Deferral request is approved with the following conditions;
1. Remediation to be completed after the site has been decommissioned.
2. Remediation plan will require OCD pre-approval prior to its implementation.
3. Reclamation standards for soils less than 4 feet (ft.) below grade (b.g.) or when top of confining caliche layer is encountered at shallower depths, will meet Table 1 of 19.15.29.12 NMAC for groundwater less than 50 ft. b.g.

NV - 04/10/2023

Armando Martinez
Operations Lead, Portfolio Operations Central

October 20, 2021

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

Re: Vacuum Glorieta West Unit Tank Battery Sites
Deferral Request Report
NMOCD Case No. 1RP-2861 and 3293
Lea County, New Mexico

Dear Bradford Billings:

Chevron Environmental Management Company (CEMC) submits herein the *Deferral Request Report* for 1RP-2861 and 3293, Vacuum Glorieta West Unit Tank Battery Sites. The Report was prepared by Arcadis U.S., Inc. (Arcadis), on behalf of CEMC. Based on the data presented in this Report no further assessments or additional cleanup actions are required until after the abandonment of the facility. A deferral status is being requested for the Site.

If you have any questions regarding this submittal, please contact Scott Foord of Arcadis at (713) 953-4853 or me at (505) 690 5408.

Respectfully,

Armando Martinez

Encl. Deferral Request Report - Vacuum Glorieta West Unit Tank Battery Sites

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ARCADIS Design & Consultancy for natural and built assets

Chevron Environmental Management Company

2019 SITE DEFERRAL REPORT

Vacuum Glorieta West Unit Tank Battery Sites
Lea County, New Mexico

OGRID No. 4323
Case No. 1RP-2861 and 3293

July 2020

2019 SITE DEFERRAL REPORT

Vacuum Glorieta West Unit Tank Battery Sites

Prepared for:

Armando Martinez

Operation Lead Central

Chevron Environmental Management Company

P.O. Box 469

Questa, New Mexico 87556

Prepared by:

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Our Ref.:

B0048616.TBAT

Date:

July 13, 2020

Ryan Nanny
Project Geologist

Scott Foord, P.G.
Certified Project Manager

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TABLES

FIGURES

APPENDICES

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) has prepared this Closure Report (Report) report for Chevron Environmental Management Company (CEMC), to document soil assessment, groundwater assessment, and geophysical mapping activities performed at the Vacuum Glorieta West Unit (VGWU) Satellite 1 (VGWU Sat 1), Satellite 2 (VGWU Sat 2) and the Tank Battery (VGWU Tank Battery) release areas, referred to collectively as VGWU Tank Battery Sites, located in Lea County, New Mexico (Site). The Site background is discussed further in **Appendix A**. These activities were conducted in response to releases that occurred between February 2012 and November 2013.

2 INITIAL RELEASES AND ASSESSMENT ACTIVITES

2.1 February 1, 2012 Release

According to the New Mexico Oil Conservation Division (NMOCD) Release Notification and Corrective Action (Form C-141), the seal on the produced water tank charge pump leaked due to a bearing failure resulting in a release of approximately 13.5 barrels (bbls) of produced water on February 1, 2012. The release was contained within the limits of the tank battery. Chevron personnel stopped the release and conducted initial response activities, including recovery of approximately 11 bbls of produced water.

Pursuant to NMOCD requirements (NMOCD 1993), form C-141 was submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to NMOCD on February 2, 2012 is included in **Appendix B**. A Remediation Permit (RP) order number was not provided and could not be located for this release. It is understood that this release falls under the RPs associated with the November 1, 2012 and November 9, 2013 RPs.

2.2 November 1, 2012 Release (1RP-2861)

According to the NMOCD Form C-141, a leak occurred from a 6-inch diameter injection line from VGWU Satellite 2 (VGWU Sat 2) resulted in a release of approximately 45.8 bbls of produced water on November 1, 2012. The cause of the leak was unknown at the time of the response. The release occurred in a pasture south of the Tank Battery. Chevron personnel stopped the release and conducted initial response activities, including recovery of approximately 30 bbls of produced water.

Pursuant to NMOCD requirements (NMOCD 1993), a Form C-141 was submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to NMOCD on November 2, 2012 is included in **Appendix B**.

2.3 November 5, 2012 Release

According to the NMOCD Form C-141, a leak occurred from a 6-inch diameter injection line from VGWU Satellite 1 (VGWU Sat 1) resulted in a release of approximately 34.3 bbls of produced water and 1.3 bbls

of oil on November 5, 2012. The cause of the leak was unknown at the time of the response. Chevron personnel stopped the release and conducted initial response activities, including recovery of approximately 18.7 bbls of produced water and 1.3 bbls of oil.

Pursuant to NMOCD requirements (NMOCD 1993), a Form C-141 was submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to the NMOCD on November 8, 2012 is included in **Appendix B**. A RP order number was not provided and could not be located for this release. It is understood that this release falls under the RPs associated with the November 1, 2012 and November 9, 2013 RPs.

2.4 November 9, 2013 Release (1RP-3293)

According to the NMOCD Form C-141, the VGWU West Production Water (PW) Tank overflowed due to a water extraction well unexpectedly producing into the tank. This resulted in a release of approximately 14.48 bbls of produced water and 2.88 bbls of oil on November 9, 2013. Chevron personnel stopped the overflow and conducted initial response activities, including recovery of approximately 16.7 bbls of fluid.

Pursuant to NMOCD requirements (NMOCD 1993), a Form C-141 submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to the NMOCD on November 23, 2013 is included in **Appendix B**. Note that an assumed typo occurred on the Form C-141 which states that the form was submitted on October 23, 2013, one month prior to the actual release that occurred at the Site.

2.5 Response Activities

Response activities were conducted on January 22, 2013 and December 9, 2013. In January 2013, Chevron personnel excavated visually affected soil in the VGWU Sat 1 injection line and VGWU Sat 2 trunk line areas which correspond to the November 5, 2012 and November 1, 2012 spill location, respectively. Excavation activities were conducted by Chevron personnel at the VGWU West PW Tank in December 2013 which corresponds to the November 9, 2013 spill location. Information regarding response activities concerning the February 2, 2012 release was not provided and could not be located. However, according to Form C-141 submitted to NMOCD on February 2, 2012 in the “Describe Area Affected and Cleanup Action Taken”, Chevron states that the next steps are for the visually contaminated caliche to be excavated up to 2 ft and sent off for disposal. During the January and December response activities, discrete confirmation soil samples were collected from the base of the excavated areas (**Figure 1**). Soil samples were submitted to Cardinal Laboratories in Hobbs, NM for the analysis of the following:

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8021B,
- Total petroleum hydrocarbons as gasoline range organics (TPH-GRO) and total petroleum hydrocarbons as diesel range organics (TPH-DRO) by USEPA Method 8015M,
- Chloride by USEPA Method SM4500Cl-B.

Based on the information in the NMOCD Form C-141, the depth of the excavated areas and sample collection depth are assumed to be 2 ft bgs. Information regarding the disposal of the excavated soil was

not available to Arcadis. After collecting the soil samples, the excavated area was reportedly backfilled with imported soil. Analytical results are summarized in **Table 1** and displayed in **Figure 1**. The laboratory analytical report with chain of custody documentation is provided in **Appendix C**.

A summary of the analytical results for the four soil samples collected from the VGWU Sat 1 spill location are as follows:

- BTEX compounds were not detected above laboratory reporting limits,
- TPH-GRO was not detected above laboratory reporting limits,
- TPH-DRO was detected in one soil sample (VGWUSAT1ILSAMPLE#2) at a concentration of 140 milligrams per kilogram (mg/kg),
- Chloride was detected in each sample collected with concentrations ranging from 1,410 mg/kg (VGWUSAT1ILSAMPLE#1) to 4,880 mg/kg (VGWUSAT1ILSAMPLE#3).

A summary of the analytical results for the three soil samples collected from the VGWU Sat 2 spill location is as follows:

- BTEX compounds were not detected above laboratory reporting limits,
- TPH-GRO was not detected above laboratory reporting limits,
- TPH-DRO was detected in each soil sample collected with concentrations ranging from 131 mg/kg (VGWUSAT2TL SAMPLE #1) to 1,020 mg/kg (VGWUSAT2TL SAMPLE #3),
- Chloride was detected in each sample collected with concentrations ranging from 6,530 mg/kg (VGWUSAT2TL SAMPLE #3) to 20,400 mg/kg (VGWUSAT2TL SAMPLE #2).

A summary of the analytical results for the three soil samples collected from the VGWU West PW Tank spill location is as follows:

- Benzene was detected in each soil sample collected with concentrations ranging from 0.568 mg/kg (VGWUBTY SS #1) to 48.8 mg/kg (VGWUBTY SS #3),
- Toluene was detected in each soil sample collected with concentrations ranging from 9.66 mg/kg (VGWUBTY SS #1) to 365 mg/kg (VGWUBTY SS #3),
- Ethylbenzene was detected in each soil sample collected with concentrations ranging from 8.76 mg/kg (VGWUBTY SS #1) to 300 mg/kg (VGWUBTY SS #3),
- Total BTEX was detected in each soil sample collected with concentrations ranging from 30.6 mg/kg (VGWUBTY SS #1) to 1,100 mg/kg (VGWUBTY SS #3),
- TPH-GRO was detected in each soil sample collected with concentrations ranging from 3,450 mg/kg (VGWUBTY SS #2) to 9,900 mg/kg (VGWUBTY SS #3),
- TPH-DRO was detected in each soil sample collected with concentrations ranging from 10,900 mg/kg (VGWUBTY SS #2) to 31,500 mg/kg (VGWUBTY SS #3),

Chloride was detected in each sample collected with concentrations ranging from 2,040 mg/kg (VGWUBTY SS #1) to 9,600 mg/kg (VGWUBTY SS #2).

3 2017 SOIL ASSESSMENT

3.1 Assessment Activities

Additional soil assessment activities were conducted on August 16, 2017. Twenty-three surface soil samples were collected within the VGWU Tank Battery Sites shown on **Figure 2**, as follows:

- Eight samples were collected to assess the November 5, 2012 spill location, referred to as VGWU Sat 1 (VGWUSAT1INJ-01 through VGWUSAT1INJ-08),
- Seven samples were collected to assess the November 1, 2012 spill location, referred to as VGWU Sat 2 (VGWUSAT2TRUNK-01 through VGWUSAT2TRUNK-07),
- Eight samples were collected to assess the February 1, 2012 spill location, referred to as VGWU Tank Battery (VGWUBAT-01 through VGWUBAT-08).

Soil sample depths ranged from 0.55-ft to 2 ft bgs. Sample locations are shown on **Figure 2** and sample methodology is described further in **Appendix D**. Soil samples were placed in laboratory-supplied containers and submitted under appropriate chain of custody protocols to Xenco Laboratories (Xenco) in Midland, TX for analysis of chloride by USEPA Method 300/300.1. Laboratory analytical results with chain of custody documentation are provided in **Appendix C**.

3.2 Assessment Results

Analytical results for the 23 surface soil samples collected in August 2017 are summarized in **Table 1**. These results are compared to the NMOCD closure criteria (CC) outlined in Title 19, Chapter 15, Part 29 (19.15.29) of the New Mexico Administrative Code (NMAC) concerning natural resources and wildlife, oil and gas, and releases which became effective on August 14, 2018. Since depth to groundwater at the Site has been confirmed greater than 100 ft bgs (**Table 2**), the closure criteria for chloride concentrations in the soil is 20,000 mg/kg.

Chloride was detected in each of the 23 surface soil samples collected at the Tank Battery Sites. Concentrations ranged from:

- 102 mg/kg (VGWUSAT1INJ-01) to 4,510 mg/kg (VGWUSAT1INJ-05) in the VGWU Sat 1 area,
- 263 mg/kg (VGWUSAT2TRUNK-06) to 2,910 mg/kg (VGWUSAT2TRUNK-04) in the VGWU Sat 2 area, and
- 62 mg/kg (VGWUBAT-01) to 8,100 mg/kg (VGWUBAT-05) in the VGWU Tank Battery area.

Chloride concentrations were below the 2018 NMAC CC of 20,000 mg/kg in each surface soil sample collected in August 2017.

4 2017 GEOPHYSICAL SURVEY

On June 28, 2017, Arcadis performed an electromagnetic conductivity survey over accessible areas of the Site covering approximately 5 acres (**Figures 3** through **6**). The objective of the survey was to determine background electrical conductivity (EC) response and identify EC anomalies within the surveyed area to assess the lateral extent of possible produced water-related soil and impacts.

The particularly high electrical conductivity of oil field production water makes the detection of produced water-related soil impacts by geophysical methods sensitive to the electrical conductivity of soil and groundwater a reliable approach. There are several methods that can be used for quantifying the EC of soil and groundwater, but a class of instruments which utilize the concept of electromagnetic induction to measure EC are very effective in many situations. Electromagnetic (EM) instruments that operate in what is known as the frequency domain are well suited for shallow investigations. EM conductivity instruments consist of co-planar transmitter and receiver coils, and a power source that can be handled by one or two persons. During the operation of the instrument, the transmitter coil is energized by an alternating current and radiates an electromagnetic field into the earth. This transmitted primary field induces electrical currents in the earth below the instrument. The magnitude of the induced current is proportional to the EC of the earth materials beneath the instrument. The induced current flow generates a secondary electromagnetic field, phase-lagged behind the primary field, that is detected by the receiver coil on the instrument. The receiver coil also detects the primary field and uses the ratio of the secondary to primary field to calculate the EC of the earth. This reading represents a bulk EC measurement, known as the apparent EC, within a volume of ground directly beneath the instrument down to its effective depth of penetration. The penetration depth is determined by the transmitter frequency, coil separation, height of instrument off the ground surface, and orientation of the coils.

For this Site, Arcadis performed shallow-imaging EM surveys with two hand-held instruments: 1) a Model EM31-MK2 EM conductivity meter manufactured by Geonics Limited, and 2) a GEM-2 broadband electromagnetic sensor manufactured by Geophex Ltd. The EM31-MK2 is designed to map the apparent EC in the upper 18 ft of the subsurface. The EM-31MK2 operating frequency is 9.8 kilohertz (kHz) and the co-planar coils are separated by 12 ft. For the survey, the EM-31MK2 was operated in the vertical magnetic dipole mode (VMD) with approximate 9 ft to 18-ft effective sensing depth.

The GEM-2 is a digital, multi-frequency sensor capable of transmitting and receiving a digitally synthesized arbitrary waveform containing multiple frequencies. The approximate depth of exploration for a given earth medium is determined by the operating frequency of the sensor. By utilizing multiple frequencies to measure the earth response from several depths, a concept of the approximate three-dimensional distribution of subsurface materials can be created. The quad-phase and in-phase instrument response values are stored in a handheld computer for subsequent processing. Data were collected in vertical dipole mode using five discrete frequencies (63 kHz, 18.3 kHz, 5.3 kHz, 1.5 kHz, and 0.45 kHz). The higher instrument frequencies are sensitive to shallow variations in the subsurface, while the lower instrument frequencies are more sensitive to deeper variations in the subsurface.

Data from both instruments were collected along lines spaced approximately 10 ft apart with nearly continuous data coverage along these lines. Positioning information was provided by a Hemisphere A100 global positioning system (GPS) receiver with dynamic, real time correction (submeter accuracy). GPS and instrument response data were simultaneously recorded in a handheld field computer. All GPS and

geophysical data collected during the survey were merged into a single data file for subsequent data processing.

Once the two EM data sets were collected, they were transferred to a laptop computer while on Site. The data sets were preprocessed (Trackmaker31 program from Geonics Limited (EM-31) and WinGEM from Geophex Ltd. (GEM-2)) and imported into Surfer Version 15 to create relative conductivity maps. A raw plot of the GPS positions was created to verify the sufficiency of data coverage, which was verified affirmatively. Preliminary contour plots of the raw apparent conductivity data were also created while on Site to verify that the data were within acceptable bounds and that project objectives were being met. To further assess EC variations in the subsurface, a GEM-2 2D profile A-A' was inverse-modeled using the software IX1Dv3 by Interpex to produce an electrical resistivity cross-section of the subsurface depicted in **Figure 6**. Modeled GEM-2 2D data at depths near the limit of the penetration of the GEM-2 instrument are less constrained with results typically displaying distortions near the base of the model.

4.1 Interpretation of Geophysical Results

Figures 3 through **5** present color-filled contour maps for the 63kHz GEM2 data (4-ft to 8-ft sensing depth), the 18.3kHz GEM2 data (6-ft to 10-ft sensing depth), and the EM-31MK2 data (9 to 18-ft sensing depth), respectively. **Figure 6** presents GEM-2 2D modelling results along the A-A' profile. Interpreted locations of metallic pipelines (based on field observations, aerial photographs, and the EM results) are denoted in the figures. The locations of 2017 shallow soil samples are depicted in **Figures 3** through **6**. Chloride results in mg/kg from the 2017 soil samples are displayed in the lower panel of **Figure 6**.

The color scale used in **Figures 3** through **6** is designed to visually portray the deviation from the background EC conditions, which are in the gray to blue green range. In contrast, anomalous areas of high EC are shown in upper portion of the color scale, from green to yellow to red, progressively indicating higher EC, which is generally assumed to reflect proportionately higher TDS pore fluids (produced water influence) or conductive metallic features (Site structure or subsurface utilities). Anomaly intensity and physical dimensions typically reveal whether the anomalies are due to pore fluid chemistry or metallic objects. Note that the data output for the GEM-2 model profile presented in **Figure 6** is in units of electrical resistivity (ohm-meters) which is the inverse quantity of electrical conductivity measured in millisiemens per meter (mS/m). A corresponding color scale is used in **Figure 6** to depict areas of low electrical resistivity in the A-A' profile with warm colors (yellow to red) that correlate to areas of high EC in the contour maps.

In the plan-view EC maps (**Figures 3** through **5**), several zones of anomalously high EC values are present throughout the tank battery Site. In particular, the 18.3 kHz GEM-2 EC (6 ft to 10-ft sensing depth) map presented in **Figure 4** displays anomalously high EC >200 mS/m (red colors) in four primary areas:

- East of the Satellite 2 trunk line spill area, near soil sample locations VGWUSAT2TRUNK-04, VGWUSAT2TRUNK-05, and VGWUSAT2TRUNK-06
- East of the VGWU West Production Water (PW) Tank, near soil sample location VGWUBAT-05
- Northwest of the Satellite 1 trunk line spill area, near soil sample location VGWUSATINJ-01

- Southwest of the Satellite 1 trunk line spill area, near of soil sample locations VGWUSATINJ-05 and VGWUSATINJ-06.

It should be noted that the locations of the significantly high EC values generally are in close proximity to metallic Site features such as above ground storage tanks, associated conveyance piping, perimeter fencing, and utilities. These metallic utilities may interfere with EC data quality and/or exaggerate the magnitude and spatial extent of anomalously high EC zones. An example of data interference attributed to metallic Site features is labeled in the **Figure 6** A-A' profile, from approximately 230 ft to 265 ft from the beginning of the profile where a resistivity data artifact is produced. Furthermore, anomalously high EC features that display a linear pattern may suggest the dispersion of produced water impacts along underground utilities/pipelines.

The GEM-2 A-A' profile shown in **Figure 6** displays the modelled EC response through the Satellite 1 trunk line spill area. In general, the A-A' profile shown in **Figure 6** displays a similar lateral extent of high EC response as the **Figures 3** through **6**, with high conductivity responses displayed in the subsurface beneath soil samples VGWUSAT1INJ-05, VGWUSAT1ING-01, VGWUSAT1INJ-02, and VGWUSAT1INJ-04. The high EC response in these areas extends to the base of the model (approximately 18 ft bgs), suggesting that produced water impacts may extend into deeper soils.

5 2018 GROUNDWATER ASSESSMENT

5.1 Monitoring Well Installation and Groundwater Sampling

Arcadis installed groundwater monitoring well VGWUBATTERY-MW1 on October 1, 2018. Groundwater at the Site was measured at a depth of 133.50 ft bgs in VGWUBATTERY-MW1 on October 2, 2018 (**Table 2**).

This monitoring well was drilled downgradient from the Tank Battery release areas to assess chloride concentrations in groundwater (**Figure 7**).

The monitoring well location was cleared using air knife to 6 inches bgs, not the required 8 ft bgs, due to refusal from caliche caprock. The Arcadis drill crew was given approval by Jason Michelson from CEMC to continue with drilling to a total depth of 153.42 ft bgs air/mud rotary. The monitor well was approved by the NMOSE for construction within the open borehole using nominal 4-inch outside diameter (OD) schedule 40 poly vinyl chloride (PVC) casing. The screened interval was to extend across the saturated thickness of the aquifer (120 ft to 150 ft bgs) and constructed of 4-inch diameter 0.10-inch machine-slotted PVC casing. Depth to static groundwater was measured following installation at approximately 133.50 ft bgs. Soil cuttings were continuously logged for lithologic characteristics according to the United Soil Classification System (USCS) and field screened for the presence of volatile organic compounds in five foot intervals using a photo ionization detector (PID) in combination with visual and field screening methods for evidence of petroleum hydrocarbons. The PID meter used during this assessment was calibrated daily with fresh air and isobutylene gas. PID soil screening results ranged from 2.7 parts per million (ppm) at 25 ft bgs to 339.8 ppm at 105 ft bgs. The soil boring log for VGWUBATTERY-MW1 is provided in **Appendix E** and the approved NMOSE permit to explore, signed September 17, 2018, for installing VGWUBATTERY-MW1 is provide in **Appendix F**.

Arcadis developed groundwater monitoring well VGWUBATTERY-MW1 on October 2, 2018. This monitoring well was purged for 35 minutes at 20 gallons per minute (gpm) for a total of 720 gallons. After development, a groundwater grab sample and duplicate groundwater grab sample was collected in laboratory-supplied containers and submitted under appropriate chain of custody protocols to Xenco for the analysis for chloride in accordance with the USEPA Method 300/300.1. Laboratory analytical results with chain of custody documentation are provided in **Appendix C**.

Upon receiving laboratory confirmation, the soil cuttings generated during well installation were taken to Sundance Services in Eunice, New Mexico for disposal in accordance with state and federal regulations on October 22, 2018.

5.2 Groundwater Sample Results

Groundwater analytical results were compared the Human Health Standards outlined in Title 20, Chapter 6, Part 2 (20.6.2) of the NMAC concerning environmental protection, water quality, ground and surface water protection which became effective on December 1, 1995.

Chloride was detected at a concentration of 96.9 milligrams per liter (mg/L) in VGWUBATTERY-MW1. Detected chloride concentrations in the groundwater sample did not exceed the NMAC human heath standard value of 250 mg/L. The groundwater analytical results for chloride are provided in **Table 2**.

6 WELL PLUG AND ABANDONMENT

Arcadis plugged and abandoned (P&A) the one groundwater monitoring well located downgradient from the Tank Battery release areas (VGWUBATTERY-MW1) on October 22, 2019. All aboveground features of the well including stovepipe, and concrete pad were destroyed and removed. After the removal of the aboveground features, the well casing was cut off to 3 ft bgs using a pneumatic tool in order minimize damage to equipment that may operate in this area in the future. The wells were pressure grouted with concrete slurry. The NMOSE plugging records and P&A field notes for VGWUBATTERY-MW1 are included in **Appendix F**.

7 SUMMARY AND CONCLUSIONS

Chloride-affected soil has been delineated to the extent possible. Analysis of confirmation and surface soil samples collected from VGWU Tank Battery (February 1, 2012 spill), VGWU Satellite 2 (November 1, 2012 spill), VGWU Satellite 1 (November 5, 2012 spill) and the VGWU West PW Tank (November 9, 2013) spill locations in 2013 and 2017 resulted in chloride concentrations that were below the 2018 NMAC CC of 20,000 mg/kg with the exception of one sample collected from VGWU Satellite 2 in 2013 which had a chloride concentration of 20,400 mg/kg (VGWUSAT2TLSAMPLE#2).

Several zones of anomalously high EC values are present throughout the tank battery Site. These higher EC areas are generally assumed to reflect proportionately higher TDS pore fluids (produced water influence) or conductive metallic features (Site structure or subsurface utilities). With the presence of metallic features within the area, it is difficult to correlate chloride concentrations to the geophysical data. However, the highest chloride concentrations were observed between ground surface and 2 ft bgs. The depth of the exceedances, in conjunction with the anticipated depth to groundwater (**Appendix G**) across

the Site, support a conclusion that impacted soil associated with the reported releases at the Sites pose no significant threat to groundwater resources or other receptors. The potential migration of remaining chloride to groundwater is not expected.

One monitoring well was installed on Site on October 1, 2018 to evaluate to potential impact to groundwater. Soil cuttings were screened in 5 ft intervals for VOCs using a PID meter that ranged from 2.7 parts per million (ppm) at 25 ft to 339.8 ppm at 105 ft. The detected chloride concentration from the grab groundwater sample from this well was 96.9 mg/L which is below NMAC human heath standard value of 250 mg/L. The well was plugged and abandoned on October 22, 2019 in accordance with the NMOSE approved well plug plan of operations as shown in **Appendix E**.

TPH and BTEX compounds have been delineated to the extent possible at the Site. Although analysis of confirmation soil samples collected in 2013 from the VGWU West PW Tank spill location resulted in exceedance of the 2018 NMAC CC for BTEX (50 mg/kg), TPH-GRO/DRO (1,000 mg/kg) and chloride (600 mg/kg for top four ft. bgs.), oilfield infrastructure, surface structures, aboveground and belowground pipeline, and utility corridors surround the Site. The presence of these structures poses a health and safety risk and prevents additional drilling and other subsurface work in this area. Delineation activities beyond the pipelines and oilfield equipment surrounding the release would not be representative of release area.

The data presented in this Report support a conclusion that affected soil associated with the release poses no significant threat to groundwater resources or other receptors.

8 RECOMMENDATIONS

Data presented in this Report support a conclusion that affected soil associated with the releases pose no significant threat to groundwater resources or other receptors. Due to the presence of oilfield infrastructure preventing additional drilling and other subsurface work in the area, and groundwater analytical results collected from VGWUBATTERY-MW1 indicating chloride has not impacted, nor is expected to impact groundwater due to the confining nature of the caprock caliche located beneath the Site and the highest chloride concentrations were observed between ground surface and 2 ft bgs, no further assessments or additional cleanup actions are required until after the abandonment of the facility. A deferral status is being requested for the Site.

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TABLES

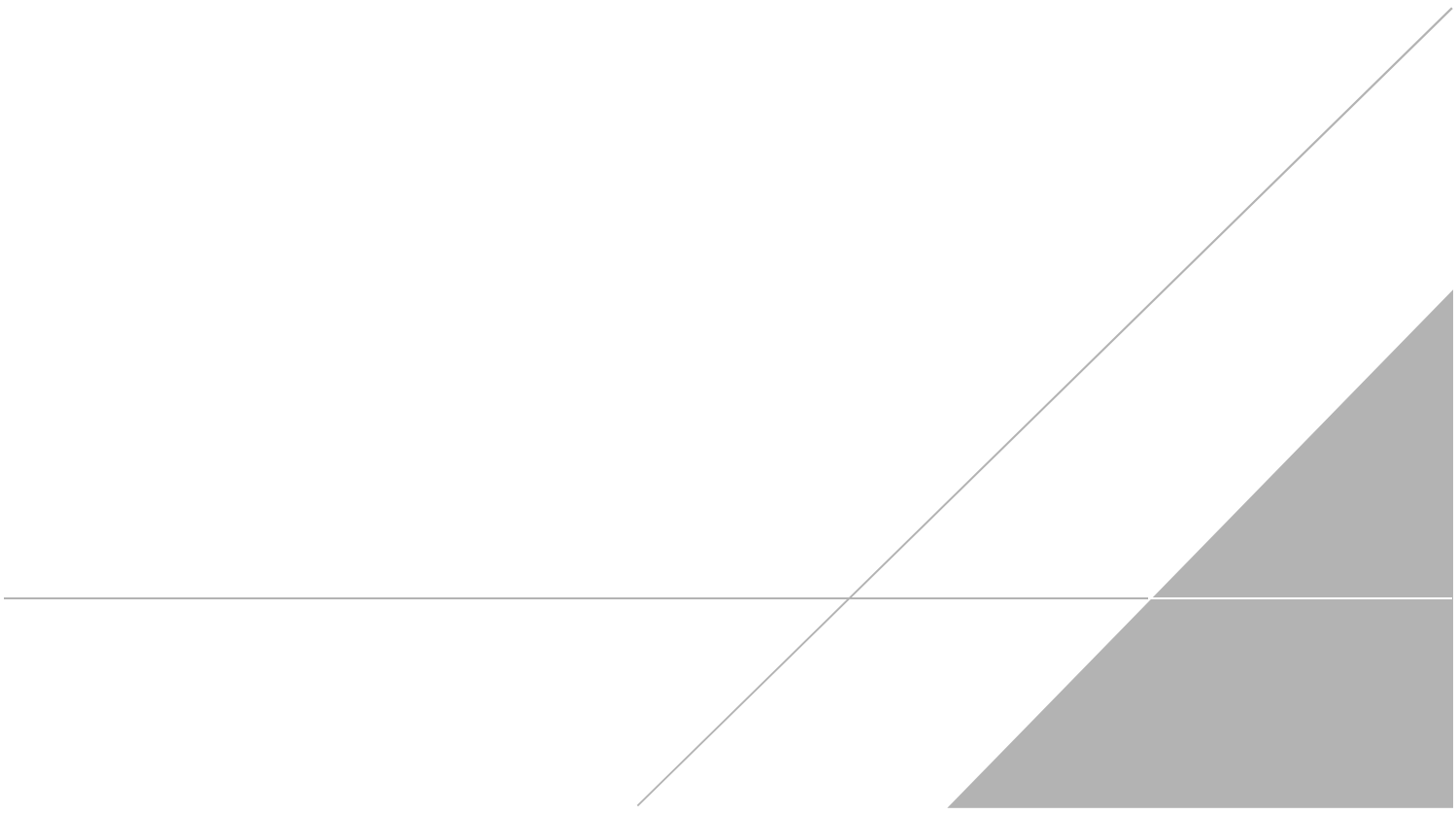


Table 1
Soil Analytical Results
Chevron EMC
Vacuum Glorieta West Unit Tank Battery Sites
Lea County, New Mexico

Boring Location ID	Sample Date	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Chloride (mg/kg)
NMAC Closure Criteria [(a)]			10	--	--	--	50	1,000		20,000
VGWUBTY SS #1	12/9/2013	2*	0.568	9.66	8.76	11.6	30.6	**5,610**	**15,900**	2,040
VGWUBTY SS #2	12/9/2013	2*	**19.8**	156	144	194	**513**	**3,450**	**10,900**	9,600
VGWUBTY SS #3	12/9/2013	2*	**48.8**	365	300	384	**1,100**	**9,900**	**31,500**	6,320
VGWUSAT1ILSAMPLE #1	1/22/2013	2*	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	1,410
VGWUSAT1ILSAMPLE #2	1/22/2013	2*	<0.050	<0.050	<0.050	<0.150	<0.300	<50.0	140	1,620
VGWUSAT1ILSAMPLE #3	1/22/2013	2*	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	4,880
VGWUSAT1ILSAMPLE #4	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	3,680
VGWUSAT2TL SAMPLE #1	1/22/2013	2*	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	131	8,200
VGWUSAT2TL SAMPLE #2	1/22/2013	2*	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	274	**20,400**
VGWUSAT2TL SAMPLE #3	1/22/2013	2*	<0.050	<0.050	<0.050	<0.150	<0.300	<50.0	**1,020**	6,530
VGWUSAT1INJ-01	8/16/2017	1.25	--	--	--	--	--	--	--	102
VGWUSAT1INJ-02	8/16/2017	0.80	--	--	--	--	--	--	--	1,400
VGWUSAT1INJ-03	8/16/2017	0.55	--	--	--	--	--	--	--	1,560
VGWUSAT1INJ-04	8/16/2017	1.95	--	--	--	--	--	--	--	1,470
VGWUSAT1INJ-05	8/16/2017	1	--	--	--	--	--	--	--	4,510
VGWUSAT1INJ-06	8/16/2017	2	--	--	--	--	--	--	--	2,150
VGWUSAT1INJ-07	8/16/2017	0.75	--	--	--	--	--	--	--	1,250
VGWUSAT1INJ-08	8/16/2017	0.80	--	--	--	--	--	--	--	303
VGWUSAT2TRUNK-01	8/16/2017	2	--	--	--	--	--	--	--	1,640
VGWUSAT2TRUNK-02	8/16/2017	1.60	--	--	--	--	--	--	--	334
VGWUSAT2TRUNK-03	8/16/2017	0.80	--	--	--	--	--	--	--	2,460
VGWUSAT2TRUNK-04	8/16/2017	1	--	--	--	--	--	--	--	2,910
VGWUSAT2TRUNK-05	8/16/2017	1	--	--	--	--	--	--	--	1,220
VGWUSAT2TRUNK-06	8/16/2017	1.16	--	--	--	--	--	--	--	263
VGWUSAT2TRUNK-07	8/16/2017	1	--	--	--	--	--	--	--	816
VGWUBAT-01	8/16/2017	1	--	--	--	--	--	--	--	62
VGWUBAT-02	8/16/2017	1	--	--	--	--	--	--	--	154
VGWUBAT-03	8/16/2017	1.50	--	--	--	--	--	--	--	123
VGWUBAT-04	8/16/2017	1	--	--	--	--	--	--	--	141
VGWUBAT-05	8/16/2017	1	--	--	--	--	--	--	--	8,100
VGWUBAT-06	8/16/2017	1	--	--	--	--	--	--	--	2,000
VGWUBAT-07	8/16/2017	0.90	--	--	--	--	--	--	--	4,870
VGWUBAT-08	8/16/2017	1	--	--	--	--	--	--	--	942

Legend:

Value	Analytical value is greater than or equal to NMAC closure criteria
mg/kg	Miligram(s) per kilogram
*	Assumed depth based on C141 Form
<	Analyte was not detected above the specified method reporting limit
--	Not Analyzed/Not Listed
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
NMAC	New Mexico Administrative Code
TPH-GRO	Total Petroleum Hydrocarbons as Gasoline Range Organics
TPH-DRO	Total Petroleum Hydrocarbons as Diesel Range Organics

Notes:
(a) Title 19, Chapter 15 of the NMAC for Natural Resources and Wildlife, Oil and Gas, and Releases, 19.15.29 NMAC. August.

Table 2
Summary of Groundwater Analytica and Gauging
Chevron EMC
Vacuum Glorieta West Unit Tank Battery Sites
Lea County, New Mexico

Well ID	Sample Date	DTW (ft bgs)	Chloride [1] (mg/L)
NMAC Standards [2]			*250*
VGWUBATTERY-MW1	10/2/2018	133.5	96.9
	10/2/2018 (DUP)	--	97.6

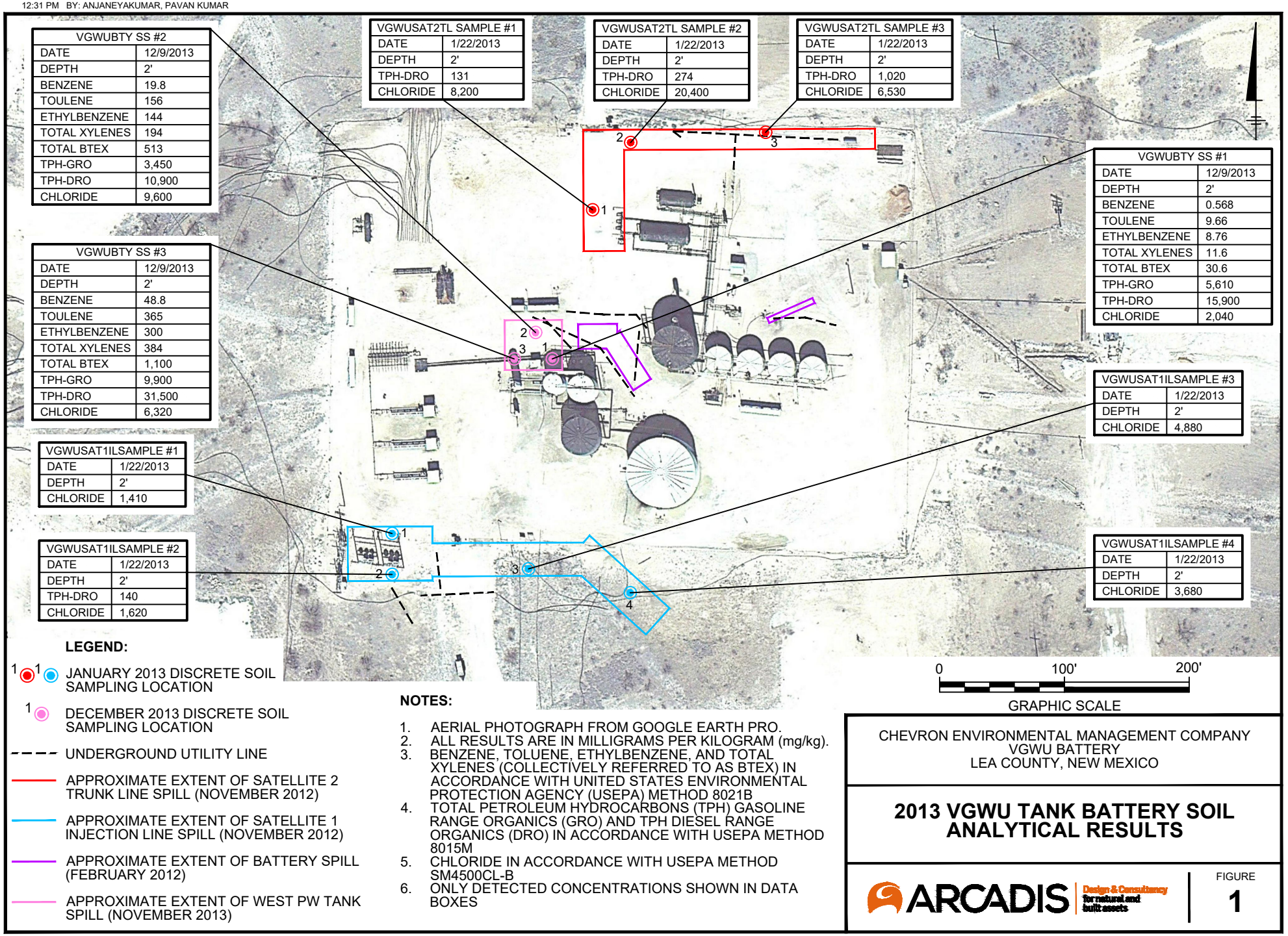
Legend:

--	Not applicable or not measured
mg/L	Miligram(s) per kilogram
DTW	Depth to groundwater
ft bgs	Below ground surface
NMAC	New Mexico Administration Code
DUP	Field duplicate sample

Notes:
1. Chloride analyzed by EPA Method 300/300.1.
2. Title 20, Chapter 6 of the NMAC for Environmental Protection, Water Quality, Ground and Surface Water Protection, 20.6.2 NMAC. December.

FIGURES

CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM
C:\Users\PAI01041\OneDrive - ARCADIS\BIM 360 Docs\CHEVRON CORPORATION\VGWU Tank Battery\2018\B0048787.0002\01-DWG\SoilData-Fig1.dwg LAYOUT: 1 SAVED: 11/26/2018 12:31 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/26/2018 12:31 PM BY: ANJANEYAKUMAR, PAVAN KUMAR



VGWUBTY SS #2	
DATE	12/9/2013
DEPTH	2'
BENZENE	19.8
TOULENE	156
ETHYLBENZENE	144
TOTAL XYLENES	194
TOTAL BTEX	513
TPH-GRO	3,450
TPH-DRO	10,900
CHLORIDE	9,600

VGWUSAT2TL SAMPLE #1	
DATE	1/22/2013
DEPTH	2'
TPH-DRO	131
CHLORIDE	8,200

VGWUSAT2TL SAMPLE #2	
DATE	1/22/2013
DEPTH	2'
TPH-DRO	274
CHLORIDE	20,400

VGWUSAT2TL SAMPLE #3	
DATE	1/22/2013
DEPTH	2'
TPH-DRO	1,020
CHLORIDE	6,530

VGWUBTY SS #1	
DATE	12/9/2013
DEPTH	2'
BENZENE	0.568
TOULENE	9.66
ETHYLBENZENE	8.76
TOTAL XYLENES	11.6
TOTAL BTEX	30.6
TPH-GRO	5,610
TPH-DRO	15,900
CHLORIDE	2,040

VGWUBTY SS #3	
DATE	12/9/2013
DEPTH	2'
BENZENE	48.8
TOULENE	365
ETHYLBENZENE	300
TOTAL XYLENES	384
TOTAL BTEX	1,100
TPH-GRO	9,900
TPH-DRO	31,500
CHLORIDE	6,320

VGWUSAT1ILSAMPLE #3	
DATE	1/22/2013
DEPTH	2'
CHLORIDE	4,880

VGWUSAT1ILSAMPLE #1	
DATE	1/22/2013
DEPTH	2'
CHLORIDE	1,410

VGWUSAT1ILSAMPLE #2	
DATE	1/22/2013
DEPTH	2'
TPH-DRO	140
CHLORIDE	1,620

VGWUSAT1ILSAMPLE #4	
DATE	1/22/2013
DEPTH	2'
CHLORIDE	3,680

LEGEND:

- JANUARY 2013 DISCRETE SOIL SAMPLING LOCATION
- DECEMBER 2013 DISCRETE SOIL SAMPLING LOCATION
- UNDERGROUND UTILITY LINE
- APPROXIMATE EXTENT OF SATELLITE 2 TRUNK LINE SPILL (NOVEMBER 2012)
- APPROXIMATE EXTENT OF SATELLITE 1 INJECTION LINE SPILL (NOVEMBER 2012)
- APPROXIMATE EXTENT OF BATTERY SPILL (FEBRUARY 2012)
- APPROXIMATE EXTENT OF WEST PW TANK SPILL (NOVEMBER 2013)

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.
2. ALL RESULTS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).
3. BENZENE, TOLUENE, ETHYLBENZENE, AND TOTAL XYLENES (COLLECTIVELY REFERRED TO AS BTEX) IN ACCORDANCE WITH UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) METHOD 8021B
4. TOTAL PETROLEUM HYDROCARBONS (TPH) GASOLINE RANGE ORGANICS (GRO) AND TPH DIESEL RANGE ORGANICS (DRO) IN ACCORDANCE WITH USEPA METHOD 8015M
5. CHLORIDE IN ACCORDANCE WITH USEPA METHOD SM4500CL-B
6. ONLY DETECTED CONCENTRATIONS SHOWN IN DATA BOXES

0 100' 200'

GRAPHIC SCALE

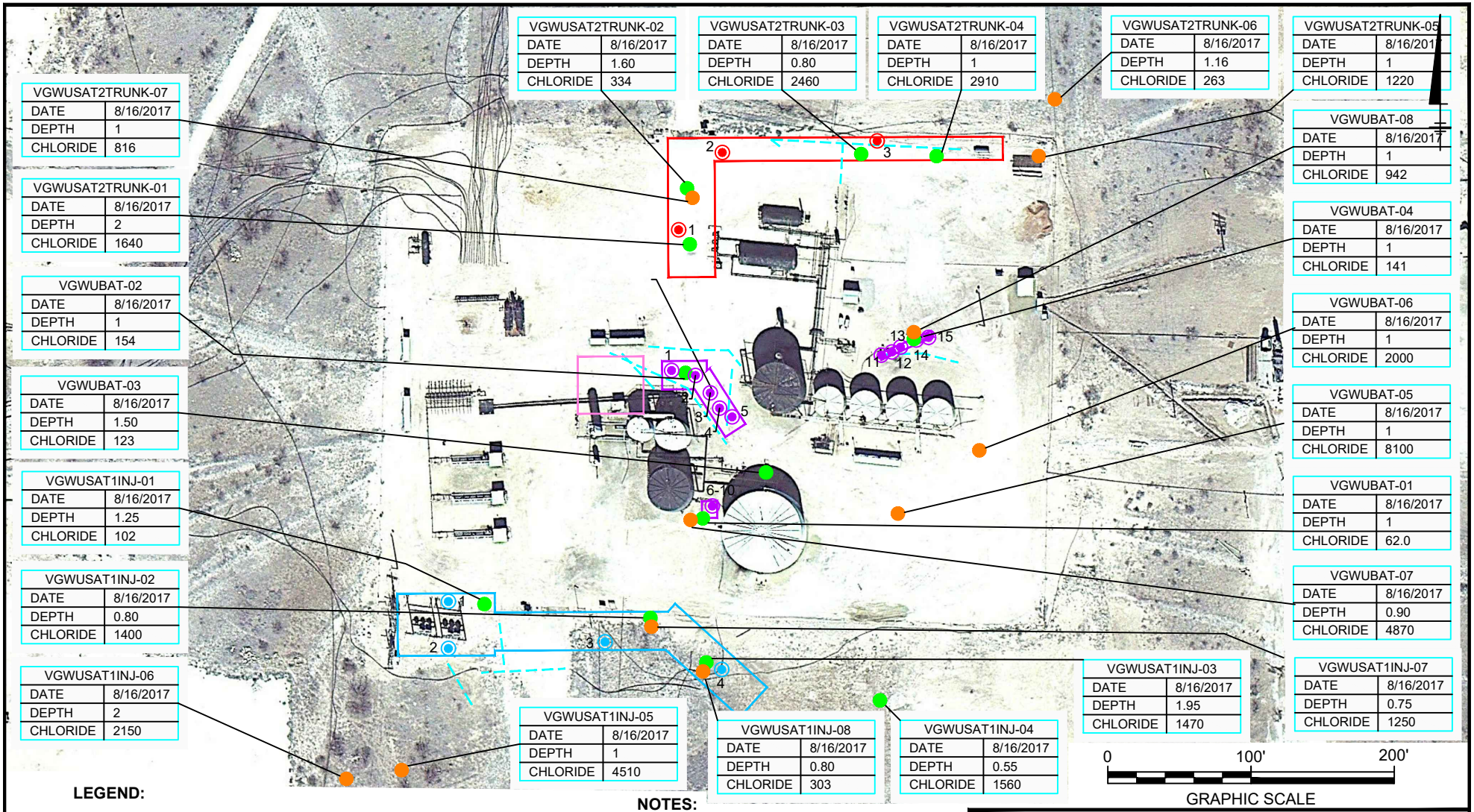
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

2013 VGWU TANK BATTERY SOIL ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM
C:\Users\nburger\BIM 360\Arcadis\ANA - CHEVRON CORPORATION\Project Files\VGWU Tank Battery\2018\B0048787.0002\01-DWG\SoilData-Fig2.dwg LAYOUT: 2 SAVED: 6/30/2020 9:44 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 6/30/2020 9:45 AM BY: BURGER, NICK



LEGEND:

- PRIMARY BORING
- SECONDARY BORING
- MAY 2012 5-POINT COMPOSITE SAMPLE LOCATION
- JANUARY 2013 DISCRETE SOIL SAMPLING LOCATION
- UNDERGROUND UTILITY LINE
- APPROXIMATE EXTENT OF SATELLITE 2 TRUNK LINE SPILL (NOVEMBER 2012)
- APPROXIMATE EXTENT OF SATELLITE 1 INJECTION LINE SPILL (NOVEMBER 2012)
- APPROXIMATE EXTENT OF BATTERY SPILL (FEBRUARY 2012)
- APPROXIMATE EXTENT OF WEST PW TANK SPILL (NOVEMBER 2013)

NOTES:

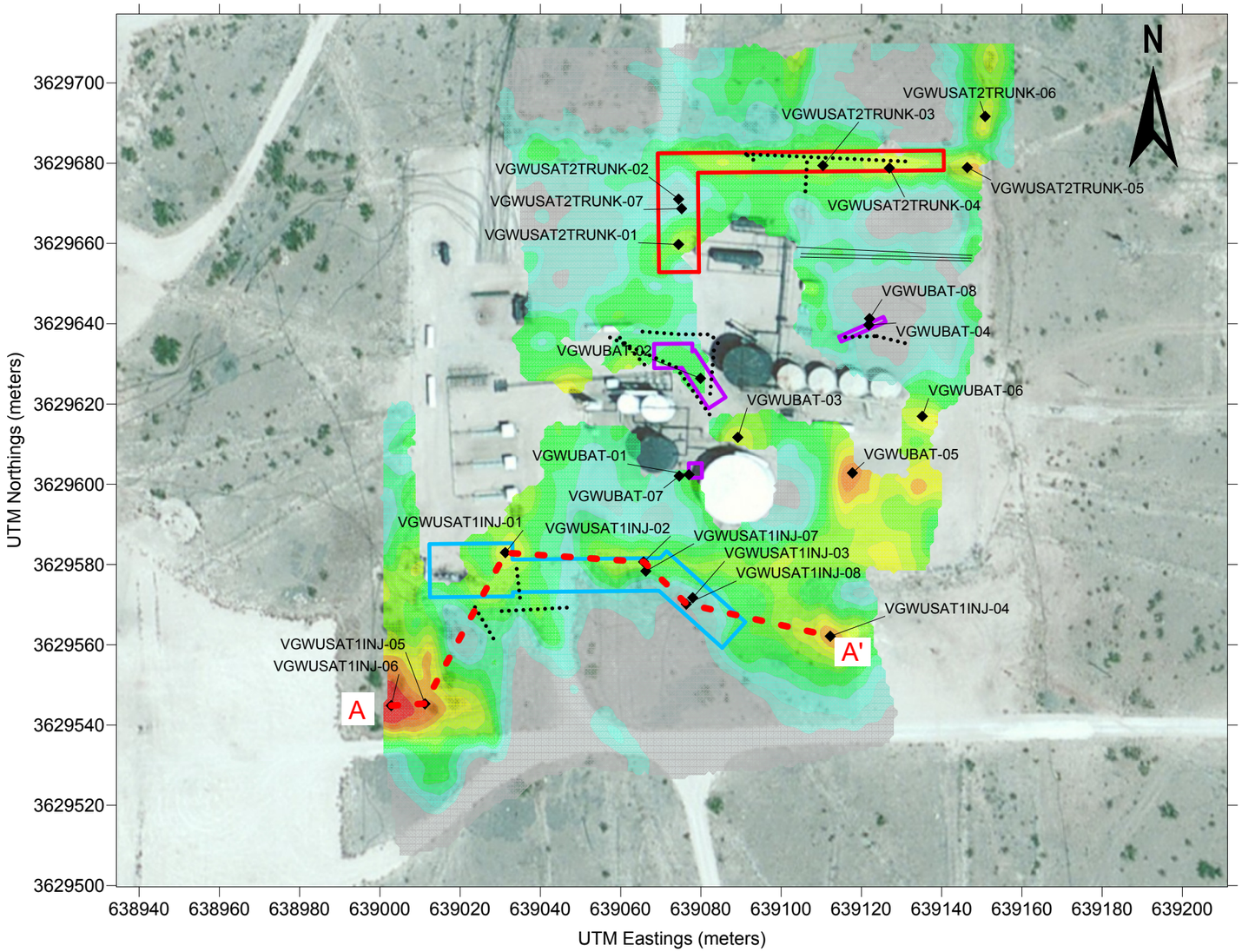
1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.
2. ALL RESULTS ARE IN MILLIGRAMS PER KILOGRAM (mg/kg).
3. NEW MEXICO OIL CONSERVATION DIVISION (NMOCD) SOIL REMEDIATION ACTION LEVEL OF 600 mg/kg.
4. NMOCD GROUNDWATER REMEDIATION ACTION LEVEL OF 250 mg/L.

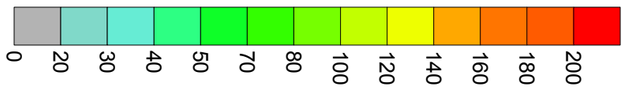
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

2017 VGWU TANK BATTERY SOIL ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2





ELECTRICAL CONDUCTIVITY
milliSiemens/meter

LEGEND

- SHALLOW 2017 SOIL SAMPLE LOCATION
- APPROXIMATE EXTENT OF SATELLITE 2 TRUNK LINE SPILL
- APPROXIMATE EXTENT OF SATELLITE 1 TRUNK LINE SPILL
- APPROXIMATE EXTENT OF BATTERY SPILL
- UNDER GROUND UTILITY LINE
- ABOVE GROUND METAL PIPELINE
- MODELLED GEM-2 PROFILE

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO

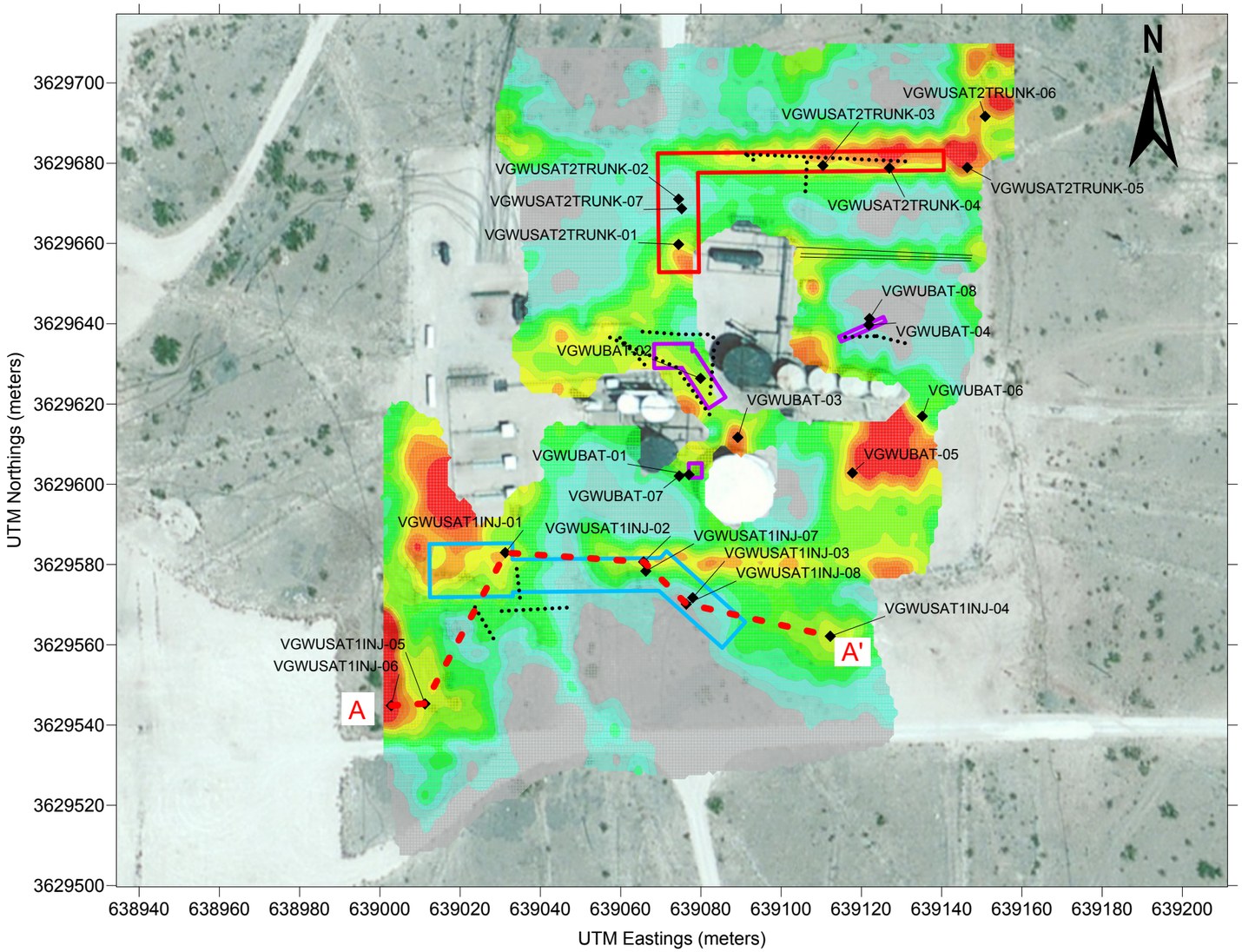
0 50 100 150 200
SCALE IN FEET

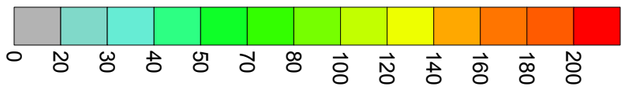
ARCADIS Design & Consultancy for natural and built assets

GEM-2 Electrical Conductivity Map - 63 kHz Frequency
Penetration Depth of 4 to 8 feet bgs

VGWU BATTERY
Chevron Environmental Management Company
Lea County, New Mexico

FIGURE 3





ELECTRICAL CONDUCTIVITY
milliSiemens/meter

LEGEND

- SHALLOW 2017 SOIL SAMPLE LOCATION
- APPROXIMATE EXTENT OF SATELLITE 2 TRUNK LINE SPILL
- APPROXIMATE EXTENT OF SATELLITE 1 TRUNK LINE SPILL
- APPROXIMATE EXTENT OF BATTERY SPILL
- UNDER GROUND UTILITY LINE
- ABOVE GROUND METAL PIPELINE
- MODELLED GEM-2 PROFILE

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO

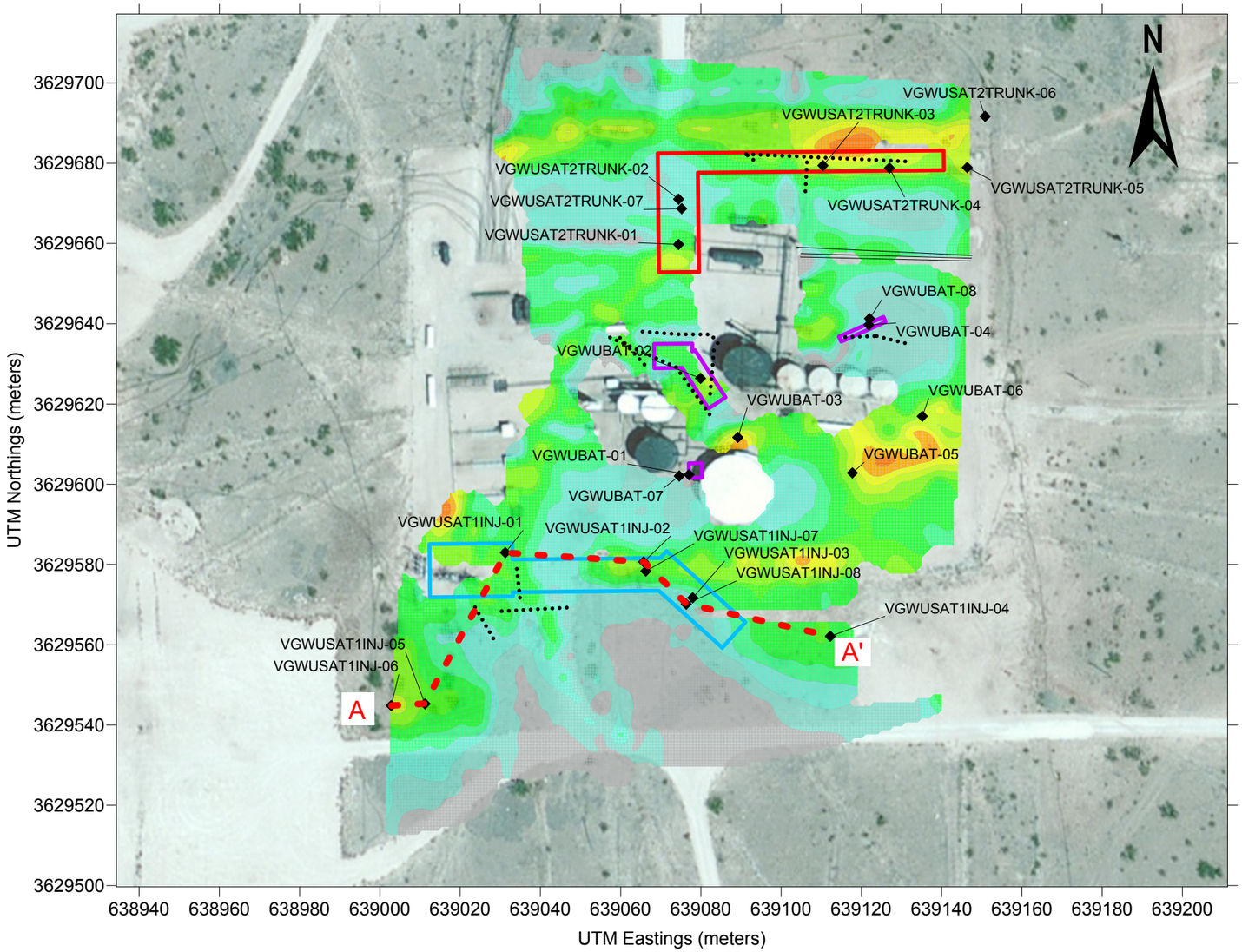
0 50 100 150 200
SCALE IN FEET

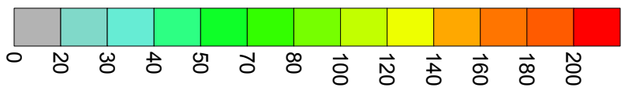
ARCADIS Design & Consultancy for natural and built assets

GEM-2 Electrical Conductivity Depth Map - 18.3 kHz Frequency
Penetration Depth of 6 to 10 feet bgs

VGWU BATTERY
Chevron Environmental Management Company
Lea County, New Mexico

FIGURE 4





ELECTRICAL CONDUCTIVITY
milliSiemens/meter

LEGEND

- SHALLOW 2017 SOIL SAMPLE LOCATION
- APPROXIMATE EXTENT OF SATELLITE 2 TRUNK LINE SPILL
- APPROXIMATE EXTENT OF SATELLITE 1 TRUNK LINE SPILL
- APPROXIMATE EXTENT OF BATTERY SPILL
- UNDER GROUND UTILITY LINE
- ABOVE GROUND METAL PIPELINE
- MODELLED GEM-2 PROFILE

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO

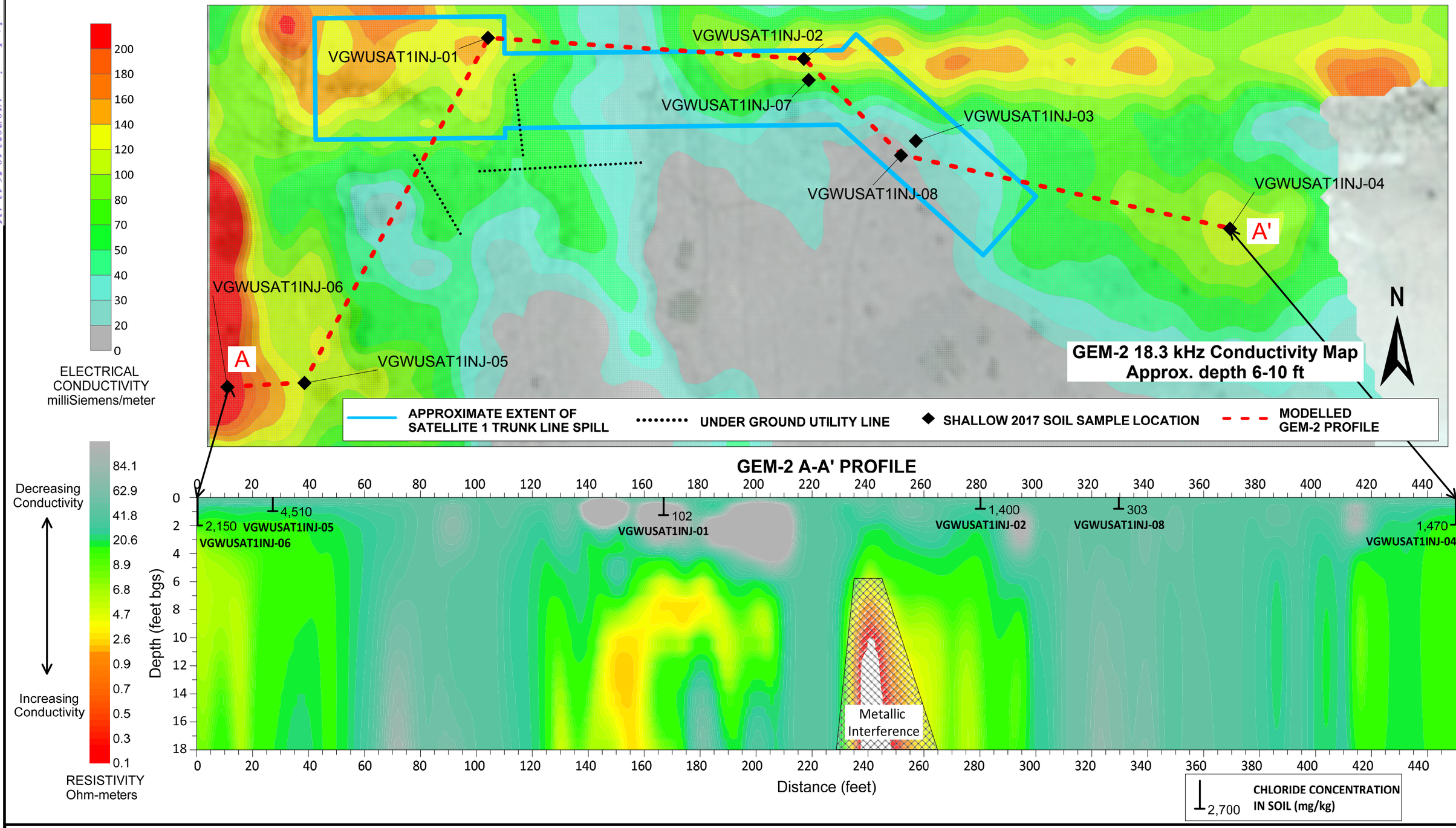
0 50 100 150 200
SCALE IN FEET

ARCADIS Design & Consultancy for natural and built assets

EM-31 Electrical Conductivity Map
Penetration Depth of 9 to 18 feet bgs

VGWU BATTERY
Chevron Environmental Management Company
Lea County, New Mexico

FIGURE 5



ARCADIS Design & Consultancy for natural and built assets

MODELLED GEM-2 PROFILE - SECTION A-A'

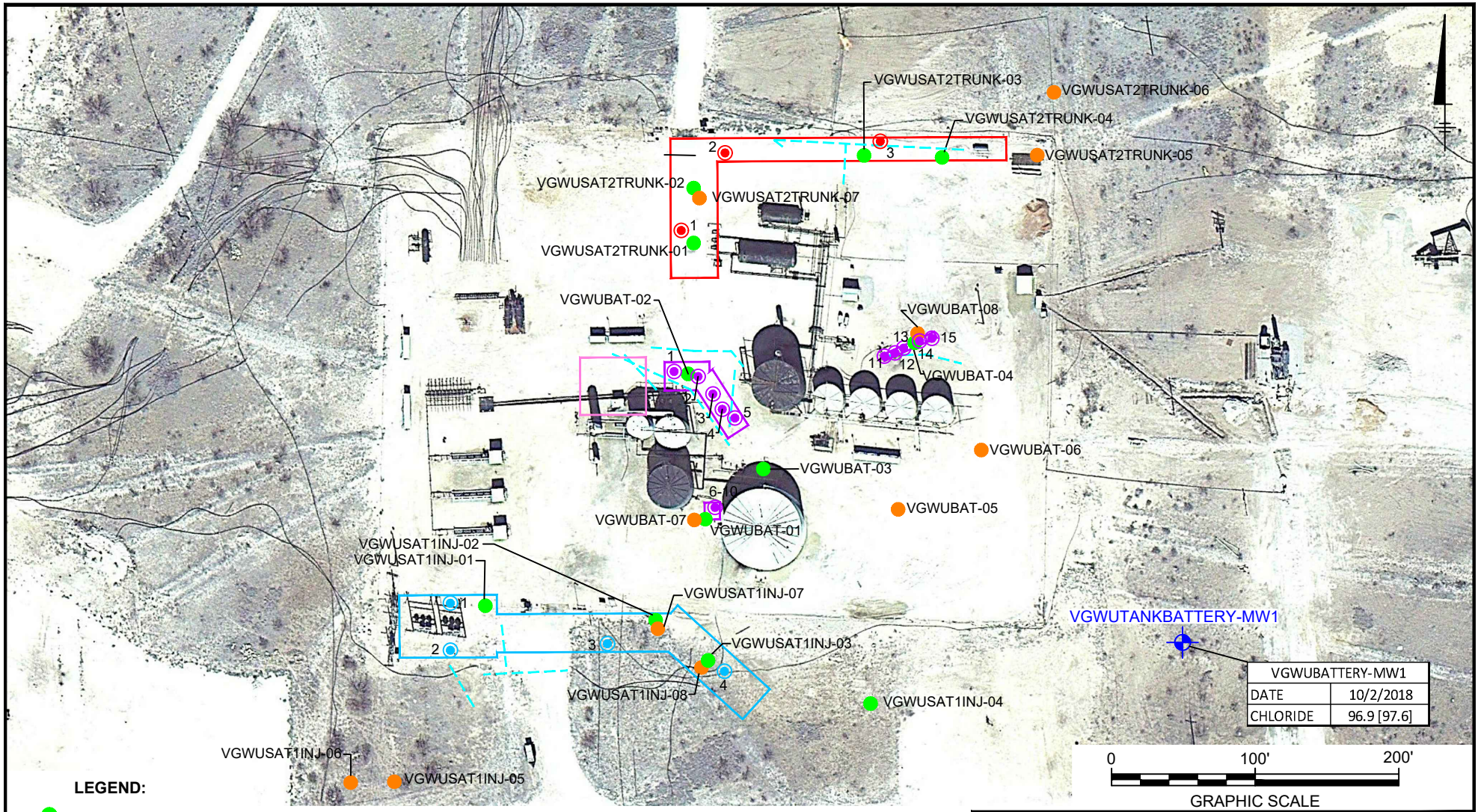
VGWU BATTERY

Chevron Environmental Management Company

Lea County, New Mexico

FIGURE 6

CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM
C:\Users\nburger\BIM 360\Arcadis\ANA - CHEVRON CORPORATION\Project Files\VGWU Tank Battery\2018\B0048787.0002\01-DWG\SoilData-Fig3.dwg LAYOUT: 3 SAVED: 6/30/2020 9:36 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 6/30/2020 9:36 AM BY: BURGER, NICK



LEGEND:

- PRIMARY BORING
- SECONDARY BORING
- MAY 2012 5-POINT COMPOSITE SAMPLE LOCATION
- JANUARY 2013 DISCRETE SOIL SAMPLING LOCATION
- UNDERGROUND UTILITY LINE
- PROPOSED MONITORING WELL LOCATION
- APPROXIMATE EXTENT OF SATELLITE 2 TRUNK LINE SPILL (NOVEMBER 2012)
- APPROXIMATE EXTENT OF SATELLITE 1 INJECTION LINE SPILL (NOVEMBER 2012)
- APPROXIMATE EXTENT OF BATTERY SPILL (FEBRUARY 2012)
- APPROXIMATE EXTENT OF WEST PW TANK SPILL (NOVEMBER 2013)

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

TANK BATTERY GROUNDWATER ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

APPENDIX A

Site Background

ARCADIS Design & Consultancy for natural and built assets

REGULATORY BACKGROUND

February 1, 2012 Release

According to the New Mexico Oil Conservation Division (NMOCD) Release Notification and Corrective Action (Form C-141), the seal on the produced water tank charge pump leaked due to a bearing failure resulting in a release of approximately 13.5 barrels (bbls) of produced water on February 1, 2012. The release was contained within the limits of the tank battery. Chevron personnel stopped the release and conducted initial response activities, including recovery of approximately 11 bbls of produced water.

Pursuant to NMOCD requirements (NMOCD 1993), form C-141 was submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to NMOCD on February 2, 2012 is included in **Appendix B**. A Remediation Permit (RP) order number was not provided and could not be located for this release. It is understood that this release falls under the RPs associated with the November 1, 2012 and November 9, 2013 RPs.

November 1, 2012 Release (1RP-2861)

According to the NMOCD Form C-141, a leak occurred from a 6-inch diameter injection line from VGWU Satellite 2 (VGWU Sat 2) resulted in a release of approximately 45.8 bbls of produced water on November 1, 2012. The cause of the leak was unknown at the time of the response. The release occurred in a pasture south of the Tank Battery. Chevron personnel stopped the release and conducted initial response activities, including recovery of approximately 30 bbls of produced water.

Pursuant to NMOCD requirements (NMOCD 1993), a Form C-141 was submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to NMOCD on November 2, 2012 is included in **Appendix B.**

November 5, 2012 Release

According to the NMOCD Form C-141, a leak occurred from a 6-inch diameter injection line from VGWU Satellite 1 (VGWU Sat 1) resulted in a release of approximately 34.3 bbls of produced water and 1.3 bbls of oil on November 5, 2012. The cause of the leak was unknown at the time of the response. Chevron personnel stopped the release and conducted initial response activities, including recovery of approximately 18.7 bbls of produced water and 1.3 bbls of oil.

Pursuant to NMOCD requirements (NMOCD 1993), a Form C-141 was submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to the NMOCD on November 8, 2012 is included in **Appendix B.** A RP order number was not provided and could not be located for this release. It is understood that this release falls under the RPs associated with the November 1, 2012 and November 9, 2013 RPs.

November 9, 2013 Release (1RP-3293)

According to the NMOCD Form C-141, the VGWU West Production Water (PW) Tank overflowed due to a water extraction well unexpectedly producing into the tank. This resulted in a release of approximately 14.48 bbls of produced water and 2.88 bbls of oil on November 9, 2013. Chevron personnel stopped the overflow and conducted initial response activities, including recovery of approximately 16.7 bbls of fluid.

Pursuant to NMOCD requirements (NMOCD 1993), a Form C-141 submitted to the NMOCD detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the Site by David Pagano (Chevron). The completed Form C-141 submitted to the NMOCD on November 23, 2013 is included in **Appendix B**. Note that an assumed typo occurred on the Form C-141 which states that the form was submitted on October 23, 2013, one month prior to the actual release that occurred at the Site.

REGULATORY FRAMEWORK

The NMOCD of the New Mexico Energy, Minerals, and Natural Resources Department has regulatory jurisdiction over corrective actions conducted at the Site. Corrective actions follow guidance given by the NMOCD in *Guidelines for Remediation of Leaks, Spills, and Releases (August 13, 1993)*. These guidelines require remediation of chloride in groundwater to the human health standards of the NMWQCC set forth in New Mexico Administrative Code 20.6.2.3103B as follows:

Analyte	NMWQCC Standard for Groundwater (mg/L)
Chloride	250

Note: mg/L = milligrams per liter

Chloride analysis preformed on samples collected from VGWUBATTERY-MW1 on October 2, 2018 showed chloride to be 96.9 mg/L, well below the NMWQCC standard of 250 mg/L.

The OCD, in accordance with the NMOCD risk-based soil remediation action levels (SRALs) for benzene, total BTEX, and total petroleum hydrocarbons (TPH) for leaks, spills, and releases (NMOCD 1993) and the New Mexico Administrative Code (NMAC) revised closure criteria (CC) outlined in Title 19, Chapter 15, Part 29 (19.15.29) of the NMAC concerning natural resources and wildlife, oil and gas, and releases for soil beneath below grade tanks, drying pads associated with closed-loop systems, and pits, require the remediation of soil exhibiting COCs above the calculated SRALs and the NMAC revised CC. The calculated SRALs and NMAC CC are detailed in the following table:

Analyte	SRALs and NMAC Closure Criteria (mg/kg)
Chloride	20,000
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	10
Total BTEX	50
Total Petroleum Hydrocarbons (TPH)	1,000

Note: mg/kg = milligrams per kilogram

Although analysis of confirmation soil samples collected in January 2013, December 2013 and in August 2017 from the Site resulted in multiple exceedances of the SRALs for BTEX and TPH and exceeds the 2018 NMAC revised closure criteria requiring the top four ft. of surface material containing chloride concentrations greater than 600 mg/kg to be remediated, oilfield infrastructure, surface structures, aboveground and belowground pipelines, and utility corridors surround the Site. The presence of these structures poses a health and safety risk and prevents additional drilling and other subsurface work in this area. Delineation activities beyond the pipelines and oilfield equipment surrounding the release would not be representative of release area.

GEOLOGY/HYDROGEOLOGY ASSESSMENT

Site Setting and Climate

The Site is located within the Vacuum Glorieta West Unit (VGWU) and is approximately 14 miles southwest of Lovington, New Mexico. New Mexico Highway 238 is located approximately 0.55 mile east of the Site. The closest agricultural area is 7.5 miles northeast of the Site.

The Site is in the western edge of the Permian Basin, a 75,000-square-mile area in west Texas and New Mexico that is populated by numerous oil and gas production wells. In New Mexico, the Permian Basin extends to Roosevelt County to the north and Chaves County to the west, and to Texas to the south.

Monthly average temperatures near the Site vary from a minimum of 27.9 degrees Fahrenheit (°F) in January to a maximum of 93.9°F in July (Western Regional Climate Center [WRCC] Hobbs, New Mexico [294026] weather station). Average annual precipitation recorded for the area of the Site from the available WRCC period of record between 1912 and 2016 was approximately 15.75 inches per year (WRCC 2019a).

Due to the arid climate, the Site experiences low precipitation and high evaporation rates. Average annual evaporation from the available WRCC period of record between 1914 and 2005 was approximately 87.68 inches per year (WRCC 2019b).

Regional Geology and Hydrogeology

The Site elevation is approximately 4,000 feet (ft) above mean sea level (amsl). The Site is located on the Llano Estacado of the Western High Plains, an ecoregion of the Great Plains of North America. The Site is positioned immediately east of the Mescalero Ridge, which demarcates the western boundary of the (Miocene to Pliocene) High Plains Ogallala Formation (Reeves 1972). A rapid drop in elevation of 200 ft to 250 ft occurs west of the northwest-trending Mescalero Ridge. The Ogallala formation is unconfined and is predominantly composed of unconsolidated alluvial fan deposits of sand and gravel near the base, overlain by interbedded sand and clay in the upper portion of the formation (Seni 1980). Repeated depositional events on the High Plains surface beginning approximately 7 million years ago, followed by aerial exposure, generated a thick sequence of caliche horizons that are competent enough to act as a cliff for the expression of Mescalero Ridge. These hard caliche deposits form the upper portion of the stratigraphic sequence. In the Site area, the Ogallala Formation is underlain by red beds of the Upper Triassic-age Dockum Group consisting of claystones, sandstones, and siltstones. Aquifers within the Dockum Group are not considered a major water resource in the area of the Site due to poor water production rates and elevated levels of natural dissolved solids.

The main source of fresh groundwater in the area of the Site comes from the Ogallala aquifer. The Ogallala aquifer has a thickness of approximately 100 ft in the vicinity of the Site and is considered the primary source of fresh water in the area. Depth to the groundwater regionally ranges from approximately 120 ft to 135 ft below ground surface (bgs).

Nearby Water Wells and Surface Water

Based on satellite imagery, no surface-water bodies were identified within a radius of approximately 0.5-mile of the Site (GoogleEarth 2019). During February 2019, Arcadis reviewed information obtained from the New Mexico Office of the State Engineer (NMOSE) online database (NMOSE 2019). Results of the database inquiry indicated that there were no water-supply wells located within a radius of 400 meters (1,312 ft) of the Site. In addition, results of the database review indicated that groundwater was anticipated at a depth of 105 ft bgs. Results of the database review are included in **Appendix G**.

Site Geology

The Site boring log used to interpret the Site geology is included in **Appendix E**. The locations of the soil borings and monitoring well are shown on **Figure 2** and **7**. The subsurface stratigraphy based off the boring log provided in **Appendix E**, included the following:

- A thin (0 to 0.5 ft) surface layer of unconsolidated fine clayey sand (topsoil),
- A caliche profile containing caprock, nodular and sand caliche, typically 15 to 20 feet below the ground surface (ft bgs),
- A thick, friable, weakly cemented calcareous sandstone, typically 20 to 55 ft bgs positioned at the base of the caliche profile,
- A 4 ft thick, firmly cemented, fine-grained sandstone,
- A 66 ft thick, loose, fine grained sand containing thin calcareous lenses,
- A 15 ft sequence of firm to weakly cemented, fine grained sandstone strongly interbedded with loose, fine grained sand,
- A 10 ft thick, loose, very fine to fine grained sand containing thin, firmly cemented, fine grained sandstone lenses.

Hydrogeologic Conditions

Regional groundwater flow in the Ogallala Aquifer is controlled by the slope of the land surface to the south to southeast. The aquifer typically behaves as an unconfined aquifer. The Dockum Group Shale is considered the underlying aquitard for the Ogallala Aquifer.

Site Hydrogeology

Groundwater beneath the Site is found within the lower Ogallala deposits. The depth to groundwater at the Site approximately 133.50 ft bgs, based on the groundwater monitoring event conducted on October 2, 2018. The saturated thickness of the unconfined aquifer is approximately 150 ft. The saturated thickness varies in conjunction with the elevation of the top of the Dockum shale.

APPENDIX B

C-141 Forms

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company CHEVRON U.S.A Inc.	Contact David Pagano
Address 56 Texas Camp Road, Lovington, NM 88260	Telephone No. Office: 575-396-4414 ext 275 Cellular: 505-787-9816
Facility Name Vacuum Glorietta West Unit Battery	Facility Type Production Tank Battery

Surface Owner State of New Mexico	Mineral Owner State of New Mexico	API No. OGRID No. B-155

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	36	17.0S	34.0E					Lea

Latitude 32.795804 **Longitude** -103.514502

NATURE OF RELEASE

Type of Release Spill to Land	Volume of Release 34.3bbls of Produced Water & 1.3bbls of oil	Volume Recovered 18.7bbls of Produced Water and 1.3bbls oil
Source of Release Water Injection Station Pump	Date and Hour of Occurrence 11/5/12 02:00 AM	Date and Hour of Discovery 11/5/12 03:00AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Geoffrey Leking	
By Whom? David Pagano	Date and Hour 11/2/12 15:30	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

6" buried trunk line from Satellite #1 leaked underground near the header inside the battery. Cause of leak will be determined when line is excavated.

Describe Area Affected and Cleanup Action Taken.*

Release occurred underground inside the battery. On discovery vacuum truck contacted and vacuumed up the standing fluids. Recovered 30.00bbls of fluids and recovered liquids placed hauled off to disposal. Next steps are for the visually contaminated soil to be excavated up to 2 feet and sent off for disposal.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name: David Pagano	Approved by Environmental Specialist:	
Title: Health & Environmental Specialist	Approval Date:	Expiration Date:
E-mail Address: david.pagano@chevron.com	Conditions of Approval:	Attached ☐
Date: 11/08/12 Phone: 505-787-9816		

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company CHEVRON U.S.A Inc.	Contact David Pagano
Address 56 Texas Camp Road, Lovington, NM 88260	Telephone No. Office: 575-396-4414 ext 275 Cellular: 505-787-9816
Facility Name Vacuum Glorietta West Unit Battery	Facility Type Water Injection Station at Production Battery

Surface Owner State of New Mexico	Mineral Owner State of New Mexico	API No. OGRID No. B-155

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	36	17.0S	34.0E					Lea

Latitude 32.795804 **Longitude** -103.514502

NATURE OF RELEASE

Type of Release Produced Water Spill	Volume of Release 13.5bbl of Produced Water	Volume Recovered 11 bbls
Source of Release Water Injection Station Pump	Date and Hour of Occurrence 02/01/12 07:00	Date and Hour of Discovery 02/01/12 09:00
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mr. Leking via voicemail	
By Whom? David Pagano	Date and Hour 02/01/12 17:30	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Pump Barring Failure caused a seal on the Produced Water Tank Charge pump to give resulting in a 13.5bbl produced water spill at the Battery.

Describe Area Affected and Cleanup Action Taken.*

Spill stayed within the boundaries of the Battery. On discovery vacuum truck contacted and vacuumed up the standing fluids which were sent to disposal. Next steps are for the visually contaminated cliché to be excavated up to 2 feet and sent off for disposal.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: David R	OIL CONSERVATION DIVISION	
Printed Name: David Pagano	Approved by Environmental Specialist:	
Title: Health & Environmental Specialist	Approval Date:	Expiration Date:
E-mail Address: david.pagano@chevron.com	Conditions of Approval:	Attached ☐
Date: 02/02/12 Phone: 505-787-9816		

* Attach Additional Sheets If Necessary

HOBBS OCD

NOV 05 2012

RECEIVED

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company CHEVRON U.S.A Inc.	Contact David Pagano
Address 56 Texas Camp Road, Lovington, NM 88260	Telephone No. Office: 575-396-4414 ext 275 Cellular: 505-787-9816
Facility Name Vacuum Glorietta West Unit Battery	Facility Type Production Tank Battery

Surface Owner State of New Mexico	Mineral Owner State of New Mexico	API No. OGRID No. B-155

LOCATION OF RELEASE

CLOSEST WELL VGWU #59 API # 30-025-30971

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C	36	17.0S	34.0E					Lea

Latitude 32.795804 **Longitude** -103.514502

NATURE OF RELEASE

Type of Release Spill to Land	Volume of Release 45.8bbls of Produced Water	Volume Recovered 30.00bbls of oil
Source of Release Water Injection Station Pump	Date and Hour of Occurrence 11/1/12 15:15	Date and Hour of Discovery 11/1/12 15:30
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Geoffrey Leking	
By Whom? David Pagano	Date and Hour 11/2/12 15:30	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

6" buried injection line leaked underground. Cause of leak will be determined when line is excavated.

Describe Area Affected and Cleanup Action Taken.*

Spill occurred in the pasture just south of the Battery. On discovery vacuum truck contacted and vacuumed up the standing fluids. Recovered 30.00bbls and recovered liquids placed into 10K overflow tank to be re-circulated back into the system. Next steps are for the visually contaminated soil to be excavated up to 2 feet and sent off for disposal.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: David Pagano

Printed Name: David Pagano

Title: Health & Environmental Specialist

E-mail Address: david.pagano@chevron.com

Date: 11/02/12 Phone: 505-787-9816

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: Geoffrey Leking

Approval Date: 11/5/12 Expiration Date: 01/07/13

Conditions of Approval: SUBMIT FINAL C-141 IN BY 01/07/13

Attached ☐ IRP-11-12-2861

* Attach Additional Sheets If Necessary

MDistrict I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

HOBBS OCD
SEP 02 2014
RECEIVED

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Chevron USA Inc.	Contact David A. Pagano
Address 15 Smith Rd., Midland, TX, 79705	Telephone No. wk: 575-396-4414X275 cell: 505-787-9816
Facility Name Vacuum Glorietta West Unit Battery	Facility Type Battery

Surface Owner **NA**	Mineral Owner **State of New Mexico**	API No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	1	18.0S	34E					Lea

Latitude = 32.796051 Longitude = -103.514502

NATURE OF RELEASE

Type of Release Spill to Land	Volume of Release 2.88 bbl oil & 14.48 bbl produced water	Volume Recovered 0mcf
Source of Release West Suction Tank	Date and Hour of Occurrence 11/9/13 6:00AM	Date and Hour of Discovery 11/9/13 6:00AM
Was Immediate Notice Given? ☐ Yes ☒ No ☐ Not Required	If YES, To Whom? Geoffrey Leking	
By Whom? James Trujillo	Date and Hour 11/10/13 1:30PM left voicemail	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

N/A

Describe Cause of Problem and Remedial Action Taken.*

West Suction produced water tank over filled due water extraction well producing into the tank unexpectedly. Operations immediately shut in production to minimize volume released.

Describe Area Affected and Cleanup Action Taken.*

Spill area was approx. 8' by 8' area just north and north west of the West Suction Tank. Vacuum Truck called out to vacuum up standing fluids and hydrovac excavated top layer of soil approx. 8-12". Vacuum Truck Recovered 16.7 bbls of fluid. Next step is to take samples to determine effectiveness of local remediation and possibly turn remediation over to the Chevron Environmental Management Company.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: David Pagano

Printed Name: David A. Pagano

Title: Health & Environmental Specialist

E-mail Address: dpgn@chevron.com

Date: 10/23/13 Phone: 505-787-9816

OIL CONSERVATION DIVISION

Approved by Environmental Specialist:

Approval Date: 9-2-14 Expiration Date: 11-2-14

Conditions of Approval:
Steve Saylor required.
Delineate & Remediate vertically per NMOCD guidelines. Submit Final C-141 by 11-2-14

Attached ☐
IRP-3293
ojrid 4228
NTO 14 24 537473
PTO 14 24 537663
FTO 14 24 537321

* Attach Additional Sheets If Necessary

SEP 05 2014

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	nGRL1231037337
District RP	1RP-2861
Facility ID	fTO1424537321
Application ID	pGRL1231037542

Release Notification

Responsible Party

Responsible Party: Chevron USA	OGRID: 4243
Contact Name: Armando Martinez	Contact Telephone: 505-690-5408
Contact email: amarti@chevron.com	Incident # *(assigned by OCD)* nTO1424537473
Contact mailing address:	

Location of Release Source

Latitude 32.795804 Longitude -103.514502
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Vacuum Glorietta West Unit Battery	Site Type: Battery
Date Release Discovered: 11/01/2012	API# *(if applicable):* 3002540179

Unit Letter	Section	Township	Range	County
C	36	17S	34E	Lea

Surface Owner: ☒ State ☐ Federal ☐ Tribal ☐ Private

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls):	Volume Recovered (bbls):
☒ Produced Water	Volume Released (bbls): 45.8	Volume Recovered (bbls): 30
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)
Cause of Release: 6” buried injection line leaked underground.		

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	1RP-2861
Facility ID	fTO1424537321
Application ID	pGRL1231037542

Was this a major release as defined by 19.15.29.7(A) NMAC? ☒ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release? More than 25 bbls were released.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	1RP-2861
Facility ID	fTO1424537321
Application ID	pGRL1231037542

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	133.5 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells. **Attached.**
Field data: **Attached.**
Data table of soil contaminant concentration data: **Attached.**
Depth to water determination: **Greater than 100 ft bgs.**
Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release: **None identified.**
Boring or excavation logs: **Attached**
Photographs including date and GIS information: **Photographs not taken.**
Topographic/Aerial maps; **Topographic map attached.**
Laboratory data including chain of custody: **Attached.**

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	1RP-2861
Facility ID	fTO1424537321
Application ID	pGRL1231037542

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Armando Martinez Title: Operations Lead Central

Signature:_____  _____ Date: _10/20/2021_____

email: ____ amarti@chevron.com _____ Telephone: 505-690-5408_____

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	1RP-2861
Facility ID	fTO1424537321
Application ID	pGRL1231037542

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

☒ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☒ Extents of contamination must be fully delineated. **Lateral delineation was achieved.**

☒ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Armando Martinez _____ Title: _____Operation Lead Central

Signature:_____ _____ Date: _10/20/2021_____

email: amarti@chevron.com _____ Telephone: ____505-690-5408_____

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval (see text box below) ☐ Denied ☐ Deferral Approved

Signature: Nelson Velez Date: 04/10/2023

Deferral request is approved with the following conditions;

1. Remediation to be completed after the site has been decommissioned.
2. Remediation plan will require OCD pre-approval prior to its implementation.
3. Reclamation standards for soils less than 4 feet (ft.) below grade (b.g.) or when top of confining caliche layer is encountered at shallower depths, will meet Table 1 of 19.15.29.12 NMAC for groundwater less than 50 ft. b.g.

District I
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1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	nTO1424537473
District RP	1RP-3293
Facility ID	fTO1424537321
Application ID	pTO1424537663

Release Notification

Responsible Party

Responsible Party: Chevron USA	OGRID: 4243
Contact Name: Armando Martinez	Contact Telephone: 505-690-5408
Contact email: amarti@chevron.com	Incident # *(assigned by OCD)* nTO1424537473
Contact mailing address:	

Location of Release Source

Latitude 32.796051 Longitude -103.514502
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Vacuum Glorietta West Unit Battery	Site Type: Battery
Date Release Discovered: 11/19/2013	API# *(if applicable):* N/A

Unit Letter	Section	Township	Range	County
B	01	18S	34E	Lea

Surface Owner: ☒ State ☐ Federal ☐ Tribal ☐ Private

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☒ Crude Oil	Volume Released (bbls): 2.88	Volume Recovered (bbls): 0
☒ Produced Water	Volume Released (bbls): 14.48	Volume Recovered (bbls): 0
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☒ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)
Cause of Release: West suction produced water tank over filled due to water extraction well producing into tank unexpectedly. Operations immediately shut in production to minimize volume released.		

State of New Mexico
Oil Conservation Division

Incident ID	nTO1424537473
District RP	1RP-3293
Facility ID	fTO1424537321
Application ID	pTO1424537663

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Incident ID	nTO1424537473
District RP	1RP-3293
Facility ID	fTO1424537321
Application ID	pTO1424537663

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	133.5 (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☒ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☒ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☒ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☒ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☒ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☒ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☒ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☐ Yes ☒ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☒ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☐ Yes ☒ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells. **Attached.**
Field data: **Attached.**
Data table of soil contaminant concentration data: **Attached.**
Depth to water determination: **Greater than 100 ft bgs.**
Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release: **None identified.**
Boring or excavation logs: **Attached**
Photographs including date and GIS information: **Photographs not taken.**
Topographic/Aerial maps; **Topographic map attached.**
Laboratory data including chain of custody: **Attached.**

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	nTO1424537473
District RP	1RP-3293
Facility ID	fTO1424537321
Application ID	pTO1424537663

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Armando Martinez Title: Operations Lead Central

Signature:_____ _____ Date: _10/20/2021_____

email: ____ amarti@chevron.com _____ Telephone: 505-690-5408_____

OCD Only

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

Incident ID	nTO1424537473
District RP	1RP-3293
Facility ID	fTO1424537321
Application ID	pTO1424537663

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☐ Detailed description of proposed remediation technique
- ☐ Scaled sitemap with GPS coordinates showing delineation points
- ☐ Estimated volume of material to be remediated
- ☐ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☐ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

☒ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.

☒ Extents of contamination must be fully delineated. **Lateral delineation was achieved.**

☒ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Armando Martinez _____ Title: _____Operation Lead Central

Signature:_____ _____ Date: __10/20/2021_____

email: amarti@chevron.com _____ Telephone: ____505-690-5408_____

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval (see text box below) ☐ Denied ☐ Deferral Approved

Signature: Nelson Velez Date: 04/10/2023

Deferral request is approved with the following conditions;

1. Remediation to be completed after the site has been decommissioned.
2. Remediation plan will require OCD pre-approval prior to its implementation.
3. Reclamation standards for soils less than 4 feet (ft.) below grade (b.g.) or when top of confining caliche layer is encountered at shallower depths, will meet Table 1 of 19.15.29.12 NMAC for groundwater less than 50 ft. b.g.

APPENDIX C

Laboratory Analytical Reports and Chain of Custody

Certificate of Analysis Summary 560619

Arcadis - Houston, Houston, TX

Project Name: HES Transfer Sites

Project Id: B0048626.1701
Contact: Jonathan Olsen
Project Location: Buckeye NM

Date Received in Lab: Fri Aug-18-17 10:17 am
Report Date: 29-AUG-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	560619-001		560619-002		560619-003		560619-004		560619-005		560619-006	
	Field Id:	VGWUSAT1INJ-06 (2')		VGWUSAT1INJ-07 (0.75')		VGWUSAT2TRUNK-05 (1'		VGWUSAT1INJ-04 (1.95')		VGWUSAT2TRUNK-03 (0.5		VGWUSAT1INJ-01 (1.25')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-16-17 15:15		Aug-16-17 14:35		Aug-16-17 13:05		Aug-16-17 16:00		Aug-16-17 13:30		Aug-16-17 14:20	
Chloride by EPA 300	***Extracted:***	Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00	
	Analyzed:	Aug-26-17 17:06		Aug-26-17 17:37		Aug-26-17 17:48		Aug-26-17 17:58		Aug-26-17 18:09		Aug-26-17 18:40	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		2150	25.0	1250	4.99	1220	4.92	1470	25.0	2460	24.5	102	4.94

Kelsey Brooks
Project Manager

Final 1.000

Certificate of Analysis Summary 560619

Arcadis - Houston, Houston, TX

Project Name: HES Transfer Sites

Project Id: B0048626.1701
Contact: Jonathan Olsen
Project Location: Buckeye NM

Date Received in Lab: Fri Aug-18-17 10:17 am
Report Date: 29-AUG-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	560619-007		560619-008		560619-009		560619-010		560619-011		560619-012	
	Field Id:	VGWUBAT-08 (1')		VGWUSAT1INJ-03 (0.55)		VGWUBAT-06 (1')		VGWUBAT-04 (1')		VGWUSAT1INJ-08 (0.80')		VGWUSAT2TRUNK-04 (1'	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-16-17 12:45		Aug-16-17 15:35		Aug-16-17 12:20		Aug-16-17 12:35		Aug-16-17 15:40		Aug-16-17 13:15	
Chloride by EPA 300	***Extracted:***	Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00	
	Analyzed:	Aug-26-17 18:50		Aug-26-17 19:00		Aug-26-17 19:11		Aug-26-17 19:21		Aug-26-17 19:31		Aug-26-17 20:02	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		942	4.94	1560	5.00	2000	24.7	141	4.95	303	4.95	2910	24.8

Kelsey Brooks
Project Manager

Final 1.000

Certificate of Analysis Summary 560619

Arcadis - Houston, Houston, TX

Project Name: HES Transfer Sites

Project Id: B0048626.1701
Contact: Jonathan Olsen
Project Location: Buckeye NM

Date Received in Lab: Fri Aug-18-17 10:17 am
Report Date: 29-AUG-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	560619-013		560619-014		560619-015		560619-016		560619-017		560619-018	
	Field Id:	VGWUSAT1INJ-05 (1')		VGWUSAT1INJ-02 (0.80')		VGWUSAT2TRUNK-01 (2'		VGWUBAT-01 (1')		VGWUBAT-07 (0.90')		VGWUBAT-05 (1')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-16-17 15:25		Aug-16-17 14:30		Aug-16-17 10:45		Aug-16-17 13:55		Aug-16-17 14:05		Aug-16-17 12:05	
Chloride by EPA 300	***Extracted:***	Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 10:00	
	Analyzed:	Aug-26-17 20:13		Aug-26-17 20:44		Aug-26-17 20:54		Aug-26-17 21:04		Aug-26-17 21:15		Aug-26-17 21:25	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		4510	25.0	1400	24.9	1640	24.8	62.0	4.98	4870	49.4	8100	49.8

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

Kelsey Brooks
Project Manager

Final 1.000

Certificate of Analysis Summary 560619

Arcadis - Houston, Houston, TX

Project Name: HES Transfer Sites

Project Id: B0048626.1701
Contact: Jonathan Olsen
Project Location: Buckeye NM

Date Received in Lab: Fri Aug-18-17 10:17 am
Report Date: 29-AUG-17
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	560619-019		560619-020		560619-021		560619-022		560619-023	
	Field Id:	VGWUBAT-03 (1.50')		VGWUSAT2TRUNK-02 (1.(		VGWUBAT-02 (1')		VGWUSAT2TRUNK-07 (1		VGWUSAT2TRUNK-06 (1.	
	Depth:										
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Aug-16-17 11:55		Aug-16-17 11:05		Aug-16-17 11:50		Aug-16-17 11:15		Aug-16-17 10:10	
Chloride by EPA 300	***Extracted:***	Aug-26-17 10:00		Aug-26-17 10:00		Aug-26-17 15:00		Aug-26-17 15:00		Aug-26-17 15:00	
	Analyzed:	Aug-26-17 21:35		Aug-26-17 21:46		Aug-26-17 22:48		Aug-26-17 23:19		Aug-26-17 23:29	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		123	4.97	334	4.96	154	4.90	816	4.97	263	4.94

Kelsey Brooks
Project Manager

Final 1.000

Analytical Report 560619

for

Arcadis - Houston

Project Manager: Jonathan Olsen

HES Transfer Sites

B0048626.1701

29-AUG-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

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

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

29-AUG-17

Project Manager: **Jonathan Olsen**
Arcadis - Houston
10205 Westheimer Rd., Suite 800
Houston, TX 77042

Reference: XENCO Report No(s): **560619**
HES Transfer Sites
Project Address: Buckeye NM

Jonathan Olsen:

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) 560619. 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. 560619 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUSAT1INJ-06 (2')	S	08-16-17 15:15		560619-001
VGWUSAT1INJ-07 (0.75')	S	08-16-17 14:35		560619-002
VGWUSAT2TRUNK-05 (1')	S	08-16-17 13:05		560619-003
VGWUSAT1INJ-04 (1.95')	S	08-16-17 16:00		560619-004
VGWUSAT2TRUNK-03 (0.80')	S	08-16-17 13:30		560619-005
VGWUSAT1INJ-01 (1.25')	S	08-16-17 14:20		560619-006
VGWUBAT-08 (1')	S	08-16-17 12:45		560619-007
VGWUSAT1INJ-03 (0.55)	S	08-16-17 15:35		560619-008
VGWUBAT-06 (1')	S	08-16-17 12:20		560619-009
VGWUBAT-04 (1')	S	08-16-17 12:35		560619-010
VGWUSAT1INJ-08 (0.80')	S	08-16-17 15:40		560619-011
VGWUSAT2TRUNK-04 (1')	S	08-16-17 13:15		560619-012
VGWUSAT1INJ-05 (1')	S	08-16-17 15:25		560619-013
VGWUSAT1INJ-02 (0.80')	S	08-16-17 14:30		560619-014
VGWUSAT2TRUNK-01 (2')	S	08-16-17 10:45		560619-015
VGWUBAT-01 (1')	S	08-16-17 13:55		560619-016
VGWUBAT-07 (0.90')	S	08-16-17 14:05		560619-017
VGWUBAT-05 (1')	S	08-16-17 12:05		560619-018
VGWUBAT-03 (1.50')	S	08-16-17 11:55		560619-019
VGWUSAT2TRUNK-02 (1.60')	S	08-16-17 11:05		560619-020
VGWUBAT-02 (1')	S	08-16-17 11:50		560619-021
VGWUSAT2TRUNK-07 (1')	S	08-16-17 11:15		560619-022
VGWUSAT2TRUNK-06 (1.16')	S	08-16-17 10:10		560619-023

CASE NARRATIVE

Client Name: Arcadis - Houston

Project Name: HES Transfer Sites

Project ID: *B0048626.1701*
Work Order Number(s): *560619*

Report Date: *29-AUG-17*
Date Received: *08/18/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3026136 Chloride by EPA 300

Lab Sample ID 560619-011 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 560619-001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020.

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

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-06 (2')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-001	Date Collected:	08.16.17 15.15		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2150**	25.0	mg/kg	08.26.17 17.06		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-07 (0.75')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-002	Date Collected:	08.16.17 14.35		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1250**	4.99	mg/kg	08.26.17 17.37		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-05 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-003	Date Collected:	08.16.17 13.05		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1220**	4.92	mg/kg	08.26.17 17.48		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-04 (1.95')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-004	Date Collected:	08.16.17 16.00		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1470**	25.0	mg/kg	08.26.17 17.58		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-03 (0.80')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-005	Date Collected:	08.16.17 13.30		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2460**	24.5	mg/kg	08.26.17 18.09		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-01 (1.25')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-006	Date Collected:	08.16.17 14.20		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**102**	4.94	mg/kg	08.26.17 18.40		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-08 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-007	Date Collected:	08.16.17 12.45		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**942**	4.94	mg/kg	08.26.17 18.50		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-03 (0.55)**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-008	Date Collected:	08.16.17 15.35		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1560**	5.00	mg/kg	08.26.17 19.00		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-06 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-009	Date Collected:	08.16.17 12.20		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2000**	24.7	mg/kg	08.26.17 19.11		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-04 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-010	Date Collected:	08.16.17 12.35		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**141**	4.95	mg/kg	08.26.17 19.21		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-08 (0.80')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-011	Date Collected:	08.16.17 15.40		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**303**	4.95	mg/kg	08.26.17 19.31		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-04 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-012	Date Collected:	08.16.17 13.15		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**2910**	24.8	mg/kg	08.26.17 20.02		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-05 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-013	Date Collected:	08.16.17 15.25		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**4510**	25.0	mg/kg	08.26.17 20.13		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT1INJ-02 (0.80')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-014	Date Collected:	08.16.17 14.30		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1400**	24.9	mg/kg	08.26.17 20.44		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-01 (2')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-015	Date Collected:	08.16.17 10.45		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1640**	24.8	mg/kg	08.26.17 20.54		5

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-01 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-016	Date Collected:	08.16.17 13.55		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**62.0**	4.98	mg/kg	08.26.17 21.04		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-07 (0.90')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-017	Date Collected:	08.16.17 14.05		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**4870**	49.4	mg/kg	08.26.17 21.15		10

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-05 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-018	Date Collected:	08.16.17 12.05		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**8100**	49.8	mg/kg	08.26.17 21.25		10

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-03 (1.50')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-019	Date Collected:	08.16.17 11.55		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**123**	4.97	mg/kg	08.26.17 21.35		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-02 (1.60')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-020	Date Collected:	08.16.17 11.05		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 10.00	Basis:	Wet Weight
Seq Number:	3026136				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**334**	4.96	mg/kg	08.26.17 21.46		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUBAT-02 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-021	Date Collected:	08.16.17 11.50		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 15.00	Basis:	Wet Weight
Seq Number:	3026137				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**154**	4.90	mg/kg	08.26.17 22.48		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-07 (1')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-022	Date Collected:	08.16.17 11.15		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 15.00	Basis:	Wet Weight
Seq Number:	3026137				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**816**	4.97	mg/kg	08.26.17 23.19		1

Certificate of Analytical Results 560619

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id:	**VGWUSAT2TRUNK-06 (1.16')**	Matrix:	Soil	Date Received:	08.18.17 10.17
Lab Sample Id:	560619-023	Date Collected:	08.16.17 10.10		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	08.26.17 15.00	Basis:	Wet Weight
Seq Number:	3026137				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**263**	4.94	mg/kg	08.26.17 23.29		1

Flagging Criteria

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

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

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

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

F RPD exceeded lab control limits.

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

U Analyte was not detected.

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

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

K Sample analyzed outside of recommended hold time.

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

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

\+ NELAC certification not offered for this compound.

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

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 - San Antonio - Atlanta - Midland/Odessa - Tampa/Lakeland - Phoenix - Latin America

	Phone	Fax
4147 Greenbriar Dr, Stafford, TX 77477	(281) 240-4200	(281) 240-4280
9701 Harry Hines Blvd , Dallas, TX 75220	(214) 902 0300	(214) 351-9139
5332 Blackberry Drive, San Antonio TX 78238	(210) 509-3334	(210) 509-3335
1211 W Florida Ave, Midland, TX 79701	(432) 563-1800	(432) 563-1713
2525 W. Huntington Dr. - Suite 102, Tempe AZ 85282	(602) 437-0330	

QC Summary 560619

Arcadis - Houston

HES Transfer Sites

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3026136 — Matrix: Solid — Date Prep: 08.26.17
MB Sample Id: 730012-1-BLK — LCS Sample Id: 730012-1-BKS — LCSD Sample Id: 730012-1-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	253	101	253	101	90-110	0	20	mg/kg	08.26.17 16:46	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3026137 — Matrix: Solid — Date Prep: 08.26.17
MB Sample Id: 730013-1-BLK — LCS Sample Id: 730013-1-BKS — LCSD Sample Id: 730013-1-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	249	100	251	100	90-110	1	20	mg/kg	08.26.17 22:27	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3026136 — Matrix: Soil — Date Prep: 08.26.17
Parent Sample Id: 560619-001 — MS Sample Id: 560619-001 S — MSD Sample Id: 560619-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	2150	250	2330	72	2320	68	90-110	0	20	mg/kg	08.26.17 17:17	X

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3026136 — Matrix: Soil — Date Prep: 08.26.17
Parent Sample Id: 560619-011 — MS Sample Id: 560619-011 S — MSD Sample Id: 560619-011 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	303	248	567	106	566	106	90-110	0	20	mg/kg	08.26.17 19:42	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3026137 — Matrix: Soil — Date Prep: 08.26.17
Parent Sample Id: 560619-021 — MS Sample Id: 560619-021 S — MSD Sample Id: 560619-021 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	154	245	405	102	405	102	90-110	0	20	mg/kg	08.26.17 22:58	

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 2

Lab Work Order #: 560619

Send Results to:

Contact & Company Name: Jonathan Olsen / Arcadis

Telephone: 713-953-4874

Address: 10205 Westheimer Road Suite 800

Fax: NA

City: Houston State: TX Zip: 77042

E-mail Address: jonathan.olsen@arcadis.com

Project Name/Location (City, State): HES Transfer Sites / Buckeye, NM

Project #: B00486261701

Sampler's Printed Name: Ryan Nanny

Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Preservative	Filtered (✓)	# of Containers	Container Information	Chlorides	REMARKS
						E	—	14	7		
VGWUSAT1INJ-06 (2')	8-16-17	1515		✓	SO			1			
VGWUSAT1INJ-07(0.75')	8-16-17	1435		✓	SO			1			15'S (~65 ms/m)
VGWUSAT2Trunk-05(1')	8-16-17	1305		✓	SO			1			
VGWUSAT1INJ-04(1.95')	8-16-17	1600		✓	SO			1			
VGWUSAT2Trunk-03(0.80')	8-16-17	1330		✓	SO			1			
VGWUSAT1INJ-01(1.25')	8-16-17	1420		✓	SO			1			
VGWUBAT-08 (1')	8-16-17	1245		✓	SO			1			15'N (~18ms/m)
VGWUSAT1INJ-03(0.55')	8-16-17	1535		✓	SO			1			
VGWUBAT-06(1')	8-16-17	1220		✓	SO			1			
VGWUBAT-04(1')	8-16-17	1235		✓	SO			1			
VGWUSAT1INJ-08(0.80')	8-16-17	1540		✓	SO			1			15'SW (~20ms/m)
VGWUSAT2Trunk-04(1')	8-16-17	1315		✓	SO			1			
VGWUSAT1INJ-05(1')	8-16-17	1525		✓	SO			1			
VGWUSAT1INJ-02(0.80')	8-16-17	1430		✓	SO			1			

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil, SE - Sediment, NL - NAPL/Oil
W - Water, SL - Sludge, SW - Sample Wipe
T - Tissue, A - Air, Other: _____

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Temp: ~~1.0~~ 1.3 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 1.0

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Xenco	Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact	Printed Name: Ryan Nanny	Printed Name: Shawnee Smith	Printed Name:	Printed Name:
☑ Cooler packed with ice (✓)		Signature:	Signature: Shawnee Smith	Signature:	Signature:
Specify Turnaround Requirements: Standard TAT	Sample Receipt:	Firm: Arcadis	Firm/Courier: Xenco	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: _____	Date/Time: 8-17-17/1700	Date/Time: 8-18-17 10:17	Date/Time:	Date/Time:

20730826 CofC AR Form 08.27.2015

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ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 2 of 2

Lab Work Order # 560619

Send Results to:

Contact & Company Name: Jonathan Olson/Arcadis
Telephone: 713-953-4874
Address: 10205 Westheimer Road
Fax: NA
City: Houston State: TX Zip: 77042
E-mail Address: jonathan.olson@arcadis.com
Project Name/Location (City, State): HES Transfer Sites/Buckeye, NM
Project #: 30048626.1701
Sampler's Printed Name: Ryan Nanny
Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Preservative	Filtered (✓)	# of Containers	Container Information	Chlorides	REMARKS
						E	-	9	7		
VGWUSAT2Trunk-01(2')	8-16-17	1045		✓	SO					1	
VGWUBAT-01(1')	8-16-17	1355		✓	SO					1	
VGWUBAT-07(0.90')	8-16-17	1405		✓	SO					1	15'W(~45mS/m)
VGWUBAT-05(1')	8-16-17	1205		✓	SO					1	
VGWUBAT-03(1.50')	8-16-17	1155		✓	SO					1	
VGWUSAT2Trunk-02(1.60')	8-16-17	1105		✓	SO					1	
VGWUBAT-02(1')	8-16-17	1150		✓	SO					1	
VGWUSAT2Trunk-07(1')	8-16-17	1115		✓	SO					1	.15'S(~30mS/m)
VGWUSAT2Trunk-06(1.16')	8-16-17	1010		✓	SO					1	

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil
W - Water
T - Tissue
SE - Sediment
SL - Sludge
A - Air
NL - NAPL/Oil
SW - Sample Wipe
Other: _____

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Temp: 1.3 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 1.0

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Xenco	Cooler Custody Seal (✓)	Printed Name: Ryan Nanny	Printed Name: Shawnee Smith	Printed Name:	Printed Name:
☑ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature: Shawnee Smith	Signature:	Signature:
Specify Turnaround Requirements: Standard TAT	Sample Receipt:	Firm: Arcadis	Firm/Courier: Xenco	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: _____	Date/Time: 8-17-17/1700	Date/Time: 8-18-17 10:17	Date/Time:	Date/Time:

20730826 CofC AR Form 08.27.2015

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by Arcadis

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Arcadis - Houston

Date/ Time Received: 08/18/2017 10:17:00 AM

Work Order #: 560619

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)?	1
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seal present on shipping container/ cooler?	**N/A**
#5 *Custody Seals intact on shipping container/ cooler?	**N/A**
#6 Custody Seals intact on sample bottles?	**N/A**
#7 *Custody Seals Signed and dated?	**N/A**
#8 *Chain of Custody present?	**Yes**
#9 Sample instructions complete on Chain of Custody?	**Yes**
#10 Any missing/extra samples?	**No**
#11 Chain of Custody signed when relinquished/ received?	**Yes**
#12 Chain of Custody agrees with sample label(s)?	**Yes**
#13 Container label(s) legible and intact?	**Yes**
#14 Sample matrix/ properties agree with Chain of Custody?	**Yes**
#15 Samples in proper container/ bottle?	**Yes**
#16 Samples properly preserved?	**Yes**
#17 Sample container(s) intact?	**Yes**
#18 Sufficient sample amount for indicated test(s)?	**Yes**
#19 All samples received within hold time?	**Yes**
#20 Subcontract of sample(s)?	**N/A**
#21 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: Jessica Kramer Date: 08/18/2017
Jessica Kramer

Checklist reviewed by: Kelsey Brooks Date: 08/22/2017
Kelsey Brooks

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

January 29, 2013

DAVID PAGANO

Chevron - Lovington

HCR 60 Box 423

Lovington, NM 88260

RE: SOIL SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 01/22/13 16:56.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 1IL SAMPLE #1 (H300180-01)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/28/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/28/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/28/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/28/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.0 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1410**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/24/2013	ND	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/24/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane *65.7 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *75.5 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 1IL SAMPLE #2 (H300180-02)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/29/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/29/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/29/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/29/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/29/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1620**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	01/24/2013	ND	205	103	200	19.4	
DRO >C10-C28	**140**	50.0	01/24/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane *76.8 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *102 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 1IL SAMPLE #3 (H300180-03)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/28/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/28/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/28/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/28/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.9 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4880**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/26/2013	ND	152	76.0	200	12.7	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	142	70.9	200	15.1	

Surrogate: 1-Chlorooctane *73.8 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *81.0 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 1IL SAMPLE #4 (H300180-04)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/28/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/28/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/28/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/28/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3680**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/26/2013	ND	152	76.0	200	12.7	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	142	70.9	200	15.1	

Surrogate: 1-Chlorooctane *74.5 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *82.5 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARLSBAD Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Chevron
Project Manager: David Pagano
Address: 56 Texas Camp Rd.
City: Lovington State: NM Zip: 88260
Phone #: 505-781-9816 Fax #:
Project #: Project Owner:
Project Name:
Project Location:
Sampler Name:

BILL TO
P.O. #:
Company: Chevron
Attn: Nick Moschetti
Address: 56 Texas Camp Rd
City: Lovington
State: NM Zip: 88260
Phone #: 575-396-4414 x201
Fax #:

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	PRESERV: ACID/BASE	ICE / COOL	OTHER	SAMPLING: DATE	TIME	TPH	BTEX	Chlorides
H300180																	
1	V6W4 Sat 1 IL Sample #1	G	1			✓					✓		11/22/13	2:45 PM	✓	✓	✓
2	V6W4 Sat 1 FL Sample #2	G	1			✓					✓			2:50 PM			
3	V6W4 Sat 1 IL Sample #3	G	1			✓					✓			2:55 PM			
4	V6W4 Sat 1 IL Sample #4	G	1			✓					✓			3:00 PM			
5	V6W4 Sat 2 TL Sample #1	G	1			✓					✓			3:05 PM			
6	V6W4 Sat 2 TL Sample #2	G	1			✓					✓			3:10 PM			
7	V6W4 Sat 2 TL Sample #3	G	1			✓					✓			3:15 PM			

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

Relinquished By: Paul Bacon Date: 11/22/13 Time: 7:56 Received By: Jodi Henson
Relinquished By: Date: Time: Received By:

Delivered By: (Circle One)
Sampler - UPS - Bus - Other:

Sample Condition: Cool: Yes / No; Intact: Yes / No
CHECKED BY: (Initials)

5°C

Phone Result: Yes / No Add'l Phone #:
Fax Result: Yes / No Add'l Fax #:
REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#26

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

January 29, 2013

DAVID PAGANO

Chevron - Lovington

HCR 60 Box 423

Lovington, NM 88260

RE: SOIL SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 01/22/13 16:56.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 2TL SAMPLE #1 (H300180-05)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/28/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/28/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/28/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/28/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**8200**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/28/2013	ND	152	76.0	200	12.7	
DRO >C10-C28	**131**	10.0	01/28/2013	ND	142	70.9	200	15.1	

Surrogate: 1-Chlorooctane *94.8 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *104 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 2TL SAMPLE #2 (H300180-06)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/28/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/28/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/28/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/28/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *100 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**20400**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/28/2013	ND	152	76.0	200	12.7	
DRO >C10-C28	**274**	10.0	01/28/2013	ND	142	70.9	200	15.1	

Surrogate: 1-Chlorooctane *96.6 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *107 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
DAVID PAGANO
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	01/22/2013	Sampling Date:	01/22/2013
Reported:	01/29/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU SAT 2TL SAMPLE #3 (H300180-07)

BTEX 8021B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/28/2013	ND	1.76	88.2	2.00	25.1	
Toluene*	<0.050	0.050	01/28/2013	ND	1.89	94.6	2.00	24.5	
Ethylbenzene*	<0.050	0.050	01/28/2013	ND	1.95	97.6	2.00	24.5	
Total Xylenes*	<0.150	0.150	01/28/2013	ND	5.97	99.6	6.00	24.0	
Total BTEX	<0.300	0.300	01/28/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**6530**	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	01/26/2013	ND	152	76.0	200	12.7	
DRO >C10-C28	**1020**	50.0	01/26/2013	ND	142	70.9	200	15.1	

Surrogate: 1-Chlorooctane *77.1 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *107 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARLSBAD Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Chevron
Project Manager: David Pagano
Address: 56 Texas Camp Rd.
City: Lovington State: NM Zip: 88260
Phone #: 505-781-9816 Fax #:
Project #: Project Owner:
Project Name:
Project Location:
Sampler Name:

BILL TO
P.O. #:
Company: Chevron
Attn: Nick Moschetti
Address: 56 Texas Camp Rd
City: Lovington
State: NM Zip: 88260
Phone #: 575-396-4414 x201
Fax #:

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	PRESERV: ACID/BASE	ICE / COOL	OTHER	SAMPLING: DATE	TIME	TPH	BTEX	Chlorides
H300180																	
1	V6W4 Sat 1 IL Sample #1	G	1			✓					✓		11/22/13	2:45 PM	✓	✓	✓
2	V6W4 Sat 1 FL Sample #2	G	1			✓					✓			2:50 PM			
3	V6W4 Sat 1 IL Sample #3	G	1			✓					✓			2:55 PM			
4	V6W4 Sat 1 IL Sample #4	G	1			✓					✓			3:00 PM			
5	V6W4 Sat 2 IL Sample #1	G	1			✓					✓			3:05 PM			
6	V6W4 Sat 2 IL Sample #2	G	1			✓					✓			3:10 PM			
7	V6W4 Sat 2 IL Sample #3	G	1			✓					✓			3:15 PM			

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.

Relinquished By: Paul Bacon Date: 11/22/13 Time: 7:56 Received By: Jodi Henson
Relinquished By: Date: Time: Received By:

Delivered By: (Circle One)
Sampler - UPS - Bus - Other:

Sample Condition: Cool: Yes / No Intact: Yes / No
CHECKED BY: (Initials)

5°C

Phone Result: Yes No Add'l Phone #:
Fax Result: Yes No Add'l Fax #:
REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#26

Certificate of Analysis Summary 601138

ARCADIS, Midland, TX

Project Name: VGWU Tank Battery

Project Id: B0048616.TBT
Contact: Brett Krehbiel
Project Location: Lea County, NM

Date Received in Lab: Wed Oct-03-18 10:23 am
Report Date: 09-OCT-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	601138-001		601138-002		601138-003							
	Field Id:	VGWUBATTERY-MW1(10		DUP-1 (100218)		EQUIPMENT BANK (1002							
	Depth:												
	Matrix:	WATER		WATER		WATER							
	Sampled:	Oct-02-18 10:25		Oct-02-18 00:00		Oct-02-18 09:25							
Chloride by EPA 300	***Extracted:***	Oct-03-18 16:00		Oct-03-18 16:00		Oct-03-18 16:00							
	Analyzed:	Oct-04-18 00:48		Oct-04-18 00:59		Oct-04-18 01:09							
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL						
Chloride		96.9	2.50	97.6	2.50	<0.500	0.500						

Kelsey Brooks
Project Manager

Final 1.000

Analytical Report 601138

for

ARCADIS

Project Manager: Brett Krehbiel

VGWU Tank Battery

B0048616.TBT

09-OCT-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 (T104704400-18-18)
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)

09-OCT-18

Project Manager: **Brett Krehbiel**
ARCADIS
1004 N. Big Spring St.
Midland, TX 79701

Reference: XENCO Report No(s): **601138**
VGWU Tank Battery
Project Address: Lea County, NM

Brett Krehbiel:

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) 601138. 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. 601138 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 601138

ARCADIS, Midland, TX

VGWU Tank Battery

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUBATTERY-MW1(100218)	W	10-02-18 10:25		601138-001
DUP-1 (100218)	W	10-02-18 00:00		601138-002
EQUIPMENT BANK (100218)	W	10-02-18 09:25		601138-003

CASE NARRATIVE

Client Name: ARCADIS

Project Name: VGWU Tank Battery

Project ID: *B0048616.TBT*
Work Order Number(s): *601138*

Report Date: *09-OCT-18*
Date Received: *10/03/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 601138

ARCADIS, Midland, TX

VGWU Tank Battery

Sample Id:	**VGWUBATTERY-MW1(100218)**	Matrix:	Water	Date Received:	10.03.18 10.23
Lab Sample Id:	601138-001	Date Collected:	10.02.18 10.25		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	10.03.18 16.00		
Seq Number:	3065350				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**96.9**	2.50	mg/L	10.04.18 00.48		5

Certificate of Analytical Results 601138

ARCADIS, Midland, TX

VGWU Tank Battery

Sample Id:	**DUP-1 (100218)**	Matrix:	Water	Date Received:	10.03.18 10.23
Lab Sample Id:	601138-002	Date Collected:	10.02.18 00.00		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	10.03.18 16.00		
Seq Number:	3065350				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**97.6**	2.50	mg/L	10.04.18 00.59		5

Certificate of Analytical Results 601138

ARCADIS, Midland, TX

VGWU Tank Battery

Sample Id:	**EQUIPMENT BANK (100218)**	Matrix:	Water	Date Received:	10.03.18 10.23
Lab Sample Id:	601138-003	Date Collected:	10.02.18 09.25		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	SCM			% Moisture:	
Analyst:	SCM	Date Prep:	10.03.18 16.00		
Seq Number:	3065350				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<0.500	0.500	mg/L	10.04.18 01.09	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

QC Summary 601138

ARCADIS

VGWU Tank Battery

Analytical Method: **Chloride by EPA 300** Prep Method: E300P

Seq Number: 3065350 Matrix: Water Date Prep: 10.03.18

MB Sample Id: 7663480-1-BLK LCS Sample Id: 7663480-1-BKS LCSD Sample Id: 7663480-1-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	25.5	102	25.6	102	90-110	0	20	mg/L	10.03.18 22:34	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P

Seq Number: 3065350 Matrix: Drinking Water Date Prep: 10.03.18

Parent Sample Id: 601112-001 MS Sample Id: 601112-001 S MSD Sample Id: 601112-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	28.4	25.0	55.0	106	55.2	107	90-110	0	20	mg/L	10.03.18 23:05	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P

Seq Number: 3065350 Matrix: Drinking Water Date Prep: 10.03.18

Parent Sample Id: 601113-001 MS Sample Id: 601113-001 S MSD Sample Id: 601113-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	4.08	25.0	28.8	99	28.9	99	90-110	0	20	mg/L	10.04.18 01:30	

MS/MSD Percent Recovery	[D] = 100*(C-A) / B	LCS = Laboratory Control Sample	MS = Matrix Spike
Relative Percent Difference	RPD = 200* | (C-E) / (C+E) |	A = Parent Result	B = Spike Added
LCS/LCSD Recovery	[D] = 100 * (C) / [B]	C = MS/LCS Result	D = MSD/LCSD % Rec
Log Difference	Log Diff. = Log(Sample Duplicate) - Log(Original Sample)	E = MSD/LCSD Result	

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order # 601138

Send Results to:

Contact & Company Name: Brett Krehbiel (Arcadis)
Telephone: 916-786-5382
Address: 101 Creekside Ridge Court, Suite 200
Fax:
City: Roseville State: CA Zip: 95678
E-mail Address: brett.krehbiel@arcadis.com
Project Name/Location (City, State): VGWU Tank Battery/ Lea County, NM
Project #: B0048616.TBAT
Sampler's Printed Name: Ryan Nanny
Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Preservative	Filtered (✓)	# of Containers	Container Information	Chloride - USEPA 300.1
						E	—	3	3	
VGWUBATTERY-MW1 (100218)	10-2-18	1025		X	W					X
DUP-1 (100218)	10-2-18	—		X	W					X
EQUIPMENT BLANK (100218)	10-2-18	0925		X	W					X

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil, SE - Sediment, NL - NAPL/Oil, W - Water, SL - Sludge, SW - Sample Wipe, T - Tissue, A - Air, Other: _____

REMARKS

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt	Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Xenco	Printed Name: Ryan Nanny	Printed Name: Esperanza Cromeyer	Printed Name: Brianna Teel	Printed Name:
☑ Cooler packed with ice (✓)	Signature:	Signature: Esperanza Cromeyer	Signature:	Signature:
Specify Turnaround Requirements: Standard	Firm: Arcadis	Firm/Courier: Mail Services	Firm/Courier: XENCO	Firm:
Shipping Tracking #:	Date/Time: 10-2-18 1506	Date/Time: 10-2-18 1:23	Date/Time: 10/3 10:23	Date/Time:

Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact

Sample Receipt:

Condition/Cooler Temp: 0.3 °C

20730826 CofC AR Form 06.27.2016

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by Arcadis


ORIGIN ID:HOBA (575) 392-7550
** MAIL SERVICES ETC, LLC
4008 N GRIMES
HOBBS, NM 88240
UNITED STATES US
SHIP DATE: 020CT18
ACTWGT: 10.00 LB MAN
CAD: 0909328/CAFE3210
DIMS: 15x11x10 IN
BILL RECIPIENT
TO XENCO LABORATORIES
FEDEX EXPRESS SHIP CENTER
FEDEX SHIP CENTER
3600 COUNTY RD 1276 S
MIDLAND TX 79711
(432) 563-1800
REF:
DEPT:
INV:
PO:
FedEx Express
WED - 03 OCT HOLD
STANDARD OVERNIGHT
HLD
TRK# 0201 6606 3917 9575
MAFA
TX-US LBB
41 MAFA

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: ARCADIS

Date/ Time Received: 10/03/2018 10:23:00 AM

Work Order #: 601138

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)?	**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: Brianna Teel Date: 10/03/2018

Brianna Teel

Checklist reviewed by: Jessica Kramer Date: 10/03/2018

Jessica Kramer

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

December 16, 2013

NICK MOSCHETTI

Chevron - Lovington

HCR 60 Box 423

Lovington, NM 88260

RE: SOIL SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 12/09/13 17:05.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
NICK MOSCHETTI
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	12/09/2013	Sampling Date:	12/09/2013
Reported:	12/16/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU BTY SS #1 (H302969-01)

BTEX 8021B mg/kg Analyzed By: MS S-04

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	**0.568**	0.050	12/10/2013	ND	1.85	92.7	2.00	0.310	
Toluene*	**9.66**	0.050	12/10/2013	ND	1.85	92.6	2.00	0.214	
Ethylbenzene*	**8.76**	0.050	12/10/2013	ND	1.82	90.8	2.00	0.456	
Total Xylenes*	**11.6**	0.150	12/10/2013	ND	5.32	88.6	6.00	0.866	
Total BTEX	**30.6**	0.300	12/10/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *189 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2040**	16.0	12/16/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: ms S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	**5610**	100	12/10/2013	ND	197	98.3	200	2.18	
DRO >C10-C28	**15900**	100	12/10/2013	ND	202	101	200	2.77	

Surrogate: 1-Chlorooctane *222 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *274 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
NICK MOSCHETTI
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	12/09/2013	Sampling Date:	12/09/2013
Reported:	12/16/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU BTY SS #2 (H302969-02)

BTEX 8021B mg/kg Analyzed By: MS/

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	**19.8**	5.00	12/11/2013	ND	1.95	97.3	2.00	2.59	
Toluene*	**156**	5.00	12/11/2013	ND	1.93	96.3	2.00	2.40	
Ethylbenzene*	**144**	5.00	12/11/2013	ND	1.88	93.9	2.00	2.90	
Total Xylenes*	**194**	15.0	12/11/2013	ND	5.47	91.1	6.00	3.41	
Total BTEX	**513**	30.0	12/11/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *107 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**9600**	16.0	12/16/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: ms S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	**3450**	100	12/10/2013	ND	197	98.3	200	2.18	
DRO >C10-C28	**10900**	100	12/10/2013	ND	202	101	200	2.77	

Surrogate: 1-Chlorooctane *173 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *253 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
NICK MOSCHETTI
HCR 60 Box 423
Lovington NM, 88260
Fax To: None

Received:	12/09/2013	Sampling Date:	12/09/2013
Reported:	12/16/2013	Sampling Type:	Soil
Project Name:	SOIL SAMPLES	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: VGWU BTY SS #3 (H302969-03)

BTEX 8021B mg/kg Analyzed By: MS/

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	**48.8**	10.0	12/11/2013	ND	1.95	97.3	2.00	2.59	
Toluene*	**365**	10.0	12/11/2013	ND	1.93	96.3	2.00	2.40	
Ethylbenzene*	**300**	10.0	12/11/2013	ND	1.88	93.9	2.00	2.90	
Total Xylenes*	**384**	30.0	12/11/2013	ND	5.47	91.1	6.00	3.41	
Total BTEX	**1100**	60.0	12/11/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**6320**	16.0	12/16/2013	ND	400	100	400	0.00	

TPH 8015M mg/kg Analyzed By: ms S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	**9900**	200	12/10/2013	ND	197	98.3	200	2.18	
DRO >C10-C28	**31500**	200	12/10/2013	ND	202	101	200	2.77	

Surrogate: 1-Chlorooctane *305 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *296 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	Chevron
Project Manager:	David Pagano
Address:	56 Texas Camp Rd
City:	Lovington State: NM Zip: 88260
Phone #:	505-787-9816 Fax #:
Project #:	Project Owner:
Project Name:	
Project Location:	
Sampler Name:	

BILL TO

P.O. #:	
Company:	Chevron
Attn:	Nick Moschetti
Address:	56 Texas Camp Rd.
City:	Lovington
State:	NM Zip: 88260
Phone #:	575-396-4414 x201
Fax #:	

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING DATE	TIME	TPH	Chlorides	Benzene
H302969																	
1	V6W4 Bty SS#1	6	1			✓					✓		12/9/13	12:40	✓	✓	✓
2	V6W4 Bty SS#2	1	1			1					1		1	12:45	1	1	1
3	V6W4 Bry SS#3													12:50			

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 12/9/13	Received By:	
David Pagano	Time: 3:05	Jodi Henson	
Relinquished By:	Date:	Received By:	
	Time:		

Delivered By: (Circle One)

Sampler - UPS - Bus - Other:

Sample Condition: Cool: Yes / No — Intact: Yes / No

3.8°C

CHECKED BY: (Initials) JH

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

APPENDIX D

Field Methodology and Documentation

FIELD METHODOLOGY

Soil samples collected utilizing Grab methodology for soil samples collected at the Site utilizing a stainless-steel hand auger or collected drill rig cuttings utilizing a stainless-steel wire mesh strainer. Soil samples were placed in clean, laboratory-supplied sample containers, labeled, placed on ice, cooled to approximately 4 degrees Celsius and transported to Xenco analytical laboratory under chain-of-custody protocol with a standard (10-day) turnaround time for analysis of chloride by Environmental Protection Agency (EPA) Method 300.0.

Prior to sampling groundwater at the Site, static fluid water levels were measured with an electronic interface probe to the nearest hundredth of a foot and recorded. Discrete samples were collected after well development disposable bailer. Geochemical water quality parameters (pH, temperature, DO, ORP and conductivity) were recorded. All non-disposable groundwater sampling equipment was thoroughly decontaminated after collecting groundwater parameters and samples to prevent possible cross-contamination between Sites. Laboratory-supplied sample containers were filled directly from the bailer. Groundwater samples were placed on ice in insulated coolers and chilled to a temperature of approximately 4°C (40°F). The coolers were sealed for shipment with proper chain-of-custody documentation and shipped to Xenco laboratory, located in Midland, Texas, for analysis of chloride by Environmental Protection Agency (EPA) Method 300.0.

APPENDIX E

Soil Boring Log

ARCADIS Design & Consultancy for natural and built assets

Chevron

Boring No.: VGWUBattery-MW1

Soil Boring Log

Sheet: 1 of 5

Project Name: Chevron EMC
Project Number: B0048616.TBAT
Project Location: HES Transfer Sites

Date Started: 10/01/2018
Date Completed: 10/01/2018

Logger: R. Nanny
Editor: NA
Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
							Stick up	
0				NA		CLAYEY SAND (Topsoil); yellowish brown (10YR 5/4); very fine; trace fine and medium grains; subrounded; poorly sorted; soft; friable; dry; trace intergranular clay; powdery; trace caliche; very pale brown (10YR 8/3); hard; subangular; 0.3 cm to 0.5 cm nodules.		
1						CAPROCK CALICHE; very pale brown (10YR 8/2 to 10YR 8/3); firm to hard; fractured; dry; laminated; trace pisolites; trace fine and coarse sand grains; subrounded; poorly sorted.		
2								
3								
4				4			7 7/8" dia. drilled hole	
5								
6								
7							4" dia. Sch 40 PVC Casing	
8								
9								
10				3.1		SILICEOUS CALICHE; grayish brown (10YR 5/2); indurated; dry; containing little silt to very fine grains; rounded; well sorted.		
11								
12								
13								
14							5% Portland bentonite mixture (0-112 ft)	
15				2.9		SANDY NODULAR CALICHE; pink (7.5YR 7/4); soft; dry; some very fine to fine grains; trace medium grains; subrounded; poorly sorted; little 0.3 cm to 0.5 cm; subrounded; nodules; soft; intermixed with firm nodules.		
16								
17								
18								
19								
20				3.1		SANDSTONE; pink (7.5YR 7/4); fine grained; subrounded; poorly sorted; firmly cemented; blocky to friable; dry; contains; trace firmly cemented; 0.3 cm to 0.5 cm subrounded nodules.		
21								
22								
23								
24								
25				2.7		SANDSTONE; pink (7.5YR 8/4); fine grained; subrounded; well sorted; weakly cemented; friable; dry; color became pink (7.5YR 8/3) at 30'; sand became poorly sorted at 40' showing 0.1cm to 0.2cm subrounded nodules; white (7.5YR 8/1); calcareous; soft to slightly firm.		
26								
27								
28								

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air/Mud Rotary
Drilling Fluid: None
Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface; ppm = parts per million; NA = not available or not applicable.

Sampling Method: Shovel/Steel mesh
Sampling Interval: NA
Water Level Start (ft. bgs.): 133.43
Water Level Finish (ft. btoc.): NA
Converted to Well: ☒ Yes ☐ No
Surface Elev.: NA
North Coor: NA
East Coor: NA

CHEVRON HES D:\A-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEC BANGALORETEMPLATEVGWU BATTERY-MW-1IGINT TEMPLATE (EXISTING-HESMW-1.GPJ ARCADIS.GDT 3/1/19

ARCADIS Design & Consultancy for natural and built assets

Chevron

Boring No.: VGWUBattery-MW1

Soil Boring Log

Sheet: 2 of 5

Project Name: Chevron EMC
Date Started: 10/01/2018
Logger: R. Nanny
Project Number: B0048616.TBAT
Date Completed: 10/01/2018
Editor: NA
Project Location: HES Transfer Sites
Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
29–60				3.2		SANDSTONE; pink (7.5YR 8/4); fine grained; subrounded; well sorted; weakly cemented; friable; dry; color became pink (7.5YR 8/3) at 30'; sand became poorly sorted at 40' showing 0.1cm to 0.2cm subrounded nodules; white (7.5YR 8/1); calcareous; soft to slightly firm.	5% Portland bentonite mixture (0-112 ft)	
				5.8				
				3.6				
				4.1		SANDSTONE; pink (7.5YR 7/3); fine grained; subrounded; poorly sorted; weakly cemented; friable; dry; formation contained trace calcareous cemented lenses beginning at 50' bgs.		
				4.7				
				5.6		SANDSTONE; pinkish gray (7.5YR 7/2); fine grained; trace medium grains; subrounded; poorly sorted; firmly cemented; dry.		

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface; ppm = parts per million; NA = not available or not applicable.

CHEVRON HES D:\A-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEC BANGALORETEMPLATEVGWU BATTERY-MW-1\GINT TEMPLATE (EXISTING-HESMW-1.GPJ ARCADIS.GDT 31/1/19

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Chevron

Boring No.: VGWUBattery-MW1

Sheet: 3 of 5

Project Name: Chevron EMC
Project Number: B0048616.TBAT
Project Location: HES Transfer Sites

Date Started: 10/01/2018
Date Completed: 10/01/2018
Logger: R. Nanny
Editor: NA
Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
61–65				4.1		SAND; pink (7.5YR 8/4); fine grained; subrounded; poorly sorted; loose; dry; contains; trace sandstone; pink (7.5YR 7/3); fine grained; trace medium grains; subrounded; poorly sorted; firmly cemented; calcareous; thin lenses.		
65–70				4.7		SAND; brownish yellow (10YR 6/6); fine grained; subrounded; well sorted; loose; slight moisture; no odor no staining; moderate sorting at 75'; becoming well sorted again at 80'. Note: Stopped to change from air rotary to mud rotary. Formation began showing trace Caliche; very pale brown (10YR 8/4); firm; 0.1 cm to 0.3 cm subrounded; nodules; formation contained thin sandstone stringers from 90' to 95'. Formation began showing trace medium grains at 95'.		
70–75				3.9				
75–80				4.7			5% Portland bentonite mixture (0-112 ft)	
80–85				3.0				
85–90				17.5				
90–92				15.9				

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface; ppm = parts per million; NA = not available or not applicable.

CHEVRON HES D:\A-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEC BANGALORETEMPLATEVGWU BATTERY-MW-1GINT TEMPLATE (EXISTING-HESMW-1.GPJ ARCADIS.GDT 31/1/19

ARCADIS Design & Consultancy for natural and built assets

Chevron

Boring No.: VGWUBattery-MW1

Soil Boring Log

Sheet: 4 of 5

Project Name: Chevron EMC
Project Number: B0048616.TBAT
Project Location: HES Transfer Sites

Date Started: 10/01/2018
Date Completed: 10/01/2018
Logger: R. Nanny
Editor: NA
Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
93				21.6		SAND; brownish yellow (10YR 6/6); fine grained; subrounded; well sorted; loose; slight moisture; no odor no staining; moderate sorting at 75'; becoming well sorted again at 80'. Note: Stopped to change from air rotary to mud rotary. Formation began showing trace Caliche; very pale brown (10YR 8/4); firm; 0.1 cm to 0.3 cm subrounded; nodules; formation contained thin sandstone stringers from 90' to 95'. Formation began showing trace medium grains at 95'.		
94								
95								
96								
97								
98								
99								
100				292.1		SAND; light brown; very fine to fine grained; subrounded; poorly sorted; loose; firmly packed; dry; trace 0.1cm to 0.2cm; firm and soft calcareous nodules; formation contained trace calcareous intergranular clay; runny; at 105' to 110'.	5% Portland bentonite mixture (0-112 ft)	
101								
102								
103								
104								
105				339.8				
106								
107								
108								
109								
110				87.3				
111								
112								
113								
114							3/2" Bentonite Chips (112-115 ft)	
115				95.0				
116								
117								
118							8/16 Silica Sand (115-150 ft)	
119								
120				217.1				
121								
122								
123							4" dia. Sch. 40 PVC 0.010 slot Well Screen (120-150 ft)	
124								

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface; ppm = parts per million; NA = not available or not applicable.

CHEVRON HES D:\A-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEC BANGALORE\TEMPLATE\VGWU BATTERY-MW-1\GINT TEMPLATE (EXISTING-HESMW-1.GPJ ARCADIS.GDT 3/1/19

ARCADIS Design & Consultancy for natural and built assets

Chevron

Boring No.: VGWUBattery-MW1

Soil Boring Log

Sheet: 5 of 5

Project Name: Chevron EMC
Project Number: B0048616.TBAT
Project Location: HES Transfer Sites

Date Started: 10/01/2018
Date Completed: 10/01/2018
Logger: R. Nanny
Editor: NA
Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
125				49.1		SANDSTONE; light brown (7.5YR 6/4); very fine to fine grained; subrounded; well sorted; firm; friable; no odor; no staining.		
126								
127								
128								
129								
130				154.2		SAND; light brown (7.5YR 6/4); fine grained; subrounded; well sorted; loose; wet; no odor; no staining.		
131								
132								
133								
134								
135				77.2		SANDSTONE; light brown (7.5YR 6/4); fine grained; trace medium and coarse grains; subrounded; poorly sorted; weakly cemented; friable; wet.		
136							4" dia. Sch. 40 PVC 0.010 slot Well Screen (120-150 ft)	
137								
138								
139								
140				125.3		SAND; light brown (7.5YR 6/4); very fine to fine grained; subrounded; poorly sorted; loose; wet; containing trace sandstone as described at 135' to 140'; thin interbeds to 145'.		
141								
142								
143								
144								
145				136.3				
146								
147								
148								
149								
150				43.6		End of boring at 150.0 ft bgs.	End Cap	
151								
152								
153								
154								
155								
156								

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface; ppm = parts per million; NA = not available or not applicable.

CHEVRON HES D:\A-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEC BANGALORE\TEMPLATE\VGWU BATTERY-MW-1\GINT TEMPLATE (EXISTING-HESMW-1.GPJ ARCADIS.GDT 3/1/19

APPENDIX F

NMOSE Approved Plugging Plan of Operations and Supporting Field Documentation

WELL PLUGGING PLAN OF OPERATIONS

NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging. This form may be used to plug a single well, or if you are plugging multiple monitoring wells on the same site using the same plugging methodology.

Alert! Your well may be eligible to participate in the Aquifer Mapping Program (AMP)-NM Bureau of Geology geoinfo.nmt.edu/resources/water/cgmn/ if within an area of interest and meets the minimum construction requirements, such as there is still water in your well, and the well construction reflected in a well record and log is not compromised, contact AMP at 575-835-5038 or -6951, or by email nmbg-waterlevels@nmt.edu, prior to completing this prior form. Showing proof to the OSE that your well was accepted in this program, may delay the plugging of your well until a later date.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP: ☐ Check here if proposing one plan for multiple monitoring wells on the same site and attaching WD-08m

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: L14399 (POD2)

Name of well owner: Chevron Environmental Management Company

Mailing address: ~~1400 Smith St, Office 07084~~ 1500 Smith St, office 3816 County: US

City: Houston State: Texas Zip code: ~~07020~~ 77002

Phone number: ~~713-372-0289~~ 832-854-5601 E-mail: jmichelson@chevron.com

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Kenneth D. Cooper - HCI Drilling

New Mexico Well Driller License No.: WD-1731 Expiration Date: 02/28/2020

IV. WELL INFORMATION: ☐ **Check here if this plan describes method for plugging multiple monitoring wells on the same site and attach supplemental form WD-08m and skip to #2 in this section.**

Note: A copy of the existing Well Record for the well(s) to be plugged should be attached to this plan.

2019 OCT 16 AM 10:23 STATE ENGINEER ROSWELL, NEW MEXICO

1) GPS Well Location: Latitude: 32 deg, 47 min, 43.0 sec
Longitude: 103 deg, 30 min, 49.2 sec, NAD 83

2) Reason(s) for plugging well(s):

MW-1 will be plugged and abandoned for site closure.

3) Was well used for any type of monitoring program? Yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? NA If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: 134 feet below land surface / feet above land surface (circle one)

6) Depth of the well: 150 feet

7) Inside diameter of innermost casing: 4 inches.

8) Casing material: PVC

9) The well was constructed with:

☐ an open-hole production interval, state the open interval: _____

☒ a well screen or perforated pipe, state the screened interval(s): 120'-150'

10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA

11) Was the well built with surface casing? NO If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? _____ If yes, please describe:

12) Has all pumping equipment and associated piping been removed from the well? NA If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

☐ **If plugging method differs between multiple wells on same site, a separate form must be completed for each method.**

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal. Attach a copy of any signed OSE variance to this plugging plan.

Also, if this planned plugging plan requires a variance to 19.27.4 NMAC, attach a detailed variance request signed by the applicant.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well:

An attempt will be made to pull the temporary well from the borehole. The borehole will then be pressure grouted with a 5% bentonite/cement mixture to 3ft bgs and backfilled with clean fill. If the temporary well cannot be removed, the well casing will be cut off 3ft bgs. The well will then be pressure grouted to 3' bgs and backfilled with clean fill.

2) Will well head be cut-off below land surface after plugging? 3 ft bgs

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant. Attach a copy of the batch mix recipe from the cement company and/or product description for specialty cement mixes or any sealant that deviates from the list of OSE approved sealants.

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface: 102 gallons

4) Type of Cement proposed: 5% Bentonite/Cement Slurry

5) Proposed cement grout mix: 6.5 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

X mixed on site

7) Grout additives requested, and percent by dry weight relative to cement:

5% dry weight of Bentonite.

8) Additional notes and calculations:

NA

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

VIII. SIGNATURE:

I, Russell Grant on behalf of CEMC, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

Signature of Applicant — Date: 10/15/2019

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

✓ Approved subject to the attached conditions.
_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 17 day of October, 2019

John R. D'Antonio Jr. P.E., New Mexico State Engineer

By: [signature]

2019 OCT 16 AM 10:21 STATE ENGINEER OFFICE ROSWELL, NEW MEXICO

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			3' bgs
Bottom of proposed interval of grout placement (ft bgl)			150' bgs
Theoretical volume of grout required per interval (gallons)			Estimated 102 gallons
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6.5 Gallons
Mixed on-site or batch-mixed and delivered?			Mixed On Site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			5%
Grout additive 2 requested			NA
Additive 2 percent by dry weight relative to cement			NA

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Specific Conditions of Approval L-14399-POD2

1) Attempt to pull the casing from the borehole.

   a) If casing cannot be pulled then cutoff 3' below ground surface.

2) Run tremie pipe to the bottom of the borehole and pump 5% Bentonite/ Portland Type I-II with a mix of 6.5 gallons of water per 94 pound sack to within three feet of surface.

   a) Bentonite must be hydrated separately and then mixed.

3) Any deviation from this plan must obtain an approved variance from this office prior to implementation.

4) A complete plugging record shall be submitted with O.S.E. District II office no later than 30 days after the plugging.

5) Aggrieval of this permit, or any of the conditions of approval therein, suspends the permit. No plugging operations shall occur while a permit is aggrieved.

Sincerely,

Christopher Angel, PG
Water Resources Professional II
Water Resource Allocation Program
Water Rights Division

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
District 2 Office, Roswell, NM

John R. D'Antonio Jr. , P.E.
State Engineer

1900 West Second Street
Roswell, New Mexico 88201
(575) 622-6521
FAX: (575) 623-8559

October 17, 2019

Chevron Environmental Management Company
Attn: Jason Michelson
1500 Smith Street, Office 38116
Houston, Texas 77002

RE: *Well Plugging Plan of Operations* for *L-14399-POD2*

Greetings:

Enclosed is your copy of Well Plugging Plan of Operations for the above referenced project, which has been approved subject to the attached Specific Conditions of Approval. The following conditions of approval have been developed to ensure compliance with the Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells 19.27.4 NMAC adopted June 30, 2017, by the State Engineer.

Aggrieval of this permit, or any of the conditions of approval therein, suspends the permit. No plugging operations shall occur while a permit is aggrieved.

Sincerely,

Christopher Angel, PG
Water Resources Professional II
Water Resource Allocation Program
Water Rights Division

Enclosure
cc Santa Fe

Location Carlsbad, NM Date 10/17/19

Project Client H&S Transfer Chevron

1330
3rd Clean out Truck. Sort/organize supplies.
1630 Go to Storage units load up truck.
1800 Back at hotel.
End M. 2050.
end of day.

10/18/19 Mi 2051

600 leave Hotel, Drive to Hobbs.
0725 Arrive at FMT Office for Dig Plan Approval by Austin Bates
0845 Finally get Austin to approve Dig Plans
Head to CVU 47H
0901 Arrive at Site.
Tailgate
Kenny and David Onsite.
0922 Pic of MW-1
Pull stick, cut down casing.
Bentonite Plug. 26 bags
0951 Finish Plugging Pic "9:51"

0955 Move to CVU-199
1020 Arrive at CVU-199
Pic 10:11 Setup on CVU-199

Location Buckeye / near Hobbs Date 10/18/19

Project / Client CVU 47H CVU 199 MW P&A.
Chevron.

1015 Pull off well housing
Cut off casing below ground surface.
Plug w/ bentonite to surface.
TD = 130' ≈ 24 bags bentonite

1040 Finish Plugging MW-1
~~Pic~~ 10:40. Top w/ soil.

1100 Leave Sik.

~~345~~ 1815 Back in Midland

Stopped by Jacknight

Stopped by Shop

1830

~~330~~ Stopped by House

1630 Washed Truck at Carwash.

end Mi 2284.

Location near Hobbs, NM Date 10/21/2019

Project / Client Chevron PB/As

Begin Mi 134135

0520 Leave House.

Gas at Kent Kwick

16.2 gal @ $39.48

0640 Arrive at FMT Office.

Wait for Call w/ Russel/ Jason.

Leslie Barnes

Safety Meetings - be concise

Start work Checks - Excavation

Right before beggining

Send Jason coordinates of starting location

in degrees and approx time.

> Stay out of work zone

back hoe swing radius.

Permit Process

- Dig Plan

- Permit from Pumper

Tommorow - tank battery

Hi Vis vest -

Tank Battery → Power lines coming in.

acknowledge.

PVC - Shatter

Grout pouring in.

Location Buckeye, Near Ibbbs NM Date 10/21/2019 21

Project / Client Chevron PPAs

4 wells today
MW-1/MW-2 at each site.
Only wells
0923 Arrived at LPU-59
2 wells MW-1, MW-2
Tailgate, Hasp signing.
0927 HCI Unload equipment, backhoe
Pics of MW-1, and MW-2 pre-pull
0950 MW-1 pulled stickup, cut casing
1003 Filled w/ *20 bags bentonite, hydrated.
Pic. Covered w/ topsoil, plugged.
1010 Begin w/ MW-2
Pulled Stickup Cut casing.
1021 Plugged hole w/ Bentonite
Pic "10:20: Covered well.
1023 Move to LPU-60.
1029 at LPU-60 MW-1
MT Pic 1028 - Pull stickup.
1040 MW-1 plugged and covered
Pic "1040"
Move to MW-2
1048 Pic of MW-2 w/ casing pulled.
~18 Bags bentonite
Pic "10:55" Completed plug

Rate in the Rain

22

Location Buckeye LPU-59/60 Date 10/22/19

Project / Client Chevron P+A

Leave LPU-60, head back to LPU-59

1101 MT

1130 Leave Site, head back to Midland.

CT 1439 Back in Midland

end Mi 135381

10/22/19

0530 Leave House in 1134

Begin Mi 135385

Gas at Kent Kwik 1788

18.8 gal @ $45.69

CT 749 Arrive at EMT Office

Get Dig Plans approved.

0838 Arrive a State A-10.

0855. Crew arrived onsite

Tailgate Meeting

- what we are doing
- Set up work zone
- All non-essential personell stay out of immediate work zone
- Watch backhoe swing radius
- Beware of where you are relative to backhoe.
- Have spotter, Keep sight of spotter.

Location State A-10 Date 10/22/19

Project / Client Chevron P+As.

> Start work checks before every well
Have crew verify
> Hospital Location (Nor Lea or Lovington)
- take smaller truck.
> Keep eyes on all your hands feet,
and each other
> Communicate.
- Signt HASP, Tailgate, and P+A JSA
discuss other JSAs.
> Keep out from under bucket/ lifted load.

0830 Jason and Leslie
arrive. Quick sit orientation
Start work checks not necessary
as per Leslie Barnes
Crew starts work. Lifting for casing.
0840
Pic 0843, Pulled stick up
off from casing.
Attempt to unscrew casing.
w/ pry bar.
Had to pull ≈ 10' casing out of
well.
0850 Bentonite/ Grout well.

Rite in the Rain

24

Location Otake A-10 / Tank B4 Date 10/22/19

Project / Client Chevron P→As.

MT

902 MW-2 Stickup pulled.

0906 MW-1 stickup/pad pulled.

0912 MW-1 Casing removed ≈ 2' below surface.

0914 MW-3 Grouted and plugged Covered at surface.

0923 Begin Grouting MW-2.
2 loads cement ≈ 15 bags cement,
8-10 bags bentonite. Top off with grout.

0936 MT MW-2 topped off

0937 Well covered w/ soil.

0941 Grouting MW-1.

0946 Loaded backhoe back up
MW-1 = 15 bags cement,
10 bags bentonite.

0949 Finished MW-1.

1005 MT Move to VGWU Tank Batt

MT MW-1

1007 Pic of MW-1 pre-pull.

MT stickup + ≈ 2' PVC removed.

10:23 Well plugged and covered.

CT Drillers

1134 Load up and leave site.

(0.5 MT) Closed permit out 430

Location Buckeye. Date 10/22/19

Project / Client Chevron HES PTAs

1308 CT Stop for Lunch in Seminole.

1445 CT Arrive at McKnight

1620 Leave Site.

1651 At home

end. Mi. 135641

File No. L-14399

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL A WELL WITH NO WATER RIGHT

(check applicable box):

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

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

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

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☐ Yes ☐ No

1. APPLICANT(S)

Name: Arcadis on behalf of Chevron Environmental Management Company	Name: New Mexico Commissioner of Public Lands, Aubrey Dunn
Contact or Agent: check here if Agent ☐ Brett Krehbiel	Contact or Agent: check here if Agent ☐ Faith Crosby
Mailing Address: 101 Creekside Ridge Court, Suite 200	Mailing Address: PO Box 1148
City: Roseville	City: Santa Fe
State: California Zip Code: 95678	State: New Mexico Zip Code: 87504-1148
Phone: 916-786-5382 ☐ Home ☐ Cell Phone (Work):	Phone: 505-827-5760 ☐ Home ☐ Cell Phone (Work):
E-mail (optional): Brett.Krehbiel@arcadis.com	E-mail (optional): fcrosby@slo.state.nm.us

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2018 SEP ... AM 10:45

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

File No.: L-14399	Trn. No.: 632168	Receipt No.: 2-39903
Trans Description (optional): POD 2		
Sub-Basin: L	PCW/LOG Due Date: 9-30-19	

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

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

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

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

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

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
L-14399 POD1 VGWUBATTERY-MW1	103 30 49.16 -103.513656°	32 47 43.00 32.795279°	312. 36. 175. 34E

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

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

Well is on land owned by: Chevron Functional Management Team

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

Approximate depth of well (feet): 150	Outside diameter of well casing (inches): 4
Driller Name: Kenneth D. Cooper	Driller License Number: WD-1670

2018 SEP -7 AM 10:55
STATE ENGINEER OFFICE ROSWELL, NEW MEXICO

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

The proped well will be installed to monitor groundwater at an oil production site (VGWU Tank Battery) located in Lea county, NM. The well will be monitored until they are no longer deemed necessary.

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

File No.: L-14399	Trn No.: 632168

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

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

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Brett Krehbiel
Print Name(s)

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

Brett Krehbiel
Applicant Signature

Applicant Signature

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2018 SEP -7 AM 10:45

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

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

Witness my hand and seal this 12th day of September 20 18, for the State Engineer,

Tom Blaine, P.E., State Engineer

By: _____ _____
Signature Print

Title: Juan Hernandez, Water Resources Manager 1
Print

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

File No.: L-14399	Trn No.: 632168

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

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

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

17-6 The well authorized by this permit shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair and Plugging of Wells; Subsection C of 19.27.4.30 NMAC unless an alternative plugging method is proposed by the well owner and approved by the State Engineer upon completion of the permitted use. All pumping appurtenance shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the state engineer. The well shall be plugged with an office of the state engineer approved sealant for use in the plugging of non-artesian wells. The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two vertical feet of approved sealant. The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil. A Plugging Report for said well shall be filed with the Office of the State Engineer in a District Office within 30 days of completion of the plugging.

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

Trn Desc: L 14399 POD2 File Number: L 14399
Trn Number: 632168

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

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

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

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

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

17-R Pursuant to section 72-8-1 NMSA 1978, the permittee shall allow the State Engineer and OSE representatives entry upon private property for the performance of their respective duties, including access to the ditch or acequia to measure flow and also to the well for meter reading and water level measurement.

LOG The Point of Diversion L 14399 POD2 must be completed and the Well Log filed on or before 09/30/2019.

IT IS THE PERMITTEES RESPONSIBILITY TO OBTAIN ALL AUTHORIZATIONS AND PERMISSIONS TO DRILL ON PROPERTY OF OTHER OWNERSHIP BEFORE COMMENCING ACTIVITIES UNDER THIS PERMIT.

SHOULD THE PERMITTEE CHANGE THE PURPOSE OF USE TO OTHER THAN MONITORING PURPOSES, AN APPLICATION SHALL BE ACQUIRED FROM THE OFFICE OF THE STATE ENGINEER.

Trn Desc: L 14399 POD2 File Number: L 14399
Trn Number: 632168

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

ACTION OF STATE ENGINEER

Notice of Intention Rcvd: Date Rcvd. Corrected:
Formal Application Rcvd: 09/07/2018 Pub. of Notice Ordered:
Date Returned - Correction: Affidavit of Pub. Filed:

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

Witness my hand and seal this 17 day of Sep A.D., 2018

Tom Blaine, P.E., State Engineer

By: _____
Juan Hernandez

Trn Desc: L 14399 POD2 File Number: L 14399
Trn Number: 632168

Tom Blaine, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 632168
File Nbr: L 14399 POD2

Sep. 17, 2018

ACRADIS/CHEVRON ENVIRO MGMT CO
BRENT KREHBIEL
101 CREEKSIDE RIDGE COURT STE 200
ROSEVILLE, CA 95678

RE: FAITH CROSBY
NEW MEXICO COMM OF PUBLIC LAND
PO BOX 1148
SANTA FE, NM 87504-1148

Greetings:

Your approved copy of the above numbered permit to drill a well for non-consumptive purposes is enclosed. You must obtain an additional permit if you intend to use the water. It is your responsibility to provide the contracted well driller with a copy of the permit that must be made available during well drilling activities.

Carefully review the attached conditions of approval for all specific permit requirements.

* If use of this well is temporary in nature and the well will be plugged at the end of the well usage, the OSE must initially approve of the plugging. If plugging approval is not conditioned in this permit, the applicant must submit a Plugging Plan of Operations for approval prior to the well being plugged. The Plugging Record must be properly completed and submitted to the OSE within 30 days of the well plugging.

* If the final intended purpose and condition requires a well ID tag and meter installation, the applicant must immediately send a completed meter report form to this office.

* The well record and log must be submitted within 30 days of the completion of the well or if the attempt was a dry hole.

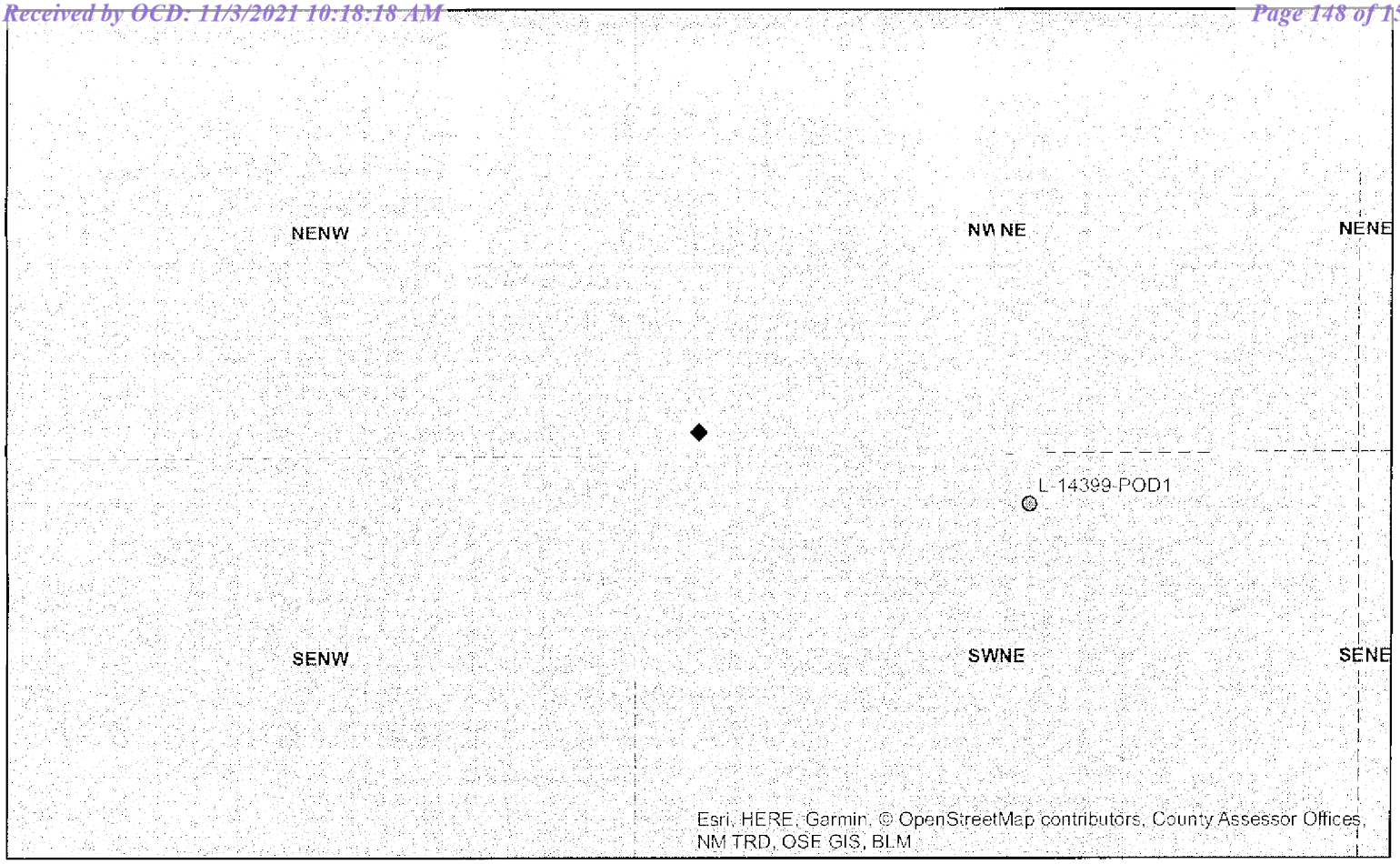
* This permit expires and will be cancelled if no well is drilled and/or a well log is not received by the date set forth in the conditions of approval.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us.

Sincerely,

for Juan Hernandez
(575)622-6521

Enclosure



Coordinates

UTM - NAD 83 (m) - Zone 13

Easting 639175.202

Northing 3629569.237

State Plane - NAD 83 (f) - Zone E

Easting 793216.491

Northing 654028.816

Degrees Minutes Seconds

Latitude 32 : 47 : 43.004400

Longitude -103 : 30 : 49.161600

Location pulled from Coordinate Search

NEW MEXICO OFFICE OF THE STATE ENGINEER

1:4,514

ft

0 90 180 360

YMENDIOLA

Spatial Information

County: Lea

Groundwater Basin: Lea County

Abstract Area: L

Land Grant: Not in Land Grant

Restrictions:

NA

PLSS Description

SWSWNWNE Qtr of Sec 36 of 017S 034E

Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

Parcel Information

UPC/DocNum:

Parcel Owner:

Address:

Legal:

POD Information

Owner: CHEVRON/ST NM/ARCADIS

File Number: L- 14399 POD2

POD Status: NoData

Permit Status: NoData

Permit Use: NoData

Purpose: MONITOR

Calculated PLSS

Coord Search Location

GIS WATERS PODs

PEN

State Land

Chaves County Parcels 2018

BLM Land Grant

PLSSTownship

PLSSFirstDiv...

PLSSSecond...

Jason Michelson
Project Manager

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

August 27, 2018

Arcadis U.S., Inc.
101 Creekside Ridge Court, Suite 200
Roseville, CA 95621

Reference: Agent Authorization Requestor for Monitoring Well Installation in Lea County, New Mexico

Mr. Krehbiel:

As directed by the New Mexico Office of the State Engineer (NMOSE), Chevron Environmental Management Company (CEMC) is providing this letter to certify that Arcadis U.S., Inc (Arcadis) is authorized to act as an agent of CEMC for the monitoring well installation work outlined below and will conduct this work under the direction of CEMC.

Under the direction of CEMC, Arcadis is managing and will oversee the installation of one monitoring well at one Chevron U.S.A Inc. (CUSA) oil production site in Lea County, New Mexico. The name and anticipated coordinates of the well is included in the table below.

Well Name	Latitude	Longitude
VGWUBATTERY-MW1	32.795279°	-103.513656°

If you have any questions or require any additional information, please feel free to contact me at (713) 372-0289.

Sincerely,

Jason Michelson

cc: Brett Krehbiel, Arcadis, Roseville, CA
Melisa Darrow, Arcadis, Phoenix, AZ

Appendix G

Depth-to-Groundwater Data

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
L 05003	L	LE		1		36	17S	34E	638742	3629538*	349	135	105	30

Average Depth to Water: **105 feet**

Minimum Depth: **105 feet**

Maximum Depth: **105 feet**

Record Count: 1

Basin/County Search:

County: Lea

UTMNAD83 Radius Search (in meters):

Easting (X): 639079.91 **Northing (Y):** 3629627.2 **Radius:** 400 meters

***UTM location was derived from PLSS - see Help**

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 59861

CONDITIONS

Operator: CHEVRON U S A INC 6301 Deauville Blvd Midland, TX 79706	OGRID: 4323
	Action Number: 59861
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Deferral request is approved with the following conditions; 1. Remediation to be completed after the site has been decommissioned. 2. Remediation plan will require OCD pre-approval prior to its implementation. 3. Reclamation standards for soils less than 4 feet (ft.) below grade (b.g.) or when top of confining caliche layer is encountered at shallower depths, will meet Table 1 of 19.15.29.12 NMAC for groundwater less than 50 ft. b.g.	4/10/2023