg/L	1	12/9/2019 2:58:00 PM	49207
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 4:44:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 4:44:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 4:44:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 4:44:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	12/9/2019 4:44:00 PM	SL6502
Surr: 4-Bromofluorobenzene	98.1	70-130		%Rec	1	12/9/2019 4:44:00 PM	SL6502
Surr: Dibromofluoromethane	99.3	70-130		%Rec	1	12/9/2019 4:44:00 PM	SL6502
Surr: Toluene-d8	98.9	70-130		%Rec	1	12/9/2019 4:44:00 PM	SL6502

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: O 6 1

Lab Order: 1912270

Lab ID: 1912270-003 **Collection Date:** 12/4/2019 1:00:00 PM
Client Sample ID: GW-11135241-120419-JP-MW-3 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	630	50	*	mg/L	100	12/6/2019 4:16:43 PM	R65020
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1910	40.0	*D	mg/L	1	12/9/2019 2:58:00 PM	49207
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 5:08:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 5:08:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 5:08:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 5:08:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/9/2019 5:08:00 PM	SL6502
Surr: 4-Bromofluorobenzene	99.1	70-130		%Rec	1	12/9/2019 5:08:00 PM	SL6502
Surr: Dibromofluoromethane	99.0	70-130		%Rec	1	12/9/2019 5:08:00 PM	SL6502
Surr: Toluene-d8	98.3	70-130		%Rec	1	12/9/2019 5:08:00 PM	SL6502

Lab ID: 1912270-004 **Collection Date:** 12/4/2019 1:39:00 PM
Client Sample ID: GW-11135241-120419-JP-MW-4 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	530	50	*	mg/L	100	12/6/2019 4:41:33 PM	R65020
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2000	40.0	*D	mg/L	1	12/9/2019 2:58:00 PM	49207
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 5:32:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 5:32:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 5:32:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 5:32:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	12/9/2019 5:32:00 PM	SL6502
Surr: 4-Bromofluorobenzene	98.7	70-130		%Rec	1	12/9/2019 5:32:00 PM	SL6502
Surr: Dibromofluoromethane	102	70-130		%Rec	1	12/9/2019 5:32:00 PM	SL6502
Surr: Toluene-d8	98.4	70-130		%Rec	1	12/9/2019 5:32:00 PM	SL6502

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: O 6 1

Lab Order: 1912270

Lab ID: 1912270-005 **Collection Date:** 12/4/2019 2:45:00 PM
Client Sample ID: GW-11135241-120419-JP-MW-5 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	570	50	*	mg/L	100	12/6/2019 5:06:22 PM	R65020
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1820	40.0	*D	mg/L	1	12/9/2019 2:58:00 PM	49207
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 5:56:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 5:56:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 5:56:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 5:56:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	12/9/2019 5:56:00 PM	SL6502
Surr: 4-Bromofluorobenzene	97.5	70-130		%Rec	1	12/9/2019 5:56:00 PM	SL6502
Surr: Dibromofluoromethane	101	70-130		%Rec	1	12/9/2019 5:56:00 PM	SL6502
Surr: Toluene-d8	98.6	70-130		%Rec	1	12/9/2019 5:56:00 PM	SL6502

Lab ID: 1912270-006 **Collection Date:** 12/4/2019
Client Sample ID: GW-11135241-120419-JP-DUP-1 **Matrix:** AQUEOUS

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **CAS**	
Chloride	570	50	*	mg/L	100	12/6/2019 5:31:10 PM	R65020
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1730	40.0	*D	mg/L	1	12/9/2019 2:58:00 PM	49207
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 6:20:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 6:20:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 6:20:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 6:20:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/9/2019 6:20:00 PM	SL6502
Surr: 4-Bromofluorobenzene	99.8	70-130		%Rec	1	12/9/2019 6:20:00 PM	SL6502
Surr: Dibromofluoromethane	99.8	70-130		%Rec	1	12/9/2019 6:20:00 PM	SL6502
Surr: Toluene-d8	98.4	70-130		%Rec	1	12/9/2019 6:20:00 PM	SL6502

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: O 6 1
Lab Order: 1912270

Lab ID: 1912270-007
Collection Date:
Client Sample ID: Trip Blank
Matrix: TRIP BLANK

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **CCM**	
Benzene	ND	1.0		µg/L	1	12/9/2019 6:44:00 PM	SL6502
Toluene	ND	1.0		µg/L	1	12/9/2019 6:44:00 PM	SL6502
Ethylbenzene	ND	1.0		µg/L	1	12/9/2019 6:44:00 PM	SL6502
Xylenes, Total	ND	1.5		µg/L	1	12/9/2019 6:44:00 PM	SL6502
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	12/9/2019 6:44:00 PM	SL6502
Surr: 4-Bromofluorobenzene	98.4	70-130		%Rec	1	12/9/2019 6:44:00 PM	SL6502
Surr: Dibromofluoromethane	99.5	70-130		%Rec	1	12/9/2019 6:44:00 PM	SL6502
Surr: Toluene-d8	96.8	70-130		%Rec	1	12/9/2019 6:44:00 PM	SL6502

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912270**

13-Dec-19

Client: GHD

Project: O 6 1

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R65020**	RunNo: **65020**
Prep Date:	Analysis Date: **12/6/2019**	SeqNo: **2230333** Units: **mg/L**

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

Sample ID: **LCS**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R65020**	RunNo: **65020**
Prep Date:	Analysis Date: **12/6/2019**	SeqNo: **2230334** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5.0	0.50	5.000	0	101	90	110			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912270**

13-Dec-19

Client: GHD

Project: O 6 1

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL65025**	RunNo: **65025**
Prep Date:	Analysis Date: **12/9/2019**	SeqNo: **2236351** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.9	70	130			
Toluene	19	1.0	20.00	0	92.8	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.0	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.9		10.00		98.6	70	130			

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL65025**	RunNo: **65025**
Prep Date:	Analysis Date: **12/9/2019**	SeqNo: **2236352** 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								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.7	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.9		10.00		99.1	70	130			

Sample ID: **1912270-001ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GW-11135241-12041**	Batch ID: **SL65025**	RunNo: **65025**
Prep Date:	Analysis Date: **12/9/2019**	SeqNo: **2236354** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.2	70	130			
Toluene	19	1.0	20.00	0	94.8	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.5	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.8		10.00		98.3	70	130			

Sample ID: **1912270-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GW-11135241-12041**	Batch ID: **SL65025**	RunNo: **65025**
Prep Date:	Analysis Date: **12/9/2019**	SeqNo: **2236355** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	92.8	70	130	6.66	20	
Toluene	18	1.0	20.00	0	87.8	70	130	7.73	20	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912270**

13-Dec-19

Client: GHD

Project: O 6 1

Sample ID: **1912270-001amsd** SampType: **MSD** TestCode: **EPA Method 8260: Volatiles Short List**

Client ID: **GW-11135241-12041** Batch ID: **SL65025** RunNo: **65025**

Prep Date: Analysis Date: **12/9/2019** SeqNo: **2236355** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		102	70	130	0	0	
Surr: Toluene-d8	9.7		10.00		97.1	70	130	0	0	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1912270**

13-Dec-19

Client: GHD

Project: O 6 1

Sample ID: **MB-49207**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **49207**	RunNo: **65033**
Prep Date: **12/6/2019**	Analysis Date: **12/9/2019**	SeqNo: **2230927** 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-49207**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **49207**	RunNo: **65033**
Prep Date: **12/6/2019**	Analysis Date: **12/9/2019**	SeqNo: **2230928** 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 Limit
S	% Recovery outside of range due to dilution or matrix		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **GHD** Work Order Number: **1912270** RcptNo: **1**

Received By: **Yazmine Garduno** **12/6/2019 9:00:00 AM**

Completed By: **Erin Melendrez** **12/6/2019 9:18:45 AM**

Reviewed By: 12/06/19

Chain of Custody

1. Is Chain of Custody sufficiently 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. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

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

Adjusted? _____

Checked by: ENM 12/6/19

Special Handling (if applicable)

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

Person Notified: _____ Date: _____

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

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.3	Good				
2	3.0	Good				

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: GHD	Turn-Around Time: 5 Day ☑ Standard ☐ Rush
Mailing Address: 6121 Indian School Rd NE Suite 200 Albuquerque NM 87110	Project Name: 0-6-2
Phone #: 505 884 0672	Project #: 11135241
email or Fax#: christine.mathews@ghd.com	Project Manager: christine Mathews
QA/QC Package: ☐ Standard ☐ Level 4 (Full Validation)	Sampler: Joshua Pigg
Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other	On Ice: ☑ Yes ☐ No
☐ EDD (Type)	# of Coolers: 1
	Cooler Temp(including CF): 4.4-0.1=4.3 (°C)
	3.1-0.1=3.0

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 912270	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 8260	Chloride 300	TDS 2540
12/4/19 11-4-19	1555	GW	120419 gw-11135241-120419-JP-MW-1	VOA/40mL Bottle	ICE	-001											X	X	X
12/4/19	1718		120419 gw-11135241-120419-JP-MW-2			-002											X	X	X
12/4/19	1300		120419 gw-11135241-120419-JP-MW-3			-003											X	X	X
12/4/19	1339		120419 gw-11135241-120419-JP-MW-4			-004											X	X	X
12/4/19	1445		120419 gw-11135241-120419-JP-MW-5			-005											X	X	X
↓	—	↓	120419 gw-11135241-120419-JP-Dup 1	↓	↓	-006											X	X	X

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
12-5-19	1530				12/5	1530
12/5	1900				12/6/19	0900

Remarks: Trip Blank Included

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 B
Mobile Dual Phase Extraction Report (Talon LPE)



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TALON LPE

MOBILE DUAL PHASE EXTRACTION REPORT
MONUMENT SITE
LEA COUNTY, NEW MEXICO
2019 MDPE EVENTS

PREPARED FOR:

ETC FIELD SERVICES, LLC
800 E SONTERRA BLVD.
SAN ANTONIO, TEXAS 78258

PREPARED BY:
TALON/LPE
921 N. BIVINS
AMARILLO, TEXAS 79107

January 10, 2020

TABLE OF CONTENTS

Section Page

I. MDPE SUMMARY REPORT AND WASTE DISPOSITION

A. MDPE Results

The following report summarizes data collected during the 8-hour High Vacuum Multi-Phase Extraction (MDPE) events conducted during 2019 at the Monument Site, located in Lea County, New Mexico. The objective of the MDPE treatment was to remove both vapor and liquid phase separated hydrocarbons (PSH) from onsite groundwater wells. Talon/LPE utilized an MDPE unit which consisted of an SVE extraction pump capable of generating vacuum up to 25" hg. Off gas vapors extracted from the extraction wells were destroyed using a propane-fired 1000-SCFM thermal oxidizer capable of processing 172.96 lbs/hr of gasoline.

A total of twenty-four (24) hours of PSH recovery was performed on MW-1 and MW-2 during the 2019 events.

Prior to and immediately following the events, the groundwater wells were gauged for groundwater elevation and PSH. Depth to groundwater ranges were measured in feet below the top of casing. Refer to Attachment 1 for a summary of data collected during the MDPE events.

The volume of PSH removed during the MDPE events is shown to reflect the portions of PSH in the liquid phase and as off-gas vapor. Air removal rates were calculated from velocity measurements recorded at the influent manifold prior to entry into the MDPE unit. PSH recovery and air flow data has been detailed and is contained in Table 1. Influent air samples were collected over the course of each event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. All influent samples from each event were tested for Total-Gas Analysis (Hydrocarbon Composition) by GPA 2261-C6+. Laboratory analytical results can be found in Attachment 2.

Based on a combination of field vapor screening and collected laboratory samples, a combined estimated total of **1.97 equivalent gallons of hydrocarbons (Total)** were removed during the events. The combined volume of hydrocarbons was comprised of approximately **0 gallons of PSH (liquid phase)** and approximately **1.97 gallons as off-gas vapor**. The calculations used to estimate the off-gas vapor mass recovered reflect the mass of total hydrocarbons recovered and does not necessarily equate to an equal mass of the product released. The mass recovery calculations may be affected by variations in the specific gravity of hydrocarbon released, age of release, activity of aerobic and/or anaerobic processes, and site specific geochemical factors.

The cumulative air flow measurements for the MDPE events were calculated using a combination of field data measurements and Preso® B+ manufacturer provided

formulas. **Air flow rates extracted from the recovery wells averaged 163.61 SCFM** during the events.

B. Air Quality

Influent air samples were collected during each event. These samples were submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The maximum influent concentration was recorded as 2,120 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 1,622 gallons of fluid were generated during these events. The fluids were temporarily transferred to an on-site storage tank prior to being transferred to an authorized disposal facility.

II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS

Formulae:

$$\text{Concentration (C\_mg/l)} = \frac{\text{C ppmv x Mol. wt. in mg(estimated) x 1000 x 0.000001}}{\text{0.0821 x Temp (K)}}$$

$$\text{Recovery Rate (lbs/hr)} = \frac{\text{(C mg/l) x 2.2 x (Flowrate) x 60 x 28.32}}{\text{1,000,000}}$$

Recovery (lbs) = (lbs/hr) x (hrs)

$$\text{Correction Factor (CF)} = \frac{\text{PID Reading(ppm)}}{\text{PID Reading at Time of Laboratory Analysis}}$$

$$\frac{\text{8.34 lbs}}{\text{gallon water}} \times \text{0.82 average specific gravity of light crude (estimated)} = \frac{\text{6.84 lbs light crude}}{\text{gallon}}$$

Table 1
System Operation Data and Mass Recovery Calculations 6/27/2019

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h20)	Differential pressure (In. h20)	Flow (SCFM)	FID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
10:00	1	82	18	244.96	14.7	83.73	50000	450.00	450.00	1.00	450	0.52	0.16	0.16	0.16
11:00	1	84	18	244.96	13.3	79.50	50000	-	450.00	1.00	450	0.52	0.16	0.16	0.32
12:00	1	86	18	244.96	15.1	84.55	50000	-	450.00	1.00	450	0.52	0.16	0.16	0.48
13:00	1	92	19	258.57	13.8	76.95	50000	-	450.00	1.00	450	0.51	0.15	0.15	0.63
14:00	1	94	19	258.57	13.2	75.13	50000	-	450.00	1.00	450	0.51	0.14	0.14	0.77
15:00	1	96	19	258.57	12.8	73.85	50000	-	450.00	1.00	450	0.51	0.14	0.14	0.92
16:00	1	96	19	258.57	13.2	74.99	50000	450.00	450.00	1.00	450	0.51	0.14	0.14	1.06
17:00	1	94	18	244.96	13.1	78.18	50000	-	450.00	1.00	450	0.51	0.15	0.15	1.21
Averages:		90.50	18.50	251.77	13.65	78.36	50000.00						Total	1.21	

PSH Mass Recovered in Vapor Phase = 0.18 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)

Measured Conc	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
450	28.7298	1	0.0821	82	300.7777778	0.523547888

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

Liquid-phase Hydrocarbon Recovery

∏ * r2 * h = volume

Gallons removed determined at time of pick up

PSH Volume in Gallons=	0
PSH Mass in Pounds=	0.00

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	1.21	lbs
	0.18	gallons
PSH Mass Recovered in Liquid Phase =	0.00	lbs
	0.00	gallons
TOTAL =	**1.21**	**lbs**
	0.18	**gallons**

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	0.045		450.00
			Total	**450.00**

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	95.5840
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	4.4020
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.0140
	Total	100
	Calculated MW	**28.7298**

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	0.045		450.00
			Total	**450.00**

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	95.6820
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	4.3040
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.0140
	Total	100
	Calculated MW	**28.7141**

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= **% Vol x 10,000**

Table 1
System Operation Data and Mass Recovery Calculations 9/25/2019

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h20)	Differential pressure (In. h20)	Flow (SCFM)	FID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
11:00	1	90	14	190.53	92.2	240.47	50000	430.00	430.00	1.00	430	0.48	0.43	0.43	0.43
12:00	1	92	14	190.53	92.4	240.29	50000	-	430.00	1.00	430	0.48	0.43	0.43	0.86
13:00	1	94	14	190.53	92.6	240.12	50000	-	430.00	1.00	430	0.48	0.43	0.43	1.29
14:00	1	96	14	190.53	92.3	239.29	50000	-	430.00	1.00	430	0.48	0.43	0.43	1.72
15:00	1	96	14	190.53	91.8	238.65	50000	-	100.00	1.00	100	0.11	0.10	0.10	1.82
16:00	1	98	14	190.53	92.4	239.00	50000	-	100.00	1.00	100	0.11	0.10	0.10	1.92
17:00	1	98	14	190.53	91.7	238.09	50000	100.00	100.00	1.00	100	0.11	0.10	0.10	2.01
18:00	1	94	15	204.14	86.1	224.16	50000	-	100.00	1.00	100	0.11	0.09	0.09	2.11
Averages:		94.75	14.13	192.23	91.44	237.51	50000.00						Total	2.11	

PSH Mass Recovered in Vapor Phase = 0.31 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)

Measured Conc	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
430	28.0508	1	0.0821	90	305.2222222	0.481342221

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

Liquid-phase Hydrocarbon Recovery

∏ * r2 * h = volume

Gallons removed determined at time of pick up

PSH Volume in Gallons=	0
PSH Mass in Pounds=	0.00

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	2.11	lbs
	0.31	gallons
PSH Mass Recovered in Liquid Phase =	0.00	lbs
	0.00	gallons
TOTAL =	**2.11**	**lbs**
	0.31	**gallons**

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	0.043		430.00
			Total	**430.00**

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	99.8260
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	0.1610
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.0130
	Total	100
	Calculated MW	**28.0508**

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	0.01		100.00
			Total	**100.00**

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	99.9530
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	0.0440
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.0030
	Total	100
	Calculated MW	**28.0251**

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= **% Vol x 10,000**

Table 1

System Operation Data and Mass Recovery Calculations 12-4-19

Time	Period (hours)	Influent Temp. (°f)	Vacuum (In. hg)	Vacuum (In. h20)	Differential pressure (In. h20)	Flow (SCFM)	FID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
11:00	1	60	17	231.35	60.8	180.97	50000	1160.00	1160.00	1.00	1160	1.37	0.93	0.93	0.93
12:00	1	62	17	231.35	56.1	173.50	50000	-	1160.00	1.00	1160	1.37	0.89	0.89	1.82
13:00	1	66	17	231.35	57.1	174.37	50000	-	1160.00	1.00	1160	1.36	0.89	0.89	2.70
14:00	1	66	17	231.35	58.5	176.50	50000	-	1160.00	1.00	1160	1.36	0.90	0.90	3.60
15:00	1	66	17	231.35	57.6	175.14	50000	-	2120.00	1.00	2120	2.49	1.63	1.63	5.23
16:00	1	66	17	231.35	55.6	172.07	50000	-	2120.00	1.00	2120	2.49	1.60	1.60	6.83
17:00	1	66	17	231.35	55.9	172.53	50000	2120.00	2120.00	1.00	2120	2.49	1.61	1.61	8.44
18:00	1	66	17	231.35	57.3	174.68	50000	-	2120.00	1.00	2120	2.49	1.63	1.63	10.07
Averages:		64.75	17.00	231.35	57.36	174.97	50000.00						Total	10.07	

PSH Mass Recovered in Vapor Phase = 1.48 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)

Measured Conc (ppmv)	Molecular Wt (Grams)	Pressure (atm)	Gas Constant (atm.liter/K.mole)	Temp. (F)	Temp. (K)	Conc. (C_mg/l)
1160	28.0564	1	0.0821	60	288.555556	1.37378233

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

Liquid-phase Hydrocarbon Recovery

∏ * r2 * h = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	10.07	lbs
	1.48	gallons
PSH Mass Recovered in Liquid Phase =	0.00	lbs
	0.00	gallons
TOTAL =	**10.07**	**lbs**
	1.48	**gallons**

Gallons removed determined at time of pick up

PSH Volume in Gallons=	0
PSH Mass in Pounds=	0.00

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	0.116		1160.00
			Total	**1160.00**

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	99.8640
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	0.1010
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.0350
	Total	100
	Calculated MW	**28.0564**

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 2

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0		0.00
N-Butane (C4H10)	58.12	0		0.00
Iso-Pentane (C4H12)	72.15	0		0.00
N-Pentane (C5H12)	72.15	0		0.00
Hexane+ (C6H14)	97.40	0.212		2120.00
			Total	**2120.00**

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	99.3000
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	0.6360
Ethane (C2H6)	30.069	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0000
N-Butane (C4H10)	58.1222	0.0000
Iso-Pentane (C4H12)	72.1488	0.0000
N-Pentane (C5H12)	72.1488	0.0000
Hexane+	97.3966	0.0640
	Total	100
	Calculated MW	**28.1621**

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= **% Vol x 10,000**

ATTACHMENT 1

MDPE Field Logs

MDPE FIELD NOTES

Site Name:	SUO - 6 - 1			Event #:	
Location:	Monument, NM			Arrive at site:	8:30
Date:	6/27/2019				
Job#:	701946.165.01			Start Vac:	9:00
Phase:		Unit:	1107	Stop Vac:	17:00
Onsite Personnel:	D. Armstrong & D. Martinez			Leave Site:	17:30

GAUGING DATA

WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW-1		24.63	0.00		24.85	0.00	Stinger @ 24"
WASTE:	H2O:	695		PSH:	0		TOTAL (GAL): 695

Sample Name		Analysis	Date:	Time:	Comments:
INFLUENT	1	C6t	27-Jun-19	10:00	FID= >50k
INFLUENT	2	C6t	27-Jun-19	16:00	FID= >50k
EFFLUENT	1	C6t	27-Jun-19	10:00	FID= 0

Notes:

Tank T 27 PSH 0 T 695 H_2O 695

Start Date: 6/27/2019 | 701946.165.01 Energy Transfer SUO- 6 - 1 - Monment, NM 1107 (8HR) Page 1 of 1

		Well Flow						Well Data				
TIME	SAMPLE TAKEN	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS:				
								MW-1				
9:00								VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
10:00	*	82	14.7	18	>50k		1432	10.8				
11:00		84	13.3	18	>50k		1429	10.9				
12:00		86	15.1	18	>50k		1436	10.9				
13:00		92	13.8	19	>50k		1432	10.9				
14:00		94	13.2	19	>50k		1426	11.1				
15:00		96	12.8	19	>50k		1439	10.9				
16:00		96	13.2	19	>50k		1434	11.0				
17:00	**	94	13.1	18	>50k		1434	10.9				

MDPE FIELD NOTES					
Site Name:	SUO - 6 - 1			Event #:	
Location:	Monument, NM			Arrive at site:	7:30
Date:	9/25/2019				
Job#:	701946.165.02			Start Vac:	8:00
Phase:		Unit:	1107	Stop Vac:	16:00
Onsite Personnel:	D. Armstrong & D. Martinez			Leave Site:	16:30

GAUGING DATA

WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW-2	0.00	25.10	0.00		25.65	0.00	Stinger @ 23" (+2)
WASTE:	H2O:	322		PSH:	0		TOTAL (GAL): 322

Sample Name		Analysis	Date:	Time:	Comments:
INFLUENT	1	C6t	25-Sep-19	9:00	FID= 62.5
INFLUENT	2	C6t	25-Sep-19	15:00	FID= 55.1
EFFLUENT	1	C6t	25-Sep-19	9:00	FID= 0

Notes:	
Tank T 322 PSH 0 T 322 PSH 0 H_2O 322	
Propane Start: 60%	
Finish: 40%	

Start Date: 9/25/2019		701946.165.02 Energy Transfer SUO- 6 - 1 - Monument, NM 1107 (8HR) Page 1 of 1										
		Well Flow						Well Data				
TIME	SAMPLE TAKEN	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS:				
								MW-2				
8:00								VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
9:00	*	74	94.9	14	62.5		1436	21.9				
10:00		82	70.4	16	61.7		1435	15.8				
11:00		86	71.1	16	60.6		1437	16				
12:00		92	71.8	16	59.3		1430	16.1				
13:00		94	68.9	16	57.4		1431	16.3				
14:00		96	67.4	16	56.5		1430	16.1				
15:00		96	68.4	16	55.1		1432	16.3				
16:00	**	98	71.2	16	54.8		1431	16.2				

MDPE FIELD NOTES					
Site Name:	SUO - 6 - 1			Event #:	
Location:	Monument, NM			Arrive at site:	9:00
Date:	12/4/2019				
Job#:	701946.165.03			Start Vac:	10:00
Phase:		Unit:	1107	Stop Vac:	18:00
Onsite Personnel:	D. Armstrong & D. Martinez			Leave Site:	18:30

GAUGING DATA

WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW-2	0.00	24.88	0.00		25.25	0.00	Stinger @ 24" (+2)
WASTE:	H2O:	605		PSH:	0		TOTAL (GAL): 605

Sample Name		Analysis	Date:	Time:	Comments:
INFLUENT	#1	C6t	4-Dec-19	11:00	FID = > 50k
INFLUENT	#2	C6t	4-Dec-19	17:00	FID = > 50k
EFFLUENT	#1	C6t	4-Dec-19	11:00	FID = 0

Notes:

Tank T 23 1/2 PSH 0 T 605 PSH 0 H_2O 605

Propane Start: 35%

Finish: 0%

Start Date: 12/4/2019		701946.165.03 Energy Transfer SUO- 6 - 1 - Monument, NM 1107 (8HR) Page 1 of 1										
		Well Flow						Well Data				
TIME	SAMPLE TAKEN	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane (%-size) 500 Gal.	EXHAUST TEMP F	COMMENTS:				
								MW-2				
10:00								VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)	VAC (INH2O)
11:00	*	60	60.8	17	> 50k		1432	11.3				
12:00		62	56.1	17	> 50k		1438	12.1				
13:00		66	57.1	17	> 50k		1436	11.4				
14:00		66	58.5	17	> 50k		1429	12.2				
15:00		66	57.6	17	> 50k		1440	12.8				
16:00		66	55.6	17	> 50k		1433	11.6				
17:00		66	55.9	17	> 50k		1438	12.3				
18:00	**	66	57.3	17	> 50k		1435	11.7				

ATTACHMENT 2

Laboratory Analytical Results

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19070533-001A

July 16, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name: Influent # 1
Station Number: 701946.165.01
Station Location: Monument, NM
Analyzed: 07/12/2019 14:18:04 by PW

Sampled By: DA
Sample Of: Gas Spot
Sample Date: 06/27/2019 10:00
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	95.584	93.211		GPM TOTAL C2+	0.006
Methane	NIL	NIL		GPM TOTAL C3+	0.006
Carbon Dioxide	4.402	6.744		GPM TOTAL iC5+	0.006
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.014	0.045	0.006		
	100.000	100.000	0.006		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9918	3.2176
Calculated Molecular Weight	28.73	93.19
Compressibility Factor	0.9996	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	1	5113
Water Sat. Gas Base BTU	1	5024

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19070533-002A

July 16, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name: Influent # 2
Station Number: 701946.165.01
Station Location: Monument, NM
Analyzed: 07/12/2019 14:31:39 by PW

Sampled By: DA
Sample Of: Gas Spot
Sample Date: 06/27/2019 16:00
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	95.682	93.358		GPM TOTAL C2+	0.006
Methane	NIL	NIL		GPM TOTAL C3+	0.006
Carbon Dioxide	4.304	6.597		GPM TOTAL iC5+	0.006
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.014	0.045	0.006		
	100.000	100.000	0.006		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9913	3.2176
Calculated Molecular Weight	28.71	93.19
Compressibility Factor	0.9996	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	1	5113
Water Sat. Gas Base BTU	1	5024

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19070533-003A

July 16, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name: Effluent # 1
Station Number: 701946.165.01
Station Location: Monument, NM
Analyzed: 07/12/2019 14:45:10 by PW

Sampled By: DA
Sample Of: Gas Spot
Sample Date: 06/27/2019 10:00
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	96.642	94.807		GPM TOTAL C2+	0.004
Methane	NIL	NIL		GPM TOTAL C3+	0.004
Carbon Dioxide	3.348	5.160		GPM TOTAL iC5+	0.004
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.010	0.033	0.004		
	100.000	100.000	0.004		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9859	3.2176
Calculated Molecular Weight	28.56	93.19
Compressibility Factor	0.9996	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	1	5113
Water Sat. Gas Base BTU	1	5024

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

SPL, Inc.

Analysis Request Chain of Custody Record

SPL

SPL Work Order No.:	SPL Work Order No.:	Acct. Mate Code:	Dept. Code	SPL Page 1 of 1

Report To: (Company Name):	Talon LPE	Project/Station Name: O-6-0	Project/Station Number: 70194.165.01	Project/Station Location: Monument NM	Requested TAT
Address	921 N. Bivins				☐ 24hr *
City/State/Zip	Amarillo, Texas 79107	Special Instructions:			☐ 48hr *
Contact:	Jason Shubert				☐ 72hr *
Phone:	806-467-0607 Fax: 806-467-0622				
Invoice To: (Company Name):	Talon LPE	Indicate Billing Type.	Net 30 day Acct. ☐	Check # / Cash Recv'd $	☐ Standard
Address	921 N Bivins		Credit Card ☐	Contact SPL, Inc for CC payment arrangements.	☐ Other Indicate Below
City/State/Zip	Amarillo, Texas 79107	* Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.			
Contact:	Jason Shubert				
Phone:	806-467-0607 Fax: 806-467-0622				
PO / Ref. No.:					
Contract/Proposal #:					* Surcharges May Apply

MOPE Sample ID & Point	Sample Date	Sample Time	Sample Type (Gas/Liq. Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info * Cylinder #	Date Out	Date In	Requested Analysis C6+	Comments
Influent #1	6-27-19	1000	Gas							✓	
Influent #2	6-27-19	1000	Gas							✓	
Effluent #1	6-27-19	1000	Gas							✓	

Sampled By-Print Name: DArmstrong
Signature:
Company Name:

Relinquished By-Print Name: DArmstrong	Date:	Time:	Received By-Print Name:	Date: 7/2	Time: 11:02
Signature:			Signature:		
Relinquished By-Print Name:	Date:	Time:	Received By-Print Name:	Date:	Time:
Signature:			Signature:		
Relinquished By-Print Name:	Date:	Time:	Received By-Print Name:	Date:	Time:
Signature:			Signature:		

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☐ P.O. Box 3079 Laurel, MS 39442 (601) 428-0842
☐ 500 Ambassador Caffery Pkwy Scott, LA 70583 (337) 237-4775
☐ 1595 US 79 South Carthage, TX 75633 (903) 693-6242
☐ 459 Hughes Dr. Traverse City, MI 49686 (616) 947-5777

Note: As a convenience to our clients, this form is available in an electronic format. Please contact one of our offices above for the form to be e-mailed to you.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19100150-001A

Oct. 09, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name:	Influent # 1	Sampled By:	DA
Station Number:	701946.165.02	Sample Of:	Gas Spot
Station Location:	Monument, NM	Sample Date:	09/25/2019 09:00
Sample Point:	SU 0-6-1	Sample Conditions:	
Analyzed:	10/03/2019 23:01:46 by JD	Method:	GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	99.826	99.704		GPM TOTAL C2+	0.006
Methane	NIL	NIL		GPM TOTAL C3+	0.006
Carbon Dioxide	0.161	0.253		GPM TOTAL iC5+	0.006
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.013	0.043	0.006		
	100.000	100.000	0.006		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9683	3.2176
Calculated Molecular Weight	28.05	93.19
Compressibility Factor	0.9997	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	1	5113
Water Sat. Gas Base BTU	1	5024

Tom Berry

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19100150-002A

Oct. 09, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name:	Influent # 2	Sampled By:	DA
Station Number:	701946.165.02	Sample Of:	Gas Spot
Station Location:	Monument, NM	Sample Date:	09/25/2019 15:00
Sample Point:	SU 0-6-1	Sample Conditions:	
Analyzed:	10/03/2019 23:23:03 by JD	Method:	GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	99.953	99.921		GPM TOTAL C2+	0.001
Methane	NIL	NIL		GPM TOTAL C3+	0.001
Carbon Dioxide	0.044	0.069		GPM TOTAL iC5+	0.001
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.003	0.010	0.001		
	100.000	100.000	0.001		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9674	3.2176
Calculated Molecular Weight	28.02	93.19
Compressibility Factor	0.9997	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	NIL	5113
Water Sat. Gas Base BTU	NIL	5024

Tom Berry

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19100150-003A

Oct. 09, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name:	Effluent #1	Sampled By:	DA
Station Number:	701946.165.02	Sample Of:	Gas Spot
Station Location:	Monument, NM	Sample Date:	09/25/2019 09:00
Sample Point:	SU 0-6-1	Sample Conditions:	
Analyzed:	10/03/2019 23:45:59 by JD	Method:	GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	98.112	97.064		GPM TOTAL C2+	0.000
Methane	NIL	NIL		GPM TOTAL C3+	0.000
Carbon Dioxide	1.887	2.933		GPM TOTAL iC5+	0.000
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.001	0.003	NIL		
	100.000	100.000	0.000		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9776	3.2176
Calculated Molecular Weight	28.32	93.19
Compressibility Factor	0.9997	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	NIL	5113
Water Sat. Gas Base BTU	NIL	5024

Tom Berry

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

SPL, Inc.

Analysis Request Chain of Custody Record

SPL

SPL Work Order No.:	SPL Work Order No.:	Acct. Mate Code:	Dept. Code	SPL		
Project/Station Name: SU 0-6-1	Project/Station Number: 701946.165.02	Project/Station Location: Monument NM		Page 1 of 1		

Report To: (Company Name):	Talon LPE	Special Instructions:	
Address	921 N. Bivins		
City/State/Zip	Amarillo, Texas 79107		
Contact:	Jason Shubert		
Phone:	806-467-0607	Fax:	806-467-0622
Invoice To: (Company Name):	Talon LPE		
Address	921 N Bivins		
City/State/Zip	Amarillo, Texas 79107		
Contact:	Jason Shubert		
Phone:	806-467-0607	Fax:	806-467-0622
PO / Ref. No.:			
Contract/Proposal #:			

Indicate Billing Type: Net 30 day Acct. ☐ Check # ____ Cash Recv'd $ ____ Credit Card ☐ Contact SPL, Inc for CC payment arrangements.

* Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.

Requested TAT

- ☐ 24hr *
- ☐ 48hr *
- ☐ 72hr *
- ☐ Standard
- ☐ Other Indicate Below

10-3 1000

* Surcharges May Apply

MDPE Sample ID & Point	Sample Date	Sample Time	Sample Type (Gas/Liq. Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info * Cylinder #	Date Out	Date In	Requested Analysis C6+	Comments
Influent#1	9-25-19	0900	Gas							✓	
Influent#2	9-25-19	1500								✓	
Effluent#1	9-25-19	0900									

Sampled By-Print Name: DArmstrong
Signature:

Company Name:

Relinquished By-Print Name: DArmstrong Date: Time:
Signature:

Received By-Print Name:
Signature: Date: Time:

Relinquished By-Print Name: Date: Time:
Signature:

Received By-Print Name:
Signature: Date: Time:

Relinquished By-Print Name: Date: Time:
Signature:

Received By-Print Name:
Signature: Date: 10-3-19 Time: 1040

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☐ 500 Ambassador Caffery Pkwy Scott, LA 70583 (337) 237-4775
☐ 9221 Highway 23 Belle Chasse, LA 70037 (504) 391-1337
☐ 1595 US 79 South Carthage, TX 75633 (903) 693-6242
☐ P.O. Box 3079 Laurel, MS 39442 (601) 428-0842
☐ 459 Hughes Dr. Traverse City, MI 49686 (616) 947-5777

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Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19120580-001A

Dec. 13, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name: Influent # 1
Station Number: 701946.165.03
Station Location: Monument, NM
Sample Point: SU 0-6-1
Analyzed: 12/12/2019 11:56:01 by PW

Sampled By: DA
Sample Of: Gas Spot
Sample Date: 12/04/2019 11:00
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	99.864	99.726		GPM TOTAL C2+	0.015
Methane	NIL	NIL		GPM TOTAL C3+	0.015
Carbon Dioxide	0.101	0.158		GPM TOTAL iC5+	0.015
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.035	0.116	0.015		
	100.000	100.000	0.015		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9685	3.2176
Calculated Molecular Weight	28.05	93.19
Compressibility Factor	0.9997	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	2	5113
Water Sat. Gas Base BTU	2	5024

Tom Berry

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19120580-002A

Dec. 13, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name: Influent # 2
Station Number: 701946.165.03
Station Location: Monument, NM
Sample Point: SU 0-6-1
Analyzed: 12/12/2019 12:51:22 by PW

Sampled By: DA
Sample Of: Gas Spot
Sample Date: 12/04/2019 17:00
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	99.300	98.794		GPM TOTAL C2+	0.028
Methane	NIL	NIL		GPM TOTAL C3+	0.028
Carbon Dioxide	0.636	0.994		GPM TOTAL iC5+	0.028
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.064	0.212	0.028		
	100.000	100.000	0.028		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9721	3.2176
Calculated Molecular Weight	28.16	93.19
Compressibility Factor	0.9997	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	3	5113
Water Sat. Gas Base BTU	3	5024

Tom Berry

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

Houston Laboratories
8820 Interchange Drive
Houston, TX 77054
Phone 713-660-0901

Certificate of Analysis

Number: 1030-19120580-003A

Dec. 13, 2019

Jason Shubert
Talon/LPE
921 N Bivins
Amarillo, TX 79107

Station Name: Effluent # 1
Station Number: 701946.165.03
Station Location: Monument, NM
Sample Point: SU 0-6-1
Analyzed: 12/12/2019 13:11:35 by PW

Sampled By: DA
Sample Of: Gas Spot
Sample Date: 12/04/2019 11:00
Sample Conditions:
Method: GPA-2261M

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.65 psia		
Nitrogen	96.574	94.707		GPM TOTAL C2+	0.004
Methane	NIL	NIL		GPM TOTAL C3+	0.004
Carbon Dioxide	3.417	5.264		GPM TOTAL iC5+	0.004
Ethane	NIL	NIL	NIL		
Propane	NIL	NIL	NIL		
Iso-butane	NIL	NIL	NIL		
n-Butane	NIL	NIL	NIL		
Iso-pentane	NIL	NIL	NIL		
n-Pentane	NIL	NIL	NIL		
Hexanes Plus	0.009	0.029	0.004		
	100.000	100.000	0.004		

Calculated Physical Properties	Total	C6+
Relative Density Real Gas	0.9863	3.2176
Calculated Molecular Weight	28.57	93.19
Compressibility Factor	0.9996	
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.65 psia & 60°F		
Real Gas Dry BTU	NIL	5113
Water Sat. Gas Base BTU	NIL	5024

Tom Berry

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.

SPL, Inc.

Analysis Request Chain of Custody Record

SPL Work Order No.: | SPL Work Order No.: | Acct. Mate Code: | Dept. Code | SPL

Page 1 of 1

Report To: (Company Name):	Talon LPE	Project/Station Name: SU 0-6-1	Project/Station Number: 701946.165.03	Project/Station Location: Monument NM	Requested TAT
Address	921 N. Bivins				☐ 24hr *
City/State/Zip	Amarillo, Texas 79107	Special Instructions:			☐ 48hr *
Contact:	Jason Shubert				☐ 72hr *
Phone:	806-467-0607 Fax: 806-467-0622				
Invoice To: (Company Name):	Talon LPE	Indicate Billing Type.	Net 30 day Acct. ☐	Check #	Cash Recv'd $
Address	921 N Bivins		Credit Card ☐	Contact SPL, Inc for CC payment arrangements.	☐ Standard ☐ Other Indicate Below
City/State/Zip	Amarillo, Texas 79107	* Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.			
Contact:	Jason Shubert				
Phone:	806-467-0607 Fax: 806-467-0622				
PO / Ref. No.:					
Contract/Proposal #:					

Requested Analysis

MDPE Sample ID & Point	Sample Date	Sample Time	Sample Type (Gas/Liq. Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info * Cylinder #	Date Out	Date In	C6+	Comments
Influent #1	12-4-19	1100	Gas							✓	
Influent #2	12-4-19	1700	"							✓	
Effluent #1	12-4-19	1100	"							✓	

* Surcharges May Apply

Sampled By-Print Name: D Armstrong
Signature:
Company Name:

Relinquished By-Print Name: D Armstrong Signature:	Date: 12/9/19	Time:	Received By-Print Name: Signature:	Date: 12/11	Time: 12:29
Relinquished By-Print Name: Signature:	Date:	Time:	Received By-Print Name: Signature:	Date:	Time:
Relinquished By-Print Name: Signature:	Date:	Time:	Received By-Print Name: Signature:	Date:	Time:

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☐ 9221 Highway 23 Belle Chasse, LA 70037 (504) 391-1337
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☐ 500 Ambassador Caffery Pkwy Scott, LA 70583 (337) 237-4775
☐ 1595 US 79 South Carthage, TX 75633 (903) 693-6242
☐ 459 Hughes Dr. Traverse City, MI 49686 (616) 947-5777

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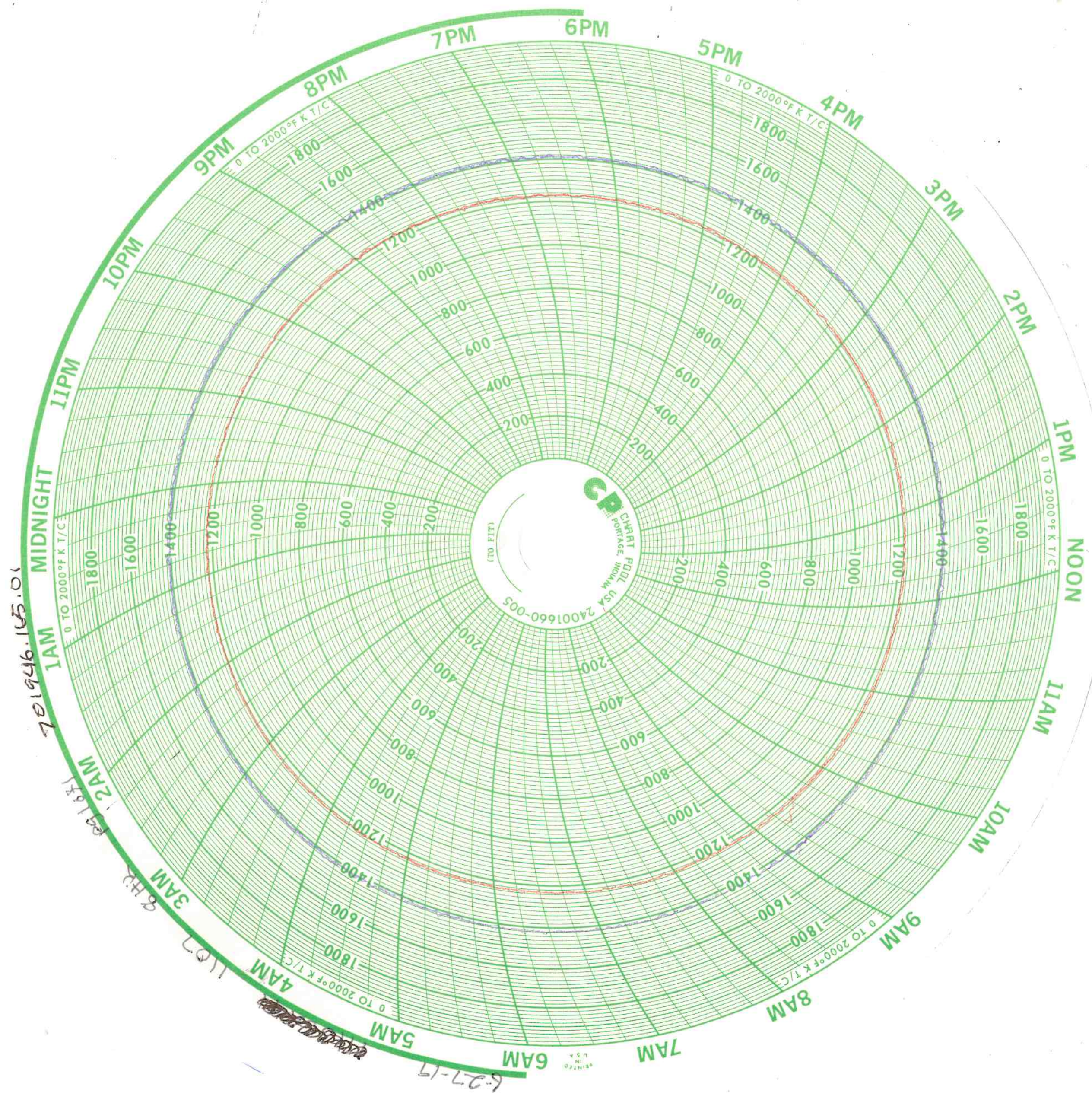
ATTACHMENT 3

Oxidizer Charts



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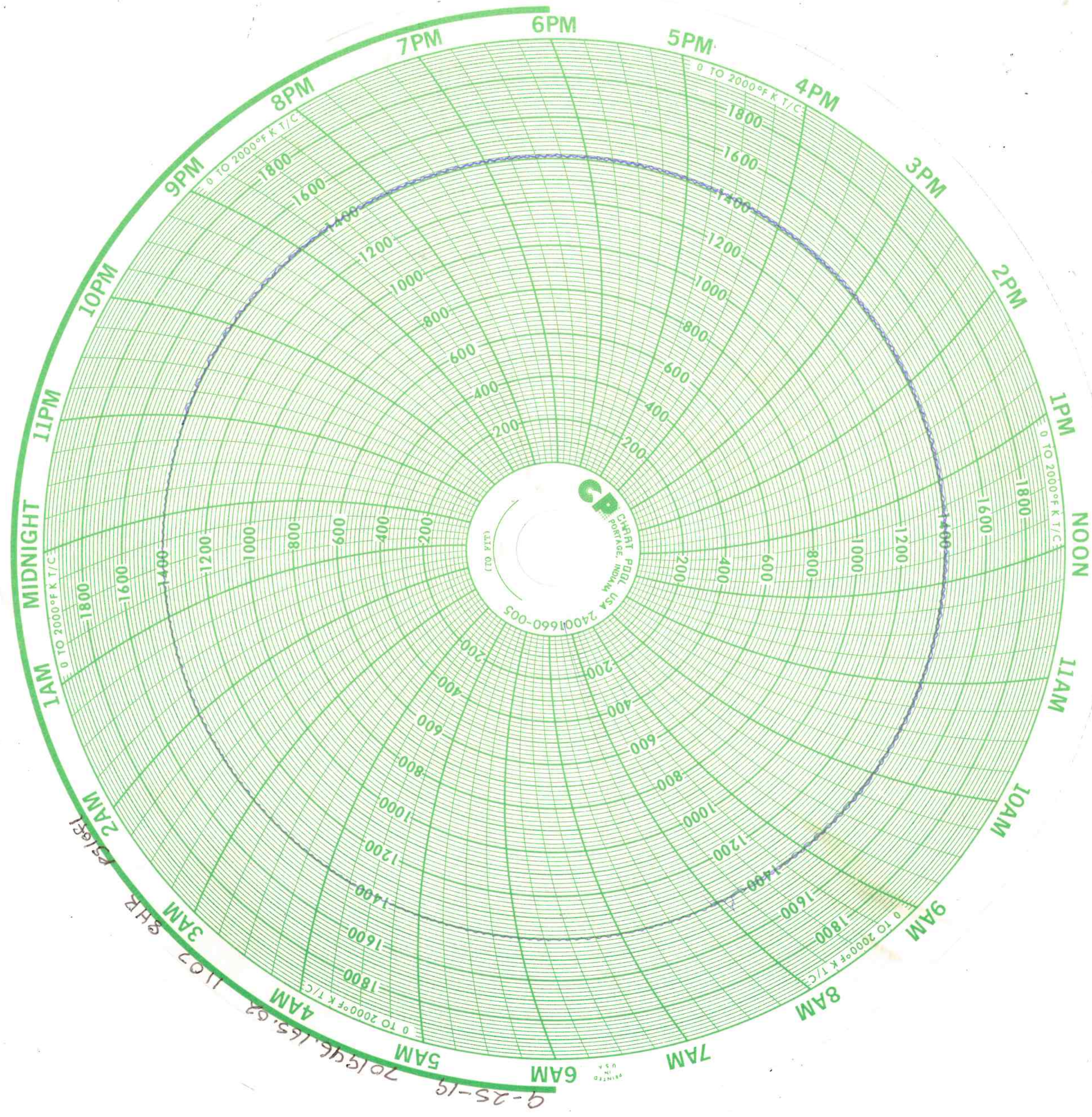
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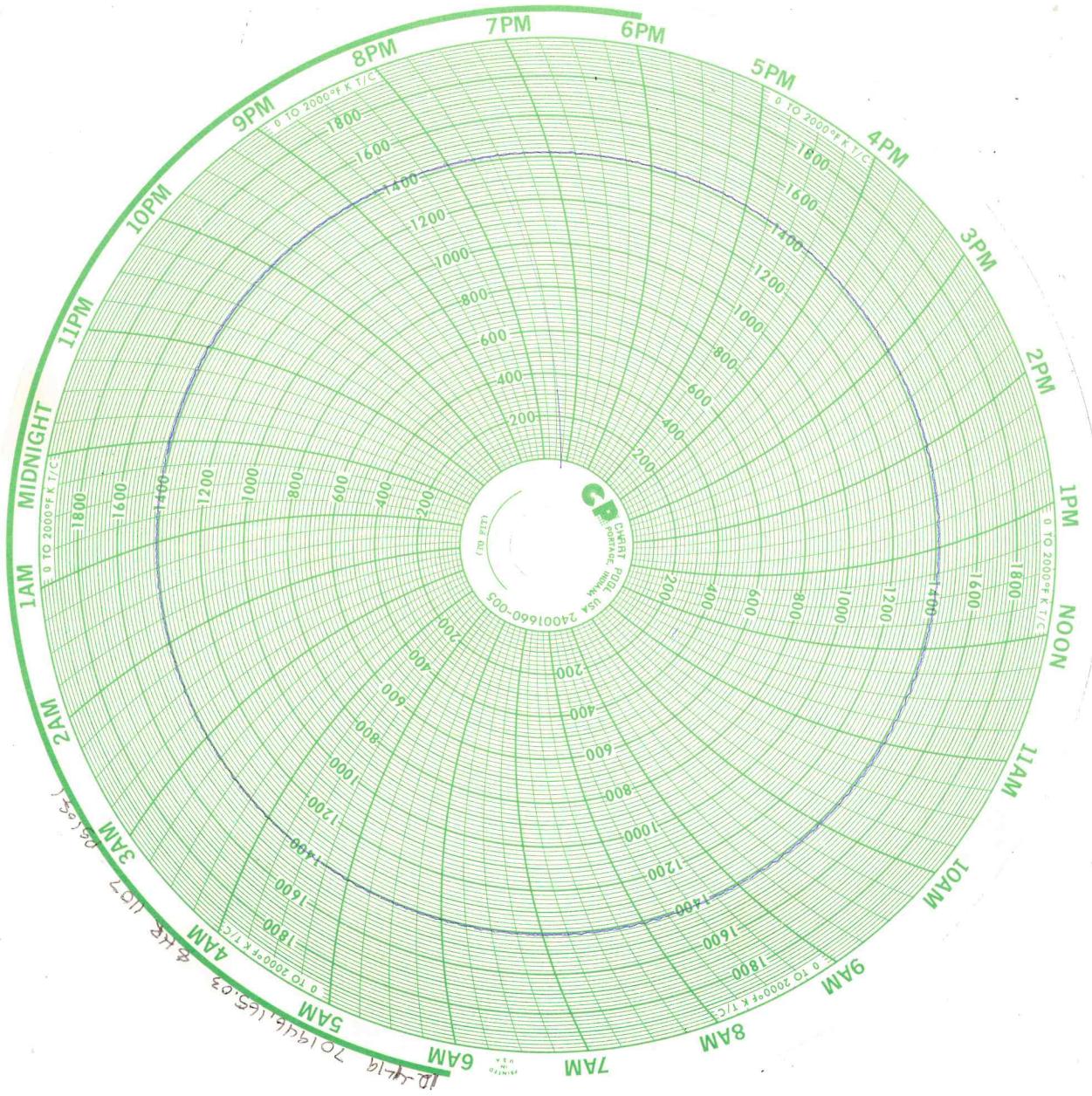
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about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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