



Kegan W. Boyer, P.G.
Project Manager

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Environmental Management
Company
1400 Smith Street
Room 07076
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Tel 713-372-7705
kegan.boyer@chevron.com

June 6, 2016

Ms. Kristen Lynch
Environmental Specialist, District 1
Oil Conservation Division, EMNRD
1625 N. French Drive
Hobbs, New Mexico 88240

REVIEWED

By Kristen Lynch at 2:56 pm, Oct 25, 2016

APPROVED

Re: Soil Sampling Summary Report and Path Forward Workplan
Howse 1 RP No. 4311 (API 30-025-36226)

Ms. Lynch,

I understand that you have recently taken over from Mr. Jamie Keyes as the District 1 Environmental Specialist for the OCD. I have been working with Mr. Keyes throughout the year on an environmental project at the Howse 1 well site (RP No. 4311) and look forward to working with you to complete this project in the coming months.

Chevron Environmental Management Company (CEMC) is submitting the attached report entitled: *Phase Two Delineation Soil Boring Assessment Summary Report and Phase Three Work Plan (RP No. 4311), Howse #1 (API #30-025-36226), Section 17, Township 20-S, Range 39-E, Latitude N 32.571190°, Longitude W -103.075300° Lea County, New Mexico* dated October 4, 2016.

This report documents the results of the site assessment activities performed at the former tank battery location associated with the plugged Howse 1 well location (API 30-025-36226). This report was prepared for CEMC by GHD Services, Inc. (GHD, formerly Conestoga-Rovers & Associates).

This report also includes a path forward workplan for final remedial activities at the site. I anticipate that the remedial activities outlined in the attached document will be completed by a GHD and contractor crew in early- to mid-November 2016. Upon completion of the remedial activities, CEMC will submit a closure report and a final C-141.

Should you have any questions regarding the content of the report or the proposed actions, please do not hesitate to contact me by phone at 713-372-7705 or via e-mail at kegan.boyer@chevron.com.

Sincerely,

Kegan W. Boyer, P.G.
Environmental Project Manager

encl: *Phase Two Delineation Soil Boring Assessment Summary Report and Phase Three Work Plan*

cc: Bernie Bockisch, GHD
Leslie Lehrman, GHD



October 4, 2016

Reference No. 11121230(3)

Mr. Kegan Boyer
Chevron Environmental Management Company
1400 Smith Street, Room 07086
Houston, Texas 77002

**Re: Phase Two: Delineation Soil Boring Assessment Summary Report and Phase Three
Work Plan (RP No. 4311)
Howse #1 (API #30-025-36226)
Section 17, Township 20-S, Range 39-E
Latitude N 32.571190°, Longitude W -103.075300°
Lea County, New Mexico**

Dear Mr. Boyer:

GHD Services, Inc. (GHD) is pleased to submit this summary report to Chevron Environmental Management Company (CEMC) summarizing recent field activities and proposed future remediation activities at the above referenced site (Site). The Howse #1 site is located 11 miles northeast of Jal in Lea County, New Mexico (Figure 1) within the Howse (San Andres) Oil Field.

1. Site Background

1.1 Soils Investigation – March 2016

The Site is a former oil production and salt water disposal well site that formerly contained a tank battery and flare. During decommissioning and demolition activities conducted by Chevron USA, Inc. in March 2016, soils beneath the tank battery location were removed to a depth of 1 to 3 feet (ft) below ground surface (bgs) in an approximately 20 ft x 120 ft area. To assess the former production equipment area for potential impacts, three soil samples were collected from three 3 ft x 6 ft x 10 ft test pits located in the center of the excavation area beneath the former tank battery location. Analytical results from the three samples, identified as A, B, and C, indicated chloride concentrations above New Mexico Oil Conservation Division (NMOCD) Recommended Remedial Action Limits (RRALs). The specific location and depth of these samples, however, was unknown. Soil analytical results are provided in Table 1. Upon identification of impacted soils, management of the Site was transferred to CEMC.

1.2 Soils Investigation – April 2016

Following the completion of the test pit sampling, GHD conducted a limited soil assessment on April 25 to 28, 2016. A total of fourteen samples were collected from the former tank battery area using a backhoe. Benzene, toluene, ethylbenzene and xylenes (BTEX) and total petroleum hydrocarbons (TPH) were not detected in any samples. Chloride exceeded the RRAL of 250 milligrams per kilogram (mg/kg) in five soil samples (#1, #5, #8, #10 and #11), at depths ranging from 4 ft to 12 ft bgs. Soil sample locations and analytical results are included on Figure 2 and also included in Table 1. Horizontal delineation of chloride impacts was achieved during this sampling event. Results of this sampling event were documented in the *Soil Assessment Summary Report* provided to the NMOCD on June 6, 2016. As chloride concentrations in soil exceeded the NMOCD RRAL of 250 mg/kg, a Form C-141 was prepared in accordance with New Mexico Administrative Code 19.15.29 and included in the *Soil Assessment Summary Report* submittal.

1.3 Regulatory Framework

There are relatively few groundwater wells in the area of the Site with which to obtain a depth to groundwater. No wells were identified within the vicinity of the site using the NMOCD GIS Oil and Gas Map. The United States Geological Survey (USGS) database was also reviewed for current groundwater data. The USGS database indicated the presence of two wells located in the vicinity of the Site. The closest well (well number 323405103044501), was located approximately 0.70 miles southwest of the Site. The depth to groundwater in this well was 46.37 ft bgs as of January 7, 2016. The depth to groundwater in the second well (well number 323555103053201), was 80.18 ft bgs as of February 3, 2016. This well was located approximately 2.4 miles north of the site. An extrapolation of these well depths would indicate that the depth to groundwater at the site would be approximately 55 ft bgs. Groundwater was not encountered in either of the soil borings installed to a total depth of 40 ft bgs in June 2016.

There do not appear to be any well head protection areas and no surface water bodies within 200 to 1,000 ft of the Site. Therefore, the preliminary total ranking score for the Site is 10 (see summary table below).

Based on this score, the applicable NMOCD Site-specific RRALs are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 1,000 mg/kg for TPH, and 250 mg/kg for chlorides.

New Mexico Oil Conservation Division Site Assessment	
Ranking Criteria	Score
Depth to Ground Water (50-99 ft bgs)	10
Wellhead Protection Area (> 1,000 ft from water source, > 200 ft from domestic source)	0
Distance to Surface Body Water (200-1,000 ft)	0
Ranking Criteria Total Score	10*
<i>*Because the ranking criteria total score is 10, NMOCD established RRALs are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 1,000 mg/kg for TPH¹, and 250 mg/kg for chlorides.</i>	

1. NMOCD Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993

During development of the Phase Three scope of work further described in Section 3, GHD contacted Jim Griswold at the NMOCD on August 11 2016 to discuss options for re-use of the excavated soils as backfill material. Jim Griswold confirmed that the excavated soils can be utilized as backfill if analytical results indicate that the chloride concentrations of the stockpiled soil are below 600 mg/kg.

1.4 Current Site Status

Additional soil samples were collected during a drilling event in June 2016 and are further described in this report. The soil boring assessment activities were conducted to assess and delineate the vertical extent of chloride concentrations above NMOCD RRALs. Two borings were installed near locations where previous sampling indicated chloride concentrations in soil. All activities performed were conducted in general accordance with the *Initial Site Assessment Work Plan* submitted to the NMOCD on April 13, 2016.

2. June 2016 Soil Boring Assessment Activities

Field activities occurred on June 22, 2016. Prior to mobilization, a New Mexico 811 utility locate was completed 48 hours prior to conducting any intrusive activities.

An air rotary drill rig was used to advance two soil borings, identified as SB-1 and SB-2, to a depth of 40 ft bgs. Soil samples were collected at 10 ft bgs and every 5 ft thereafter. Collected soils were field screened for chloride by mixing 25 grams of soil with 100 milliliters of de-ionized water. The rinsate was then filtered and analyzed using Hach chloride test strips. Soils were also field screened for organic vapors using a calibrated Petroflag TPH Analyzer. The soil borings were advanced until field screening readings indicated that chloride concentrations in soil were likely below RRALs over at least a 15 foot soil interval. As BTEX and TPH GRO/DRO were not detected during previous sampling events, and field screening results did not indicate the presence of organic vapors in any soil interval from either boring, samples were only analyzed for chlorides. Soil boring locations are included on Figure 2.

Samples selected for laboratory analysis were placed in laboratory-supplied containers, recorded on a chain of custody form, and placed on ice in a cooler to maintain a temperature of 40°F (4°C) or lower. Soil samples were submitted to Xenco Laboratories (Xenco) in Midland, Texas for analysis of chloride by EPA Method 300.

2.1 Analytical Results

Six samples were collected from each of the two soil borings starting at 10 ft bgs, and every 5 ft thereafter to a depth of 35 ft bgs. Chloride was detected at concentrations above RRALs in four samples: SB-1 (10 and 15 ft bgs) and SB-2 (15 and 20 ft bgs). The analytical results indicate that chloride concentrations were below RRALs in at least a 15 foot soil interval above the water table.

Soil analytical results are summarized in Table 1. A copy of the analytical data and chain of custody documentation is included as Attachment A.

3. Phase Three Scope of Work

Based on the results of the soil assessment activities completed at the Site, horizontal and vertical delineation of the identified chloride impacts has been achieved.

To complete the closure process at the Site, GHD recommends the following remedial actions:

- Excavate soils within the approximate limits of the former tank battery pad and additional areas to the north, northwest, and southeast of the pad, to a depth of approximately 4 ft bgs. The proposed excavation limits are included on Figure 2. The excavated soils will be stockpiled onsite and assessed for suitability as backfill material.
- Collect confirmation excavation sidewall samples approximately every 50 feet once the proposed excavation limits have been reached to confirm all chloride-impacted soil has been removed.
- Place a seamed 20-mil polyethylene liner in the bottom of the excavation at a depth of 4 ft bgs.
- Collect 5-point composite samples from the stockpiled soil from approximately every 250 cy and analyze for chlorides by EPA Method 300. If analytical results indicate that the stockpiled soils have chloride concentrations below 600 mg/kg, the stockpiled soils will be used to backfill the excavation.
- If the analytical results of the stockpiled material indicate that chloride concentrations are above 600 mg/kg, the stockpiled soils will be disposed at an appropriate landfill and clean backfill material will be obtained and used to backfill the excavation.
- Upon completion of backfilling activities, the backfill material will be wheel compacted to grade.
- Upon completion of the backfill and grading, the disturbed area will be fertilized and reseeded with a BLM-approved seed mix.

4. Closing

Upon completion of excavation, lining and backfilling activities, a summary report will be prepared and submitted to CEMC. The report will summarize the results of the field program and will include a sample location map, tabulation of the soil analytical results, and photographic documentation. A final C-141 will also be prepared upon completion of site remediation.

Should you have any questions, or require additional information regarding this submittal, please feel free to contact either of us.

Sincerely,

GHD



Leslie Maranciak
Project Manager

LM/ag/2



Bernard Bockisch, PMP
Senior Project Manager

Attachments:

Table 1 – Soil Analytical Data Summary BTEX/TPH/Chlorides

Figure 1 – Site Location Map

Figure 2 – Soil Chloride Analytical Results and Proposed Excavation Limits

Attachment A – Analytical Data Report and Chain of Custody Documentation

Tables

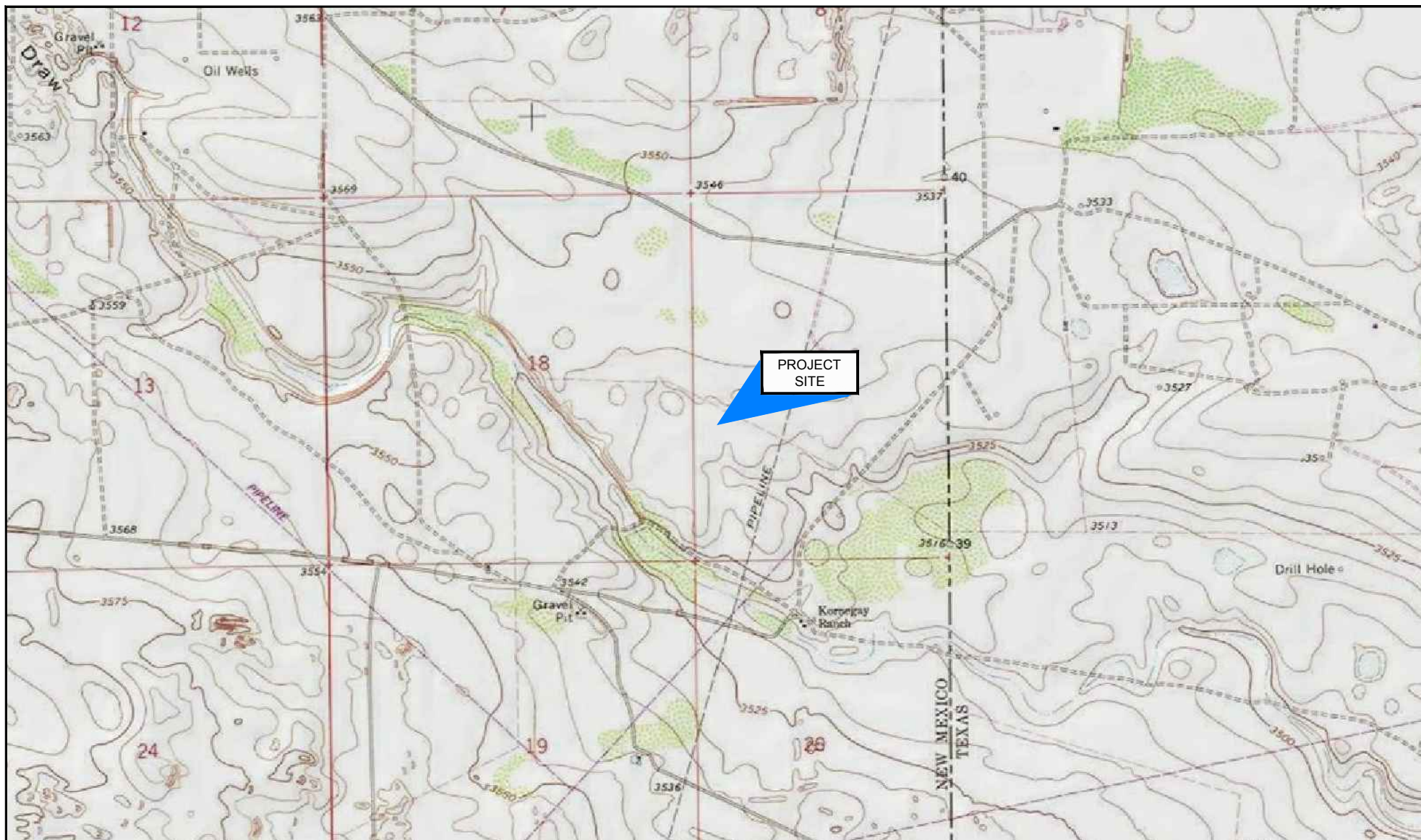
TABLE 1
SOIL ANALYTICAL DATA SUMMARY - BTEX/TPH/CHLORIDES
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
HOWSE #1 SITE
LEA COUNTY, NEW MEXICO

Sample Location:	Sample ID:	Sample Date:	Sample Depth:	Parameters	Chloride	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Total BTEX	Total Petroleum Hydrocarbons (C6-C10)	Total Petroleum Hydrocarbons (C10-C28)	Total Petroleum Hydrocarbons (C6-C35)
				Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
				RRAL	250	10	--	--	--	50	--	--	100
A	A	3/3/2016	Unknown		1320	--	--	--	--	--	--	--	--
B	B	3/3/2016	Unknown		1570	--	--	--	--	--	--	--	--
C	C	3/3/2016	Unknown		928	--	--	--	--	--	--	--	--
#1	# 1-S-10.5-160426	4/26/2016	10.5 ft BGS		1660	<0.000368	<0.00110	<0.000537	<0.000927	<0.000368	<10.8	<10.8	<10.8
#1A	# 1A-S-4-160427	4/27/2016	4 ft BGS		200	<0.000344	<0.00103	<0.000503	<0.000867	<0.000344	<10.2	<10.2	<10.2
#2	# 2-S-4-160426	4/26/2016	4 ft BGS		61.4	<0.000354	<0.00106	<0.000518	<0.000893	<0.000354	<10.5	<10.5	<10.5
#3	# 3-S-4-160426	4/26/2016	4 ft BGS		43.6	<0.000350	<0.00104	<0.000512	<0.000883	<0.000350	<10.3	<10.3	<10.3
#4	# 4-S-4-160426	4/26/2016	4 ft BGS		109	<0.000347	<0.00103	<0.000507	<0.000874	<0.000347	<10.3	<10.3	<10.3
#5	# 5-S-12-160427	4/27/2016	12 ft BGS		620	<0.000390	<0.00116	<0.000571	<0.000984	<0.000390	<11.5	<11.5	<11.5
#5A	# 5A-S-9-160427	4/27/2016	9 ft BGS		185	<0.000360	<0.00107	<0.000527	<0.000908	<0.000360	<10.6	<10.6	<10.6
#6	# 6-S-12-160427	4/27/2016	12 ft BGS		211	<0.000370	<0.00110	<0.000541	<0.000933	<0.000370	<10.9	<10.9	<10.9
#6A	# 6A-S-4-160427	4/27/2016	4 ft BGS		52.9	<0.000365	<0.00109	<0.000534	<0.000920	<0.000365	<10.8	<10.8	<10.8
#7	# 7-S-4-160426	4/26/2016	4 ft BGS		130	<0.000374	<0.00111	<0.000546	<0.000942	<0.000374	<11.1	<11.1	<11.1
#8	# 8-S-4-160426	4/26/2016	4 ft BGS		278	<0.000379	<0.00113	<0.000554	<0.000956	<0.000379	<11.2	<11.2	<11.2
#9	# 9-S-12-160427	4/27/2016	12 ft BGS		124	<0.000369	<0.00110	<0.000540	<0.000930	<0.000369	<10.9	<10.9	<10.9
#10	# 10-S-12-160427	4/27/2016	12 ft BGS		274	<0.000383	<0.00114	<0.000559	<0.000965	<0.000383	<11.3	<11.3	<11.3
#11	# 11-S-12-160427	4/27/2016	12 ft BGS		770	<0.000371	<0.00111	<0.000542	<0.000935	<0.000371	<10.9	<10.9	<10.9
SB-1	SB-1-S-10-162206	6/22/2016	10 ft BGS		1870	--	--	--	--	--	--	--	--
SB-1	SB-1-S-15-162206	6/22/2016	15 ft BGS		542	--	--	--	--	--	--	--	--
SB-1	SB-1-S-20-162206	6/22/2016	20 ft BGS		56.7	--	--	--	--	--	--	--	--
SB-1	SB-1-S-25-162206	6/22/2016	25 ft BGS		11.4	--	--	--	--	--	--	--	--
SB-1	SB-1-S-30-162206	6/22/2016	30 ft BGS		39.1	--	--	--	--	--	--	--	--
SB-1	SB-1-S-35-162206	6/22/2016	35 ft BGS		48.8	--	--	--	--	--	--	--	--
SB-2	SB-2-S-10-162206	6/22/2016	10 ft BGS		158	--	--	--	--	--	--	--	--
SB-2	SB-2-S-15-162206	6/22/2016	15 ft BGS		270	--	--	--	--	--	--	--	--
SB-2	SB-2-S-20-162206	6/22/2016	20 ft BGS		346	--	--	--	--	--	--	--	--
SB-2	SB-2-S-25-162206	6/22/2016	25 ft BGS		122	--	--	--	--	--	--	--	--
SB-2	SB-2-S-30-162206	6/22/2016	30 ft BGS		<0.858	--	--	--	--	--	--	--	--
SB-2	SB-2-S-35-162206	6/22/2016	35 ft BGS		210	--	--	--	--	--	--	--	--

Notes:

1. Shaded cells indicate RRAL exceeded.
2. RRAL - Recommended Remedial Action Limits (NMOCD)
3. BGS - Below Ground Surface
4. "--" Indicates not sampled for the listed constituent

Figures



Source: USGS 7.5 Minute Quad "Hobbs SE, New Mexico"

Lat/Long: 32.57119° North, 103.07530° West

0 1000 2000ft

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



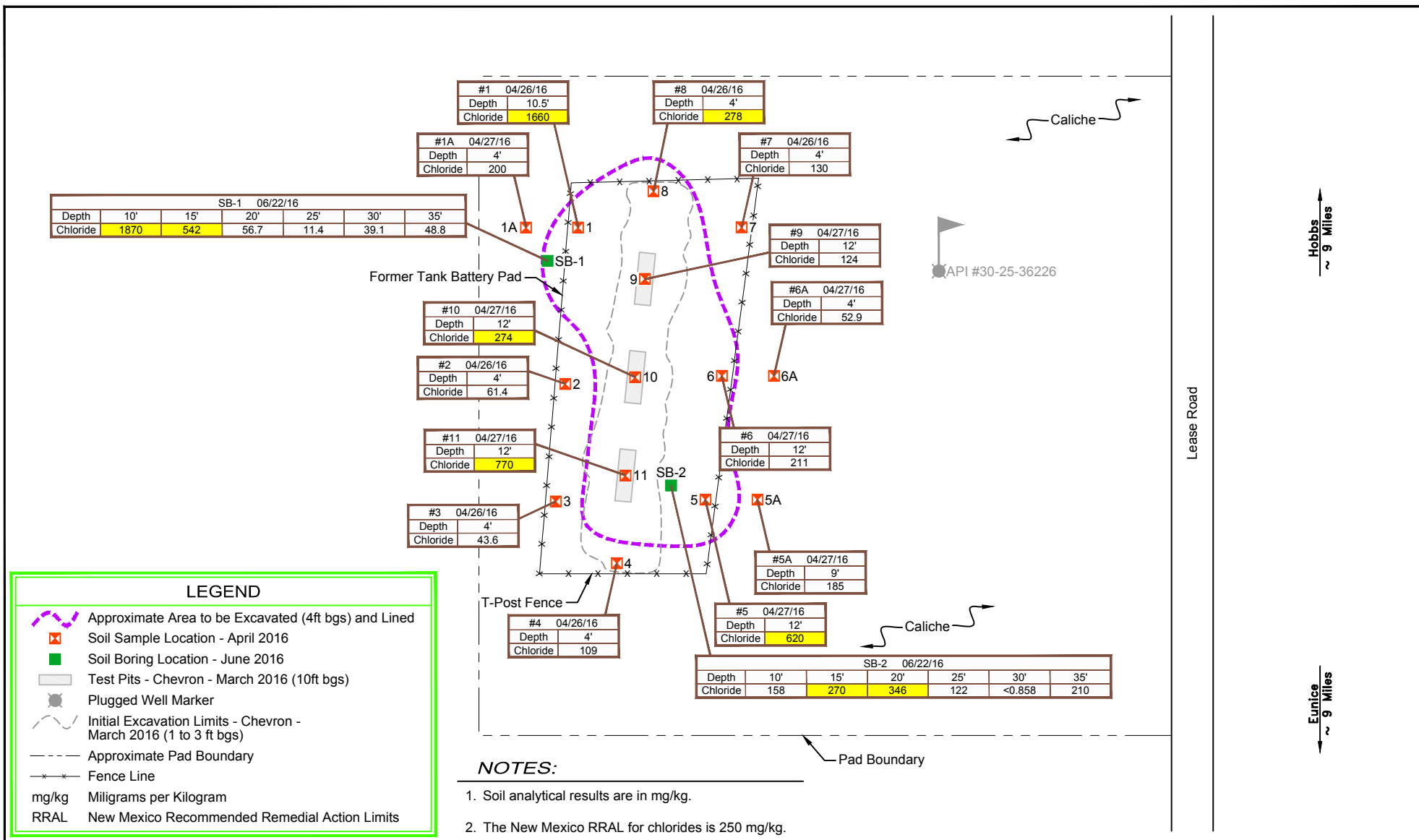
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
LEA COUNTY, NEW MEXICO
HOWSE #1

SITE LOCATION MAP

11121230-00

Jul 28, 2016

FIGURE 1



0 20 40ft



HOWSE #1
LEA COUNTY, NEW MEXICO

SOIL CHLORIDE ANALYTICAL RESULTS AND PROPOSED EXCAVATION LIMITS

11121230-00
Sep 16, 2016

FIGURE 2

Appendix A

Analytical Data Report and Chain of Custody Documentation

Analytical Report 532203

**for
GHD Services, INC- Midland**

Project Manager: Chris Knight

Howse # 1 Site

11121230

19-JUL-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



19-JUL-16

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

Reference: XENCO Report No(s): **532203**
Howse # 1 Site
Project Address: Lea County, NM

Chris Knight:

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) 532203. 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. 532203 will be filed for 60 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

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

Certified and approved by numerous States and Agencies.

A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America



Sample Cross Reference 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB-1-S-10-162206	S	06-22-16 13:55	- 10 ft	532203-001
SB-1-S-15-162206	S	06-22-16 14:00	- 15 ft	532203-002
SB-1-S-20-162206	S	06-22-16 14:05	- 20 ft	532203-003
SB-1-S-25-162206	S	06-22-16 14:10	- 25 ft	532203-004
SB-1-S-30-162206	S	06-22-16 14:15	- 30 ft	532203-005
SB-1-S-35-162206	S	06-22-16 14:20	- 35 ft	532203-006
SB-2-S-10-162206	S	06-22-16 12:50	- 10 ft	532203-008
SB-2-S-15-162206	S	06-22-16 12:55	- 15 ft	532203-009
SB-2-S-20-162206	S	06-22-16 13:00	- 20 ft	532203-010
SB-2-S-25-162206	S	06-22-16 13:05	- 25 ft	532203-011
SB-2-S-30-162206	S	06-22-16 13:10	- 30 ft	532203-012
SB-2-S-35-162206	S	06-22-16 13:15	- 35 ft	532203-013
SB-1-S-40-162206	S	06-22-16 14:25	- 40 ft	Not Analyzed
SB-2-S-40-162206	S	06-22-16 13:20	- 40 ft	Not Analyzed



CASE NARRATIVE



Client Name: GHD Services, INC- Midland

Project Name: Howse # 1 Site

Project ID: 11121230

Work Order Number(s): 532203

Report Date: 19-JUL-16

Date Received: 06/23/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-1-S-10-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-001

Date Collected: 06.22.16 13.55

Sample Depth: 10 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture: 13.85

Analyst: MNR

Date Prep: 06.24.16 17.00

Basis: Dry Weight

Seq Number: 996934

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	1870	100	mg/kg	06.24.16 21.34		10



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-1-S-15-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-002

Date Collected: 06.22.16 14.00

Sample Depth: 15 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture: 7.35

Analyst: MNR

Date Prep: 06.24.16 17.00

Basis: Dry Weight

Seq Number: 996934

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	542	50.0	mg/kg	06.24.16 21.57		5



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-1-S-20-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-003

Date Collected: 06.22.16 14.05

Sample Depth: 20 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture: 23.33

Analyst: MNR

Date Prep: 06.24.16 17.00

Basis: Dry Weight

Seq Number: 996934

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	56.7	10.0	mg/kg	06.24.16 22.05		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-1-S-25-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-004

Date Collected: 06.22.16 14.10

Sample Depth: 25 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture: 9.3

Analyst: MNR

Date Prep: 06.24.16 17.00

Basis: Dry Weight

Seq Number: 996934

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	11.4	10.0	mg/kg	06.24.16 22.28		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-1-S-30-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-005

Date Collected: 06.22.16 14.15

Sample Depth: 30 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture:

Analyst: MNR

Date Prep: 07.13.16 19.45

Basis: Wet Weight

Seq Number: 998070

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	39.1	10.0	mg/kg	07.14.16 13.19		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-1-S-35-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-006

Date Collected: 06.22.16 14.20

Sample Depth: 35 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture:

Analyst: MNR

Date Prep: 07.13.16 19.45

Basis: Wet Weight

Seq Number: 998070

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	48.8	10.0	mg/kg	07.14.16 13.26		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-2-S-10-162206** Matrix: Soil Date Received: 06.23.16 11.15
Lab Sample Id: 532203-008 Date Collected: 06.22.16 12.50 Sample Depth: 10 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: MNR % Moisture: 35.19
Analyst: MNR Date Prep: 06.24.16 17.00 Basis: Dry Weight
Seq Number: 996934 SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	158	10.0	mg/kg	06.24.16 22.36		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-2-S-15-162206** Matrix: Soil Date Received: 06.23.16 11.15
Lab Sample Id: 532203-009 Date Collected: 06.22.16 12.55 Sample Depth: 15 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: MNR % Moisture: 5.12
Analyst: MNR Date Prep: 06.24.16 17.00 Basis: Dry Weight
Seq Number: 996934 SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	270	10.0	mg/kg	06.24.16 22.44		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-2-S-20-162206** Matrix: Soil Date Received: 06.23.16 11.15
Lab Sample Id: 532203-010 Date Collected: 06.22.16 13.00 Sample Depth: 20 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: MNR % Moisture: 10.9
Analyst: MNR Date Prep: 06.24.16 17.00 Basis: Dry Weight
Seq Number: 996934 SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	346	10.0	mg/kg	06.24.16 22.52		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-2-S-25-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-011

Date Collected: 06.22.16 13.05

Sample Depth: 25 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture: 8.5

Analyst: MNR

Date Prep: 06.24.16 17.00

Basis: Dry Weight

Seq Number: 996934

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	122	10.0	mg/kg	06.24.16 23.00		1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-2-S-30-162206**

Matrix: Soil

Date Received: 06.23.16 11.15

Lab Sample Id: 532203-012

Date Collected: 06.22.16 13.10

Sample Depth: 30 ft

Analytical Method: Inorganic Anions by EPA 300/300.1

Prep Method: E300P

Tech: MNR

% Moisture: 7.91

Analyst: MNR

Date Prep: 06.24.16 17.00

Basis: Dry Weight

Seq Number: 996934

SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	ND	10.0	mg/kg	06.24.16 23.07	U	1



Certificate of Analytical Results 532203



GHD Services, INC- Midland, Midland, TX

Howse # 1 Site

Sample Id: **SB-2-S-35-162206** Matrix: Soil Date Received: 06.23.16 11.15
Lab Sample Id: 532203-013 Date Collected: 06.22.16 13.15 Sample Depth: 35 ft
Analytical Method: Inorganic Anions by EPA 300/300.1 Prep Method: E300P
Tech: MNR % Moisture:
Analyst: MNR Date Prep: 07.14.16 16.33 Basis: Wet Weight
Seq Number: 998104 SUB: E871002

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	210	10.0	mg/kg	07.14.16 21.29		1

GHD Services, INC- Midland

Howse # 1 Site

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 996934

Matrix: Solid

Prep Method: E300P

MB Sample Id: 710308-1-BLK

LCS Sample Id: 710308-1-BKS

Date Prep: 06.24.16

LCSD Sample Id: 710308-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	250	256	102	250	100	90-110	2	20	mg/kg	06.24.16 19:29	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 998070

Matrix: Solid

Prep Method: E300P

MB Sample Id: 710940-1-BLK

LCS Sample Id: 710940-1-BKS

Date Prep: 07.13.16

LCSD Sample Id: 710940-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	250	253	101	261	104	90-110	3	20	mg/kg	07.14.16 12:32	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 998104

Matrix: Solid

Prep Method: E300P

MB Sample Id: 710972-1-BLK

LCS Sample Id: 710972-1-BKS

Date Prep: 07.14.16

LCSD Sample Id: 710972-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<10.0	250	234	94	239	96	90-110	2	20	mg/kg	07.14.16 20:04	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 996934

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 532203-001

MD Sample Id: 532203-001 D

Date Prep: 06.24.16

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1870	2030	8	20	mg/kg	06.24.16 21:42	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 996934

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 532242-001

MD Sample Id: 532242-001 D

Date Prep: 06.24.16

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	8610	8680	1	20	mg/kg	06.24.16 19:52	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 998070

Matrix: Soil

Prep Method: E300P

Parent Sample Id: 532978-001

MD Sample Id: 532978-001 D

Date Prep: 07.13.16

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	40600	36600	10	20	mg/kg	07.14.16 12:55	



GHD Services, INC- Midland

Howse # 1 Site

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 998104

Matrix: Soil

Parent Sample Id: 533240-001

MD Sample Id: 533240-001 D

Prep Method: E300P

Date Prep: 07.14.16

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	14.2	<10.0	NC	20	mg/kg	07.18.16 14:25	U

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 996934

Matrix: Soil

Parent Sample Id: 532203-001

MS Sample Id: 532203-001 S

Prep Method: E300P

Date Prep: 06.24.16

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Chloride	1870	2500	4160	92	80-120	mg/kg	06.24.16 21:49	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 996934

Matrix: Soil

Parent Sample Id: 532242-001

MS Sample Id: 532242-001 S

Prep Method: E300P

Date Prep: 06.24.16

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Chloride	8610	12500	19400	86	80-120	mg/kg	06.24.16 20:00	

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 998070

Matrix: Soil

Parent Sample Id: 532978-001

MS Sample Id: 532978-001 S

Prep Method: E300P

Date Prep: 07.13.16

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Chloride	40600	50000	101000	121	80-120	mg/kg	07.14.16 13:03	X

Analytical Method: Inorganic Anions by EPA 300/300.1

Seq Number: 998104

Matrix: Soil

Parent Sample Id: 533240-001

MS Sample Id: 533240-001 S

Prep Method: E300P

Date Prep: 07.14.16

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	Limits	Units	Analysis Date	Flag
Chloride	14.2	250	263	100	80-120	mg/kg	07.18.16 14:33	

Analytical Method: Percent Moisture

Seq Number: 997257

Matrix: Solid

MB Sample Id: 997257-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	ND	%	06.28.16 18:50	



GHD Services, INC- Midland

Howse # 1 Site

Analytical Method: Percent Moisture

Seq Number: 997257

Parent Sample Id: 532203-001

Matrix: Soil

MD Sample Id: 532203-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	16.1	15.5	4	20	%	06.28.16 18:50	

Analytical Method: Percent Moisture

Seq Number: 997257

Parent Sample Id: 532203-011

Matrix: Soil

MD Sample Id: 532203-011 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	9.29	9.61	3	20	%	06.28.16 18:50	

- 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 **SQL** 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

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CHAIN OF CUSTODY

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Service Center - San Antonio, Texas (210-509-3334)						www.xenoco.com		Xenoco Quote #	Xenoco Job #								
Client / Reporting Information				Project Information				Matrix Codes									
Company Name / Branch: GHD-Midland				Project Name/Number: Howse #1 Site 11121230													
Company Address: 2135 S Loop 250 W, Midland, TX 79703				Project Location: Lea County, NM													
Email: christopher.knight@ghd.com				Invoice To: GHD - 00 6320 Rofmway Ste 100 Houston, TX 77040													
Phone No: 512-506-8903				Po Number: 11121230													
Project Contact: Christopher Knight																	
Samplers Name <u>Jennifer Stoffel</u>																	
No.	Field ID / Point of Collection	Sample Depth	Date	Time	Matrix	# of bottles	HCI	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride % Solids	Analytical Information	Matrix Codes
1	SB-1-S-10-162206	10'	6/24/16	13:55	S	1											
2	SB-1-S-15-162206	15'	6/24/16	14:00	S	1											
3	SB-1-S-20-162206	20'	6/24/16	14:05	S	1											
4	SB-1-S-25-162206	25'	6/24/16	14:10	S	1											
5	SB-1-S-30-162206	30'	6/24/16	14:15	S	1											
6	SB-1-S-35-162206	35'	6/24/16	14:20	S	1											
7	SB-1-S-40-162206	40'	6/24/16	14:25	S	1											
8	SB-2-S-10-162206	10'	6/24/16	12:50	S	1											
9	SB-2-S-15-162206	15'	6/24/16	12:55	S	1											
10	SB-2-S-20-162206	20'	6/24/16	13:00	S	1											
Turnaround Time (Business days) _____ Data Deliverable Information _____ Notes:																	
<input type="checkbox"/> Same Day TAT		<input checked="" type="checkbox"/> 5 Day TAT		<input type="checkbox"/> Level II Std QC		<input type="checkbox"/> Level IV (Full Data Pkg / raw data)											
<input type="checkbox"/> Next Day EMERGENCY		<input type="checkbox"/> 7 Day TAT		<input type="checkbox"/> Level III Std QC+ Forms		<input type="checkbox"/> TRRP Level IV											
<input type="checkbox"/> 2 Day EMERGENCY		<input type="checkbox"/> Contract TAT		<input type="checkbox"/> Level 3 (CLP Forms)		<input type="checkbox"/> UST / RG -411											
<input type="checkbox"/> 3 Day EMERGENCY				<input type="checkbox"/> TRRP Checklist													
TAT Starts Day received by Lab, if received by 5:00 pm																	
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY																	
Relinquished by Sampler:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:			
1 Jennifer Stoffel		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM			
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:			
3 [Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM			
Relinquished by:		Date Time:		Received By:		Date Time:		Relinquished By:		Date Time:		Received By:		Date Time:			
5 [Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM		[Signature]		6/28/16 11:15 AM			
FED-EX / UPS: Tracking # _____																	
On Ice <input checked="" type="checkbox"/> Cooler Temp. 0.3°C Thermo. Corr. Factor 0.9																	



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52203

Final 1.002



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: GHD Services, INC- Midland

Date/ Time Received: 06/23/2016 11:15:00 AM

Work Order #: 532203

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)?	.3
#2 *Shipping container in good condition?	N/A
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	N/A
#5 *Custody Seals intact on shipping container/ cooler?	N/A
#6 Custody Seals intact on sample bottles?	N/A
#7 *Custody Seals Signed and dated?	N/A
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	No
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Mary Alexis Negron
Mary Negron

Date: 06/23/2016

Checklist reviewed by:

Kelsey Brooks
Kelsey Brooks

Date: 06/23/2016