Jason Michelson
Project Manager

Chevron Environmental Management Company
1400 Smith Street, #07084
Houston, Texas 77002
Work: 713-372-0289
Cell: 281-660-8564
jmichelson@chevron.com

APPROVED
By Olivia Yu at 3:57 pm, Jul 24, 2018

May 21, 2018

Olivia Yu
Environmental Specialist
New Mexico Oil Conservation Division, District 1
1625 N. French Drive
Hobbs, NM 88240

NMOCD approves of the delineation completed thus far and the proposed additional delineation for 1RP-3688.

Re: Chevron Vacuum Grayburg San Andres Unit 148
2017 Site Assessment Report
Case No. 1RP-3688
Lea County, New Mexico

Dear Ms. Yu,

Please find enclosed for your files copies of the following report:

- VGSAU 148 – 2017 Site Assessment Report, Unit S, Section 1, Township 18 South, Range 34 East; Lea County New Mexico.

The report was prepared by GHD Services (GHD) on behalf of Chevron Environmental Management Company (CEMC) to document on-going assessment activities throughout 2017 at the Site.

Please do not hesitate to call Scott Foord with GHD at 713-734-3090 or myself at 713-372-0289, should you have any questions.

Sincerely,

Jason Michelson

Encl. VGSAU 148 – 2017 Site Assessment Report

C.C. Amy Barnhill, Chevron/MCBU

Site Assessment Report

VGSAU 148 (1RP-3688)
Produced Water Release
Lea County, New Mexico

Chevron Environmental
Management Company

Table of Contents

Figure Index

Table Index

Appendix Index

1. Introduction

GHD is pleased to present this Site Assessment Report to Chevron Environmental Management Company (CEMC) for the VGSAU 148 produced water release location (hereafter referred to as the "Site"). The Site is located in Unit S, Section 1, Township 18 South, Range 34 East, approximately one-half mile south of the Chevron Buckeye Field Management Team office in Lea County, New Mexico. The Site is located within the Vacuum Grayburg-San Andres Unit (VGSAU) oil field (Figure 1).

2. Project Information and Background

The release site is situated proximate to multiple produced water and oil gathering lines that converge at a surface manifold location. According to the New Mexico Oil Conservation Division (NMOCD) Release Notification and Corrective Action Form C-141 submitted to the agency by Chevron, the release occurred on June 22, 2015 and was immediately reported to Ms. Kellie Jones, Hobbs District 1 NMOCD office. The volume of the spill was reported as 153.55 barrels of produced water of which 30 barrels were recovered. A failure of a fiberglass water line was listed as the cause of the release.

In June 2016, Chevron contracted GHD to perform a soil assessment at the Site by implementing a soil boring installation and sampling program. On June 13 and 14, 2016, GHD subcontractor Harrison Cooper, Inc. (HCI) advanced five soil borings (SB-1 through SB-5) utilizing an air-rotary drilling rig to depths of approximately 50 feet below ground surface (bgs). A subsequent soil assessment was conducted on August 22 and 23, 2016. HCI advanced four additional soil borings (SB-6 through SB-9) to 50 feet bgs.

All soil samples collected during the June mobilization (SB-1 through SB-5) were below the NMOCD Site-specific Recommended Remediation Action Levels (RRALs) for TPH (1,000 milligram per kilogram (mg/kg)) and total BTEX (50 mg/kg). Chloride concentrations in samples collected from SB-2, SB-3, SB-4, and SB-5 exceeded the NMOCD Site-specific RRAL of 250 mg/kg for vertical delineation of chlorides. The chloride exceedances ranged from 285 mg/kg to 4,210 mg/kg at depths ranging from 5 to 10 feet bgs. The samples collected from the deeper intervals (up to 50 ft bgs) within SB-2, SB-3, SB-4, and SB-5 were below the RRAL for chloride.

Samples collected for chlorides analysis during the August mobilization (SB-6 through SB-9) were below the NMOCD RRAL in all but three samples. Chloride exceeded the RRAL in SB-7 at 15 feet bgs (352 mg/kg) and 20 feet bgs (954 mg/kg), and in SB-9 at 5 feet bgs (6,540 mg/kg). Analytical results associated with assessment activities conducted in June and August 2016 indicated the horizontal extent of chloride impacts in soil had not been fully delineated. Analytical results are summarized in Table 1.

In 2017, a two-phase geophysical investigation was completed at the Site and six additional soil borings were subsequently installed (SB-10 through SB-15) and sampled in an attempt to fully delineate the horizontal extents of the chloride impact. The results of the soil borings and

geophysical investigation are provided herein. Figure 3 depicts the soil boring locations installed between 2014 through 2017.

3. Geophysical Survey – EM31 and ER

In June and August 2017, GHD completed a two-phase geophysical investigation at the Site. The purpose of the investigation was to delineate areas of elevated conductivity in order to map the extent of suspected chloride impacts to soil at the Site. The first phase of the investigation consisted of an electromagnetic (EM) survey to delineate the footprint of the suspected impacts. Based on the EM survey results, an electrical resistivity (ER) survey was completed to determine the vertical distribution of the suspected impacts. Survey coverage data are presented on attached Figures 4 and 5.

The EM survey was completed with an EM31 terrain conductivity meter. Prior to conducting the EM31 survey, a grid consisting of parallel lines was established over the proposed area of investigation indicated on Figure 4. Measurements of EM31 data were collected along 30-foot spaced grid lines over the area of investigation, with station spacings of approximately 4 feet on all grid lines. The ER survey line location was chosen based on the EM31 survey results, and transected the EM31 conductivity anomaly. The configuration of the electrodes (also called an array) and the electrode spacings were optimized to achieve an approximate depth of investigation of approximately 70 feet bgs, and the electrode spacing on all grid lines was on the order of 6.6 feet (i.e., 2 meters).

3.1 EM31 Survey Methodology

The EM31 survey was completed to determine the horizontal extent or limits of chloride impacts in the shallow subsurface soils at the Site. The EM31 consists of transmitter and receiver coils located at opposite ends of a rigid boom. The coil separation for the EM31 is approximately 13 feet, which yields an approximate depth of penetration of 18 feet bgs in vertical dipole mode. Measurements of terrain conductivity from the EM31 were used to assess the extent of chloride impacts at the Site. The data for the EM31 survey were then processed as a colored contour plot. The plot was superimposed on an aerial image of the Site plan, and is used to locate elevated conductivity responses indicative of chloride-impacted areas relative to the Site features. Figure 4 depicts the EM31 survey results.

3.2 EM31 Survey Results

The colored contour conductivity plot presented on Figure 4 reveals that the highest intensity conductivity responses are colored red to purple, while areas of low response are colored blue. All remaining intermediate responses correspond to the color scale presented on the figure. Results from non-impacted areas within the survey coverage indicate that background conductivity responses were approximately 20 milliSiemens/meter (mS/m). Anomalous responses relative to background were generally 1.5 to 10 times higher, and ranged from approximately 30 to 200 mS/m. The EM31 survey results delineated three main areas of suspected brine-impacted soils (on the northeast, southeast, and west side of the Site).

The response areas on the western portion of the Site are comprised of numerous smaller conductive zones that run parallel to a high pressure gas line. The area on the northwest portion of the Site is located between two additional high pressure gas lines. Several of the smaller conductive zones with higher responses are believed associated with conductive metal piping. An area was identified southeast of the Site boundary and is believed to be a former pit not associated with the VGSAU 148 release.

3.3 ER Survey Methodology

The ER survey profile was completed in August 2017 to determine the vertical extent of chloride-impact in soil on one selected survey line located along the east central section of the Site (see Figure 3). This area exhibited the strongest responses during the EM31 survey. The ER survey was conducted with a dual-function resistivity meter, which operates simultaneously as a transmitter and receiver. The survey utilized two multi-electrode cables yielding a total spread of 72 electrodes. The receiver was programmed to automatically "switch" between measured quadripoles, yielding a pseudosection of apparent resistivity. The apparent resistivity data were then imported into an inversion software program, and processed to yield a modeled profile section of resistivity.

3.4 ER Survey Results

The electrical resistivity results for the survey line are presented on Figure 5. These results are based on the measured apparent resistivity values for various depths along the survey line. Calculations of measured apparent resistivity values include the type of ER array (Wenner), the electrode spacing, and raw field data (i.e., applied current and measured voltage for each data point).

The measured apparent resistivity data were processed with the inversion program RES2DINV, to yield the modeled resistivity section presented on Figure 5. The modeled section represents the resistance of earth materials in the shallow subsurface, and thus provides an interpretation of the overburden sequences and areas of suspected brine impacts along the survey line. The highest resistivity values are colored dark blue, while areas of low resistivity (or conversely, high conductivity) are colored yellow to red. All remaining intermediate responses correspond to the color scale presented on the bottom of each section.

The colored plot reveals that the contour intervals ranged from 2.25 to 1,000 Ohm.meters (Ohm.m). The intermediate contour intervals were determined by applying a normalized distribution curve to the data such that the entire range of responses could be identified by discrete colors. The interpreted colored contoured plot suggests that suspected brine-impacted soils can likely be characterized by modeled responses of approximately 2.25 to 40 Ohm.m.

3.5 Geophysical Survey Correlations/Conclusions

- The geophysical investigation successfully delineated the horizontal and vertical extents of suspected brine-impacted areas in the shallow subsurface within the Site boundaries.
- The EM31 survey delineated two areas of suspected brine-impacted soils within the Site boundaries.

- In general, the ER survey results indicate the zone of suspected brine impact is a surficial zone, affecting soils at surface down to approximately 30-40 feet bgs.
- The suspected brine impacts appear confined to near surface areas that correlate well with soil sample analytical results for chlorides from the 2016 and 2017 assessment activities.

4. Remediation Standards

Information available on the Petroleum Recovery Research Center (PRRC) Mapping Portal, current (GHD) managed groundwater site(s) data, and the United States Geological Survey (USGS) Current Water Database for the Nation indicate:

- The depth to groundwater at the Site is greater than 100 feet bgs.
- The nearest private domestic water source is greater than 200 feet from the release site.
- The nearest public/municipal water source is greater than 1,000 feet from the release site.
- The release site lies more than 1,000 horizontal feet from the nearest surface water body.

GHD currently monitors two groundwater sites within a 1-mile radius of the Site (Buckeye Compressor Station Site and VGSAU 58 (both under AP-104)). The Buckeye Compressor Station Site is monitored with a network of 28 monitor wells. MW-12 is located approximately 0.80 miles northeast of VGSAU 148. Groundwater gauging data from MW-12 through 2017 documents that depth to water has ranged from 127.65 to 132.80 feet below top of casing (btoc). The deepest reported chloride impacted soil at the Site is within the 39-40 feet bgs interval, and depth to groundwater from that impacted interval is estimated between 50-99 feet.

Consequently, the NMOCD ranking criteria total score for the Site is 10. The anticipated site-specific RRALs to be applied to this location by the NMOCD are 10 mg/kg for benzene; 50 mg/kg for total benzene, toluene, ethylbenzene and xylenes (BTEX); 1,000 mg/kg for total petroleum hydrocarbons (TPH); and an NMOCD-accepted 600* mg/kg for horizontal and 250 mg/kg for vertical delineation of chlorides.

*In an August 28, 2017 telephone conversation between Bernard Bockisch (GHD) and Jim Griswold (NMOCD Environmental Bureau Chief), GHD was informed NMOCD is accepting chloride concentrations of 600 mg/kg for horizontal delineation assessment clean up levels.

New Mexico Oil Conservation Division Site Assessment	
Depth to Ground Water (50-99 feet)	10
Wellhead Protection Area (> 1,000 feet from water source, > 200 feet from domestic source)	0
Distance to Surface Body Water (> 1,000 horizontal feet)	0
Ranking Criteria Total Score	**10****
**Because the ranking criteria total score is 10, NMOCD established RRALs are 50 mg/kg for BTEX, 1,000 mg/kg TPH (GRO + DRO), and 250 mg/kg for vertical delineation of chlorides[1].	

[1] NMOCD Guidance for Remediation of Leaks, Spills and Releases, August 13, 1993

5. Soil Assessment

In order to further define the horizontal extent of chloride impact at the Site, six (6) additional soils borings (SB-10 though SB-15) were installed using an air rotary drilling rig. GHD's contracted service provider HCI (a New Mexico-licensed water well driller) and GHD mobilized to the Site to begin drilling activities on October 17, 2017. Each boring location was cleared for underground utilities with the use of an air knife up to a depth of 5.0 feet bgs or refusal. SB-10 through SB-15 were advanced to 50 feet bgs. Site details and boring locations are shown on Figure 3.

Chloride screening of soil samples collected from each boring was accomplished in the field by mixing soil samples with distilled water, then testing the rinsate using Hach chloride test strips. The soil types observed during drilling of SB-10 through SB-15 consisted primarily of silty sands. The soils were logged in accordance with the Unified Soil Classification System, and soil boring logs are provided in Appendix A.

Soil samples were collected at 0.5-1 foot, 4-5 feet, and then ten-foot intervals starting at 9-10 feet within each of the six soil borings. Soil samples were placed in laboratory-supplied sample containers on ice, labeled, and submitted to Xenco Laboratories in Midland, Texas for analysis of chlorides by EPA Method 300. Groundwater was not encountered in any of the soil borings. Following completion of activities, the soil cuttings were returned to their respective boreholes and backfilled with hydrated bentonite pellets from 10 feet bgs to the ground surface.

5.1 Soil Sampling Analytical Results

Analytical results associated with the soil boring installation activities performed in October 2017 are discussed in the following section. Some of the deeper soil samples were held by the laboratory pending results of shallower soil samples, and were subsequently not analyzed at the direction of GHD. Analytical results are presented in Table 1 and the laboratory reports are provided in Appendix B. These results are shown in map view on Figure 6, and are summarized below:

- Soil samples collected from SB-10, SB-12, and SB-14 demonstrated chloride concentrations below the site-specific RRAL of 250 mg/kg in samples from 0.5-30 feet intervals. As such, deeper soil sample intervals (30-50 feet) were not analyzed.
- Soil samples from SB-11 exhibited chloride concentrations exceeding the RRAL in five sample intervals (4-40 ft ranging from 332 to 2,310 mg/kg). The chloride concentrations decreased through the deeper intervals with the highest concentrations from the 4-5 feet bgs interval (2,310 mg/kg). The soil boring terminal depth (50 feet bgs) sample reported chloride below the RRAL at 86.1 mg/kg.
- Soil samples from SB-13 exhibited chloride concentrations exceeding the RRAL in four sample intervals (4-5 feet bgs, 9-10 feet bgs, 29-30 feet bgs, and 39-40 feet bgs ranging from 255 to 1,610 mg/kg). The soil boring terminal depth (50 feet bgs) sample reported chloride below the RRAL at 87.0 mg/kg.
- Soil samples from SB-15 exhibited chloride concentrations exceeding the RRAL in the three shallowest sample intervals (707 mg/kg, 601 mg/kg, and 573 mg/kg at 0.5-1 feet bgs, 4-5 feet bgs, and 9-10 feet bgs, respectively). The chloride concentrations decreased throughout the

deeper intervals to 5.52 mg/kg at 39-40 feet bgs. As such, the deeper interval soil sample (49-50 feet bgs) was not analyzed.

6. Conclusions

Analytical results associated with assessment activities conducted in 2016 and 2017 indicate the horizontal extents of the chloride impact in soil have not been fully delineated. The vertical extent of chloride impact appears delineated and confined to shallow soils less than 40 feet bgs, therefore the risk of impact to groundwater is believed minimal.

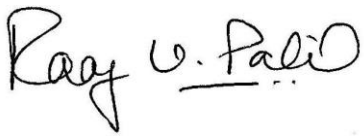
7. 2018 Assessment Activities

On February 13, 2018, GHD and Chevron representatives met with NMOCD to discuss further assessment activities addressing the presence of chloride in. Additional assessment activities based on those discussions are summarized in the Work Plan included in Appendix C of this report.

Submitted by:

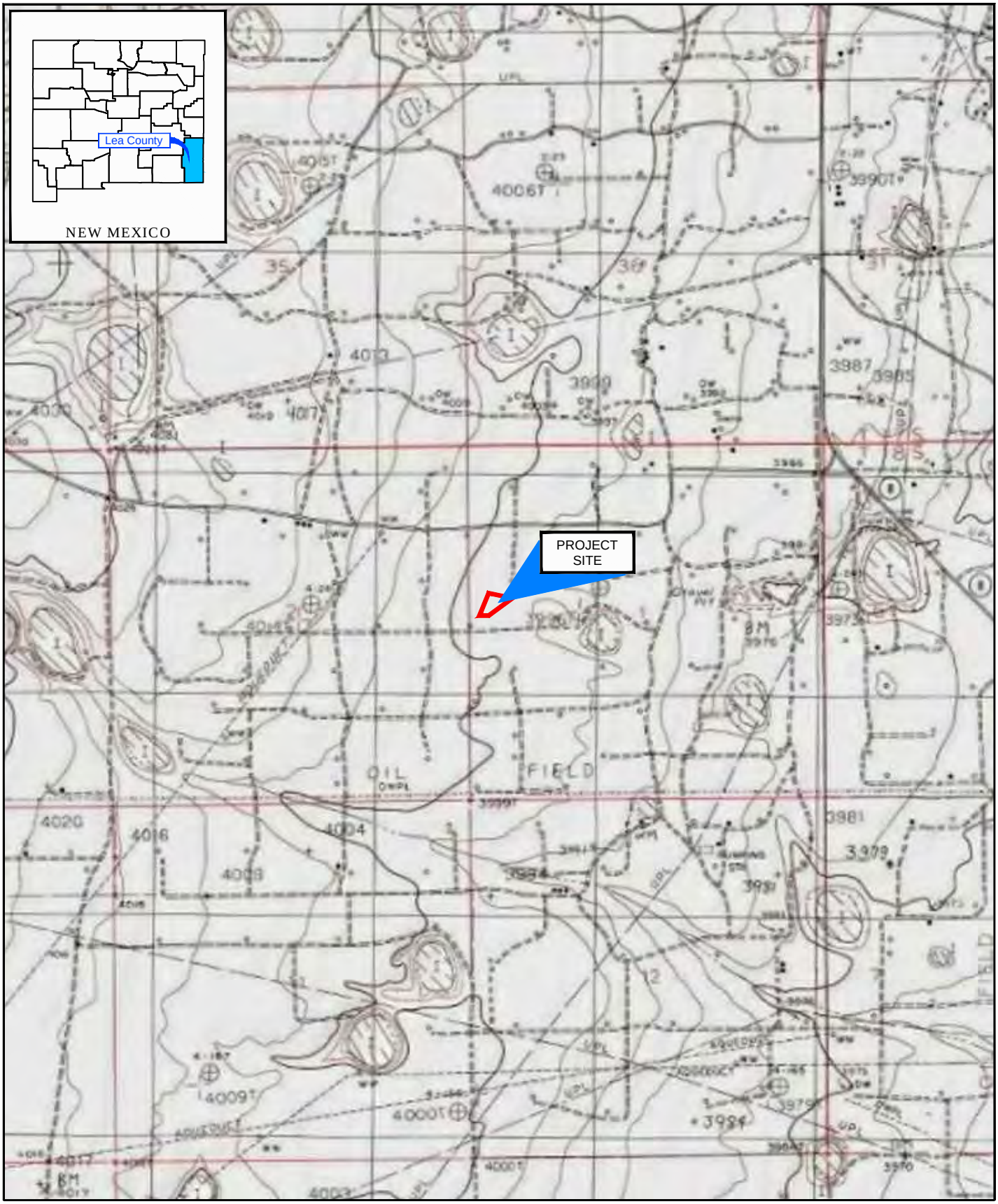
GHD Services, Inc.

Scott Foord, P.G., Project Manager



Raaj U. Patel, P.G., Program Manager

Figures



Source: USGS 7.5 Minute Quad "Buckeye and Lovington SW, New Mexico"

Lat/Long: 32.777256ÁNorth, -103.521904ÁWest

0 1000 2000ft

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

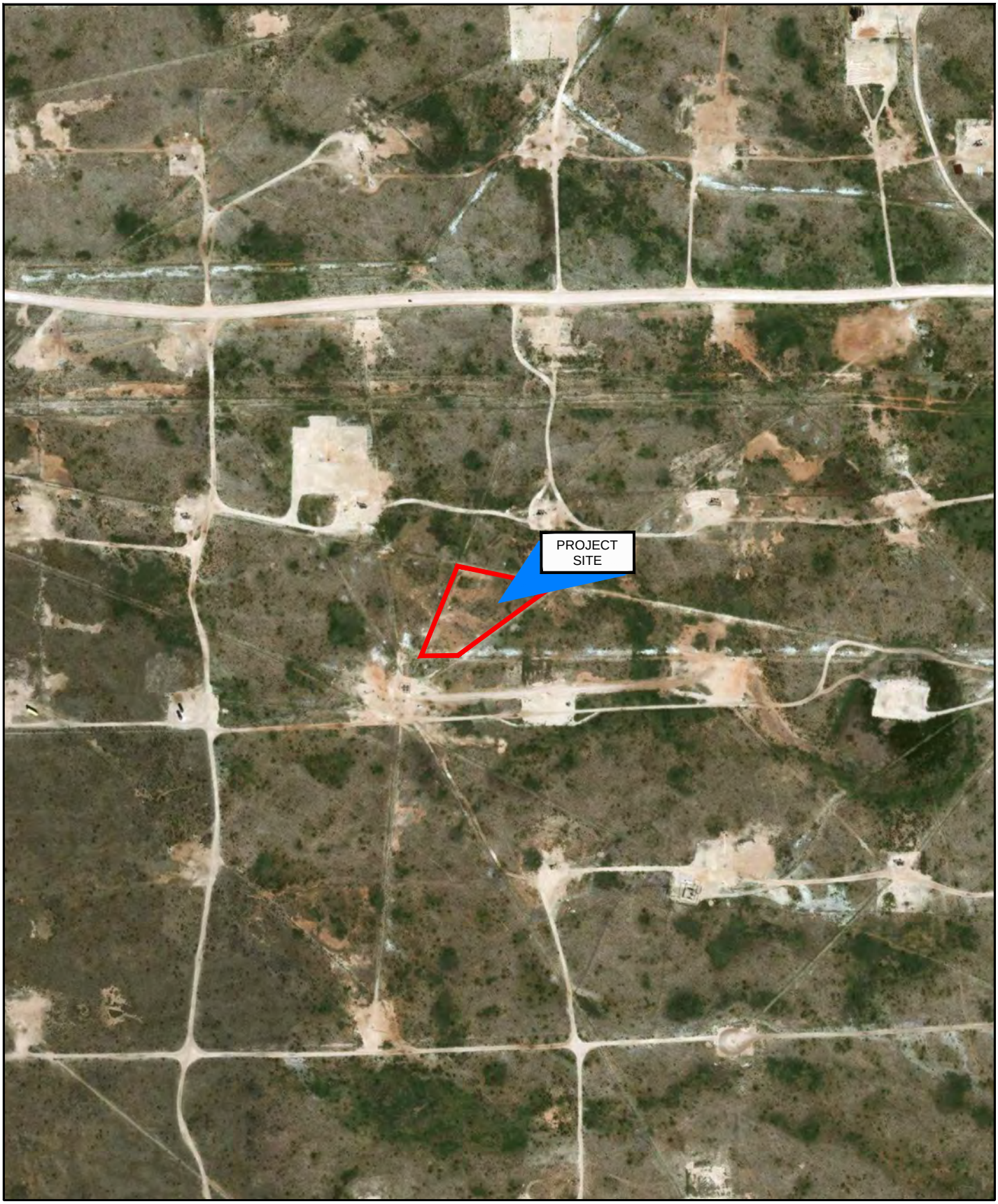
CEMC
LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

11121241-00
Feb 7, 2018

SITE LOCATION MAP

FIGURE 1

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1112----\11121241-CEMC-Buckeye_VGSAU 148\11121241-00(002)\11121241-00(002)GN-DL001.dwg



Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.777256ÁNorth, -103.521904ÁWest

0 200 500ft

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

CEMC
LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

11121241-00

Mar 2, 2018

SITE AERIAL MAP

FIGURE 2

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1112----\11121241-CEMC-Buckeye_VGSAU 148\11121241-00(002)\11121241-00(002)GN-DL001.dwg

Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.777256ÁNorth, -103.521904ÁWest

0 40 80ft

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

CEMC
LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

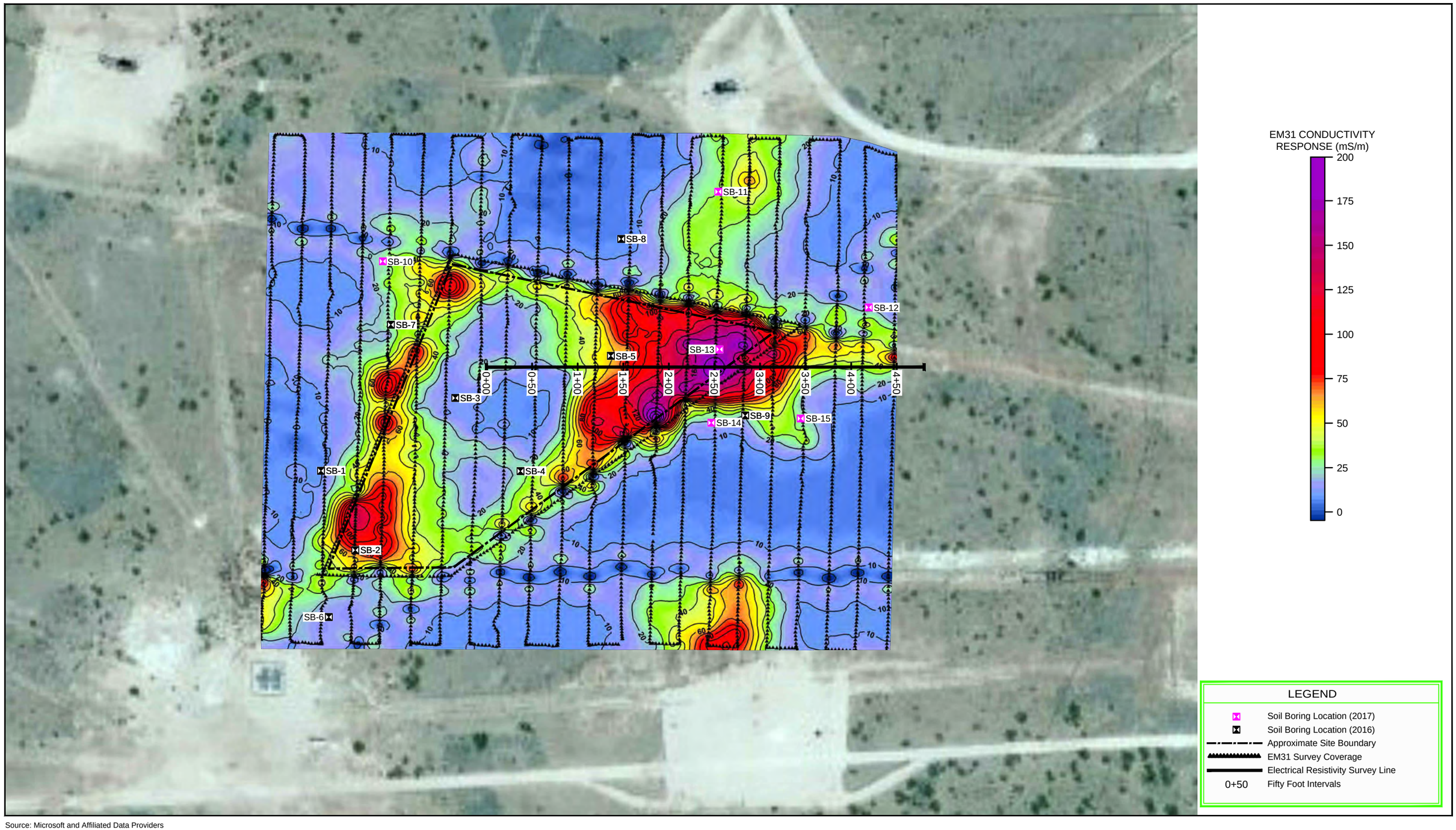
11121241-00

Apr 17, 2018

SITE DETAILS

FIGURE 3

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1112----\11121241-CEMC-Buckeye_VGSAU 148\11121241-00(002)\11121241-00(002)GN-DL001.dwg



Source: Microsoft and Affiliated Data Providers

0 50 100ft

Coordinate System:
NAD 1983 (2011) State Plane
New Mexico East (US Feet)

CEMC
BUCKEYE FMT, LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

EM31 GEOPHYSICAL INVESTIGATION

11121241-2017

Apr 18, 2018

FIGURE 4

CAD File: P:\drawings\11121000s\11121241\11121241-REPORTS\11121241-2017(002)\11121241-2017(002)GN\11121241-2017(002)GN-WA001.dwg

VGSAU 148 - LINE 1
INVERSE MODEL RESISTIVITY SECTION

DISTANCE (ft)

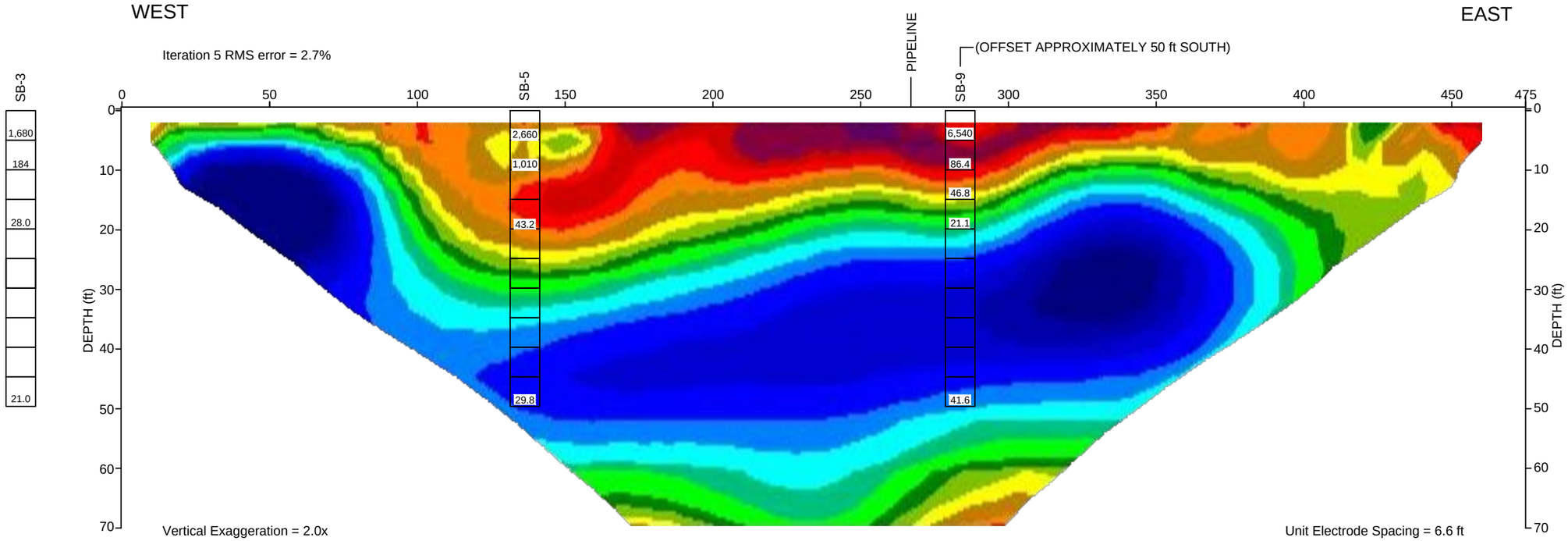
WEST

EAST

Iteration 5 RMS error = 2.7%

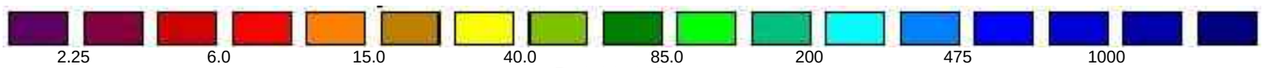
PIPELINE

(OFFSET APPROXIMATELY 50 ft SOUTH)



Vertical Exaggeration = 2.0x

Unit Electrode Spacing = 6.6 ft



NOTE:

CEMC
BUCKEYE FMT, LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

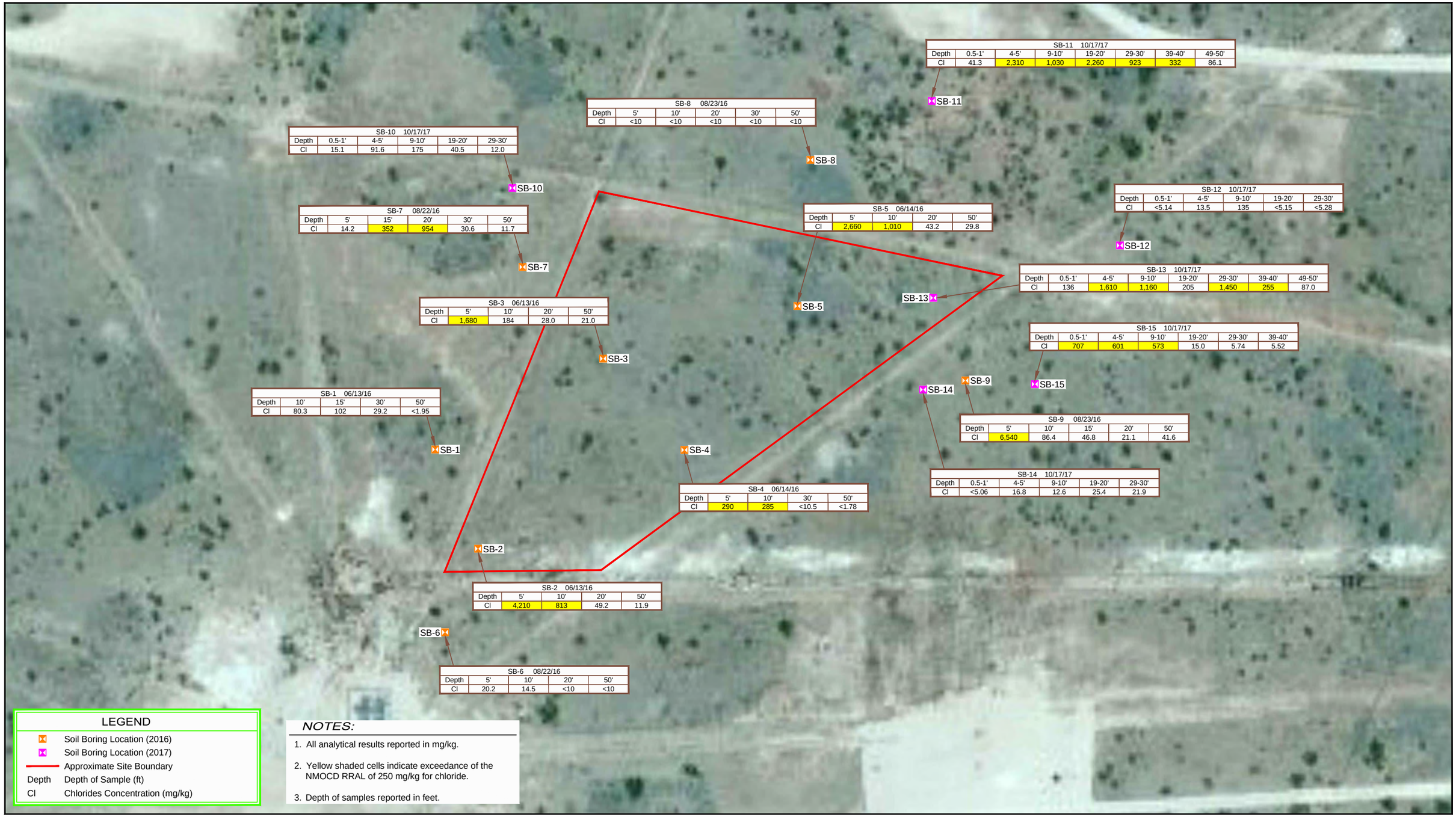
ELECTRICAL RESISTIVITY CROSS-SECTION SURVEY RESULTS AND HISTORICAL SOIL ANALYTICAL DATA

11121241-2017

Apr 18, 2018

FIGURE 5

CAD File: P:\drawings\11121000s\11121241\11121241-REPORTS\11121241-2017(002)\11121241-2017(002)GN\11121241-2017(002)GN-WA002.dwg



Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.777256ÁNorth, -103.521904ÁWest

0 40 80ft

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

Sample ID — SB-10 10/17/17 — Sample Date
Depth 0.5-1' — Sample Depth (ft)
Chloride 707 — Sample Result (mg/kg)

GHD

CEMC
LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

11121241-00

Apr 17, 2018

SITE DETAILS AND ANALYTICAL RESULTS MAP

FIGURE 6

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1112----\11121241-CEMC-Buckeye_VGSAU 148\11121241-00(002)\11121241-00(002)GN-DL001.dwg

Table

TABLE 1
SOIL ANALYTICAL SUMAMRY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGSAU 148
LEA COUNTY, NEW MEXICO

Sample ID	Full Sample Name	Depth (feet)	Date	Chlorides mg/kg
NMOCD Recommended Action Levels				**250**
SB-1	SB-1-10-161306	10 ft BGS	6/13/2016	80.3
SB-1	SB-1-15-161306	15 ft BGS	6/13/2016	102
SB-1	SB-1-30-161306	30 ft BGS	6/13/2016	29.2
SB-1	SB-1-50-161306	50 ft BGS	6/13/2016	<11.5
SB-2	SB-2-5-161306	5 ft BGS	6/13/2016	**4210**
SB-2	SB-2-10-161306	10 ft BGS	6/13/2016	**813**
SB-2	SB-2-20-161306	20 ft BGS	6/13/2016	49.2
SB-2	SB-2-50-161306	50 ft BGS	6/13/2016	11.9
SB-3	SB-3-5-161306	5 ft BGS	6/13/2016	**1680**
SB-3	SB-3-10-161306	10 ft BGS	6/13/2016	184
SB-3	SB-3-20-161306	20 ft BGS	6/13/2016	28
SB-3	SB-3-50-161306	50 ft BGS	6/13/2016	21
SB-4	SB-4-5-161306	5 ft BGS	6/14/2016	**290**
SB-4	SB-4-10-161306	10 ft BGS	6/14/2016	**285**
SB-4	SB-4-30-161306	30 ft BGS	6/14/2016	<10.5
SB-4	SB-4-50-161306	50 ft BGS	6/14/2016	<10.4
SB-5	SB-5-5-161306	5 ft BGS	6/14/2016	**2660**
SB-5	SB-5-10-161306	10 ft BGS	6/14/2016	**1010**
SB-5	SB-5-20-161306	20 ft BGS	6/14/2016	43.2
SB-5	SB-5-50-161306	50 ft BGS	6/14/2016	29.8
SB-6	SB-6-082216-5	5 ft BGS	8/22/2016	20.2
SB-6	SB-6-082216-10	10 ft BGS	8/22/2016	14.5
SB-6	SB-6-082216-20	20 ft BGS	8/22/2016	<10.0
SB-6	SB-6-082216-50	50 ft BGS	8/22/2016	<10.0
SB-7	SB-7-082216-5	5 ft BGS	8/22/2016	14.2
SB-7	SB-7-082216-15	15 ft BGS	8/22/2016	**352**
SB-7	SB-7-082216-20	20 ft BGS	8/22/2016	**954**
SB-7	SB-7-082216-30	30 ft BGS	8/22/2016	30.6
SB-7	SB-7-082216-50	50 ft BGS	8/22/2016	11.7
SB-8	SB-8-082316-5	5 ft BGS	8/23/2016	<10.0
SB-8	SB-8-082316-10	10 ft BGS	8/23/2016	<10.0
SB-8	SB-8-082316-20	20 ft BGS	8/23/2016	<10.0
SB-8	SB-8-082316-30	30 ft BGS	8/23/2016	<10.0
SB-8	SB-8-082316-50	50 ft BGS	8/23/2016	<10.0

TABLE 1
SOIL ANALYTICAL SUMAMRY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGSAU 148
LEA COUNTY, NEW MEXICO

Sample ID	Full Sample Name	Depth (feet)	Date	Chlorides mg/kg
NMOCD Recommended Action Levels				**250**
SB-9	SB-9-082316-5	5 ft BGS	8/23/2016	**6540**
SB-9	SB-9-082316-10	10 ft BGS	8/23/2016	86.4
SB-9	SB-9-082316-15	15 ft BGS	8/23/2016	46.8
SB-9	SB-9-082316-20	20 ft BGS	8/23/2016	21.1
SB-9	SB-9-082316-50	50 ft BGS	8/23/2016	41.6
SB-10	SB-10-S-0.5-1-171017	0.5-1 ft BGS	10/17/2017	15.1
SB-10	SB-10-S-4-5-171017	4-5 ft BGS	10/17/2017	91.6
SB-10	SB-10-S-9-10-171017	9-10 ft BGS	10/17/2017	175
SB-10	SB-10-S-19-20-171017	19-20 ft BGS	10/17/2017	40.5
SB-10	SB-10-S-29-30-171017	29-30 ft BGS	10/17/2017	12
SB-11	SB-11-S-0.5-1-171017	0.5-1 ft BGS	10/17/2017	41.3
SB-11	SB-11-S-4-5-171017	4-5 ft BGS	10/17/2017	**2310**
SB-11	SB-11-S-9-10-171017	9-10 ft BGS	10/17/2017	**1030**
SB-11	SB-11-S-19-20-171017	19-20 ft BGS	10/17/2017	**2260**
SB-11	SB-11-S-29-30-171017	29-30 ft BGS	10/17/2017	**923**
SB-11	SB-11-S-39-40-171017	39-40 ft BGS	10/17/2017	**332**
SB-11	SB-11-S-49-50-171017	49-50 ft BGS	10/17/2017	86.1
SB-12	SB-12-S-0.5-1-171017	0.5-1 ft BGS	10/17/2017	<5.14
SB-12	SB-12-S-4-5-171017	4-5 ft BGS	10/17/2017	13.5
SB-12	SB-12-S-9-10-171017	9-10 ft BGS	10/17/2017	135
SB-12	SB-12-S-19-20-171017	19-20 ft BGS	10/17/2017	<5.15
SB-12	SB-12-S-29-30-171017	29-30 ft BGS	10/17/2017	<5.28
SB-13	SB-13-S-0.5-1-171017	0.5-1 ft BGS	10/17/2017	136
SB-13	SB-13-S-4-5-171017	4-5 ft BGS	10/17/2017	**1610**
SB-13	SB-13-S-9-10-171017	9-10 ft BGS	10/17/2017	**1160**
SB-13	SB-13-S-19-20-171017	19-20 ft BGS	10/17/2017	205
SB-13	SB-13-S-29-30-171017	29-30 ft BGS	10/17/2017	**1450**
SB-13	SB-13-S-39-40-171017	39-40 ft BGS	10/17/2017	**255**
SB-13	SB-13-S-49-50-171017	49-50 ft BGS	10/17/2017	87
SB-14	SB-14-S-0.5-1-171017	0.5-1 ft BGS	10/17/2017	<5.06
SB-14	SB-14-S-4-5-171017	4-5 ft BGS	10/17/2017	16.8
SB-14	SB-14-S-9-10-171017	9-10 ft BGS	10/17/2017	12.6
SB-14	SB-14-S-19-20-171017	19-20 ft BGS	10/17/2017	25.4
SB-14	SB-14-S-29-30-171017	29-30 ft BGS	10/17/2017	21.9

TABLE 1
SOIL ANALYTICAL SUMAMRY
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGSAU 148
LEA COUNTY, NEW MEXICO

Sample ID	Full Sample Name	Depth (feet)	Date	Chlorides mg/kg
NMOCD Recommended Action Levels				**250**
SB-15	SB-15-S-0.5-1-171017	0.5-1 ft BGS	10/17/2017	**707**
SB-15	SB-15-S-4-5-171017	4-5 ft BGS	10/17/2017	**601**
SB-15	SB-15-S-9-10-171017	9-10 ft BGS	10/17/2017	**573**
SB-15	SB-15-S-19-20-171017	19-20 ft BGS	10/17/2017	15
SB-15	SB-15-S-29-30-171017	29-30 ft BGS	10/17/2017	5.74
SB-15	SB-15-S-39-40-171017	39-40 ft BGS	10/17/2017	5.52

Notes:

- Bold concentrations above lab reporting limits.
- Highlighted cells indicated concentrations exceeding regulatory limits.
- "--" indicates not analyzed or not applicable.
- BTEX analyses by EPA Method 8021B.
- TPH analyzed by EPA Method SW8015B Mod.
- Chlorides analyzed by EPA Method 300.

Appendices

Appendix A
SB-10 through SB-15 Soil Boring Log

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: VGSAU # 148
PROJECT NUMBER: 11121241
CLIENT: Chevron Environmental Management Company
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-10
DATE COMPLETED: 17 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	TOP SOIL	1.00					
	CALICHE		4-5		1.0		28
			9-10		1.0		46
	SANDSTONE; contains caliche	15.00					
			19-20		1.0		<28
	SILTY SAND (SM); light brown, contains caliche	25.00					
			29-30		1.0		<28
	SILTY SAND (SM); light reddish brown	35.00					
			39-40		1.0		<28
			49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS	50.00					

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 11121241 CVX VGSAU 148.GPJ CRA_CORP.GDT 11/4/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: VGSAU # 148
PROJECT NUMBER: 11121241
CLIENT: Chevron Environmental Management Company
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-11
DATE COMPLETED: 17 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	TOP SOIL	1.00					
5	SANDY CLAY (CLS); red		4-5		1.0		443
		7.50					
10	SILTY SAND (SM); light brown, contains caliche		9-10		1.0		194
15							
20			19-20		1.0		443
25							
30			29-30		1.0		166
35		35.00					
	SILTY SAND (SM); light reddish brown						
40			39-40		1.0		59
45							
50		50.00	49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS						
55							
60							
65							
70							
75							
80							
85							
90							
95							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 11121241 CVX VGSAU 148.GPJ CRA_CORP.GDT 11/4/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: VGSAU # 148
PROJECT NUMBER: 11121241
CLIENT: Chevron Environmental Management Company
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-12
DATE COMPLETED: 17 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	TOP SOIL	1.00					
	SILTY SAND (SM); light brown, contains caliche		4-5		1.0		<28
			9-10		1.0		<28
			19-20		1.0		<28
	SILTY SAND (SM); light brown	25.00					
			29-30		1.0		<28
	SILTY SAND (SM); light reddish brown	35.00					
			39-40		1.0		<28
			49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS	50.00					

NOTES:

LABORATORY ANALYSIS

OVERBURDEN LOG 11121241 CVX VGSAU 148.GPJ CRA_CORP.GDT 11/4/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: VGSAU # 148
PROJECT NUMBER: 11121241
CLIENT: Chevron Environmental Management Company
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-13
DATE COMPLETED: 17 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	TOP SOIL	1.00	0.5-1		1.0		<28
	SANDY CLAY (CLS); red		4-5		1.0		336
	SILTY SAND (SM); light brown, contains caliche	7.50	9-10		1.0		196
			19-20		1.0		37
			29-30		1.0		229
			39-40		1.0		49
	END OF BOREHOLE @ 50.0ft BGS	50.00	49-50		1.0		<29

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 11121241 CVX VGSAU 148.GPJ CRA_CORP.GDT 11/4/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: VGSAU # 148
PROJECT NUMBER: 11121241
CLIENT: Chevron Environmental Management Company
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-14
DATE COMPLETED: 17 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	TOP SOIL	1.00					
	CALICHE		4-5		1.0		<28
			9-10		1.0		<28
	SILTY SAND (SM); light brown, contains caliche	15.00					
			19-20		1.0		<28
			29-30		1.0		<28
	SILTY SAND (SM); light brown	35.00					
			39-40		1.0		<28
	SILTY SAND (SM); light reddish brown	45.00					
			49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS	50.00					

NOTES:

LABORATORY ANALYSIS

OVERBURDEN LOG 11121241 CVX VGSAU 148.GPJ CRA_CORP.GDT 11/4/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: VGSAU # 148
PROJECT NUMBER: 11121241
CLIENT: Chevron Environmental Management Company
LOCATION: Lea County, New Mexico

HOLE DESIGNATION: SB-15
DATE COMPLETED: 17 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	TOP SOIL	1.00					
	SILTY SAND (SM); light brown		4-5		1.0		153
			9-10		1.0		109
	CALICHE; white	15.00					
			19-20		1.0		<28
	SILTY SAND (SM); light brown, contains caliche	25.00					
			29-30		1.0		<28
	SILTY SAND (SM); light reddish brown	35.00					
			39-40		1.0		<28
			49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS	50.00					

5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 11121241 CVX VGSAU 148.GPJ CRA_CORP.GDT 11/4/18

Appendix B
Soil Laboratory Analytical Report

Certificate of Analysis Summary 565932

GHD Services, INC- Midland, Midland, TX

Project Name: VGSAU 148

Project Id: 11121241
Contact: Scott Foord
Project Location: Lea county, NM

Date Received in Lab: Thu Oct-19-17 08:46 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	565932-001		565932-002		565932-003		565932-004		565932-005		565932-008	
	Field Id:	SB-10-S-0.5-1-171017		SB-10-S-4-5--171017		SB-10-S-9-10-171017		SB-10-S-19-20-171017		SB-10-S-29-30-171017		SB-14-S-0.5-1-171017	
	Depth:	0.5-1		4-5		9-10		19-20		29-30		0.5-1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-17-17 09:55		Oct-17-17 10:00		Oct-17-17 10:05		Oct-17-17 10:10		Oct-17-17 10:15		Oct-17-17 11:00	
Chloride by EPA 300	***Extracted:***	Oct-27-17 14:40		Oct-27-17 14:40		Oct-27-17 14:40		Oct-27-17 14:40		Oct-27-17 14:40		Oct-27-17 14:40	
	Analyzed:	Oct-28-17 00:30		Oct-28-17 00:49		Oct-28-17 00:55		Oct-28-17 01:02		Oct-28-17 01:08		Oct-28-17 01:14	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		15.1	5.48	91.6	5.11	175	5.19	40.5	5.19	12.0	5.17	<5.06	5.06
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		9.48	1.00	3.54	1.00	4.59	1.00	4.04	1.00	4.02	1.00	3.17	1.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 565932

GHD Services, INC- Midland, Midland, TX

Project Name: VGSAU 148

Project Id: 11121241
Contact: Scott Foord
Project Location: Lea county, NM

Date Received in Lab: Thu Oct-19-17 08:46 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	565932-009		565932-010		565932-011		565932-012		565932-015		565932-016	
	Field Id:	SB-14-S-4-5-171017		SB-14-S-9-10-171017		SB-14-S-19-20-171017		SB-14-S-29-30-171017		SB-13-S-0.5-1-171017		SB-13-S-4-5-171017	
	Depth:	4-5		9-10		19-20		29-30		0.5-1		4-5	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-17-17 11:05		Oct-17-17 11:10		Oct-17-17 11:15		Oct-17-17 11:20		Oct-17-17 12:00		Oct-17-17 12:05	
Chloride by EPA 300	***Extracted:***	Oct-27-17 14:40		Oct-27-17 14:40		Oct-30-17 12:00		Oct-30-17 12:00		Oct-30-17 12:00		Oct-30-17 12:00	
	Analyzed:	Oct-28-17 01:21		Oct-28-17 01:27		Oct-30-17 14:04		Oct-30-17 14:30		Oct-30-17 14:39		Oct-30-17 14:48	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		16.8	5.23	12.6	5.14	25.4	5.21	21.9	5.11	136	5.24	1610	5.51
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		5.53	1.00	4.38	1.00	4.68	1.00	3.03	1.00	4.62	1.00	10.3	1.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 565932

GHD Services, INC- Midland, Midland, TX

Project Name: VGSAU 148

Project Id: 11121241
Contact: Scott Foord
Project Location: Lea county, NM

Date Received in Lab: Thu Oct-19-17 08:46 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	565932-017		565932-018		565932-019		565932-020		565932-021		565932-022	
	Field Id:	SB-13-S-9-10-171017		SB-13-S-19-20-171017		SB-13-S-29-30-171017		SB-13-S-39-40-171017		SB-13-S-49-50-171017		SB-15-S-0.5-1-171017	
	Depth:	9-10		19-20		29-30		39-40		49-50		0.5-1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-17-17 12:10		Oct-17-17 12:15		Oct-17-17 12:20		Oct-17-17 12:25		Oct-17-17 12:30		Oct-17-17 13:00	
Chloride by EPA 300	***Extracted:***	Oct-30-17 12:00		Oct-30-17 12:00		Oct-30-17 12:00		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30	
	Analyzed:	Oct-30-17 14:57		Oct-30-17 15:23		Oct-30-17 15:32		Oct-30-17 10:09		Oct-30-17 10:29		Oct-30-17 10:35	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1160	5.30	205	5.05	1450	5.50	255	5.29	87.0	5.28	707	5.25
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		6.54	1.00	2.65	1.00	9.03	1.00	5.84	1.00	6.58	1.00	6.48	1.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 565932

GHD Services, INC- Midland, Midland, TX

Project Name: VGSAU 148

Project Id: 11121241
Contact: Scott Foord
Project Location: Lea county, NM

Date Received in Lab: Thu Oct-19-17 08:46 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	565932-023		565932-024		565932-025		565932-026		565932-027		565932-029	
	Field Id:	SB-15-S-4-5-171017		SB-15-S-9-10-171017		SB-15-S-19-20-171017		SB-15-S-29-30-171017		SB-15-S-39-40-171017		SB-12-S-0.5-1-171017	
	Depth:	4-5		9-10		19-20		29-30		39-40		0.5-1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-17-17 13:05		Oct-17-17 13:10		Oct-17-17 13:15		Oct-17-17 13:30		Oct-17-17 13:20		Oct-17-17 14:10	
Chloride by EPA 300	***Extracted:***	Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30	
	Analyzed:	Oct-30-17 10:41		Oct-30-17 10:48		Oct-30-17 11:07		Oct-30-17 11:13		Oct-30-17 11:20		Oct-30-17 11:26	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		601	5.21	573	5.23	15.0	5.00	5.74	5.03	5.52	5.14	<5.14	5.14
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		5.69	1.00	4.71	1.00	1.49	1.00	2.23	1.00	3.60	1.00	3.18	1.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 565932

GHD Services, INC- Midland, Midland, TX

Project Name: VGSAU 148

Project Id: 11121241
Contact: Scott Foord
Project Location: Lea county, NM

Date Received in Lab: Thu Oct-19-17 08:46 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	565932-030		565932-031		565932-032		565932-033		565932-036		565932-037	
	Field Id:	SB-12-S-4-5-171017		SB-12-S-9-10-171017		SB-12-S-19-20-171017		SB-12-S-29-30-171017		SB-11-S-0.5-1-171017		SB-11-S-4-5-171017	
	Depth:	4-5		9-10		19-20		29-30		0.5-1		4-5	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-17-17 14:15		Oct-17-17 14:20		Oct-17-17 14:25		Oct-17-17 14:30		Oct-17-17 14:45		Oct-17-17 14:50	
Chloride by EPA 300	***Extracted:***	Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30	
	Analyzed:	Oct-30-17 11:32		Oct-30-17 11:39		Oct-30-17 11:58		Oct-30-17 12:04		Oct-30-17 12:23		Oct-30-17 12:30	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		13.5	5.03	135	5.10	<5.15	5.15	<5.28	5.28	41.3	5.42	2310	27.8
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		2.59	1.00	3.83	1.00	4.74	1.00	6.04	1.00	8.18	1.00	10.9	1.00

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 565932

GHD Services, INC- Midland, Midland, TX

Project Name: VGSAU 148

Project Id: 11121241
Contact: Scott Foord
Project Location: Lea county, NM

Date Received in Lab: Thu Oct-19-17 08:46 am
Report Date: 31-OCT-17
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	565932-038		565932-039		565932-040		565932-041		565932-042	
	Field Id:	SB-11-S-9-10-171017		SB-11-S-19-20-171017		SB-11-S-29-30-171017		SB-11-S-39-40-171017		SB-11-S-49-50-171017	
	Depth:	9-10		19-20		29-30		39-40		49-50	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-17-17 14:55		Oct-17-17 15:00		Oct-17-17 15:05		Oct-17-17 15:10		Oct-17-17 15:15	
Chloride by EPA 300	***Extracted:***	Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30		Oct-28-17 14:30	
	Analyzed:	Oct-30-17 12:36		Oct-30-17 12:42		Oct-30-17 12:49		Oct-30-17 12:55		Oct-30-17 13:02	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1030	5.20	2260	26.7	923	5.33	332	5.13	86.1	5.28
Percent Moisture	***Extracted:***										
	Analyzed:	Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00		Oct-20-17 09:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		4.16	1.00	6.43	1.00	6.57	1.00	3.50	1.00	5.52	1.00

Kelsey Brooks
Project Manager

Analytical Report 565932

for

GHD Services, INC- Midland

Project Manager: Scott Foord

VGSAU 148

11121241

31-OCT-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

31-OCT-17

Project Manager: **Scott Foord**
GHD Services, INC- Midland
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **565932**
VGSAU 148
Project Address: Lea county, NM

Scott Foord:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 565932. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 565932 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB-10-S-0.5-1-171017	S	10-17-17 09:55	0.5 - 1	565932-001
SB-10-S-4-5--171017	S	10-17-17 10:00	4 - 5	565932-002
SB-10-S-9-10-171017	S	10-17-17 10:05	9 - 10	565932-003
SB-10-S-19-20-171017	S	10-17-17 10:10	19 - 20	565932-004
SB-10-S-29-30-171017	S	10-17-17 10:15	29 - 30	565932-005
SB-14-S-0.5-1-171017	S	10-17-17 11:00	0.5 - 1	565932-008
SB-14-S-4-5-171017	S	10-17-17 11:05	4 - 5	565932-009
SB-14-S-9-10-171017	S	10-17-17 11:10	9 - 10	565932-010
SB-14-S-19-20-171017	S	10-17-17 11:15	19 - 20	565932-011
SB-14-S-29-30-171017	S	10-17-17 11:20	29 - 30	565932-012
SB-13-S-0.5-1-171017	S	10-17-17 12:00	0.5 - 1	565932-015
SB-13-S-4-5-171017	S	10-17-17 12:05	4 - 5	565932-016
SB-13-S-9-10-171017	S	10-17-17 12:10	9 - 10	565932-017
SB-13-S-19-20-171017	S	10-17-17 12:15	19 - 20	565932-018
SB-13-S-29-30-171017	S	10-17-17 12:20	29 - 30	565932-019
SB-13-S-39-40-171017	S	10-17-17 12:25	39 - 40	565932-020
SB-13-S-49-50-171017	S	10-17-17 12:30	49 - 50	565932-021
SB-15-S-0.5-1-171017	S	10-17-17 13:00	0.5 - 1	565932-022
SB-15-S-4-5-171017	S	10-17-17 13:05	4 - 5	565932-023
SB-15-S-9-10-171017	S	10-17-17 13:10	9 - 10	565932-024
SB-15-S-19-20-171017	S	10-17-17 13:15	19 - 20	565932-025
SB-15-S-29-30-171017	S	10-17-17 13:30	29 - 30	565932-026
SB-15-S-39-40-171017	S	10-17-17 13:20	39 - 40	565932-027
SB-12-S-0.5-1-171017	S	10-17-17 14:10	0.5 - 1	565932-029
SB-12-S-4-5-171017	S	10-17-17 14:15	4 - 5	565932-030
SB-12-S-9-10-171017	S	10-17-17 14:20	9 - 10	565932-031
SB-12-S-19-20-171017	S	10-17-17 14:25	19 - 20	565932-032
SB-12-S-29-30-171017	S	10-17-17 14:30	29 - 30	565932-033
SB-11-S-0.5-1-171017	S	10-17-17 14:45	0.5 - 1	565932-036
SB-11-S-4-5-171017	S	10-17-17 14:50	4 - 5	565932-037
SB-11-S-9-10-171017	S	10-17-17 14:55	9 - 10	565932-038
SB-11-S-19-20-171017	S	10-17-17 15:00	19 - 20	565932-039
SB-11-S-29-30-171017	S	10-17-17 15:05	29 - 30	565932-040
SB-11-S-39-40-171017	S	10-17-17 15:10	39 - 40	565932-041
SB-11-S-49-50-171017	S	10-17-17 15:15	49 - 50	565932-042
SB-10-S-39-40-171017	S	10-17-17 10:20	39 - 40	Not Analyzed
SB-10-S-49-50-171017	S	10-17-17 10:25	49 - 50	Not Analyzed
SB-14-S-39-40-171017	S	10-17-17 11:25	39 - 40	Not Analyzed
SB-14-S-49-50-171017	S	10-17-17 11:30	49 - 50	Not Analyzed
SB-15-S-49-50-171017	S	10-17-17 13:25	49 - 50	Not Analyzed
SB-12-S-39-40-171017	S	10-17-17 14:35	39 - 40	Not Analyzed
SB-12-S-49-50-171017	S	10-17-17 14:40	49 - 50	Not Analyzed

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3031877 Inorganic Anions by EPA 300

Lab Sample ID 566256-004 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 565932-011, -012, -015, -016, -017, -018, -019.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-10-S-0.5-1-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-001	Date Collected:	10.17.17 09.55	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	9.48
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**15.1**	5.48	mg/kg	10.28.17 00.30		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-10-S-4-5--171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-002	Date Collected:	10.17.17 10.00	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.54
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**91.6**	5.11	mg/kg	10.28.17 00.49		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-10-S-9-10-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-003	Date Collected:	10.17.17 10.05	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.59
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**175**	5.19	mg/kg	10.28.17 00.55		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-10-S-19-20-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-004	Date Collected:	10.17.17 10.10	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.04
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**40.5**	5.19	mg/kg	10.28.17 01.02		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-10-S-29-30-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-005	Date Collected:	10.17.17 10.15	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.02
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**12.0**	5.17	mg/kg	10.28.17 01.08		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-14-S-0.5-1-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-008	Date Collected:	10.17.17 11.00	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.17
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.06	5.06	mg/kg	10.28.17 01.14	U	1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-14-S-4-5-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-009	Date Collected:	10.17.17 11.05	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	5.53
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**16.8**	5.23	mg/kg	10.28.17 01.21		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-14-S-9-10-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-010	Date Collected:	10.17.17 11.10	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.38
Analyst:	MNV	Date Prep:	10.27.17 14.40	Basis:	Dry Weight
Seq Number:	3031757				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**12.6**	5.14	mg/kg	10.28.17 01.27		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-14-S-19-20-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-011	Date Collected:	10.17.17 11.15	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.68
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**25.4**	5.21	mg/kg	10.30.17 14.04		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-14-S-29-30-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-012	Date Collected:	10.17.17 11.20	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.03
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**21.9**	5.11	mg/kg	10.30.17 14.30		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-0.5-1-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-015	Date Collected:	10.17.17 12.00	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.62
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**136**	5.24	mg/kg	10.30.17 14.39		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-4-5-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-016	Date Collected:	10.17.17 12.05	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	10.33
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1610**	5.51	mg/kg	10.30.17 14.48		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-9-10-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-017	Date Collected:	10.17.17 12.10	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	6.54
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1160**	5.30	mg/kg	10.30.17 14.57		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-19-20-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-018	Date Collected:	10.17.17 12.15	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	2.65
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**205**	5.05	mg/kg	10.30.17 15.23		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-29-30-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-019	Date Collected:	10.17.17 12.20	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	9.03
Analyst:	MNV	Date Prep:	10.30.17 12.00	Basis:	Dry Weight
Seq Number:	3031877				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1450**	5.50	mg/kg	10.30.17 15.32		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-39-40-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-020	Date Collected:	10.17.17 12.25	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	5.84
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**255**	5.29	mg/kg	10.30.17 10.09		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-13-S-49-50-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-021	Date Collected:	10.17.17 12.30	Sample Depth:	49 - 50
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	6.58
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**87.0**	5.28	mg/kg	10.30.17 10.29		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-15-S-0.5-1-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-022	Date Collected:	10.17.17 13.00	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	6.48
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**707**	5.25	mg/kg	10.30.17 10.35		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-15-S-4-5-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-023	Date Collected:	10.17.17 13.05	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	5.69
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**601**	5.21	mg/kg	10.30.17 10.41		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-15-S-9-10-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-024	Date Collected:	10.17.17 13.10	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.71
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**573**	5.23	mg/kg	10.30.17 10.48		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-15-S-19-20-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-025	Date Collected:	10.17.17 13.15	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	1.49
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**15.0**	5.00	mg/kg	10.30.17 11.07		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-15-S-29-30-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-026	Date Collected:	10.17.17 13.30	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	2.23
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**5.74**	5.03	mg/kg	10.30.17 11.13		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-15-S-39-40-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-027	Date Collected:	10.17.17 13.20	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.6
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**5.52**	5.14	mg/kg	10.30.17 11.20		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-12-S-0.5-1-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-029	Date Collected:	10.17.17 14.10	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.18
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.14	5.14	mg/kg	10.30.17 11.26	U	1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-12-S-4-5-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-030	Date Collected:	10.17.17 14.15	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	2.59
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**13.5**	5.03	mg/kg	10.30.17 11.32		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-12-S-9-10-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-031	Date Collected:	10.17.17 14.20	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.83
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**135**	5.10	mg/kg	10.30.17 11.39		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-12-S-19-20-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-032	Date Collected:	10.17.17 14.25	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.74
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.15	5.15	mg/kg	10.30.17 11.58	U	1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-12-S-29-30-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-033	Date Collected:	10.17.17 14.30	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	6.04
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.28	5.28	mg/kg	10.30.17 12.04	U	1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-0.5-1-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-036	Date Collected:	10.17.17 14.45	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	8.18
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**41.3**	5.42	mg/kg	10.30.17 12.23		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-4-5-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-037	Date Collected:	10.17.17 14.50	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	10.86
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2310**	27.8	mg/kg	10.30.17 12.30		5

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-9-10-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-038	Date Collected:	10.17.17 14.55	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	4.16
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1030**	5.20	mg/kg	10.30.17 12.36		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-19-20-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-039	Date Collected:	10.17.17 15.00	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	6.43
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2260**	26.7	mg/kg	10.30.17 12.42		5

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-29-30-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-040	Date Collected:	10.17.17 15.05	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	6.57
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**923**	5.33	mg/kg	10.30.17 12.49		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-39-40-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-041	Date Collected:	10.17.17 15.10	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	3.5
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**332**	5.13	mg/kg	10.30.17 12.55		1

Certificate of Analytical Results 565932

GHD Services, INC- Midland, Midland, TX

VGSAU 148

Sample Id:	**SB-11-S-49-50-171017**	Matrix:	Soil	Date Received:	10.19.17 08.46
Lab Sample Id:	565932-042	Date Collected:	10.17.17 15.15	Sample Depth:	49 - 50
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	5.52
Analyst:	MNV	Date Prep:	10.28.17 14.30	Basis:	Dry Weight
Seq Number:	3031810				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**86.1**	5.28	mg/kg	10.30.17 13.02		1

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

QC Summary 565932

GHD Services, INC- Midland

VGSAU 148

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031757 Matrix: Solid Date Prep: 10.27.17
MB Sample Id: 7633404-1-BLK LCS Sample Id: 7633404-1-BKS LCSD Sample Id: 7633404-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	248	99	245	98	90-110	1	20	mg/kg	10.27.17 22:22	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031810 Matrix: Solid Date Prep: 10.28.17
MB Sample Id: 7633406-1-BLK LCS Sample Id: 7633406-1-BKS LCSD Sample Id: 7633406-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	264	106	265	106	90-110	0	20	mg/kg	10.30.17 09:57	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031877 Matrix: Solid Date Prep: 10.30.17
MB Sample Id: 7633457-1-BLK LCS Sample Id: 7633457-1-BKS LCSD Sample Id: 7633457-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	235	94	237	95	90-110	1	20	mg/kg	10.30.17 13:46	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031757 Matrix: Soil Date Prep: 10.27.17
Parent Sample Id: 565927-022 MS Sample Id: 565927-022 S MSD Sample Id: 565927-022 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	125	352	472	99	473	99	90-110	0	20	mg/kg	10.27.17 22:41	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031757 Matrix: Soil Date Prep: 10.27.17
Parent Sample Id: 565927-032 MS Sample Id: 565927-032 S MSD Sample Id: 565927-032 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	452	262	696	93	705	97	90-110	1	20	mg/kg	10.28.17 00:11	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031810 Matrix: Soil Date Prep: 10.28.17
Parent Sample Id: 565932-020 MS Sample Id: 565932-020 S MSD Sample Id: 565932-020 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	255	264	527	103	524	102	90-110	1	20	mg/kg	10.30.17 10:16	

QC Summary 565932

GHD Services, INC- Midland

VGSAU 148

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031810 Matrix: Soil Date Prep: 10.28.17
Parent Sample Id: 565932-031 MS Sample Id: 565932-031 S MSD Sample Id: 565932-031 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	135	255	414	109	415	110	90-110	0	20	mg/kg	10.30.17 11:45	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031877 Matrix: Soil Date Prep: 10.30.17
Parent Sample Id: 565932-011 MS Sample Id: 565932-011 S MSD Sample Id: 565932-011 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	25.4	261	249	86	250	86	90-110	0	20	mg/kg	10.30.17 14:13	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3031877 Matrix: Soil Date Prep: 10.30.17
Parent Sample Id: 566256-004 MS Sample Id: 566256-004 S MSD Sample Id: 566256-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	175	246	429	103	430	104	90-110	0	20	mg/kg	10.30.17 16:16	

Analytical Method: **Percent Moisture**
Seq Number: 3030988 Matrix: Solid
MB Sample Id: 3030988-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<1.00	%	10.20.17 09:00	

Analytical Method: **Percent Moisture**
Seq Number: 3030992 Matrix: Solid
MB Sample Id: 3030992-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<1.00	%	10.20.17 09:00	

Analytical Method: **Percent Moisture**
Seq Number: 3030995 Matrix: Solid
MB Sample Id: 3030995-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<1.00	%	10.20.17 09:00	

QC Summary 565932

GHD Services, INC- Midland

VGSAU 148

Analytical Method: **Percent Moisture**
Seq Number: 3030988 Matrix: Soil
Parent Sample Id: 565932-001 MD Sample Id: 565932-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	9.48	10.3	8	20	%	10.20.17 09:00	

Analytical Method: **Percent Moisture**
Seq Number: 3030988 Matrix: Soil
Parent Sample Id: 565932-015 MD Sample Id: 565932-015 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	4.62	5.64	20	20	%	10.20.17 09:00	

Analytical Method: **Percent Moisture**
Seq Number: 3030992 Matrix: Soil
Parent Sample Id: 565932-033 MD Sample Id: 565932-033 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	6.04	6.39	6	20	%	10.20.17 09:00	

Analytical Method: **Percent Moisture**
Seq Number: 3030992 Matrix: Soil
Parent Sample Id: 565932-036 MD Sample Id: 565932-036 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	8.18	8.23	1	20	%	10.20.17 09:00	

Analytical Method: **Percent Moisture**
Seq Number: 3030995 Matrix: Soil
Parent Sample Id: 565932-042 MD Sample Id: 565932-042 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	5.52	5.99	8	20	%	10.20.17 09:00	

CHAIN OF CUSTODY

Page 1 Of 5

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200)
Dallas Texas (214-902-0300)
San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)
Phoenix, Arizona (480-355-0900)
www.xenco.com

Xenco Quote # | Xenco Job # 565932

Client / Reporting Information

Company Name / Branch: GHD / Houston
Company Address: 6320 Rothway St #100 Houston TX 77040
Email: Chris.Knight@ghd.com Phone No: 512-506-8803
Project Contact: Scott.Foord@ghd.com
Samplers's Name Rebecca Jones

Project Information

Project Name/Number: ~~CW #77~~ 11121241
Project Location: Lea County, NM
Invoice To:
PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	moisture	Field Comments
1	SB-10-S-0.5-1-171017	0.5-1	10/17	0955	S	1								1	X	X	
2	SB-10-S-4-5-171017	4-5		1000		1								1	X	X	
3	SB-10-S-9-10-171017	9-10		1005		1								1	X	X	
4	SB-10-S-19-20-171017	19-20		1010		1								1	X	X	
5	SB-10-S-29-30-171017	29-30		1015		1								1	X	X	
6	SB-10-S-39-40-171017	39-40		1020		1								1	X	X	hold
7	SB-10-S-49-50-171017	49-50		1025		1								1	X	X	hold
8	SB-14-S-0.5-1-171017	0.5-1		1100		1								1	X	X	
9	SB-14-S-4-5-171017	4-5		1105		1								1	X	X	
10	SB-14-S-9-10-171017	9-10	↓	1110	↓	1								1	X	X	

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [x] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Temp: 5.7 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 5.5

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler	Date Time	Received By	Relinquished By	Date Time	Received By
1	Rebecca Jones	10/18/17 0920	Scott Foord			
2					10/19/17 1015	
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						10.19.17 8:46
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such loses are due to circumstances beyond the control of Xenco. A minimum charge of $75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at $5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.

CHAIN OF CUSTODY

Page 2 of 5

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200) | San Antonio, Texas (210-509-3334) | Phoenix, Arizona (480-355-0900)

Dallas Texas (214-902-0300) | Midland, Texas (432-704-5251)

www.xenco.com

Xenco Quote # | Xenco Job # 565932

Client / Reporting Information

Company Name / Branch: GHD/HOUSTON

Company Address:

Email: Chris.Knight@ghd.com Phone No:

Project Contact: Scott.Foord@ghd.com

Samplers's Name Rebecca Jones

Project Information

Project Name/Number: VGSAU148/11121241

Project Location:

Invoice To:

PO Number:

Analytical Information

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	moisture	Field Comments
1	SB-14-S-19-20-171017	19-20	10/17	1115	S	1								1	/	/	
2	SB-14-S-29-30-171017	29-30		1120		1								1	/	/	
3	SB-14-S-39-40-171017	39-40		1125		1								1	/	/	hold
4	SB-14-S-49-50-171017	49-50		1130		1								1	/	/	hold
5	SB-13-S-0.5-1-171017	0.5-1		1200		1								1	/	/	
6	SB-13-S-4-5-171017	4-5		1205		1								1	/	/	
7	SB-13-S-9-10-171017	9-10		1210		1								1	/	/	
8	SB-13-S-19-20-171017	19-20		1215		1								1	/	/	
9	SB-13-S-29-30-171017	29-30		1220		1								1	/	/	
10	SB-13-S-39-40-171017	39-40	↓	1225	↓	1								1	/	/	

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [X] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:

Temp: 5.7 IR ID:R-8

CF:(0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: 5.5

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10/18/17-0930	Scott Foord			
2					10/18/17 1110	
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						10.19.17 8:46
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor
						X

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such loses are due to circumstances beyond the control of Xenco. A minimum charge of $75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at $5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.

CHAIN OF CUSTODY

Page 3 Of 5

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200)
Dallas Texas (214-902-0300)
San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)
Phoenix, Arizona (480-355-0900)
www.xenco.com

Xenco Quote # | Xenco Job # 565932

Client / Reporting Information

Company Name / Branch: GHD/HOUSTON
Company Address:
Email: Chris.Knight
Phone No:
Project Contact: Scott Foord
Samplers's Name Rebecca Jones

Project Information

Project Name/Number: 11121241
Project Location:
Invoice To:
PO Number:

Analytical Information

Chloride
Moisture

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	Moisture	Field Comments
1	SB-13-S-49-50-171017	49-50	10/17	1230	S	1								1	X	X	
2	SB-15-S-0.5-1-171017	0.5-1		1300		1								1	X	X	
3	SB-15-S-4-5-171017	4-5		1305		1								1	X	X	
4	SB-15-S-9-10-171017	9-10		1310		1								1	X	X	
5	SB-15-S-19-20-171017	19-20		1315		1								1	X	X	
6	SB-15-S-29-30-171017	29-30		1330		1								1	X	X	
7	SB-15-S-39-40-171017	39-40		1320		1								1	X	X	
8	SB-15-S-49-50-171017	49-50		1325		1								1	X	X	hold
9	SB-12-S-0.5-1-171017	0.5-1		1410		1								1	X	X	
10	SB-12-S-4-5-171017	4-5	↓	1415	↓	1								1	X	X	

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [x] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Notes:

Temp: 5.7 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 5.5

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10/18/17-0920	Scott Foord			
2					10/18/17 10:00	
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						10/19/17 8:46AM
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor
						X

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such loses are due to circumstances beyond the control of Xenco. A minimum charge of $75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at $5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.

XENCO LABORATORIES

Setting the Standard since 1990

CHAIN OF CUSTODY

Page 4 Of 5

Stafford,Texas (281-240-4200)
Dallas Texas (214-902-0300)
San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)
Phoenix, Arizona (480-355-0900)
www.xenco.com

Xenco Quote #:
Xenco Job #: 565932

Client / Reporting Information

Company Name / Branch: GHD/Houston
Company Address:
Email: Chris.Knight
Phone No:
Project Contact: Scott Foord
Samplers's Name: Rebecca Jones

Project Information

Project Name/Number: 1121241
Project Location:
Invoice To:
PO Number:

Analytical Information: Chloride, moisture

Matrix Codes
W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	moisture	Field Comments
1	SB-12-S-9-10-171017	9-10	10/17	1420	S	1								1	\	\	
2	SB-12-S-19-20-171017	19-20	↓	1425	↓	1								1	\	\	
3	SB-12-S-29-30-171017	29-30		1430		1								1	\	\	
4	SB-12-S-39-40-171017	39-40		1435		1								1	\	\	hold
5	SB-12-S-49-50-171017	49-50		1440		1								1	\	\	hold
6	SB-11-S-0.5-1-171017	0.5-1		1445		1								1	\	\	
7	SB-11-S-4-5-171017	4-5		1450		1								1	\	\	
8	SB-11-S-9-10-171017	9-10		1455		1								1	\	\	
9	SB-11-S-19-20-171017	19-20		1500		1								1	\	\	
10	SB-11-S-29-30-171017	29-30	↓	1505	↓	1								1	\	\	

Turnaround Time (Business days)

- [ ] Same Day TAT
- [ ] 5 Day TAT
- [ ] Next Day EMERGENCY
- [ ] 7 Day TAT
- [ ] 2 Day EMERGENCY
- [x] Contract TAT
- [ ] 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- [ ] Level II Std QC
- [ ] Level IV (Full Data Pkg /raw data)
- [ ] Level III Std QC+ Forms
- [ ] TRRP Level IV
- [ ] Level 3 (CLP Forms)
- [ ] UST / RG -411
- [ ] TRRP Checklist

Temp: 5.7 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 5.5

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 Rebecca Jones	10/18/17-0920	1 Scott Foord	2 [signature]	10/18/17 1[illegible]	2 [signature] 10.19.17 8:46
Relinquished by: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable: [ ]	On Ice: [x] Cooler Temp. Thermo. Corr. Factor

CHAIN OF CUSTODY

Page 2 Of 5

XENCO LABORATORIES

Setting the Standard since 1990

Stafford,Texas (281-240-4200)
Dallas Texas (214-902-0300)
San Antonio, Texas (210-509-3334)
Midland, Texas (432-704-5251)
Phoenix, Arizona (480-355-0900)
www.xenco.com

Xenco Quote #
Xenco Job # 560932

Client / Reporting Information

Company Name / Branch: GHD/Houston
Company Address:
Email: Chris.knight
Phone No:
Project Contact: Scott.Foord
Samplers's Name: Rebecca Jones

Project Information

Project Name/Number: 11121241
Project Location:
Invoice To:
PO Number:

Analytical Information

Chloride / Moisture

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Field Comments
1	SB-11-S-39-40-171017	39-40	10/17	1510	S	1								1	
2	SB-11-S-49-50-171017	49-50	10/17	1515	S	1								1	
3															
4															
5															
6															
7															
8															
9															
10															

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☒ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Temp: 5.7 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 5.5

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10/18/17 0920	Scott Foord			
2					10/18/17 10:30	
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
4						10.19.17 8:46
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor

Notice: Notice: Signature of this document and relinquishment of samples constitutes a valid purchase order from client company to Xenco, its affiliates and subcontractors. It assigns standard terms and conditions of service. Xenco will be liable only for the cost of samples and shall not assume any responsibility for any losses or expenses incurred by the Client if such loses are due to circumstances beyond the control of Xenco. A minimum charge of $75 will be applied to each project. Xenco's liability will be limited to the cost of samples. Any samples received by Xenco but not analyzed will be invoiced at $5 per sample. These terms will be enforced unless previously negotiated under a fully executed client contract.

XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: GHD Services, INC- Midland

Date/ Time Received: 10/19/2017 08:46:00 AM

Work Order #: 565932

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	5.5
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**No**
#18 Water VOC samples have zero headspace?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Shawnee Smith Date: 10/19/2017
Shawnee Smith

Checklist reviewed by: Kelsey Brooks Date: 10/20/2017
Kelsey Brooks

Appendix C
2018 Work Plan

May 18, 2018 Reference No. 11121241

Ms. Olivia Yu
Environmental Specialist
New Mexico Oil Conservation Division – District 1
1625 N. French Drive
Hobbs, New Mexico 88240

Dear Ms. Yu,

Re: 2018 Scope of Work – Additional Soil Assessment
VGSAU 148 (1RP-3688)
Lea County, New Mexico

1. Project Information

The Site is located in Unit E Section 1, Township 18 South, Range 34 East, approximately one-half mile south of the Chevron Buckeye Field Management Team (FMT) office in Lea County, New Mexico. The Site is located within the Vacuum Grayburg-San Andres Unit (VGSAU) oil field. The release site is situated proximate to multiple produced water and oil gathering lines that converge at a surface manifold location. According to the New Mexico Oil Conservation Division (NMOCD) Release Notification and Corrective Action Form C-141 submitted to the agency by Chevron, the release occurred on June 22, 2015 and was immediately reported to Ms. Kellie Jones, Hobbs District 1 NMOCD office. The volume of the spill was reported as 153.55 barrels of produced water of which 30 barrels were recovered. A failure of a fiberglass water line was listed as the cause of the release.

Information available on the Petroleum Recovery Research Center (PRRC) Mapping Portal, current (GHD) managed groundwater site(s) data, and the United States Geological Survey (USGS) Current Water Database for the Nation indicate:

- The depth to groundwater at the Site is greater than 100 feet below ground surface (bgs).
- The nearest private domestic water source is greater than 200 feet from the release site.
- The nearest public/municipal water source is greater than 1,000 feet from the release site.
- The release site lies more than 1,000 horizontal feet from the nearest surface water body.

GHD currently monitors two groundwater sites within a 1-mile radius of the Site (Buckeye Compressor Station Site and VGSAU 58 (both under AP-104)). The Buckeye Compressor Station Site is monitored with a network of 28 monitor wells. MW-12 is located approximately 0.80 miles northeast of VGSAU 148. Groundwater gauging data from MW-12 through 2017 documents that depth to water has ranged from 127.65 to 132.80 feet below top of casing (btoc). The deepest reported chloride impacted soil at the Site is within the 39-40 feet bgs interval, and depth to groundwater from that impacted interval is estimated between 50-99 feet.

Consequently, the NMOCD ranking criteria total score for the Site is 10. The anticipated site-specific RRALs to be applied to this location by the NMOCD are 10 mg/kg for benzene; 50 mg/kg for total

GHD
6320 Rothway Street Suite 100 Houston Texas 77040 USA
T 713 734 3090 **F** 713 734 3391 **W** http://www.ghd.com/

benzene, toluene, ethylbenzene and xylenes (BTEX); 1,000 mg/kg for total petroleum hydrocarbons (TPH); and an NMOCD-accepted 600* mg/kg for horizontal and 250 mg/kg for vertical delineation of chlorides.

*In an August 28, 2017 telephone conversation between Bernard Bockisch (GHD) and Jim Griswold (NMOCD Environmental Bureau Chief), GHD was informed NMOCD is accepting chloride concentrations of 600 mg/kg for horizontal delineation assessment clean up levels.

On June 13 and 14, 2016, GHD subcontractor HCl advanced five soil borings (SB-1 through SB-5) utilizing an air-rotary drilling rig to depths of approximately 50 feet bgs. A subsequent soil assessment was conducted on August 22 and 23, 2016. HCl advanced four additional soil borings (SB-6 through SB-9) to 50 feet bgs. Six additional soil borings (SB-10 through SB-15) were advanced in 2017 following the geophysical surveys using an air rotary drill rig and soil samples were collected for analytical analyses for chlorides. Soil sample analytical results are depicted on Figure 1.

The data from these assessments indicate that horizontal delineation of chloride impacts have not been achieved at the Site.

2. 2018 Scope of Work

On February 13, 2018, GHD and Chevron representatives met with NMOCD and the New Mexico State Land Office (NMSLO) regarding further delineation activities and future remedial actions addressing the presence of chloride concentrations at the Site. Further delineation activities recommended include the advancement of sixteen soil borings to 40 feet bgs (see Figure 1). The specific locations of the soil borings have been determined based on the geophysical survey and previous soil sample analytical results.

Field Program

The field program will consist of the following:

Soil Boring Installation:

- Prior to mobilizing the drilling equipment to the Site, a site visit will be performed by GHD. GHD will mark the proposed boring locations for New Mexico 811 notification. A One Call ticket will be initiated by the driller to identify subsurface hazards within the proposed drilling areas. Chevron will spot locate any underground utilities and/or pipelines within the assessment area;
- A ground penetrating radar (GPR) survey will be conducted across the Site and the findings of the survey will be marked, as appropriate;
- GHD will coordinate field work with management personnel of the Chevron FMT. A MCBU Dig Plan and FMT excavation permit will be acquired before performing the proposed tasks;
- An air knife, hydro-excavation methods or similar borehole clearance equipment will be utilized to clear each boring location to a depth of approximately 5-feet bgs (or refusal) and approximately 8-inches in diameter. An air-rotary drilling rig, operated by a licensed State of New Mexico water well driller, will be utilized to advance the proposed borings;

- A geologist will record the subsurface lithology and sample data of soil boring logs. Soil samples will be collected at ten foot intervals. A chloride field sampling kit will be used to field test intervals during boring activities. The total depth and nature of any sampling of soils will be based on results of the chloride field screening and the professional judgment of the GHD geologist. The intent of the sampling is to establish the depth at which soil concentrations are below the Site RRAL's;
- Selected soil samples will be submitted for analysis of chlorides by EPA Method 300; and
- The soil borings will be properly plugged with bentonite.

Quality Assurance/ Quality Control

Confirmation soil sampling will be completed in accordance with our standard Quality Assurance/ Quality Control procedures designed to minimize cross-contamination between samples and to provide reliable laboratory results.

Reporting

A short letter report summarizing remediation activities will be submitted to the NMOCD. The letter report will include a Site description, project history, description of field events, a discussion of results, and recommendations (if any).

The report will include:

- A scaled Site plan showing the locations of the soil borings and other Site features;
- Soil boring logs;
- Tabulation of field screening and laboratory analytical results; and
- Geotagged photographic documentation of field activities.

3. Work Plan Approval Request

GHD is prepared to initiate the scope of work immediately. If you have any questions or comments with regards to this work plan, please do not hesitate to contact our Houston office at (713) 734-3090. Your timely response to this correspondence is appreciated.

Sincerely,

GHD

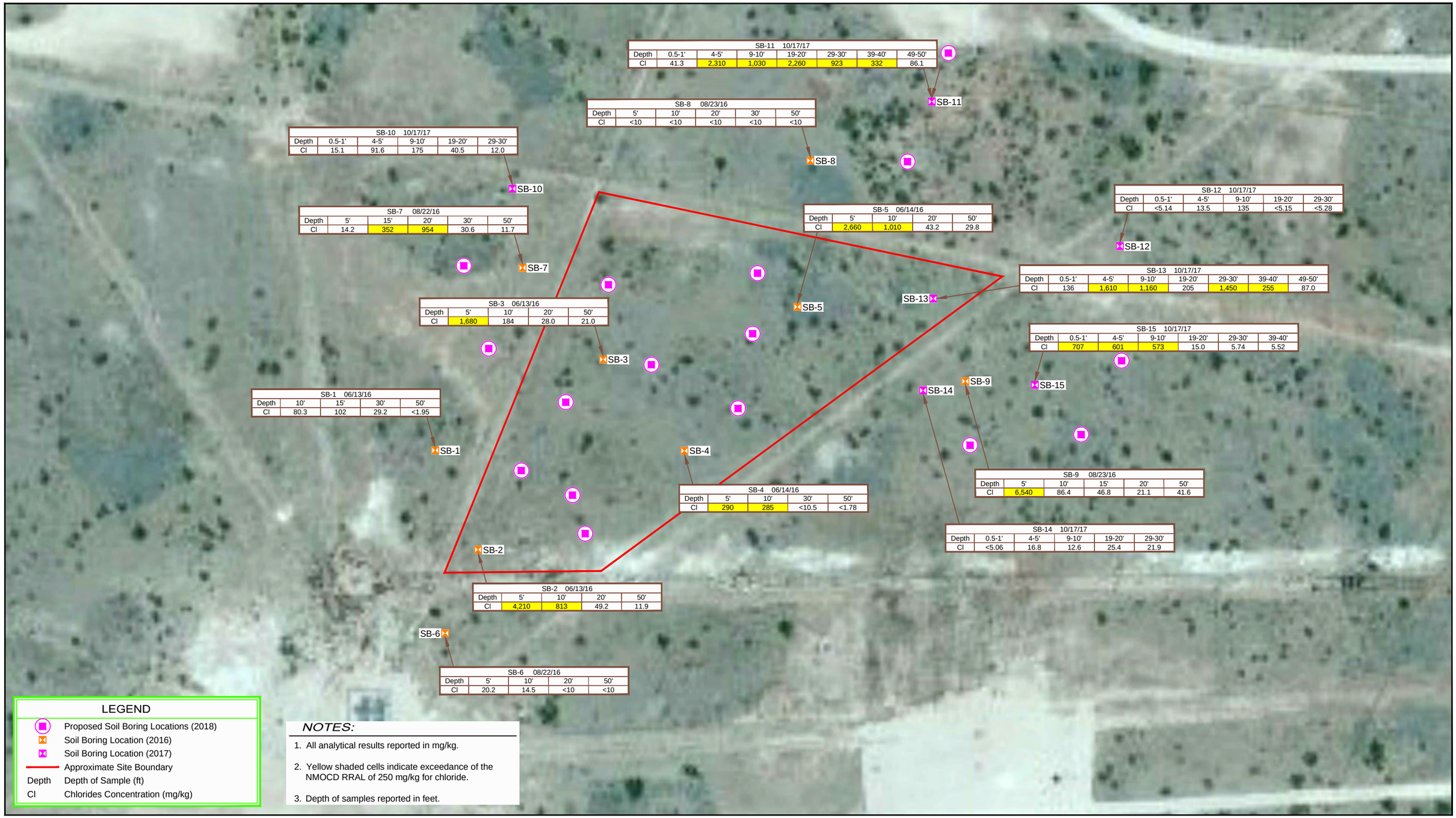
Scott Foord, P.G.
Project Manager

Raaj Patel, P.G.
Program Manager

SF/ag/1

Encl.
Attachment: Figure 1 – Proposed Soil Boring Location Map

Figure



LEGEND

- Proposed Soil Boring Locations (2018)
- Soil Boring Location (2016)
- Soil Boring Location (2017)
- Approximate Site Boundary
- Depth — Depth of Sample (ft)
- Cl — Chlorides Concentration (mg/kg)

NOTES:

1. All analytical results reported in mg/kg.
2. Yellow shaded cells indicate exceedance of the NMOCD RRAL of 250 mg/kg for chloride.
3. Depth of samples reported in feet.

Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.777256ÁNorth, -103.521904ÁWest

0 40 80ft

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

Sample ID — SB-10 10/17/17 — Sample Date
Depth 0.5-1' — Sample Depth (ft)
Chloride 707 — Sample Result (mg/kg)

GHD

CEMC
LEA COUNTY, NEW MEXICO
VGSAU 148 PRODUCED WATER RELEASE ASSESSMENT

11121241-00

May 7, 2018

PROPOSED SOIL BORING LOCATION MAP

FIGURE 1

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1112----\11121241-CEMC-Buckeye_VGSAU 148\Proposed\11121241-00(Proposed-01)GN-DL001.dwg