

From: [Hall, Brittany, EMNRD](#)
To: ["Jordan, Morgan"](#)
Cc: ["Brand, Chris"; Buchanan, Michael, EMNRD; Bratcher, Michael, EMNRD; Romero, Rosa, EMNRD; Minnix, Sharon, EMNRD; McCarty, Stephanie, EMNRD](#)
Subject: RE: [EXTERNAL] Incident # nPAC0616540406 -Alternative Sampling Plan Request (CHEVRON LOVINGTON PADDOCK UNIT 59)
Date: Wednesday, August 26, 2026 10:50:00 AM
Attachments: [image001.png](#)
[app4535 \(1\).pdf](#)

Morgan and Chris,

After further research, it has been determined that this incident is within the City of Lovington's municipal boundaries. As the release is within an incorporated municipal boundary or a defined municipal fresh water well field the previous approval of the sampling plan consisting of final confirmation samples of 5-point composite samples representative of no more than 400 square feet has been rescinded and is now **DENIED**. Final confirmation samples must be five-point composite samples representative of no more than 200 square feet. Additionally, grab samples must be collected from any wet or discolored areas. Final confirmation samples must meet the most stringent closure criteria (600 mg/kg for chloride, 100 mg/kg for TPH, 50 mg/kg for BTEX, and 10 mg/kg for benzene) found on Table I of 19.15.29 NMAC.

A copy of this email correspondence will be uploaded to the incident files.

The attached approved report (application ID 4535) will be returned to Under OCD Review and subsequently denied.

Thank you,

Brittany Hall ● Environmental Field Compliance Supervisor
Environmental Field Compliance Group
EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
505.517.5333 | Brittany.Hall@emnrd.nm.gov
<http://www.emnrd.nm.gov/oecd/>

Effective 12/1/2024: OCD has updated guidance on karst potential occurrence zones. This notice can be found at: <https://www.emnrd.nm.gov/oecd/oecd-announcements-and-notifications/> under "2024 OCD ANNOUNCEMENTS AND NOTIFICATIONS".

The Digital C-141 guidance documents can be found at <https://www.emnrd.nm.gov/oecd/oecd-announcements-and-notifications/> or <https://www.emnrd.nm.gov/oecd/oecd-forms/>.

From: Hall, Brittany, EMNRD

Sent: Monday, August 24, 2026 7:46 AM

To: Jordan, Morgan <Douglas.Jordan@arcadis.com>

Cc: Brand, Chris <Chrisbrand@chevron.com>; Buchanan, Michael, EMNRD
<Michael.Buchanan@emnrd.nm.gov>

Subject: RE: [EXTERNAL] Incident # nPAC0616540406 -Alternative Sampling Plan Request (CHEVRON LOVINGTON PADDOCK UNIT 59)

Morgan,

The sampling plan is approved. The final confirmation samples must be 5-point composite samples representative of no more than 400 square feet. Additionally, grab samples must be collected from any wet or discolored areas. The excavation must be extended past four feet below ground surface if the soils do not meet the closure criteria.

Field screening and analytical results for the stockpiles must be included in the closure report. Pursuant to 19.15.29.13 D. (1) The soil cover must include a top layer, which is either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater. Please include photos of the top layer of topsoil.

Please include a copy of this correspondence in the next C-141 submittal.

Thank you,

Brittany Hall ● Environmental Field Compliance Supervisor
Environmental Field Compliance Group
EMNRD - Oil Conservation Division
1000 Rio Brazos Road | Aztec, NM 87410
505.517.5333 | Brittany.Hall@emnrd.nm.gov
<http://www.emnrd.nm.gov/ocd/>

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The Digital C-141 guidance documents can be found at <https://www.emnrd.nm.gov/ocd/ocd-announcements-and-notifications/> or <https://www.emnrd.nm.gov/ocd/ocd-forms/>.

From: Jordan, Morgan <Douglas.Jordan@arcadis.com>

Sent: Friday, August 21, 2026 7:17 AM

To: Enviro, OCD, EMNRD <OCD.Enviro@emnrd.nm.gov>; Hall, Brittany, EMNRD
<Brittany.Hall@emnrd.nm.gov>

Cc: Brand, Chris <Chrisbrand@chevron.com>

Subject: [EXTERNAL] Incident # nPAC0616540406 -Alternative Sampling Plan Request (CHEVRON LOVINGTON PADDOCK UNIT 59)

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

We are beginning excavation activities next week at Incident # nPAC0616540406. This site is located outside the municipal well field boundary. We have conducted extensive assessment activities on this site, and it has a large footprint of approximately 7,000 square feet. We'd like to please request approval for an alternative sampling plan of 400 square feet, five-point composite sample areas as we feel this frequency would sufficiently verify cleanup standards have been met across the excavation area.

Additionally, we plan to proceed per the approved Remediation Plan, attached. Closure criteria for soil (19.15.29 NMAC) for depth to groundwater greater than 100 ft limits will be used for cleanup standards greater than 4 feet bgs. The Remediation Plan was approved by the NMOCD in 2021. Please let me know if you have any questions or would like to discuss further. Thank you for your time.

Thank You,

Morgan Jordan | Project Manager | douglas.jordan@arcadis.com
Arcadis | Arcadis U.S., Inc.
[98 San Jacinto Blvd, Suite 414 | Austin, TX | 78701](#) | USA
M. +1 281 644 9437

Connect with us! www.arcadis.com | [LinkedIn](#) | [Twitter](#) | [Facebook](#)



Be green, leave it on the screen.

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Jason Michelson
Project Manager

**Chevron Environmental
Management Company**
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Houston, Texas 77002
Work: 832-854-5601
Cell: 281-660-8564
jmichelson@chevron.com

March 16, 2020

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

**Re: Lovington Paddock Unit No. 59 Well Site
Case No. 1RP-915
2018 Site Assessment Report and Work Plan
Lea County, New Mexico**

Dear whom it concerns,

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

- Lovington Paddock Unit No. 59 Well Site 1RP-915 2018 Site Assessment Report

The submittal was prepared by GHD Services, Inc. (GHD) on behalf of Chevron Environmental Management Company (CEMC).

Please do not hesitate to call Scott Foord with Arcadis U.S., Inc., the current consultant, at 713-953-4853 or myself at 832-854-5601, should you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Jason Michelson".

Jason Michelson

Encl. Lovington Paddock Unit No. 59 Well Site 1RP-915 2018 Site Assessment Report

C.C. Amy Barnhill, Chevron/MCBU



Site Assessment Report

Lovington Paddock Unit 59

1RP-915

Produced Water Release

Lea County, New Mexico

Chevron Environmental
Management Company





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1. Introduction

GHD is pleased to present this Site Assessment Report to Chevron Environmental Management Company (CEMC) for the Lovington Paddock Unit (LPU) 59 site release location (hereafter referred to as the "Site"). The Site is located in Unit G, Section 1, Township 17 South, Range 36 East, approximately 5 miles southeast of the City of Lovington (COL) in Lea County, New Mexico. The land surface is owned by the COL and the minerals are managed by the State of New Mexico. The location of the Site is identified on the vicinity map of Figure 1 and the aerial map of Figure 2.

2. Regulatory Criteria

2.1 Soil

Historical subsurface investigation activities were completed in accordance with the Guidelines for Remediation of Leaks, Spills, and Releases Rule 19.15.29 New Mexico Administrative Code (NMAC) from the New Mexico Oil Conservation Division (NMOCD) dated August 13, 1993. The former site-specific Recommended Remediation Action Levels (RRALs) previously applied to this location by the NMOCD were 10 milligrams per kilogram (mg/kg) for benzene, 50 mg/kg for total benzene, toluene, ethylbenzene, and xylenes (BTEX), 100 mg/kg for total petroleum hydrocarbons (TPH), and 600 mg/kg for chloride.

Rule 19.15.29 was revised and reissued on August 14, 2018. The following criteria from Table 1 (below) within NMAC 19.15.29.12 was utilized to determine site-specific screening limits.

Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/l TDS	Constituent	Limit*
>100 feet	Chloride**	20,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

* Numerical limits or natural background level, whichever is greater.

** This applies to release of produced water or other fluids which may contain chloride.

Localized depth to groundwater was confirmed to be approximately 107 feet below ground surface (bgs) in 2018 based on the information from monitoring wells MW-1 and MW-2 (located approximately 120-feet to the southeast of the original spill). See Figure 3 for monitoring well and soil boring locations. Additionally, information available from various sources including the New Mexico Office of the State Engineer (NMOSE) Point of Diversion (POD) Mapping Portal, Petroleum Recovery Research Center (PRRC) Mapping Portal, currently managed groundwater site(s) data by GHD, and the United States Geological Survey (USGS) Current Water Database for the Nation, concludes:



- a) the depth to groundwater at the Site is greater than 100-feet bgs;
- b) the site is not within 300 feet of any continuously flowing watercourse;
- c) the site is not within 200 feet of any lakebed, sinkhole or playa lake;
- d) the site is not within 300 feet of an occupied permanent residence, school, etc.;
- e) the site is not within 500 feet of a spring or private, domestic fresh water well;
- f) the site is not within 1,000 feet of any fresh water well or spring;
- g) the site is not within incorporated municipal boundaries or within a defined municipal fresh water well field;
- h) the site is not within 300 feet of a wetland;
- i) the site is not within an area overlying a subsurface mine;
- j) the site is not within an unstable area; and
- k) the site is not within a 100-year floodplain.

Consequently, the anticipated site-specific screening limits to be applied to this location by the NMOCD based on the revised Rule are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 2,500 mg/kg for total TPH, and 20,000 mg/kg for chloride.

2.2 Groundwater

The guidance also requires remediation of groundwater to human health standards of the New Mexico Water Quality Control Commission (NMWQCC) established in New Mexico Administrative Code Section 20.6.2.3103. Standards for chloride and total dissolved solids (TDS) are listed below.

Analyte	NMWQCC Standard for Groundwater (mg/L)
Chloride	250
TDS	1,000

3. Project Information and Background

According to historical records provided to GHD, an estimated 40 barrels (10 barrels recovered) of produced water were released from a pipe in a valve box at this location on June 4, 2006. The approximate affected area was estimated at 200 feet x 200 feet.

Shallow soil samples were collected from the impacted area in July 2010 from six hand augered sample locations (AH-1 through AH-6) at sampling intervals of 0 to 0.5 feet below ground surface (bgs), and in August 2010 from six locations in a sample trench (T-1 through T-6) at sample intervals of 0 to 1 feet bgs. Sample analyses included TPH; BTEX; and chloride from the July 2010 sampling event, and chloride only during the August 2010 sampling event. TPH and BTEX concentrations were below laboratory detection limits in the upper sample intervals from the hand augered locations (0 to 0.5 feet), and therefore these analyses were not performed for the deeper intervals collected



from the trench samples. Chloride results from both intervals collected at locations AH-2, AH-4, T-2, T-3, T-4, T-5, and T-6 exceeded the historical RRAL of 250 mg/kg for chloride.

In May 2011, GHD subcontractor Harrison Cooper, Inc. (HCI) advanced five soil borings (SB-1 through SB-5) utilizing an air-rotary drilling rig to depths ranging from 20 to 40 feet bgs, and soil samples were collected at five-foot intervals within each of the five soil borings. Samples were submitted to ALS Environmental laboratory in Houston, Texas for analysis of chlorides by EPA Method 300.

Laboratory analytical results indicated that the vertical extent of chloride impact was not yet defined in borings SB-2 and SB-3. On June 27, 2012, GHD and CEMC met at the NMOCD District 1 Hobbs office to discuss the path forward for the Site. The NMOCD requested that additional assessment be completed to further evaluate the vertical extent of chloride impacts.

In December 2012, under the supervision of GHD, HCI advanced two additional borings (SB-2b and SB-3b) utilizing an air-rotary drilling rig to depths of 70 feet bgs. Soil samples were collected from 40 to 70 feet bgs at 10-foot intervals in an effort to delineate the vertical extent of chloride impacts to soil. Samples were placed in laboratory-supplied sample containers on ice, labeled, and submitted to Lancaster Labs in Lancaster, Pennsylvania for analysis of chloride by EPA Method 300. Groundwater was not encountered in either boring. Following completion of activities, the borings were backfilled with hydrated bentonite pellets to the ground surface.

Monitoring well MW-1 was installed in October 2016 to assess potential groundwater impact in follow-up to soil analytical results collected and reported during previous assessments conducted in 2010 through 2012. The initial assessments indicated chloride concentrations extending vertically to a depth of at least 70 feet bgs. MW-1 was installed utilizing mud rotary drilling methods therefore no soil samples were collected during MW-1 installation activities. The depth to groundwater was confirmed at the Site at 101 feet bgs. BTEX and TPH constituents were non-detect in the groundwater sample, and chloride concentrations reported for the groundwater sample collected from MW-1 in October 2016 were below the NMWQCC standard of 250 milligrams per liter (mg/L).

Analytical results associated with assessment activities conducted from 2010 through 2016 indicated that the horizontal and vertical extent of chloride impact in soil had not been fully delineated. Groundwater from MW-1 was re-sampled in May 2017, and six additional soil borings (SB-6 through SB-11) were advanced and analytical analyses performed in October 2017 in an attempt to fully delineate the horizontal and vertical extents of chloride impact to soil.

The Site is delineated based on the revised NMOCD regulatory requirements for chloride in soil. Groundwater sample results from MW-1 were below NMWQCC standards for chloride and TDS. However, NMOCD requested a down gradient well be installed to confirm no impact to groundwater down gradient of the release area. As such, MW-2 was installed approximately 130-feet in the general down gradient direction (southeast of the spill location). Details of the drilling and sampling activities for MW-2 are in the following sections.



4. 2018 Drilling and Sampling

One monitoring well (MW-2) was advanced at the Site to further assess and impact to water southeast of the release area. Prior to mobilizing drilling equipment to the Site, the soil boring locations were pre marked and a New Mexico 811 One-Call utility locate was completed at least 48 hours prior to start of work. A secondary utility check was completed that included Ground Penetrating Radar (GPR) services by High Mesa of Albuquerque, New Mexico.

On September 6, 2018, GHD and GHD subcontractor HCI, mobilized to the Site to begin monitoring well installation activities for MW-2. The well was pre-cleared with a hydro-excavator to a depth of 5 feet bgs or until refusal. The well was then drilled to 90 feet bgs via air rotary and then to 130 feet bgs with mud rotary due to borehole collapse. The total drilling depth was approximately 25-feet below the water table. During drilling, a GHD geologist observed, visually inspected, and logged soil cuttings at 10-foot intervals and recorded subsurface lithology in accordance with the Unified Soil Classification System in field books. The boring log prepared from the field information can be found in Appendix A.

The soil types observed in soil samples collected during the drilling program consisted of fine grained sand with caliche followed by fine grained sand with pebbles and then poorly graded sand with caliche. Chloride screening was accomplished in the field by mixing soil samples with distilled water, then testing the rinsate using Hach chloride test strips.

Soils samples were collected for laboratory analysis from MW-2 at 4, 10, 20, 30, 40, 50, 60, 70, 80, and 90 feet bgs. Soil samples were packed into laboratory prepared jars and stored in a cooler with ice. The soil samples were sent to Xenco Laboratories (Xenco) in Midland, Texas for chloride analysis by EPA Method 300.

4.1 Soil Sampling Analytical Results

A soil analytical summary of results from 2010 through 2018 is presented in Table 1. A Chloride Analytical Results Map for Soils (2010 – 2018) is presented as Figure 4.

- Chloride concentrations above the revised Rule 19.15.29 screening limit of 20,000 mg/kg were not reported in any of the soil samples collected from MW-2.

The 2018 soil laboratory analytical report is included in Appendix B.

5. Groundwater Assessment

Groundwater sample results from existing monitoring well MW-1 have been collected at a minimum of annually since October 2016 with reported chloride concentrations below the NMWQCC standard of 250 mg/L. All groundwater samples have also been below the TDS standard of 1,000 mg/L. MW-2 was installed in September 2018 and MW-1 was re-sampled in October 2018 along with newly installed well MW-2.



5.1 Monitoring Well Installation

MW-2 was completed with four-inch diameter, schedule 40 polyvinyl chloride (PVC) casing, 30 feet of 0.010-inch PVC slotted screen, a 20/40 sand filter pack overlain by a bentonite seal extending up to 10 feet bgs, and riser casing extending above the ground surface. The well was completed at the surface with a stick-up protective casing set in an approximate 2 feet by 2 feet concrete pad.

Preliminary gauging data indicated that groundwater was present at approximately 105 feet below the top of casing. The well was developed by removal of sufficient volumes of water to clear the well casing and annulus of sediment. Turbid water was removed with a 3-inch diameter bailer. Following bailing, well development was completed by pumping with a submersible pump. The boring log, well construction diagram, and the State Well Report are provided in Appendix A.

Soil cuttings, drilling fluids and well development water were contained in a lined mudbox. The drill cuttings/fluids and development water were transported as exploration and production (E&P) exempt waste to Sundance Services, Inc. near Eunice, New Mexico.

5.2 Groundwater Sampling

Groundwater gauging was conducted and the vertical conductivity profiled throughout the entire water column of each of the monitoring wells (MW-1 and MW-2) prior to groundwater sampling activities. Depth to groundwater was measured in MW-1 and MW-2 to the nearest hundredth of a foot (106.42 and 107.30 feet bgs respectively) from the top of casing using an electronic water level meter on October 31, 2018. The conductivity profile of the water column was determined by recording conductivity at five-foot intervals from the top of the water column to the total depth of the well (230 feet bgs for MW-1 and 130 feet bgs for MW-2). The results of the conductivity profile are summarized on Table 3.

Low-flow purging techniques were used prior to sampling. During purging, the flow rate was adjusted to approximately 100 milliliters per minute in order to achieve minimal drawdown from the static water level. Temperature, oxidation reduction potential (ORP), pH, conductivity, and dissolved oxygen (DO) were monitored during purging. Purging continued until at least three of these parameters remained stabilized within a 10 percent range during three consecutive measurements. A groundwater sample was then collected in laboratory-supplied containers, labeled, and chilled on ice in an insulated cooler to maintain a temperature of 40°F (4°C) or lower. Field equipment was decontaminated with a Liquinox™ wash and distilled water rinse before beginning field activities and between wells.

Groundwater samples were submitted to Xenco Laboratories in Midland, Texas for analysis of chloride by EPA Method 300 and TDS by Method SM2540C. Chain of custody documentation was maintained throughout the sample collection and delivery process. Analyses were completed within required holding times.

5.3 Groundwater Analytical Results

Chloride was detected at a concentration of 159 mg/L from MW-1 and 137 mg/L from MW-2, which are both below the 250 mg/L standard. TDS was reported at a concentration of 727 mg/L from the



sample collected from MW-1 and 753 mg/L from the sample collected from MW-2, which are below the 1,000 mg/L standard.

Groundwater analytical results for chloride and TDS are summarized in Table 2 in reference to NMWQCC standards. The laboratory analytical report is provided in Appendix B.

6. Summary of Findings

Evaluation of the analytical data obtained from soil assessment and delineation activities performed from 2010 through 2018 indicate horizontal and vertical delineation of chloride impacts to soil has been achieved at the Site.

6.1 2019 Remediation Activities

Lateral and horizontal delineation of soil has been completed at the Site. Groundwater samples collected from MW-1 and MW-2 have confirmed no impact to groundwater at the Site. As such, soil remediation activities (excavation) per NMAC 19.15.29.13 will be conducted at the Site following NMOCD approval of the 2019 Remediation Work Plan attached as Appendix C of this report. GHD would also like to request permission to plug and abandon monitoring wells MW-1 and MW-2.

All of Which is Respectfully Submitted,

GHD

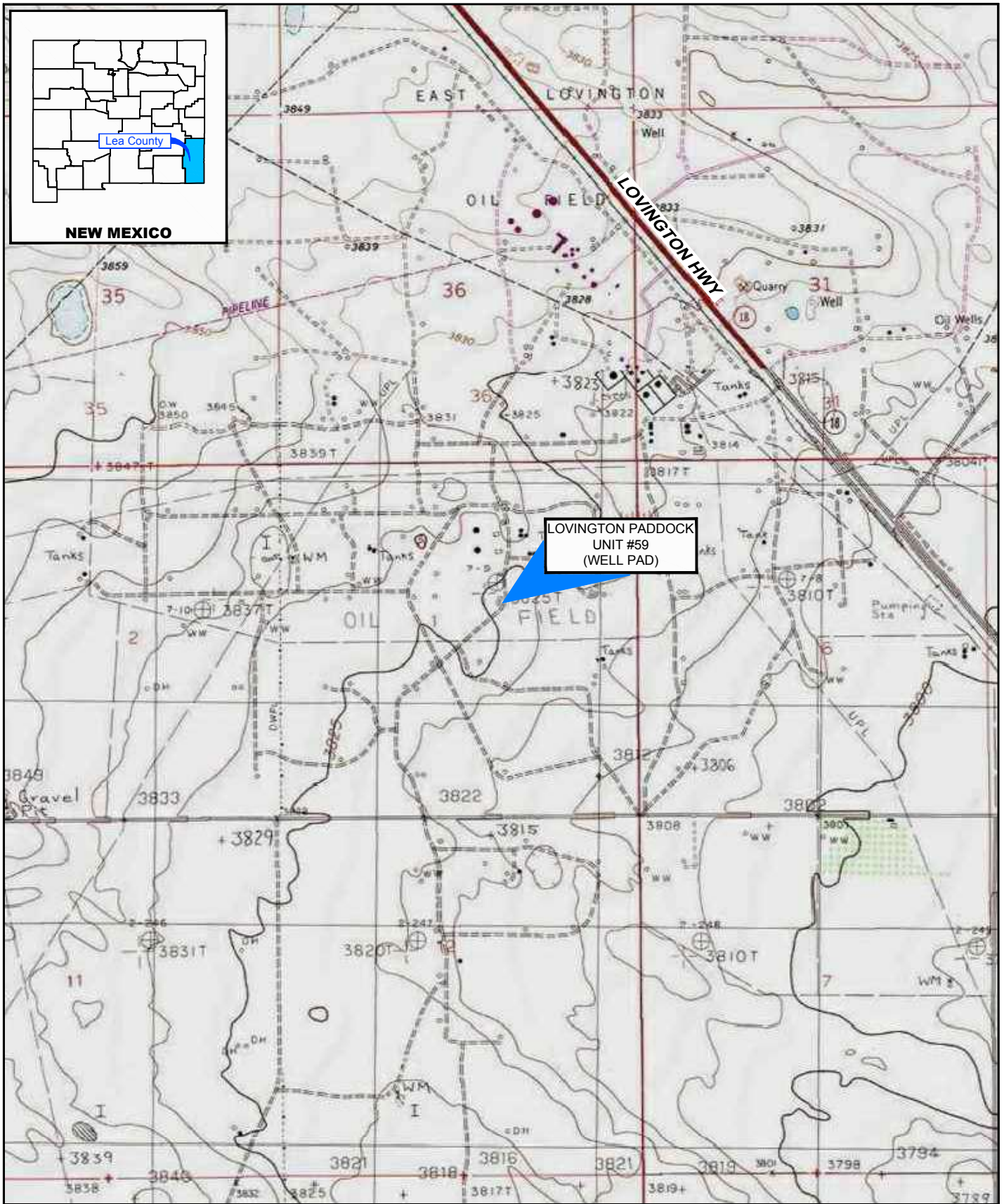
A handwritten signature in black ink that reads "Paige A. Hall".

Paige Hall
Project Manager

A handwritten signature in black ink that reads "Raaj U. Patel".

Raaj U. Patel, P.G.,
Senior Project Manager

Figures



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

Lat/Long: 32.8657° North, 103.3060° West

0 1000 2000ft

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



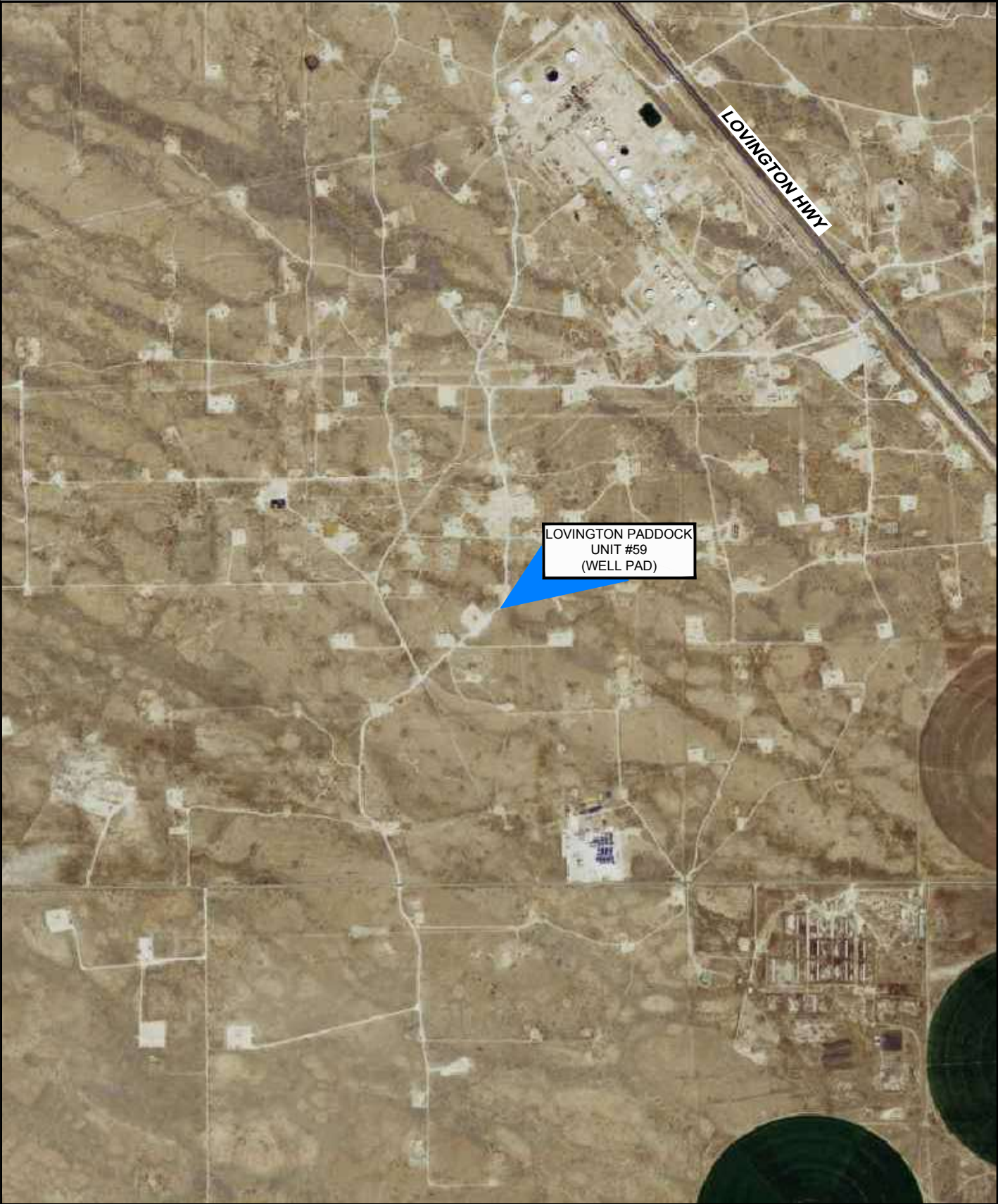
CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

SITE VICINITY MAP

073819-00
Feb 6, 2018

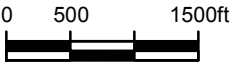
FIGURE 1

CAD File: H:\CAD\Files\07-1073-1073819-CEMC-LPU #59\073819-00\073819-00(006)\GN-DL001.dwg



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

Lat/Long: 32.8657° North, 103.3060° West



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

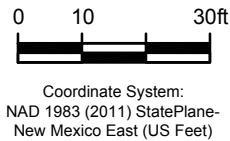


CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

SITE LOCATION MAP

073819-00
Feb 6, 2018

FIGURE 2



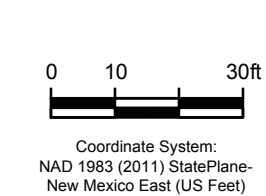
CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

SOIL BORING AND MONITOR WELL LOCATION MAP

073819-00
Nov 14, 2018

FIGURE 3





Sample ID	MW-2	10/31/18	Sample Date
	Chloride	137	Sample Result (mg/L)
	TDS	753	



CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00
Jan 2, 2019

CHLORIDE ANALYTICAL RESULTS MAP - GROUND WATER

FIGURE 5

Tables

Table 1

Summary of Soil Analytical Results
 Chevron Environmental Management Company
 Lovington Paddock Unit 59
 Lea County, New Mexico

Sample ID	Depth (feet)	Date	Benzene mg/kg	Toluene mg/kg	Ethyl- benzene mg/kg	Total Xylenes mg/kg	Total BTEX mg/kg	TPH			Chlorides mg/kg
								DRO mg/kg	GRO mg/kg	GRO/DRO mg/kg	
NMOCD Screening Standards											
			10	---	---	---	50	---	---	1,000	20,000
Restoration Requirements within the Top 4 feet bgs											
AH-1	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<200
	T-1	0.5-1	8/18/10	--	--	--	--	--	--	--	448.00
AH-2	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	2910.00
	T-2	0.5-1	8/18/10	--	--	--	--	--	--	--	1620.00
AH-3	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<400
	T-3	0.5-1	8/18/10	--	--	--	--	--	--	--	7140.00
AH-4	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	2720.00
	T-4	0.5-1	8/18/10	--	--	--	--	--	--	--	1650.00
AH-5	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<400
	T-5	0.5-1	8/18/10	--	--	--	--	--	--	--	515.00
AH-6	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<200
	T-6	0.5-1	8/18/10	--	--	--	--	--	--	--	534.00
SB-1	4-5	5/26/11	--	--	--	--	--	--	--	--	4.75
	9-10	5/26/11	--	--	--	--	--	--	--	--	54.10
	14-15	5/26/11	--	--	--	--	--	--	--	--	104.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	111.00
SB-2	4-5	5/26/11	--	--	--	--	--	--	--	--	102.00
	9-10	5/26/11	--	--	--	--	--	--	--	--	312.00
	14-15	5/26/11	--	--	--	--	--	--	--	--	706.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	1260.00
	24-25	5/26/11	--	--	--	--	--	--	--	--	1174.00
	29-30	5/26/11	--	--	--	--	--	--	--	--	1180.00
	34-35	5/26/11	--	--	--	--	--	--	--	--	1140.00
	39-40	5/26/11	--	--	--	--	--	--	--	--	622.00
SB-2B	49-50	12/18/12	--	--	--	--	--	--	--	--	606.00
	59-60	12/18/12	--	--	--	--	--	--	--	--	618.00
	69-70	12/18/12	--	--	--	--	--	--	--	--	176.00
SB-3	4-5	5/26/11	--	--	--	--	--	--	--	--	148.00
	9-10	5/26/11	--	--	--	--	--	--	--	--	436.00
	14-15	5/26/11	--	--	--	--	--	--	--	--	390.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	338.00
SB-3b	49-50	12/18/12	--	--	--	--	--	--	--	--	2210.00
	59-60	12/18/12	--	--	--	--	--	--	--	--	1750.00
	69-70	12/18/12	--	--	--	--	--	--	--	--	1690.00
SB-4	4-5	5/26/11	--	--	--	--	--	--	--	--	70.60
	9-10	5/26/11	--	--	--	--	--	--	--	--	12.00
	14-15	5/26/11	--	--	--	--	--	--	--	--	12.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	12.00
SB-5	4-5	5/26/11	--	--	--	--	--	--	--	--	4.96
	9-10	5/26/11	--	--	--	--	--	--	--	--	75.20
	14-15	5/26/11	--	--	--	--	--	--	--	--	22.40
	19-20	5/26/11	--	--	--	--	--	--	--	--	49.20
SB-6	0.5-1	10/19/17	--	--	--	--	--	--	--	--	5.19
	4-5	10/19/17	--	--	--	--	--	--	--	--	6.24
	9-10	10/19/17	--	--	--	--	--	--	--	--	11.80
	19-20	10/19/17	--	--	--	--	--	--	--	--	19.70
	29-30	10/19/17	--	--	--	--	--	--	--	--	225.00
	Dup.	29-30	10/19/17	--	--	--	--	--	--	--	222.00
SB-7	0.5-1	10/19/17	--	--	--	--	--	--	--	--	7.71
	4-5	10/19/17	--	--	--	--	--	--	--	--	<4.95
	9-10	10/19/17	--	--	--	--	--	--	--	--	17.50

Table 1

Summary of Soil Analytical Results
 Chevron Environmental Management Company
 Lovington Paddock Unit 59
 Lea County, New Mexico

Sample ID	Depth (feet)	Date	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Total BTEX	TPH			Chlorides
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	DRO mg/kg	GRO mg/kg	GRO/DRO mg/kg	mg/kg
NMOCD Screening Standards											
			10	---	---	---	50	---	---	1,000	20,000
Restoration Requirements within the Top 4 feet bgs											
SB-7	19-20	10/19/17	--	--	--	--	--	--	--	--	286.00
	29-30	10/19/17	--	--	--	--	--	--	--	--	--
	39-40	10/19/17	--	--	--	--	--	--	--	--	--
	49-50	10/19/17	--	--	--	--	--	--	--	--	--
	59-60	10/19/17	--	--	--	--	--	--	--	--	--
	69-70	10/19/17	--	--	--	--	--	--	--	--	52.00
	79-80	10/19/17	--	--	--	--	--	--	--	--	53.40
	89-90	10/19/17	--	--	--	--	--	--	--	--	78.10
SB-8	0.5-1	10/19/17	--	--	--	--	--	--	--	--	<4.94
	4-5	10/19/17	--	--	--	--	--	--	--	--	6.74
	9-10	10/19/17	--	--	--	--	--	--	--	--	<4.92
	19-20	10/19/17	--	--	--	--	--	--	--	--	84.40
SB-9	0.5-1	10/19/17	--	--	--	--	--	--	--	--	11.20
	4-5	10/19/17	--	--	--	--	--	--	--	--	17.70
	9-10	10/19/17	--	--	--	--	--	--	--	--	5.31
	19-20	10/19/17	--	--	--	--	--	--	--	--	58.20
SB-10	0.5-1	10/19/17	--	--	--	--	--	--	--	--	<4.93
	4-5	10/19/17	--	--	--	--	--	--	--	--	191.00
	9-10	10/19/17	--	--	--	--	--	--	--	--	645.00
	19-20	10/19/17	--	--	--	--	--	--	--	--	1400.00
	29-30	10/19/17	--	--	--	--	--	--	--	--	564.00
	39-40	10/19/17	--	--	--	--	--	--	--	--	423.00
	49-50	10/19/17	--	--	--	--	--	--	--	--	64.70
	59-60	10/19/17	--	--	--	--	--	--	--	--	28.90
SB-11	0.5-1	10/19/17	--	--	--	--	--	--	--	--	<24.6
	4-5	10/19/17	--	--	--	--	--	--	--	--	9.97
	9-10	10/19/17	--	--	--	--	--	--	--	--	<4.94
	19-20	10/19/17	--	--	--	--	--	--	--	--	<4.95
	29-30	10/19/17	--	--	--	--	--	--	--	--	--
	39-40	10/19/17	--	--	--	--	--	--	--	--	--
	49-50	10/19/17	--	--	--	--	--	--	--	--	--
	59-60	10/19/17	--	--	--	--	--	--	--	--	--
	69-70	10/19/17	--	--	--	--	--	--	--	--	12.30
	79-80	10/19/17	--	--	--	--	--	--	--	--	9.83
	89-90	10/19/17	--	--	--	--	--	--	--	--	13.80
MW-02	4	9/6/18	--	--	--	--	--	--	--	--	34.30
	10	9/6/18	--	--	--	--	--	--	--	--	20.20
	20	9/6/18	--	--	--	--	--	--	--	--	33.90
	30	9/6/18	--	--	--	--	--	--	--	--	13.10
	40	9/6/18	--	--	--	--	--	--	--	--	15.60
	50	9/6/18	--	--	--	--	--	--	--	--	28.80
	60	9/6/18	--	--	--	--	--	--	--	--	12.40
	70	9/6/18	--	--	--	--	--	--	--	--	19.30
	80	9/6/18	--	--	--	--	--	--	--	--	<5.44
	90	9/6/18	--	--	--	--	--	--	--	--	<5.31

Notes:

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

**Summary of Groundwater Analytical Results
 Chevron Environmental Management Company**

Lea County, New Mexico

<i>Well ID</i>	<i>Date</i>	<i>Benzene</i>	<i>Toluene</i>	<i>Ethylbenzene</i>	<i>Total Xylenes</i>	<i>TPH GRO</i>	<i>TPH DRO</i>	<i>Chloride</i>	<i>Total Dissolved Solids</i>
NMWQCC Standards		0.01	0.75	0.75	0.62	--	--	250	1000
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-1	10/19/16	<0.002	<0.002	<0.002	<0.002	<1.50	<1.50	117	--
	5/26/17	--	--	--	--	--	--	144	530
	10/19/17	<0.002	<0.002	<0.002	<0.002	<1.50	<1.50	117	--
	10/31/18	--	--	--	--	--	--	159	727
MW-2	10/31/18	--	--	--	--	--	--	137	753
Dup-1	10/31/18	--	--	--	--	--	--	141	689

NOTES:

NMWQCC - New Mexico Water Quality Control Commission

'mg/L' indicates milligrams per liter

-- indicates analyte not analyzed

- BTEX analysis by EPA Method 8021B.

- TPH analysis by Method SW8015B.

- Chloride analyzed by EPA Method 300.1

**Summary of MW-1 and MW-2 Electrical Conductivity Profile
Chevron Environmental Management Company
Lovington Paddock Unit 59
Lea County, New Mexico**

Well: MW-1
Date: 10/31/2018

Depth	Conductivity	Temperature
106.42		
110	880	20.0
115	882	20.0
120	887	20.0
125	871	20.0
130	822	20.0
135	805	20.0
140	766	20.0
145	763	20.1
150	766	20.1
155	768	20.1
160	772	20.1
165	771	20.1
170	782	20.1
175	783	20.2
180	785	20.2
185	787	20.2
190	787	20.2
195	787	20.2
200	789	20.2
205	787	20.2
210	790	20.2
215	790	20.2
220	790	20.2
225	791	20.2
230	793	20.2
231.76		

NOTES:

Depth - feet below top of casing

Conductivity - microseimens per centimeter

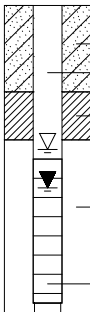
Temperature - degrees Celsius

Appendices

Appendix A

Monitoring Well Log and State Well Report (MW-2)

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW		WELL-GRADED GRAVELS WITH OR WITHOUT SAND
			GP		POORLY-GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GM		SILTY GRAVELS WITH OR WITHOUT SAND
			GC		CLAYEY GRAVELS WITH OR WITHOUT SAND
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW		WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP		POORLY-GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OL		ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OH		ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
	HIGHLY ORGANIC SOILS		PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

SYMBOLS KEY		ABBREVIATION KEY	
AK Air Knife  Auger Cuttings  Composite  Rock Core  Hydro-Vac  Hand Auger  Large Bore  Macro-Core  Modified Split Spoon  No Recovery  Post Hole Digger  Shelby Tube  Sonic Core  Split Spoon  Undisturbed Core  Vane Shear  Grout Blank Casing Bentonite Pellets First Encountered Groundwater Static Groundwater Filter Pack Screened Casing		CA - CHEMICAL ANALYSIS (CORROSIVITY) CD - CONSOLIDATED DRAINED TRIAXIAL CN - CONSOLIDATION CU - CONSOLIDATED UNDRAINED TRIAXIAL DS - DIRECT SHEAR PP - POCKET PENETROMETER (TSF) (3,0) - (WITH SHEAR STRENGTH IN KSF) RV - R-VALUE SA - SIEVE ANALYSIS: % PASSING #200 SIEVE (200) - (WITH % PASSING NO. 200 SIEVE) SW - SWELL TEST TC - CYCLIC TRIAXIAL TV - TORVANE SHEAR UC - UNCONFINED COMPRESSION (1.5) - (WITH SHEAR STRENGTH IN KSF) UU - UNCONSOLIDATED UNDRAINED TRIAXIAL WA - WASH ANALYSIS (200%) - (WITH % PASSING NO. 200 SIEVE)	



Key to Boring Log



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: LPU-59
PROJECT NUMBER: 073819
CLIENT: Chevron
LOCATION: Lovington
DRILLING COMPANY: HCI

HOLE DESIGNATION: MW-2
DATE COMPLETED: 6 September 2018
DRILLING METHOD: Hydro Excavation, Air Rotary, Mud Rotary
FIELD PERSONNEL: Sean Parry

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	Monitoring Well	SAMPLE				
				DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	Chloride (mg/kg)
5	fine sand with caliche, yellowish orange, dry			4	1.0			34.3
10				10	1.0			20.2
20				20	1.0			33.9
30		30.00		30	1.0			13.1
35	fine sand, light brown, dry			40	1.0			15.6
45				50	1.0			28.8
55				60	1.0			12.4
60		60.00		70	1.0			19.3
65	fine sand with pebbles, light yellowish orange, dry							
70		70.00						
	fine sand with some pebbles, light reddish brown, dry							

NOTES: Mud Rotary began at 90 FT BGS

WATER FOUND ▼

STATIC WATER LEVEL ▼

LABORATORY ANALYSIS ○

This log should not be used separately from the original report.



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: LPU-59
PROJECT NUMBER: 073819
CLIENT: Chevron
LOCATION: Lovington
DRILLING COMPANY: HCI

HOLE DESIGNATION: MW-2
DATE COMPLETED: 6 September 2018
DRILLING METHOD: Hydro Excavation, Air Rotary, Mud Rotary
FIELD PERSONNEL: Sean Parry

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	Monitoring Well	SAMPLE				
				DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	Chloride (mg/kg)
80	fine sand with some pebbles, light reddish brown, moist	80.00	Filter pack 8/16 sieve 4-inch SCH 40 PVC screen 0.010 slot WELL DETAILS Screened interval: 100.00 to 130.00ft BGS Length: 30ft Slot Size: 0.01 Material: PVC Seal: 0.00 to 95.00ft BGS Material: Cement Bentonite Mix Sand Pack: 95.00 to 130.00ft BGS Material: 8/16 sieve sand BOREHOLE DIAMETER 8	80	1.0	1.0		<5.44
85								
90				90	1.0	1.0		<5.44
95								
100	poorly graded sand with caliche, very light brown	100.00						
105								
110	poorly graded sand with caliche, light brown	110.00						
115								
120	poorly graded sand, reddish brown	120.00						
125								
130	poorly graded sand, reddish brown END OF BOREHOLE @ 130.0ft BGS	129.00 130.00						
135								
140								
145								
NOTES: Mud Rotary began at 90 FT BGS WATER FOUND ▼ STATIC WATER LEVEL ▼ LABORATORY ANALYSIS ○								

OVERBURDEN LOG 073819 - LPU 59.GPJ CRA_CORP.GDT 25/9/18

This log should not be used separately from the original report.



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION	OSE POD NO. (WELL NO.) L 14207 POD 8 (MW-2)		WELL TAG ID NO.		OSE FILE NO(S).			
	WELL OWNER NAME(S) CHEVRON EMC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 1400 SMITH STREET				CITY HOUSTON	STATE TX	ZIP 77002	
	WELL LOCATION (FROM GPS)	DEGREES 32	MINUTES 51	SECONDS 56.019 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND			
		LONGITUDE 103	18	20.3898 W	* DATUM REQUIRED: WGS 84			
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE								
2. DRILLING & CASING INFORMATION	LICENSE NO. 1731		NAME OF LICENSED DRILLER KENNY COOPER			NAME OF WELL DRILLING COMPANY HARRISON & COOPER, INC,		
	DRILLING STARTED 09/06/2018		DRILLING ENDED 09/06/2018		DEPTH OF COMPLETED WELL (FT) 130'	BORE HOLE DEPTH (FT) 130'	DEPTH WATER FIRST ENCOUNTERED (FT)	
	COMPLETED WELL IS: ARTESIAN DRY HOLE SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT)		
	DRILLING FLUID: AIR MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: ROTARY HAMMER CABLE TOOL OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0	100	8	RISER	FJ	4"	SCH.40	
	100	130	8	SCREEN	FJ	4"	SCH.40	.010
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0	2	8	CONCRETE	1	POURED		
	2	95	8	CEMENT/BENTONITE	2	TREMMIE		
	95	130	8	SAND - 8/16	2	TREMMIE		

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)	
	FROM	TO					
	0	30	30	SAND - FINE, yellowishorange DRY, CONTAINS CALICHE	Y	N	
	30	60	30	SAND - FINE, LIGHT BROWN, DRY	Y	N	
	60	70	10	SAND - LIGHT YELLOWISH ORANGE, DRY, CONTAINS PEBBLES	Y	N	
	70	80	10	SAND - LIGHT REDDISHBROWN, DRY, CONTAINS PEBBLES	Y	N	
	80	100	20	SAND - LIGHT REDDISHBROWN, MOIST, CONTAINS PEBBLES	Y	N	
	100	110	10	SAND - VERY LIGHT BROWN, CONTAINS CALICHE	Y	N	
	110	120	10	SAND - LIGHT BROWN, CONTAINS CALICHE	Y	N	
	120	130	10	SAND - REDDISHBROWN	Y	N	
					Y	N	
					Y	N	
					Y	N	
					Y	N	
					Y	N	
					Y	N	
					Y	N	
	METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:				TOTAL ESTIMATED WELL YIELD (gpm):		0
	PUMP AIR LIFT BAILER OTHER – SPECIFY:						
	5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.				
MISCELLANEOUS INFORMATION:							
PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:							
6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:						
	KENNY COOPER			11/14/2018			
SIGNATURE OF DRILLER / PRINT SIGNEE NAME				DATE			

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 2 OF 2

Appendix B

Laboratory Analytical Reports – 2018



Certificate of Analysis Summary 598441

GHD Services, INC- Midland, Midland, TX

Project Name: CEMC LPU-59



Project Id: 073819-2018-001

Contact: Scott Foord

Project Location:

Date Received in Lab: Sat Sep-08-18 08:00 am

Report Date: 21-SEP-18

Project Manager: Debbie Simmons

<i>Analysis Requested</i>	<i>Lab Id:</i>	598441-001	598441-002	598441-003	598441-004	598441-005	598441-006
	<i>Field Id:</i>	MW2-4-060918	MW2-10-060918	MW2-20-060918	MW2-30-060918	MW2-40-060918	MW2-50-060918
	<i>Depth:</i>	4-	10-	20-	30-	40-	50-
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-06-18 11:30	Sep-06-18 11:35	Sep-06-18 11:40	Sep-06-18 11:45	Sep-06-18 11:50	Sep-06-18 11:55
Chloride by EPA 300	<i>Extracted:</i>	Sep-11-18 12:15	Sep-11-18 12:15	Sep-11-18 12:15	Sep-11-18 12:15	Sep-11-18 12:15	Sep-11-18 12:15
	<i>Analyzed:</i>	Sep-11-18 15:10	Sep-11-18 15:16	Sep-11-18 15:41	Sep-11-18 15:47	Sep-11-18 15:53	Sep-11-18 15:59
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		34.3 5.52	20.2 5.36	33.9 5.38	13.1 5.41	15.6 5.56	28.8 5.37
Percent Moisture	<i>Extracted:</i>	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40
	<i>Analyzed:</i>	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40
	<i>Units/RL:</i>	% RL	% RL	% RL	% RL	% RL	% RL
Percent Moisture		9.99	6.94	7.24	7.56	10.1	6.30

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use.
The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories.
XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented.
Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Debbie Simmons
Project Manager



Certificate of Analysis Summary 598441

GHD Services, INC- Midland, Midland, TX

Project Name: CEMC LPU-59



Project Id: 073819-2018-001

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Date Received in Lab: Sat Sep-08-18 08:00 am

Report Date: 21-SEP-18

Project Manager: Debbie Simmons

<i>Analysis Requested</i>	<i>Lab Id:</i>	598441-007	598441-008	598441-009	598441-010		
	<i>Field Id:</i>	MW2-60-060918	MW2-70-060918	MW2-80-060918	MW2-90-060918		
	<i>Depth:</i>	60-	70-	80-	90-		
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL		
	<i>Sampled:</i>	Sep-06-18 11:57	Sep-06-18 12:00	Sep-06-18 12:05	Sep-06-18 12:10		
Chloride by EPA 300	<i>Extracted:</i>	Sep-11-18 12:15	Sep-11-18 12:15	Sep-11-18 12:15	Sep-11-18 14:00		
	<i>Analyzed:</i>	Sep-11-18 16:06	Sep-11-18 16:12	Sep-11-18 16:18	Sep-11-18 16:55		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Chloride		12.4 5.16	19.3 5.51	<5.44 5.44	<5.31 5.31		
Percent Moisture	<i>Extracted:</i>	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40		
	<i>Analyzed:</i>	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40	Sep-11-18 11:40		
	<i>Units/RL:</i>	% RL	% RL	% RL	% RL		
Percent Moisture		3.42	9.46	8.02	5.48		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Debbie Simmons
Project Manager

Analytical Report 598441

for
GHD Services, INC- Midland

Project Manager: Scott Foord

CEMC LPU-59

073819-2018-001

21-SEP-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-18-27), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-13)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-17)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-16)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)

Xenco-Atlanta (LELAP Lab ID #04176)

Xenco-Tampa: Florida (E87429)

Xenco-Lakeland: Florida (E84098)



21-SEP-18

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

Reference: XENCO Report No(s): **598441**
CEMC LPU-59
Project Address:

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) 598441. 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. 598441 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,

Debbie Simmons

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 - Midland - San Antonio - Phoenix - Oklahoma - Latin America



Sample Cross Reference 598441



GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW2-4-060918	S	09-06-18 11:30	4	598441-001
MW2-10-060918	S	09-06-18 11:35	10	598441-002
MW2-20-060918	S	09-06-18 11:40	20	598441-003
MW2-30-060918	S	09-06-18 11:45	30	598441-004
MW2-40-060918	S	09-06-18 11:50	40	598441-005
MW2-50-060918	S	09-06-18 11:55	50	598441-006
MW2-60-060918	S	09-06-18 11:57	60	598441-007
MW2-70-060918	S	09-06-18 12:00	70	598441-008
MW2-80-060918	S	09-06-18 12:05	80	598441-009
MW2-90-060918	S	09-06-18 12:10	90	598441-010



CASE NARRATIVE

Client Name: *GHD Services, INC- Midland*

Project Name: *CEMC LPU-59*

Project ID: 073819-2018-001
Work Order Number(s): 598441

Report Date: 21-SEP-18
Date Received: 09/08/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-4-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-001

Date Collected: 09.06.18 11.30

Sample Depth: 4

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 9.99

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	34.3	5.52	mg/kg	09.11.18 15.10		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-10-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-002

Date Collected: 09.06.18 11.35

Sample Depth: 10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 6.94

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	20.2	5.36	mg/kg	09.11.18 15.16		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-20-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-003

Date Collected: 09.06.18 11.40

Sample Depth: 20

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 7.24

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	33.9	5.38	mg/kg	09.11.18 15.41		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-30-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-004

Date Collected: 09.06.18 11.45

Sample Depth: 30

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 7.56

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	13.1	5.41	mg/kg	09.11.18 15.47		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-40-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-005

Date Collected: 09.06.18 11.50

Sample Depth: 40

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 10.12

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	15.6	5.56	mg/kg	09.11.18 15.53		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-50-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-006

Date Collected: 09.06.18 11.55

Sample Depth: 50

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 6.3

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	28.8	5.37	mg/kg	09.11.18 15.59		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-60-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-007

Date Collected: 09.06.18 11.57

Sample Depth: 60

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 3.42

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	12.4	5.16	mg/kg	09.11.18 16.06		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-70-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-008

Date Collected: 09.06.18 12.00

Sample Depth: 70

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 9.46

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	19.3	5.51	mg/kg	09.11.18 16.12		1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-80-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-009

Date Collected: 09.06.18 12.05

Sample Depth: 80

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: OJS

% Moisture: 8.02

Analyst: SCM

Date Prep: 09.11.18 12.15

Basis: Dry Weight

Seq Number: 3062836

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.44	5.44	mg/kg	09.11.18 16.18	U	1



Certificate of Analytical Results 598441

**GHD Services, INC- Midland, Midland, TX**
CEMC LPU-59Sample Id: **MW2-90-060918**

Matrix: Soil

Date Received: 09.08.18 08.00

Lab Sample Id: 598441-010

Date Collected: 09.06.18 12.10

Sample Depth: 90

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: SCM

% Moisture: 5.48

Analyst: SCM

Date Prep: 09.11.18 14.00

Basis: Dry Weight

Seq Number: 3062839

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.31	5.31	mg/kg	09.11.18 16.55	U	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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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



GHD Services, INC- Midland CEMC LPU-59

Analytical Method: Chloride by EPA 300

Seq Number: 3062836

MB Sample Id: 7662038-1-BLK

Matrix: Solid

LCS Sample Id: 7662038-1-BKS

Prep Method: E300P

Date Prep: 09.11.18

LCSD Sample Id: 7662038-1-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	254	102	255	102	90-110	0	20	mg/kg	09.11.18 13:13	

Analytical Method: Chloride by EPA 300

Seq Number: 3062839

MB Sample Id: 7662040-1-BLK

Matrix: Solid

LCS Sample Id: 7662040-1-BKS

Prep Method: E300P

Date Prep: 09.11.18

LCSD Sample Id: 7662040-1-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	260	104	258	103	90-110	1	20	mg/kg	09.11.18 16:43	

Analytical Method: Chloride by EPA 300

Seq Number: 3062836

Parent Sample Id: 598340-001

Matrix: Soil

MS Sample Id: 598340-001 S

Prep Method: E300P

Date Prep: 09.11.18

MSD Sample Id: 598340-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	322	250	558	94	556	94	90-110	0	20	mg/kg	09.11.18 14:58	

Analytical Method: Chloride by EPA 300

Seq Number: 3062836

Parent Sample Id: 598350-001

Matrix: Soil

MS Sample Id: 598350-001 S

Prep Method: E300P

Date Prep: 09.11.18

MSD Sample Id: 598350-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	82.5	250	330	99	331	99	90-110	0	20	mg/kg	09.11.18 15:35	

Analytical Method: Chloride by EPA 300

Seq Number: 3062839

Parent Sample Id: 598439-006

Matrix: Soil

MS Sample Id: 598439-006 S

Prep Method: E300P

Date Prep: 09.11.18

MSD Sample Id: 598439-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	4.28	294	303	102	302	101	90-110	0	20	mg/kg	09.11.18 18:28	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



GHD Services, INC- Midland CEMC LPU-59

Analytical Method: Chloride by EPA 300

Seq Number: 3062839

Parent Sample Id: 598441-010

Matrix: Soil

MS Sample Id: 598441-010 S

Prep Method: E300P

Date Prep: 09.11.18

MSD Sample Id: 598441-010 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.912	266	262	98	262	98	90-110	0	20	mg/kg	09.11.18 17:01	

Analytical Method: Percent Moisture

Seq Number: 3062818

Matrix: Solid

MB Sample Id: 3062818-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<	%	09.11.18 11:40	

Analytical Method: Percent Moisture

Seq Number: 3062818

Matrix: Soil

Parent Sample Id: 598439-063

MD Sample Id: 598439-063 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	6.64	6.17	7	20	%	09.11.18 11:40	

Analytical Method: Percent Moisture

Seq Number: 3062818

Matrix: Soil

Parent Sample Id: 598441-010

MD Sample Id: 598441-010 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	5.48	5.48	0	20	%	09.11.18 11:40	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * [(C - E) / (C + E)]$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



Chain of Custody

Houston, TX (281) 240-4200 Dallas, TX (214) 902-0300 San Antonio, TX (210) 509-3334

Midland, TX (432-704-5440) EL Paso, TX (915) 585-3443 Lubbock, TX (806) 794-1296

Hobbs, NM (575-392-7550) Phoenix, AZ (480-355-0900) Atlanta, GA (770-449-8800) Tampa, FL (813-620-2000)

Work Order No: 598441

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Page 1 of 1

Project Manager:	Scott Foord	Bill to: (if different)	Cenergy Partners c/o Jason Michaelson
Company Name:	GHD	Company Name:	Chevron Environmental Management Company
Address:	2135 S. Loop 250 West	Address:	1400 Smith Street, Office 07084
City, State ZIP:	Midland, TX. 79703	City, State ZIP:	Houston, TX. 77002
Phone:	713-734-3090	Email:	Christopher.Knight@ghd.com & William.Foord@ghd.com

Work Order Comments	
Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐	
State of Project:	
Reporting: Level II ☐ Level III ☐ PST/UST ☐ RRP ☐ Level IV ☐	
Deliverables: EDD ☐ ADaPT ☐ Other:	

Project Name:	CEMC LPU-59	Turn Around	ANALYSIS REQUEST															Work Order Notes				
Project Number:	073819-2018-001	Routine ☒																TAT starts the day received by the lab, if received by 4:30pm				
P.O. Number:		Rush:																				
Sampler's Name:	Sean Parry	Due Date:																				
SAMPLE RECEIPT		Temp Blank: ☒ Yes ☐ No																	Wet Ice: ☒ Yes ☐ No			
Temperature (°C):	0.3	Thermometer ID																	Sample Comments			
Received Intact:	☒ Yes ☐ No																					
Cooler Custody Seals:	Yes ☒ No ☐ N/A	Correction Factor: 0.0																				
Sample Custody Seals:	Yes ☒ No ☐ N/A	Total Containers:																				
Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	Chloride	% Moisture															
MW2-4-060918	S	9/6/18	1130	4	1	/	/															
MW2-10-060918	S	9/6/18	1135	10	1	/	/															
MW2-20-060918	S	9/6/18	1140	20	1	/	/															
MW2-30-060918	S	9/6/18	1145	30	1	/	/															
MW2-40-060918	S	9/6/18	1150	40	1	/	/															
MW2-50-060918	S	9/6/18	1155	50	1	/	/															
MW2-60-060918	S	9/6/18	1157	60	1	/	/															
MW2-70-060918	S	9/6/18	1200	70	1	/	/															
MW2-80-060918	S	9/6/18	1205	80	1	/	/															
MW2-90-060918	S	9/6/18	1210	90	1	/	/															

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Ti Sn U V Zn
 Circle Method(s) and Metal(s) to be analyzed TCLP / SPLP 6010: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Ti U 1631 / 245.1 / 7470 / 7471 : Hg

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 losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 <i>[Signature]</i>	<i>[Signature]</i>	9/7/18 0855	2 <i>[Signature]</i>	<i>[Signature]</i>	0900 9/8/18
3			4		
5			6		

ORIGIN ID: H0BA (575) 392-7350
MAIL SERVICES ETC, LLC
4008 N GRIMES
HOBBS, NM 88240
UNITED STATES US

SHIP DATE: 07SEP18
ACTWGT: 62.00 LB MAN
CAD: 0909328/CAFE3210
DIMS: 25x15x14 IN
BILL RECIPIENT

TO XENCO LABORATORIES
FEDEX OFFICE PRINT & SHIP CENTER
FEDEX OFFICE PRINT & SHIP CENTER
200 W INTERSTATE 20
MIDLAND TX 79701

REF: (432) 563-1800 DEPT:

INV: PO:



FedEx Express


TRK# 6606 3917 7594
0201

41 MAFA

SATURDAY HOLD
PRIORITY OVERNIGHT
HLD
MAFKI
TX-US LBB



ID 09/16

551C1/F78C/184C
J18111804200100



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: GHD Services, INC- Midland

Date/ Time Received: 09/08/2018 08:00:00 AM

Work Order #: 598441

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?	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:

Brianna Teel

Date: 09/10/2018

Checklist reviewed by:

Debbie Simmons

Date: 09/11/2018



Certificate of Analysis Summary 604309

GHD Services, INC- Midland, Midland, TX

Project Name: CEMC LPU-59



Project Id: 073819-2018-001

Contact: Scott Foord

Project Location:

Date Received in Lab: Fri Nov-02-18 11:15 am

Report Date: 13-NOV-18

Project Manager: Debbie Simmons

<i>Analysis Requested</i>	Lab Id: 604309-001 Field Id: MW-1-W-181031 Depth: Matrix: GROUND WATER Sampled: Oct-31-18 12:30	Lab Id: 604309-002 Field Id: MW-2-W-181031 Depth: Matrix: GROUND WATER Sampled: Oct-31-18 11:10	Lab Id: 604309-003 Field Id: DUP-1-W-181031 Depth: Matrix: GROUND WATER Sampled: Oct-31-18 00:00			
Chloride by EPA 300	Extracted: Nov-07-18 10:00 Analyzed: Nov-07-18 12:39 Units/RL: mg/L RL	Extracted: Nov-07-18 11:00 Analyzed: Nov-07-18 18:21 Units/RL: mg/L RL	Extracted: Nov-07-18 11:00 Analyzed: Nov-07-18 18:31 Units/RL: mg/L RL			
Chloride	159 2.50	137 2.50	141 2.50			
TDS by SM2540C	Extracted: Analyzed: Nov-06-18 09:00 Units/RL: mg/L RL	Extracted: Analyzed: Nov-06-18 09:00 Units/RL: mg/L RL	Extracted: Analyzed: Nov-06-18 09:00 Units/RL: mg/L RL			
Total Dissolved Solids	727 5.00	753 5.00	689 5.00			

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Debbie Simmons
Project Manager

Analytical Report 604309

for
GHD Services, INC- Midland

Project Manager: Scott Foord

CEMC LPU-59

073819-2018-001

13-NOV-18

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):

Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):

Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)

Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)

Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)

Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)

Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)

Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)

Xenco-Atlanta (LELAP Lab ID #04176)

Xenco-Tampa: Florida (E87429)

Xenco-Lakeland: Florida (E84098)



13-NOV-18

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

Reference: XENCO Report No(s): **604309**
CEMC LPU-59
Project Address:

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) 604309. 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. 604309 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,

A handwritten signature in cursive script that reads 'Debbie Simmons'.

Debbie Simmons

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 - Midland - San Antonio - Phoenix - Oklahoma - Latin America

**Sample Cross Reference 604309****GHD Services, INC- Midland, Midland, TX**

CEMC LPU-59

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1-W-181031	W	10-31-18 12:30		604309-001
MW-2-W-181031	W	10-31-18 11:10		604309-002
DUP-1-W-181031	W	10-31-18 00:00		604309-003



CASE NARRATIVE

Client Name: *GHD Services, INC- Midland*

Project Name: *CEMC LPU-59*

Project ID: 073819-2018-001
Work Order Number(s): 604309

Report Date: 13-NOV-18
Date Received: 11/02/2018

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None



Certificate of Analytical Results 604309



GHD Services, INC- Midland, Midland, TX CEMC LPU-59

Sample Id: **MW-1-W-181031**

Matrix: Ground Water

Date Received: 11.02.18 11.15

Lab Sample Id: 604309-001

Date Collected: 10.31.18 12.30

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 11.07.18 10.00

Seq Number: 3069004

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	159	2.50	mg/L	11.07.18 12.39		5

Analytical Method: TDS by SM2540C

Tech: OJS

% Moisture:

Analyst: OJS

Seq Number: 3068878

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	727	5.00	mg/L	11.06.18 09.00		1



Certificate of Analytical Results 604309



GHD Services, INC- Midland, Midland, TX CEMC LPU-59

Sample Id: **MW-2-W-181031**

Matrix: Ground Water

Date Received: 11.02.18 11.15

Lab Sample Id: 604309-002

Date Collected: 10.31.18 11.10

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 11.07.18 11.00

Seq Number: 3069122

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	137	2.50	mg/L	11.07.18 18.21		5

Analytical Method: TDS by SM2540C

Tech: OJS

% Moisture:

Analyst: OJS

Seq Number: 3068878

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	753	5.00	mg/L	11.06.18 09.00		1



Certificate of Analytical Results 604309



GHD Services, INC- Midland, Midland, TX CEMC LPU-59

Sample Id: **DUP-1-W-181031**

Matrix: Ground Water

Date Received: 11.02.18 11.15

Lab Sample Id: 604309-003

Date Collected: 10.31.18 00.00

Analytical Method: Chloride by EPA 300

Prep Method: E300P

Tech: CHE

% Moisture:

Analyst: CHE

Date Prep: 11.07.18 11.00

Seq Number: 3069122

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	141	2.50	mg/L	11.07.18 18.31		5

Analytical Method: TDS by SM2540C

Tech: OJS

% Moisture:

Analyst: OJS

Seq Number: 3068878

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	689	5.00	mg/L	11.06.18 09.00		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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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



GHD Services, INC- Midland CEMC LPU-59

Analytical Method: Chloride by EPA 300

Seq Number: 3069004

MB Sample Id: 7665626-1-BLK

Matrix: Water

LCS Sample Id: 7665626-1-BKS

Prep Method: E300P

Date Prep: 11.07.18

LCSD Sample Id: 7665626-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	24.1	96	24.2	97	90-110	0	20	mg/L	11.07.18 11:17	

Analytical Method: Chloride by EPA 300

Seq Number: 3069122

MB Sample Id: 7665651-1-BLK

Matrix: Water

LCS Sample Id: 7665651-1-BKS

Prep Method: E300P

Date Prep: 11.07.18

LCSD Sample Id: 7665651-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	24.3	97	24.3	97	90-110	0	20	mg/L	11.07.18 17:29	

Analytical Method: Chloride by EPA 300

Seq Number: 3069004

Parent Sample Id: 604625-001

Matrix: Drinking Water

MS Sample Id: 604625-001 S

Prep Method: E300P

Date Prep: 11.07.18

MSD Sample Id: 604625-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	8.25	25.0	34.6	105	34.7	106	90-110	0	20	mg/L	11.07.18 11:48	

Analytical Method: Chloride by EPA 300

Seq Number: 3069004

Parent Sample Id: 604651-001

Matrix: Drinking Water

MS Sample Id: 604651-001 S

Prep Method: E300P

Date Prep: 11.07.18

MSD Sample Id: 604651-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	10.5	25.0	37.9	110	37.9	110	90-110	0	20	mg/L	11.07.18 14:13	

Analytical Method: Chloride by EPA 300

Seq Number: 3069122

Parent Sample Id: 604626-001

Matrix: Drinking Water

MS Sample Id: 604626-001 S

Prep Method: E300P

Date Prep: 11.07.18

MSD Sample Id: 604626-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	12.8	25.0	38.5	103	38.5	103	90-110	0	20	mg/L	11.07.18 18:00	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C-A) / B$
 $RPD = 200 * |(C-E) / (C+E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
 A = Parent Result
 C = MS/LCS Result
 E = MSD/LCSD Result

MS = Matrix Spike
 B = Spike Added
 D = MSD/LCSD % Rec



GHD Services, INC- Midland CEMC LPU-59

Analytical Method: Chloride by EPA 300

Seq Number: 3069122

Parent Sample Id: 604789-001

Matrix: Drinking Water

MS Sample Id: 604789-001 S

Prep Method: E300P

Date Prep: 11.08.18

MSD Sample Id: 604789-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	64.7	259	63.7	255	90-110	2	20	mg/L	11.08.18 11:58	X

Analytical Method: TDS by SM2540C

Seq Number: 3068878

MB Sample Id: 3068878-1-BLK

Matrix: Water

LCS Sample Id: 3068878-1-BKS

LCSD Sample Id: 3068878-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	<5.00	1000	963	96	959	96	80-120	0	10	mg/L	11.06.18 09:00	

Analytical Method: TDS by SM2540C

Seq Number: 3068878

Parent Sample Id: 604307-001

Matrix: Ground Water

MD Sample Id: 604307-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	1080	1190	10	10	mg/L	11.06.18 09:00	

Analytical Method: TDS by SM2540C

Seq Number: 3068878

Parent Sample Id: 604310-003

Matrix: Ground Water

MD Sample Id: 604310-003 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	449	448	0	10	mg/L	11.06.18 09:00	

MS/MSD Percent Recovery
Relative Percent Difference
LCS/LCSD Recovery
Log Difference

$[D] = 100 * (C - A) / B$
 $RPD = 200 * |(C - E) / (C + E)|$
 $[D] = 100 * (C) / [B]$
 Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec



Chain of Custody

Houston, TX (281) 240-4200 Dallas, TX (214) 902-0300 San Antonio, TX (210) 509-3334

Midland, TX (432) 704-5440 EL Paso, TX (915) 585-3443 Lubbock, TX (806) 794-1296

Hobbs,NM (575-392-7550) Phoenix,AZ (480-355-0900) Atlanta,GA (770-449-8800) Tampa,FL (813-620-2000)

Work Order No: W937

www.xenco.com Page 1 of 1

Project Manager:	Scott Foord	Bill to: (if different)	Jason Michaelson
Company Name:	GHD	Company Name:	Chevron Enviromental Management Company
Address:	2135 S. Loop 250 West	Address:	1400 Smith Street, Office 07094
City, State ZIP:	Midland, TX. 79703	City, State ZIP:	Houston, TX. 77002
Phone:	713-734-3090 or 281-725-7477	Email:	William.Foord@ghd.com & Christopher.Knight@ghd.com & Megan.Willis@ghd.com

Work Order Comments	
Program:	UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐
State of Project:	
Reporting:	Level II ☒ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐
Deliverables:	EDD ☐ ADaPT ☐ Other:

[illegible]

Total	200.7 / 6010	200.8 / 6020:	8RCRA	13PPM	Texas 11	Al	Sb	As	Ba	Be	B	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Mo	Ni	K	Se	Ag	SiO2	Na	Sr	Ti	Sn	U	V	Zn
<i>Circle Method(s) and Metal(s) to be analyzed</i>			TCLP / SPLP 6010:		8RCRA		Sb	As	Ba	Be	Cd	Cr	Co	Cu	Pb	Mn	Mo	Ni	Se	Ag	Ti	U											

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 losses are due to circumstances beyond the control of Xenco. A minimum charge of \$75.00 will be applied to each project and a charge of \$5 for each sample submitted to Xenco, but not analyzed. These terms will be enforced unless previously negotiated.

Relinquished by: (Signature)		Received by: (Signature)		Date/Time	
1					
3					
5					



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In



Client: GHD Services, INC- Midland

Date/ Time Received: 11/02/2018 11:15:00 AM

Work Order #: 604309

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
#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)?	N/A
#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: BT

PH Device/Lot#: A032690

Checklist completed by:

Katie Lowe

Date: 11/02/2018

Checklist reviewed by:

Debbie Simmons

Date: 11/02/2018

Appendix C

2019 Remediation Work Plan



March 21, 2019

Reference No. 073819

New Mexico Oil Conservation Division – District 1
 1625 N. French Drive
 Hobbs, New Mexico 88240

Dear NMOCD:

**Re: 2019 Remediation Work Plan
 Lovington Paddock Unit 59 – Produced Water Release (1RP-915)
 Lea County, New Mexico**

1. Project Information

The Site is located in Unit G, Section 1, Township 17 South, Range 36 East, approximately 5 miles southeast of the City of Lovington (COL) in Lea County, New Mexico. According to historical records provided to GHD, an estimated 40 barrels (10 barrels recovered) of produced water were released from a pipe in a valve box at this location on June 4, 2006. The approximate affected area was estimated at 200 feet x 200 feet.

2. NMOCD Closure Requirement Criteria for Soils

Subsurface investigation activities were completed in accordance with the Guidelines for Remediation of Leaks, Spills, and Releases Rule 19.15.29 New Mexico Administrative Code (NMAC) from the NMOCD dated August 13, 1993. The former the site-specific Recommended Remediation Action Levels (RRALs) previously applied to this location by the NMOCD were 10 milligrams per kilogram (mg/kg) for benzene, 50 mg/kg for total benzene, toluene, ethylbenzene, and xylenes (BTEX), 100 mg/kg for petroleum hydrocarbons (TPH), and 600 mg/kg for chloride.

Rule 19.15.29 was revised and reissued on August 14, 2018. The following criteria from Table 1 (below) within NMAC 19.15.29.12 was utilized to determine site-specific screening limits.

Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/l TDS	Constituent	Limit**
>100 feet	Chloride***	20,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

** Numerical limits or natural background level, whichever is greater.

*** This applies to release of produced water or other fluids which may contain chloride.



Localized depth to groundwater was confirmed to be approximately 107 feet below ground surface (bgs) in 2018 based on the information from monitoring wells MW-1 (located approximately on top of the original spill) and MW-2 (located approximately 120-feet to the southeast of the original spill). Additionally, information available from various sources including the New Mexico Office of the State Engineer (NMOSE) Point of Diversion (POD) Mapping Portal, Petroleum Recovery Research Center (PRRC) Mapping Portal, currently managed groundwater site(s) data by GHD, and the United States Geological Survey (USGS) Current Water Database for the Nation, concludes:

- a) the depth to groundwater at the Site is greater than 100-feet bgs;
- b) the site is not within 300 feet of any continuously flowing watercourse;
- c) the site is not within 200 feet of any lakebed, sinkhole or playa lake;
- d) the site is not within 300 feet of an occupied permanent residence, school, etc.;
- e) the site is not within 500 feet of a spring or private, domestic fresh water well;
- f) the site is not within 1,000 feet of any fresh water well or spring;
- g) the site is not within incorporated municipal boundaries or within a defined municipal fresh water well field;
- h) the site is not within 300 feet of a wetland;
- i) the site is not within an area overlying a subsurface mine;
- j) the site is not within an unstable area; and
- k) the site is not within a 100-year floodplain.

Consequently, the anticipated site-specific screening limits to be applied to this location by the NMOCD based on the revised Rule are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 2,500 mg/kg for total TPH, and 20,000 mg/kg for chloride.

Per 19.15.29.13, Restoration, Reclamation, and Re-vegetation, the impacted area must be remediated a minimum of 4-feet bgs with non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg. Soil cover must consist of topsoil at a thickness comparable to background topsoil thicknesses, or one foot of suitable earthen material capable of establishing and maintaining vegetation at the site. Reclamation is considered complete when all disturbed areas have established vegetative cover with a life-form ratio of plus or minus 50 percent of pre-remedial levels, and plant cover of a minimum of 70 percent of previous levels, excluding noxious weeds.

Evaluation of the analytical data obtained from soil assessment and delineation activities performed from 2010 through 2018 indicate horizontal and vertical delineation of chloride impacts to soil has been achieved at the Site to support remediation activities (excavation and lining of the area).



3. 2019 Scope of Work

The scope of work for this project in 2019 will involve soil remediation activities inclusive of excavation, sampling, lining the excavation, backfilling, and restoration (re-seeding of off-pad areas) of the impacted area (see Figure 1).

Chloride impacted caliche well pad material and soil will be excavated accompanied by confirmation soil sample analysis. Field screening of soils for chlorides will be performed in order to guide excavation activities. Subsequently, the excavation will be lined, backfilled with clean caliche material and soil, graded and contoured to ensure proper surface area drainage, and the soil (off-pad areas) fertilized and re-seeded. The following outlines basic project details that will be completed by GHD and GHD subcontractors.

Field Program

- Prior to mobilizing excavation equipment to the Site, a New Mexico 811 utility notification will be made at least 48-hours prior to mobilization.
- In addition to the utility locate, data from the geophysical survey conducted prior to 2018 drilling activities will be re-evaluated for the proposed excavation area.
- Following all utility clearance activities, a Chevron Dig Plan will be prepared and approved by Chevron prior to performing any excavation activities.
- Underground utilities in proximity to the proposed excavation area will be day-lighted via hydroexcavation prior to remedial excavation activities.
- GHD anticipates that pipeline operators will not allow excavation within 10 feet of any pipelines, therefore remediation within these areas will be deferred until operations of the pipelines cease.
- Approximately 560 cubic yards (cy) of shallow sub-surface area consisting of caliche well pad materials and off-pad soil areas will be excavated (Figure 1). Impacted soil in the affected area will be excavated until field screening indicates that the soil is below the limit for chloride (600 mg/kg) specified in NMMAC 19.15.29.13 D (1), or until a depth of 4 feet bgs is reached.
- Soils will be field screened for chloride during excavation activities utilizing Hach chloride test strips. Soils with field test results greater than 3,000 mg/kg chloride will be transported to an approved disposal facility. If field screening indicates that soils are below 3,000 mg/kg chloride, it will be segregated into 50-100 cy stockpiles and a 5-point composite sample will be collected and analyzed for chloride by EPA Method 300. Soils with analytical results above 600 mg/kg will be transported to the R360 facility located in Hobbs, New Mexico for disposal. Stockpiled soils with analytical results below 600 mg/kg will be further consolidated on-site for use as backfill.
- Five-point composite confirmation soil samples will be collected from the excavation floor and sidewalls at 200 square feet intervals for analysis of chloride by EPA Method 300. Lateral limits of the excavation will halt once confirmation sample analytical results are 600 mg/kg chloride or less.



- If impacts appear to extend past four feet bgs, the sides of the excavation will be sloped and a 20-mil polyethylene liner will be placed in the bottom of the excavation. Liner seams will be overlapped a minimum of 24 inches. Each liner will be placed without rips or tears.
- The excavation will be backfilled with caliche and soil from an off-site borrow pit (Pearce Ranch Trust) to grade.
- The disturbed off-pad area will be fertilized and re-seeded with a Bureau of Land Management-approved seed mix.

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 report summarizing remediation activities will be submitted. The 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 excavation and other Site features;
- Tabulation of field screening and laboratory analytical results; and
- Geotagged photographic documentation of field activities.

Vegetation Monitoring

Following completion of soil remediation activities at the Site, and as required by the New Mexico State Land Office (NMSLO), GHD will conduct vegetation monitoring visits to the Site. The status of vegetative growth within the remediated area will be documented with photographs and in field notes during each visit. A closure request report will be completed following one year of monitoring for submittal to NMSLO.

4. Work Plan Approval Request

GHD is prepared to initiate the scope of work following NMOCD approval of this work plan. 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.



Lat/Long: 32.8657° North, 103.3060° West



Sample ID	SB-2b	12/18/12	Sample Date
	Depth	4-5'	Sample Depth (ft)
	Chloride	606	Sample Result (mg/kg)



073819-00
Jan 12, 2019

FIGURE 1

Released to Imaging: 8/26/2026 10:56:41 AM



about GHD

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

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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 617883

CONDITIONS

Operator: CHEVRON TEXACO EXPLORATION & PRODUCTION CO. 15 Smith Road Midland, TX 79705	OGRID: 216419
	Action Number: 617883
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

CONDITIONS

Created By	Condition	Condition Date
bhall	documentation for the rescission of the approved sampling plan. The sampling plan was subsequently denied after the rescission.	8/26/2026