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October 23, 2019

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

Re: Vacuum Glorieta West Unit O-40 Trunk Line
Remedial Plan #: 1RP-3259 and 1RP-3252
2018 Site Assessment Report
Lea County, New Mexico

Dear whom it concerns,

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

- Vacuum Glorieta West Unit O-40 Trunk Line 2018 Site Assessment Report

The submittal was prepared by Arcadis U.S., Inc. (Arcadis) on behalf of Chevron Environmental Management Company (CEMC).

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

Sincerely,

Jason Michelson

Encl. Vacuum Glorieta West Unit O-40 Trunk Line 2018 Site Assessment Report

C.C. Amy Barnhill, Chevron/MCBU

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ARCADIS Design & Consultancy for natural and built assets

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ENVIRONMENT

Subject:
Site Assessment Report
2018 HES Transfer Site
O-40 Trunk Line from the Vacuum Glorieta West Unit Battery
NMOCD Case No. 1RP-3259 and 1RP-3252
Lea County, New Mexico

Date:
October 23, 2019

Contact:
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Our ref:
B0048616.0O40

ARCADIS U.S., Inc.
TX Engineering License # F-533
Geoscientist License # 50158

Dear whom it concerns:

On behalf of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) prepared this Site Assessment Report (Report) for O-40 Trunk Line from the Chevron Mid-Continent Business Unit (MCBU) Vacuum Glorieta West Unit (VGWU) Battery located in Lea County, New Mexico (site; **Figure 1**). This Report summarizes the field activities completed and the results of samples collected during soil and groundwater investigation activities conducted on-site in October 2013, September 2016, December 2017, July 2018, and October 2018. The purpose of this Report is to present soil boring and monitoring well locations, monitoring well construction details, analytical results of samples collected, and the data evaluation performed as part of the investigations referenced above following the December 5, 2012 release of approximately 149 barrels (bbls) of produced water.

SITE DESCRIPTION AND BACKGROUND

The following site description and background section provides an overview of the site location and regional setting including geology, hydrogeology, nearby drinking water wells, surface water, and climate.

Site Location and Description

The site is located within the Vacuum Glorieta West Unit (VGWU) and is directly east of the VGWU Battery. Lovington, New Mexico (the closest town), is approximately 14 miles northeast of the site and the closest agricultural area is

approximately 7 miles northeast of the site. New Mexico Highway 238 is located approximately 0.4 mile east of the site.

The site is located in the western edge of the Permian Basin, a 75,000-square-mile area in 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, Chaves and Eddy County to the west, and to Texas to the south.

Nearby Water Wells and Surface Water

Based on review of satellite imagery, no surface-water bodies have been identified within a 0.6-mile radius of the site (GoogleEarth 2018). In October 2013, Arcadis staff field verified that there are no surface-water bodies located within 1,000 feet of the site.

In January 2019, Arcadis reviewed information obtained from the New Mexico Office of the State Engineer (NMOSE) online database (NMOSE 2019), which indicated that no water-supply wells were located within 1,000 feet of the site. The NMOSE online database identified 259 water-supply wells within a 5-mile radius of the site (NMOSE 2019). A domestic water-supply well, located approximately 1,440 feet northeast (i.e., hydraulically cross-gradient) of the site, was identified as the closest designated-use well to the site.

Climate

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 4,001 feet above mean sea level. The site is located in the Querecho Plains immediately west 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 approximately 200 to 250 feet occurs west of the northwest-trending Mescalero Ridge. The Ogallala Formation east of the ridge 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 (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. The nearest area where the Ogallala is underlain by the Cretaceous-age Trinity Group is approximately 45 miles to the northwest (Fallin 1988).

The Querecho Plain is 80 percent covered by a moderately stable dune field (Reeves 1972) that is deposited on top of Triassic Dockum red beds. The red bed surface, which is approximately 400,000 to 500,000 years old, is relatively flat with minor erosional incisions and near-surface caliche layer ranging in thickness from 3- to 13-feet (Bachman 1980). Deposition of sand and formation of the dune field began approximately 60,000 years ago, with additional development beginning approximately 9,000 years ago (Hall 2002). The surface and interior of these dunes do not contain caliche; however, a 1-foot layer of caliche is common at the bottom of the dunes at the contact with the red bed surface. Groundwater in the area is in the Dockum Group at a depth of approximately 100 feet (Summers 1972). Compared to the Ogallala Formation to the west of the site, the Dockum Group groundwater is not a major resource in the area, with poor potential water production rates and elevated natural dissolved solids.

Water-supply wells located on the southern High Plains east of Mescalero Ridge in central Lea County and near the site, as discussed in the Nearby Water Wells and Surface Water section of this report, are completed in the High Plains Aquifer (HPA). The HPA consists primarily of the Ogallala Formation, and in localized areas, alluvial sediment of Quaternary age. Near the site, the HPA is present directly above the Triassic-age Dockum Group, which occurs at a depth of approximately 140 feet below ground surface (bgs) (Ash 1963, Fahlquist 2003, Nativ 1988, Nicholson and Clebsch 1961, Tillery 2008). The regional groundwater flow direction is generally toward the east-southeast (Tillery 2008).

INITIAL RELEASE RESPONSE

Response Actvities

A release of approximately 149 bbls of produced water occurred at the site (primarily pasture land) on December 5, 2012 due to a leak from an underground fiberglass line. Chevron personnel from the Mid-Continent Business Unit (MCBU) stopped the release and recovered approximately 35 bbls of fluids using a vacuum truck. On December 5, 2012, Chevron MCBU personnel excavated visually impacted soil in the area to a depth of approximately 2 feet bgs. Information regarding the disposal of the excavated soil was not made available to Arcadis.

Pursuant to New Mexico Oil Conservation Division (NMOCD) requirements (NMOCD 1993), Chevron MCBU submitted a Notification of Release and Correction (Form C-141) to the NMOCD, detailing the location, volume of release, and initial and planned cleanup efforts for the site. The original C-141 form is included as **Attachment 1**.

Six discrete confirmation soil samples were collected from the base of the excavation on January 22, 2013 (**Figure 2**). Soil sample containers were transported on ice, under chain of custody procedures, to Cardinal Laboratories Environmental Analytical Services in Hobbs, NM for the following analyses:

- 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

Confirmation Soil Sample Results

The analytical results for BTEX, TPH-GRO, TPH-DRO, and chloride for the six discrete confirmation soil samples collected in January 2013 are provided in **Table 1** and summarized below:

- BTEX compounds were not detected above the laboratory reporting limits (LRLs).
- TPH-DRO and TPH-GRO were not detected above LRLs.
- Chloride was detected in all six confirmation samples, at concentrations ranging from 6,480 milligrams per kilogram (mg/kg) (VGWU #040 Sample #4) to 12,000 mg/kg (VGWU #040 Sample #6).

The complete laboratory analytical results with chain of custody documentation are included in **Attachment 2**. Chloride results from 2013 were compared to the New Mexico Administrative Code's (NMAC's) closure criteria (CC) published in 2009 (NMAC 2009). Chloride concentrations in all six confirmation soil samples were above the 2009 CC of 500 mg/kg, which prompted additional site assessment activities.

2013 SOIL INVESTIGATIONS

Site Assessment Activities

In October 2013, Arcadis conducted site assessment activities to characterize the lateral and vertical extents of potential soil impacts at the site. Soil boring locations were selected based on the results of confirmation soil sampling completed at the site in January 2013, locations of pipelines and other equipment at the site, and the extent of the release as documented by Chevron MCBU personnel during the initial response activities.

To evaluate the potential extent of impacts to soil at the site, Arcadis advanced the following nine soil borings on October 22 and 23, 2013 (**Figure 2**):

- VGWU 40-01
- VGWU 40-02
- VGWU 40-03
- VGWU 40-04
- VGWU 40-05
- VGWU 40-06
- VGWU 40-07
- VGWU 40-08
- VGWU 40-09

Prior to conducting drilling activities, each boring location was cleared for subsurface utilities with an air knife. The air knife could not be advanced more than 2 to 3 inches bgs due to the presence of a thick caliche layer. Each soil boring was then advanced to a total depth of approximately 30 feet bgs using air rotary drilling equipment.

Soil was continuously logged for stratigraphic characteristics according to the United Soil Classification System (USCS). The soil samples were field screened for the presence of volatile organic compounds using a photo ionization detector (PID), in combination with visual and olfactory screening methods, for

evidence of petroleum hydrocarbons. Field personnel recorded PID readings, soil types, and other pertinent geologic data on boring logs (**Attachment 3**). No staining or elevated PID readings were observed. Lithologic data indicated the subsurface material consisted primarily of caliche (soil carbonate) profiles including “caprock,” nodular, and sandy caliche layers from approximately 0 to 30 feet bgs.

Six soil samples were collected from each boring location beginning at a depth of 2 feet bgs (the approximate depth of the soil excavation in the initial release response activities) and continuing at 5-foot intervals from 5 to 30 feet bgs. A total of 63 samples were collected in clean, laboratory-supplied glass jars, labeled, placed in an ice-chilled cooler, and submitted under appropriate chain of custody protocols to TestAmerica Laboratories in Houston, TX. Soil samples collected from each boring were analyzed for chloride by USEPA Method 9056.

Following sampling, the boreholes were filled with soil cuttings from the total depth to ground surface. The ground surface was restored to match the surrounding conditions.

Soil Sample Results

The analytical results for chloride concentrations in the 63 soil assessment samples are provided in **Table 1** and summarized below. Laboratory analytical results with chain of custody documentation are provided in **Attachment 2**.

Chloride was detected in 62 of the 63 soil assessment samples at concentrations ranging from 6 mg/kg (VGWU 40- 05 at 15 feet bgs) to 5,200 mg/kg (VGWU 40- 04 at 5 feet bgs). Chloride was detected above the 2009 NMAC CC concentration of 500 mg/kg in 22 of the 63 soil assessment samples. The depth at which soil samples were collected with chloride concentration exceedances ranged from 2 feet bgs (VGWU 40-07) to 30 feet bgs (VGWU 40-02; **Figure 2**).

2016 SOIL INVESTIGATIONS

Soil Delineation Activities

In September 2016, Arcadis conducted further site assessment activities to delineate chloride-impacted soil at the site. Soil boring locations were selected based on the results of site assessment soil sampling completed at the site in October 2013, locations of pipelines and other equipment at the site, and the extent of the release as documented by Chevron MCBU personnel during the initial response activities. Soil borings locations were proposed in pairs such that one boring would be advanced outside of the release area. Arcadis then stepped out 20 to 30 lateral feet from the first boring, in the opposite direction of the release area, to advance a second boring.

Arcadis advanced a total 10 soil borings on September 12 and 13, 2016 (**Figure 2**):

- VGWU 40-10
- VGWU 40-11
- VGWU 40-12
- VGWU 40-13
- VGWU 40-14
- VGWU 40-15
- VGWU 40-16

- VGWU 40-17
- VGWU 40-18
- VGWU 40-19

In addition, VGWUO40-02 was reinstalled in its original location in order to collect additional samples from deeper depths.

Prior to conducting drilling activities, each boring location was cleared for subsurface utilities with an air knife to a depth of 4 feet bgs. Soil was logged for lithologic characteristics according to the USCS.

Soil samples were collected from each of the 10 boring locations at 2 and 4 feet bgs. Arcadis used Quantab® field screening methods to quantify chloride concentrations in soil prior to sample collection (Boyer 2004). If chloride field screenings resulted in chloride concentrations above 200 mg/kg, borings were advanced further until concentrations were below 200 mg/kg.

A total of 26 soil samples were collected in clean, laboratory-supplied glass jars, labeled, placed in an ice-chilled cooler, and submitted under appropriate chain of custody protocols to Xenco Laboratories (Xenco) in Midland, TX, a Texas-certified laboratory. Soil samples collected from each boring were analyzed for chloride by USEPA Method 300/300.1.

Following sampling, the boreholes were filled with soil cuttings from the total depth to ground surface. The ground surface was restored to match the surrounding conditions.

Soil Sample Results

The analytical results for chloride concentrations in the 26 soil assessment samples are provided in **Table 1** and summarized below. Laboratory analytical results with chain of custody documentation are provided in **Attachment 2**.

Chloride was detected in 23 of the 26 soil samples at concentrations ranging from 10.1 mg/kg (VGWU 40-13 at 10 feet bgs) to 1,980 mg/kg (VGWU 40- 10 at 2 feet bgs). Chloride was detected above the 2009 NMAC CC concentration of 500 mg/kg in 5 of the 26 soil samples. The depth at which soil samples were collected with chloride concentration exceedances ranged from 4 feet bgs (VGWU 40-13 and VGWU 40-16) to 70 feet bgs (VGWU 40-10; **Figure 2**).

2017 AND 2018 GROUNDWATER ASSESSMENT

Monitoring Well Installation and Groundwater Sampling

Soil delineation sampling conducted in 2016 and chloride field screening suggested potential impacts near groundwater at VGWU O-40. Arcadis installed groundwater monitoring well VGWUO40-MW1 on December 4, 2017 to evaluate to potential impact of groundwater (**Figure 3**)

The monitor well location was hand cleared using air knife to a minimum depth of 8 feet bgs and was advanced to a total of 150 feet bgs. The monitor well was constructed within the open borehole using nominal 4-inch outside diameter (OD) schedule 40 poly vinyl chloride (PVC) casing. The screened interval extends across the saturated thickness of the aquifer (119.26 feet to 149.26 feet bgs) and constructed 0.10-inch machine-slotted PVC casing. Depth to groundwater was measured following installation at approximately 132 feet bgs.

Soil was continuously logged for lithologic characteristics according to the USCS (**Attachment 3**). After well installation and development, one groundwater grab sample was collected from the newly installed well. In July and October 2018, additional groundwater samples were collected VGWUO40-MW1. Groundwater samples collected during each of the sampling events were placed 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 **Attachment 4**.

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 New Mexico Administrative Code (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 470 micrograms per liter (mg/L) in VGWUO40-MW1 during the December 2017 sampling, 556 mg/L in July 2018, and 630 mg/L in October 2018. Detected chloride concentrations during each groundwater sampling event exceed the NMAC human heath standard value of 250 mg/L. The cumulative groundwater analytical results for chloride are provided in **Table 2**.

2018 GEOPHYSICAL SURVEY

On October 25, 2018, Arcadis performed an electromagnetic conductivity survey over accessible areas of the site covering approximately 4 acres (**Figures 4** through **6**). Two inaccessible flooded areas, from recent rainfall events, were encountered within the survey area and are depicted in blue cross-hatch in **Figures 4** 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 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 a GEM-2 broadband electromagnetic sensor manufactured by Geophex Ltd. 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 (93 kilohertz (kHz), 63 kHz, 18.3 kHz, 5.3 kHz, and 1.5 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 were collected along lines spaced approximately 10 feet 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 EM data sets were collected, they were transferred to a laptop computer while on-site. The data sets were preprocessed using *WinGEM* from Geophex Ltd. 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, additional GEM-2 data were collected along a west to east transect line (A-A') and a south to north transect line (B-B') as depicted in **Figure 4**. In order to produce a more robust model, data from 13 discrete frequencies were collected along the two transect lines (93 kHz, 80kHz, 63kHz, 38.3kHz, 21.9kHz, 18.3kHz, 12.4 kHz, 5.3kHz, 2.9 kHz, 2.4kHz, 1.5 kHz, 0.63 kHz, and 0.45kHz). The data were inverse-modeled using the software IX1Dv3 by Interpex to produce electrical resistivity cross-sections of the subsurface. 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.

Interpretation of Geophysical Results

Figures 4 through **6** present color-filled contour maps for:

- 63kHz GEM2 data (4 to 8-foot sensing depth)
- 18.3kHz GEM2 data (6 to 10-foot sensing depth)
- 5.3kHz GEM2 data (8 to 12-foot sensing depth), respectively.

Figures 7 and **8** present GEM-2 2D modelling results along the A-A' and B-B' profiles. Locations of metallic flow line (based on field observations and aerial photographs) and 2018 shallow soil sample locations (collected on the day of the geophysical survey October 25, 2018) are denoted in the figures.

The color scale used in **Figures 4** through **8** 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 total dissolved solids within 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. The data output for the GEM-2 model profiles presented in **Figure 7** and **8** is in units of electrical resistivity (ohm-meters, logarithmic scale) which is the inverse quantity of electrical conductivity (mS/m). A corresponding logarithmic color scale is used in **Figure 7** and **8** to depict areas of areas of low electrical resistivity in the A-A' and B-B' profiles with warm colors (yellow to red) that correlate to areas of high EC in the contour maps.

In general, an elevated EC response is observed throughout the spill area surveyed with elevated EC values >100 mS/m shown in yellow to red colors (**Figures 4** through **6**). In general, the shape of the elevated EC areas correlates with buried flow lines that run east-west through the red-outlined spill area. The highest magnitude EC response (>200 mS/m) was observed in the center of the outlined spill area, immediately west of soil sample location VGWUO40-22. The 2x magnitude of the EC response in this area, relative to other elevated EC values measured throughout the survey area, suggest a greater degree of impact and/or a potential source area for the spill.

The west to east GEM-2 A-A' profile shown in **Figure 7** crossed the above mentioned central >200 mS/m EC area. The A-A' model resolves a confined “perched” high conductivity zone that extends from approximately 1 to 15 feet bgs, providing some vertical delineation of the elevated EC response and suggesting that produced water impacts may not extend to deeper soils. The south to north GEM-2 B-B' profile shown in **Figure 8** intersects the western edge of the high >200 mS/m EC zone. The B-B' model resolves three discontinuous confined “perched” high conductivity zones that extend to a maximum depth of 6 feet bgs.

2018 SOIL INVESTIGATIONS

Site Assessment Activates

In conjunction with the geophysical survey, and for calibration purposes, as well as to provide site specific laboratory data, Arcadis collected 5 surface soil samples (VGWU 40-20, VGWU 40-21, VGWU 40-22, VGWU 40-23, and VGWU 40-24) on October 25, 2018, using a hand auger from a depth of half foot bgs (**Figure 2**). The samples were collected in clean, laboratory-supplied sample containers, labeled, placed on ice, cooled to approximately 4 degrees Celsius, and submitted to Xenco under chain-of-custody protocol for analysis of chloride by USEPA Method 300.1.

Soil cuttings from each boring were placed back in the borehole.

Soil Sample Results

The analytical data from the soil samples collected in October 2018 are compared to the 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 which became effective on August 14, 2018. Since depth to groundwater at the site has been confirmed to be over 100 feet bgs, the closure criteria for chloride concentrations in the soil is 20,000 mg/kg.

October 23, 2019

Chloride was detected in 3 of the 5 surface soil samples collected in October 2018 at concentrations ranging from 27.5 mg/kg (VGWU 40- 22) to 972 mg/kg (VGWU 40- 23). Chloride concentrations detected in the surface soil samples did not exceed the 2018 NMAC CC of 20,000 mg/kg. Analytical results for chloride concentrations in the 5 soil samples are provided in **Table 1**

CONCLUSION

Potential migration of remaining chloride to groundwater is not expected due to the relatively small volume of unrecovered material, low precipitation (WRCC 2019a), high evapotranspiration rates (WRCC 2019b), and fine-grained nature of caliche layers present beneath the site. In addition, the geophysical survey provide data that indicate high conductivity zones at the site do not extent passed approximately 15 feet bgs which further demonstrates that the remaining soil concentrations associated with the release do not pose a significant risk to groundwater resources.

Soil data presented in this report support a conclusion that impacted soil associated with the December 5, 2012 release at the site poses no significant threat to groundwater resources or other receptors.

Although impacted soil poses little threat to the groundwater at the site, chloride concentrations detected in groundwater samples collected from VGWUO40-MW1 in December 2017, July 2018, and October 2018 exceed the NMAC human heath standard value of 250 mg/L. Chloride concentrations ranged from 459 mg/L in December 2017 to 630 mg/L in October 2018. Further investigations are needed to determine the extent of chloride-impacts in the groundwater and the source of impact.

CLOSING

Arcadis proposes installing and sampling two groundwater monitoring well to further assess chloride concentrations in groundwater at the site.

If you have any questions or comments regarding the information presented in this Report, please contact Scott Foord 713953.4853 or at William.Foord@arcadis.com.

Sincerely,

Arcadis U.S., Inc.

Scott Foord
Project Manager

Greg Cutshall
Program Manager

Copies:
Jason Michelson (CEMC)

Bradford Billings 07/09/2021 OCD

October 23, 2019

Enclosures:

Tables

1 Soil Sampling Analytical Results
2 Groundwater Gauging Data and Analytical Results

Figures

1 Site Location Map
2 Soil Analytical Results
3 Groundwater Analytical Results
4 GEM-2 Conductivity Map – 63kHz
5 GEM-2 Conductivity Map – 18.3kHz
6 GEM-2 Conductivity Map – 5.3kHz
7 Modelled GEM-2 Profile – Section A-A'
8 Modelled GEM-2 Profile – Section B-B'

Attachments

1 C-141 Form
2 Laboratory Analytical Results and Chain of Custody
3 Soil Boring Logs and Monitor Well Logs

References

Ash, S.R. 1963. Ground-water conditions in northern Lea County, New Mexico. New Mexico Bureau of Mines and Mineral Resources, Atlas HA-62.

Bachman, George O. 1980. Regional Geology and Cenozoic History of Pecos Region, Southeastern New Mexico, US Dept. of Interior Geological Survey, Open File Report 80-1099, 120 pp.

Boyer, David G. 2004. Field Determination of Chloride in Salt Impacted Soils – Just Add Water!. 1th Annual International Petroleum Environmental Conference, October 2004, Albuquerque, NM. 11 pp.

Fahlquist, L. 2003. Ground-water quality of the southern High Plains Aquifer, Texas and New Mexico, 2001. U. S. Geological Survey Open-File Report 03-345, 69 p.

Fallin, J.A. Tony. 1988. Hydrogeology of Lower Cretaceous Strata Under the Southern High Plains of New Mexico, New Mexico Geology, Vol. 10, No. 1, pp. 6-9, February 1988.

GoogleEarth. 2018. Lovington, New Mexico, 32_46_57.76N, 103_29_26.55W, elev 3913 feet, Google Earth Imagery. December 20.

Hall, Stephen A. 2002. Field Guide to the Geoarcaeology of the Mescalero Sands, Southeastern New Mexico, Report Submitted to the State of New Mexico Historic Preservation Division and New Mexico Bureau of Land Management, Project No. 35-00-15334.11. October 2002.

Nativ, R. 1988. Hydrogeology and hydrochemistry of the Ogallala aquifer, Southern High Plains, Texas Panhandle and eastern New Mexico: The University of Texas at Austin, Bureau of Economic Geology Report of Investigations no. 177, 64 p.

New Mexico Administrative Code. 1995. Title 20, Chapter 6 of the New Mexico Administrative Code for Environmental Protection, Water Quality, Ground and Surface Water Protection, 20.6.2 NMAC. December.

New Mexico Administrative Code. 2009. Title 19, Chapter 15 of the New Mexico Administrative Code concerning pits, closed-loop systems, below grade tanks and sumps, and other alternative methods, 19.15.17 NMAC. July.

New Mexico Administrative Code. 2018. Title 19, Chapter 15 of the New Mexico Administrative Code for Natural Resources and Wildlife, Oil and Gas, and Releases, 19.15.29 NMAC. August.

New Mexico Office of the State Engineer. 2019. Water Information, Maps and Data, Geospatial Data, OSE Well Data, http://www.ose.state.nm.us/water_info_data.html, January.

Nicholson, A., Jr., and A. Clebsch, Jr. 1961. Geology and Ground-Water Conditions in Southern Lea County, New Mexico. ERMS 241583. Ground-Water Report 6. Socorro, NM: New Mexico Bureau of Mines and Mineral Resources.

Reeves, C.C. Jr. 1972. Tertiary-Quaternary stratigraphy and geomorphology of West Texas and southeastern New Mexico: New Mexico Geological Society, Guidebook 23, p. 108-117.

Seni, S.J. 1980. Sand-body geometry and depositional systems, Ogallala Formation, Texas. University of Texas, Bureau of Economic Geology, Report of Investigations No.105, 40 p.

Summers, W.K. 1972. Geology and Regional Hydrology of the Pecos River Basin, New Mexico, New Mexico Bureau of Geology and Mineral Resources, Open File Report No. 37, 393 pp. June 1972.

Tillery, A. 2008. Current (2004-07) conditions and changes in ground-water levels from predevelopment to 2007, Southern High Plains Aquifer, Southeast New Mexico-Lea County Underground Water Basin. U.S. Geological Survey, Scientific Investigations Map 3044.

United States Environmental Protection Agency. 1996. Multimedia Exposure Assessment Model for exposure assessment, MULTIMED 2.0 Beta. October.

United States Environmental Protection Agency. 2010. List of Contaminants and their Maximum Contaminant Levels, List of National Secondary Drinking Water Regulations. Online at: http://water.epa.gov/drink/contaminants/#List. July 1.

Western Regional Climate Center. 2019a. Hobbs, New Mexico (294026) weather station. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm4026. Viewed on January 2.

Western Regional Climate Center. 2019b. Artesia, New Mexico, monthly average pan evaporation. http://www.wrcc.dri.edu/htmlfiles/westevap.final.html#NEW MEXICO. Viewed on January 2.

TABLES

Table 1
Soil Analytical Results
Chevron EMC
Vacuum Glorieta West Unit O-40 Trunk Line
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

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)	% Moisture
NMAC Closure Criteria [(a)]			10	---	---	---	50	1,000		20,000	---
VGWU #040 Sample #1	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	11,000	--
VGWU #040 Sample #2	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	9,760	--
VGWU #040 Sample #3	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	11,600	--
VGWU #040 Sample #4	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	6,480	--
VGWU #040 Sample #5	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	9,920	--
VGWU #040 Sample #6	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	12,000	--
VGWU 40- 01	10/23/2013	2	--	--	--	--	--	--	--	1,000	5
	10/23/2013	5	--	--	--	--	--	--	--	2,100	4
	10/23/2013	10	--	--	--	--	--	--	--	400	6
	10/23/2013	15	--	--	--	--	--	--	--	350	5
	10/23/2013	20	--	--	--	--	--	--	--	33	8
	10/23/2013	25	--	--	--	--	--	--	--	15	4
	10/23/2013	30	--	--	--	--	--	--	--	180	3
VGWU 40- 02	10/22/2013	2	--	--	--	--	--	--	--	2,600	6
	10/22/2013	5	--	--	--	--	--	--	--	4,300	10
	10/22/2013	10	--	--	--	--	--	--	--	4,700	3
	10/22/2013	15	--	--	--	--	--	--	--	3,900	6
	10/22/2013	20	--	--	--	--	--	--	--	2,600	7
	10/23/2013	25	--	--	--	--	--	--	--	3,100	3
	10/23/2013	30	--	--	--	--	--	--	--	3,600	4
	6/23/2016	80	--	--	--	--	--	--	--	93	--
VGWU 40- 03	10/23/2013	2	--	--	--	--	--	--	--	3,600	5
	10/23/2013	5	--	--	--	--	--	--	--	910	3
	10/23/2013	10	--	--	--	--	--	--	--	37	3
	10/23/2013	15	--	--	--	--	--	--	--	23	3
	10/23/2013	20	--	--	--	--	--	--	--	14	1
	10/23/2013	25	--	--	--	--	--	--	--	8	2
	10/23/2013	30	--	--	--	--	--	--	--	27	2
VGWU 40- 04	10/22/2013	2	--	--	--	--	--	--	--	1,700	6
	10/22/2013	5	--	--	--	--	--	--	--	5,200	9
	10/22/2013	10	--	--	--	--	--	--	--	360	6
	10/22/2013	15	--	--	--	--	--	--	--	93	8
	10/22/2013	20	--	--	--	--	--	--	--	23	6
	10/22/2013	25	--	--	--	--	--	--	--	71	12
	10/22/2013	30	--	--	--	--	--	--	--	21	8
VGWU 40- 05	10/23/2013	2	--	--	--	--	--	--	--	54	1
	10/23/2013	5	--	--	--	--	--	--	--	53	8
	10/23/2013	10	--	--	--	--	--	--	--	10	2
	10/23/2013	15	--	--	--	--	--	--	--	6	1
	10/23/2013	20	--	--	--	--	--	--	--	6	2
	10/23/2013	25	--	--	--	--	--	--	--	7	3
	10/23/2013	30	--	--	--	--	--	--	--	7	5
VGWU 40- 06	10/23/2013	2	--	--	--	--	--	--	--	51	2
	10/23/2013	5	--	--	--	--	--	--	--	27	6
	10/23/2013	10	--	--	--	--	--	--	--	7	4
	10/23/2013	15	--	--	--	--	--	--	--	<4.4	9
	10/23/2013	20	--	--	--	--	--	--	--	6	4
	10/23/2013	25	--	--	--	--	--	--	--	7	4
	10/23/2013	30	--	--	--	--	--	--	--	10	4
VGWU 40- 07	10/23/2013	2	--	--	--	--	--	--	--	2,400	4
	10/23/2013	5	--	--	--	--	--	--	--	130	2
	10/23/2013	10	--	--	--	--	--	--	--	33	3
	10/23/2013	15	--	--	--	--	--	--	--	96	5
	10/23/2013	20	--	--	--	--	--	--	--	14	3
	10/23/2013	25	--	--	--	--	--	--	--	8	4
	10/23/2013	30	--	--	--	--	--	--	--	9	3

Table 1
Soil Analytical Results
Chevron EMC
Vacuum Glorieta West Unit O-40 Trunk Line
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)	% Moisture
NMAC Closure Criteria [(a)]			10	---	---	---	50	1,000		20,000	---
VGWU 40- 08	10/23/2013	2	--	--	--	--	--	--	--	2,000	3
	10/23/2013	5	--	--	--	--	--	--	--	700	6
	10/23/2013	10	--	--	--	--	--	--	--	2,600	8
	10/23/2013	15	--	--	--	--	--	--	--	11	13
	10/23/2013	20	--	--	--	--	--	--	--	46	5
	10/23/2013	25	--	--	--	--	--	--	--	130	4
	10/23/2013	30	--	--	--	--	--	--	--	61	7
VGWU 40- 09	10/23/2013	2	--	--	--	--	--	--	--	2,500	5
	10/23/2013	5	--	--	--	--	--	--	--	1,800	2
	10/23/2013	10	--	--	--	--	--	--	--	900	4
	10/23/2013	15	--	--	--	--	--	--	--	2,300	10
	10/23/2013	20	--	--	--	--	--	--	--	580	9
	10/23/2013	25	--	--	--	--	--	--	--	70	7
	10/23/2013	30	--	--	--	--	--	--	--	130	5
VGWUO40-10	9/12/2016	2	--	--	--	--	--	--	--	1,980	--
	9/12/2016	4	--	--	--	--	--	--	--	428	--
	9/12/2016	7	--	--	--	--	--	--	--	259	
	9/12/2016	70	--	--	--	--	--	--	--	920	
VGWUO40-11	9/12/2016	2	--	--	--	--	--	--	--	44.2	--
	9/12/2016	4	--	--	--	--	--	--	--	<10.0	--
VGWUO40-12	9/13/2016	2	--	--	--	--	--	--	--	87	--
	9/13/2016	4	--	--	--	--	--	--	--	54	--
VGWUO40-13	9/12/2016	2	--	--	--	--	--	--	--	753	--
	9/12/2016	4	--	--	--	--	--	--	--	714	--
	9/12/2016	10	--	--	--	--	--	--	--	10.1	--
VGWUO40-14	9/12/2016	2	--	--	--	--	--	--	--	87	--
	9/12/2016	4	--	--	--	--	--	--	--	101	--
VGWUO40-15	9/12/2016	2	--	--	--	--	--	--	--	<10.0	--
	9/12/2016	4	--	--	--	--	--	--	--	<10.0	--
VGWUO40-16	9/13/2016	2	--	--	--	--	--	--	--	329.00	--
	9/13/2016	4	--	--	--	--	--	--	--	881.00	--
	9/13/2016	50	--	--	--	--	--	--	--	16.40	--
VGWUO40-17	9/13/2016	2	--	--	--	--	--	--	--	52.8	--
	9/13/2016	4	--	--	--	--	--	--	--	34.8	--
VGWUO40-18	9/13/2016	2	--	--	--	--	--	--	--	65.30	--
	9/13/2016	4	--	--	--	--	--	--	--	318.00	--
	9/13/2016	70	--	--	--	--	--	--	--	142.00	--
VGWUO40-19	9/13/2016	2	--	--	--	--	--	--	--	54.2	--
	9/13/2016	4	--	--	--	--	--	--	--	59.6	--
VGWUO40-20	10/25/2018	0.5	--	--	--	--	--	--	--	<4.95	--
VGWUO40-21	10/25/2018	0.5	--	--	--	--	--	--	--	938.0	--
VGWUO40-22	10/25/2018	0.5	--	--	--	--	--	--	--	27.5	--
VGWUO40-23	10/25/2018	0.5	--	--	--	--	--	--	--	972	--
VGWUO40-24	10/25/2018	0.5	--	--	--	--	--	--	--	<5.01	--

Legend:

%	Percent
mg/kg	Miligram(s) per kilogram
<	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
Groundwater Gauging Data and Analytical Results
Chevron EMC
Vacuum Glorieta West Unit O-40 Trunk Line
Lea County, New Mexico

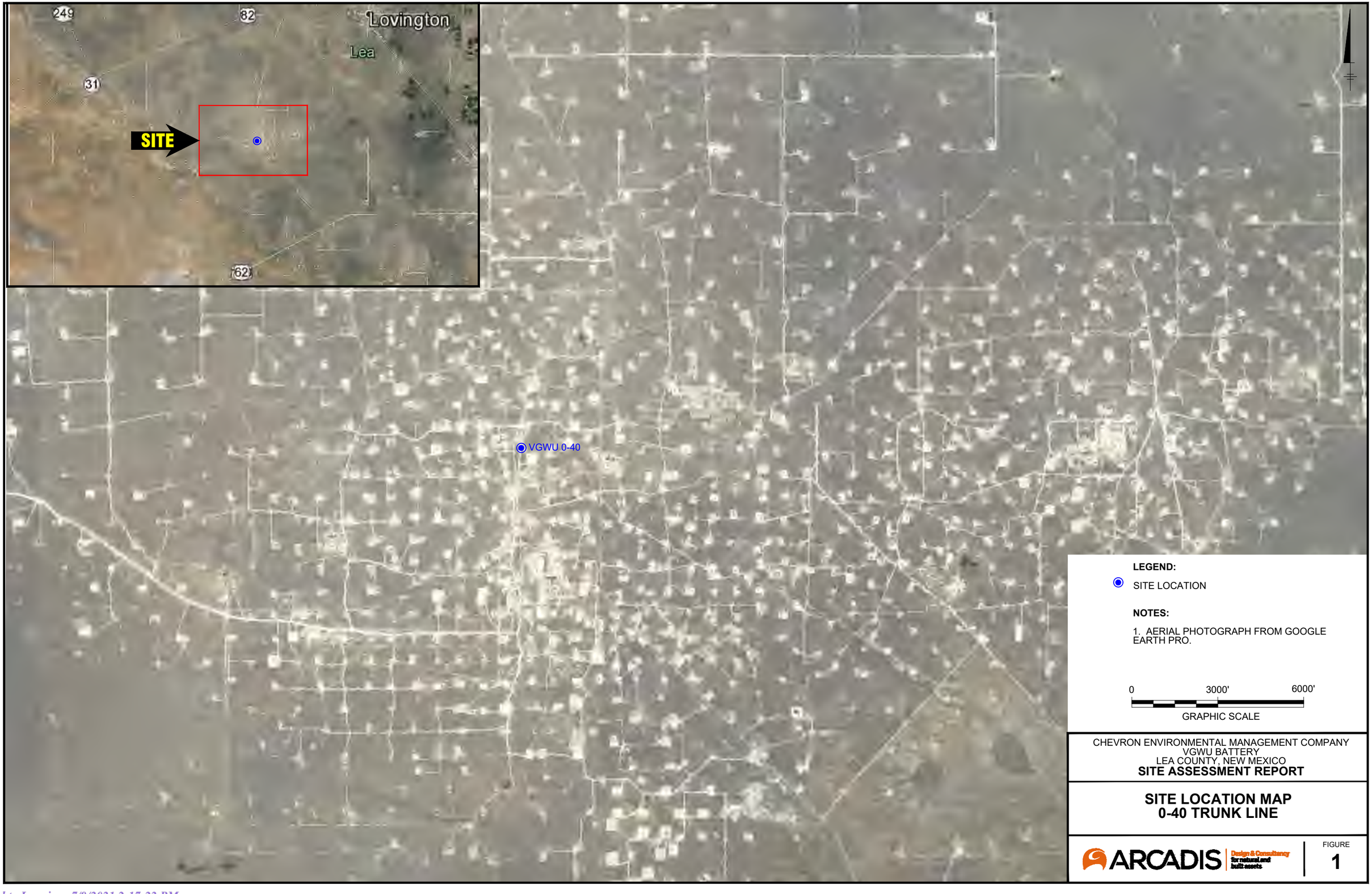
Monitoring Well ID	Date	DTW (ft btoc)	Chloride[1] (mg/L)
NMAC Standards [2]			250
VGWUO40-MW1	12/7/2017	149.3	**470**
	12/7/2017 (DUP)	--	**459**
	7/31/2018	134.8	**556**
	7/31/2018 (DUP)	--	**526**
	10/25/2018	135.0	**630**
	10/25/2018 (DUP)	--	**628**

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.

Legend:

###	Analytical value is greater than or equal to NMAC closure criteria
--	Not applicable or not measured
NMAC	New Mexico Administrative Code
DUP	Field duplicate sample
DTW	Depth to Water
mg/L	Miligram(s) per liter
BTOC	Below top of casing
ft	Feet

FIGURES



LEGEND:

SITE LOCATION

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.

0 3000' 6000'

GRAPHIC SCALE

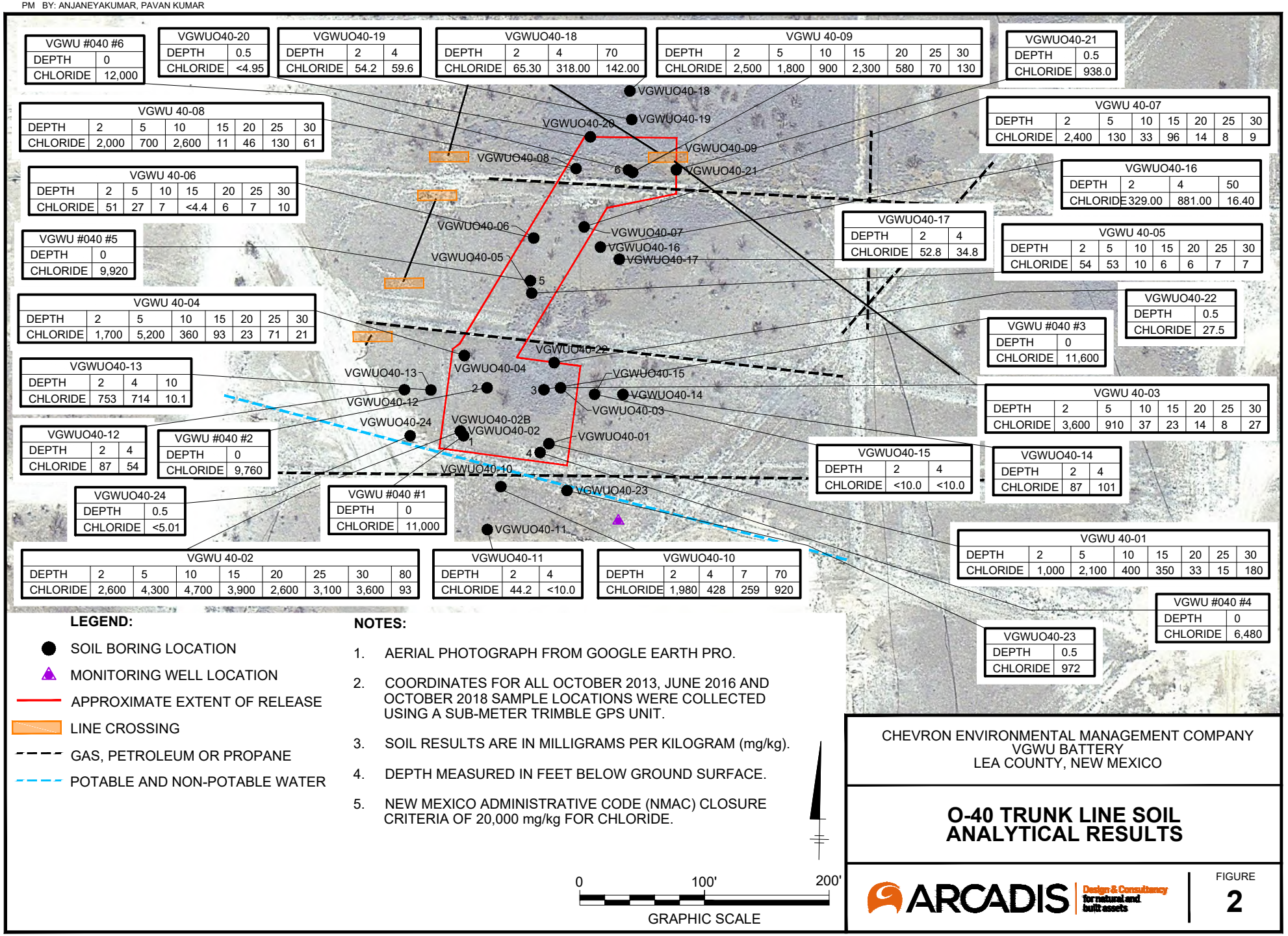
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO
SITE ASSESSMENT REPORT

SITE LOCATION MAP
0-40 TRUNK LINE

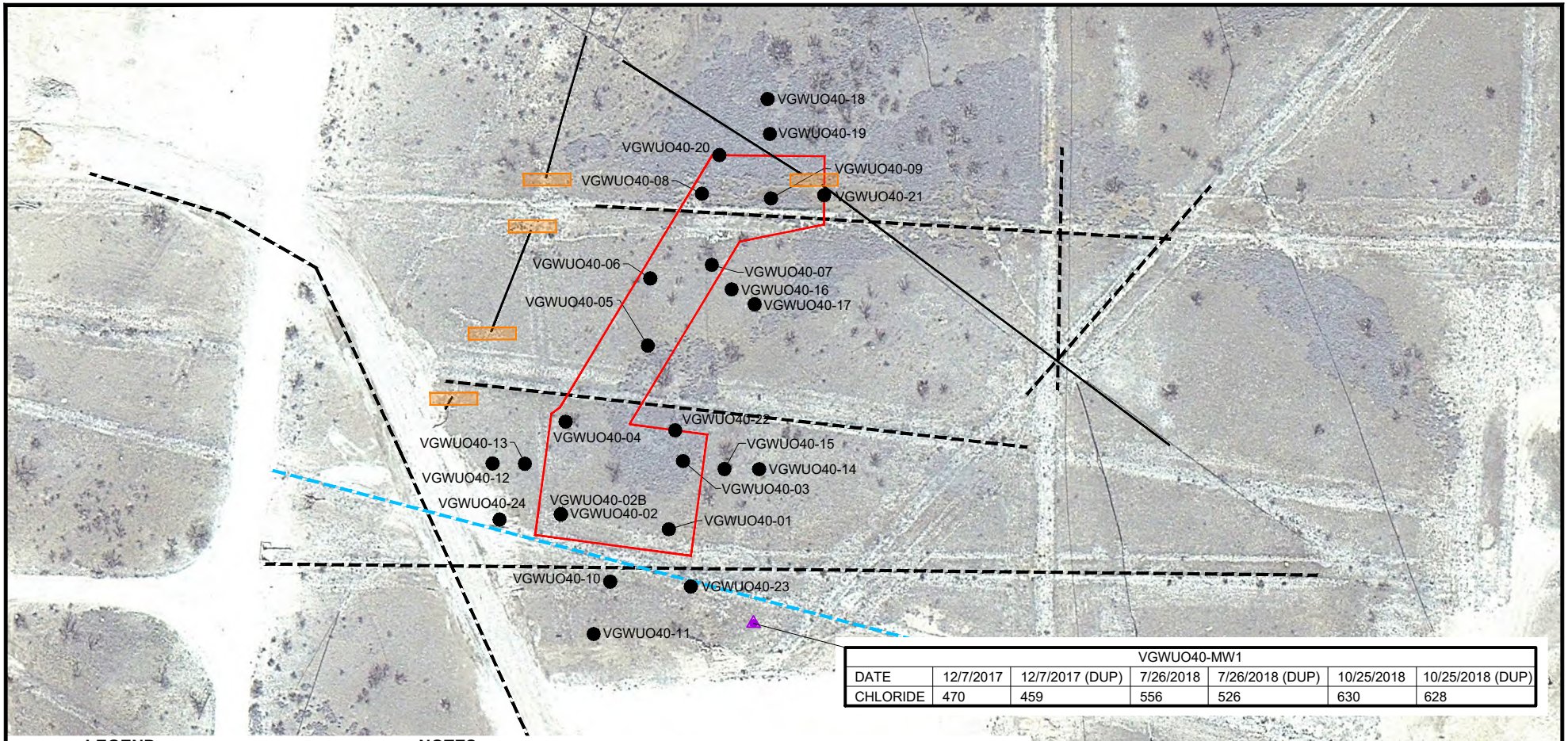
ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM
C:\Users\PAI01041\OneDrive - ARCADIS\BIM 360 Docs\CHEVRON CORPORATION\HES-0-40 TL\2018\B0048611.1701\01-DWG\1701-GWAR-Fig3.dwg LAYOUT: 3 SAVED: 12/21/2018 4:25 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 12/21/2018 4:27 PM BY: ANJANEYAKUMAR, PAVAN KUMAR



CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM
C:\Users\PAI01041\OneDrive - ARCADIS\BIM 360 Docs\CHEVRON CORPORATION\HES-0-40 TL\2018\B0048611.1701\01-DWG\1701-GWAR-Fig2.dwg LAYOUT: 2 SAVED: 12/21/2018 4:25 PM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 12/21/2018 4:26 PM BY: ANJANEYAKUMAR, PAVAN KUMAR



VGWUO40-MW1						
DATE	12/7/2017	12/7/2017 (DUP)	7/26/2018	7/26/2018 (DUP)	10/25/2018	10/25/2018 (DUP)
CHLORIDE	470	459	556	526	630	628

LEGEND:

- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- APPROXIMATE EXTENT OF RELEASE
- LINE CROSSING
- GAS, PETROLEUM OR PROPANE
- POTABLE AND NON-POTABLE WATER

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.
2. GROUNDWATER RESULTS ARE IN MILLIGRAMS PER LITER (mg/L).
3. (DUP) = DUPLICATE SAMPLE.
4. NEW MEXICO OIL CONSERVATION DIVISION (NMOCD) GROUNDWATER REMEDIATION ACTION LEVEL OF 250 mg/L.

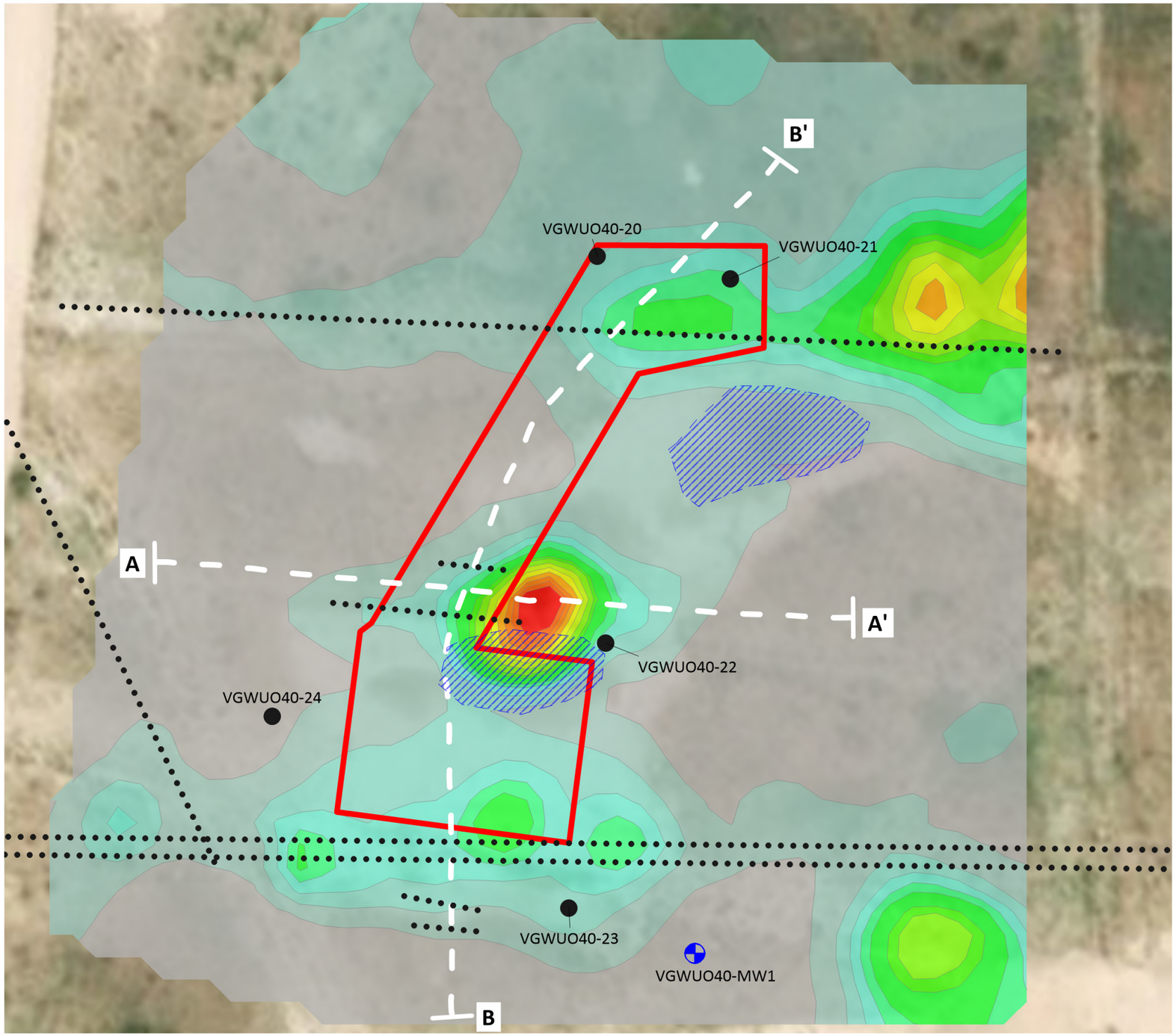
0 100' 200'
GRAPHIC SCALE

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

O-40 TRUNK LINE GROUNDWATER ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3



0 10 20 30 40 50 70 80 100 120 140 160 180 200

ELECTRICAL CONDUCTIVITY
milliSiemens/meter

LEGEND

- APPROXIMATE EXTENT OF SPILL
- FLOW LINES
- OCTOBER 2018 SHALLOW SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- MODELLED GEM-2 PROFILE
- PONDED RAINWATER AT TIME OF SURVEY (10/25/2018)

0 25 50 75 100

SCALE IN FEET

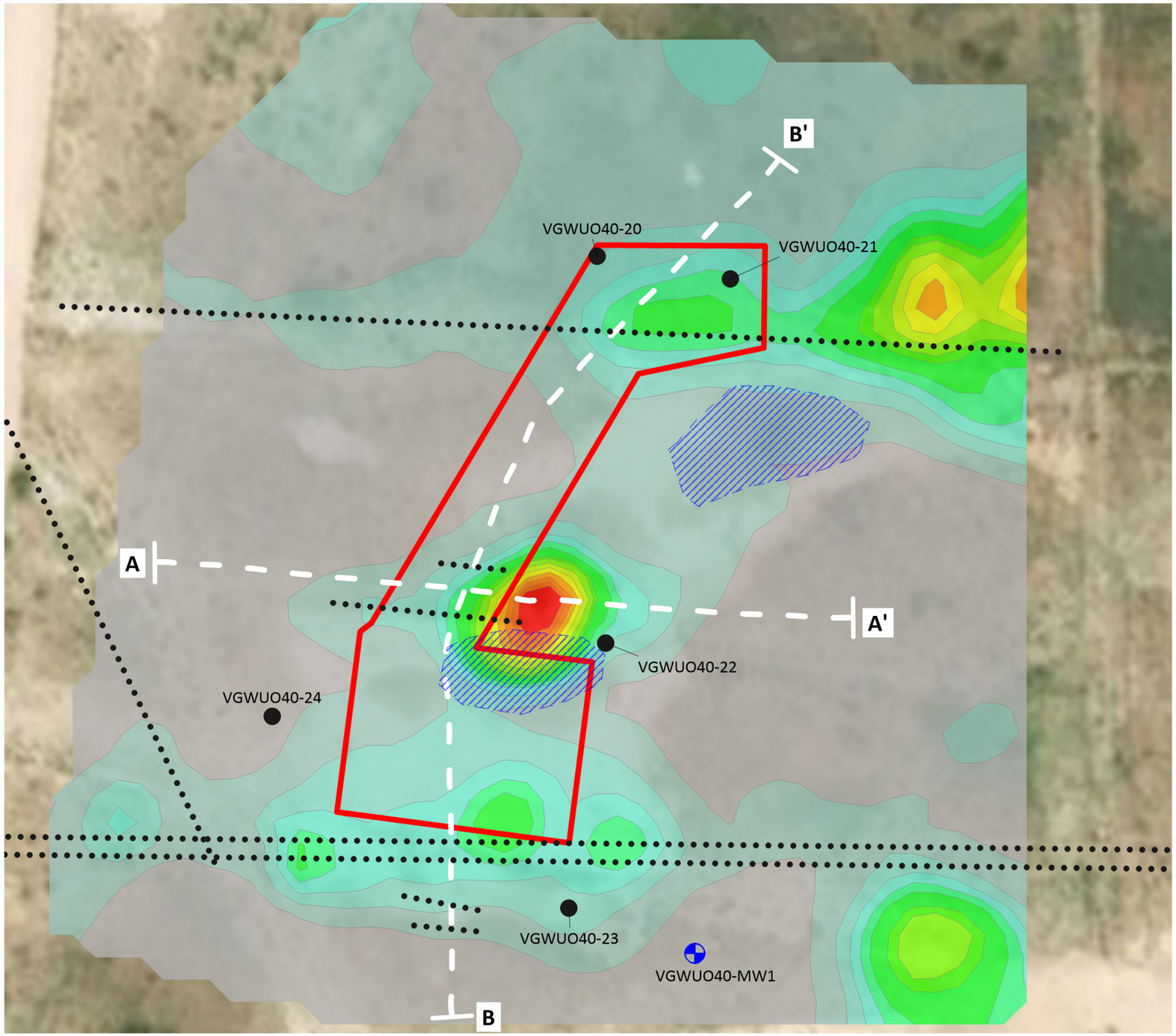
NOTE: AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.

ARCADIS Design & Consultancy for natural and built assets

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

VGWU O-40 TRUNK LINE
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

FIGURE 4



0 10 20 30 40 50 70 80 100 120 140 160 180 200

ELECTRICAL CONDUCTIVITY
milliSiemens/meter

LEGEND

- APPROXIMATE EXTENT OF SPILL
- FLOW LINES
- OCTOBER 2018 SHALLOW SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- MODELLED GEM-2 PROFILE
- PONDED RAINWATER AT TIME OF SURVEY (10/25/2018)

0 25 50 75 100

SCALE IN FEET

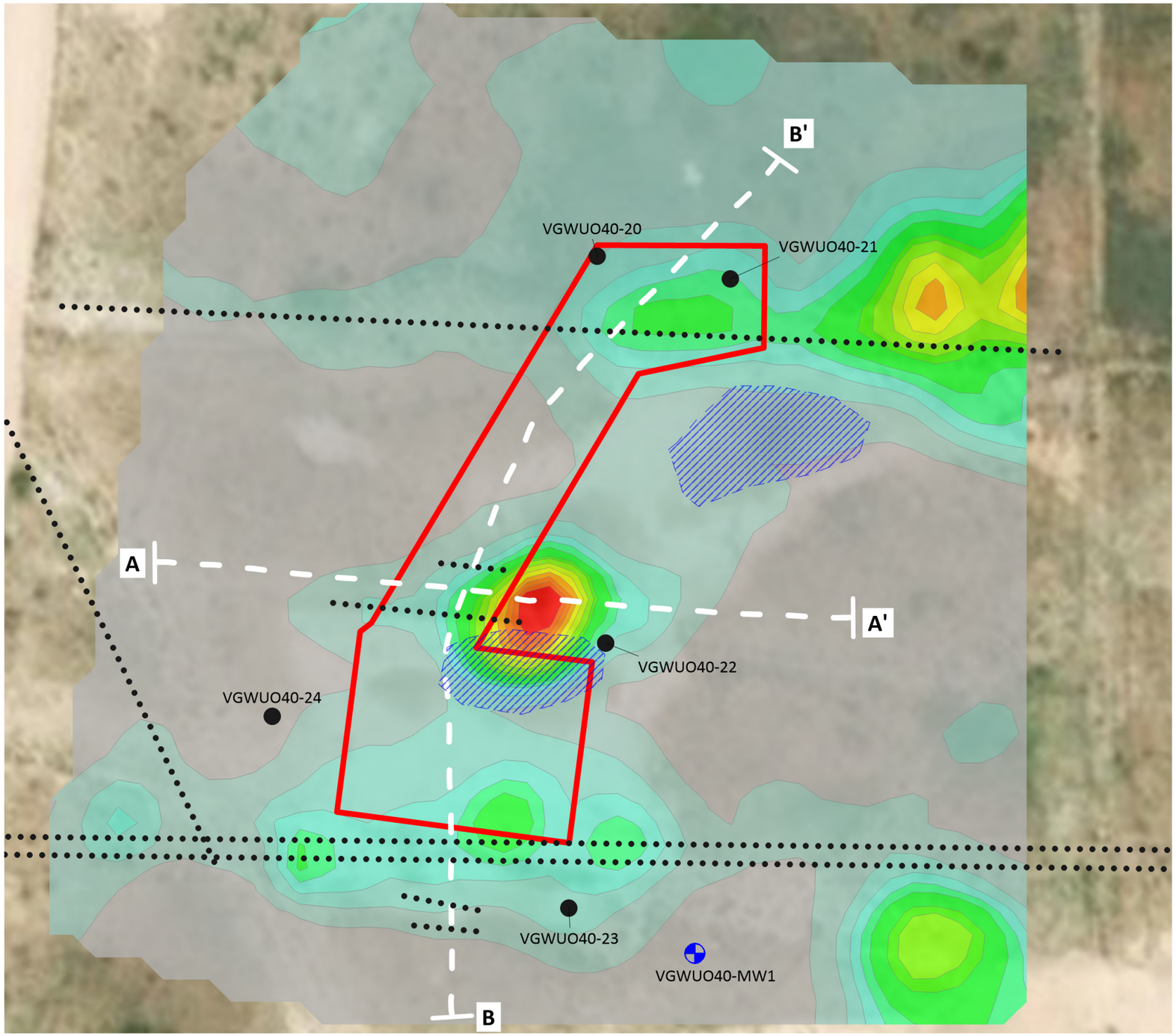
NOTE: AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.

ARCADIS Design & Consultancy for natural and built assets

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

VGWU O-40 TRUNK LINE
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

FIGURE 5



0 10 20 30 40 50 70 80 100 120 140 160 180 200

ELECTRICAL CONDUCTIVITY
milliSiemens/meter

LEGEND

- APPROXIMATE EXTENT OF SPILL
- FLOW LINES
- OCTOBER 2018 SHALLOW SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- MODELLED GEM-2 PROFILE
- PONDED RAINWATER AT TIME OF SURVEY (10/25/2018)

0 25 50 75 100

SCALE IN FEET

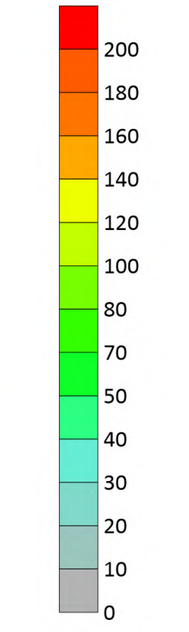
NOTE: AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.

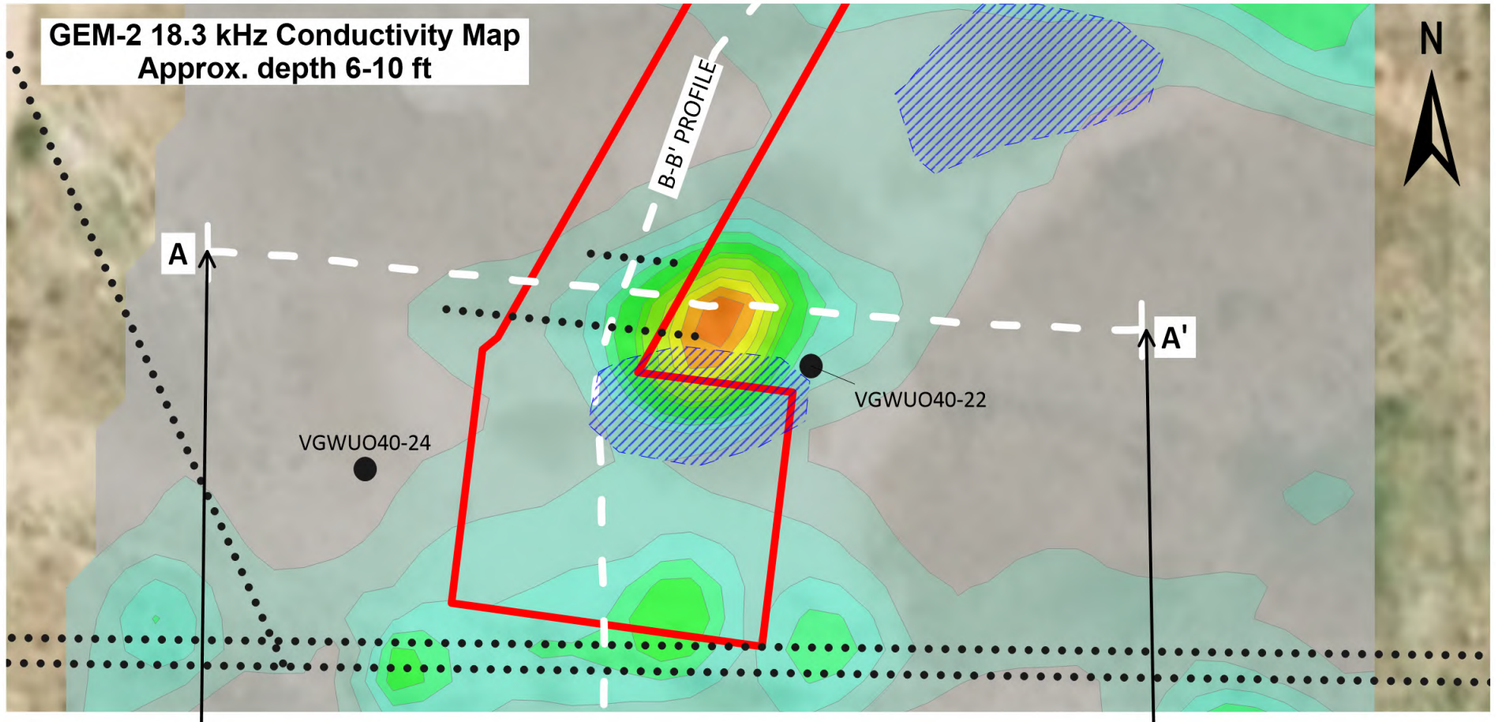
ARCADIS Design & Consultancy for natural and built assets

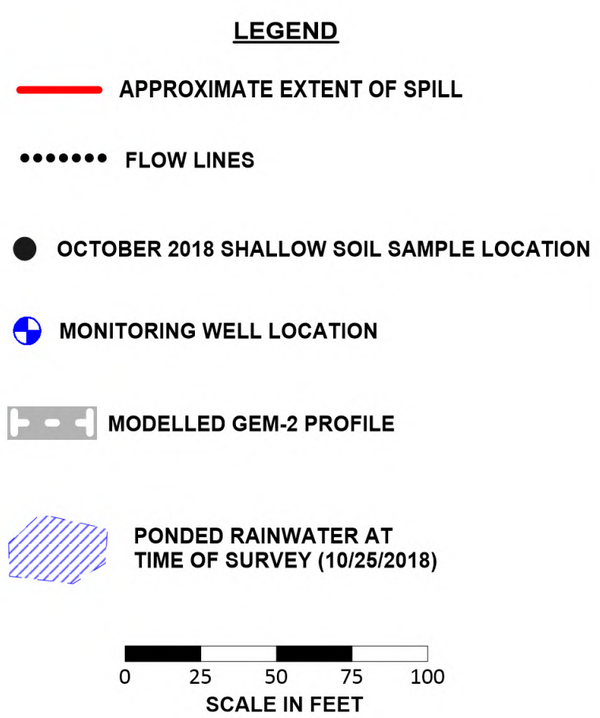
GEM-2 Electrical Conductivity Depth Map - 5.3 kHz Frequency
Approximate Penetration Depth of 8 to 12 feet bgs

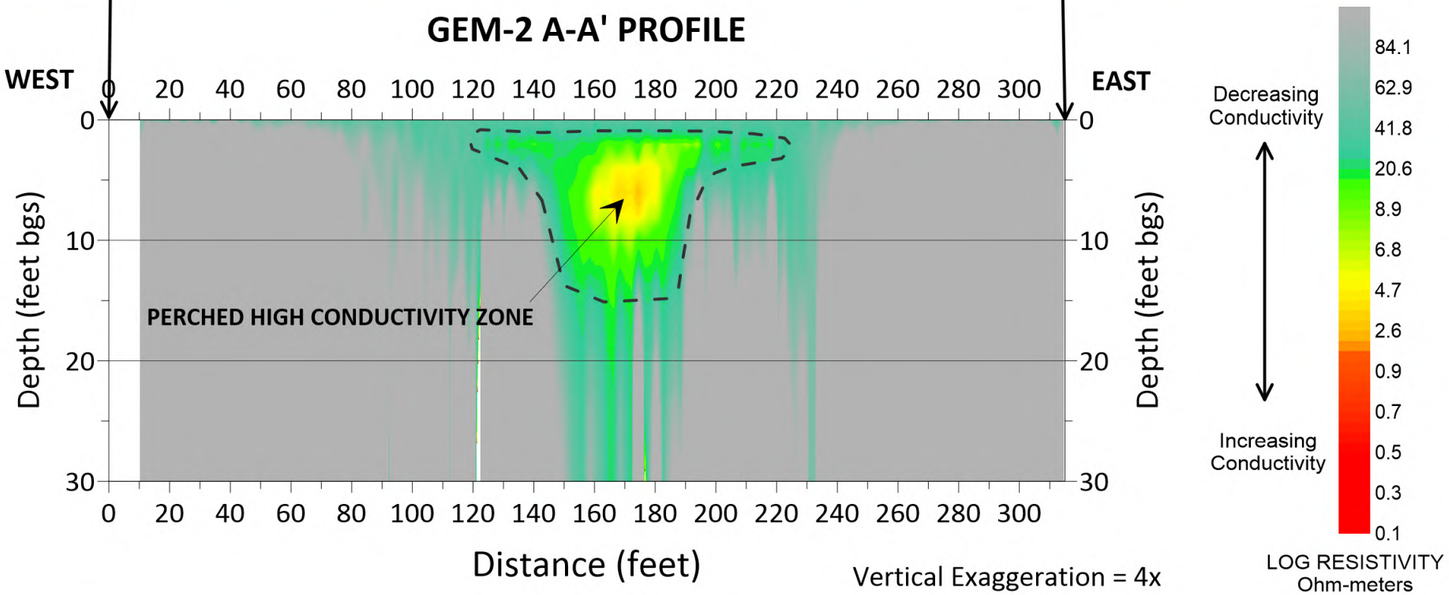
VGWU O-40 TRUNK LINE
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

FIGURE 6







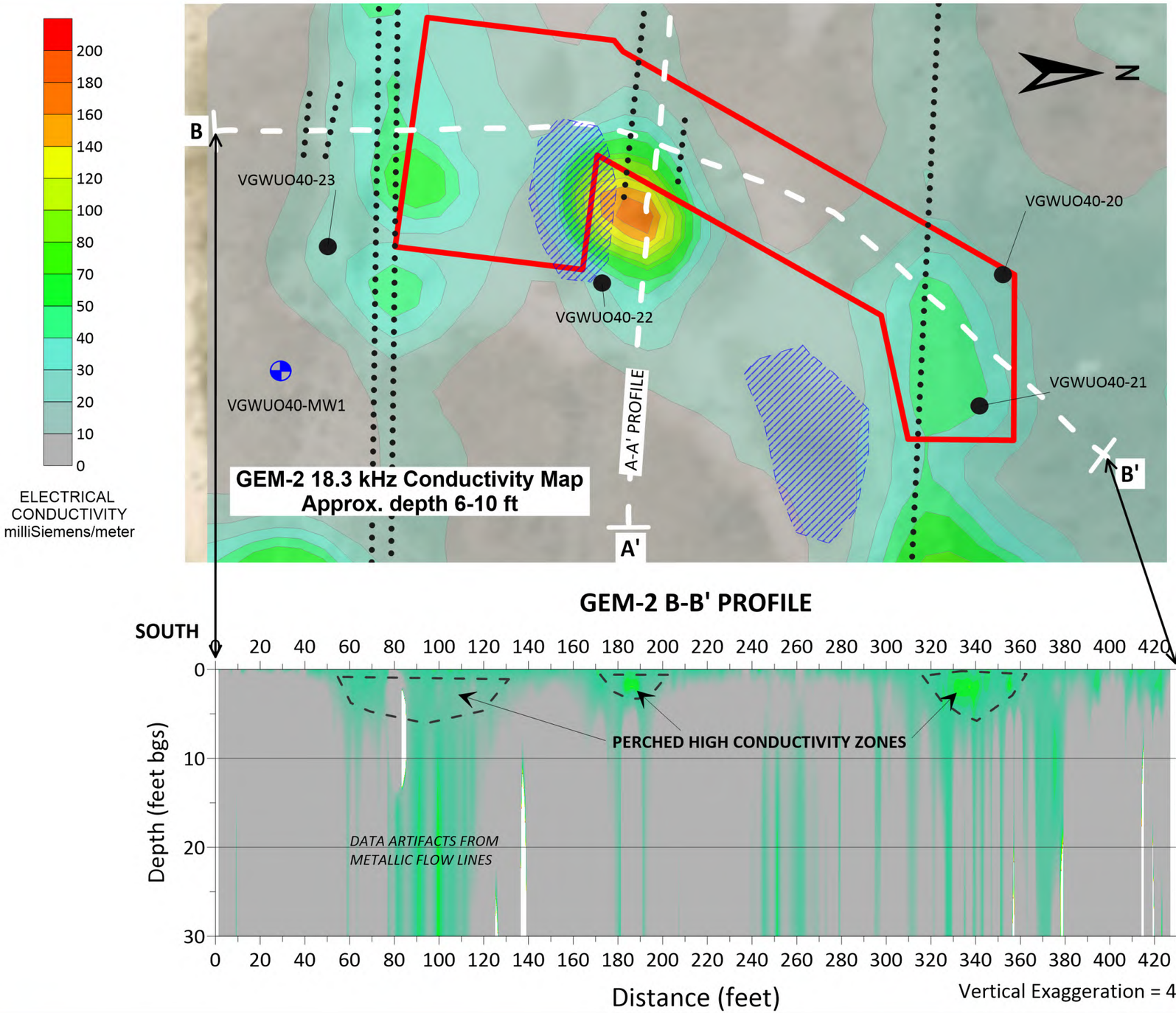


ARCADIS Design & Consultancy for natural and built assets

MODELLED GEM-2 PROFILE - SECTION A-A'

VGWU O-40 TRUNK LINE
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

FIGURE 7



LEGEND

- APPROXIMATE EXTENT OF SPILL
- FLOW LINES
- OCTOBER 2018 SHALLOW SOIL SAMPLE LOCATION
- MONITORING WELL LOCATION
- MODELLED GEM-2 PROFILE
- PONDED RAINWATER AT TIME OF SURVEY (10/25/2018)

0 25 50 75 100
SCALE IN FEET

ARCADIS Design & Consultancy for natural and built assets

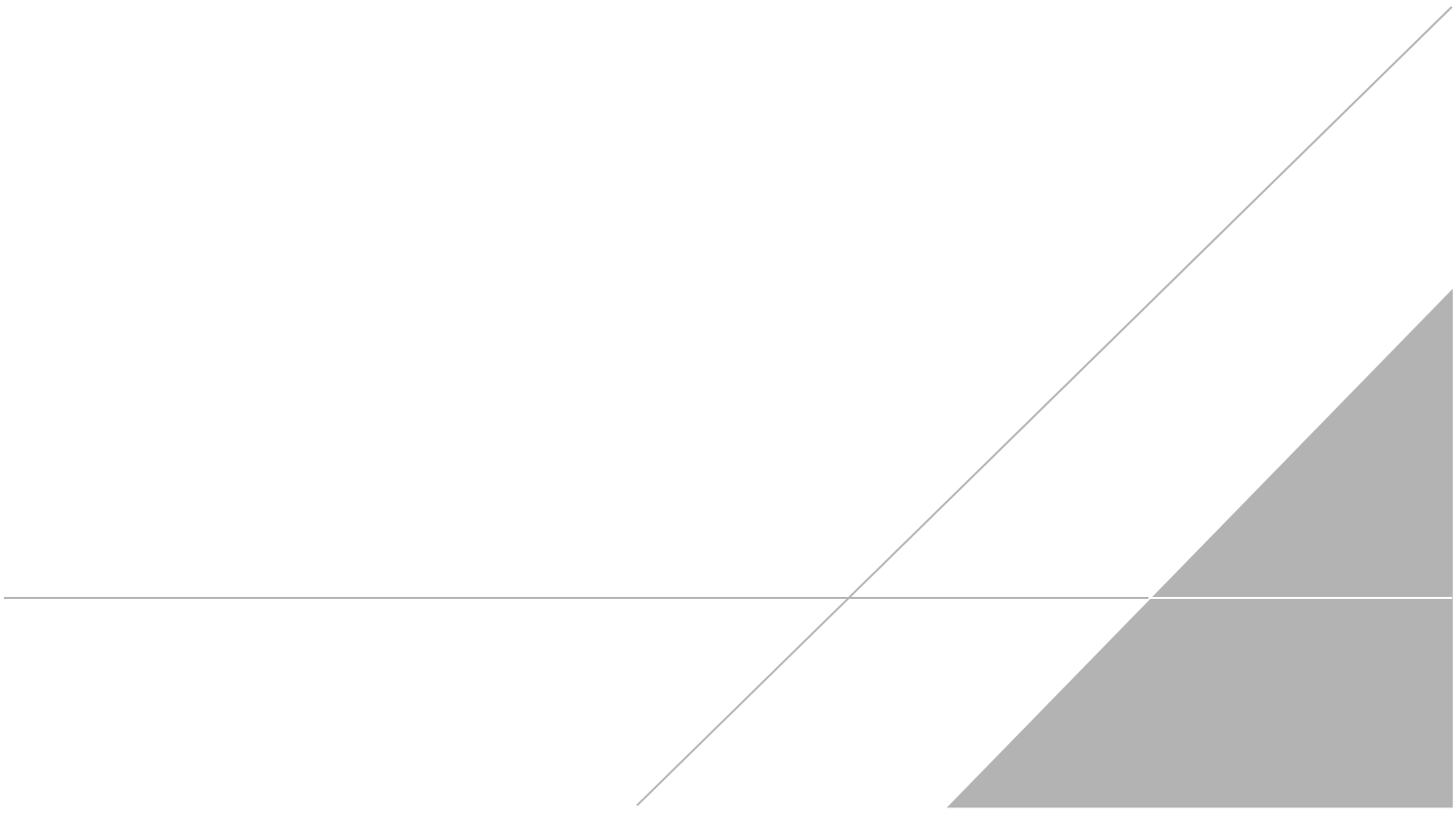
MODELLED GEM-2 PROFILE - SECTION B-B'

VGWU O-40 TRUNK LINE
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
VGWU BATTERY
LEA COUNTY, NEW MEXICO

FIGURE 8

ATTACHMENT 1.

C-141 Form



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 SWD trunk line	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
G	36	17.0S	34.0E					Lea

Latitude 32.795081 **Longitude** -103.511756

NATURE OF RELEASE

Type of Release Spill to Land	Volume of Release 149bbls of Produced Water	Volume Recovered 35bbls of Produced Water
Source of Release Water Injection Station Pump	Date and Hour of Occurrence 12/5/12 04:00 AM	Date and Hour of Discovery 12/5/12 08:00AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Geoffrey Leking	
By Whom? David Pagano	Date and Hour 11/5/12 2:20	
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 fiberglass trunk line from VGWU Battery to the O-40SWD leaked underground approx 700 feet west/southwest of the battery. Cause of leak will be determined when line is excavated.

Describe Area Affected and Cleanup Action Taken.*

Release occurred in pasture area just 100 feet north of CVU 457 well. On discovery, vacuum truck contacted and vacuumed up the standing fluids. Recovered 35bbls 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: 12/12/12 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: Luke Welch
Address: 56 Texas Camp Road, Lovington NM 88260	Telephone No.: Office: (713) 372-0292 Mobile: (832) 627-9171
Facility Name: Vacuum Glorietta West Unit Battery SWD Trunk Line	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
B	1	17.0S	36E					Lea

Latitude 32.795081° **Longitude** -103.511756°

NATURE OF RELEASE

Type of Release: Spill to Land	Volume of Release: 149 bbls of Produced Water	Volume Recovered: 35 bbls of Produced Water
Source of Release: Water Injection Station Pump	Date and Hour of Occurrence: 12/5/12 04:00 AM	Date and Hour of Discovery: 12/5/12 08:00 AM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Geoffrey Leking	
By Whom? David Pagano	Date and Hour: 11/5/12 2:20	
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 fiberglass trunk line from VGWU Battery to the O-40SWD leaked underground approx. 700 feet west/southwest of the battery.

Describe Area Affected and Cleanup Action Taken.*

Release occurred in pasture area just 100 feet north of CVU 457 well. On discovery, vacuum truck contacted and vacuumed up the standing fluids. Recovered 35 bbls of fluids and recovered liquids placed hauled off to disposal. Visually contaminated soil was excavated up to 2 feet.
Six discrete soil confirmation samples were collected from the base of the excavation. An additional site assessment was conducted to confirm the extent of soil impacts.

Analytical results of the additional assessment are attached.

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: Luke Welch	Approved by Environmental Specialist:	
Title: Project Manager	Approval Date:	Expiration Date:
E-mail Address: LWelch@chevron.com	Conditions of Approval:	Attached ☐
Date: Phone: (713) 372-0292		

* Attach Additional Sheets If Necessary

ATTACHMENT 2.

Laboratory Analytical Results and Chain of Custody

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 16:55.

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 #040 SAMPLE #1 (H300179-05)

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	01/29/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/29/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/29/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/29/2013	ND	6.04	101	6.00	13.5	
Total BTEX	<0.300	0.300	01/29/2013	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	**11000**	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	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane *90.1 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *96.4 %* *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

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 #040 SAMPLE #2 (H300179-06)

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	01/26/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5	
Total BTEX	<0.300	0.300	01/26/2013	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	**9760**	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 *65.6 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *80.1 %* *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

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 #040 SAMPLE #3 (H300179-07)

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	01/26/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5	
Total BTEX	<0.300	0.300	01/26/2013	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	**11600**	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 *82.1 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *97.2 %* *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

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 #040 SAMPLE #4 (H300179-08)

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	01/26/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5	
Total BTEX	<0.300	0.300	01/26/2013	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	**6480**	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	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane *89.8 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *103 %* *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

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 #040 SAMPLE #5 (H300179-09)

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	01/26/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5	
Total BTEX	<0.300	0.300	01/26/2013	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	**9920**	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 *68.8 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *77.8 %* *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

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 #040 SAMPLE #6 (H300179-10)

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	01/26/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5	
Total BTEX	<0.300	0.300	01/26/2013	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	**12000**	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	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane *92.8 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *100 %* *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

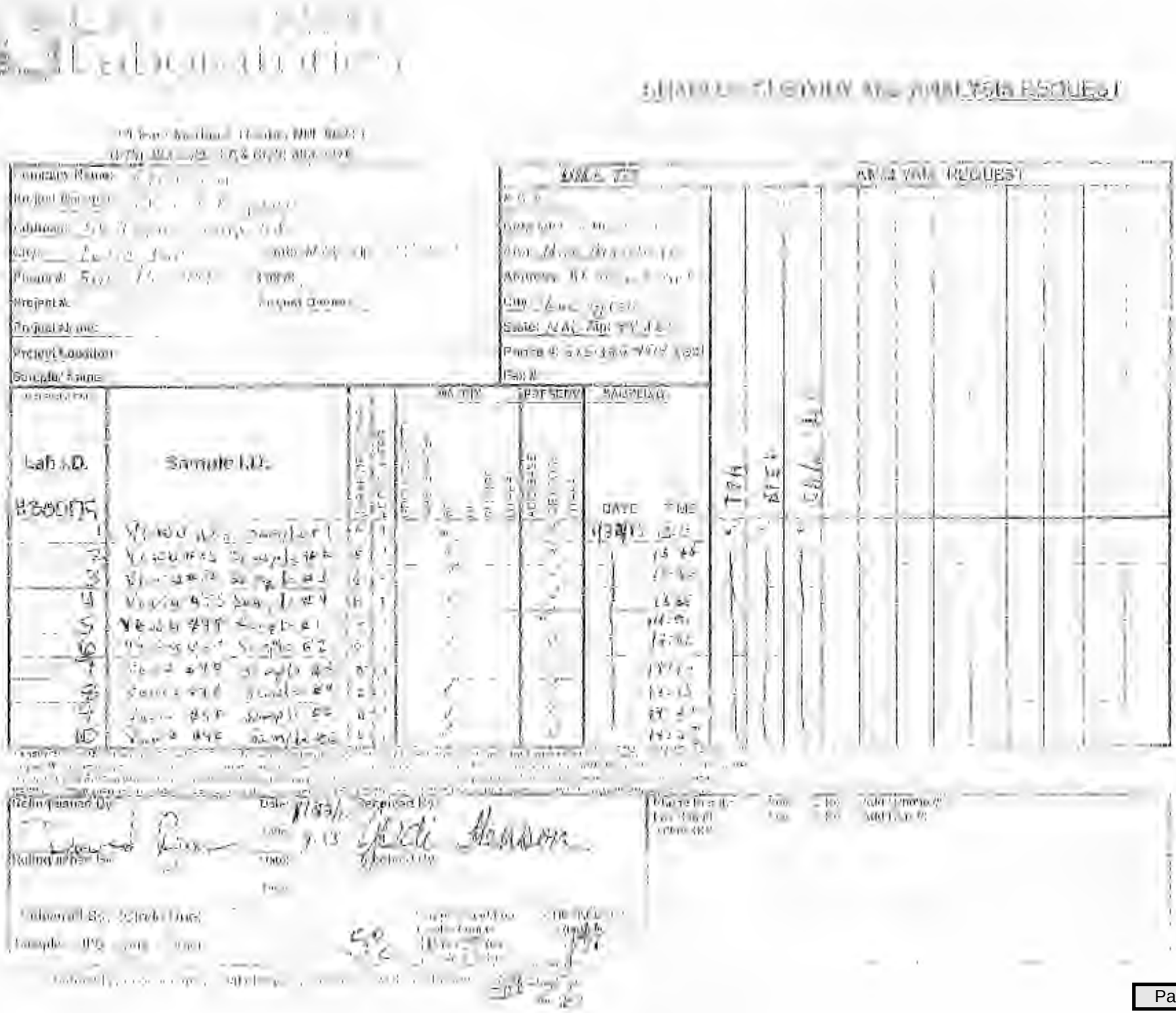
Notes and Definitions

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

Celey D. Keene, Lab Director/Quality Manager



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Tel: (713)690-4444

TestAmerica Job ID: 600-81631-1
Client Project/Site: HES Transfer Sites, Lea County NM

For:
ARCADIS U.S., Inc.
2929 Briarpark Drive
Suite 300
Houston, Texas 77042

Attn: Mr. Jonathan Olsen

Authorized for release by:
11/5/2013 2:16:31 PM
Cathy Upton, Data Delivery Analyst
(713)690-4444
cathy.upton@testamericainc.com

Designee for

Sachin Kudchadkar, Senior Project Manager
(713)690-4444
sachin.kudchadkar@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Job ID: 600-81631-1

Laboratory: TestAmerica Houston

Narrative

Job Narrative
600-81631-1

Comments
No additional comments.

Receipt
The samples were received on 10/25/2013 9:57 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2º C and 5.6º C.

General Chemistry
Method(s) 9056: The matrix spike (MS) recovery for batch 119258 was outside control limits for Chloride. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 9056: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 119258 were outside control limits for Chloride. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 9056: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 119606 were outside control limits for Chloride. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other analytical or quality issues were noted.

Industrial Hygiene
No analytical or quality issues were noted.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Method	Method Description	Protocol	Laboratory
9056	Anions, Ion Chromatography	SW846	TAL HOU
Moisture	Percent Moisture	EPA	TAL HOU

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-81631-15	VGWU 040-04 (102213) 2'	Solid	10/22/13 15:36	10/25/13 09:57
600-81631-16	VGWU 040-04 (102213) 5'	Solid	10/22/13 15:38	10/25/13 09:57
600-81631-17	VGWU 040-04 (102213) 10'	Solid	10/22/13 15:42	10/25/13 09:57
600-81631-18	VGWU 040-04 (102213) 15'	Solid	10/22/13 15:45	10/25/13 09:57
600-81631-19	VGWU 040-04 (102213) 20'	Solid	10/22/13 15:48	10/25/13 09:57
600-81631-20	VGWU 040-04 (102213) 25'	Solid	10/22/13 15:50	10/25/13 09:57
600-81631-21	VGWU 040-04 (102213) 30'	Solid	10/22/13 15:55	10/25/13 09:57
600-81631-22	VGWU 040-02 (102213) 2'	Solid	10/22/13 16:06	10/25/13 09:57
600-81631-23	VGWU 040-02 (102213) 5'	Solid	10/22/13 16:07	10/25/13 09:57
600-81631-24	VGWU 040-02 (102213) 10'	Solid	10/22/13 16:10	10/25/13 09:57
600-81631-25	VGWU 040-02 (102213) 15'	Solid	10/22/13 16:14	10/25/13 09:57
600-81631-26	VGWU 040-02 (102213) 20'	Solid	10/22/13 16:18	10/25/13 09:57
600-81631-27	VGWU 040-02 (102313) 25'	Solid	10/23/13 09:57	10/25/13 09:57
600-81631-28	VGWU 040-02 (102313) 30'	Solid	10/23/13 10:20	10/25/13 09:57
600-81631-29	VGWU 040-01 (102313) 2'	Solid	10/23/13 10:29	10/25/13 09:57
600-81631-30	VGWU 040-01 (102313) 5'	Solid	10/23/13 10:31	10/25/13 09:57
600-81631-31	VGWU 040-01 (102313) 10'	Solid	10/23/13 10:33	10/25/13 09:57
600-81631-32	VGWU 040-01 (102313) 15'	Solid	10/23/13 10:36	10/25/13 09:57
600-81631-33	VGWU 040-01 (102313) 20'	Solid	10/23/13 10:38	10/25/13 09:57
600-81631-34	VGWU 040-01 (102313) 25'	Solid	10/23/13 10:41	10/25/13 09:57
600-81631-35	VGWU 040-01 (102313) 30'	Solid	10/23/13 10:45	10/25/13 09:57
600-81631-36	VGWU 040-03 (102313) 2'	Solid	10/23/13 10:59	10/25/13 09:57
600-81631-37	VGWU 040-03 (102313) 5'	Solid	10/23/13 11:01	10/25/13 09:57
600-81631-38	VGWU 040-03 (102313) 10'	Solid	10/23/13 11:03	10/25/13 09:57
600-81631-39	VGWU 040-03 (102313) 15'	Solid	10/23/13 11:07	10/25/13 09:57
600-81631-40	VGWU 040-03 (102313) 20'	Solid	10/23/13 11:10	10/25/13 09:57
600-81631-41	VGWU 040-03 (102313) 25'	Solid	10/23/13 11:15	10/25/13 09:57
600-81631-42	VGWU 040-03 (102313) 30'	Solid	10/23/13 11:18	10/25/13 09:57
600-81631-50	VGWU 040-06 (102313) 2'	Solid	10/23/13 12:13	10/25/13 09:57
600-81631-51	VGWU 040-06 (102313) 5'	Solid	10/23/13 12:15	10/25/13 09:57
600-81631-52	VGWU 040-06 (102313) 10'	Solid	10/23/13 12:18	10/25/13 09:57
600-81631-53	VGWU 040-06 (102313) 15'	Solid	10/23/13 12:24	10/25/13 09:57
600-81631-54	VGWU 040-06 (102313) 20'	Solid	10/23/13 12:26	10/25/13 09:57
600-81631-55	VGWU 040-06 (102313) 25'	Solid	10/23/13 12:28	10/25/13 09:57
600-81631-56	VGWU 040-06 (102313) 30'	Solid	10/23/13 12:30	10/25/13 09:57
600-81631-57	VGWU 040-05 (102313) 2'	Solid	10/23/13 12:46	10/25/13 09:57
600-81631-58	VGWU 040-05 (102313) 5'	Solid	10/23/13 12:47	10/25/13 09:57
600-81631-59	VGWU 040-05 (102313) 10'	Solid	10/23/13 12:49	10/25/13 09:57
600-81631-60	VGWU 040-05 (102313) 15'	Solid	10/23/13 12:53	10/25/13 09:57
600-81631-61	VGWU 040-05 (102313) 20'	Solid	10/23/13 12:55	10/25/13 09:57
600-81631-62	VGWU 040-05 (102313) 25'	Solid	10/23/13 12:56	10/25/13 09:57
600-81631-63	VGWU 040-05 (102313) 30'	Solid	10/23/13 12:58	10/25/13 09:57
600-81631-64	VGWU 040-07 (102313) 2'	Solid	10/23/13 13:14	10/25/13 09:57
600-81631-65	VGWU 040-07 (102313) 5'	Solid	10/23/13 13:16	10/25/13 09:57
600-81631-66	VGWU 040-07 (102313) 10'	Solid	10/23/13 13:17	10/25/13 09:57
600-81631-67	VGWU 040-07 (102313) 15'	Solid	10/23/13 13:18	10/25/13 09:57
600-81631-68	VGWU 040-07 (102313) 20'	Solid	10/23/13 13:20	10/25/13 09:57
600-81631-69	VGWU 040-07 (102313) 25'	Solid	10/23/13 13:24	10/25/13 09:57
600-81631-70	VGWU 040-07 (102313) 30'	Solid	10/23/13 13:27	10/25/13 09:57
600-81631-85	VGWU 040-08 (102313) 2'	Solid	10/23/13 14:43	10/25/13 09:57
600-81631-86	VGWU 040-08 (102313) 5'	Solid	10/23/13 14:44	10/25/13 09:57
600-81631-87	VGWU 040-08 (102313) 10'	Solid	10/23/13 14:48	10/25/13 09:57
600-81631-88	VGWU 040-08 (102313) 15'	Solid	10/23/13 14:50	10/25/13 09:57

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-81631-89	VGWU 040-08 (102313) 20'	Solid	10/23/13 14:54	10/25/13 09:57
600-81631-90	VGWU 040-08 (102313) 25'	Solid	10/23/13 14:57	10/25/13 09:57
600-81631-91	VGWU 040-08 (102313) 30'	Solid	10/23/13 14:58	10/25/13 09:57
600-81631-99	VGWU 040-09 (102313) 2'	Solid	10/23/13 15:47	10/25/13 09:57
600-81631-100	VGWU 040-09 (102313) 5'	Solid	10/23/13 15:48	10/25/13 09:57
600-81631-101	VGWU 040-09 (102313) 10'	Solid	10/23/13 15:50	10/25/13 09:57
600-81631-102	VGWU 040-09 (102313) 15'	Solid	10/23/13 15:53	10/25/13 09:57
600-81631-103	VGWU 040-09 (102313) 20'	Solid	10/23/13 15:56	10/25/13 09:57
600-81631-104	VGWU 040-09 (102313) 25'	Solid	10/23/13 15:58	10/25/13 09:57
600-81631-105	VGWU 040-09 (102313) 30'	Solid	10/23/13 16:00	10/25/13 09:57

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-04 (102213) 2' — Lab Sample ID: 600-81631-15

Date Collected: 10/22/13 15:36
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.0		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1700		43		mg/Kg	☼		10/29/13 23:49	10

Client Sample ID: VGWU 040-04 (102213) 5' — Lab Sample ID: 600-81631-16

Date Collected: 10/22/13 15:38
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.9		1.0		%			10/28/13 08:43	1
Percent Solids	91		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5200		440		mg/Kg	☼		10/30/13 00:44	100

Client Sample ID: VGWU 040-04 (102213) 10' — Lab Sample ID: 600-81631-17

Date Collected: 10/22/13 15:42
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.9		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	360		4.3		mg/Kg	☼		10/30/13 01:02	1

Client Sample ID: VGWU 040-04 (102213) 15' — Lab Sample ID: 600-81631-18

Date Collected: 10/22/13 15:45
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.5		1.0		%			10/28/13 08:43	1
Percent Solids	92		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	93		4.3		mg/Kg	☼		10/30/13 01:20	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-04 (102213) 20' — Lab Sample ID: 600-81631-19

Date Collected: 10/22/13 15:48 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.3		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23		4.3		mg/Kg	☼		10/30/13 01:38	1

Client Sample ID: VGWU 040-04 (102213) 25' — Lab Sample ID: 600-81631-20

Date Collected: 10/22/13 15:50 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12		1.0		%			10/28/13 08:43	1
Percent Solids	88		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	71		4.5		mg/Kg	☼		10/30/13 01:57	1

Client Sample ID: VGWU 040-04 (102213) 30' — Lab Sample ID: 600-81631-21

Date Collected: 10/22/13 15:55 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.6		1.0		%			10/28/13 08:43	1
Percent Solids	92		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	21		4.3		mg/Kg	☼		10/30/13 02:51	1

Client Sample ID: VGWU 040-02 (102213) 2' — Lab Sample ID: 600-81631-22

Date Collected: 10/22/13 16:06 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.6		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2600		42		mg/Kg	☼		10/30/13 03:09	10

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-02 (102213) 5' — Lab Sample ID: 600-81631-23

Date Collected: 10/22/13 16:07
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.6		1.0		%			10/28/13 08:43	1
Percent Solids	90		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4300		440		mg/Kg	☼		10/30/13 03:28	100

Client Sample ID: VGWU 040-02 (102213) 10' — Lab Sample ID: 600-81631-24

Date Collected: 10/22/13 16:10
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.7		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4700		410		mg/Kg	☼		10/30/13 03:46	100

Client Sample ID: VGWU 040-02 (102213) 15' — Lab Sample ID: 600-81631-25

Date Collected: 10/22/13 16:14
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.7		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3900		420		mg/Kg	☼		10/30/13 04:04	100

Client Sample ID: VGWU 040-02 (102213) 20' — Lab Sample ID: 600-81631-26

Date Collected: 10/22/13 16:18
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.6		1.0		%			10/28/13 08:43	1
Percent Solids	93		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2600		43		mg/Kg	☼		10/30/13 04:59	10

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-02 (102313) 25'

Lab Sample ID: 600-81631-27
Date Collected: 10/23/13 09:57
Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.5		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3100		210		mg/Kg	☼		10/30/13 05:17	50

Client Sample ID: VGWU 040-02 (102313) 30'

Lab Sample ID: 600-81631-28
Date Collected: 10/23/13 10:20
Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.9		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3600		210		mg/Kg	☼		10/30/13 05:35	50

Client Sample ID: VGWU 040-01 (102313) 2'

Lab Sample ID: 600-81631-29
Date Collected: 10/23/13 10:29
Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.9		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1000		21		mg/Kg	☼		10/30/13 06:30	5

Client Sample ID: VGWU 040-01 (102313) 5'

Lab Sample ID: 600-81631-30
Date Collected: 10/23/13 10:31
Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.0		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2100		21		mg/Kg	☼		10/30/13 06:48	5

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-01 (102313) 10' — Lab Sample ID: 600-81631-31

Date Collected: 10/23/13 10:33 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.3		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	400		8.5		mg/Kg	☼		10/30/13 07:06	2

Client Sample ID: VGWU 040-01 (102313) 15' — Lab Sample ID: 600-81631-32

Date Collected: 10/23/13 10:36 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.3		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	350		4.2		mg/Kg	☼		10/30/13 07:24	1

Client Sample ID: VGWU 040-01 (102313) 20' — Lab Sample ID: 600-81631-33

Date Collected: 10/23/13 10:38 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.6		1.0		%			10/28/13 08:43	1
Percent Solids	92		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33		4.3		mg/Kg	☼		10/30/13 07:42	1

Client Sample ID: VGWU 040-01 (102313) 25' — Lab Sample ID: 600-81631-34

Date Collected: 10/23/13 10:41 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	15		4.2		mg/Kg	☼		10/30/13 08:01	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-01 (102313) 30' Lab Sample ID: 600-81631-35

Date Collected: 10/23/13 10:45 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.5		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	180		4.1		mg/Kg	☼		10/30/13 08:55	1

Client Sample ID: VGWU 040-03 (102313) 2' Lab Sample ID: 600-81631-36

Date Collected: 10/23/13 10:59 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.8		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3600		210		mg/Kg	☼		10/30/13 10:26	50

Client Sample ID: VGWU 040-03 (102313) 5' Lab Sample ID: 600-81631-37

Date Collected: 10/23/13 11:01 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.7		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	910		8.2		mg/Kg	☼		10/30/13 10:45	2

Client Sample ID: VGWU 040-03 (102313) 10' Lab Sample ID: 600-81631-38

Date Collected: 10/23/13 11:03 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.7		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	37		4.1		mg/Kg	☼		10/30/13 11:03	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-03 (102313) 15' — Lab Sample ID: 600-81631-39

Date Collected: 10/23/13 11:07 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.8		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	23		4.1		mg/Kg	☼		10/31/13 21:21	1

Client Sample ID: VGWU 040-03 (102313) 20' — Lab Sample ID: 600-81631-40

Date Collected: 10/23/13 11:10 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.4		1.0		%			10/28/13 08:43	1
Percent Solids	99		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14		4.1		mg/Kg	☼		10/31/13 22:16	1

Client Sample ID: VGWU 040-03 (102313) 25' — Lab Sample ID: 600-81631-41

Date Collected: 10/23/13 11:15 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.0		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.5		4.1		mg/Kg	☼		10/31/13 22:34	1

Client Sample ID: VGWU 040-03 (102313) 30' — Lab Sample ID: 600-81631-42

Date Collected: 10/23/13 11:18 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.8		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27		4.1		mg/Kg	☼		10/31/13 22:52	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-06 (102313) 2' — Lab Sample ID: 600-81631-50

Date Collected: 10/23/13 12:13
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.2		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	51		4.1		mg/Kg	☼		10/31/13 23:10	1

Client Sample ID: VGWU 040-06 (102313) 5' — Lab Sample ID: 600-81631-51

Date Collected: 10/23/13 12:15
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.8		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27		8.5		mg/Kg	☼		10/31/13 23:28	2

Client Sample ID: VGWU 040-06 (102313) 10' — Lab Sample ID: 600-81631-52

Date Collected: 10/23/13 12:18
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.9		4.2		mg/Kg	☼		11/01/13 00:23	1

Client Sample ID: VGWU 040-06 (102313) 15' — Lab Sample ID: 600-81631-53

Date Collected: 10/23/13 12:24
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.9		1.0		%			10/28/13 08:43	1
Percent Solids	91		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.4		mg/Kg	☼		11/01/13 00:41	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-06 (102313) 20' — Lab Sample ID: 600-81631-54

Date Collected: 10/23/13 12:26
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.0		4.2		mg/Kg	☼		11/01/13 00:59	1

Client Sample ID: VGWU 040-06 (102313) 25' — Lab Sample ID: 600-81631-55

Date Collected: 10/23/13 12:28
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.3		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.1		4.2		mg/Kg	☼		11/01/13 01:18	1

Client Sample ID: VGWU 040-06 (102313) 30' — Lab Sample ID: 600-81631-56

Date Collected: 10/23/13 12:30
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	10		4.2		mg/Kg	☼		11/01/13 01:36	1

Client Sample ID: VGWU 040-05 (102313) 2' — Lab Sample ID: 600-81631-57

Date Collected: 10/23/13 12:46
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.0		1.0		%			10/28/13 08:43	1
Percent Solids	99		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	54		4.0		mg/Kg	☼		11/01/13 02:31	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-05 (102313) 5' — Lab Sample ID: 600-81631-58

Date Collected: 10/23/13 12:47 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.8		1.0		%			10/28/13 08:43	1
Percent Solids	92		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	53		4.3		mg/Kg	☼		11/01/13 02:49	1

Client Sample ID: VGWU 040-05 (102313) 10' — Lab Sample ID: 600-81631-59

Date Collected: 10/23/13 12:49 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.5		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.5		4.1		mg/Kg	☼		11/01/13 03:07	1

Client Sample ID: VGWU 040-05 (102313) 15' — Lab Sample ID: 600-81631-60

Date Collected: 10/23/13 12:53 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.4		1.0		%			10/28/13 08:43	1
Percent Solids	99		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.7		4.1		mg/Kg	☼		11/01/13 04:02	1

Client Sample ID: VGWU 040-05 (102313) 20' — Lab Sample ID: 600-81631-61

Date Collected: 10/23/13 12:55 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.2		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.0		4.1		mg/Kg	☼		11/01/13 04:20	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-05 (102313) 25' — Lab Sample ID: 600-81631-62

Date Collected: 10/23/13 12:56
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.5		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.1		4.1		mg/Kg	☼		11/01/13 04:38	1

Client Sample ID: VGWU 040-05 (102313) 30' — Lab Sample ID: 600-81631-63

Date Collected: 10/23/13 12:58
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.9		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.8		4.2		mg/Kg	☼		11/01/13 04:56	1

Client Sample ID: VGWU 040-07 (102313) 2' — Lab Sample ID: 600-81631-64

Date Collected: 10/23/13 13:14
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.2		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2400		21		mg/Kg	☼		11/01/13 05:14	5

Client Sample ID: VGWU 040-07 (102313) 5' — Lab Sample ID: 600-81631-65

Date Collected: 10/23/13 13:16
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.6		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		4.1		mg/Kg	☼		11/01/13 05:51	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-07 (102313) 10' Lab Sample ID: 600-81631-66

Date Collected: 10/23/13 13:17 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.5		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33		4.1		mg/Kg	☼		11/01/13 06:45	1

Client Sample ID: VGWU 040-07 (102313) 15' Lab Sample ID: 600-81631-67

Date Collected: 10/23/13 13:18 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.4		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	96		4.2		mg/Kg	☼		11/01/13 08:16	1

Client Sample ID: VGWU 040-07 (102313) 20' Lab Sample ID: 600-81631-68

Date Collected: 10/23/13 13:20 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.1		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14		4.1		mg/Kg	☼		11/01/13 08:35	1

Client Sample ID: VGWU 040-07 (102313) 25' Lab Sample ID: 600-81631-69

Date Collected: 10/23/13 13:24 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.9		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	8.1		4.2		mg/Kg	☼		11/01/13 08:53	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-07 (102313) 30' — Lab Sample ID: 600-81631-70

Date Collected: 10/23/13 13:27
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.3		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.3		4.1		mg/Kg	☼		11/02/13 00:33	1

Client Sample ID: VGWU 040-08 (102313) 2' — Lab Sample ID: 600-81631-85

Date Collected: 10/23/13 14:43
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.3		1.0		%			10/28/13 08:43	1
Percent Solids	97		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2000		21		mg/Kg	☼		11/02/13 01:28	5

Client Sample ID: VGWU 040-08 (102313) 5' — Lab Sample ID: 600-81631-86

Date Collected: 10/23/13 14:44
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.1		1.0		%			10/28/13 08:43	1
Percent Solids	94		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	700		8.5		mg/Kg	☼		11/02/13 01:46	2

Client Sample ID: VGWU 040-08 (102313) 10' — Lab Sample ID: 600-81631-87

Date Collected: 10/23/13 14:48
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.3		1.0		%			10/28/13 08:43	1
Percent Solids	92		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2600		44		mg/Kg	☼		11/02/13 02:04	10

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-08 (102313) 15' — Lab Sample ID: 600-81631-88

Date Collected: 10/23/13 14:50 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13		1.0		%			10/28/13 08:43	1
Percent Solids	87		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11		4.6		mg/Kg	☼		11/02/13 02:23	1

Client Sample ID: VGWU 040-08 (102313) 20' — Lab Sample ID: 600-81631-89

Date Collected: 10/23/13 14:54 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.7		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	46		4.2		mg/Kg	☼		11/02/13 02:41	1

Client Sample ID: VGWU 040-08 (102313) 25' — Lab Sample ID: 600-81631-90

Date Collected: 10/23/13 14:57 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.5		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		4.2		mg/Kg	☼		11/02/13 03:35	1

Client Sample ID: VGWU 040-08 (102313) 30' — Lab Sample ID: 600-81631-91

Date Collected: 10/23/13 14:58 Matrix: Solid
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.4		1.0		%			10/28/13 08:43	1
Percent Solids	93		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	61		4.3		mg/Kg	☼		11/02/13 03:54	1

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-09 (102313) 2' — Lab Sample ID: 600-81631-99

Date Collected: 10/23/13 15:47
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.5		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2500		42		mg/Kg	☼		11/02/13 04:12	10

Client Sample ID: VGWU 040-09 (102313) 5' — Lab Sample ID: 600-81631-100

Date Collected: 10/23/13 15:48
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.3		1.0		%			10/28/13 08:43	1
Percent Solids	98		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1800		20		mg/Kg	☼		11/02/13 04:30	5

Client Sample ID: VGWU 040-09 (102313) 10' — Lab Sample ID: 600-81631-101

Date Collected: 10/23/13 15:50
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.3		1.0		%			10/28/13 08:43	1
Percent Solids	96		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	900		8.4		mg/Kg	☼		11/02/13 04:48	2

Client Sample ID: VGWU 040-09 (102313) 15' — Lab Sample ID: 600-81631-102

Date Collected: 10/23/13 15:53
Date Received: 10/25/13 09:57
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.8		1.0		%			10/28/13 08:43	1
Percent Solids	90		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2300		22		mg/Kg	☼		11/02/13 05:43	5

Client Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU 040-09 (102313) 20' — Lab Sample ID: 600-81631-103

Date Collected: 10/23/13 15:56 **Matrix: Solid**
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.9		1.0		%			10/28/13 08:43	1
Percent Solids	91		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	580		8.8		mg/Kg	☼		11/02/13 06:01	2

Client Sample ID: VGWU 040-09 (102313) 25' — Lab Sample ID: 600-81631-104

Date Collected: 10/23/13 15:58 **Matrix: Solid**
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.6		1.0		%			10/28/13 08:43	1
Percent Solids	93		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	70		4.3		mg/Kg	☼		11/02/13 06:19	1

Client Sample ID: VGWU 040-09 (102313) 30' — Lab Sample ID: 600-81631-105

Date Collected: 10/23/13 16:00 **Matrix: Solid**
Date Received: 10/25/13 09:57

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.5		1.0		%			10/28/13 08:43	1
Percent Solids	95		1.0		%			10/28/13 08:43	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		4.2		mg/Kg	☼		11/02/13 07:14	1

Definitions/Glossary

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Qualifiers

General Chemistry

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F	MS/MSD Recovery and/or RPD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Method: 9056 - Anions, Ion Chromatography

Lab Sample ID: MB 600-119139/1-A
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			10/29/13 23:13	1

Lab Sample ID: MB 600-119139/27-A
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			10/30/13 08:19	1

Lab Sample ID: LCS 600-119139/28-A
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	197		mg/Kg		98	90 - 110

Lab Sample ID: LCS 600-119139/2-A
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	198		mg/Kg		99	90 - 110

Lab Sample ID: 600-81631-15 MS
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: VGWU 040-04 (102213) 2'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1700		1060	2570	F	mg/Kg	☼	78	80 - 120

Lab Sample ID: 600-81631-15 MSD
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: VGWU 040-04 (102213) 2'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1700		1060	2600		mg/Kg	☼	82	80 - 120	1	20

Lab Sample ID: 600-81631-25 MS
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: VGWU 040-02 (102213) 15'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3900		10600	13500		mg/Kg	☼	90	80 - 120

Lab Sample ID: 600-81631-25 MSD
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: VGWU 040-02 (102213) 15'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	3900		10600	13400		mg/Kg	☼	90	80 - 120	1	20

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Lab Sample ID: 600-81631-35 MS
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: VGWU 040-01 (102313) 30'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	180		104	254	F	mg/Kg	☼	75	80 - 120

Lab Sample ID: 600-81631-35 MSD
Matrix: Solid
Analysis Batch: 119258

Client Sample ID: VGWU 040-01 (102313) 30'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	180		104	257	F	mg/Kg	☼	78	80 - 120	1	20

Lab Sample ID: MB 600-119229/1-A
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			10/31/13 20:45	1

Lab Sample ID: MB 600-119229/27-A
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			11/01/13 06:09	1

Lab Sample ID: LCS 600-119229/28-A
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	187		mg/Kg		94	90 - 110

Lab Sample ID: LCS 600-119229/2-A
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	196		mg/Kg		98	90 - 110

Lab Sample ID: 600-81631-39 MS
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: VGWU 040-03 (102313) 15'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	23		103	111		mg/Kg	☼	86	80 - 120

Lab Sample ID: 600-81631-39 MSD
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: VGWU 040-03 (102313) 15'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	23		103	110		mg/Kg	☼	85	80 - 120	1	20

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Method: 9056 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 600-81631-56 MS
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: VGWU 040-06 (102313) 30'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10		104	96.9		mg/Kg	☼	84	80 - 120

Lab Sample ID: 600-81631-56 MSD
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: VGWU 040-06 (102313) 30'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10		104	97.7		mg/Kg	☼	84	80 - 120	1	20

Lab Sample ID: 600-81631-66 MS
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: VGWU 040-07 (102313) 10'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	33		104	115		mg/Kg	☼	80	80 - 120

Lab Sample ID: 600-81631-66 MSD
Matrix: Solid
Analysis Batch: 119416

Client Sample ID: VGWU 040-07 (102313) 10'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	33		104	116		mg/Kg	☼	81	80 - 120	1	20

Lab Sample ID: MB 600-119474/1-A
Matrix: Solid
Analysis Batch: 119606

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			11/01/13 23:57	1

Lab Sample ID: LCS 600-119474/2-A
Matrix: Solid
Analysis Batch: 119606

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	197		mg/Kg		98	90 - 110

Lab Sample ID: 600-81631-70 MS
Matrix: Solid
Analysis Batch: 119606

Client Sample ID: VGWU 040-07 (102313) 30'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	9.3		103	96.9		mg/Kg	☼	85	80 - 120

Lab Sample ID: 600-81631-70 MSD
Matrix: Solid
Analysis Batch: 119606

Client Sample ID: VGWU 040-07 (102313) 30'
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	9.3		103	98.1		mg/Kg	☼	86	80 - 120	1	20

QC Sample Results

Client: ARCADIS U.S., Inc. TestAmerica Job ID: 600-81631-1
Project/Site: HES Transfer Sites, Lea County NM

Lab Sample ID: 600-81631-101 MS **Client Sample ID: VGWU 040-09 (102313) 10'**
Matrix: Solid **Prep Type: Soluble**
Analysis Batch: 119606

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	900		209	998	4	mg/Kg	☼	47	80 - 120

Lab Sample ID: 600-81631-101 MSD **Client Sample ID: VGWU 040-09 (102313) 10'**
Matrix: Solid **Prep Type: Soluble**
Analysis Batch: 119606

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	900		209	1010	4	mg/Kg	☼	51	80 - 120	1	20

Method: Moisture - Percent Moisture

Lab Sample ID: 600-81631-16 DU **Client Sample ID: VGWU 040-04 (102213) 5'**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 119025

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	8.9		10		%		11	20
Percent Solids	91		90		%		1	20

Lab Sample ID: 600-81631-25 DU **Client Sample ID: VGWU 040-02 (102213) 15'**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 119025

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	5.7		4.8		%		17	20
Percent Solids	94		95		%		0.9	20

Lab Sample ID: 600-81631-36 DU **Client Sample ID: VGWU 040-03 (102313) 2'**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 119025

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	4.8		4.6		%		4	20
Percent Solids	95		95		%		0.2	20

Lab Sample ID: 600-81631-53 DU **Client Sample ID: VGWU 040-06 (102313) 15'**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 119025

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	8.9		8.8		%		0.5	20
Percent Solids	91		91		%		0.05	20

Lab Sample ID: 600-81631-63 DU **Client Sample ID: VGWU 040-05 (102313) 30'**
Matrix: Solid **Prep Type: Total/NA**
Analysis Batch: 119025

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	4.9		5.1		%		4	20
Percent Solids	95		95		%		0.2	20

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Method: Moisture - Percent Moisture (Continued)

Lab Sample ID: 600-81631-87 DU
Matrix: Solid
Analysis Batch: 119025

Client Sample ID: VGWU 040-08 (102313) 10'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	8.3			7.9		%				4	20
Percent Solids	92			92		%				0.4	20

Lab Sample ID: 600-81631-104 DU
Matrix: Solid
Analysis Batch: 119025

Client Sample ID: VGWU 040-09 (102313) 25'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	6.6			6.5		%				1	20
Percent Solids	93			93		%				0.08	20

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

General Chemistry

Analysis Batch: 119025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-15	VGWU 040-04 (102213) 2'	Total/NA	Solid	Moisture	
600-81631-16	VGWU 040-04 (102213) 5'	Total/NA	Solid	Moisture	
600-81631-16 DU	VGWU 040-04 (102213) 5'	Total/NA	Solid	Moisture	
600-81631-17	VGWU 040-04 (102213) 10'	Total/NA	Solid	Moisture	
600-81631-18	VGWU 040-04 (102213) 15'	Total/NA	Solid	Moisture	
600-81631-19	VGWU 040-04 (102213) 20'	Total/NA	Solid	Moisture	
600-81631-20	VGWU 040-04 (102213) 25'	Total/NA	Solid	Moisture	
600-81631-21	VGWU 040-04 (102213) 30'	Total/NA	Solid	Moisture	
600-81631-22	VGWU 040-02 (102213) 2'	Total/NA	Solid	Moisture	
600-81631-23	VGWU 040-02 (102213) 5'	Total/NA	Solid	Moisture	
600-81631-24	VGWU 040-02 (102213) 10'	Total/NA	Solid	Moisture	
600-81631-25	VGWU 040-02 (102213) 15'	Total/NA	Solid	Moisture	
600-81631-25 DU	VGWU 040-02 (102213) 15'	Total/NA	Solid	Moisture	
600-81631-26	VGWU 040-02 (102213) 20'	Total/NA	Solid	Moisture	
600-81631-27	VGWU 040-02 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-28	VGWU 040-02 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-29	VGWU 040-01 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-30	VGWU 040-01 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-31	VGWU 040-01 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-32	VGWU 040-01 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-33	VGWU 040-01 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-34	VGWU 040-01 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-35	VGWU 040-01 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-36	VGWU 040-03 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-36 DU	VGWU 040-03 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-37	VGWU 040-03 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-38	VGWU 040-03 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-39	VGWU 040-03 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-40	VGWU 040-03 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-41	VGWU 040-03 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-42	VGWU 040-03 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-50	VGWU 040-06 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-51	VGWU 040-06 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-52	VGWU 040-06 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-53	VGWU 040-06 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-53 DU	VGWU 040-06 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-54	VGWU 040-06 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-55	VGWU 040-06 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-56	VGWU 040-06 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-57	VGWU 040-05 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-58	VGWU 040-05 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-59	VGWU 040-05 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-60	VGWU 040-05 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-61	VGWU 040-05 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-62	VGWU 040-05 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-63	VGWU 040-05 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-63 DU	VGWU 040-05 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-64	VGWU 040-07 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-65	VGWU 040-07 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-66	VGWU 040-07 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-67	VGWU 040-07 (102313) 15'	Total/NA	Solid	Moisture	

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

General Chemistry (Continued)

Analysis Batch: 119025 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-68	VGWU 040-07 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-69	VGWU 040-07 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-70	VGWU 040-07 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-85	VGWU 040-08 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-86	VGWU 040-08 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-87	VGWU 040-08 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-87 DU	VGWU 040-08 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-88	VGWU 040-08 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-89	VGWU 040-08 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-90	VGWU 040-08 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-91	VGWU 040-08 (102313) 30'	Total/NA	Solid	Moisture	
600-81631-99	VGWU 040-09 (102313) 2'	Total/NA	Solid	Moisture	
600-81631-100	VGWU 040-09 (102313) 5'	Total/NA	Solid	Moisture	
600-81631-101	VGWU 040-09 (102313) 10'	Total/NA	Solid	Moisture	
600-81631-102	VGWU 040-09 (102313) 15'	Total/NA	Solid	Moisture	
600-81631-103	VGWU 040-09 (102313) 20'	Total/NA	Solid	Moisture	
600-81631-104	VGWU 040-09 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-104 DU	VGWU 040-09 (102313) 25'	Total/NA	Solid	Moisture	
600-81631-105	VGWU 040-09 (102313) 30'	Total/NA	Solid	Moisture	

Leach Batch: 119139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-15	VGWU 040-04 (102213) 2'	Soluble	Solid	DI Leach	
600-81631-15 MS	VGWU 040-04 (102213) 2'	Soluble	Solid	DI Leach	
600-81631-15 MSD	VGWU 040-04 (102213) 2'	Soluble	Solid	DI Leach	
600-81631-16	VGWU 040-04 (102213) 5'	Soluble	Solid	DI Leach	
600-81631-17	VGWU 040-04 (102213) 10'	Soluble	Solid	DI Leach	
600-81631-18	VGWU 040-04 (102213) 15'	Soluble	Solid	DI Leach	
600-81631-19	VGWU 040-04 (102213) 20'	Soluble	Solid	DI Leach	
600-81631-20	VGWU 040-04 (102213) 25'	Soluble	Solid	DI Leach	
600-81631-21	VGWU 040-04 (102213) 30'	Soluble	Solid	DI Leach	
600-81631-22	VGWU 040-02 (102213) 2'	Soluble	Solid	DI Leach	
600-81631-23	VGWU 040-02 (102213) 5'	Soluble	Solid	DI Leach	
600-81631-24	VGWU 040-02 (102213) 10'	Soluble	Solid	DI Leach	
600-81631-25	VGWU 040-02 (102213) 15'	Soluble	Solid	DI Leach	
600-81631-25 MS	VGWU 040-02 (102213) 15'	Soluble	Solid	DI Leach	
600-81631-25 MSD	VGWU 040-02 (102213) 15'	Soluble	Solid	DI Leach	
600-81631-26	VGWU 040-02 (102213) 20'	Soluble	Solid	DI Leach	
600-81631-27	VGWU 040-02 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-28	VGWU 040-02 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-29	VGWU 040-01 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-30	VGWU 040-01 (102313) 5'	Soluble	Solid	DI Leach	
600-81631-31	VGWU 040-01 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-32	VGWU 040-01 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-33	VGWU 040-01 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-34	VGWU 040-01 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-35	VGWU 040-01 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-35 MS	VGWU 040-01 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-35 MSD	VGWU 040-01 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-36	VGWU 040-03 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-37	VGWU 040-03 (102313) 5'	Soluble	Solid	DI Leach	

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

General Chemistry (Continued)

Leach Batch: 119139 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-38	VGWU 040-03 (102313) 10'	Soluble	Solid	DI Leach	
LCS 600-119139/28-A	Lab Control Sample	Soluble	Solid	DI Leach	
LCS 600-119139/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
MB 600-119139/1-A	Method Blank	Soluble	Solid	DI Leach	
MB 600-119139/27-A	Method Blank	Soluble	Solid	DI Leach	

Leach Batch: 119229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-39	VGWU 040-03 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-39 MS	VGWU 040-03 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-39 MSD	VGWU 040-03 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-40	VGWU 040-03 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-41	VGWU 040-03 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-42	VGWU 040-03 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-50	VGWU 040-06 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-51	VGWU 040-06 (102313) 5'	Soluble	Solid	DI Leach	
600-81631-52	VGWU 040-06 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-53	VGWU 040-06 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-54	VGWU 040-06 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-55	VGWU 040-06 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-56	VGWU 040-06 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-56 MS	VGWU 040-06 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-56 MSD	VGWU 040-06 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-57	VGWU 040-05 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-58	VGWU 040-05 (102313) 5'	Soluble	Solid	DI Leach	
600-81631-59	VGWU 040-05 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-60	VGWU 040-05 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-61	VGWU 040-05 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-62	VGWU 040-05 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-63	VGWU 040-05 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-64	VGWU 040-07 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-65	VGWU 040-07 (102313) 5'	Soluble	Solid	DI Leach	
600-81631-66	VGWU 040-07 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-66 MS	VGWU 040-07 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-66 MSD	VGWU 040-07 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-67	VGWU 040-07 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-68	VGWU 040-07 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-69	VGWU 040-07 (102313) 25'	Soluble	Solid	DI Leach	
LCS 600-119229/28-A	Lab Control Sample	Soluble	Solid	DI Leach	
LCS 600-119229/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
MB 600-119229/1-A	Method Blank	Soluble	Solid	DI Leach	
MB 600-119229/27-A	Method Blank	Soluble	Solid	DI Leach	

Analysis Batch: 119258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-15	VGWU 040-04 (102213) 2'	Soluble	Solid	9056	119139
600-81631-15 MS	VGWU 040-04 (102213) 2'	Soluble	Solid	9056	119139
600-81631-15 MSD	VGWU 040-04 (102213) 2'	Soluble	Solid	9056	119139
600-81631-16	VGWU 040-04 (102213) 5'	Soluble	Solid	9056	119139
600-81631-17	VGWU 040-04 (102213) 10'	Soluble	Solid	9056	119139
600-81631-18	VGWU 040-04 (102213) 15'	Soluble	Solid	9056	119139

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

General Chemistry (Continued)

Analysis Batch: 119258 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-19	VGWU 040-04 (102213) 20'	Soluble	Solid	9056	119139
600-81631-20	VGWU 040-04 (102213) 25'	Soluble	Solid	9056	119139
600-81631-21	VGWU 040-04 (102213) 30'	Soluble	Solid	9056	119139
600-81631-22	VGWU 040-02 (102213) 2'	Soluble	Solid	9056	119139
600-81631-23	VGWU 040-02 (102213) 5'	Soluble	Solid	9056	119139
600-81631-24	VGWU 040-02 (102213) 10'	Soluble	Solid	9056	119139
600-81631-25	VGWU 040-02 (102213) 15'	Soluble	Solid	9056	119139
600-81631-25 MS	VGWU 040-02 (102213) 15'	Soluble	Solid	9056	119139
600-81631-25 MSD	VGWU 040-02 (102213) 15'	Soluble	Solid	9056	119139
600-81631-26	VGWU 040-02 (102213) 20'	Soluble	Solid	9056	119139
600-81631-27	VGWU 040-02 (102313) 25'	Soluble	Solid	9056	119139
600-81631-28	VGWU 040-02 (102313) 30'	Soluble	Solid	9056	119139
600-81631-29	VGWU 040-01 (102313) 2'	Soluble	Solid	9056	119139
600-81631-30	VGWU 040-01 (102313) 5'	Soluble	Solid	9056	119139
600-81631-31	VGWU 040-01 (102313) 10'	Soluble	Solid	9056	119139
600-81631-32	VGWU 040-01 (102313) 15'	Soluble	Solid	9056	119139
600-81631-33	VGWU 040-01 (102313) 20'	Soluble	Solid	9056	119139
600-81631-34	VGWU 040-01 (102313) 25'	Soluble	Solid	9056	119139
600-81631-35	VGWU 040-01 (102313) 30'	Soluble	Solid	9056	119139
600-81631-35 MS	VGWU 040-01 (102313) 30'	Soluble	Solid	9056	119139
600-81631-35 MSD	VGWU 040-01 (102313) 30'	Soluble	Solid	9056	119139
600-81631-36	VGWU 040-03 (102313) 2'	Soluble	Solid	9056	119139
600-81631-37	VGWU 040-03 (102313) 5'	Soluble	Solid	9056	119139
600-81631-38	VGWU 040-03 (102313) 10'	Soluble	Solid	9056	119139
LCS 600-119139/28-A	Lab Control Sample	Soluble	Solid	9056	119139
LCS 600-119139/2-A	Lab Control Sample	Soluble	Solid	9056	119139
MB 600-119139/1-A	Method Blank	Soluble	Solid	9056	119139
MB 600-119139/27-A	Method Blank	Soluble	Solid	9056	119139

Analysis Batch: 119416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-39	VGWU 040-03 (102313) 15'	Soluble	Solid	9056	119229
600-81631-39 MS	VGWU 040-03 (102313) 15'	Soluble	Solid	9056	119229
600-81631-39 MSD	VGWU 040-03 (102313) 15'	Soluble	Solid	9056	119229
600-81631-40	VGWU 040-03 (102313) 20'	Soluble	Solid	9056	119229
600-81631-41	VGWU 040-03 (102313) 25'	Soluble	Solid	9056	119229
600-81631-42	VGWU 040-03 (102313) 30'	Soluble	Solid	9056	119229
600-81631-50	VGWU 040-06 (102313) 2'	Soluble	Solid	9056	119229
600-81631-51	VGWU 040-06 (102313) 5'	Soluble	Solid	9056	119229
600-81631-52	VGWU 040-06 (102313) 10'	Soluble	Solid	9056	119229
600-81631-53	VGWU 040-06 (102313) 15'	Soluble	Solid	9056	119229
600-81631-54	VGWU 040-06 (102313) 20'	Soluble	Solid	9056	119229
600-81631-55	VGWU 040-06 (102313) 25'	Soluble	Solid	9056	119229
600-81631-56	VGWU 040-06 (102313) 30'	Soluble	Solid	9056	119229
600-81631-56 MS	VGWU 040-06 (102313) 30'	Soluble	Solid	9056	119229
600-81631-56 MSD	VGWU 040-06 (102313) 30'	Soluble	Solid	9056	119229
600-81631-57	VGWU 040-05 (102313) 2'	Soluble	Solid	9056	119229
600-81631-58	VGWU 040-05 (102313) 5'	Soluble	Solid	9056	119229
600-81631-59	VGWU 040-05 (102313) 10'	Soluble	Solid	9056	119229
600-81631-60	VGWU 040-05 (102313) 15'	Soluble	Solid	9056	119229
600-81631-61	VGWU 040-05 (102313) 20'	Soluble	Solid	9056	119229

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

General Chemistry (Continued)

Analysis Batch: 119416 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-62	VGWU 040-05 (102313) 25'	Soluble	Solid	9056	119229
600-81631-63	VGWU 040-05 (102313) 30'	Soluble	Solid	9056	119229
600-81631-64	VGWU 040-07 (102313) 2'	Soluble	Solid	9056	119229
600-81631-65	VGWU 040-07 (102313) 5'	Soluble	Solid	9056	119229
600-81631-66	VGWU 040-07 (102313) 10'	Soluble	Solid	9056	119229
600-81631-66 MS	VGWU 040-07 (102313) 10'	Soluble	Solid	9056	119229
600-81631-66 MSD	VGWU 040-07 (102313) 10'	Soluble	Solid	9056	119229
600-81631-67	VGWU 040-07 (102313) 15'	Soluble	Solid	9056	119229
600-81631-68	VGWU 040-07 (102313) 20'	Soluble	Solid	9056	119229
600-81631-69	VGWU 040-07 (102313) 25'	Soluble	Solid	9056	119229
LCS 600-119229/28-A	Lab Control Sample	Soluble	Solid	9056	119229
LCS 600-119229/2-A	Lab Control Sample	Soluble	Solid	9056	119229
MB 600-119229/1-A	Method Blank	Soluble	Solid	9056	119229
MB 600-119229/27-A	Method Blank	Soluble	Solid	9056	119229

Leach Batch: 119474

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-70	VGWU 040-07 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-70 MS	VGWU 040-07 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-70 MSD	VGWU 040-07 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-85	VGWU 040-08 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-86	VGWU 040-08 (102313) 5'	Soluble	Solid	DI Leach	
600-81631-87	VGWU 040-08 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-88	VGWU 040-08 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-89	VGWU 040-08 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-90	VGWU 040-08 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-91	VGWU 040-08 (102313) 30'	Soluble	Solid	DI Leach	
600-81631-99	VGWU 040-09 (102313) 2'	Soluble	Solid	DI Leach	
600-81631-100	VGWU 040-09 (102313) 5'	Soluble	Solid	DI Leach	
600-81631-101	VGWU 040-09 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-101 MS	VGWU 040-09 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-101 MSD	VGWU 040-09 (102313) 10'	Soluble	Solid	DI Leach	
600-81631-102	VGWU 040-09 (102313) 15'	Soluble	Solid	DI Leach	
600-81631-103	VGWU 040-09 (102313) 20'	Soluble	Solid	DI Leach	
600-81631-104	VGWU 040-09 (102313) 25'	Soluble	Solid	DI Leach	
600-81631-105	VGWU 040-09 (102313) 30'	Soluble	Solid	DI Leach	
LCS 600-119474/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
MB 600-119474/1-A	Method Blank	Soluble	Solid	DI Leach	

Analysis Batch: 119606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-70	VGWU 040-07 (102313) 30'	Soluble	Solid	9056	119474
600-81631-70 MS	VGWU 040-07 (102313) 30'	Soluble	Solid	9056	119474
600-81631-70 MSD	VGWU 040-07 (102313) 30'	Soluble	Solid	9056	119474
600-81631-85	VGWU 040-08 (102313) 2'	Soluble	Solid	9056	119474
600-81631-86	VGWU 040-08 (102313) 5'	Soluble	Solid	9056	119474
600-81631-87	VGWU 040-08 (102313) 10'	Soluble	Solid	9056	119474
600-81631-88	VGWU 040-08 (102313) 15'	Soluble	Solid	9056	119474
600-81631-89	VGWU 040-08 (102313) 20'	Soluble	Solid	9056	119474
600-81631-90	VGWU 040-08 (102313) 25'	Soluble	Solid	9056	119474
600-81631-91	VGWU 040-08 (102313) 30'	Soluble	Solid	9056	119474

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

General Chemistry (Continued)

Analysis Batch: 119606 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-81631-99	VGWU 040-09 (102313) 2'	Soluble	Solid	9056	119474
600-81631-100	VGWU 040-09 (102313) 5'	Soluble	Solid	9056	119474
600-81631-101	VGWU 040-09 (102313) 10'	Soluble	Solid	9056	119474
600-81631-101 MS	VGWU 040-09 (102313) 10'	Soluble	Solid	9056	119474
600-81631-101 MSD	VGWU 040-09 (102313) 10'	Soluble	Solid	9056	119474
600-81631-102	VGWU 040-09 (102313) 15'	Soluble	Solid	9056	119474
600-81631-103	VGWU 040-09 (102313) 20'	Soluble	Solid	9056	119474
600-81631-104	VGWU 040-09 (102313) 25'	Soluble	Solid	9056	119474
600-81631-105	VGWU 040-09 (102313) 30'	Soluble	Solid	9056	119474
LCS 600-119474/2-A	Lab Control Sample	Soluble	Solid	9056	119474
MB 600-119474/1-A	Method Blank	Soluble	Solid	9056	119474

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-04 (102213) 2'

Lab Sample ID: 600-81631-15
Matrix: Solid
Date Collected: 10/22/13 15:36
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	119258	10/29/13 23:49	DAW	TAL HOU

Client Sample ID: VGWU 040-04 (102213) 5'

Lab Sample ID: 600-81631-16
Matrix: Solid
Date Collected: 10/22/13 15:38
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		100	5 mL	5 mL	119258	10/30/13 00:44	DAW	TAL HOU

Client Sample ID: VGWU 040-04 (102213) 10'

Lab Sample ID: 600-81631-17
Matrix: Solid
Date Collected: 10/22/13 15:42
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 01:02	DAW	TAL HOU

Client Sample ID: VGWU 040-04 (102213) 15'

Lab Sample ID: 600-81631-18
Matrix: Solid
Date Collected: 10/22/13 15:45
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 01:20	DAW	TAL HOU

Client Sample ID: VGWU 040-04 (102213) 20'

Lab Sample ID: 600-81631-19
Matrix: Solid
Date Collected: 10/22/13 15:48
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 01:38	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-04 (102213) 25'

Lab Sample ID: 600-81631-20

Date Collected: 10/22/13 15:50
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 01:57	DAW	TAL HOU

Client Sample ID: VGWU 040-04 (102213) 30'

Lab Sample ID: 600-81631-21

Date Collected: 10/22/13 15:55
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 02:51	DAW	TAL HOU

Client Sample ID: VGWU 040-02 (102213) 2'

Lab Sample ID: 600-81631-22

Date Collected: 10/22/13 16:06
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	119258	10/30/13 03:09	DAW	TAL HOU

Client Sample ID: VGWU 040-02 (102213) 5'

Lab Sample ID: 600-81631-23

Date Collected: 10/22/13 16:07
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		100	5 mL	5 mL	119258	10/30/13 03:28	DAW	TAL HOU

Client Sample ID: VGWU 040-02 (102213) 10'

Lab Sample ID: 600-81631-24

Date Collected: 10/22/13 16:10
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		100	5 mL	5 mL	119258	10/30/13 03:46	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-02 (102213) 15'

Lab Sample ID: 600-81631-25
Date Collected: 10/22/13 16:14
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		100	5 mL	5 mL	119258	10/30/13 04:04	DAW	TAL HOU

Client Sample ID: VGWU 040-02 (102213) 20'

Lab Sample ID: 600-81631-26
Date Collected: 10/22/13 16:18
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	119258	10/30/13 04:59	DAW	TAL HOU

Client Sample ID: VGWU 040-02 (102313) 25'

Lab Sample ID: 600-81631-27
Date Collected: 10/23/13 09:57
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		50	5 mL	5 mL	119258	10/30/13 05:17	DAW	TAL HOU

Client Sample ID: VGWU 040-02 (102313) 30'

Lab Sample ID: 600-81631-28
Date Collected: 10/23/13 10:20
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		50	5 mL	5 mL	119258	10/30/13 05:35	DAW	TAL HOU

Client Sample ID: VGWU 040-01 (102313) 2'

Lab Sample ID: 600-81631-29
Date Collected: 10/23/13 10:29
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	119258	10/30/13 06:30	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-01 (102313) 5'

Lab Sample ID: 600-81631-30

Date Collected: 10/23/13 10:31
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	119258	10/30/13 06:48	DAW	TAL HOU

Client Sample ID: VGWU 040-01 (102313) 10'

Lab Sample ID: 600-81631-31

Date Collected: 10/23/13 10:33
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	119258	10/30/13 07:06	DAW	TAL HOU

Client Sample ID: VGWU 040-01 (102313) 15'

Lab Sample ID: 600-81631-32

Date Collected: 10/23/13 10:36
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 07:24	DAW	TAL HOU

Client Sample ID: VGWU 040-01 (102313) 20'

Lab Sample ID: 600-81631-33

Date Collected: 10/23/13 10:38
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 07:42	DAW	TAL HOU

Client Sample ID: VGWU 040-01 (102313) 25'

Lab Sample ID: 600-81631-34

Date Collected: 10/23/13 10:41
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 08:01	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-01 (102313) 30'

Lab Sample ID: 600-81631-35
Matrix: Solid
Date Collected: 10/23/13 10:45
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 08:55	DAW	TAL HOU

Client Sample ID: VGWU 040-03 (102313) 2'

Lab Sample ID: 600-81631-36
Matrix: Solid
Date Collected: 10/23/13 10:59
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		50	5 mL	5 mL	119258	10/30/13 10:26	DAW	TAL HOU

Client Sample ID: VGWU 040-03 (102313) 5'

Lab Sample ID: 600-81631-37
Matrix: Solid
Date Collected: 10/23/13 11:01
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	119258	10/30/13 10:45	DAW	TAL HOU

Client Sample ID: VGWU 040-03 (102313) 10'

Lab Sample ID: 600-81631-38
Matrix: Solid
Date Collected: 10/23/13 11:03
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119139	10/29/13 09:39	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119258	10/30/13 11:03	DAW	TAL HOU

Client Sample ID: VGWU 040-03 (102313) 15'

Lab Sample ID: 600-81631-39
Matrix: Solid
Date Collected: 10/23/13 11:07
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	10/31/13 21:21	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-03 (102313) 20'

Lab Sample ID: 600-81631-40

Date Collected: 10/23/13 11:10
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	10/31/13 22:16	DAW	TAL HOU

Client Sample ID: VGWU 040-03 (102313) 25'

Lab Sample ID: 600-81631-41

Date Collected: 10/23/13 11:15
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	10/31/13 22:34	DAW	TAL HOU

Client Sample ID: VGWU 040-03 (102313) 30'

Lab Sample ID: 600-81631-42

Date Collected: 10/23/13 11:18
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	10/31/13 22:52	DAW	TAL HOU

Client Sample ID: VGWU 040-06 (102313) 2'

Lab Sample ID: 600-81631-50

Date Collected: 10/23/13 12:13
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	10/31/13 23:10	DAW	TAL HOU

Client Sample ID: VGWU 040-06 (102313) 5'

Lab Sample ID: 600-81631-51

Date Collected: 10/23/13 12:15
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	119416	10/31/13 23:28	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-06 (102313) 10'

Lab Sample ID: 600-81631-52
Matrix: Solid
Date Collected: 10/23/13 12:18
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 00:23	DAW	TAL HOU

Client Sample ID: VGWU 040-06 (102313) 15'

Lab Sample ID: 600-81631-53
Matrix: Solid
Date Collected: 10/23/13 12:24
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 00:41	DAW	TAL HOU

Client Sample ID: VGWU 040-06 (102313) 20'

Lab Sample ID: 600-81631-54
Matrix: Solid
Date Collected: 10/23/13 12:26
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 00:59	DAW	TAL HOU

Client Sample ID: VGWU 040-06 (102313) 25'

Lab Sample ID: 600-81631-55
Matrix: Solid
Date Collected: 10/23/13 12:28
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 01:18	DAW	TAL HOU

Client Sample ID: VGWU 040-06 (102313) 30'

Lab Sample ID: 600-81631-56
Matrix: Solid
Date Collected: 10/23/13 12:30
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 01:36	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-05 (102313) 2'

Lab Sample ID: 600-81631-57
Date Collected: 10/23/13 12:46
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 02:31	DAW	TAL HOU

Client Sample ID: VGWU 040-05 (102313) 5'

Lab Sample ID: 600-81631-58
Date Collected: 10/23/13 12:47
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 02:49	DAW	TAL HOU

Client Sample ID: VGWU 040-05 (102313) 10'

Lab Sample ID: 600-81631-59
Date Collected: 10/23/13 12:49
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 03:07	DAW	TAL HOU

Client Sample ID: VGWU 040-05 (102313) 15'

Lab Sample ID: 600-81631-60
Date Collected: 10/23/13 12:53
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 04:02	DAW	TAL HOU

Client Sample ID: VGWU 040-05 (102313) 20'

Lab Sample ID: 600-81631-61
Date Collected: 10/23/13 12:55
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 04:20	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-05 (102313) 25'

Lab Sample ID: 600-81631-62

Date Collected: 10/23/13 12:56
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 04:38	DAW	TAL HOU

Client Sample ID: VGWU 040-05 (102313) 30'

Lab Sample ID: 600-81631-63

Date Collected: 10/23/13 12:58
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 04:56	DAW	TAL HOU

Client Sample ID: VGWU 040-07 (102313) 2'

Lab Sample ID: 600-81631-64

Date Collected: 10/23/13 13:14
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	119416	11/01/13 05:14	DAW	TAL HOU

Client Sample ID: VGWU 040-07 (102313) 5'

Lab Sample ID: 600-81631-65

Date Collected: 10/23/13 13:16
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 05:51	DAW	TAL HOU

Client Sample ID: VGWU 040-07 (102313) 10'

Lab Sample ID: 600-81631-66

Date Collected: 10/23/13 13:17
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 06:45	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-07 (102313) 15'

Lab Sample ID: 600-81631-67
Date Collected: 10/23/13 13:18
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 08:16	DAW	TAL HOU

Client Sample ID: VGWU 040-07 (102313) 20'

Lab Sample ID: 600-81631-68
Date Collected: 10/23/13 13:20
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 08:35	DAW	TAL HOU

Client Sample ID: VGWU 040-07 (102313) 25'

Lab Sample ID: 600-81631-69
Date Collected: 10/23/13 13:24
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119229	10/30/13 10:09	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119416	11/01/13 08:53	DAW	TAL HOU

Client Sample ID: VGWU 040-07 (102313) 30'

Lab Sample ID: 600-81631-70
Date Collected: 10/23/13 13:27
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 00:33	DAW	TAL HOU

Client Sample ID: VGWU 040-08 (102313) 2'

Lab Sample ID: 600-81631-85
Date Collected: 10/23/13 14:43
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	119606	11/02/13 01:28	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-08 (102313) 5'

Lab Sample ID: 600-81631-86
Matrix: Solid
Date Collected: 10/23/13 14:44
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	119606	11/02/13 01:46	DAW	TAL HOU

Client Sample ID: VGWU 040-08 (102313) 10'

Lab Sample ID: 600-81631-87
Matrix: Solid
Date Collected: 10/23/13 14:48
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	119606	11/02/13 02:04	DAW	TAL HOU

Client Sample ID: VGWU 040-08 (102313) 15'

Lab Sample ID: 600-81631-88
Matrix: Solid
Date Collected: 10/23/13 14:50
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 02:23	DAW	TAL HOU

Client Sample ID: VGWU 040-08 (102313) 20'

Lab Sample ID: 600-81631-89
Matrix: Solid
Date Collected: 10/23/13 14:54
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 02:41	DAW	TAL HOU

Client Sample ID: VGWU 040-08 (102313) 25'

Lab Sample ID: 600-81631-90
Matrix: Solid
Date Collected: 10/23/13 14:57
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 03:35	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-08 (102313) 30'

Lab Sample ID: 600-81631-91
Date Collected: 10/23/13 14:58
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 03:54	DAW	TAL HOU

Client Sample ID: VGWU 040-09 (102313) 2'

Lab Sample ID: 600-81631-99
Date Collected: 10/23/13 15:47
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	119606	11/02/13 04:12	DAW	TAL HOU

Client Sample ID: VGWU 040-09 (102313) 5'

Lab Sample ID: 600-81631-100
Date Collected: 10/23/13 15:48
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	119606	11/02/13 04:30	DAW	TAL HOU

Client Sample ID: VGWU 040-09 (102313) 10'

Lab Sample ID: 600-81631-101
Date Collected: 10/23/13 15:50
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	119606	11/02/13 04:48	DAW	TAL HOU

Client Sample ID: VGWU 040-09 (102313) 15'

Lab Sample ID: 600-81631-102
Date Collected: 10/23/13 15:53
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	119606	11/02/13 05:43	DAW	TAL HOU

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Client Sample ID: VGWU 040-09 (102313) 20'

Lab Sample ID: 600-81631-103

Date Collected: 10/23/13 15:56
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	119606	11/02/13 06:01	DAW	TAL HOU

Client Sample ID: VGWU 040-09 (102313) 25'

Lab Sample ID: 600-81631-104

Date Collected: 10/23/13 15:58
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 06:19	DAW	TAL HOU

Client Sample ID: VGWU 040-09 (102313) 30'

Lab Sample ID: 600-81631-105

Date Collected: 10/23/13 16:00
Matrix: Solid
Date Received: 10/25/13 09:57

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			119025	10/28/13 08:43	AYS	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	119474	11/01/13 14:54	DAW	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	119606	11/02/13 07:14	DAW	TAL HOU

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-81631-1

Laboratory: TestAmerica Houston

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0759	08-04-13 *
Louisiana	NELAP	6	01967	06-30-14
Oklahoma	State Program	6	9503	08-31-13 *
Texas	NELAP	6	T104704223-10-6-TX	10-31-13 *
USDA	Federal		P330-08-00217	04-01-14
Utah	NELAP	8	GULF	10-31-13 *

* Expired certification is currently pending renewal and is considered valid.

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 1 of 10
Company: ARCADIS U.S., Inc.				Job #: Boo48616.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Trunk Line	SSOW#:			

Analysis Requested

600-81631 Chain of Custody

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
VGWU 040-10(102213) 2'	10-22-13	1431	6	Solid				X			1	Hold
VGWU 040-10(102213) 5'	10-22-13	1432	6	Solid				X			1	Hold
VGWU 040-10(102213) 10'	10-22-13	1435	6	Solid				X			1	Hold
VGWU 040-10(102213) 15'	10-22-13	1437	6	Solid				X			1	Hold
VGWU 040-10(102213) 20'	10-22-13	1438	6	Solid				X			1	Hold
VGWU 040-10(102213) 25'	10-22-13	1442	6	Solid				X			1	Hold
VGWU 040-10(102213) 30'	10-22-13	1445	6	Solid				X			1	Hold
VGWU 040-12(102213) 2'	10-22-13	1506	6	Solid				X			1	Hold
VGWU 040-12(102213) 5'	10-22-13	1508	6	Solid				X			1	Hold
VGWU 040-12(102213) 10'	10-22-13	1512	6	Solid				X			1	Hold
VGWU 040-12(102213) 15'	10-22-13	1514	6	Solid				X			1	Hold

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
		10-24-13/1700	ARCADIS US			
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by	Date/Time	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 2 of 10
Company: ARCADIS U.S., Inc.		Analysis Requested		Job #: B004816.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			Preservation Codes:
City: Houston	TAT Requested (days): Standard			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify)
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			Other:
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 10-40 Trunk Line	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
2 VGWU 040-12(102213) 20'	10-22-13	1516	6	Solid				X			1	Hold
3 VGWU 040-12(102213) 25'	10-22-13	1518	6	Solid				X			1	Hold
4 VGWU 040-12(102213) 30'	10-22-13	1520	6	Solid				X			1	Hold
VGWU 040-04(102213) 2'	10-22-13	1536	6	Solid				X			1	
VGWU 040-04(102213) 5'	10-22-13	1538	6	Solid				X			1	
VGWU 040-04(102213) 10'	10-22-13	1542	6	Solid				X			1	
VGWU 040-04(102213) 15'	10-22-13	1545	6	Solid				X			1	
VGWU 040-04(102213) 20'	10-22-13	1548	6	Solid				X			1	
VGWU 040-04(102213) 25'	10-22-13	1550	6	Solid				X			1	
VGWU 040-04(102213) 30'	10-22-13	1555	6	Solid				X			1	
1 VGWU 040-02(102213) 2'	10-22-13	1606	6	Solid				X			1	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10-24-13/1700	Arcadis-us			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 3 of 10
Company: ARCADIS U.S., Inc.				Job #: B004816.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Trunk Line	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
VGWU 040-02 (102213) 5'	10-22-13	1607	G	Solid				X			1	
VGWU 040-02 (102213) 10'	10-22-13	1610	G	Solid				X			1	
VGWU 040-02 (102213) 15'	10-22-13	1614	G	Solid				X			1	
VGWU 040-02 (102213) 20'	10-22-13	1618	G	Solid				X			1	
VGWU 040-02 (102313) 25'	10-23-13	0957	G	Solid				X			1	
VGWU 040-02 (102313) 30'	10-23-13	1020	G	Solid				X			1	
VGWU 040-01 (102313) 2'	10-23-13	1029	G	Solid				X			1	
VGWU 040-01 (102313) 5'	10-23-13	1031	G	Solid				X			1	
VGWU 040-01 (102313) 10'	10-23-13	1033	G	Solid				X			1	
VGWU 040-01 (102313) 15'	10-23-13	1036	G	Solid				X			1	
VGWU 040-01 (102313) 20'	10-23-13	1038	G	Solid				X			1	

Possible Hazard Identification

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
		10-24-13/1700	Arcadis-US			
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 4 of 10
Company: ARCADIS U.S., Inc.				Job #: B004816.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Tourtz Line	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N		
VGWU 040-01 (102313) 25'	10-23-13	1041	6	Solid				X			1	
VGWU 040-01 (102313) 30'	10-23-13	1045	6	Solid				X			1	
VGWU 040-03 (102313) 2'	10-23-13	1059	6	Solid				X			1	
VGWU 040-03 (102313) 5'	10-23-13	1101	6	Solid				X			1	
VGWU 040-03 (102313) 10'	10-23-13	1103	6	Solid				X			1	
VGWU 040-03 (102313) 15'	10-23-13	1107	6	Solid				X			1	
VGWU 040-03 (102313) 20'	10-23-13	1110	6	Solid				X			1	Ext 10-23-13
VGWU 040-03 (102313) 25'	10-23-13	1115	6	Solid				X			1	
VGWU 040-03 (102313) 30'	10-23-13	1118	6	Solid				X			1	
VGWU 040-11 (102313) 2'	10-23-13	1132	6	Solid				X			1	Hold
VGWU 040-11 (102313) 5'	10-23-13	1134	6	Solid				X			1	Hold

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-24-13 1700	Arcadis-US			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 5 of 10
Company: ARCADIS U.S., Inc.				Job #: B0048616.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: V6WU 0-40 Trunk Line	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
45 V6WU 040-11(102313) 10'	10-23-13	1138	6	Solid				X			1	Hold.
46 V6WU 040-11(102313) 15'	10-23-13	1140	6	Solid				X			1	Hold.
47 V6WU 040-11(102313) 20'	10-23-13	1145	6	Solid				X			1	Hold.
48 V6WU 040-11(102313) 25'	10-23-13	1150	6	Solid				X			1	Hold.
49 V6WU 040-11(102313) 30'	10-23-13	1155	6	Solid				X			1	Hold.
50 V6WU 040-06(102313) 2'	10-23-13	1213	6	Solid				X			1	
V6WU 040-06(102313) 5'	10-23-13	1215	6	Solid				X			1	
V6WU 040-06(102313) 10'	10-23-13	1218	6	Solid				X			1	
V6WU 040-06(102313) 15'	10-23-13	1224	6	Solid				X			1	
V6WU 040-06(102313) 20'	10-23-13	1226	6	Solid				X			1	
51 V6WU 040-06(102313) 25'	10-23-13	1228	6	Solid				X			1	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	[signature]	10-24-13/1700	Arcadis-US			
	Relinquished by:	Date/Time:	Company	Received by	Date/Time	Company
	Relinquished by	Date/Time:	Company	[signature]	10/25/13 0957	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
8310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 6 of 10
Company: ARCADIS U.S., Inc.		Analysis Requested		Job #: B0048616.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			Preservation Codes:
City: Houston	TAT Requested (days): Standard			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: TX, 77042				Other:
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Trunk Line	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B - BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
56 VGWU 040-06(102313) 30'	10-23-13	1230	6	Solid				X			1	
VGWU 040-05(102313) 2'	10-23-13	1246	6	Solid				X			1	
VGWU 040-05(102313) 5'	10-23-13	1247	6	Solid				X			1	
VGWU 040-05(102313) 10'	10-23-13	1249	6	Solid				X			1	
VGWU 040-05(102313) 15'	10-23-13	1253	6	Solid				X			1	
VGWU 040-05(102313) 20'	10-23-13	1255	6	Solid				X			1	
VGWU 040-05(102313) 25'	10-23-13	1256	6	Solid				X			1	
VGWU 040-05(102313) 30'	10-23-13	1258	6	Solid				X			1	
VGWU 040-07(102313) 2'	10-23-13	1314	6	Solid				X			1	
VGWU 040-07(102313) 5'	10-23-13	1316	6	Solid				X			1	
VGWU 040-07(102313) 10'	10-23-13	1317	6	Solid				X			1	

Possible Hazard Identification (Rev 10-23-13)
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10-24-13/1700	Arcadis-US			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 7 of 10
Company: ARCADIS U.S., Inc.		Analysis Requested		Job #: B00 48616.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			Preservation Codes:
City: Houston	TAT Requested (days): Standard			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			Other:
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWell 0-40 Trunk Line	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B - BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
67 VGWell 040-07 (102313) 15'	10-23-13	1318	G	Solid				X			1	
68 VGWell 040-07 (102313) 20'	10-23-13	1320	G	Solid				X			1	
69 VGWell 040-07 (102313) 25'	10-23-13	1324	G	Solid				X			1	
70 VGWell 040-07 (102313) 30'	10-23-13	1327	G	Solid				X			1	
VGWell 040-13 (102313) 2'	10-23-13	1348	G	Solid				X			1	Hold
VGWell 040-13 (102313) 5'	10-23-13	1349	G	Solid				X			1	Hold
VGWell 040-13 (102313) 10'	10-23-13	1352	G	Solid				X			1	Hold
VGWell 040-13 (102313) 15'	10-23-13	1355	G	Solid				X			1	Hold
VGWell 040-13 (102313) 20'	10-23-13	1357	G	Solid				X			1	Hold
VGWell 040-13 (102313) 25'	10-23-13	1359	G	Solid				X			1	Hold
VGWell 040-13 (102313) 30'	10-23-13	1400	G	Solid				X			1	Hold

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10-24-13 1700	Arcadis-US			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 8 of 10
Company: ARCADIS U.S., Inc.				Job #: B004816.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			
City: Houston	TAT Requested (days): Standard			
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Trunk line	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N		
78 VGWU 040-14(102313) 2'	10-23-13	1416	G	Solid				X			1	Hold
79 VGWU 040-14(102313) 5'	10-23-13	1418	G	Solid				X			1	Hold
80 VGWU 040-14(102313) 10'	10-23-13	1420	G	Solid				X			1	Hold
81 VGWU 040-14(102313) 15'	10-23-13	1422	G	Solid				X			1	Hold
82 VGWU 040-14(102313) 20'	10-23-13	1424	G	Solid				X			1	Hold
83 VGWU 040-14(102313) 25'	10-23-13	1426	G	Solid				X			1	Hold
84 VGWU 040-14(102313) 30'	10-23-13	1428	G	Solid				X			1	Hold
VGWU 040-08(102313) 2'	10-23-13	1443	G	Solid				X			1	
VGWU 040-08(102313) 5'	10-23-13	1444	G	Solid				X			1	
VGWU 040-08(102313) 10'	10-23-13	1448	G	Solid				X			1	
VGWU 040-08(102313) 15'	10-23-13	1450	G	Solid				X			1	

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		10-24-13/1700	Arcadis-US			
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	10/25/13 0957	

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s)	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 9 of 10
Company: ARCADIS U.S., Inc.		Analysis Requested		Job #: B004816.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			Preservation Codes:
City: Houston	TAT Requested (days): Standard			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: TX, 77042				
Phone: (617) 251-8741	PO #: Purchase Order Requested			Other:
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Trunk Line	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N		
VGWU 040-08(102313) 20'	10-23-13	1454	6	Solid				X			1	
VGWU 040-08(102313) 25'	10-23-13	1457	6	Solid				X			1	
VGWU 040-08(102313) 30'	10-23-13	1458	6	Solid				X			1	
VGWU 040-15(102313) 2'	10-23-13	1513	6	Solid				X			1	Hold
VGWU 040-15(102313) 5'	10-23-13	1514	6	Solid				X			1	Hold
VGWU 040-15(102313) 10'	10-23-13	1516	6	Solid				X			1	Hold
VGWU 040-15(102313) 15'	10-23-13	1518	6	Solid				X			1	Hold
VGWU 040-15(102313) 20'	10-23-13	1522	6	Solid				X			1	Hold
VGWU 040-15(102313) 25'	10-23-13	1524	6	Solid				X			1	Hold
VGWU 040-15(102313) 30'	10-23-13	1527	6	Solid				X			1	Hold
VGWU 040-09(102313) 2'	10-23-13	1547	6	Solid				X			1	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-24-13 1700	Arcadis-US			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks.

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information	Sampler: Ryan Nanny	Lab PM: Kudchadkar, Sachin G	Carrier Tracking No(s):	COC No: 600-23595-8666.1
Client Contact: Mr. Jonathan Olsen	Phone: (617) 251-8741	E-Mail: sachin.kudchadkar@testamericainc.com		Page: Page 10 of 10
Company: ARCADIS U.S., Inc.		Analysis Requested		Job #: B004816.0000
Address: 2929 Briarpark Drive Suite 300	Due Date Requested:			Preservation Codes:
City: Houston	TAT Requested (days): Standard			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA; M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
State, Zip: TX, 77042				Other:
Phone: (617) 251-8741	PO #: Purchase Order Requested			
Email: jonathan.olsen@arcadis-us.com	WO #:			
Project Name: HES Transfer Sites, Lea County NM	Project #: 60004633			
Site: VGWU 0-40 Trunk Line	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015B_DRO	9056_28D - Chloride	8015B_GRO	8021B- BTEX	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
VGWU 040-09(102313)5'	10-23-13	1548	6	Solid				X			1	
VGWU 040-09(102313)10'	10-23-13	1550	6	Solid				X			1	
VGWU 040-09(102313)15'	10-23-13	1553	6	Solid				X			1	
VGWU 040-09(102313)20'	10-23-13	1556	6	Solid				X			1	
VGWU 040-09(102313)25'	10-23-13	1558	6	Solid				X			1	
VGWU 040-09(102313)30'	10-23-13	1600	6	Solid				X			1	
				Solid								
				Solid								
				Solid								
				Solid								
				Solid								

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		10-24-13 1700	Arcadis-US			
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10/25/13 0957	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc. Job Number: 600-81631-1

Login Number: 81631 **List Source: TestAmerica Houston**
List Number: 1
Creator: Lopez, Sandro R

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	5.6/2.2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Analytical Report 536657

for

Arcadis - Houston

Project Manager: Jonathan Olsen

HES Transfer

30-SEP-16

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

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

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

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30-SEP-16

Project Manager: **Jonathan Olsen**
Arcadis - Houston
2929 Briarpark Dr., Ste 300
Houston, TX 77042

Reference: XENCO Report No(s): **536657**
HES Transfer
Project Address: Lovington 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) 536657. 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. 536657 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

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Certified and approved by numerous States and Agencies.
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Houston - Dallas - Odessa - San Antonio - Tampa - Lakeland - Atlanta - Phoenix - Oklahoma - Latin America

Sample Cross Reference 536657

Arcadis - Houston, Houston, TX

HES Transfer

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUO40-11 (2')	S	09-12-16 10:05		536657-001
VGWUO40-11 (4')	S	09-12-16 10:05		536657-002
VGWUO40-10 (2')	S	09-12-16 10:05		536657-003
VGWUO40-10 (4')	S	09-12-16 10:05		536657-004
VGWUO40-10 (7')	S	09-12-16 10:05		536657-005
VGWUO40-10 (70')	S	09-12-16 10:05		536657-006
VGWUO40-14 (2')	S	09-12-16 10:05		536657-007
VGWUO40-14 (4')	S	09-12-16 10:05		536657-008
VGWUO40-15 (2')	S	09-12-16 10:05		536657-009
VGWUO40-15 (4')	S	09-12-16 10:05		536657-010
VGWUO40-13 (2')	S	09-12-16 10:05		536657-011
VGWUO40-13 (4')	S	09-12-16 10:05		536657-012
VGWUO40-13 (10')	S	09-12-16 10:05		536657-013

CASE NARRATIVE

Client Name: Arcadis - Houston
Project Name: HES Transfer

Project ID:
Work Order Number(s): *536657*

Report Date: *30-SEP-16*
Date Received: *09/13/2016*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3000202 Inorganic Anions by EPA 300/300.1
Lab Sample ID 536657-010 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered above QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 536657-001, -002, -003, -004, -007, -008, -009, -010, -011, -012.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analysis Summary 536657

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Tue Sep-13-16 10:05 am

Report Date: 30-SEP-16

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536657-001		536657-002		536657-003		536657-004		536657-005		536657-006	
	Field Id:	VGWUO40-11 (2')		VGWUO40-11 (4')		VGWUO40-10 (2')		VGWUO40-10 (4')		VGWUO40-10 (7')		VGWUO40-10 (70')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-16-16 15:48		Sep-16-16 15:48		Sep-16-16 15:48		Sep-16-16 15:48		Sep-22-16 09:00		Sep-30-16 09:00	
	Analyzed:	Sep-16-16 21:56		Sep-16-16 22:04		Sep-16-16 22:27		Sep-16-16 22:35		Sep-22-16 18:09		Sep-30-16 12:57	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		44.2	10.0	ND	10.0	1980	10.0	428	10.0	259	10.0	920	5.00

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

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 536657

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Tue Sep-13-16 10:05 am

Report Date: 30-SEP-16

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536657-007		536657-008		536657-009		536657-010		536657-011		536657-012	
	Field Id:	VGWUO40-14 (2')		VGWUO40-14 (4')		VGWUO40-15 (2')		VGWUO40-15 (4')		VGWUO40-13 (2')		VGWUO40-13 (4')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05		Sep-12-16 10:05	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-16-16 15:48		Sep-16-16 15:48		Sep-16-16 15:48		Sep-16-16 15:48		Sep-16-16 15:48		Sep-16-16 15:48	
	Analyzed:	Sep-16-16 22:43		Sep-16-16 22:51		Sep-16-16 22:58		Sep-16-16 23:06		Sep-16-16 23:30		Sep-16-16 23:37	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		87.0	10.0	101	10.0	ND	10.0	ND	10.0	753	10.0	714	10.0

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

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 536657

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Tue Sep-13-16 10:05 am

Report Date: 30-SEP-16

Project Manager: Kelsey Brooks

Analysis Requested								
	Lab Id:	536657-013						
	Field Id:	VGWUO40-13 (10')						
	Depth:							
	Matrix:	SOIL						
	Sampled:	Sep-12-16 10:05						
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-22-16 09:00						
	Analyzed:	Sep-22-16 18:16						
	Units/RL:	mg/kg	RL					
Chloride		10.1	10.0					

Kelsey Brooks
Project Manager

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

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	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	

BS / BSD Recoveries

Project Name: HES Transfer

Work Order #: 536657 **Project ID:**

Analyst: MNR **Date Prepared:** 09/16/2016 **Date Analyzed:** 09/16/2016

Lab Batch ID: 3000202 **Sample:** 713850-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	275	110	250	274	110	0	90-110	20	

Analyst: MNR **Date Prepared:** 09/22/2016 **Date Analyzed:** 09/22/2016

Lab Batch ID: 3000568 **Sample:** 714063-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	244	98	250	238	95	2	90-110	20	

Analyst: MNR **Date Prepared:** 09/30/2016 **Date Analyzed:** 09/30/2016

Lab Batch ID: 3001120 **Sample:** 714399-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	233	93	250	234	94	0	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order # : 536657 **Project ID:**

Lab Batch ID: 3000202 **QC- Sample ID:** 536602-003 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/16/2016 **Date Prepared:** 09/16/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	2350	1250	3640	103	1250	3630	102	0	90-110	20	

Lab Batch ID: 3000202 **QC- Sample ID:** 536657-010 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/16/2016 **Date Prepared:** 09/16/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	278	111	250	279	112	0	90-110	20	X

Lab Batch ID: 3000568 **QC- Sample ID:** 536919-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/22/2016 **Date Prepared:** 09/22/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	41.8	250	299	103	250	292	100	2	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order # : 536657 **Project ID:**

Lab Batch ID: 3000568 **QC- Sample ID:** 537017-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/22/2016 **Date Prepared:** 09/22/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1900	1250	3070	94	1250	3040	91	1	90-110	20	

Lab Batch ID: 3001120 **QC- Sample ID:** 536657-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/30/2016 **Date Prepared:** 09/30/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	920	250	1160	96	250	1150	92	1	90-110	20	

Lab Batch ID: 3001120 **QC- Sample ID:** 537439-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/30/2016 **Date Prepared:** 09/30/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	4120	2500	6760	106	2500	6650	101	2	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order # 5361657

Send Results to:

Contact & Company Name: Arcadis; Jonathan Olsen
Telephone: 7139534874
Address: 2929 Briarpark Dr Suite 300
Fax:
City: Houston State: TX Zip: 77042
E-mail Address: Jonathan.Olsen@arcadis.com
Project Name/Location (City, State): Lovington, NM (HES)
Project #:
Sampler's Printed Name: Melisa Phan
Sampler's Signature:

Preservative	E							
Filtered (✓)	NA							
# of Containers	1							
Container Information	7							

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: _____

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Chloride	REMARKS
VGWU040-11(2')	9/12/16	1005		X		X	
VGWU040-11(4')	9/12/16	1007		X		X	
VGWU040-10(2')	9/12/16	1050		X		X	
VGWU040-10(4')	9/12/16	1053		X		X	
VGWU040-10(7')	9/12/16	1109		X		X	HOLD
VGWU040-10(70')	9/12/16	1300		X		X	HOLD
VGWU040-14(2')	9/12/16	1345		X		X	
VGWU040-14(4')	9/12/16	1350		X		X	
VGWU040-15(2')	9/12/16	1415		X		X	
VGWU040-15(4')	9/12/16	1417		X		X	
VGWU040-13(2')	9/12/16	1500		X		X	
VGWU040-13(4')	9/12/16	1503		X		X	
VGWU040-13(10')	9/12/16	1518		X		X	HOLD

Special Instructions/Comments:
Standard TAT

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name: Melisa Phan	Printed Name: K Butler	Printed Name:	Printed Name:
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature: K Butler	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: Arcadis	Firm/Courier: MS	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: 8°	Date/Time: 9/12/16 1630	Date/Time: 9/12/16 1635	Date/Time:	Date/Time:

20730826 CofC AR Form 08.27.2015

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

Part # 156148-434 RRD 04/16
41 MAFA
79701
TX-US LBB
TRK# 6606 3912 4785
0201
TUE - 13 SEP 3:00P
STANDARD OVERNIGHT
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Express
MIDLAND TX 79701
(432) 563-1800
REF:
DEPT:
INV:
PO:
XENCO LABORATORIES
XENCO LABORATORIES
1211 W FLORIDA AVE
TO
HOBBS, NM 88240
UNITED STATES US
ORIGIN ID:HOBA (575) 392-7550
MRIL SERVICES ETC, LLC
4008 N GRIMES
BILL RECIPIENT
SHIP DATE: 12SEP16
ACTWGT: 12.0 LB MAN
CAD: 0909328/CAFE2915
DIMS: 14x11x9 IN
538C1/0853/3298

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Arcadis - Houston

Date/ Time Received: 09/13/2016 10:05:00 AM

Work Order #: 536657

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)?	
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seal present on shipping container/ cooler?	**Yes**
#5 *Custody Seals intact on shipping container/ cooler?	**Yes**
#6 Custody Seals intact on sample bottles?	**Yes**
#7 *Custody Seals Signed and dated?	**Yes**
#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 (less than 1/4 inch bubble)?	**N/A**
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst: PH Device/Lot#:

Checklist completed by: Jessica Kramer Date: 09/13/2016

Jessica Kramer

Checklist reviewed by: Kelsey Brooks Date: 09/13/2016

Kelsey Brooks

Analytical Report 536864

for

Arcadis - Houston

Project Manager: Jonathan Olsen

HES Transfer

11-OCT-16

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

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

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

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11-OCT-16

Project Manager: **Jonathan Olsen**
Arcadis - Houston
2929 Briarpark Dr., Ste 300
Houston, TX 77042

Reference: XENCO Report No(s): **536864**
HES Transfer
Project Address: Lovington 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) 536864. 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. 536864 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

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

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 536864

Arcadis - Houston, Houston, TX

HES Transfer

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUO40-12 (2')	S	09-13-16 08:50		536864-001
VGWUO40-12 (4')	S	09-13-16 08:55		536864-002
VGWUO40-17 (2')	S	09-13-16 10:30		536864-003
VGWUO40-17 (4')	S	09-13-16 10:34		536864-004
VGWUO40-16 (2')	S	09-13-16 09:58		536864-005
VGWUO40-16 (4')	S	09-13-16 10:00		536864-006
VGWUO40-16 (50')	S	09-13-16 10:48		536864-007
VGWUO40-19 (2')	S	09-13-16 11:46		536864-008
VGWUO40-19 (4')	S	09-13-16 11:50		536864-009
VGWUO40-18 (2')	S	09-13-16 12:14		536864-010
VGWUO40-18 (4')	S	09-13-16 12:16		536864-011
VGWUO40-18 (70')	S	09-13-16 13:23		536864-012
VGWU85-06 (2')	S	09-13-16 14:41		536864-013
VGWU85-06 (4')	S	09-13-16 14:42		536864-014
VGWU85-06 (10')	S	09-13-16 14:44		536864-016
VGWU85-06 (50')	S	09-13-16 15:27		536864-017
VGWU85-11 (2')	S	09-13-16 16:00		536864-018
VGWU85-11 (4')	S	09-13-16 16:01		536864-019
VGWUSAT3-03 (4')	S	09-14-16 09:49		536864-023
VGWUSAT3-03 (40')	S	09-14-16 10:40		536864-024
VGWUSAT3-05 (4')	S	09-14-16 11:11		536864-025
VGWUSAT3-05 (40')	S	09-14-16 11:55		536864-026
VGWU118-15 (2')	S	09-14-16 14:00		536864-027
VGWU118-15 (4')	S	09-14-16 14:01		536864-028
VGWU118-18 (2')	S	09-14-16 14:30		536864-031
VGWU118-18 (4')	S	09-14-16 14:31		536864-032
VGWU118-18 (7')	S	09-14-16 14:32		536864-033
VGWU118-18 (10')	S	09-14-16 14:33		536864-034
VGWU85-06 (7')	S	09-13-16 14:43		Not Analyzed
VGWU85-11 (7')	S	09-13-16 16:02		Not Analyzed
VGWU85-11 (10')	S	09-13-16 16:05		Not Analyzed
VGWU85-11 (11')	S	09-13-16 16:21		Not Analyzed
VGWU118-15 (7')	S	09-14-16 14:02		Not Analyzed
VGWU118-15 (10')	S	09-14-16 14:03		Not Analyzed

CASE NARRATIVE

Client Name: Arcadis - Houston
Project Name: HES Transfer

Project ID:
Work Order Number(s): *536864*

Report Date: *11-OCT-16*
Date Received: *09/15/2016*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:
Contact: Jonathan Olsen
Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am
Report Date: 11-OCT-16
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536864-001		536864-002		536864-003		536864-004		536864-005		536864-006	
	Field Id:	VGWUO40-12 (2')		VGWUO40-12 (4')		VGWUO40-17 (2')		VGWUO40-17 (4')		VGWUO40-16 (2')		VGWUO40-16 (4')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-13-16 08:50		Sep-13-16 08:55		Sep-13-16 10:30		Sep-13-16 10:34		Sep-13-16 09:58		Sep-13-16 10:00	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-20-16 08:00		Sep-20-16 08:00		Sep-20-16 08:00		Sep-20-16 08:00		Sep-20-16 08:00		Sep-20-16 08:00	
	Analyzed:	Sep-20-16 14:44		Sep-20-16 14:51		Sep-20-16 14:59		Sep-20-16 15:07		Sep-20-16 15:15		Sep-20-16 15:23	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		86.6	10.0	54.0	10.0	52.8	10.0	34.8	10.0	329	10.0	881	10.0

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Kelsey Brooks
Project Manager

Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536864-007		536864-008		536864-009		536864-010		536864-011		536864-012	
	Field Id:	VGWUO40-16 (50')		VGWUO40-19 (2')		VGWUO40-19 (4')		VGWUO40-18 (2')		VGWUO40-18 (4')		VGWUO40-18 (70')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-13-16 10:48		Sep-13-16 11:46		Sep-13-16 11:50		Sep-13-16 12:14		Sep-13-16 12:16		Sep-13-16 13:23	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-30-16 09:00		Sep-21-16 10:00		Sep-21-16 10:00		Sep-21-16 10:00		Sep-21-16 10:00		Sep-30-16 09:00	
	Analyzed:	Sep-30-16 13:18		Sep-21-16 12:10		Sep-21-16 12:33		Sep-21-16 12:41		Sep-21-16 12:49		Sep-30-16 13:26	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		16.4	5.00	54.2	10.0	59.6	10.0	65.3	10.0	318	10.0	142	5.00

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Kelsey Brooks
Project Manager

Final 1.002

Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536864-013		536864-014		536864-016		536864-017		536864-018		536864-019	
	Field Id:	VGWU85-06 (2')		VGWU85-06 (4')		VGWU85-06 (10')		VGWU85-06 (50')		VGWU85-11 (2')		VGWU85-11 (4')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-13-16 14:41		Sep-13-16 14:42		Sep-13-16 14:44		Sep-13-16 15:27		Sep-13-16 16:00		Sep-13-16 16:01	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-21-16 10:00		Sep-21-16 10:00		Sep-30-16 09:00		Oct-10-16 09:35		Sep-21-16 10:00		Sep-21-16 10:00	
	Analyzed:	Sep-21-16 12:57		Sep-21-16 17:46		Sep-30-16 13:47		Oct-10-16 19:19		Sep-21-16 13:28		Sep-21-16 13:36	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		6120	100	2540	50.0	3760	50.0	37.8	5.00	14.0	10.0	31.1	10.0

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:
Contact: Jonathan Olsen
Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am
Report Date: 11-OCT-16
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536864-023		536864-024		536864-025		536864-026		536864-027		536864-028	
	Field Id:	VGWUSAT3-03 (4')		VGWUSAT3-03 (40')		VGWUSAT3-05 (4')		VGWUSAT3-05 (40')		VGWU118-15 (2')		VGWU118-15 (4')	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-14-16 09:49		Sep-14-16 10:40		Sep-14-16 11:11		Sep-14-16 11:55		Sep-14-16 14:00		Sep-14-16 14:01	
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-21-16 10:00		Sep-30-16 09:00		Sep-30-16 09:00		Oct-10-16 09:35		Sep-21-16 10:00		Sep-21-16 10:00	
	Analyzed:	Sep-21-16 13:44		Sep-30-16 13:54		Sep-30-16 14:01		Oct-10-16 19:26		Sep-21-16 13:51		Sep-21-16 13:59	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		454	10.0	12.0	5.00	943	5.00	ND	5.00	18.5	10.0	ND	10.0

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	536864-031		536864-032		536864-033		536864-034					
	Field Id:	VGWU118-18 (2')		VGWU118-18 (4')		VGWU118-18 (7')		VGWU118-18 (10')					
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Sep-14-16 14:30		Sep-14-16 14:31		Sep-14-16 14:32		Sep-14-16 14:33					
Inorganic Anions by EPA 300/300.1	***Extracted:***	Sep-21-16 10:00		Sep-21-16 10:00		Sep-30-16 09:00		Oct-10-16 09:35					
	Analyzed:	Sep-21-16 14:23		Sep-21-16 14:46		Sep-30-16 14:08		Oct-10-16 19:33					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		91.4	10.0	355	10.0	307	5.00	41.3	5.00				

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Kelsey Brooks
Project Manager

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

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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	

BS / BSD Recoveries

Project Name: HES Transfer

Work Order #: 536864 **Project ID:**

Analyst: MNR **Date Prepared:** 09/20/2016 **Date Analyzed:** 09/20/2016

Lab Batch ID: 3000344 **Sample:** 713949-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	250	100	250	257	103	3	90-110	20	

Analyst: MNR **Date Prepared:** 09/21/2016 **Date Analyzed:** 09/21/2016

Lab Batch ID: 3000445 **Sample:** 713999-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	246	98	250	250	100	2	90-110	20	

Analyst: MNR **Date Prepared:** 09/30/2016 **Date Analyzed:** 09/30/2016

Lab Batch ID: 3001120 **Sample:** 714399-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	233	93	250	234	94	0	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

BS / BSD Recoveries

Project Name: HES Transfer

Work Order #: 536864 **Project ID:**

Analyst: MNR **Date Prepared:** 10/10/2016 **Date Analyzed:** 10/10/2016

Lab Batch ID: 3001741 **Sample:** 714723-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	250	100	250	262	105	5	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order # : 536864 **Project ID:**

Lab Batch ID: 3000344 **QC- Sample ID:** 536602-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/20/2016 **Date Prepared:** 09/20/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	2780	1250	4000	98	1250	4030	100	1	90-110	20	

Lab Batch ID: 3000344 **QC- Sample ID:** 536660-002 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/20/2016 **Date Prepared:** 09/20/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1970	1250	3230	101	1250	3210	99	1	90-110	20	

Lab Batch ID: 3000445 **QC- Sample ID:** 536864-008 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/21/2016 **Date Prepared:** 09/21/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	54.2	250	298	98	250	294	96	1	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order # : 536864 **Project ID:**

Lab Batch ID: 3000445 **QC- Sample ID:** 536864-028 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/21/2016 **Date Prepared:** 09/21/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	250	100	250	244	98	2	90-110	20	

Lab Batch ID: 3001120 **QC- Sample ID:** 536657-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/30/2016 **Date Prepared:** 09/30/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	920	250	1160	96	250	1150	92	1	90-110	20	

Lab Batch ID: 3001120 **QC- Sample ID:** 537439-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 09/30/2016 **Date Prepared:** 09/30/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	4120	2500	6760	106	2500	6650	101	2	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order # : 536864 **Project ID:**

Lab Batch ID: 3001741 **QC- Sample ID:** 538189-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/10/2016 **Date Prepared:** 10/10/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1720	250	1980	104	250	1970	100	1	90-110	20	

Lab Batch ID: 3001741 **QC- Sample ID:** 538316-006 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 10/10/2016 **Date Prepared:** 10/10/2016 **Analyst:** MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	258	250	501	97	250	493	94	2	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

HES transfer sites
Chevron PM Rob Spear

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 3

Lab Work Order # 53698G4

Send Results to:

Contact & Company Name: Jonathan Olsen Arcadis	Telephone: 713.953.4874
Address: 2929 Briarpark Dr Suite 300	Fax:
City: Houston State: TX Zip: 77042	E-mail Address: Jonathan.Olsen@arcadis.com
Project Name/Location (City, State): Lovington, NM (HES)	Project #:
Sampler's Printed Name: Melisa Phan	Sampler's Signature:

Preservative	E
Filtered (✓)	NA
# of Containers	1
Container Information	7

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: _____

PARAMETER ANALYSIS & METHOD

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Chloride	REMARKS
VGWU040-12(2')	9/13/16	850		X	SO	X	
VGWU040-12(4')	9/13/16	855		X	SO	X	
VGWU040-17(2')	9/13/16	1030		X	SO	X	
VGWU040-17(4')	9/13/16	1034		X	SO	X	
VGWU040-16(2')	9/13/16	958		X	SO	X	
VGWU040-16(4')	9/13/16	1000		X	SO	X	
VGWU040-16(58')	9/13/16	1048		X	SO	X	HOLD
VGWU040-19(2')	9/13/16	1146		X	SO	X	
VGWU040-19(4')	9/13/16	1150		X	SO	X	
VGWU040-18(2')	9/13/16	1214		X	SO	X	
VGWU040-18(4')	9/13/16	1216		X	SO	X	
VGWU040-18(70')	9/13/16	1323		X	SO	X	HOLD
~~VGWU040-85'~~ (4)							
VGWU85-06(2')	9/13/16	1441		X	SO	X	

Special Instructions/Comments:
Standard TAT

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name: Melisa Phan	Printed Name: Desiree Cossio	Printed Name:	Printed Name: J KRAMER
☒ Cooler packed with ice (✓)	☒ Intact ☐ Not Intact	Signature:	Signature: Desiree Cossio	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: Arcadis	Firm/Courier: MS.	Firm/Courier:	Firm: Xenco
Shipping Tracking #:	Condition/Cooler Temp: 12 °C	Date/Time: 9/14/16 1600	Date/Time: 9/14/16 4:00 pm	Date/Time:	Date/Time: 9.15.16 1130

20730826 CofC AR Form 08.27.2015

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

Received 6.3°C

Chevron PM - Rob Speer
HES Transfer Sites

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 2 of 3

Lab Work Order # 536864

Send Results to:

Contact & Company Name: Jonathan Olsen Arcadis
Address: 2929 Briarpark Dr Suite 300
City: Houston State: TX Zip: 77092
Telephone: 713.953.4874
Fax:
E-mail Address: Jonathan.Olsen@arcadis.com
Project Name/Location (City, State): Lovington, NM (HES)
Project #:
Sampler's Printed Name: Melisa Pham
Sampler's Signature:

Preservative	~~E/C~~
Filtered (Y)	NA
# of Containers	1
Container Information	7

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

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Chloride	REMARKS
VGWU85-06(4')	9/13/16	1442		X	SO	X	
VGWU85-06(7')	9/13/16	1443		X	SO	X	HOLD
VGWU85-06(10')	9/13/16	1444		X	SO	X	HOLD
VGWU85-06(50')	9/13/16	1527		X	SO	X	HOLD
VGWU85-11(2')	9/13/16	1600		X	SO	X	~~HOLD~~
VGWU85-11(4')	9/13/16	1601		X	SO	X	
VGWU85-11(7')	9/13/16	1602		X	SO	X	HOLD
VGWU85-11(18')	9/13/16	1605		X	SO	X	HOLD
VGWU85-11(40)	9/13/16	1621		X	SO	X	HOLD
VGWUSAT3-03(4')	9/14/16	949		X	SO	X	
VGWUSAT3-03(40')	9/14/16	1040		X	SO	X	HOLD
VGWUSAT3-05(4')	9/14/16	1111		X	SO	X	HOLD
VGWUSAT3-05(40')	9/14/16	1155		X	SO	X	HOLD
VGWU118-15(2')	9/14/16	~~1300~~ 1400		X	SO	X	

Special Instructions/Comments: Standard TAT

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name: Melisa Pham	Printed Name: Dessirae Coon	Printed Name:	Printed Name: KRAMER
X Cooler packed with ice (✓)	X Intact ☐ Not Intact	Signature:	Signature: Dessirae Coon	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: Arcadis	Firm/Courier: MS	Firm/Courier:	Firm: Xenco
Shipping Tracking #:	Condition/Cooler Temp: 12 C	Date/Time: 9/14/16 1600	Date/Time: 9/14/16 4:00pm	Date/Time:	Date/Time: 9/15/16 1138

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6.0 C

HES Transfer Sites
Chevron PM Rob Speer

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 3 of 3

Lab Work Order # 536086

Send Results to:

Contact & Company Name: Jonathan Olsen Arcadis
Address: 2929 Briarpark Dr Suite 300
City: Houston State: TX Zip: 77042
Telephone: 713_953.4874
Fax:
E-mail Address: Jonathan.Olsen@arcadis.com
Project Name/Location (City, State): (HES) Lovington, NM
Project #:
Sampler's Printed Name: Melisa Phan
Sampler's Signature:

Preservative	E							
Filtered (✓)	NA							
# of Containers	1							
Container Information	7							

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: _____

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	PARAMETER ANALYSIS & METHOD: Chloride	REMARKS
VGWM118-15(4')	9/14/16	1401					
VGWM118-15(7')	9/14/16	1402					HOLD
VGWM118-15(10')	9/14/16	1403					HOLD
VGWM118-18(2')	9/14/16	1430					
VGWM118-18(4')	9/14/16	1431					
VGWM118-18(7')	9/14/16	1432					HOLD
VGWM118-18(10')	9/14/16	1433					HOLD

Special Instructions/Comments:

Standard TAT

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name: Melisa Phan	Printed Name: Dessirae Cobos	Printed Name:	Printed Name: [illegible]
☒ Cooler packed with ice (✓)	☒ Intact ☐ Not Intact	Signature: [signature]	Signature: Dessirae Cobos	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: Arcadis	Firm/Courier: MS.	Firm/Courier:	Firm: Xenco
Shipping Tracking #:	Condition/Cooler Temp: 12°C	Date/Time: 9/14/16 1600	Date/Time: 9/14/16 4:00pm	Date/Time:	Date/Time: 9.15.16 1130

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

6.0-3°C

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: Arcadis - Houston

Date/ Time Received: 09/15/2016 11:30:00 AM

Work Order #: 536864

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)?	6.3
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seal present on shipping container/ cooler?	**Yes**
#5 *Custody Seals intact on shipping container/ cooler?	**Yes**
#6 Custody Seals intact on sample bottles?	**Yes**
#7 *Custody Seals Signed and dated?	**Yes**
#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 (less than 1/4 inch bubble)?	**N/A**
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	**N/A**
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	**N/A**

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

Analyst:

PH Device/Lot#:

Checklist completed by: Jessica Kramer
Jessica Kramer
Date: 09/15/2016

Checklist reviewed by: Kelsey Brooks
Kelsey Brooks
Date: 09/16/2016

Analytical Report 570585

for

Arcadis - Houston

Project Manager: Jonathan Olsen

HES Transfer Sites

Boo48611.1701.00002

16-DEC-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

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

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

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

16-DEC-17

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

Reference: XENCO Report No(s): **570585**
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) 570585. 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. 570585 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,

Mike Kimmel
Client Services Manager

Sample Cross Reference 570585

Arcadis - Houston, Houston, TX

HES Transfer Sites

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Dup-1 (120717)	W	12-07-17 00:00		570585-001
Equipment Blank (120717)	W	12-07-17 10:38		570585-002
VGWU040-MW-1 (120717)	W	12-07-17 11:28		570585-003

CASE NARRATIVE

Client Name: Arcadis - Houston

Project Name: HES Transfer Sites

Project ID: *Boo48611.1701.00002*
Work Order Number(s): *570585*

Report Date: *16-DEC-17*
Date Received: *12/07/2017*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Certificate of Analysis Summary 570585

Arcadis - Houston, Houston, TX

Project Name: HES Transfer Sites

Project Id: Boo48611.1701.00002
Contact: Jonathan Olsen
Project Location: Buckeye, NM

Date Received in Lab: Thu Dec-07-17 02:21 pm
Report Date: 16-DEC-17
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	570585-001		570585-002		570585-003					
	Field Id:	Dup-1 (120717)		Equipment Blank (120717)		VGWU040-MW-1 (120717)					
	Depth:										
	Matrix:	WATER		WATER		WATER					
	Sampled:	Dec-07-17 00:00		Dec-07-17 10:38		Dec-07-17 11:28					
Chloride by EPA 300	***Extracted:***	Dec-08-17 15:30		Dec-08-17 15:30		Dec-08-17 15:30					
	Analyzed:	Dec-08-17 23:49		Dec-08-17 23:55		Dec-09-17 00:13					
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL				
Chloride		459	5.00	ND	0.500	470	5.00				

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

Mike Kimmel
Client Services Manager

Final 1.000

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

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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	

BS / BSD Recoveries

Project Name: HES Transfer Sites

Work Order #: 570585 **Project ID:** Boo48611.1701.00002

Analyst: MNV **Date Prepared:** 12/08/2017 **Date Analyzed:** 12/08/2017

Lab Batch ID: 3035553 **Sample:** 7635708-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<0.500	20.0	19.1	96	20.0	19.2	96	1	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Form 3 - MS / MSD Recoveries

Project Name: HES Transfer Sites

Work Order # : 570585 **Project ID:** Boo48611.1701.00002

Lab Batch ID: 3035553 **QC- Sample ID:** 570535-001 S **Batch #:** 1 **Matrix:** Drinking Water

Date Analyzed: 12/08/2017 **Date Prepared:** 12/08/2017 **Analyst:** MNV

Reporting Units: mg/L

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by EPA 300 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	5.57	25.0	31.2	103	25.0	31.7	105	2	90-110	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order # 570585

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 #: B0048611.1701.00002
Sampler's Printed Name: Ryan Nanny
Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Chloride
Dup-1 (120717)	12-7-17	—		✓	W	1
Equipment Blank (120717)	12-7-17	1038		✓	W	1
VGWU040-MW-1 (120717)	12-7-17	1128		✓	W	1

Preservative	E
Filtered (✓)	NA
# of Containers	3
Container Information	3

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

Jars of Dirt already had water in them! -Mail Servs KJ

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Temp: 3.5 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 3.3

Laboratory Information and Receipt

Lab Name: Xenco
☒ Cooler packed with ice (✓)
Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact
Specify Turnaround Requirements: 5-day TAT
Shipping Tracking #:
Sample Receipt:
Condition/Cooler Temp: 0.7

Relinquished By	Received By		Laboratory Received By
Printed Name: Ryan Nanny	Printed Name: Karina Jimenez	Printed Name: Karina Jimenez	Printed Name: Bill Rahmann
Signature:	Signature:	Signature:	Signature: Bill Rah
Firm: Arcadis	Firm/Courier: MS	Firm/Courier: MS	Firm: Xenco
Date/Time: 12-7-17 / 1603	Date/Time: 12-7-17 / 4:03	Date/Time: 12-7-17 / 4:26	Date/Time: 12-8-17 11:15

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: 12/07/2017 02:21:00 PM

Work Order #: 570585

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)?	3.3
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**No**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**No**
#18 Water VOC samples have zero headspace?	**N/A**

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

Analyst: ch

PH Device/Lot#: 213315

Checklist completed by: Connie Hernandez Date: 12/08/2017

Checklist reviewed by: Mike Kimmel Date: 12/16/2017

Certificate of Analysis Summary 594037

ARCADIS, Midland, TX

Project Name: VGWU040

Project Id: B0048611.1701
Contact: Brett Krehbiel
Project Location: Hobbs, NM

Date Received in Lab: Fri Jul-27-18 04:40 pm
Report Date: 01-AUG-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	594037-001		594037-002									
	Field Id:	Dup-1(072618)		VGWU040-MW1(072618)									
	Depth:												
	Matrix:	WATER		WATER									
	Sampled:	Jul-26-18 00:00		Jul-26-18 17:03									
Chloride by EPA 300	***Extracted:***	Jul-31-18 14:00		Jul-31-18 14:00									
	Analyzed:	Jul-31-18 18:31		Jul-31-18 18:44									
	Units/RL:	mg/L	RL	mg/L	RL								
Chloride		526	125	556	125								

Kelsey Brooks
Project Manager

Final 1.000

Analytical Report 594037

for

ARCADIS

Project Manager: Brett Krehbiel

VGWU040

B0048611.1701

01-AUG-18

Collected By: Client

6701 Aberdeen, Suite 9 Lubbock, TX 79424

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-26), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-17-16), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab Code: TX00158): Texas (T104704400-18-15)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

01-AUG-18

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

Reference: XENCO Report No(s): **594037**
VGWU040
Project Address: Hobbs, 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) 594037. 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. 594037 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

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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

Sample Cross Reference 594037

ARCADIS, Midland, TX

VGWU040

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
Dup-1(072618)	W	07-26-18 00:00		594037-001
VGWU040-MW1(072618)	W	07-26-18 17:03		594037-002

CASE NARRATIVE

Client Name: ARCADIS

Project Name: VGWU040

Project ID: *B0048611.1701*
Work Order Number(s): *594037*

Report Date: *01-AUG-18*
Date Received: *07/27/2018*

This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory.

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 594037

ARCADIS, Midland, TX

VGWU040

Sample Id: **Dup-1(072618)**
Lab Sample Id: 594037-001
Matrix: Water
Date Collected: 07.26.18 00.00
Date Received: 07.27.18 16.40

Analytical Method: Chloride by EPA 300
Tech: RNL
Analyst: RNL
Seq Number: 3058427
Date Prep: 07.31.18 14.00
Prep Method: E300P
% Moisture:

Parameter	Cas Number	Result	RL	MDL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**526**	125	17.3	mg/L	07.31.18 18.31		50

Certificate of Analytical Results 594037

ARCADIS, Midland, TX

VGWU040

Sample Id: **VGWU040-MW1(072618)** Matrix: Water Date Received:07.27.18 16.40

Lab Sample Id: 594037-002 Date Collected: 07.26.18 17.03

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: RNL % Moisture:

Analyst: RNL Date Prep: 07.31.18 14.00

Seq Number: 3058427

Parameter	Cas Number	Result	RL	MDL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**556**	125	17.3	mg/L	07.31.18 18.44		50

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 594037

ARCADIS

VGWU040

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3058427 Matrix: Water Date Prep: 07.31.18
MB Sample Id: 7659486-1-BLK LCS Sample Id: 7659486-1-BKS LCSD Sample Id: 7659486-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.347	25.0	26.1	104	26.0	104	90-110	0	20	mg/L	07.31.18 16:02	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3058427 Matrix: Waste Water Date Prep: 07.31.18
Parent Sample Id: 593949-001 MS Sample Id: 593949-001 S MSD Sample Id: 593949-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	471	1250	1830	109	1810	107	80-120	1	20	mg/L	07.31.18 16:52	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3058427 Matrix: Water Date Prep: 07.31.18
Parent Sample Id: 593985-001 MS Sample Id: 593985-001 S MSD Sample Id: 593985-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	130	250	417	115	411	112	80-120	1	20	mg/L	07.31.18 19:33	

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 2

Lab Work Order # 594037

Send Results to:

Contact & Company Name: Brett Krabbiel / Arcadis
Telephone: 916-786-5382
Address: 1004 N. Big Spring St., Suite 300
Fax: NA
City: Midland State: TX Zip: 79701
E-mail Address: Brett.Krabbiel@arcadis.com
Project Name/Location (City, State): VGWU040 / Hobbs, NM
Project #: B004811.1701
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	PARAMETER ANALYSIS & METHOD: Chlorides
						E	—	2	3	
001 Dup-1(072618)	7-26-18	—		✓	W			1		1
002 VGWU040-mw1(072618)	7-26-18	1703		✓	W			1		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: _____

REMARKS

Special Instructions/Comments: * VGWU040 Trunk Line *

☐ Special QA/QC Instructions(✓):

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: BRENDA WARD	Printed Name:	Printed Name:
☑ Cooler packed with ice (✓)		Signature:	Signature: Brenda Ward	Signature:	Signature:
Specify Turnaround Requirements: Standard	Sample Receipt:	Firm: Arcadis	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: 2.8	Date/Time: 7-27-18 / 1620	Date/Time: 7/27/18 16:20	Date/Time:	Date/Time:

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XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: ARCADIS

Date/ Time Received: 07/27/2018 04:40:00 PM

Work Order #: 594037

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

Temperature Measuring device used : IR3

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2.8
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**No**
#18 Water VOC samples have zero headspace?	**N/A**

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

Analyst: asd

PH Device/Lot#: 208515

Checklist completed by: Ashley Derstine Date: 07/31/2018

Checklist reviewed by: Kelsey Brooks Date: 08/01/2018

Certificate of Analysis Summary 603762

Arcadis - Roseville, CA, Roseville, CA

Project Name: VGWU O-40 Truckline

Project Id: B0048616.0040
Contact: Brett Krehbiel
Project Location: Lea County, NM

Date Received in Lab: Sat Oct-27-18 09:00 am
Report Date: 31-OCT-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	603762-001		603762-002									
	Field Id:	VGWUO40-MW1		Dup-1									
	Depth:												
	Matrix:	WATER		WATER									
	Sampled:	Oct-25-18 14:15		Oct-25-18 00:00									
Chloride by EPA 300	***Extracted:***	Oct-29-18 15:00		Oct-29-18 15:00									
	Analyzed:	Oct-29-18 19:40		Oct-29-18 19:45									
	Units/RL:	mg/L	RL	mg/L	RL								
Chloride		630	5.00	628	5.00								

Kelsey Brooks
Project Manager

Analytical Report 603762

for

Arcadis - Roseville, CA

Project Manager: Brett Krehbiel

VGWU O-40 Truckline

B0048616.0040

31-OCT-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

31-OCT-18

Project Manager: **Brett Krehbiel**
Arcadis - Roseville, CA
101 Creekside Ridge
CT 200
Roseville, CA 95678

Reference: XENCO Report No(s): **603762**
VGWU O-40 Truckline
Project Address: Lea County, NM

Brett Krehbiel:

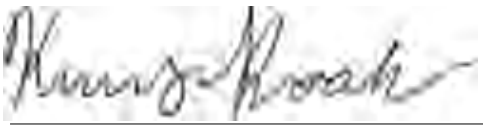
We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 603762. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory 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. 603762 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

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Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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

Sample Cross Reference 603762

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUO40-MW1	W	10-25-18 14:15		603762-001
Dup-1	W	10-25-18 00:00		603762-002

CASE NARRATIVE

Client Name: Arcadis - Roseville, CA
Project Name: VGWU O-40 Truckline

Project ID: *B0048616.0040*
Work Order Number(s): *603762*

Report Date: *31-OCT-18*
Date Received: *10/27/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 603762

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**VGWUO40-MW1**	Matrix:	Water	Date Received:	10.27.18 09.00
Lab Sample Id:	603762-001	Date Collected:	10.25.18 14.15		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	SCM	Date Prep:	10.29.18 15.00		
Seq Number:	3067928				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**630**	5.00	mg/L	10.29.18 19.40		10

Certificate of Analytical Results 603762

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**Dup-1**	Matrix:	Water	Date Received:	10.27.18 09.00
Lab Sample Id:	603762-002	Date Collected:	10.25.18 00.00		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	SCM	Date Prep:	10.29.18 15.00		
Seq Number:	3067928				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**628**	5.00	mg/L	10.29.18 19.45		10

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 603762

Arcadis - Roseville, CA

VGWU O-40 Truckline

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3067928 Matrix: Water Date Prep: 10.29.18
MB Sample Id: 7665067-1-BLK LCS Sample Id: 7665067-1-BKS LCSD Sample Id: 7665067-1-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	25.4	102	90-110	0	20	mg/L	10.29.18 16:37	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3067928 Matrix: Water Date Prep: 10.29.18
Parent Sample Id: 603729-001 MS Sample Id: 603729-001 S MSD Sample Id: 603729-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	171	125	292	97	298	102	90-110	2	20	mg/L	10.29.18 17:07	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3067928 Matrix: Water Date Prep: 10.29.18
Parent Sample Id: 603732-002 MS Sample Id: 603732-002 S MSD Sample Id: 603732-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	208	125	353	116	340	106	90-110	4	20	mg/L	10.29.18 18:44	X

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 #: 600376 2

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 O-40 Trunkline, Lea County, NM

Project #: B0048616.0040

Sampler's Printed Name: RAPHAEL FRANCO

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		2	3	
VGWUO40-MW1	10/25/18	1415	W	X	W					X
Dup-1	10/25/18	/	W	X	W					X

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	Cooler Custody Seal (✓)	Printed Name: RAPHAEL FRANCO	Printed Name: Esperanza Gonzalez	Printed Name: Esperanza Gonzalez	Printed Name: Brianna Teel
☒ Cooler packed with ice (✓)	☒ Intact ☐ Not Intact	Signature:	Signature: Espera Gonz	Signature: Espera Gonz	Signature:
Specify Turnaround Requirements: Standard	Sample Receipt:	Firm:	Firm/Courier:	Firm/Courier:	Firm: XENCO
Shipping Tracking #:	Condition/Cooler Temp: 0.8	Date/Time: 10-26-18/0900	Date/Time: 10-26-18 8:39	Date/Time: 10-26-18 11:02	Date/Time: 10/27/18 0900

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 - Roseville, CA

Date/ Time Received: 10/27/2018 09:00:00 AM

Work Order #: 603762

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)?	.8
#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)?	**Yes**
#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: 10/29/2018

Checklist reviewed by: Kelsey Brooks — Date: 10/29/2018

Certificate of Analysis Summary 603763

Arcadis - Roseville, CA, Roseville, CA

Project Name: VGWU O-40 Truckline

Project Id: B0048616.0040
Contact: Brett Krehbiel
Project Location: Lea County, NM

Date Received in Lab: Sat Oct-27-18 09:00 am
Report Date: 30-OCT-18
Project Manager: Kelsey Brooks

Analysis Requested												
	Lab Id:	603763-001		603763-002		603763-003		603763-004		603763-005		
	Field Id:	VGWUO40-20		VGWUO40-21		VGWUO40-22		VGWUO40-23		VGWUO40-24		
	Depth:											
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	Sampled:	Oct-25-18 12:10		Oct-25-18 12:20		Oct-25-18 12:30		Oct-25-18 12:50		Oct-25-18 13:00		
Chloride by EPA 300	***Extracted:***	Oct-29-18 11:30		Oct-29-18 11:30		Oct-29-18 11:30		Oct-29-18 11:30		Oct-29-18 11:30		
	Analyzed:	Oct-29-18 15:38		Oct-29-18 15:43		Oct-29-18 15:55		Oct-29-18 16:01		Oct-29-18 16:06		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	
Chloride		<4.95	4.95	938	4.98	27.5	4.96	972	4.99	<5.01	5.01	

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

Kelsey Brooks
Project Manager

Final 1.000

Analytical Report 603763

for

Arcadis - Roseville, CA

Project Manager: Brett Krehbiel

VGWU O-40 Truckline

B0048616.0040

30-OCT-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

30-OCT-18

Project Manager: **Brett Krehbiel**
Arcadis - Roseville, CA
101 Creekside Ridge
CT 200
Roseville, CA 95678

Reference: XENCO Report No(s): **603763**
VGWU O-40 Truckline
Project Address: Lea County, NM

Brett Krehbiel:

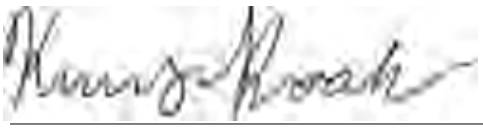
We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 603763. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory 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. 603763 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

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

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

Sample Cross Reference 603763

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUO40-20	S	10-25-18 12:10		603763-001
VGWUO40-21	S	10-25-18 12:20		603763-002
VGWUO40-22	S	10-25-18 12:30		603763-003
VGWUO40-23	S	10-25-18 12:50		603763-004
VGWUO40-24	S	10-25-18 13:00		603763-005

CASE NARRATIVE

Client Name: Arcadis - Roseville, CA
Project Name: VGWU O-40 Truckline

Project ID: *B0048616.0040*
Work Order Number(s): *603763*

Report Date: *30-OCT-18*
Date Received: *10/27/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 603763

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**VGWUO40-20**	Matrix:	Soil	Date Received:	10.27.18 09.00
Lab Sample Id:	603763-001	Date Collected:	10.25.18 12.10		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.29.18 11.30	Basis:	Wet Weight
Seq Number:	3067996				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<4.95	4.95	mg/kg	10.29.18 15.38	U	1

Certificate of Analytical Results 603763

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**VGWUO40-21**	Matrix:	Soil	Date Received:	10.27.18 09.00
Lab Sample Id:	603763-002	Date Collected:	10.25.18 12.20		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.29.18 11.30	Basis:	Wet Weight
Seq Number:	3067996				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**938**	4.98	mg/kg	10.29.18 15.43		1

Certificate of Analytical Results 603763

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**VGWUO40-22**	Matrix:	Soil	Date Received:	10.27.18 09.00
Lab Sample Id:	603763-003	Date Collected:	10.25.18 12.30		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.29.18 11.30	Basis:	Wet Weight
Seq Number:	3067996				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**27.5**	4.96	mg/kg	10.29.18 15.55		1

Certificate of Analytical Results 603763

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**VGWUO40-23**	Matrix:	Soil	Date Received:	10.27.18 09.00
Lab Sample Id:	603763-004	Date Collected:	10.25.18 12.50		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.29.18 11.30	Basis:	Wet Weight
Seq Number:	3067996				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**972**	4.99	mg/kg	10.29.18 16.01		1

Certificate of Analytical Results 603763

Arcadis - Roseville, CA, Roseville, CA

VGWU O-40 Truckline

Sample Id:	**VGWUO40-24**	Matrix:	Soil	Date Received:	10.27.18 09.00
Lab Sample Id:	603763-005	Date Collected:	10.25.18 13.00		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	CHE			% Moisture:	
Analyst:	CHE	Date Prep:	10.29.18 11.30	Basis:	Wet Weight
Seq Number:	3067996				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.01	5.01	mg/kg	10.29.18 16.06	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 603763

Arcadis - Roseville, CA

VGWU O-40 Truckline

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3067996 Matrix: Solid Date Prep: 10.29.18
MB Sample Id: 7665051-1-BLK LCS Sample Id: 7665051-1-BKS LCSD Sample Id: 7665051-1-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	246	98	246	98	90-110	0	20	mg/kg	10.29.18 13:25	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3067996 Matrix: Soil Date Prep: 10.29.18
Parent Sample Id: 603758-002 MS Sample Id: 603758-002 S MSD Sample Id: 603758-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	146	250	403	103	402	102	90-110	0	20	mg/kg	10.29.18 15:06	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3067996 Matrix: Soil Date Prep: 10.29.18
Parent Sample Id: 603767-001 MS Sample Id: 603767-001 S MSD Sample Id: 603767-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	163	248	414	101	421	104	90-110	2	20	mg/kg	10.29.18 13:46	

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

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

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

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

Final 1.000

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order #: 003763

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 O-40 Trunkline, Lea County, NM
Project #: B0048616.0040
Sampler's Printed Name: RAPHAEL FRANCO
Sampler's Signature:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Chloride - USEPA 300.1
Preservative			E			
Filtered (✓)						
# of Containers			5			
Container Information			9			
VGWUO40-20	10-25-18	1210	50	X	SO	X
VGWUO40-21	10/25/18	1220	50	X	SO	X
VGWUO40-22	10/25/18	1230	50	X	SO	X
VGWUO40-23	10/25/18	1250	50	X	SO	X
VGWUO40-24	10/25/18	1300	50	X	SO	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
W - Water
T - Tissue
SE - Sediment
SL - Sludge
A - Air
NL - NAPL/Oil
SW - Sample Wipe
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: RAPHAEL FRANCO	Printed Name: Esperanza Gonzalez	Printed Name: Esperanza Gonzalez	Printed Name: Brianna Teel
☒ Cooler packed with ice (✓)	Signature:	Signature: Esperanza Gonzalez	Signature: Esperanza Gonzalez	Signature:
Cooler Custody Seal (✓): ☒ Intact ☐ Not Intact	Firm:	Firm/Courier:	Firm/Courier:	Firm: Xenco
Specify Turnaround Requirements: Standard	Date/Time: 10-26-18/0900	Date/Time: 10-26-18 4:39	Date/Time: 10-26-18 11:00	Date/Time: 10/27/18 0900
Shipping Tracking #:	Sample Receipt: Condition/Cooler Temp: 0.8			

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 - Roseville, CA

Date/ Time Received: 10/27/2018 09:00:00 AM

Work Order #: 603763

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)?	.8
#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: PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 10/29/2018

Brianna Teel

Checklist reviewed by: Kelsey Brooks Date: 10/29/2018

Kelsey Brooks

ATTACHMENT 3.

Soil Boring Logs and Monitor Well Logs

Date Started/Finished: 6/25/2014

Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-01

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0	1	HV / AR	5	24.5	⊠		SANDY CLAY (Topsoil), Brown (10YR4/2), firm, blocky, subangular, sand is silt to fine grained, poorly sorted, roots in sample, dry.
5	-5	2	AR	5	21.6	⊠		CAPROCK CALICHE, White (2.5Y8/1) to Pale Yellow (2.5Y7/3), indurated, fractured, laminated, dry, siliceous budding.
10	-10	3	AR	5	22.4	⊠		SANDY CALICHE, Very Pale Brown (10YR8/2), soft, very lightly cemented, dry, very fine subrounded, moderately sorted.
15	-15	4	AR	5	16.3	⊠		SANDSTONE, Pink (7.5YR8/3), fine to medium grained, subrounded, moderately sorted, friable to firmly cemented, calcareous. Formation becomes less calcareous with increasing depth.
20	-20	5	AR	5	27.7	⊠		
25	-25	6	AR	5	22.7	⊠		
30	-30				11.2			

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

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Project: B0048616 Template: ChevronSoilBoring.ldfx
Data File: VGWUO40-01 Date: 6/25/2014 Created/Edited by: MC

Date Started/Finished: 10/28/2013
Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-02

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0							
		1	HV / AR	5	13.2	☒		SANDY CLAY, Brown (7.5YR4/2), firm, blocky, subrounded to subangular, silt to fine grained, poorly sorted, roots in sample, dry.
								CAPROCK CALICHE, White (2.5Y8/1) to Pale Yellow (2.5Y7/3), indurated, fractured, laminated, siliceous budding.
5	-5	2	AR	5	13.8	☒		
10	-10	3	AR	5	11.3	☒		SANDY CALICHE, Very Pale Brown (10YR8/2), soft, very lightly cemented, dry, very fine, subrounded, moderately sorted.
15	-15	4	AR	5	16.1	☒		SANDSTONE, Pink (7.5YR8/3), fine grained, subrounded, moderately sorted, calcareous, friable, dry.
20	-20	5	AR	5	12.1	☒		
25	-25	6	AR	5	70.8*	☒		
30	-30				870*			

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac; * - Possible false PID readings due to instrument error.

Project: B0048616 Template: ChevronSoilBoring.ldfx
Data File: VGWUO40-02 Date: 6/25/2014 Created/Edited by: MC

Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-03

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0	1	HV / AR	5	5.7			SANDY CLAY, Brown (7.5YR4/2), firm, blocky, dry, subrounded to subangular, sand is silt to fine grained, poorly sorted.
								CAPROCK CALICHE, White (2.5Y8/1) to Pale Yellow (2.5Y7/3), indurated, fractured, laminated, dry, siliceous budding.
5	-5	2	AR	5	9.6			
10	-10	3	AR	5	11.7			SANDY CALICHE, Very Pale Brown (10YR8/2), firm, dry, very fine to fine grained, subrounded, moderately sorted.
15	-15	4	AR	5	8.6			SANDSTONE, Pink (7.5YR8/3), very fine to medium grained, subangular to subrounded, poorly sorted, dry, firm.
20	-20	5	AR	5	6.3			Same as above, formation became weakly cemented, sand became fine grained, subrounded, moderately sorted.
25	-25	6	AR	5	9.2			Same as above, formation beacme strongly calcareous Pinkish White (7.5Y8/2)
30	-30				14.3			

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx
Data File:VGWUO40-03 Date: 6/26/2014 Created/Edited by: MC

Drilling Contractor: Cascade Drilling

Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 25' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-04

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0	1	HV / AR	5	7.6	⊠		SANDY CLAY, Brown (7.5YR4/2), firm, blocky, subangular, silt to fine grained, poorly sorted, roots in sample, dry.
5	-5	2	AR	5	10.5	⊠		CAPROCK CALICHE, White (2.5Y8/1) to Pale Yellow (2.5Y7/3), indurated, fractured, laminated, dry, siliceous interbedding.
10	-10	3	AR	5	5.9	⊠		SAND, Pink (7.5YR8/3), fine grained, subrounded, well sorted, loose, calcareous, dry.
15	-15	4	AR	5	7.1	⊠		
20	-20	5	AR	5	8.4	⊠		
25	-25	6	AR	5	12.8	⊠		
30	-30				7.6	⊠		

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx
Data File:VGWUO40-04 Date: 6/26/2014 Created/Edited by: MC

Date Start/Finish:

Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary

Sampling Method: Shovel

Borehole Depth: 30' bgs

Descriptions By: R.Nanny

Well/Boring ID: **VGWUO40-05**

Client: Chevron EMC

Location: VGWUO40- Trunk Line from VGWU Battery

Chevron

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0		HV					SANDY CLAY, Brown (10YR4/2), firm, blocky, subrounded to subangular, sand is silt to fine grained, poorly sorted, roots in sample, dry.
		1	AR	5	6.8	X		CAPROCK CALICHE, White (2.5Y8/1) to Light Yellowish Brown (10YR6/4), indurated, fractured, laminated, dry, siliceous bedding.
5	-5	2	AR	5	8.1	X		CALICHE, White (2.5Y8/1), firm, powdery, dry, trace sand, very fine to fine grained, subrounded to subangular, poorly sorted, formation becomes less cemented and sand grains increase in size with increasing depth.
10	-10	3	AR	5	4.8	X		
15	-15	4	AR	5	3.8	X		SANDY CALICHE, Very Pale Brown (10YR8/2), firm, powdery, dry, sand is very fine to fine grained, subrounded, moderately sorted.
20	-20	5	AR	5	8.3	X		
25	-25	6	AR	5	5.8	X		SANDSTONE, Very Pale Brown (10YR8/3), fine grained, subrounded, moderately sorted, firmly cemented, dry, calcareous.
30	-30				5.8			

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Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx

Data File:VGWUO40-05

Date: 6/26/2014

Created/Edited by: MC

Date Started/Finished: 10/28/2013
Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-06

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0	1	HV / AR	5	6.4	⊠		CLAYEY SAND, , Brown (10YR5/3), very fine to fine grained, subrounded to subangular, poorly sorted, dry, friable, trace caliche, White (2.5YR8/1), indurated nodules, 0.3 cm to 0.5 cm, roots in sample. CAPROCK CALICHE, White (2.5Y8/1) to Light Yellowish Brown (10YR6/4), indurated, fractured, laminated, dry, siliceous bedding.
5	-5	2	AR	5	5.7	⊠		CALICHE, White (2.5Y8/1), firm, powdery, dry, trace sand, very fine to fine grained, subrounded to subangular, poorly sorted, formation becomes less cemented and sand grains are increasing in size with increasing depth.
10	-10	3	AR	5	5.8	⊠		
15	-15	4	AR	5	6.0	⊠		SANDY CALICHE, Very Pale Brown (10YR8/2),soft, dry, sand is very fine to fine grained, subrounded, poorly sorted, loose.
20	-20	5	AR	5	4.6	⊠		SANDSTONE, Very Pale Brown (10YR8/3), fine grained, subrounded, moderately sorted, friable to firmly cemented, dry, slightly calcareous.
25	-25	6	AR	5	4.6	⊠		
30	-30				4.0	⊠		Same as above, becoming moderately calcareous at 30' bgs.

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx
Data File:VGWUO40-06 Date: 6/26/2014 Created/Edited by: MC

Date Started/Finished: 10/28/2013

Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-07

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0							
		1	HV / AR	5	4.4	⊠		SANDY CLAY (TOPSOIL), Brown (7.5YR4/2), firm, blocky, dry, sand is silt to fine grained, sub-angular, poorly sorted.
								CAPROCK CALICHE, White (2.5Y8/1) to Light Yellowish Brown (10YR6/4), indurated, fractured, laminated, dry, siliceous bedding.
5	-5	2	AR	5	3.5	⊠		CALICHE, White (2.5Y8/1), firm, powdery, dry, trace sand, very fine to fine grained, subrounded to subangular, poorly sorted, formation becomes less cemented and sand grains are increasing in size and amount with increasing depth.
10	-10	3	AR	5	4.8	⊠		
15	-15	4	AR	5	5.9	⊠		CLAYEY SANDY CALICHE, Pink (7.5YR8/3), firm, dry, slightly powdery, sand is very fine to fine grained, sub-rounded, poorly sorted, trace intergrainular clay, dry, powdery.
20	-20	5	AR	5	2.8	⊠		SANDSTONE, Very Pale Brown (10YR8/3), fine grained, subrounded, moderately sorted, friable to firmly cemented, dry, slightly calcareous at 20' becoming less calcareous at 25'.
25	-25	6	AR	5	3.3	⊠		
30	-30				2.5	⊠		

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx
Data File:VGWUO40-07 Date: 9/23/2014 Created/Edited by: SA

Date Started/Finished: 10/28/2013
Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-08

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0	1	HV AR	5	6.2	☒		CLAYEY SAND (TOPSOIL), Brown (10YR5/3), silt to fine grained, sub-angular, poorly sorted, loose to slightly firm, powdery roots in sample. CAPROCK CALICHE, White (2.5Y8/1) to Light Yellowish Brown (10YR6/4), indurated, fractured, laminated, dry, siliceous bedding.
5	-5	2	AR	5	7.1	☒		CALICHE, White (2.5Y8/1), firm, powdery, dry, trace sand, very fine to fine grained, subangular, poorly sorted.
10	-10	3	AR	5	2.8	☒		
15	-15	4	AR	5	4.9	☒		SANDSTONE, Pink (7.5YR8/4), fine grained, sub-rounded, moderately sorted, weakly cemented, dry.
20	-20	5	AR	5	5.1	☒		SAND, Reddish Yellow (7.5YR7/6), fine grained, moderately sorted, weakly cemented, dry.
25	-25	6	AR	5	5.9	☒		SANDSTONE, Very Pale Brown (10YR8/3), fine grained, sub-rounded, moderately sorted, firmly cemented, dry, calcareous.
30	-30				4.8	☒		

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx
Data File:VGWUO40-08 Date: 9/23/2014 Created/Edited by: SA

Drilling Company: Harrison and Cooper Inc./K Cooper

Drilling Method: Air Rotary
Sampling Method: Shovel

Borehole Depth: 30' bgs
Descriptions By: R.Nanny

Well/Boring ID: VGWUO40-09

Client: Chevron EMC
Location: VGWUO40- Trunk Line from VGWU Battery

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	0	1	HV / AR	5	3.2	⊠		SANDY CLAY (TOPSOIL), Brown (10YR5/3), silt to fine grained, trace medium grains in sample, loose becoming blocky at 0.5' in depth, roots in sample, dry. CAPROCK CALICHE, White (2.5Y8/1) to Light Yellowish Brown (10YR6/4), indurated, fractured, laminated, dry, siliceous bedding.
5	-5	2	AR	5	3.3	⊠		CALICHE, White (2.5Y8/1), vrey firm to indurated, powdery, dry, trace sand, very fine grained, sub-rounded, poorly sorted.
10	-10	3	AR	5	1.8	⊠		CALICHE SAND, Very Pale Brown (10YR8/2), firm grained, sub-rounded, poorly sorted, weakly to slightly firm cementation, dry, strongly calcareous.
15	-15	4	AR	5	1.6	⊠		
20	-20	5	AR	5	2.7	⊠		SANDSTONE, Very Pale Brown (10YR8/3), fine grained, sub-rounded, moderately sorted, firmly cemented, dry, calcareous.
25	-25	6	AR	5	2.1	⊠		
30	-30				3.5	⊠		

Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; HV=Hydrovac

Project: B0048616 Template:ChevronSoilBoring.ldfx
Data File:VGWUO40-09 Date: 9/23/2014 Created/Edited by: SA

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Soil Boring Log

Boring No.: VGWUO40-10

Sheet: 1 of 2

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/12/2016
Date Completed: 09/12/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–35				VGWUO40-10 (2) at 1050 VGWUO40-10 (4) at 1053 VGWUO40-10 (7) at 1109			(0.0-2.0') 50% SILT, nonplastic; 40% sand, fine to medium; 10% gravel, angular to subangular; dry; roots (organic matter); low reaction to HCl; light gray (10YR 7/2). (2.0-10.0') 90% SILT, nonplastic; 5% sand, medium; 5% gravel, subrounded; high reaction to HCl; white (10YR 0/1). At 20.0 ft bgs, 90% SILT, nonplastic; 5% sand, medium; 5% gravel, subrounded; high reaction to HCl; white (10YR 0/1). (30.0-50.0') 90% SAND, very fine to medium; 10% silt, nonplastic; dry; weak to no reaction to HCl; pink (10YR 7/3).	Backfilled with native material	

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2, 4, 7 and 70 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

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Soil Boring Log

Boring No.: VGWUO40-10

Sheet: 2 of 2

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/12/2016
Date Completed: 09/12/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
36–72				VGWUO40-10 (70) at 1300			(60.-70.0') 90% SAND, very fine to medium; 10% silt, nonplastic; moist; weak to no reaction to HCl; yellowish brown (10YR 5/4).	Backfilled with native material	
							End of boring at 70.0 ft bgs.		

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

2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

URGENT BORING LOGS.CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES1\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

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Soil Boring Log

Boring No.: VGWUO40-11

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/12/2016
Date Completed: 09/12/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-2.0') 85% SILT, nonplastic; 15% sand, medium to coarse; dry; high reaction to HCl; light gray (caliche) (10YR 7/2).		
2				VGWUO40-11 (2) at 1005				Backfilled with native material	
3									
4				VGWUO40-11 (4) at 1007			At 4.0 ft bgs, 95% SILT, nonplastic; 5% fine to medium sand; dry; high reaction to HCl; very pale brown (caliche) (10YR 8/2).		
5							End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2 and 4 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES TURGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

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Soil Boring Log

Boring No.: VGWUO40-12

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-4.0') 60% SILT, nonplastic; 40% sand, very fine to medium; dry; weak reaction to HCl; light gray (10YR 7/2).		
2				VGWUO40-12 (2) at 0850				Backfilled with native material	
3									
4				VGWUO40-12 (4) at 0855			End of boring at 4.0 ft bgs.		
5									

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2 and 4 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES1\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

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Soil Boring Log

Boring No.: VGWUO40-13

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/12/2016
Date Completed: 09/12/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-4.0') 60% SILT, nonplastic; 40% sand, very fine to medium; dry; weak reaction to HCl; light gray (Caliche) (10YR 7/2).		
2				VGWUO40-13 (2) at 1500					
3									
4				VGWUO40-13 (4) at 1503					
5								Backfilled with native material	
6									
7									
8									
9									
10				VGWUO40-13 (10) at 1518			At 10 ft bgs, 75% SILT, nonplastic; 15% medium sand, 5% fine sand; 5% gravel, rounded to subrounded; high reaction to HCl; dry; white (10YR 8/1).		
11							End of boring at 10.0 ft bgs.		

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2, 4 and 10 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES TURGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

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Soil Boring Log

Boring No.: VGWUO40-14

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/12/2016
Date Completed: 09/12/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-4.0') 75% SAND, fine to medium; 15% silt, nonplastic; 10% gravel, angular to subangular; well sorted; dry; moderate reaction to HCl; pink (7.5YR 7/3). Note: Secondary color gray (7.5YR 6/1).		
2				VGWUO40-14 (2) at 1345				Backfilled with native material	
3									
4				VGWUO40-14 (4) at 1350					
5							End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2 and 4 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS.CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES1\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-15

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/12/2016
Date Completed: 09/12/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-4.0') 80% SAND, fine to medium; 10% silt, nonplastic; 10% gravel, subangular; well sorted; dry; moderate reaction to HCl; pink (7.5YR 7/3).		
2				VGWUO40-15 (2) at 1415				Backfilled with native material	
3									
4				VGWUO40-15 (4) at 1417			End of boring at 4.0 ft bgs.		
5									

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2 and 4 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

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ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-16

Sheet: 1 of 2

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–25				VGWUO40-16 (2) at 0958			(0.0-4.0') 75% SAND, very fine to medium; 10% silt, nonplastic; 15% gravel, subangular to angular; well sorted; dry; weak to moderate reaction to HCl; pink (7.5YR 7/3).	Backfilled with native material	
				VGWUO40-16 (4) at 1000			(4.0-10.0') 80% SILT, nonplastic; 10% sand, fine to medium; 10% gravel, subrounded to subangular; high reaction to HCl; dry; white (10YR 8/1).		
							At 20.0 ft bgs, 80% SILT, nonplastic; 10% sand, fine to medium; 10% gravel, subrounded to subangular; high reaction to HCl; dry; white (10YR 8/1).		

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2, 4 and 50 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES1\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-16

Sheet: 2 of 2

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
26									
27									
28									
29									
30									
31							(30.0-50.0') 90% SAND, fine to medium; 10% silt, nonplastic; dry; weak reaction to HCl; pink (7.5YR 7/3).		
32									
33									
34									
35									
36									
37									
38								Backfilled with native material	
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50				VGWUO40-16 (50) at 1048					
51							End of boring at 50.0 ft bgs.		

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

2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

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Boring No.: VGWUO40-17

Soil Boring Log

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-4.0') 60% SILT, nonplastic; 40% sand, very fine to medium; dry; weak reaction to HCl; light gray (10YR 7/2).		
2				VGWUO40-17 (2) at 1030				Backfilled with native material	
3									
4				VGWUO40-17 (4) at 1034					
							End of boring at 4.0 ft bgs.		
5									

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2 and 4 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES T\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-18

Sheet: 1 of 2

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–4				VGWUO40-18 (2) at 1214 VGWUO40-18 (4) at 1216			(0.0-4.0') 80% SAND, fine to medium; 10% silt, nonplastic; 10% gravel, subangular to angular; well sorted; dry; weak reaction to HCl; pink (7.5YR 7/3).		
5–20							(4.0-10.0') 75% SILT, nonplastic; 10% sand, very fine to fine; 15% gravel, subrounded; high reaction to HCl; dry; white (10YR 8/1).	Backfilled with native material	
21–30							At 20.0 ft bgs, 75% SILT, nonplastic; 10% sand, very fine to fine; 15% gravel, subrounded; high reaction to HCl; dry; white (10YR 8/1).		
31–35							(30.0-50.0') 85% SAND, fine to medium; 10% silt, nonplastic; 5% gravel, subrounded; dry; weak reaction to HCl; pink (7.5YR 7/3).		

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2, 4 and 70 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

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Soil Boring Log

Boring No.: VGWUO40-18

Sheet: 2 of 2

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
36–70				VGWUO40-18 (70) at 1323			(60.0-70.0') 85% SAND, fine to medium; 10% silt, nonplastic; 5% gravel, subrounded; moist; weak reaction to HCl; yellowish brown (7.5YR 5/4).	Backfilled with native material	
71–72							End of boring at 70.0 ft bgs.		

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

2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

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Soil Boring Log

Boring No.: VGWUO40-19

Sheet: 1 of 1

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 09/13/2016
Date Completed: 09/13/2016
Logger: Melisa Phan
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1							(0.0-4.0') 80% SAND, fine to medium; 10% silt, nonplastic; 10% gravel, subangular; well sorted; dry; weak reaction to HCl; pink (7.5YR 7/3).		
2				VGWUO40-19 (2) at 1146				Backfilled with native material	
3									
4				VGWUO40-19 (4) at 1150			End of boring at 4.0 ft bgs.		
5									

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
2016 borings are generally logged in intervals: 0-10, 20, 30-50, 60-70 ft bgs.

Sampling Method: NA
Sampling Interval: 2 and 4 ft bgs
Water Level Start (ft. bgs.): NA
Water Level Finish (ft. btoc.): NA
Converted to Well: ☐ Yes ☒ No
Surface Elev.: NA
North Coor:
East Coor:

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ARCADIS Design & Consultancy for natural and built assets

Boring No.: VGWUO40-MW-1

Soil Boring Log

Sheet: 1 of 5

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 12/04/2017
Date Completed: 12/04/2017
Logger: R. Nanny
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1–30					0.7		(0.0-0.4') No cuttings available (Hydro-Vac). (0.4-15.0') CAPROCK CALICHE; indurated; fractured; dry; showing trace fine grains, subrounded; poorly sorted and pisolites; white (2.5Y 8/1) laminated with pinkish white (7.5Y 8/2).	7 inch diameter Drilled Hole Well Casing 4 inch diameter Sch.40	
					1.0		(15.0-35.0') SANDY CALICHE, very fine, subrounded; moderately sorted; firm; friable; dry containing little to some; trace caliche nodules, 0.2 to 0.3' in size; pink (7.5YR 8/3).	Portland Bentonite mix Grout (2-110 ft)	
					1.5		Sand increased to some and fine; poorly sorted at 28.0 ft bgs.		

Drilling Co.: HCI Drilling
Driller: Kenny Cooper
Drilling Method: Air / Mud Rotary
Drilling Fluid: None
Drilling Rig NA
Remarks: ' / ft= feet; " / in= inch; bgs= below ground surface; ppm= parts per million; NA= not applicable / available.
Well stick up constructed at 0 to 2 ft above ground surface.

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

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ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-MW-1

Sheet: 2 of 5

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 12/04/2017
Date Completed: 12/04/2017
Logger: R. Nanny
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
31–40					1.5		(35.0-37.0') SILICEOUS CALICHE, indurated, containing some very fine, subrounded; moderately sorted; dry; brown (7.5YR 5/4).		
							(37.0-60.0') SANDSTONE, very fine to fine, subrounded; poorly sorted; friable; dry; calcareous; pink (7.5YR 8/3).		
41–50					2.2			Portland Bentonite mix Grout (2-110 ft)	
51–60					2.7				
61–62							(60.0-70.0') SANDSTONE, fine, subrounded; poorly sorted; friable; weakly cemented; dry; formation contains firm; pink (7.5YR 8/4).		

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

URGENT BORING LOGS:CHEVRON D:\1. GINT BORING LOGS\CHEVRON WES1\URGENT BORING LOGS\URGENT BORING LOGS P.GPJ ARCADIS.GDT 28/12/18

ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-MW-1

Sheet: 3 of 5

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 12/04/2017
Date Completed: 12/04/2017
Logger: R. Nanny
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
63									
64									
65					60.7				
66									
67									
68									
69									
70							Blocky formation lenses beginning at 70 ft bgs.		
71							(70.0-90.0') SANDSTONE, very fine to fine, subrounded; moderately sorted; weakly cemented; dry; trace caliche; pinkish white (7.5YR 8/2); soft; nodules 0.1 to 0.2' in size; light brown (7.5YR 6/3).		
72									
73									
74									
75					75.5				
76									
77									
78								Portland Bentonite mix Grout (2-110 ft)	
79									
80									
81									
82									
83									
84									
85					92.1				
86									
87									
88									
89									
90									
91							(90.0-145.0') SANDSTONE, very fine to fine, subrounded; poorly sorted; weakly cemented; containing trace calcareous intergranular clay and caliche; pinkish white (7.5YR 8/2); ranging from soft to firm; nodules 0.1-0.2' in size; light brown (7.5YR 6/4).		
92									
93									
94									

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

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ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-MW-1

Sheet: 4 of 5

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 12/04/2017
Date Completed: 12/04/2017
Logger: R. Nanny
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
95					61.2				
96									
97									
98									
99									
100									
101									
102								Portland Bentonite mix Grout (2-110 ft)	
103									
104									
105					47.2				
106									
107									
108									
109									
110									
111								Well Seal 3/8 inch Hydrated Bentonite Chips (110-114 ft)	
112									
113									
114									
115					36.8				
116									
117								8/16 Silica Sand (114-149 ft)	
118									
119									
120							Formation became moderately to firmly cemented at 120.0 ft bgs.		
121									
122									
123								Well Screen 4 inch diameter Sch. 40 0.010" slot (119.26-149.26 ft)	
124									
125					43.1				
126									

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

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ARCADIS Design & Consultancy for natural and built assets

Soil Boring Log

Boring No.: VGWUO40-MW-1

Sheet: 5 of 5

Project Name: CHEVRON EMC
Project Number: B0048616.0O40.0003A
Project Location: LEA COUNTY, NEW MEXICO

Date Started: 12/04/2017
Date Completed: 12/04/2017
Logger: R. Nanny
Reviewed by: A. Lehman
Date Reviewed: 01/07/2019

Depth (feet)	Sample Interval	Blow Counts	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
127									
128									
129									
130							Began trace gravel, block, flint, 0.1 cm in size, rounded at 130.0 ft bgs increasing in size and amount with increasing depth.		
131									
132									
133									
134									
135					25.3				
136									
137								Well Screen 4 inch diameter Sch. 40 0.010" slot (119.26-149.26 ft)	
138									
139									
140							Formation contained trace calcareous; thin lenses and nodules very pale brown (10YR 8/3) at 140.0 ft bgs.		
141									
142									
143									
144									
145					113.2		(145.0-150.0') GRAVELLY SAND, very fine to fine, subrounded; poorly sorted; tightly packed; wet; containing trace gravel; multicolored; churt; flint and quartz pebbles; 0.1 to 0.5 cm; subrounded; loose; formation also contained; trace clay; brownish yellow (10YR 6/3); nodules 0.2 to 0.5 cm in size; subrounded; firm; blocky and clay stone; light red; (2.5YR 6/6); lenses; firm; blocky; thin; light brown (7.5YR 6/4).		
146									
147									
148									
149									
150								End Cap	
151							End of boring at 150.0 ft bgs.		
152									
153									
154									
155									
156									
157									
158									

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

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District I
1625 N. French Dr., Hobbs, NM 88240
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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 2101

CONDITIONS

Operator: Arcadis U.S., Inc 630 Plaza Drive Highlands Ranch, CO 80129	OGRID: 329073
	Action Number: 2101
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
bbillings	1) Each individual incident number needs a separate report, even if duplicate 2) Approved monitor well plan 3) Approved as investigation report but needs soil remediation/plan	7/9/2021