PRELIMINARY RESULTS

April 4, 2018 Reference No. 11135241

Mr. Bradford Billings
Energy Minerals and Natural Resources Division
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Mr. Mark Naranjo
New Mexico State Land Office
2827 N.Dal Paso, Suite 117
Hobbs, New Mexico 88260

Dear Messrs. Billings and Naranjo:

Re: Additional Assessment Summary Report
0-6-1 4" (1RP-4643)
ETC Field Services LLC
Site Location: Unit J, Sec. 20, T 20-S, R 37-E
(Lat 32.557054N°, Long -103.27255W°)
Lea County, New Mexico

GHD Services, Inc. (GHD) is pleased to present this report for the above referenced site. The 0-6-1 4" Line Release (hereafter referred to as the "Site") is located within Unit J, Section 20, Township 20 South, Range 37 East, in Lea County, New Mexico (see Figure 1). The property is owned by the New Mexico State Land Office (NMSLO).

On March 13, 2017, a release of approximately 150 barrels (bbls) of natural gas/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 one-inch (in.) hole to develop on a section of the 4-in. diameter 0-6-1 pipeline. Approximately 50 bbls of fluids were recovered. Contaminated soils were excavated and stockpiled on site and the excavation backfilled. NMOCD release number 1RP-4643 was assigned.

1. Recommended Remediation Action Limits

Based on data collected from groundwater monitoring well MW-1 (installed at the site on August 29, 2017, see Figure 2) the depth to groundwater is approximately 25 feet below ground surface (ft bgs). Additionally, there are no well head protection areas or surface water bodies within 1,000 feet of the Site. Therefore, the preliminary total ranking score is 20 (see table below).

Based on this score, the applicable NMOCD Site specific Recommended Remediation Action Limits (RRALs) for soil are 10 milligrams per kilogram (mg/kg) for benzene, 50 mg/kg for total benzene, toluene,

ethylbenzene, and xylenes (BTEX), 100 mg/kg for total petroleum hydrocarbons (TPH), and 600 mg/kg for chlorides.

New Mexico Oil Conservation Division Site Assessment	
Ranking Criteria	Score
Depth to Ground Water (<50 ft bgs)	20
Wellhead Protection Area (> 1000 feet from water source, > 200 feet from domestic source)	0
Distance to Surface Body Water (>1000 feet)	0
Ranking Criteria Total Score	**20***

Notes:

* Because the ranking criteria total score is 20, NMOCD established RRALs are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 100 mg/kg for total TPH and 600 parts per million (ppm) for chlorides[1].

[1] NMOCD Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993 and recent discussions with Mr. Jim Griswold with the NMOCD.

The New Mexico Water Quality Control Commission (NMWQCC) mandates that groundwater quality in New Mexico be protected. Groundwater quality standards can be found in Title 20, Chapter 6, Part 2, Section 3103 of the New Mexico Administrative Code (20.6.2.3103 NMAC). The NMWQCC standards for constituents identified at the Site are as follows:

Constituent	NMWQCC Standard
Benzene	10 ug/L
Toluene	750 ug/L
Ethylbenzene	750 ug/L
Xylenes	620 ug/L
Chloride	250 mg/L
Total Dissolved Solids	1,000 mg/L

Note:
ug/L = micrograms per liter and mg/L = milligrams per liter

2. Assessment Activities

2.1 March 2017 Release Repair

The impacted area had been initially excavated to a depth of approximately 15 ft bgs in two locations. Excavations were performed to repair the pipeline. Soil samples were collected by ETC Field Services from the base of each excavation (Figure 3). The soil samples were submitted to Cardinal Laboratories in Hobbs, New Mexico for BTEX by EPA Method 8260B, TPH by EPA Method 8015B, and chloride by EPA Method 300.

The soil samples contained benzene concentrations ranging from below the laboratory reporting limit (LRL) to 0.084 mg/kg, total BTEX concentrations ranging from 1.956 mg/kg to 4.248 mg/kg, total TPH

concentrations ranging from 132.2 mg/kg to 213.3 mg/kg, and chloride concentrations ranging from 16 to 32 mg/kg (Table 1). The highest TPH and chloride concentrations were from the sample collected below the release point. The laboratory reports are included in Appendix A.

GHD submitted a work plan, dated April 11, 2017, to the NMOCD to install four soil borings and one monitor well at the Site to further assess potential soil and groundwater impacts. The work plan was approved by Ms. Olivia Yu of the NMOCD on April 21, 2017 via email. In order to install the monitor well, a water easement was obtained from the New Mexico State Land office on August 4, 2017.

2.2 August 2017 Subsurface Assessment

Assessment activities that included the drilling of six soil borings and the installation of one groundwater monitoring well were performed at the Site on August 29 and 30, 2017 by GHD. Four soil borings were advanced surrounding the release area and soil samples were collected at approximately 5-foot intervals. The soil samples were field screened using either a calibrated photoionization detector (PID) or PetroFlag Hydrocarbon Analyzer (Petroflag).

The soil borings were advanced to assess the horizontal extent of petroleum concentrations in the soil. Field screening data from two of the borings (BN-1 and BE-1) indicated the presence of petroleum hydrocarbons in the soil column. As a result, additional “step-out” borings were advanced (BN-2 and BE-2). One monitor well (MW-1) was also advanced near the release point (Figure 2) to assess if an impact to groundwater had occurred.

Select samples collected from the soil borings were submitted to Hall Environmental Analysis Laboratories (HEAL) located in Albuquerque, New Mexico. The samples were submitted for BTEX by EPA Method 8021B, TPH by EPA Method 8015, and chloride by EPA Method 300.0.

The soil sample collected from the boring advanced for MW-1 at a depth of 15 ft bgs to 17 ft bgs contained a benzene concentration of 0.032 mg/kg. Concentrations of BTEX or TPH constituents were below the LRLs in the remaining soil samples. The sample collected from the boring advanced for MW-1 at a depth of 15 ft bgs to 17 ft bgs indicated a chloride concentration of 1100 mg/kg. The samples collected from this soil boring below this depth indicated chloride concentrations that ranged from 170 mg/kg to 81 mg/kg. Chloride concentrations observed from the remainder of the soil samples that were submitted for laboratory analysis were less than 430 mg/kg. The soil analytical data is summarized on Figure 3 and in Table 1.

A groundwater sample was collected from MW-1 on September 20, 2017 and submitted to HEAL for analysis of BTEX by EPA Method 8021B, chloride by EPA Method 300.0, and total dissolved solids (TDS) by SM2540C analysis. This sample contained a benzene concentration of 200 ug/L and a total BTEX concentration of 451 ug/L. Chloride was detected at a concentration of 580 mg/L. The TDS concentration was 2,010 mg/L. The analytical data is summarized on Table 2.

A second groundwater sample was collected from MW-1 on October 17, 2017 to confirm the original sample results. The sample was submitted to HEAL for BTEX analysis by EPA Method 8021B, chloride by

EPA Method 300.0, and TDS by EPA Method SM2540C Mod. Benzene was detected at a concentration of 150 ug/L, chloride at a concentration of 560 mg/L, and TDS at a concentration of 1,620 mg/L.

Please see the Assessment Summary Report prepared by GHD dated October 23, 2017 for additional details regarding this assessment.

2.3 December 2017 Subsurface Assessment

The results of the August 2017 assessment indicated the need for further assessment of chloride and BTEX in the groundwater. GHD proposed to install additional groundwater monitoring wells to assess the horizontal extent of chloride and BTEX concentrations in the groundwater. The scope of work included the installation of two air sparge wells so that a pilot study could be performed to assess the effectiveness of this technology at the site.

GHD submitted a work plan, dated November 17, 2017, to the NMOCD. The work plan included a pilot study to assess the effectiveness of soil vapor extraction (SVE) and air sparging (AS) in the vicinity of MW-1. The work plan was approved by Mr. Bradford Billings of the NMOCD on December 13, 2017 and by Ms. Amber Groves with the NMSLO on December 18, 2017, both via email.

The field work for the work plan was performed on December 18 through 21, 2017. The soil boring locations were marked and a New Mexico One Call utility locate ticket was completed at least 48 hours prior to mobilization. In addition, an application to Amend Water Easement was submitted to the NMSLO on November 30, 2017. Approval to proceed was provided by the NMSLO on December 18, 2017 via email and the Water Easement was signed on December 19, 2017. An application to Drill a Well With no Water Right was submitted to the New Mexico Office of the State Engineer on November 30, 2017 and the permit was approved on December 5, 2017. Copies of each are included in Appendix B.

GHD installed four additional monitoring wells at the site and two AS wells. Monitoring well 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. See Figure 2 for the monitor well locations.EnviroDrill, Inc. of Albuquerque, New Mexico installed the monitoring and AS wells. A CME-75 drill rig equipped with hollow stem augers advanced the soil borings. Soil samples were collected every 5 feet of depth using a split spoon sampler. Soil samples were logged in accordance with the Unified Soil Classification System.

The observed soils at the site primarily consisted of very fine to fine grained sand with varying degrees of silt. Clayey sand/sandy clay was observed in the soil boring for AS-1 from 40 ft bgs to the terminus of the boring at 45 ft bgs. The soil boring logs are included in Appendix C.

Three soil samples were collected from each of the soil borings and submitted to HEAL for analysis. The samples were submitted for BTEX by EPA Method 8021B, TPH by EPA Method 8015, and chloride by EPA Method 300.0. Soil samples were placed on ice and shipped to the laboratory via courier under chain of custody documentation.

The monitoring wells were constructed of 2-in. diameter, flush-threaded, Schedule 40 PVC casing and 20 feet of 0.020-in. machine slot well screen. The well screen was placed from the bottom of boring

(approximately 35 ft bgs) and extended to approximately 15 ft below ground surface. The monitor wells were constructed with additional screen located above the water table so that they could also be used as SVE wells.

The borehole annulus was backfilled with a 10/20 sand filter pack to approximately 2 ft above the top of the screen interval. An approximately 2 ft thick bentonite seal was placed on top of the sand. The remainder of the well annulus was grouted to ground surface with a 95 percent Portland cement and 5 percent bentonite powder grout. The well was completed with an above ground, lockable well vault that was placed within 24-in. by 24-in. by 4-in. thick concrete pad. A lock was placed on each well vault. Monitoring well construction details are included in the soil boring logs located in Appendix C.

The AS wells were completed with 5 feet of U-Pack, 0.020-in. machine slot pre-packed screen. The U-Pack screen was installed from 15 to 20 ft below static groundwater level (total depth of 40 to 45 ft bgs). The annulus around the screen was filled with 10/20 sand to approximately 2 ft above the screen. The well annulus was backfilled with bentonite pel-plug from the top of sand to static groundwater level. The remainder of the annulus was backfilled with a 95 percent Portland/ 5 percent bentonite powder grout. Air sparge wells were constructed with an above ground, lockable well vault that was placed within 24-in. by 24-in. by 4-in. thick concrete pad. Monitoring well construction details are included in the soil boring logs located in Appendix C.

2.4 Soil Sample Results

Soil samples submitted for laboratory analysis were below the LRL for BTEX or TPH constituents. Chloride concentrations ranged from below the LRL to 140 mg/kg. The analytical data is summarized on Figure 3 and in Table 1 and the laboratory analytical data can be found in Appendix A.

3. Quarterly Groundwater Sampling

GHD initiated quarterly groundwater monitoring on January 4, 2018 that included sampling all five monitoring wells (MW-1 through MW-5). The depth to groundwater in the wells ranged from 24.43 feet below top of casing (ft btoc) to 25.79 ft btoc as measured on January 4, 2018 (Table 2). Based on the groundwater elevation data, the direction of flow is to the south, southeast. A potentiometric surface map for data collected on January 4, 2018 is presented as Figure 4.

Approximately 3.25 to 6.25 gallons of water were purged from each well with a disposable bailer. Well purging was performed until field parameters (pH, temperature, oxidation reduction potential (ORP), and conductivity) stabilized. Field parameters were monitored using a YSI 556 multi parameter sonde during the sampling event. Following purging a groundwater sample was collected from each well utilizing the disposable bailer.

3.1 Groundwater Sampling Results

The ground water samples collected from MW-1, MW-4, and MW-5 contained benzene concentrations of 130 ug/L, 230 ug/L, and 130 ug/L, respectively. Samples collected from MW-2 and MW-3 did not contain benzene concentrations above the LRL. Toluene was detected above the LRL in MW-5 at a concentration of 15 ug/L. Ethylbenzene was detected in MW-1, MW-4, and MW-5 at concentrations of 56 ug/L, 140 ug/L, and 77 ug/L, respectively and total xylenes were detected in MW-1, MW-4, and MW-5 at concentrations of 30 ug/L, 8.9 ug/L, and 47 ug/L, respectively.

Chloride was detected above the NMWQCC standard of 250 mg/L in all five wells at concentrations ranging from 620 to 710 mg/L with the highest concentration detected in MW-2. TDS was detected above the NMWQCC standard of 1,000 mg/L in all five wells at concentrations ranging from 1,720 mg/L to 2,010 mg/L with the highest concentration found in MW-4.

GHD believes that the elevated chloride and TDS concentrations originate from an uprgradient source and not from the O-6-1 Release. This is based on:

- The relatively minimal chloride concentrations observed in the soil samples collected at the site. The soil sample collected from MW-1 at 15 to 17 ft bgs contained 1100 mg/kg chloride. The two chloride samples below this were less than 170 mg/kg. All of the other samples, including those in MW-1 were less than the dissolved chloride concentrations that are observed in the groundwater.
- Chloride concentrations in the upgradient well (MW-2) are elevated even though there are no benzene concentrations in this well.
- It appears that there is a former pit located upgradient of the release location.

The analytical data is summarized on Figure 5 and in Table 3 and the laboratory analytical data can be found in Appendix A.

4. Pilot Study Results and Discussion

A soil vapor extraction (SVE) pilot study was performed at the site on January 30, 2018. The SVE pilot study was performed using a Rotron 454 vacuum blower connected to a moisture separator. The SVE pilot study consisted of applying a vacuum to monitor well MW-1 for a period of approximately four hours. System vacuum, flow, and hydrocarbon concentration (as monitored by a calibrated PID) data were collected from the SVE system. The surrounding monitor wells (MW-2 through MW-5) were monitored for vacuum.

The SVE system was operated at a vacuum of approximately 43 in. of water and a flow rate of approximately 25 actual cubic feet per minute (CFM) for approximately two hours (see Table 4). At that time, the flow rate was increased to approximately 35 CFM with a corresponding decreased vacuum of approximately 35 in. of water.

Subsurface pressures were observed in MW-2, MW-3, MW-4, and MW-5 and recorded. Maximum exhibited vacuums ranged from 0.06 in. of water in MW-3 (81 feet from MW-1) to 1.95 in. of water in MW-2 (20.6 feet from MW-1). See Table 4 for the SVE Pilot Study Data.

Petroleum hydrocarbon vapor concentrations began at 450.4 ppm and decreased to 332 ppm during the study. In addition, two air samples were collected from the exhaust of the SVE system at 2 hours 38 minutes and 4 hours 3 minutes from the beginning of the test. The air samples were analyzed for BTEX and napthalenes by EPA Method 8260, and TPH GRO by EPA Method 8015 by HEAL.

An air sparge (AS) pilot study was performed at the site on January 31, 2018. The AS pilot study was performed using a rotary vane compressor and consisted of injecting ambient air into:

- AS-1 for a period of 2 hours and 45 minutes, and
- AS-1 and AS-2 for a period of 2 hours and 30 minutes.

Subsurface pressures were observed in MW-1, MW-2, MW-4, and MW-5 and recorded. Injection pressures for the study began at 10 pounds per square inch (PSI) and ended at 4.5 PSI (See Table 5). The flow began at 3 CFM and ended at 10.5 CFM. Maximum exhibited pressures ranged from 0.08 in. of water in MW-4 (50.5 feet from AS-1) to 0.58 in. of water in MW-1 (20.6 feet from AS-1).

Down-hole water quality parameters were also collected prior to, during, and at the completion of the test. The down-hole water quality parameters were collected by a calibrated In-Situ SmarTroll MP with a 100 foot long cable. The SmarTroll collected parameters of temperature, rugged dissolved oxygen, ORP, pH, and conductivity. In general, the groundwater parameter data indicated a slight increase in rugged dissolved oxygen and ORP (see Table 6)

Data collected during the AS/SVE pilot test was evaluated to assess the suitability of this technology for the Site and to determine the necessary design parameters for full-scale design. The results of the pilot study are as follows.

4.1 Air Flow Rate versus Vacuum/Pressure

For each test the unit was operated for short durations at various flow rates and corresponding vacuum levels for the purpose of determining the AS and SVE performance over the operating range of the compressor and blower. The step test at MW-1 showed a desirable operating range between 25-35 CFM with an applied vacuum of 35-43 in. of water. The step tests at AS-1 and the combined AS-1/AS-2 test displayed good performance with a flow of over 10 CFM with an applied pressure of 4 PSI. An initial pressure of 8-10 PSI was required for initial breakout of flow into the formation.

4.2 Radius of Influence

The radius of influence (ROI) for each pilot test is estimated based on the vacuum/pressure response measured at the nearby wells, as well as past experience gained from operating AS/SVE systems in similar soils.

4.2.1 SVE ROI

A probe response of 0.5 to 1.0 percent of the applied SVE wellhead vacuum is generally considered significant in ROI estimation. The applied wellhead vacuum ranged from 35 to 43 scfm during the test. The vacuum response of 0.44 in. of water at MW-5 is over 1% of the wellhead vacuum, indicating a ROI of 41.5 feet or more. See Appendix D.

4.2.2 AS ROI

For AS ROI, the pressure induced at nearby monitoring wells was measured. During the AS-1 test, significant pressure was induced in MW-2, at a distance of 34 feet, but not in MW-4 at a distance of 50.5 feet. Noticeable response was observed at all monitoring wells (MW-1, MW-2, MW-4, and MW-5) during the combined AS-1/AS-2 test, indicating that a ROI of 35-40 feet is achievable. See Appendix D.

4.3 Soil Permeability to Air Flow

A mathematical model was used to calculate soil permeability to air flow based on steady-state conditions at the SVE wellhead. The simplistic steady-state radial flow solution for compressible flow can be used to estimate air permeability using the extraction vacuum and flow rate along with other test parameters. Intrinsic permeability typically ranges from 10^{-6} cm^2 for sandy soils down to 10^{-10} cm^2 for tight clays and silts. Based on flow and vacuum measured during the test, the calculated permeability of the soils in the test area was 1.05×10^{-7} cm^2, indicating good permeability for the application of SVE. The permeability calculation is included in Appendix D.

4.4 Mass Removal

Mass removal of GRO (as ethylbenzene) was estimated based on vapor samples collected during the test and estimated average soil concentrations in the test area. Vapor concentrations at startup are representative of equilibrium vapor concentrations in the soil matrix, while concentrations observed after a period of operation are more indicative of expected long-term removal rates. Based on long-term removal rates and the baseline contaminant mass present at the Site, SVE treatment duration and off-gas loading can be estimated.

Vapor samples collected during the test indicated GRO concentrations in the extracted vapor at 4,400 ug/l. By the end of the test the GRO concentration had dropped to 3,600 ug/l.

The initial drop in extracted vapor concentrations is typical for the startup period of SVE systems as advective removal of vapors at equilibrium in the soil pore space occurs. Once pore space vapors are removed, the further extraction of target compounds from the adsorbed and dissolved phases becomes diffusion limited and proceeds at a lower rate.

The extracted vapor concentrations correlate to an initial GRO removal rate of approximately 25 lbs. per day, which will likely steadily decrease to less than 1 lb. per day within the first year of operation (Appendix D). Analytical results of air samples are included in Appendix A.

5. Summary and Recommendations

Based on the results of the soil samples that were collected it appears that the horizontal extent of petroleum hydrocarbon and chloride concentrations has been assessed in the soil. Chloride impacted soils exceeding the RRAL at the Site were encountered at a depth ranging 15-17 ft bgs in one soil boring (MW-1).

The three groundwater samples collected from MW-1 all indicated benzene, chloride, and TDS concentrations exceeding their respective NMWQCC standards. Benzene concentrations from samples collected from MW-4 and MW-5 on January 4, 2018 also exceeded the NMWQCC standard.

Chloride and TDS concentrations have exceeded the NMWQCC standards for all of the samples analyzed from MW-1 through MW-5. However, GHD believes that the elevated chloride and TDS concentrations originate from an uprgradient source and not from the O-6-1 Release. This is based on:

- The relatively minimal chloride concentrations observed in the soil samples collected at the site. The soil sample collected from MW-1 at 15 to 17 ft bgs contained 1100 mg/kg chloride. The two chloride samples below this were less than 170 mg/kg. All of the other samples, including those in MW-1 were less than the dissolved chloride concentrations that are observed in the groundwater.
- Chloride concentrations in the upgradient well (MW-2) are elevated even though there are no benzene concentrations in this well.
- It appears that there is a former pit located upgradient of the release location.

Based on the results of the additional assessment, GHD recommends to continue quarterly groundwater monitoring while implementing soil and groundwater remediation.

The data and observations mentioned above 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 is estimated that 75-90% of the mass currently present would be removed in less than a year of operation. Operating the system for eight months and then shutting down during the winter will allow for site-wide monitoring and reevaluation, as well as allowing for diffusion to occur from the soils present.

Given the excellent permeability that was observed in the vadose and saturated zones, GHD recommends the installation and operation of an AS/SVE system using the existing wells. GHD believes that by addressing the source area, the remainder of the benzene plume will reduce in size over time.

In the event that residual benzene concentrations need to be addressed with additional wells, they will be installed at a later date.

Should you have any questions or require additional information regarding this submittal please feel free to contact myself, or Bernie Bockisch at (505) 884-0672 or Bernard.Bockisch@ghd.com.

Sincerely,

GHD

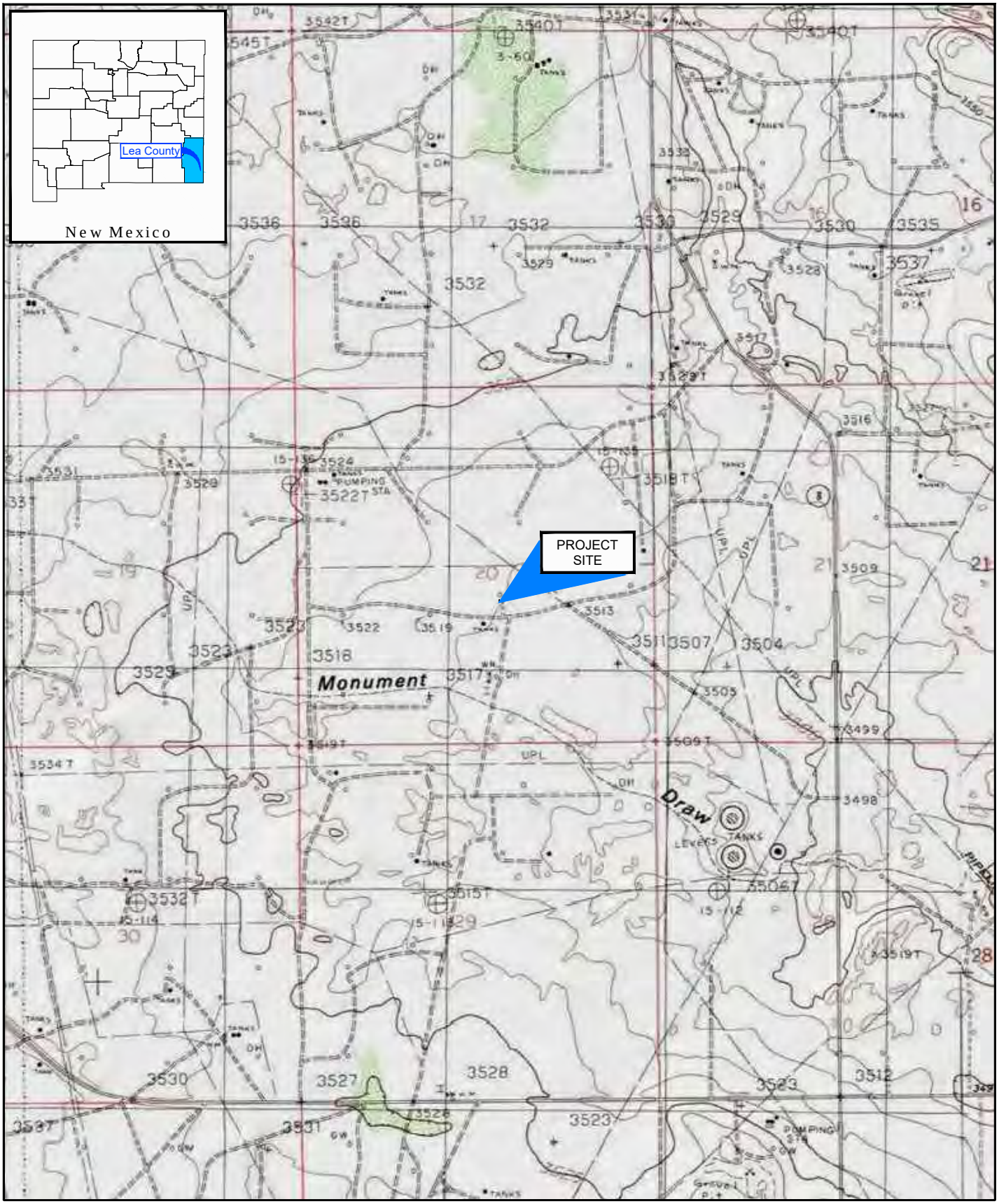
Alan Brandon
Senior Project Manager

Bernard Bockisch
New Mexico Operations Manager

AB/ji/01

Encl.

Figures



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

Lat/Long: 32.557054° North, 103.27255° West

0 1000 2000ft

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

ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

11135241-2018

Feb 27, 2018

SITE LOCATION MAP

FIGURE 1

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1113----\11135241-ETC-S-U-6 Six Inch Line Release\11135241-2018(000)GN-DL001.dwg

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

Lat/Long: 32.557054° North, 103.27255° West

0 10 30ft

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

ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

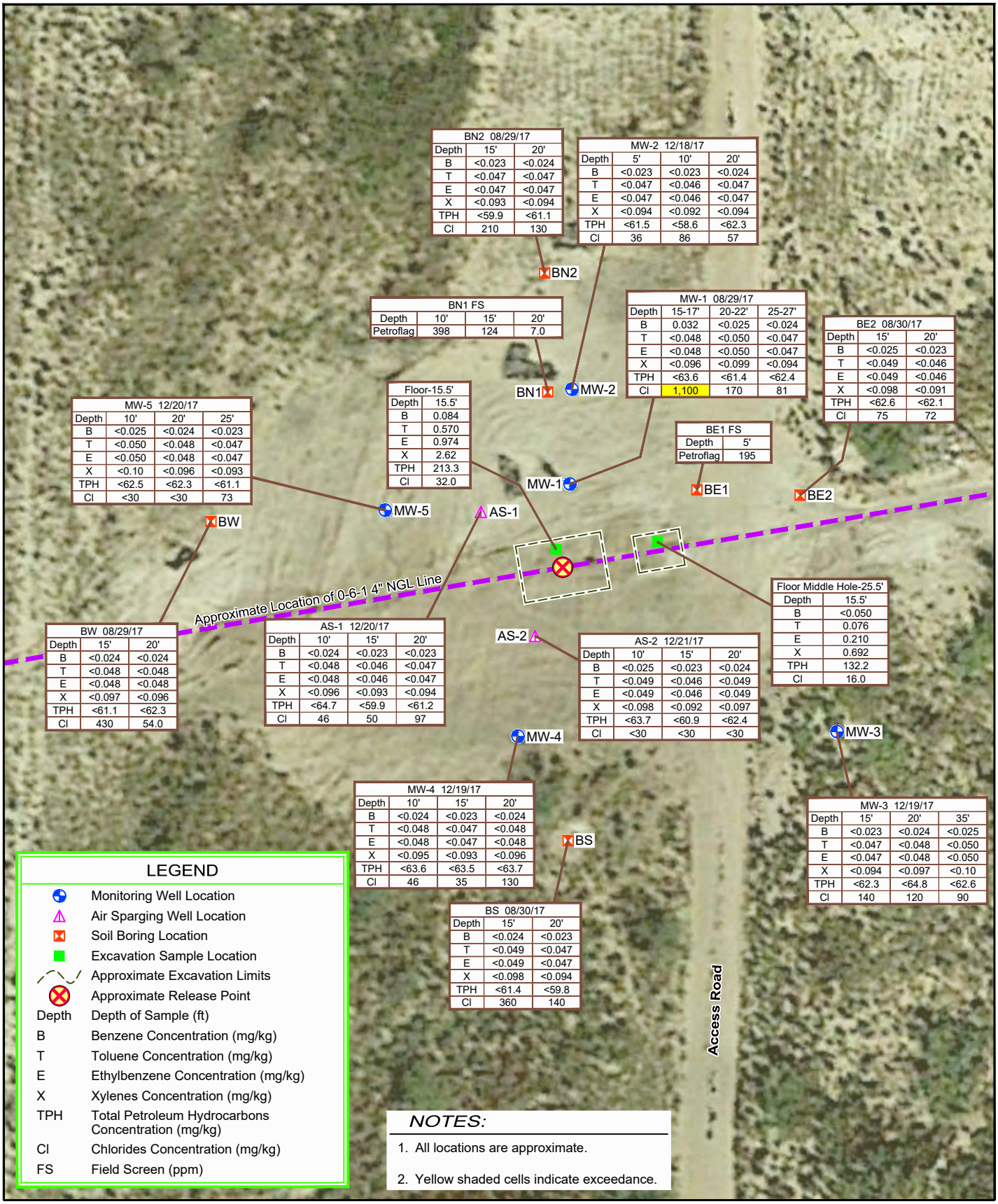
SOIL BORING AND MONITORING WELL LOCATIONS

11135241-2018

Apr 2, 2018

FIGURE 2

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1113----\11135241-ETC-S-U-6 Six Inch Line Release\11135241-2018(000)GN-DL001.dwg



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

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

ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

11135241-2018

Apr 2, 2018

SOIL CONCENTRATION MAP

FIGURE 3

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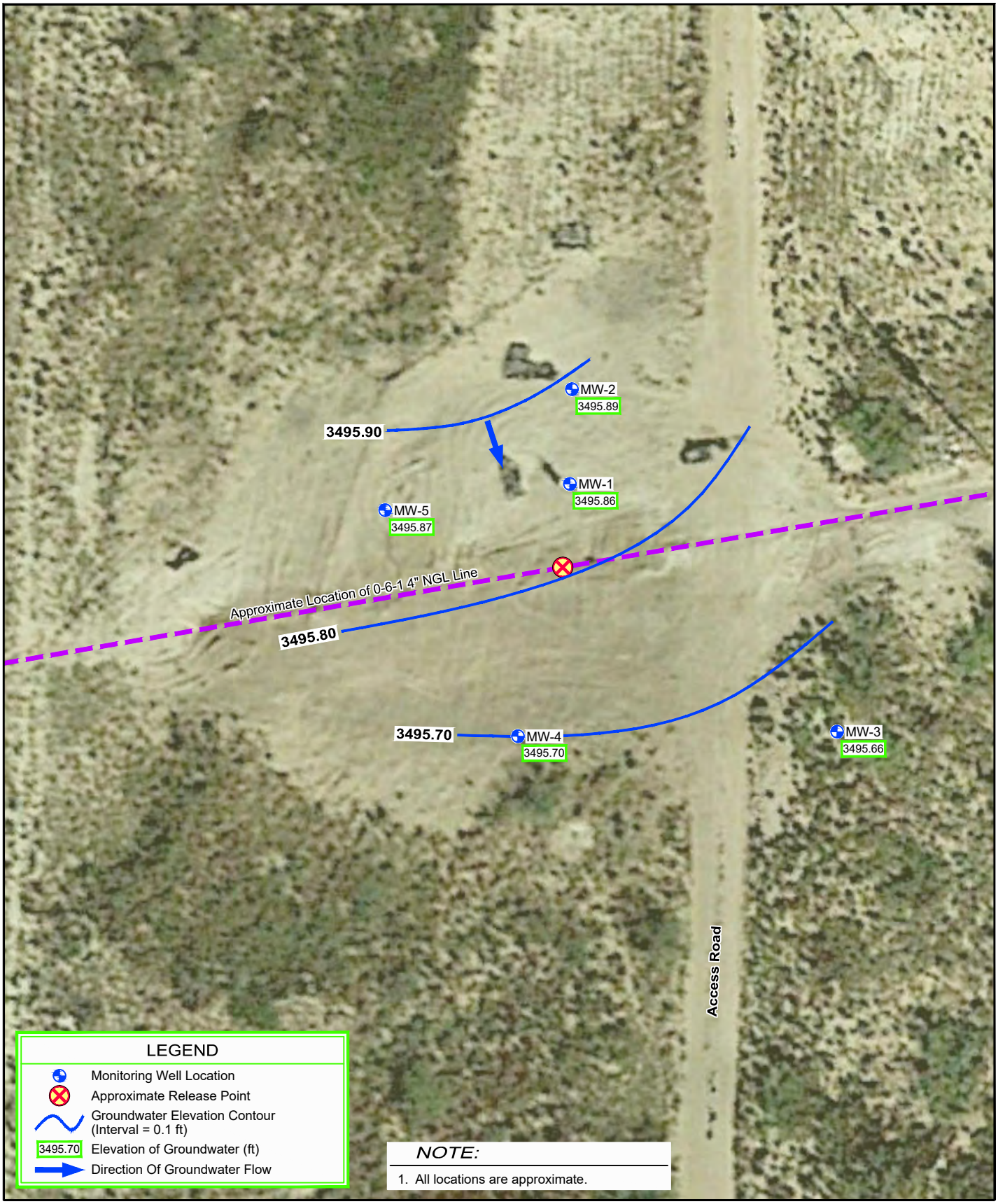


Source: Image © 2016 Google - Imagery Date: November 2, 2017

Lat/Long: 32.557054° North, 103.27255° West

0 10 30ft

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

ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

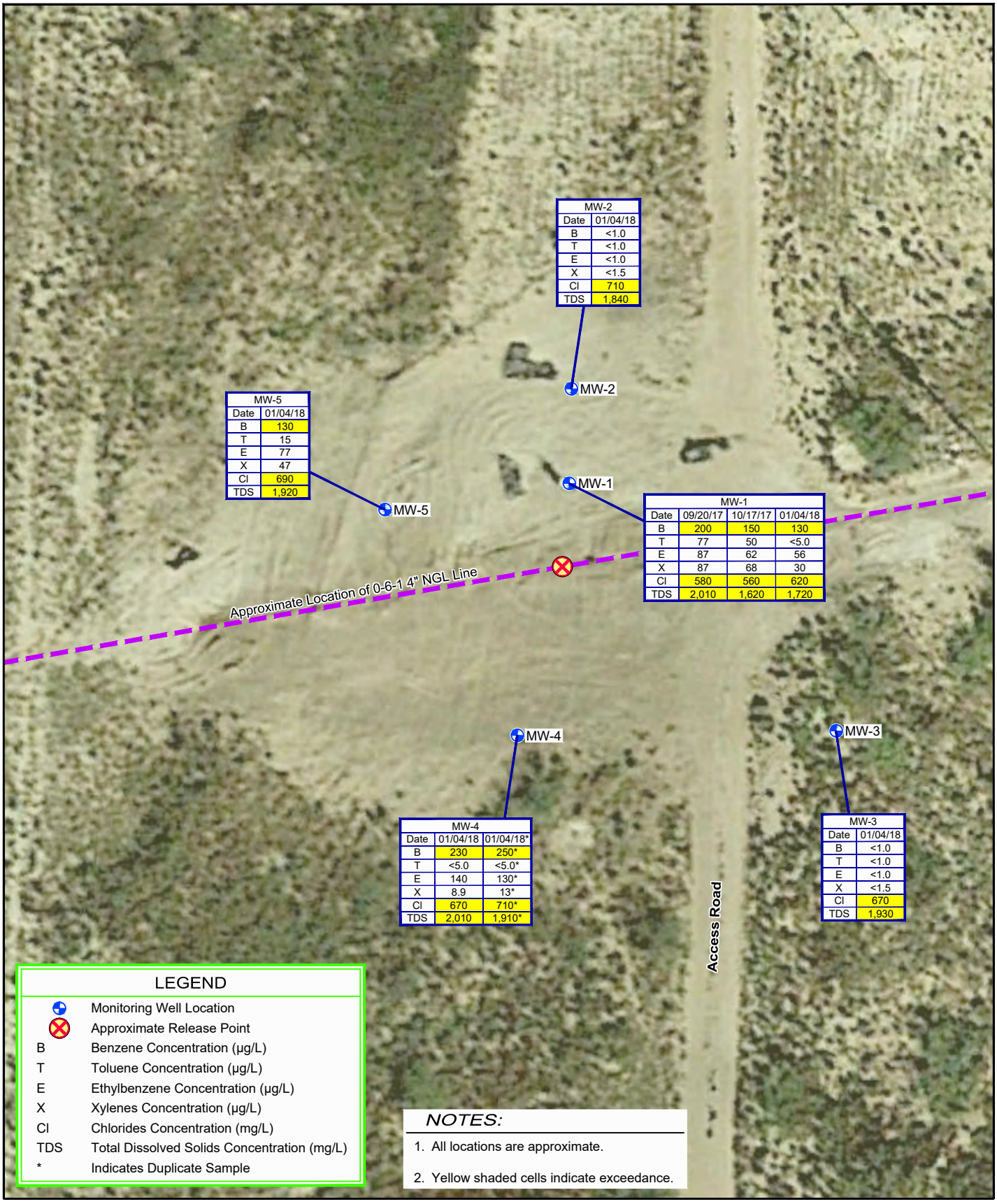
JANUARY 2018 GROUNDWATER POTENTIOMETRIC SURFACE MAP

11135241-2018

Apr 2, 2018

FIGURE 4

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1113----\11135241-ETC-S-U-6 Six Inch Line Release\11135241-2018(000)GN-DL001.dwg



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)

GHD

ETC FIELD SERVICES LLC
LEA COUNTY, NEW MEXICO
0-6-1 4" LINE RELEASE

GROUNDWATER CONCENTRATION MAP

11135241-2018

Apr 2, 2018

FIGURE 5

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1113----\11135241-ETC-S-U-6 Six Inch Line Release\11135241-2018(000)GN-DL001.dwg

Tables

Table 1

ETC Field Services LLC - 0-6-1
Section 20, Township 20 South, Range 37 East
Lea County, New Mexico
Soil Analytical Results Summary

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 EXT DRO (C28-C36) (mg/kg)	Total TPH GRO/DRO (mg/kg)	Field Screen - Hydrocarbons (PetroFlag) (ppm)
NMOCD Remediation Action Levels			**600**	**10**	**NE**	**NE**	**NE**	**50**	**NE**	**NE**	**NE**	**100**	
	SUBSURFACE INVESTIGATION SAMPLES												
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-BN-2-20	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-BE-2-15	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-BE-2-20	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	<47	<61.5	--
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	<9.6	<48	<62.3	--
S-11135241-121917-MG-MW-3-15	12/19/2017	15	140	<0.023	<0.047	<0.047	<0.094	<0.211	<4.7	<9.6	<48	<62.3	--
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	<0.10	<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	<0.10	<0.225	<5.0	<9.5	<48	<62.5	1019
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	64
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	<0.219	<4.9	<9.5	<48	<62.4	188

Notes:

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

Table 2

Groundwater Elevation Summary
ETC Field Services, LLC.
0-6-1 4 Inch
Lea County, New Mexico

Well ID	Elevation*	Date Measured	Depth to LNAPL (ft below TOC)	Depth to Groundwater (ft below TOC)	LNAPL THICKNESS (ft)	Relative Water Level
MW-1	3520.29	9/20/2017	--	24.70	--	3495.59
		10/17/2017	--	24.60	--	3495.69
		1/4/2018	--	24.43	--	3495.86
MW-2	3520.42	1/4/2018	--	24.53	--	3495.89
MW-3	3520.45	1/4/2018	--	24.79	--	3495.66
MW-4	3520.35	1/4/2018	--	24.65	--	3495.70
MW-5	3520.57	1/4/2018	--	24.70	--	3495.87

Notes:

-- Not applicable since no measurable thickness of hydrocarbon is present

Table 3

Groundwater Elevation Summary
ETC Field Services LLC - 0-6-1
Section 20, Township 20 South, Range 37 East
Lea County, New Mexico

MW ID	Sample ID	Date	Chlorides	Benzene	Toluene	Ethylbenzene	Xylenes	TDS	Conductivity*	ORP*	pH*	Sample Temperature*
			(mg/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)	(uS/cm)	(millivolts)	(s.u.)	(deg C)
	NMWQCC Standard		***250***	***10***	***750***	***750***	***620***	***1,000***	**NE**	**NE**	**6-9**	**NE**
MW-1	GW-11135241-092017-MG-MW-1	9/20/2017	**580**	**200**	77	87	87	**2,010**	2302	-151.5	6.83	19.79
MW-1	GW-11135241-10172017-MG-MW-1	10/17/2017	**560**	**150**	50	62	68	**1,620**	2587	-192.3	7.11	19.66
MW-1	GW-11135241-010418-SP-MW-1	1/4/2018	**620**	**130**	<5.0	56	30	**1,720**	2605	-241.3	6.75	19.11
MW-2	GW-11135241-010418-SP-MW-2	1/4/2018	**710**	<1.0	<1.0	<1.0	<1.5	**1,840**	2627	-191.8	7.08	19.07
MW-3	GW-11135241-010418-SP-MW-3	1/4/2018	**670**	<1.0	<1.0	<1.0	<1.5	**1,930**	2638	-138	7.23	19.2
MW-4	GW-11135241-010418-SP-MW-4	1/4/2018	**670**	**230**	<5.0	140	8.9	**2,010**	3081	-277.2	7.04	19.75
	GW-11135241-010418-SP-DUP	1/4/2018	**710**	**250**	<5.0	130	13	**1,910**	3081	-277.2	7.04	19.75
MW-5	GW-11135241-010418-SP-MW-5	1/4/2018	**690**	**130**	15	77	47	**1,920**	2955	-275.2	7.04	19.45

Notes:

TDS = Total dissolved solids
ORP = Oxidation-reduction potential
* = Field parameter
NE = Not established
NMWQCC = New Mexico Water Quality Control Commission
mg/L = Milligrams per liter (parts per million)
ug/L = Micrograms per liter (parts per billion)
BOLD = Concentrations that exceed the NMWQCC groundwater quality standard

Table 4

Soil Vapor Extraction Pilot Study Data
ETC Field Services LLC
0-6-1 4 Inch
Lea County, New Mexico

Time	Sustem Vacuum	System Flow	MW-2	MW-3	MW-4	MW-5	PID
	"H2O	CFM	"H2O	"H2O	"H2O	"H2O	PPM
	Distance (feet):		20.6	81	57.6	41.5	
12:01	43	25	0.80	0.00	0.02	0.10	-
12:15	43	25	-	0.02	0.10	0.30	450.5
12:18		-	1.30	-	-	-	-
12:30	43	25	1.30	0.00	0.10	0.30	453
12:45	43	25	1.30	0.02	0.10	0.32	444
13:00	43	25	1.30	0.04	0.10	0.32	429
13:30	43	25	1.35	0.04	0.10	0.32	405
14:00	25	25	1.40	0.04	0.10	0.30	391
14:30	34	35	1.95	0.04	0.14	0.44	358
15:00	35	35	1.95	0.04	0.12	0.46	348
15:15	35	35	1.85	0.06	0.12	0.44	319
15:30	35	35	1.80	0.04	0.14	0.44	338
15:45	35	35	1.80	0.04	0.14	0.44	330
16:00	35	35	1.85	0.04	0.14	0.44	332

Table 5

Air Sparge Pilot Study Data
ETC Field Services LLC
0-6-1 4 Inch
Lea County, New Mexico

Time	Sustem Pressure	System Flow	MW-1	MW-2	MW-4	MW-5
	PSI	CFM	"H2O	"H2O	"H2O	"H2O
	AS-1 Distance (feet):		20.6	34	50.5	21.5
	AS-2 Distance (feet):		35	55.5	23	43.5
10:15	10.00	3.0	0.04	0.00	-	0.04
10:22	9.00	5.0	0.10	0.04	0.02	0.10
10:30	8.25	6.0	0.17	0.08	0.08	0.18
10:40	7.50	7.0	0.26	0.14	0.06	0.24
10:50	7.00	7.5	0.34	0.16	0.08	0.32
11:00	6.50	8.0	0.38	0.18	0.06	0.32
11:15	6.00	8.0	0.46	0.22	0.06	0.38
11:30	6.00	8.0	0.44	0.16	0.04	0.36
11:45	5.50	8.5	0.48	0.18	0.04	0.38
12:00	5.00	9.0	0.52	0.22	0.04	0.42
12:30	4.50	9.5	0.56	0.22	0.04	0.42
13:00	4.00	10.0	0.58	0.26	0.06	0.44
13:30	4.00	10.0	0.58	0.26	0.04	0.44
14:00	4.00	10.5	0.58	0.26	0.04	0.44
Switch to both AS-1 and AS-2						
14:36	8	7	0.18	0.10	0.10	0.12
14:45	7	8	0.24	0.12	0.12	0.20
15:00	6	8.5	0.32	0.16	0.14	0.24
15:15	5.5	9	0.32	0.14	0.16	0.28
15:30	5	9.5	0.34	0.16	0.16	0.26
15:45	4.5	10.5	0.34	0.16	0.16	0.26
16:00	4	11	0.34	0.16	0.26	0.24
16:30	4.5	10.5	0.34	0.12	0.20	0.24

Table 6

AS Groundwater Parameter Data
ETC Field Services LLC
0-6-1 4 Inch
Lea County, New Mexico

Time	Temp	Depth	RDO	RDOsat	ORP	pH	Conductivity
	Celcius	Feet	Mg/l	%			
9:20	20.39	4.57	-0.04	-0.5	-174.4	6.96	2499
14:14	22.18	4.66	-0.01	-0.1	85.2	7.01	2561
16:39	22.22	3.91	0.17	2.2	-126.8	7.02	2572

Attachments

Attachment A
Laboratory Reports

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

January 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: VPS 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	4.5	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.Bockisch@ghd.com

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

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

Project #: 1113S241.

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. 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	1113S241-121817-MG-MW2-5	4oz Jar	ICE	-001	X		X									X				
12/18/17	1615		1113S241-121817-MG-MW2-10			-002	X		X									X				
12/18/17	1620		1113S241-121817-MG-MW-2-20			-003	X		X									X				
12/19/17	1050		1113S241-121917-MG-MW-3-15			-004	X		X									X				
12/19/17	1055		1113S241-121917-MG-MW-3-20			-005	X		X									X				
12/19/17	1100		1113S241-121917-MG-MW-3-35			-006	X		X									X				
12/19/17	1425		1113S241-121917-MG-MW-4-10			-007	X		X									X				
12/19/17	1430		1113S241-121917-MG-MW-4-15			-008	X		X									X				
12/19/17	1435		1113S241-121917-MG-MW-4-20			-009	X		X									X				
12/20/17	0920		1113S241-122017-MG-MW-5-10			-010	X		X									X				
12/20/17	0925		1113S241-122017-MG-MW-5-20			-011	X		X									X				
12/20/17	0930		1113S241-122017-MG-MW-5-35			-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: 4121 Indian School Rd Ste 200 NE Albuquerque, NM 87110

Phone #: 505 884 0672

email or Fax#: BernardBocklisch@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 Bocklisch

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1712D08791	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-1135241-122017-MG-AS-1-10	4oz Soil Jar	ICE	-0013	X		X									X				
12/20/17	1135		S-1135241-122017-MG-AS-1-15			-0014	X		X									X				
12/20/17	1140		S-1135241-122017-MG-AS-1-20			-0015	X		X									X				
12/21/17	0920		S-1135241-122017-MG-AS-2-10			-0016	X		X									X				
12/21/17	0925		S-1135241-122017-MG-AS-2-15			-0017	X		X									X				
12/21/17	0930		S-1135241-122117-MG-AS-2-20			-0018	X		X									X				

Date	Time	Relinquished by	Received by	Date	Time
12/21/17	1322			12/21/17	1322
12/22/17	1002			12/22/17	0940

Remarks:

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

courier

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

January 23, 2018

Alan Brandon

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

RE: 0 6 1 4 Line Release OrderNo.: 1801275

Dear Alan Brandon:

Hall Environmental Analysis Laboratory received 7 sample(s) on 1/5/2018 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: 0 6 1 4 Line Release

Lab Order: 1801275

Lab ID: 1801275-001 **Collection Date:** 1/4/2018 11:40:00 AM
Client Sample ID: GW-11135241-010418-SP-MW-1 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	620	25	*	mg/L	50	1/17/2018 5:26:54 PM	R4850
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1720	200	*D	mg/L	1	1/11/2018 11:27:00 AM	35934
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	130	5.0		µg/L	5	1/11/2018 3:48:25 PM	R4838
Toluene	ND	5.0		µg/L	5	1/11/2018 3:48:25 PM	R4838
Ethylbenzene	56	5.0		µg/L	5	1/11/2018 3:48:25 PM	R4838
Xylenes, Total	30	7.5		µg/L	5	1/11/2018 3:48:25 PM	R4838
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	5	1/11/2018 3:48:25 PM	R4838
Surr: Toluene-d8	99.9	70-130		%Rec	5	1/11/2018 3:48:25 PM	R4838

Lab ID: 1801275-002 **Collection Date:** 1/4/2018 12:20:00 PM
Client Sample ID: GW-11135241-010418-SP-MW-2 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	710	25	*	mg/L	50	1/17/2018 5:39:18 PM	R4850
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1840	200	*D	mg/L	1	1/11/2018 11:27:00 AM	35934
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/11/2018 1:53:26 PM	R4838
Toluene	ND	1.0		µg/L	1	1/11/2018 1:53:26 PM	R4838
Ethylbenzene	ND	1.0		µg/L	1	1/11/2018 1:53:26 PM	R4838
Xylenes, Total	ND	1.5		µg/L	1	1/11/2018 1:53:26 PM	R4838
Surr: 4-Bromofluorobenzene	109	70-130		%Rec	1	1/11/2018 1:53:26 PM	R4838
Surr: Toluene-d8	101	70-130		%Rec	1	1/11/2018 1:53:26 PM	R4838

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: 0 6 1 4 Line Release

Lab Order: 1801275

Lab ID: 1801275-003 **Collection Date:** 1/4/2018 12:58:00 PM
Client Sample ID: GW-11135241-010418-SP-MW-3 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	670	25	*	mg/L	50	1/17/2018 6:16:33 PM	R48508
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1930	200	*D	mg/L	1	1/11/2018 11:27:00 AM	35934
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/11/2018 2:16:30 PM	R48385
Toluene	ND	1.0		µg/L	1	1/11/2018 2:16:30 PM	R48385
Ethylbenzene	ND	1.0		µg/L	1	1/11/2018 2:16:30 PM	R48385
Xylenes, Total	ND	1.5		µg/L	1	1/11/2018 2:16:30 PM	R48385
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	1/11/2018 2:16:30 PM	R48385
Surr: Toluene-d8	97.9	70-130		%Rec	1	1/11/2018 2:16:30 PM	R48385

Lab ID: 1801275-004 **Collection Date:** 1/4/2018 1:22:00 PM
Client Sample ID: GW-11135241-010418-SP-MW-4 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	670	25	*	mg/L	50	1/17/2018 6:28:59 PM	R48508
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2010	200	*D	mg/L	1	1/11/2018 11:27:00 AM	35934
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	230	5.0		µg/L	5	1/11/2018 4:11:17 PM	R48385
Toluene	ND	5.0		µg/L	5	1/11/2018 4:11:17 PM	R48385
Ethylbenzene	140	5.0		µg/L	5	1/11/2018 4:11:17 PM	R48385
Xylenes, Total	8.9	7.5		µg/L	5	1/11/2018 4:11:17 PM	R48385
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	5	1/11/2018 4:11:17 PM	R48385
Surr: Toluene-d8	100	70-130		%Rec	5	1/11/2018 4:11:17 PM	R48385

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: 0 6 1 4 Line Release

Lab Order: 1801275

Lab ID: 1801275-005 **Collection Date:** 1/4/2018 2:02:00 PM
Client Sample ID: GW-11135241-010418-SP-MW-5 **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	690	25	*	mg/L	50	1/17/2018 6:41:23 PM	R4850
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1920	200	*D	mg/L	1	1/11/2018 11:27:00 AM	35934
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	130	5.0		µg/L	5	1/12/2018 10:28:31 AM	R4843
Toluene	15	5.0		µg/L	5	1/12/2018 10:28:31 AM	R4843
Ethylbenzene	77	5.0		µg/L	5	1/12/2018 10:28:31 AM	R4843
Xylenes, Total	47	7.5		µg/L	5	1/12/2018 10:28:31 AM	R4843
Surr: 4-Bromofluorobenzene	97.5	70-130		%Rec	5	1/12/2018 10:28:31 AM	R4843
Surr: Toluene-d8	97.8	70-130		%Rec	5	1/12/2018 10:28:31 AM	R4843

Lab ID: 1801275-006 **Collection Date:** 1/4/2018
Client Sample ID: GW-11135241-010418-SP-DUP **Matrix:** AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	710	25	*	mg/L	50	1/17/2018 6:53:47 PM	R4850
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1910	200	*D	mg/L	1	1/11/2018 11:27:00 AM	35934
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	250	5.0		µg/L	5	1/12/2018 10:51:23 AM	R4843
Toluene	ND	5.0		µg/L	5	1/12/2018 10:51:23 AM	R4843
Ethylbenzene	130	5.0		µg/L	5	1/12/2018 10:51:23 AM	R4843
Xylenes, Total	13	7.5		µg/L	5	1/12/2018 10:51:23 AM	R4843
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	5	1/12/2018 10:51:23 AM	R4843
Surr: Toluene-d8	98.9	70-130		%Rec	5	1/12/2018 10:51:23 AM	R4843

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: 0 6 1 4 Line Release

Lab Order: 1801275

Lab ID: 1801275-007
Collection Date:
Client Sample ID: Trip Blank
Matrix: AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/11/2018 1:07:30 PM	R48385
Toluene	ND	1.0		µg/L	1	1/11/2018 1:07:30 PM	R48385
Ethylbenzene	ND	1.0		µg/L	1	1/11/2018 1:07:30 PM	R48385
Xylenes, Total	ND	1.5		µg/L	1	1/11/2018 1:07:30 PM	R48385
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	1/11/2018 1:07:30 PM	R48385
Surr: Toluene-d8	97.0	70-130		%Rec	1	1/11/2018 1:07:30 PM	R48385

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#: **1801275**

23-Jan-18

Client: GHD

Project: 0 6 1 4 Line Release

Sample ID	**MB**	SampType:	**mblk**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBW**	Batch ID:	**R48508**	RunNo:	**48508**					
Prep Date:		Analysis Date:	**1/17/2018**	SeqNo:	**1560564**	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:	**R48508**	RunNo:	**48508**					
Prep Date:		Analysis Date:	**1/17/2018**	SeqNo:	**1560565**	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	97.9	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#: **1801275**

23-Jan-18

Client: GHD

Project: 0 6 1 4 Line Release

Sample ID	**100ng btex lcs**	SampType:	**LCS4**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**BatchQC**	Batch ID:	**R48385**		RunNo:	**48385**				
Prep Date:		Analysis Date:	**1/11/2018**		SeqNo:	**1554732**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	88.3	80	120			
Toluene	19	1.0	20.00	0	97.2	80	120			
Ethylbenzene	19	1.0	20.00	0	96.2	80	120			
Xylenes, Total	55	1.5	60.00	0	91.7	80	120			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.0	70	130			
Surr: Toluene-d8	9.8		10.00		98.1	70	130			

Sample ID	**rb**	SampType:	**MBLK**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**PBW**	Batch ID:	**R48385**		RunNo:	**48385**				
Prep Date:		Analysis Date:	**1/11/2018**		SeqNo:	**1554734**	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: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Sample ID	**1801275-004ams**	SampType:	**MS4**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**GW-11135241-01041**	Batch ID:	**R48385**		RunNo:	**48385**				
Prep Date:		Analysis Date:	**1/11/2018**		SeqNo:	**1554741**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	310	5.0	100.0	221.4	92.1	80	120			
Toluene	97	5.0	100.0	2.820	94.0	80	120			
Ethylbenzene	230	5.0	100.0	128.7	96.9	80	120			
Xylenes, Total	290	7.5	300.0	9.736	92.4	80	120			
Surr: 4-Bromofluorobenzene	48		50.00		96.2	70	130			
Surr: Toluene-d8	48		50.00		96.5	70	130			

Sample ID	**1801275-004amsd**	SampType:	**MSD4**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**GW-11135241-01041**	Batch ID:	**R48385**		RunNo:	**48385**				
Prep Date:		Analysis Date:	**1/11/2018**		SeqNo:	**1554742**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	330	5.0	100.0	221.4	104	80	120	3.72	20	
Toluene	98	5.0	100.0	2.820	95.0	80	120	1.09	20	
Ethylbenzene	230	5.0	100.0	128.7	98.2	80	120	0.551	20	
Xylenes, Total	300	7.5	300.0	9.736	95.6	80	120	3.24	20	

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1801275**

23-Jan-18

Client: GHD

Project: 0 6 1 4 Line Release

Sample ID	**1801275-004amsd**	SampType:	**MSD4**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**GW-11135241-01041**	Batch ID:	**R48385**		RunNo:	**48385**				
Prep Date:		Analysis Date:	**1/11/2018**		SeqNo:	**1554742**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	47		50.00		93.8	70	130	0	0	
Surr: Toluene-d8	50		50.00		99.9	70	130	0	0	

Sample ID	**100ng btex lcs**	SampType:	**LCS4**		TestCode:	**EPA Method 8260: Volatiles Short List**				
Client ID:	**BatchQC**	Batch ID:	**R48430**		RunNo:	**48430**				
Prep Date:		Analysis Date:	**1/12/2018**		SeqNo:	**1556886**	Units:	**µg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.6	80	120			
Toluene	20	1.0	20.00	0	97.6	80	120			
Ethylbenzene	19	1.0	20.00	0	96.1	80	120			
Xylenes, Total	58	1.5	60.00	0	96.4	80	120			
Surr: 4-Bromofluorobenzene	9.4		10.00		93.8	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:	**R48430**		RunNo:	**48430**				
Prep Date:		Analysis Date:	**1/12/2018**		SeqNo:	**1556891**	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: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		101	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#: **1801275**

23-Jan-18

Client: GHD

Project: 0 6 1 4 Line Release

Sample ID	**MB-35934**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**PBW**	Batch ID:	**35934**	RunNo:	**48368**					
Prep Date:	**1/9/2018**	Analysis Date:	**1/11/2018**	SeqNo:	**1554310**	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-35934**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**					
Client ID:	**LCSW**	Batch ID:	**35934**	RunNo:	**48368**					
Prep Date:	**1/9/2018**	Analysis Date:	**1/11/2018**	SeqNo:	**1554311**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1000	20.0	1000	0	100	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: **1801275** RcptNo: 1

Received By: **Isaiah Ortiz** **1/5/2018 9:45:00 AM** IO

Completed By: **Ashley Gallegos** **1/5/2018 2:31:11 PM** AG

Reviewed By: SRR 01/05/18

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: _____

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			

Chain-of-Custody Record

Client: GHD - Albuquerque

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

Phone #: 505-884-0672

email or Fax#: Alan.Brandon@ghd.com

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☑ Standard ☐ Rush _____

Project Name: O-6 14" Line Release

Project #: 11135241

Project Manager: Alan Brandon

Sampler: Steve Perez

On Ice: ☑ Yes ☐ No

Sample Temperature: 2.6 - 0.3 (ice) 2.0

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 Request ID	Container Type and #	Preservative Type	HEAL No. 1801275
1/4/18	1140	GW	GW-11135241-010418-SP-MW-1	Misc.	HCL	-001
	1220		GW-11135241-010418-SP-MW-2			-002
	1258		GW-11135241-010418-SP-MW-3			-003
	1322		GW-11135241-010418-SP-MW-4			-004
	1402		GW-11135241-010418-SP-MW-5			-005
			GW-11135241-010418-SP-DUP			-006
			Trip Blank			-007
			IMO 1/5/2018 1540			

Analysis Request

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) BTEX	8270 (Semi-VOA)	300.0 Chloride	2540C TDS			Air Bubbles (Y or N)
									X		X	X			
									X		X	X			
									X		X	X			
									X		X	X			
									X		X	X			
									X						
									X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/4/18	15:30	Steve Perez		1/4/18	1530
1/4/18	1900			1/5/18	9:45

Remarks:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

February 12, 2018

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

RE: 0-6-1 SU 6 OrderNo.: 1802128

Dear Bernie Bockisch:

Hall Environmental Analysis Laboratory received 2 sample(s) on 2/2/2018 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

Analytical Report
Lab Order: **1802128**
Date Reported: **2/12/2018**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: 0-6-1 SU 6
Lab Order: 1802128

Lab ID: 1802128-001 **Collection Date:** 1/30/2018 2:38:00 PM
Client Sample ID: A-11135241-013018-BB-1438 **Matrix:** AIR

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	4400	250		µg/L	50	2/5/2018 11:38:37 AM	G48902
Surr: BFB	170	80.2-145	S	%Rec	50	2/5/2018 11:38:37 AM	G48902
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	17	1.0		µg/L	10	2/8/2018 2:41:00 PM	SL4899
Toluene	5.1	1.0		µg/L	10	2/8/2018 2:41:00 PM	SL4899
Ethylbenzene	7.3	1.0		µg/L	10	2/8/2018 2:41:00 PM	SL4899
Naphthalene	ND	2.0		µg/L	10	2/8/2018 2:41:00 PM	SL4899
1-Methylnaphthalene	ND	4.0		µg/L	10	2/8/2018 2:41:00 PM	SL4899
2-Methylnaphthalene	ND	4.0		µg/L	10	2/8/2018 2:41:00 PM	SL4899
Xylenes, Total	11	1.5		µg/L	10	2/8/2018 2:41:00 PM	SL4899
Surr: 1,2-Dichloroethane-d4	80.1	70-130		%Rec	10	2/8/2018 2:41:00 PM	SL4899
Surr: 4-Bromofluorobenzene	80.8	70-130		%Rec	10	2/8/2018 2:41:00 PM	SL4899
Surr: Dibromofluoromethane	84.6	70-130		%Rec	10	2/8/2018 2:41:00 PM	SL4899
Surr: Toluene-d8	88.7	70-130		%Rec	10	2/8/2018 2:41:00 PM	SL4899

Lab ID: 1802128-002 **Collection Date:** 1/30/2018 4:03:00 PM
Client Sample ID: A-11135241-013018-BB-1603 **Matrix:** AIR

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	3600	250		µg/L	50	2/5/2018 12:01:28 PM	G48902
Surr: BFB	161	80.2-145	S	%Rec	50	2/5/2018 12:01:28 PM	G48902
EPA METHOD 8260B: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	14	1.0		µg/L	10	2/8/2018 3:06:00 PM	SL4899
Toluene	4.0	1.0		µg/L	10	2/8/2018 3:06:00 PM	SL4899
Ethylbenzene	6.3	1.0		µg/L	10	2/8/2018 3:06:00 PM	SL4899
Naphthalene	ND	2.0		µg/L	10	2/8/2018 3:06:00 PM	SL4899
1-Methylnaphthalene	ND	4.0		µg/L	10	2/8/2018 3:06:00 PM	SL4899
2-Methylnaphthalene	ND	4.0		µg/L	10	2/8/2018 3:06:00 PM	SL4899
Xylenes, Total	8.9	1.5		µg/L	10	2/8/2018 3:06:00 PM	SL4899
Surr: 1,2-Dichloroethane-d4	79.2	70-130		%Rec	10	2/8/2018 3:06:00 PM	SL4899
Surr: 4-Bromofluorobenzene	80.5	70-130		%Rec	10	2/8/2018 3:06:00 PM	SL4899
Surr: Dibromofluoromethane	85.2	70-130		%Rec	10	2/8/2018 3:06:00 PM	SL4899
Surr: Toluene-d8	88.4	70-130		%Rec	10	2/8/2018 3:06:00 PM	SL4899

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#: **1802128**

12-Feb-18

Client: GHD

Project: 0-6-1 SU 6

Sample ID **1802128-001ADUP** SampType: **DUP** TestCode: **EPA Method 8015D: Gasoline Range**

Client ID: **A-11135241-013018-** Batch ID: **G48902** RunNo: **48902**

Prep Date: Analysis Date: **2/5/2018** SeqNo: **1573646** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	4200	250						5.18	20	
Surr: BFB	180000		100000		175	80.2	145	0	0	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting 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#: **1802128**

12-Feb-18

Client: GHD

Project: 0-6-1 SU 6

Sample ID	**1802128-001ADUP**	SampType:	**DUP**	TestCode:	**EPA Method 8260B: Volatiles Short List**
Client ID:	**A-11135241-013018-**	Batch ID:	**SL48997**	RunNo:	**48997**
Prep Date:		Analysis Date:	**2/8/2018**	SeqNo:	**1576926** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	14	1.0						14.5	20	
Toluene	4.3	1.0						16.2	20	
Ethylbenzene	6.2	1.0						15.8	20	
Naphthalene	ND	2.0						0	20	
1-Methylnaphthalene	ND	4.0						0	20	
2-Methylnaphthalene	ND	4.0						0	20	
Xylenes, Total	8.8	1.5						18.0	20	
Surr: 1,2-Dichloroethane-d4	8.0		10.00		79.8	70	130	0	0	
Surr: 4-Bromofluorobenzene	8.1		10.00		80.5	70	130	0	0	
Surr: Dibromofluoromethane	8.4		10.00		83.9	70	130	0	0	
Surr: Toluene-d8	8.9		10.00		88.9	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting 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: 1802128 | RcptNo: 1

Received By: **Anne Thorne** 2/2/2018 2:09:00 PM

Completed By: **Anne Thorne** 2/2/2018 2:16:03 PM

Reviewed By: 2/2/18

Chain of Custody

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

Log In

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

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

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

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

Person Notified: _____ Date _____

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

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Chain-of-Custody Record

Client: GHD SERVICES INC.

Mailing Address: 6121 INDIAN SCHOOL RD SUITE 200, 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: O-6-1 (SW6)

Project #: 11135241

Project Manager: BERNARD BOCKISCH

Sampler: BERNARD BOCKISCH

On Ice: ☐ Yes ☑ No

Sample Temperature:

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. 1802128	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) BTEX/MTBE only	8270 (Semi-VOA)					Air Bubbles (Y or N)
1/30/18	1438	AIR	A-11135241-013018-BB-1438	TEDLAR	NONE	-001			✓							✓						
1/30/18	1603	AIR	A-11135241-013018-BB-1603	TEDLAR	NONE	-002			✓							✓						

Date: 1/31/18 Time: 14:08 Relinquished by: [signature]

Received by: [signature] Date: 02/02/18 Time: 1409

Date: Time: Relinquished by:

Received by: Date: Time:

Remarks:

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

Attachment B
Permits

Tom Blaine, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 612111
File Nbr: L 14330

Aug. 18, 2017

CHRISTINE MATHEWS
GHD SERVICES INC
6121 INDIAN SCHOOL ROAD NE
ALBUQUERQUE, NM 87110

Greetings:

Enclosed is your copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page. In accordance with the conditions of approval, the well can only be tested for 10 cumulative days, and the well is to be plugged on or before 08/31/2018, unless a permit to use the water is acquired from this office.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 08/31/2018.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

Deborah Dunaway
(575)622-6521

Enclosure

explore

File No. L-14330

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL

A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/ 2-38517

Purpose:	☐ Pollution Control And/Or Recovery	☐ Ground Source Heat Pump
☐ Exploratory Well (Pump test)	☐ Construction Site/Public Works Dewatering	☐ Other(Describe):
☒ Monitoring Well	☐ Mine Dewatering	

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

☒ Temporary Request - Requested Start Date: 8/28/2017 Requested End Date: TBD

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

1. APPLICANT(S)

Name: GHD Services Inc. on behalf of ETC Field Services, LLC	Name: ETC Field Services, LLC
Contact or Agent: check here if Agent ☒ Christine Mathews	Contact or Agent: check here if Agent ☐ Dean Ericson
Mailing Address: 6121 Indian School Rd NE	Mailing Address: 600 N. Marienfeld Ste. 700
City: Albuquerque	City: Midland
State: New Mexico Zip Code: 87110	State: Texas Zip Code: 79701
Phone: 505-269-0088 ☐ Home ☒ Cell Phone (Work):	Phone: 432-238-2142 ☒ Home ☒ Cell Phone (Work):
E-mail (optional): chrsitine.mathews@ghd.com	E-mail (optional): Dean.Ericson@energyTransfer.com

FOR OSE INTERNAL USE Application for Permit, Form WR-07, Rev 11/17/16

File No.: L-14330	Trn. No.: 612111	Receipt No.: 2-38517
Trans Description (optional): EXPL- PODI - monitor		
Sub-Basin: L	PCW/LOG Due Date: 8-31-18	

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
MW-1	103°16'21.15"W	32°33'25.43"N	NW1/4 SE1/4 of S20 T20S R37E

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ☐ **Yes** ■ **No** **If yes, how many**_____

Other description relating well to common landmarks, streets, or other:

Well is on land owned by: New Mexico State Land Office. See attached water easement.

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. Attached? ☐ **Yes** ■ **No**
If yes, how many_____

Approximate depth of well (feet): 35	Outside diameter of well casing (inches): 2
Driller Name: EnviroDrill Inc	Driller License Number: WD 1186

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

Well construction is 2-in. dia. PVC casing with 15 ft. length 0.010-in. slotted screen. A 10/20 grade silica sand pack will be placed in annulus around screen to 2 ft. above top of screen elevation. A 2 ft. thick hydrated bentonite chip plug will be placed on top of sand pack followed by cement/bentonite grout to surface.

Monitoring wells are being installed at the request of NMOCD to assress groundwater quality.

The duration of planned monitoring will continue until NMOCD grants remedial Site closure.

2017 AUG 14 PM 3:30

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: L-14330	Trn No.: 612111

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory:	**Pollution Control and/or Recovery:**	**Construction De-Watering:**	**Mine De-Watering:**
☐ Include a description of any proposed pump test, if applicable.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge. ☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ■ Include the reason for the monitoring well, and, ■ The duration of the planned monitoring.		**Ground Source Heat Pump:** ☐ Include a description of the geothermal heat exchange project, ☐ The number of boreholes for the completed project and required depths. ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Christine Mathews on behalf of ETC Field Services, LLC
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 14 August 20 17, for the State Engineer,

Tom Blaine, P.E., State Engineer

By: Signature — Juan Hernandez, Print

Title: Water Resources Manager

Print

2017 AUG 14 PM 3:30

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: L-14330 Trn No.: 612111

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

17-1B Depth of the well shall not exceed the thickness of the Ogallala formation.

17-4 No water shall be appropriated and beneficially used under this permit.

17-7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

17-B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with 72-12-12 NMSA 1978. A licensed driller shall not be required for the construction of a well driven without the use of a drill rig, provided that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter.

17-C The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. It is the well owner's responsibility to ensure that the well driller files the well record.
The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-P The well shall be constructed, maintained, and operated to prevent inter-aquifer exchange of water and to prevent loss of hydraulic head between hydrogeologic zones.

17-Q The State Engineer retains jurisdiction over this permit.

Trn Desc: L 14330 POD1

File Number: L 14330
Trn Number: 612111

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – ROSWELL OFFICE

OFFICIAL RECEIPT NUMBER: 2 - 38517 DATE: 8-14-17 FILE NO.: L

TOTAL: 5.00 RECEIVED: five DOLLARS CHECK NO.: 1130 CASH: _____

PAYOR: Christine Mathews ADDRESS: 8810 Cottonwood Rd NE CITY: ABQ STATE: NM

ZIP: 87111 RECEIVED BY: _____

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; and **yellow** copy for Water Rights. If a mistake is made, void the original and all copies and submit to Program Support/ASD as part of your daily deposit.

A. Ground Water Filing Fees

___ 1. Change of Ownership of Water Right $ 2.00
___ 2. Application to Appropriate or Supplement Domestic 72-12-1 Well $ 125.00
___ 3. Application to Repair or Deepen 72-12-1 Well $ 75.00
___ 4. Application for Replacement 72-12-1 Well $ 75.00
___ 5. Application to Change Purpose of Use 72-12-1 Well $ 75.00
___ 6. Application for Stock Well/Temp. Use $ 5.00

___ 7. Application to Appropriate Irrigation, Municipal, or Commercial Use $ 25.00
___ 8. Declaration of Water Right $ 1.00
___ 9. Application for Supplemental Non 72-12-1 Well $ 25.00
___ 10. Application to Change Place or Purpose of Use Non 72-12-1 Well $ 25.00
___ 11. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Ground Water $ 50.00
___ 12. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Ground Water $ 50.00
___ 13. Application to Change Point of Diversion of Non 72-12-1 Well $ 25.00
___ 14. Application to Repair or Deepen Non 72-12-1 Well $ 5.00

---

1 - X 15. Application for Test, Expl. Observ. Well $ 5.00
___ 16. Application for Extension of Time $ 25.00
___ 17. Proof of Application to Beneficial Use $ 25.00
___ 18. Notice of Intent to Appropriate $ 25.00

B. Surface Water Filing Fees

___ 1. Change of Ownership of a Water Right $ 5.00
___ 2. Declaration of Water Right $ 10.00
___ 3. Amended Declaration $ 25.00
___ 4. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Surface Water $ 200.00
___ 5. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water $ 200.00
___ 6. Application to Change Point of Diversion $ 100.00
___ 7. Application to Change Place and/or Purpose of Use $ 100.00
___ 8. Application to Appropriate $ 25.00
___ 9. Notice of Intent to Appropriate $ 25.00
___ 10. Application for Extension of Time $ 50.00
___ 11. Supplemental Well to a Surface Right $ 100.00
___ 12. Return Flow Credit $ 100.00
___ 13. Proof of Completion of Works $ 25.00
___ 14. Proof of Application of Water to Beneficial Use $ 25.00
___ 15. Water Development Plan $ 100.00
___ 16. Declaration of Livestock Water Impoundment $ 10.00
___ 17. Application for Livestock Water Impoundment $ 10.00

All fees are non-refundable.

C. Well Driller Fees

___ 1. Application for Well Driller's License $ 50.00
___ 2. Application for Renewal of Well Driller's License $ 50.00
___ 3. Application to Amend Well Driller's License $ 50.00

D. Reproduction of Documents

___ @ 0.25¢ $_____
___ Map(s) $_____

E. Certification $_____

F. Other $_____

G. Comments:

mail

NEW MEXICO STATE LAND OFFICE
WATER MONITORING EASEMENT

NO. WM-662

THIS AGREEMENT, dated this **5th day of May, 2017,** made and entered into between the State of New Mexico Commissioner of Public Lands, acting trustee pursuant to the Act of June 21, 1910, 36 Stat. 557, ch. 310, § 10, (Commissioner), and ETC Field Services, LLC, whose address is 600 N. Marienfield, Suite 700, Midland, TX 79702 (Grantee). This Water Monitoring Easement is not effective until signed by the Commissioner.

1. Grant of Easement

For consideration, including the covenants herein, the Commissioner grants to Grantee a Water Easement for **one (1)** well-site to be located within the following described area (Easement Land) in **Lea** County:

Quarter-Quarter	*Section*	*Township*	*Range*	*Number of Acres*
NW4SE4	20	20S	37E	2.50

The water shall be diverted from the following described well:

SLO Well-Site	*OSE Well Number or Lat/Long*	*Date Well Completed*	*Well Capacity*	*Volume of Use*
WM-1	32.557065, -103.272541	2017	<10 gpm	<50 gallons/year

A well-site is one half (.5) acre with the denominated well in the center. Depending on their proximity, well-sites may overlap.

2. Term of Easement

A. Term

This Water Easement is for a term of five (5) years, commencing on **May 22, 2017**, and expiring on **May 21, 2022** unless terminated earlier as provided herein.

B. Renewal

Upon Grantee's written request submitted to the Commissioner at least sixty (60) days prior to the expiration of this Easement, the parties may renew this Easement if the Commissioner, in his sole discretion, determines such renewal to be in the best interests of the trust.

C. Reversion to Commissioner

At such time that this Water Easement expires, is not renewed, or is otherwise terminated, or if Grantee has failed to use the Easement Land for the permitted purposes for a period of one (1) year, the Easement Land and Water Rights developed or appropriated on this Water Easement shall *ipso facto* revert to the Commissioner who may, in his sole discretion, thereafter make this Water Easement, with improvements, if any, available for further use. The Commissioner shall give Grantee notice of this by registered mail and no further notice or action on the Commissioner's part shall be required. Any loss of any kind, arising from the non-renewal of this Easement is acknowledged and accepted by the Grantee as a business risk and the Grantee's acknowledgement and acceptance shall be considered an inducement by Grantee to the Commissioner to enter into this Water Easement, shall not be considered a "taking" of any rights or property of Grantee, and shall not be the basis of any action at law or in equity to recover damages of any kind.

3. Purpose

This grant of easement is for the purpose of allowing Grantee's placement of a monitoring well for the benefit of the trust and for the following specific purpose: for Corrective Action 1RP-4643 issued by NMOCD on 03/15/2017 in order to monitor groundwater impact of an underground oil pipeline SU6 spill on 03/07/2017. This grant of Water Monitoring Easement entitles Grantee to the exclusive use of any Water Rights developed or obtained in connection herewith for the term of this easement. The Commissioner may permit other uses on or within this Water Easement to the extent that they do not impair Grantee's permitted purposes.

4. Water Rights

A. Water Rights Agreement

It is a condition precedent to the grant of this Water Easement that Grantee shall have executed a standard State Land Office Water Rights Agreement, which agreement is incorporated herein. Grantee has executed WRA-WM-662 effective May 22, 2017 which Grantee hereby reaffirms. Breach of any term of that Water Rights Agreement shall be deemed a material breach of this Water Easement.

B. Ownership of Water Rights

On lands where the surface is owned by the Commissioner, any and all Water Rights developed on the Easement Land by Grantee shall be developed in the name of the Commissioner. Grantee, at its own expense, shall comply with all regulations of, and obtain all necessary permits and other documents from and required by the New Mexico Office of the State Engineer. Grantee shall have the use of such Water Rights solely for approved easement operations and activities during the term of the Water Easement. All water appropriated shall be pursuant to state law and regulations. Upon expiration or termination of the Water Easement, such Water Rights shall be retained by the Commissioner, unless the Commissioner grants prior written approval. Grantee shall not develop, move, sever, or transfer any Water Rights onto or from the Easement Land without the express, written approval of the Commissioner, nor shall Grantee change the purpose or place of use of any Water Rights covered by this Water Easement without the express, written approval of the Commissioner.

C. Filing and Copies

Grantee shall file all necessary documents regarding declarations of, drilling permits, or applications for appropriation of water with the State Engineer's Office. Grantee shall diligently

pursue all such filings in order that Water Rights are perfected in a timely and efficient manner and pursuant to the standard Water Rights Agreement entered into previously by the parties and incorporated herein. Grantee shall send the Commissioner a copy of all such filings contemporaneously with any OSE filing. Grantee shall send to the Commissioner a copy of any and all OSE response(s) or other communication(s) regarding the Water Rights filing within ten (10) days of receipt.

D. Notice of Changes to Water Rights

Grantee shall provide direct notice (not by publication) to the Commissioner of any OSE filing seeking to change the point of diversion, place of use, purpose of use, or to transfer any Water Rights off or onto this Water Easement. Grantee shall not pursue such change or transfer without the express written approval of the Commissioner.

E. Commissioner Participation in Filing

The Commissioner, in his discretion, may assist Grantee in any such filings or proceedings before the State Engineer. However, the Commissioner may withhold approval of any filings with the State Engineer's Office, may withdraw participation or approval of any joint filing with the State Engineer's Office, and may contest or challenge any filing (even if the Commissioner was previously a joint applicant or party to the filing), if the Commissioner determines that a filing is not or is no longer in the best interest of the trust. At the written request of the Commissioner, Grantee shall withdraw any Water Rights declaration or filing with the State Engineer's Office.

F. Protection of Water Rights

Grantee shall additionally act promptly and diligently to preserve, protect and defend any Water Rights from impairment, forfeiture or abandonment. Grantee shall notify the Commissioner of any actions before or filings with the State Engineer, whether by Grantee or others, which affect water underlying state trust lands within this Water Easement or any related Water Rights.

5. Grantee Standard of Care

Grantee shall act prudently in drilling, developing, appropriating, transporting and using water and Water Rights from state trust lands. "Prudent" within the context of this provision means that standard of care of a reasonable water user acting pursuant to provisions of New Mexico water law and other applicable laws, rules and regulations.

6. Metering

A. Installation and Maintenance of Meter

☐ If box is checked, Grantee shall install a water flow meter within thirty (30) days of the effective date of this Water Easement for any existing well (if not already installed), or prior to production for any wells installed after the effective date of this Water Easement, to measure the quantity of water diverted pursuant to this Water Easement. The water flow meter shall be calibrated in the field within thirty (30) days of installation and documentation of the initial field calibration shall be submitted to the Commissioner. The water flow meter shall be maintained in good working order at all times. The Commissioner shall have the right at any time to enter the Easement Land to inspect the water flow meter. At all time during the life of this Water Easement, Grantee shall maintain quarterly metering records that document with reasonable accuracy the quantity of water diverted pursuant to this Water Easement.

B. Meter Reporting

☐ If box is checked, Grantee shall submit to the Commissioner copies of quarterly metering records with the reports required in Paragraph 12.

7. Documentation

As soon as practicable, Grantee shall furnish to the Commissioner copies of records, reports and plats of its operation, produced during the term of this Water Easement, including but not limited to water quality tests, well logs, drill cores, meter readings, and any data relating to hydrology and geological formations.

8. Amendment

This Water Easement shall not be altered, changed, or amended except by a written instrument executed by both the Commissioner and Grantee. An amendment is required to add wells to this Water Easement to appropriate the full amount of water set forth in Paragraph 3 herein, as well as to add replacement or supplement wells necessary to maintain such full amount. Each such amendment application shall be accompanied by the filing fee set forth in the Commissioner's current schedule of fees, and an annual rental payment per well, to be calculated and due as described in Paragraph 12. If any proposed amendment involves a change in the approved use of this Water Easement, Grantee shall provide (at a minimum) all information requested in the Commissioner's Water Easement application and any additional information requested by the Commissioner.

9. Rights-of-way

Grantee shall have the right, without further consideration, upon reasonable notice to the Commissioner, to define and establish rights-of-way, upon the Easement Land, to install or maintain any necessary equipment or facilities on the Water Easement. It is Grantee's sole responsibility to notify and obtain in advance the approval of any surface lessee for any right-of-way. Grantee must accurately plat and define such rights-of-way and provide such plats to the Commissioner as soon as practicable. The Commissioner reserves the right to require such rights-of-way to be moved when the development or other use of the surrounding trust lands require this. Rights of way outside the Easement Land will be granted by the Commissioner in his discretion. No right-of-way, or other access across, or use of any lands other than those expressly granted in this Water Easement is implied or expressed.

10. Surveys

Grantee shall survey each well site as soon as practicable after drilling, and submit a copy of the survey plat when completed to the Commissioner.

11. Improvements

A. Authorized Improvements

Grantee may make or place such improvements and equipment upon or under the Easement Lands as are reasonably necessary to the purpose of the Easement, subject to the requirements for removal of improvements and equipment set forth in Paragraph C below. All Grantee improvements such as well housing, piping, casing, and related equipment installed or obtained by Grantee on the granted Easement shall remain Grantee's sole property and liability. All such improvements shall be subject to the lien described in NMSA 1978 § 19-7-34. Grantee shall submit a written request for approval from the Commissioner prior to making any changes

or additions to Authorized Improvements on the Easement Land. At the request of the Commissioner, Grantee shall submit updated survey plats showing such changes or additions.

B. Unauthorized Improvements

In the event that improvements not authorized by the Commissioner are placed on or under the Easement Land, at the Commissioner's discretion, such improvements may thereafter be deemed forfeited to the Commissioner and for purposes of Sections 19-7-14 and 19-10-28 NMSA 1978, no payments shall be due pursuant to those sections for such remaining improvements, or the Commissioner may order the removal, at Grantee's expense, of such improvements and the restoration of the Easement Land to its condition existing prior to the placement of said improvements.

C. Removal of Improvements or Equipment

Upon the termination, expiration or assignment of Grantee's interest in this Water Easement, Grantee may remove all such improvements, but only to the extent that such removal will not cause material injury to the Easement Land, and provided that all sums due to the Commissioner have been paid and that such removal is accomplished within sixty (60) days of the date of termination, expiration or assignment; or, Grantee may sell its interest in such physical improvements to a subsequent grantee or assignee. Any such sale or removal shall be subject to the Commissioner's paramount statutory lien. The Commissioner may, in writing, consent to the Grantee leaving designated improvements upon the Easement Land, and such improvements shall thereafter be deemed forfeited to the Commissioner, and no payments for such remaining improvements shall be due under Sections 19-7-14 and 19-10-28 NMSA 1978. Any other improvements not removed or sold by Grantee shall continue to be Grantee's sole property and liability, shall be deemed in trespass, and shall give rise to such remedies for trespass and waste as may be available to the Commissioner at law or in equity. The Commissioner may extend the 60-day period upon good cause shown.

12. Payment of Rental

A. Annual Rental

Grantee shall pay annual rental in the amount of $500.00 to be due on or before May 22nd of each year. If this Water Easement is relinquished, cancelled or otherwise terminated prior to the end of the term set forth above, the annual rental shall not be prorated, reduce or refunded for any part of any year during which the Water Easement is in effect.

B. Percent Rental

☐ In addition, if box is checked, then Grantee shall pay to the Commissioner a quarterly sum equal to thirty-five percent (35 %) of Grantee's gross water sales from this Water Easement due within thirty (30) days of the end of each quarter and as determined by Grantee's sworn report of quarterly metering, sales records and receipts. This shall comprise percent rental for this Water Easement.

C. Payment Submittal

Payment of all sums due hereunder shall be made payable to "Commissioner of Public Lands" and shall include the State Land Office Water Easement number **WM-662**, and shall be submitted to the Director of Oil Gas Minerals Division, New Mexico State Land Office, 310 Old Santa Fe Trail, P.O. Box 1148, Santa Fe, New Mexico 87504-1148.

13. Receipt of Monies:

A. Receipt of Monies

No receipt of monies, including rental, by the Commissioner from Grantee, or any other person acting for or on Grantee's behalf, after termination or expiration of this Water Easement shall reinstate, continue, or extend the Term; affect any notice previously given to Grantee; operate as a waiver of the Commissioner's right to enforce payment of any rent or other monies due or thereafter falling due; or, operate as waiver of the right of the Commissioner to recover possession of the Easement Land by legal action.

B. Acceptance of Payment

Grantee understands that the Commissioner's receipt of any monies is governed by the New Mexico State Land Office Rules. Grantee agrees that the Commissioner's negotiation of Grantee's check or other means of payment, and crediting the proceeds of such instrument to a suspense account, does not constitute acceptance of Grantee's payment.

C. Application of Payments

The Commissioner shall have the right to apply any payments made by Grantee to satisfy Grantee's obligations to the Commissioner in any order at the Commissioner's sole discretion, and without regard to Grantee's instructions as to the application of any such payment or part thereof, whether such instructions are endorsed on Grantee's check or otherwise, unless the Commissioner and Grantee otherwise agree, in writing, before the Commissioner accepts such payment. The Commissioner's acceptance of a check or payment by Grantee or others on Grantee's behalf shall not, in any way, affect Grantee's obligations hereunder nor shall it be deemed an approval of any assignment or subletting of this Water Easement.

14. Signage

Grantee shall post on each well a sign with the Grantee's name, Water Easement number, State Land Office well number, State Engineer Office permit number and location by legal description.

15. Site Security and Fencing

Any and all site security of any kind for Grantee, Grantee's agents, employees or invitees, the Easement Land, or any personal property thereon shall be the sole responsibility and obligation of Grantee, and shall be provided by Grantee at Grantee's sole cost and expense. Grantee agrees to provide reasonable security for the Easement Land and all construction areas within the Easement Land consistent with standard industry practices and in conformity with Grantee's duty to prevent waste and trespass. If the Commissioner requires or approves in advance in writing, Grantee will furnish proof to the Commissioner that required or approved fencing is completed and in good repair.

16. Reclamation

Grantee agrees to reclaim by grading, levelling or terracing all areas disturbed by its activities on the Easement Land, and to landscape such areas at its own cost and expense. A Reclamation Plan must be submitted to and approved by Grantor prior to implementation. Grantor will not release Grantee from its responsibility for reclamation and revegetation until all work described in the Reclamation Plan has been completed and Grantor has performed an inspection on the Easement Land. The goal of the Reclamation Plan shall be to achieve native

plant cover and diversity levels equal to or exceeding the natural potential levels in undisturbed soils adjacent to the project area. The Reclamation Plan shall include the following:

A. Narrative

The Reclamation Plan shall include a narrative describing all reclamation activities including removal of debris and equipment.

B. Re-Vegetation Requirements

A detailed description of the seed mix (native seed only), seeding rate/acre, method of dispersal, timing of dispersal, follow up monitoring plan, a re-seeding plan if initial efforts are unsuccessful, and a plan for addressing noxious weeds shall all be included in the Reclamation Plan. All seed mixtures submitted for approval shall specify pounds of pure live seed per acre. The seed shall contain no primary or secondary noxious weeds. Commercially sold seed shall be either certified or registered seed. The Noxious Weed component of the Reclamation Plan should include identification of the species of concern and the methods used to eradicate those species from the site. Eradication techniques may include mechanical treatment, chemical treatment, follow-up and monitoring. A Final Report is required on implementation and completion of the Reclamation that includes a brief narrative of the seeding and monitoring efforts and photos of the reclaimed area. Once Grantee has submitted the Final Report and the Grantor has approved the work, Grantor will provide acknowledgment that reclamation requirements have been met.

17. Compliance With State Land Office Rules and Other Laws

Grantee shall comply with all applicable laws pertaining to, and with all rules and regulations and procedures of, the New Mexico Office of the State Engineer where the State Engineer has jurisdiction over the water. Grantee shall fully comply with all federal, state and local laws, rules, regulations, ordinances and requirements applicable to the Easement Land or to Grantee's operations thereon, including but not limited to all applicable laws governing water; endangered or threatened species; hazardous materials; environmental protection; land use; health and safety; cultural, historic or archeological / paleontological properties; waste; trespass, and the New Mexico Cultural Properties Act, NMSA 1978, 18-6-1 et seq. Such agencies are not to be deemed third party beneficiaries hereunder; however, this clause is enforceable by the Commissioner as herein provided or as otherwise permitted by law. Grantee shall comply with all New Mexico State Land Office Rules and Regulations, 19.2 NMAC, including those that may be hereafter promulgated. Grantee's obligations under this paragraph include but are not limited to compliance with NMSA 1978 Section 19-6-5, requiring a lessee of State Trust Land to protect the Easement Land from waste or trespass. Grantee's compliance with all laws, regulations and policy shall be at its own expense.

18. Relinquishment

A. Relinquishment

Grantee may, with the Commissioner's approval, relinquish this Easement provided that Grantee is in compliance with all terms of this Easement, including the payment of all rentals due, and if all improvements made pursuant to the Easement on, for, or appurtenant to the Easement Land have been approved by the Commissioner and arrangements satisfactory to the Commissioner have been made for either their removal or retention. Grantee may request relinquishment of all or any part of the Easement Land by filing relinquishment forms prescribed

by the Commissioner and paying the relinquishment fee in the Commissioner's schedule of fees. Granting the request is at the discretion of the Commissioner.

B. No Release of Liability or Obligations

Grantee shall not, by relinquishment, avoid or be released from any liability for known or unknown waste or damage to the Easement Land, including environmental damage arising from, or in connection with, Grantee's use or occupancy thereof. Likewise, by relinquishment Grantee shall not be relieved of or discharged of obligations accrued by Grantee as of the date of relinquishment, including the obligation to reclaim the surface, revegetate the surface, pay the rentals required under Paragraph 12 and indemnify the Commissioner in accordance with the terms of this Easement.

C. No Refunds for Relinquishment

Upon any relinquishment, Grantee shall not be entitled to the refund of any rental previously paid.

19. Assignment or Sublease

Grantee shall not assign or sublease any rights granted hereunder, any part thereof, any portion of the Easement Land or any improvements located on the Easement Land without the prior amendment of this Water Easement pursuant to Paragraph 8 to permit such sublease or assignment, payment of the fee provided in the Commissioner's schedule of fees, and completion of required forms indicating the Commissioner's consent. Grantee may assign this Water Easement in whole only. The assignee shall succeed to all of the rights and privileges of the Grantee hereunder and shall be held to have assumed all of the duties and obligations of the Grantee to the Commissioner (including payments of rentals up to and after the date of the assignment), except that the Commissioner reserves the right to increase the annual rental and percent rental to be payable by the assigned under Paragraph 12. No such assignment or sublease shall attempt to convey any permanent interest in Water Rights. Any sublease or assignment without Water Easement amendment shall be null and void.

20. Collateral Assignment

Grantee shall obtain approval of the Commissioner before making any collateral assignment or mortgage of its interest in this Water Easement or its improvements or Water Rights, and any such collateral assignment or mortgage shall be subject to the conditions, limitations and requirements set forth in the State Land Office rules. The Commissioner's approval of a collateral assignment or mortgage shall not release Grantee from any of its obligations under this Water Easement, except as agreed to in writing by the Commissioner. If the Commissioner gives Grantee a notice of default, the Commissioner shall simultaneously provide a copy of the notice to an approved collateral assignee or mortgagee, which shall have the right to cure the default within the time provided, subject to the requirements of State Land Office rules. An approved collateral assignee or mortgagee may succeed to the rights and duties of Grantee, and it may assign the Water Easement in accordance with Paragraph 19, and State Land Office Rules governing assignments.

21. Grantee Breach and Cancellation

The Commissioner may terminate this Water Easement for breach of any term or covenant of this Water Easement. Any substantial deviation in water quantity or water quality, if reasonably attributable to Grantee, or any change in place of use or purpose of use from that

stated herein, shall constitute grounds for the Commissioner, in his sole discretion, to terminate, amend, modify, renegotiate, cancel or otherwise change this Water Easement; provided, however, that the Commissioner shall mail to the Grantee, by certified mail, addressed to the mailing address of Grantee shown in the Commissioner's current records, a thirty (30) day notice of intention to alter or terminate, specifying the reasons for which the notice is given. Proof of mailing, but no proof of receipt of notice, shall be necessary, and thirty (30) days after such mailing this Water Easement shall terminate *ipso facto* without further notice or proceeding required of the Commissioner; provided, however, there shall be no termination and reversion if Grantee has previously made arrangements satisfactory to the Commissioner to discharge or resolve the breach.

22. Holding Over

Upon termination or expiration of this Water Easement, any act or conduct of Grantee, including, but not limited to, the unapproved entry upon, occupancy, or use, whether continuous or not, of all or any part of the Easement Land by Grantee, the Grantee's agents, or by any unauthorized improvements or other improvements required or ordered to be removed upon termination or expiration shall constitute Holding Over. At the termination or expiration of this Water Easement, Grantee immediately shall deliver possession to the Commissioner. In the event of Grantee's Holding Over, Grantee shall pay the Commissioner from time to time, upon demand, as rental for the period of any hold over, to be due for each day of such hold over, an amount equal to two hundred percent (200%) of the annual rent. Nothing contained herein shall be construed as a grant to Grantee of the right to hold over or otherwise enter the Easement Land for any purpose after the expiration or termination of this Water Easement without the prior written approval of the Commissioner. At any time that Grantee is holding over, the Commissioner shall, without requirement of further notice or grace period, have any and all rights to evict or otherwise remove Grantee by force or otherwise, with all costs and fees incurred in such action to be due and payable by Grantee. This Section shall survive the termination or expiration of this Water Easement.

23. Bond

Prior to commencement of operations under this Water Easement. Grantee shall obtain the Commissioner's approval of and file a surety bond with the Commissioner in the amount of **five thousand dollars ($5,000.00)** to secure payment to the Commissioner of such damage as may occur to livestock, range, water, crops or tangible improvements on the subject lands as may result from Grantee's use and occupation under this Water Easement. Such bond shall be payable for the term of this Water Easement, and may be utilized for reclamation of disturbed lands following the operations of Grantee under this Water Easement. Payment under this paragraph is to be made to the Commissioner and not to any other party. Grantee's bond shall not be liquidated damages, and the Commissioner reserves the right to pursue any other remedy for damages available at law or in equity.

24. Indemnification

Grantee shall hold harmless, indemnify and defend the State of New Mexico, the Commissioner and the Commissioner's employees, agents, and contractors, and beneficiaries, in both their official and individual capacities, from any and all liabilities, claims, losses, damages, or expenses, including but not limited to reasonable attorneys' fees, loss of land value, third party claims, penalties or removal, remedial or restoration costs arising out of, alleged to arise out of or

indirectly connected with a) the operations hereunder of Grantee or Grantee's employees, agents, contractors, or invitees, b) any hazardous materials located in, under, or upon or otherwise affecting the Easement Land or adjacent property, or c) the activities of third parties on the Easement Land, whether with or without Grantee's knowledge or consent. In the event that any action, suit or proceeding is brought against Grantee, Grantee shall, as soon as practicable but no later than two (2) days after it receives notice thereof, notify the legal counsel of the Commissioner and the Risk Management Division of the New Mexico General Services Department by certified mail. This paragraph shall survive the termination, cancellation or relinquishment of this Water Easement, and any cause of action of the Commissioner to enforce this provision shall not be deemed to accrue until the Commissioner's actual discovery of said liability, claim, loss, damage, or expense.

25. Insurance

During the Term of this Water Easement, Grantee shall, at Grantee's cost and expense and at no cost to the Commissioner, insure all improvements against liability to third parties and for construction risks, in accordance with industry standards for the estimate probably loss. Grantee's insurance carriers shall be in good standing, adequately underwritten, and duly licensed to issue insurance policies in New Mexico. Grantee shall provide the Commissioner with proof of insurance upon the Commissioner's request. In addition, Grantee shall obtain at its own expense, insurance coverage adequate to protect its operations, property, employees and agents in amounts Grantee finds sufficient. Grantee shall be solely responsible for obtaining insurance policies that provide coverage for losses of Grantee-owned property, including improvements. The Commissioner shall not be required to provide such insurance coverage or be responsible for payment of Grantee's costs for such insurance.

26. No Waiver by Commissioner

No employee or agent of the Commissioner has the power, right, or authority to orally waive any of the conditions, covenants, or agreements of this Water Easement; and no waiver by the Commissioner of any of the conditions, covenants, or agreements of this Water Easement shall be effective unless in writing and executed by the Commissioner. The Commissioner's waiver of Grantee's breach or default of any of the conditions, covenants, or agreements hereof shall not constitute or be construed as a waiver of any other or subsequent breach or default by Grantee. The failure of the Commissioner to enforce at any time any of the conditions, covenants, or agreements of this Water Easement, or to exercise any option herein provided, or to require at any time performance by Grantee of any of the conditions, covenants, or agreements of this Water Easement shall not constitute or be construed to be a waiver of such conditions, covenants, or agreements, nor shall it affect the validity of this Water Easement or any part thereof, or the Commissioner's right to thereafter enforce each and every such condition, covenant, or agreement.

27. Scope of Agreement

This Water Easement incorporates all the agreements, covenants, and understandings between the Commissioner and Grantee concerning the subject matter hereof and all such agreements, covenants, and understandings are merged into this Water Easement. In addition, this Water Easement incorporates the terms of Grantee's contemporaneous standard Water Rights Agreement as though set out fully herein. No prior agreement or understanding between

the Commissioner and Grantee shall be valid or enforceable unless expressly embodied in this Water Easement.

28. Non-impairment

Nothing in this Water Easement is to be construed to allow the impairment of the rights of any lawful holder, present or future, of any geothermal resources, or any mineral, grazing, commercial, easement, or Water Rights on the subject or any other state trust lands.

29. Severability

In the event that any provision of this Water Easement is held invalid or unenforceable under applicable law, this Water Easement shall be deemed not to include that provision and all other provisions shall remain in full force and effect.

30. Successors In Interest

All terms, conditions, and covenants of this Water Easement and all amendments thereto shall extend to and bind the permitted heirs, successors, and assigns of Grantee and the Commissioner. There are no third party beneficiaries of this Water Easement.

31. Dispute Resolution, Applicable Law and Venue

Any disputes arising under or in connection with this Water Easement shall be first resolved by mandatory contest pursuant to 19.2.15 NMAC. Subsequent appeal, if any, shall be in the First Judicial District Court of Santa Fe. In all instances, the law of New Mexico shall apply. The laws of the State of New Mexico shall govern this Water Easement, without giving effect to the conflict of law provisions of the State of New Mexico. Grantee consents to venue and jurisdiction in the District Court in and for the County of Santa Fe, State of New Mexico for purposes of any appeal pursuant to 19.2.15 NMAC, and to service of process under the laws of the State of New Mexico in any action relating to this Water Easement or its subject matter.

32. Time

Time is of the essence in the performance of each and every provision of this Water Easement. Grantee's failure to perform any or all of its obligations under this Water Easement in a timely manner shall be a breach of this Water Easement.

33. Singular And Plural; Use Of Genders

Whenever the singular is used herein, the same shall include the plural; whenever a particular gender is used herein, the same shall include the other gender and no gender.

34. Headings And Titles

The use of section or paragraph headings and titles herein is for descriptive purposes only and is independent of the covenants, conditions, and agreements contained herein.

35. No Joint Venture

The Commissioner is not and will not be construed or held to be a partner, joint venturer or associate of Grantee in the conduct of the business of Grantee. The Commissioner will not be liable for any debts incurred by Grantee in the conduct of the business of Grantee. The relationship between the Commissioner and Grantee is, and will remain, solely that of the Commissioner and Grantee.

36. No Commissioner Personal Liability

In the event of a court action, Grantee shall not seek damages from the Commissioner or any employee of SLO or the State of New Mexico in their individual capacity. This Section shall survive termination of this Water Easement.

37. Notices

Written notice by registered or certified U.S. Postal Service, return receipt requested, or delivered by reputable overnight courier, return receipt of tracking system, to the addresses of the party hereunder shall constitute sufficient notice to comply with the terms of this Water Easement. Notice will be deemed effective upon delivery. Either the Commissioner or Grantee may change its respective address as provided in this Section effective three (3) business days after giving written notice of the change to the other. The addresses for notice are:

Notice to the Commissioner:

New Mexico Commissioner of Public Lands
Attn: Oil Gas Minerals Division
P.O. Box 1148
Santa Fe, New Mexico 87504-1148
FAX: (505) 827-4739

With copy to:

New Mexico State Land Office
General Counsel
P.O. Box 1148
Santa Fe, NM 87504-1148
FAX: (505) 827-4262

Notice to Grantee:

ETC Field Services
600 N. Marienfield, Suite 700
Midland, TX 79702

Attn: Dean Ericson

With Copy to:

GHD
6121 Indian School Rd.NE
Albuquerque, NM 87110

Attn: Bernie Bockisch, PMP

IN WITNESS WHEREOF, the Commissioner of Public Lands and the Grantee have signed this Easement to be effective on the date signed by the Commissioner.

GRANTEE:
ETC FIELD SERVICES, LLC

By: Dean D. Ericson Date: _____

Name: Dean D. Ericson

Title: Sr. Environmental Specialist

ACKNOWLEDGMENT IN AN INDIVIDUAL CAPACITY

State of Texas

County of Midland

This instrument was acknowledged before me on July 20, 2017 (date) by Dean D. Ericson (name).

Dona J. Meadows
(Signature of notarial officer)

(seal)

My commission expires: 11.10.20

DONA J. MEADOWS
My Notary ID # 6555569
Expires November 10, 2020

- **OR** -

(Grantee signature must be notarized on the following page)

2017 JUL 21 AM 10:11

ACKNOWLEDGMENT IN A REPRESENTATIVE CAPACITY

State of _____

County of _____

This instrument was acknowledged before me on _____ (date) by

_____ (name) as

_____ (title) of

_____

_____ (name of party on behalf of whom instrument is executed).

_____

(Signature of notarial officer)

(seal)

My commission expires: _____

GRANTOR

NEW MEXICO COMMISSIONER OF PUBLIC LANDS

S
E _____ dated: August 9, 2017

A Aubrey Dunn, Commissioner of Public Lands

L

Tom Blaine, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 617025
File Nbr: L 14330

Dec. 05, 2017

CHRISTINE MATHEWS
GHD SERVICES INC
6121 INDIAN SCHOOL ROAD NE
ALBUQUERQUE, NM 87110

Greetings:

Enclosed is your copy of the above numbered permit that has been approved with the conditions of approval, the well(s) are for monitoring purposes and will be monitored for the duration of the project.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 12/15/2018.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

Deborah Dunaway
(575)622-6521

Enclosure

explore

File No. L-14330

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL

A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/

Purpose:	☐	Pollution Control And/Or Recovery	☐	Ground Source Heat Pump
☐ Exploratory Well (Pump test)	☐	Construction Site/Public Works Dewatering	☐	Other(Describe):
☒ Monitoring Well	☐	Mine Dewatering		

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

☒ Temporary Request - Requested Start Date: 12/11/2017 Requested End Date: TBD

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

2017 NOV 30 PM 2:58

1. APPLICANT(S)

Name: GHD Services Inc. on behalf of ETC Field Services, LLC	Name: ETC Field Services, LLC
Contact or Agent: Bernard Bockisch — check here if Agent ☒	Contact or Agent: Dean Ericson — check here if Agent ☐
Mailing Address: 6121 Indian School Rd NE	Mailing Address: 600 N. Marienfeld Ste. 700
City: Albuquerque	City: Midland
State: New Mexico Zip Code: 87110	State: Texas Zip Code: 79701
Phone: 505-280-0572 ☐ Home ☒ Cell Phone (Work):	Phone: 432-238-2142 ☒ Home ☒ Cell Phone (Work):
E-mail (optional): Bernard.bockisch@ghd.com	E-mail (optional): Dean.Ericson@energyTransfer.com>

FOR OSE INTERNAL USE Application for Permit, Form WR-07, Rev 11/17/16

File No.: L-14330	Trn. No.: 617025	Receipt No.: 2-38804
Trans Description (optional): EXPL- PODS 2-7 monitor		
Sub-Basin: L	PCW/LOG Due Date: 12-15-18	

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
L-14330-POD2 MW-2	103°16'21.04"W	32°33'25.66"N	NW/4 NW1/4 SE1/4 of S20 T20S R37E
L-14330-POD3 MW-3	103°16'20.34"W	32°33'25.20"N	NW/4 NW1/4 SE1/4 of S20 T20S R37E
L-14330-POD4 MW-4	103°16'21.04"W	32°33'25.15"N	NW/4 NW1/4 SE1/4 of S20 T20S R37E
L-14330-POD5 MW-5	103°16'21.55"W	32°33'25.54"N	NW/4 NW1/4 SE1/4 of S20 T20S R37E
L-14330-POD6 AS-1	103°16'21.26"W	32°33'25.56"N	NW/4 NW1/4 SE1/4 of S20 T20S R37E

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ■ Yes ☐ No **If yes, how many** one

Other description relating well to common landmarks, streets, or other:

Well is on land owned by: New Mexico State Land Office. See attached water easement.

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. **Attached?** ■ Yes ☐ No
If yes, how many one

Approximate depth of well (feet): 35	Outside diameter of well casing (inches): 2
Driller Name: Enviro-Drill, Inc.	Driller License Number: WD 1186

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

Well construction is 2-in. dia. PVC casing with 15 ft. length 0.010-in. slotted screen. A 10/20 grade silica sand pack will be placed in annulus around screen to 2 ft. above top of screen elevation. A 2 ft. thick hydrated bentonite chip plug will be placed on top of sand pack followed by cement/bentonite grout to surface.

Monitoring wells are being installed at the request of NMOCD to address groundwater quality.

The duration of planned monitoring will continue until NMOCD grants remedial Site closure.

FOR OSE INTERNAL USE — Application for Permit, Form WR-07

File No.: L-14330	Trn No.: 617025

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory:	**Pollution Control and/or Recovery:**	**Construction De-Watering:**	**Mine De-Watering:**
☐ Include a description of any proposed pump test, if applicable.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge.	☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ■ Include the reason for the monitoring well, and, ■ The duration of the planned monitoring.	☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	**Ground Source Heat Pump:** ☐ Include a description of the geothermal heat exchange project, ☐ The number of boreholes for the completed project and required depths. ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), BERNARD BOCKISCH ON BEHALF OF ETC FIELD SERVICES, LLC
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

ACTION OF THE STATE ENGINEER

This application is:

☑ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare, subject to the attached conditions of approval.

Witness my hand and seal this 5th day of December 20 17, for the State Engineer,

Tom Blaine, P.E., State Engineer

By: Juan Hernandez
Signature Print

Title: Water Resources Manager I
Print

2017 NOV 30 PM 3:13

FOR OSE INTERNAL USE Application for Permit, Form WR-07

File No.: L-14330	Trn No.: 617025

NEW MEXICO OFFICE OF THE STATE ENGINEER

ATTACHMENT 1
POINT OF DIVERSION DESCRIPTIONS

This Attachment is to be completed if more than one (1) point of diversion is described on an Application or Declaration.

a. Is this a:	**b. Information on Attachment(s):**
☐ Move-From Point of Diversion(s) ☒ Move-To Point of Diversion(s)	Number of points of diversion involved in the application: one Total number of pages attached to the application: one

☐ **Surface Point of Diversion** **OR** ☒ **Well**	
Name of ditch, acequia, or spring:	
Stream or water course:	
Tributary of:	

c. Location (Required):
Required: Move to POD location coordinate must be either New Mexico State Plane (NAD 83), UTM (NAD 83), **or** Lat/Long (WGS84)

NM State Plane (NAD83) (feet) NM West Zone ☐ NM Central Zone ☐ NM East Zone ☐	UTM (NAD83) (meters) Zone 13N ☐ Zone 12N ☐	☒ Lat/Long– (WGS84) 1/10th of second	OTHER (allowable only for move-from descriptions - see application form for format) ☐ PLSS (quarters, section, township, range) ☐ Hydrographic Survey, Map & Tract ☐ Lot, Block & Subdivision ☐ Grant
POD Number: L-14330-POD7 AS-2	X or Longitude: 103°16'21.04"W	Y or Latitude: 32°33'25.31"N	Other Location Description: NW/4 NW1/4 SE1/4 of S20 T20S R37E
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:
POD Number:	X or Longitude:	Y or Latitude:	Other Location Description:

2017 NOV 13 PM 3:51 OSE ROSWELL NM

FOR OSE INTERNAL USE

Form wr-08
POD DESCRIPTIONS - ATTACHMENT 1

File Number: L-14330	Trn Number: 617025
Trans Description (optional): EXPL - PODS 2-7 monitor	

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

17-1B Depth of the well shall not exceed the thickness of the Ogallala formation.

17-4 No water shall be appropriated and beneficially used under this permit.

17-7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

17-B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with 72-12-12 NMSA 1978. A licensed driller shall not be required for the construction of a well driven without the use of a drill rig, provided that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter.

17-C The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. It is the well owner's responsibility to ensure that the well driller files the well record.
The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-P The well shall be constructed, maintained, and operated to prevent inter-aquifer exchange of water and to prevent loss of hydraulic head between hydrogeologic zones.

17-Q The State Engineer retains jurisdiction over this permit.

EXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

PROVAL (Continued)

ion L 14330 POD2 must be completed and the Well
ore 12/15/2018.

ion L 14330 POD3 must be completed and the Well
ore 12/15/2018.

ion L 14330 POD4 must be completed and the Well
ore 12/15/2018.

ion L 14330 POD5 must be completed and the Well
ore 12/15/2018.

ion L 14330 POD6 must be completed and the Well
ore 12/15/2018.

ion L 14330 POD7 must be completed and the Well
ore 12/15/2018.

'S RESPONSIBILITY TO OBTAIN ALL AUTHORIZATIONS
DRILL ON PROPERTY OF OTHER OWNERSHIP BEFORE
ES UNDER THIS PERMIT.

Part A, section (2), subsection (a), a
for a vertical annular seal of less than 20
top of the screen may be located at 20 feet
e (bgs) with the annular seal starting 18 feet

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

ACTION OF STATE ENGINEER

Notice of Intention Rcvd:	Date Rcvd. Corrected:
Formal Application Rcvd: 11/30/2017	Pub. of Notice Ordered:
Date Returned - Correction:	Affidavit of Pub. Filed:

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the [illegible]ic conditions listed previously.

Witness my hand and [illegible] this [illegible] day of Dec A.D., 2017

Tom Blaine, P.E. [illegible]e Engineer

By: _____
JUAN HERNANDEZ

Trn Desc: L 14330 PODS 2-7

File Number: L 14330
Trn Number: 617025

Aubrey Dunn
COMMISSIONER

State of New Mexico
Commissioner of Public Lands

310 OLD SANTA FE TRAIL
P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

COMMISSIONER'S OFFICE
Phone (505) 827-5760
Fax (505) 827-5766
www.nmstatelands.org

December 19, 2017

Stacy Boultinghouse
ETC Field Services LLC
600 N. Marienfeld Street
Suite 700
Midland, TX 79702

Re: State of New Mexico Water Easement WM-662 Amendment #1, adding 6 new wells
SU6 0-6-1 4" Pipeline Release

Dear Ms. Boultinghouse,

Enclosed please find a copy of the approved Amendment #1 of Water Easement WM-662 for your files.

If you require further assistance, please contact Faith Crosby, Oil and Gas Minerals Division at (505) 827-5849 fcrosby@slo.state.nm.us

Thank you for doing business with the New Mexico State Land Office.

Respectfully,

Aubrey Dunn
Commissioner of Public Lands

EM/fc
Encl.
Cc: Alan Brandon/GHD by email
XC:

NEW MEXICO STATE LAND OFFICE
WATER EASEMENT

NO. WM-662

Amendment #1

THIS AGREEMENT, dated this **___day of December, 2017,** made and entered into between the State of New Mexico Commissioner of Public Lands, acting trustee pursuant to the Act of June 21, 1910, 36 Stat. 557, ch. 310, § 10, (Commissioner), and **ETC Field Services LLC**, whose address is **600 N. Marienfeld, Suite 700, Midland, TX 79702** (Grantee). This Water Easement is not effective until signed by the Commissioner.

1. Amendment of Easement

For consideration, including the covenants herein, the Commissioner grants to Grantee an amendment to add **4** new monitoring wells and **2** new air sparge wells for a site total of **seven (7)** wells located within the following described area (Easement Land) in **Lea** County:

Quarter-Quarter	*Section*	*Township*	*Range*	*Number of Acres*
NW4SE4	**20**	**20S**	**37E**	**10**

The water shall be diverted from the following described wells:

SLO Well-Site	*OSE Well Number (or lat/long if no OSE well #)*	*Date Well Completed*	*Well Capacity*	*Volume of Use*
MW-1	**32.557065N/-103.272541W**	**5/2017**		**<10 GPY combined**
MW-2	**32°33'25.66"/-103°.16'21.04"**	**12/2017**		
MW-3	**32°33'25.20"/-103°.16'20.34"**	**12/2017**		
MW-4	**32°33'25.15"/-103°.16'21.04"**	**12/2017**		
MW-5	**32°33'25.54"/-103°16'21.55"**	**12/2017**		
AS-1	**32°33'25.56"/-103°16'21.26"**	**12/2017**		
AS-2	**32°33'25.31"/-103°16'21.04"**	**12/2017**		

A well-site is one half (0.5) acre with the denominated well in the center. Depending on their proximity, well-sites may overlap.

2. Purpose and Approved Use

This grant of Amendment is for the purpose of allowing Grantee's water monitoring for the benefit of the trust and for the following specific purpose: ground water monitoring and remediation activities on the 0-6-1 4" pipeline release under OCD #1RP-4643 issued 03/15/2017. This grant of Water Easement entitles Grantee to the exclusive use of any Water Rights developed or obtained in connection herewith for the term of this easement. The Commissioner may permit other uses on or within this Water Easement to the extent that they do not impair Grantee's permitted purposes.

3. Payment of Rental

A. Annual Rental

Grantee shall pay annual rental in the amount of **$3,500.00** ($500.00 per well) to be due on or before **May 22nd** of each year. If this Water Easement is relinquished, cancelled or otherwise terminated prior to the end of the term set forth above, the annual rental shall not be prorated, reduce or refunded for any part of any year during which the Water Easement is in effect.

Notice to the Commissioner:

New Mexico Commissioner of Public Lands
Attn: Oil Gas Minerals Division
P.O. Box 1148
Santa Fe, New Mexico 87504-1148
FAX: (505) 827-4739

With copy to:

New Mexico State Land Office
General Counsel
P.O. Box 1148
Santa Fe, NM 87504-1148
FAX: (505) 827-4262

Notice to Grantee:

ETC Field Services, LLC
600 N. Marienfeld
Suite 700
Midland, TX 79702
Attn: Stacy Boultinghouse

With Copy to:

GHD
6121 Indian School Rd. NE
Suite 200
Albuquerque, NM 87110
Attn: Alan Brandon

IN WITNESS WHEREOF, the Commissioner of Public Lands and the Grantee have signed this Amendment to be effective on the date signed by the Commissioner.

GRANTEE:
ETC FIELD SERVICES LLC

By: SBoultinghouse Date: 12.15.17

Name: Stacy Boultinghouse

Title: Environmental Mgr

ACKNOWLEDGMENT IN AN INDIVIDUAL CAPACITY

State of Texas

County of Bexar

This instrument was acknowledged before me on 12.15.17 (date) by Beth Byrnes (name).

Beth Byrnes
(Signature of notarial officer)

(seal)

BETH BYRNES
Notary ID #131180041
My Commission Expires
June 20, 2021

My commission expires: 6-20-2021

- OR -

(Grantee signature must be notarized on the following page)

ACKNOWLEDGMENT IN A REPRESENTATIVE CAPACITY

State of _____

County of _____

This instrument was acknowledged before me on _____ (date) by

_____ (name) as

_____ (title) of

_____

_____ (name of party on behalf of whom instrument is executed).

_____

(Signature of notarial officer)

(seal)

My commission expires: _____

GRANTOR

NEW MEXICO COMMISSIONER OF PUBLIC LANDS

S
E _____ dated: 12-20-17

A Aubrey Dunn, Commissioner of Public Lands

L

Attachment C
Soil Boring Logs
MW Construction Diagrams

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: AS1
DATE COMPLETED: December 20, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/Cl (ppm)
0	SLOUGH, brown	0.67	CONCRETE					
	SW-SAND, fine to very fine grained, well graded, light tan, moist, odor		BENTONITE	1HSA			5	4.7 PID <1.0 Cl
5	SLOUGH, brown	5.00	2" PVC WELL CASING					
		5.50						
	SM-SILTY SAND, well graded, dark gray, moist, odor			2HSA			2	69.6 PID 159 PF <1.0 Cl
10	SW-SAND, fine to very fine grained, clean, well graded, light gray, dry, odor	10.00		3HSA			4	11.8 PID 81 PF <1.0 Cl
15				4HSA			4	20.2 PID 70 PF <1.0 Cl
20	SM-SILTY SAND, medium to fine grained, well graded, tan/gray, wet, odor	20.00		5HSA			3	9.8 PID 64 PF <1.0 Cl
25	SW-SAND, some silt, medium to fine grained, well graded, tan/gray, wet, odor	25.00		6HSA			3	0.4 PID <1.0 Cl
30	SM-SILTY SAND, fine to very fine grained, well graded, light tan/white, wet	30.00	BENTONITE PELLETS	7HSA			7	0.5 PID <1.0 Cl
35								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 11135241-WI.GPJ GHD_Corp 1/5/18

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: AS1
DATE COMPLETED: December 20, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/ Cl (ppm)
36	SW-SAND, some silt, medium to fine grained, well graded, tan, wet	35.00						
38			SAND PACK	8HSA			0	0.8 PID <1.0 Cl
40	SC/CL-CLAYEY SAND/SANDY CLAY, lean, well graded, tan, wet	40.00						
42			2" PVC WELL SCREEN	9HSA			0	0.9 PID <1.0 Cl
44								
46	END OF BOREHOLE @ 45.0ft BGS	45.00						
48								
50								
52								
54								
56								
58								
60								
62								
64								
66								
68								

WELL DETAILS
Screened interval:
40.00 to 45.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 0.020
Material: PVC
Seal:
24.00 to 36.00ft BGS
Material: BENTONITE PELLETS
Sand Pack:
36.00 to 45.00ft BGS
Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: AS2
DATE COMPLETED: December 20, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/Cl (ppm)
0	SW-SAND, trace silt, fine to very fine grained, clean, well graded, tan/light gray, dry, odor		CONCRETE					
2			BENTONITE	1HSA			5	2.0 PID <1.0 Cl
4								
5.00	SM-SILTY SAND, fine grained, well graded, dark gray, moist, odor	5.00	2" PVC WELL CASING					
6								
8				2HSA			2	22.1 PID 102 PF <1.0 Cl
10		10.00						
10.00	SW-SAND, fine to very fine grained, clean, well graded, black/dark gray, moist, odor							
12				3HSA			4	16.8 PID 292 PF <1.0 Cl
14								
15.0	- tan/light gray at 15.0ft BGS							
16								
18				4HSA			4	2.5 PID 188 PF <1.0 Cl
20	- with black/dark gray at 20.0ft BGS							
22				5HSA			3	4.6 PID 81 PF <1.0 Cl
24								
25.0	- medium to fine grained, tan/light brown at 25.0ft BGS							
26								
28				6HSA			3	1.9 PID <1.0
30								
32			BENTONITE PELLETS	7HSA			7	2.1 PID <1.0 Cl
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: AS2
DATE COMPLETED: December 20, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/ Cl (ppm)
36	- trace silt, wet at 35.0ft BGS							
38				8HSA			0	1.4 PID <1.0 Cl
40			SAND PACK					
42			2" PVC WELL SCREEN	9HSA			0	2.9 PID <1.0 Cl
44								
46	END OF BOREHOLE @ 45.0ft BGS	45.00						
48			WELL DETAILS Screened interval: 40.00 to 45.00ft BGS Length: 5ft Diameter: 2in Slot Size: 0.020 Material: PVC Seal: 26.40 to 38.40ft BGS Material: BENTONITE PELLETS Sand Pack: 38.40 to 45.00ft BGS Material: SAND					
50								
52								
54								
56								
58								
60								
62								
64								
66								
68								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-2
DATE COMPLETED: December 18, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/ Cl (ppm)
0	ML-SANDY SILT, trace medium sand, low plasticity, poorly graded, white, moist		CONCRETE					
2			BENTONITE POWDER	1HSA				2.0 PID <1.0 Cl
4								
5.00	SW-SAND, very fine and medium grained, clean, well graded, light tan/gray, moist		2" PVC WELL CASING					
6								
8				2HSA				1.7 PID <1.0 Cl
10	- fine to very fine grained at 10.0ft BGS							
12			BENTONITE CHIPS	3HSA				0.7 PID <1.0 Cl
14								
	- fine grained at 15.0ft BGS							
16								
18			2" PVC WELL SCREEN	4HSA				1.9 PID <1.0 Cl
20	- fine to medium grained, light tan/brown, wet at 20.0ft BGS		SAND PACK					
22				5HSA				0.6 PID <1.0 Cl
24								
	- grading to very fine silty sand, light tan/gray, wet at 25.0ft BGS							
26								
28				6HSA				0.6 PID <1.0 Cl
30		30.00						
	SM-SILTY SAND, fine to medium grained, well graded, light tan/gray, wet							
32				7HSA				0.4 PID <1.0 Cl
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-2
DATE COMPLETED: December 18, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID/PF/ Cl (ppm)
36	END OF BOREHOLE @ 35.0ft BGS	35.00	WELL DETAILS Screened interval: 15.00 to 35.00ft BGS Length: 20ft Diameter: 2in Slot Size: 0.020 Material: PVC Seal: 11.00 to 13.00ft BGS Material: BENTONITE CHIPS Sand Pack: 13.00 to 35.00ft BGS Material: SAND					
38								
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68								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-3
DATE COMPLETED: December 19, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/ Cl (ppm)
0	SLOUGH, brown	0.67	CONCRETE					
2	ML-SANDY SILT, clean, light tan/gray, well graded, moist		BENTONITE POWDER	1HSA			5	0.5 PID <1.0 Cl
4		5.00	2" PVC WELL CASING					
6	SW-SAND, some silt, fine grained, clean, well graded, light tan/gray, moist							
8				2HSA			2	0.4 PID <1.0 Cl
10	- fine to very fine grained at 10.0ft BGS							
12			BENTONITE CHIPS	3HSA			3	0.7 PID <1.0 Cl
14								
16	- trace silt at 15.0ft BGS							
18			2" PVC WELL SCREEN	4HSA			16	0.6 PID <1.0 Cl
20	- no silt, medium to fine grained at 20.0ft BGS		SAND PACK					
22				5HSA			3	0.4 PID <1.0 Cl
24								
26								
28				6HSA			10	0.3 PID <1.0 Cl
30								
32				7HSA			4	0.6 PID <1.0 Cl
34	- some silt at 34.5ft BGS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-3
DATE COMPLETED: December 19, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID/PF/ CI (ppm)
36	END OF BOREHOLE @ 35.0ft BGS	35.00	WELL DETAILS Screened interval: 15.00 to 35.00ft BGS Length: 20ft Diameter: 2in Slot Size: 0.020 Material: PVC Seal: 11.00 to 13.00ft BGS Material: BENTONITE CHIPS Sand Pack: 13.00 to 15.00ft BGS Material: SAND					
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NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-4
DATE COMPLETED: December 19, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/Cl (ppm)
0	SLOUGH, brown		CONCRETE					
2			BENTONITE POWDER	1HSA			2	1.0 PID <1.0 Cl
4	SW-SAND, fine to very fine grained, clean, well graded, light tan/gray, dry	4.00						
		5.00	2" PVC WELL CASING					
6	SM-SILTY SAND, fine to very fine grained, well graded, gray, moist, odor							
8				2HSA			3	32.9 PID 359 PF <1.0 Cl
10	SW-SAND, fine to very fine grained, clean, well graded, dark gray, moist, odor	10.00						
12			BENTONITE CHIPS	3HSA			4	18.2 PID 128 PF <1.0 Cl
14	- medium to fine grained, light gray at 15.0ft BGS							
16								
18			2" PVC WELL SCREEN	4HSA			13	5.1 PID 292 PF <1.0 Cl
20	- medium to fine grained, gray, wet at 20.0ft BGS		SAND PACK					
22				5HSA			5	0.7 PID 68 PF <1.0 Cl
24	- fine to very fine grained, light tan/brown at 25.0ft BGS							
26								
28				6HSA			7	2.3 PID 97 PF <1.0 Cl
30	SM-SILTY SAND, fine to very fine grained, well graded, light tan, wet, slight odor	30.00						
32				7HSA			8	0.6 PID 99 PF <1.0 Cl
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-4
DATE COMPLETED: December 19, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID/PF/ Cl (ppm)
36	END OF BOREHOLE @ 35.0ft BGS	35.00	WELL DETAILS Screened interval: 15.00 to 35.00ft BGS Length: 20ft Diameter: 2in Slot Size: 0.020 Material: PVC Seal: 11.00 to 13.00ft BGS Material: BENTONITE CHIPS Sand Pack: 13.00 to 15.00ft BGS Material: SAND					
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66								
68								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-5
DATE COMPLETED: December 20, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE	SAMPLE PID/PF/Cl (ppm)
0	SLOUGH, brown	0.67	CONCRETE					
2	SW-SAND, fine to very fine grained, clean, well graded, light gray, moist, odor		BENTONITE POWDER	1HSA			5	3.4 PID 58 PF <1.0 Cl
4								
6	- some silt, dark gray at 5.0ft BGS		2" PVC WELL CASING					
8				2HSA			5	16.6 PID 1019 PF <1.0 Cl
10	- light gray at 10.0ft BGS							
12			BENTONITE CHIPS	3HSA			2	12.9 PID 97 PF <1.0 Cl
14								
16								
18			2" PVC WELL SCREEN	4HSA			2	99 PF <1.0 Cl 7.6 Cl
20	- with silt, medium to fine grained, light tan/gray, wet at 20.0ft BGS		SAND PACK					
22				5HSA			2	104 PF <1.0 Cl 9.0 Cl
24								
26	SW/SM-SAND/SILTY SAND, fine to very fine grained, light tan/gray, wet, odor	25.00						
28				6HSA			2	1.8 PID 64 PF <1.0 Cl
30								
32				7HSA			2	2.1 PID 78 PF <1.0 Cl
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: O-6-1 4" ASSESSMENT
PROJECT NUMBER: 11135241
CLIENT: ETC FIELD SERVICES
LOCATION: MONUMENT, NEW MEXICO

HOLE DESIGNATION: MW-5
DATE COMPLETED: December 20, 2017
DRILLING METHOD: HSA
FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID/PF/ Cl (ppm)
36	END OF BOREHOLE @ 35.0ft BGS	35.00	WELL DETAILS Screened interval: 15.00 to 35.00ft BGS Length: 20ft Diameter: 2in Slot Size: 0.020 Material: PVC Seal: 11.00 to 13.00ft BGS Material: BENTONITE CHIPS Sand Pack: 13.00 to 15.00ft BGS Material: SAND					
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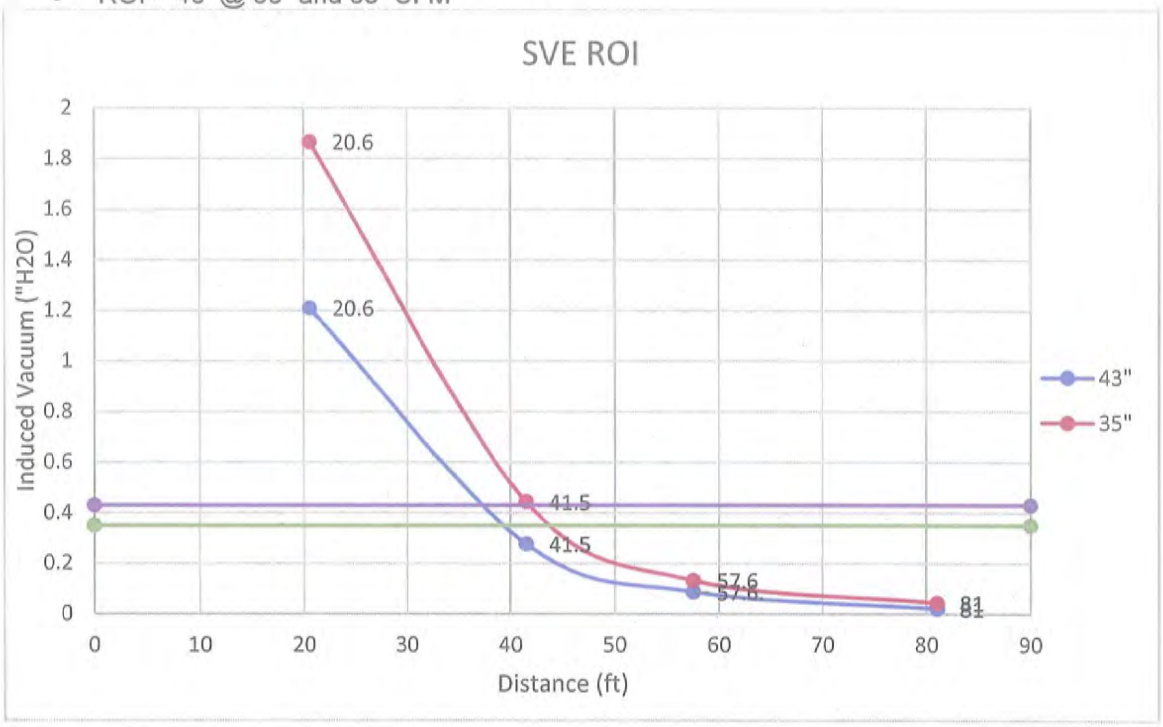
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

Attachment D
Air Sample Data
SVE Pilot Study Calculations

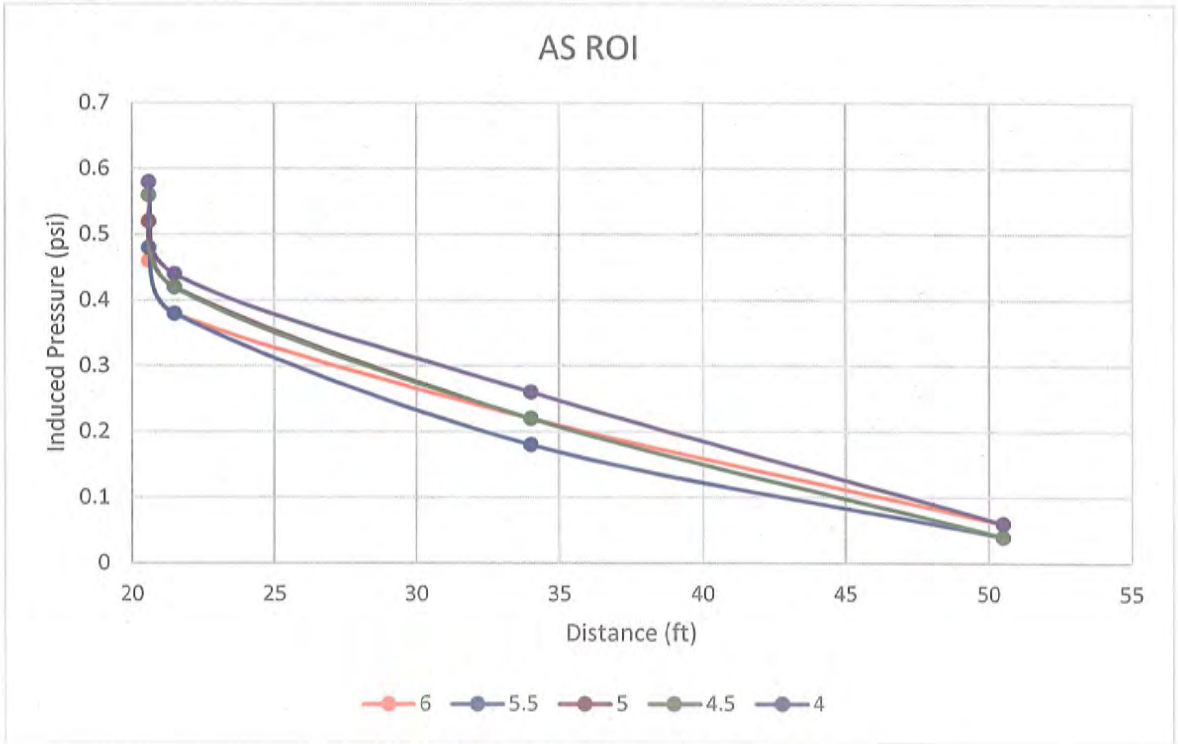
SVE

- ROI – 40' @ 35" and 35 CFM



AS

- 40+' @ 4-5 PSI and 8-10 CFM using both wells



CALCULATION OF AIR PERMEABILITY - STEADY STATE

ETC 0-6-1 4" Line Release

Lea County, New Mexico

Calculation of air permeability, k, under steady-state conditions.

Equation(1) : $Q / H = pi \times (k/u) \times Pw \times [1 - (Patm/Pw) \times (Patm/Pw)] / \ln(Rw/Ri)$

TestWell	Max Flow
INPUTS	
Flow, cfm	*35*
Pw,"H2OVac	*35*
Bar.Press. "Hg	*30*
Rw,in	*1*
Ri, ft	*40*
Well Screen Length	*10*
Formation Depth, h	*30*
Void Fraction	*0.25*
Efficiency	*50%*
OUTPUTS	
k, cm2	1.05E-07
u,g/cm-sec	0.00018
Pw,g/cm-sec2	928,503
Patm,g/cm-sec2	1,015,909
Rw,cm	2.54
Ri, cm	1219.2
ln(Rw/Ri)	-6.173786104
FLOWRATE	
Q/H, cm3/sec/cm	54
Q/H, cfm/ft	3.5
Total Flow, cfm	35
FLUX-Ft/min (2)	
@20%RI	0.05
@40%RI	0.02
@60%RI	0.02
@80%RI	0.01
@100%RI	0.01
Pore Vol./Yr (2) (3)	
@20%RI	6,103
@40%RI	1,526
@60%RI	678
@80%RI	381
@100%RI	244

Note 1) Johnson, P.C., M.W.Kemblowski,J.D.Colthart,D.L.Byers and C.C.Stanley.1988. *A Practical Approach to the Design, Operation and Monitoring of In-Situ Soil Venting Systen*

2) Assumes site is sealed top and bottom.

3) Calculated as volume times efficiency divided by pore volume of cylinder with radius equal to x%RI and height h.

4) Soil permeability to air, k (cm^2) equals approximately 10^{-5} cm-sec times hydraulic conductivity, K (cm/sec).

SVE DESIGN ESTIMATES - 6 PORE VOLUMES PER DAY
ETC 0-6-1 4" Line Release
Lea County, New Mexico

Reference No: 11135241

Input Site Information	
Areal extent, ft2	2,700
Depth, ft	30
Soil Density, dry lb/ft3	110
Void Fraction	0.25
Temp, C	10
ROI, ft (Ri)	30
Air Permeability, cm2 (k)	1.05E-07
Flow Rate, Pore Volumes per day	6
Well Radius, in. (Rw)	1
% On (Blowers)	90%

Calculated Site Information	
Soil Volume, ft3	81,000
Soil Volume, yd3	3,000
Soil Mass, tons	4,455
Molar volume, l/mole insitu	25.0
Feet of Screen Required	29
Wellhead Vacuum Req'd. "H2O (1)	28
Wellhead Vacuum Req'd. "Hg	2.1
Total ACFM	84
Total SCFM (60 F, 1 atm)	80
Flow per foot of screen (Q/H)	2.9

			Extracted Soil Vapor Concentrations (2)						*Soil Concentrations*		*Mass in Soil*			*Removal Rate*		*Estimated (3)*	
			Initial		*Final*		*Average*		*Initial*	*Final*	*Initial*	*Final*	*Remove*	*Initial*	*Final*	*Cleanup Duration*	
Compound Name	*Chemical Formula*	*M.W.*	*ug/l*	*ppmv*	*ug/l*	*ppmv*	*ug/l*	*ppmv*	*ppm*	*ppm*	*lbs.*	*lbs.*	*lbs.*	*lb/day*	*lb/day*	*days*	*years*
ETHYLBENZENE	C8H10	106.167	4000.00	941.91	200.00	47.096	1141.624	268.83	200.0	10.0	1782.00	89.10	1692.90	25.878	0.145	206	0.6
- TOTALS -			4,000.0	941.91	200.00	47.096	1,141.624	268.83	200.0	10.0	1,782	89	1,693	25.878	0.145	206	0.6

Notes: (1) Johnson, P.C., M.W.Kemblowski,J.D.Colthart,D.L.Byers and C.C.Stanley.1988.
A Practical Approach to the Design, Operation and Monitoring of In-Situ Soil Venting Systems
Q / H = pi x (k/u) x Pw x [1 - (Patm/Pw) x (Patm/Pw)] / ln(Rw/Ri)
Where: Patm = Atmospheric Pressure, absolute
Pw = Wellhead pressure, absolute
u = Viscosity of air (0.00018 g/cm-s)

(2) ug/l x (25/MW) = ppmv, where 25 = l/mole @ room temperature and pressure.

(3) Assumes constant ratio of soil vapor concentration to soil concentration for duration of treatment (i.e. ignores short-circuiting and diffusion limiting conditions)
t (f) = [ln x(o) - ln x(f)] * x(o) / K
Where: t(f) = time, in days, to reach x(f) mass remaining

SVE - Soil Vapor Extraction

Design

- 2 SVE wells spaced ~75' apart on opposite ends of release area
- 10' well screens
- Use currently installed AS wells

Mass Removal

- Initial soil ppm – 200
- Final soil ppm - 10
- Initial vapor ug/l – 4000
- Final vapor ug/l – 200
- Lbs removed – 1693
- Initial lb/day – 20.7
- Final lb/day – 0.12
- Duration – 9 months

Emissions

- 25 lb/day
- 1.04 lb/hr
- Can emit up to 10 lbs/hr VOC without permit required

Carbon

- 36 lbs/day

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