# 1RP-2733

# Termination Request

# DATE: April 19th, 2012

Rice Environmental Consulting & Safety
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

CERTIFIED MAIL
RETURN RECIEPT NO. 7011 2000 0002 0285 5018

**April 19th, 2012**

**Mr. Edward Hansen**
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: **Termination Request**
**Apache Corporation**
**Lou Wortham Central Battery AD (1R0811-2733)**
**UL/C, D, E & F sec. 11 T22S R37E**

Mr. Hansen:

Apache Corporation (Apache) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site. The site is located approximately 2.5 miles southeast of Eunice, New Mexico at UL/C, D, E & F, Sec. 11, T22S, R37E as shown on the Site Location Map (Figure 1). Groundwater at this site is located approximately +/-40 feet below ground surface (bgs).

On August 3rd and 4th, 2011 twelve soil bores and two monitor wells were installed at the site. SB-1 through SB-5 were installed west of the Central Battery, and SB-6 through SB-12 were installed east of the Central Battery. In SB-1, SB-2, and SB-4, laboratory chloride data indicated that elevated chloride were present in the vadose zone at depth; although, in SB-1 and SB-2 laboratory chlorides decreased with depth. In SB-1, laboratory chloride readings peaked at 24 ft bgs with a reading of 4,400 mg/kg and decreased to 3,360 mg/kg at 33 ft bgs. In SB-2, laboratory chloride readings peaked at 15 ft bgs with a reading of 1,220 mg/kg and decreased to 896 mg/kg at 33 ft bgs. In SB-4, chloride readings increased with depth to 992 mg/kg at 33 ft bgs. In SB-3, chloride readings were 368 mg/kg at 12 ft and, in SB-5, chloride readings were 208 mg/kg at 18 ft which showed chlorides readings that did not impact the capillary fringe. In all soil bores west of the battery, except SB-1 and SB-3, Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) had laboratory readings of non-detect. In SB-1, GRO readings were 539 mg/kg at 12 ft with DRO readings of 95.4 mg/kg at the surface, 4,010 mg/kg at 12 ft, then a decrease to 47.5 mg/kg at 24 ft.. In SB-3, the DRO reading at the surface was 23.6 mg/kg, and all other laboratory readings for GRO and DRO were non-detect.

On the east side of the battery, SB-6, SB-8 and SB-10 through SB-12, had low laboratory chloride readings that did not impact the capillary fringe. In SB-7, laboratory chloride

readings peaked at 18 ft bgs with a chloride reading of 2,680 mg/kg and decreased to 2,280 mg/kg at 33 ft bgs. In SB-9, laboratory chloride readings increased as the bore was advanced to a high of 3,000 mg/kg at 33 ft bgs. In all the soil bores east of the battery, GRO and DRO laboratory readings were low or became low as the soil bores advanced through the vadose zone.

The two monitor wells were not sampled as they were installed. The source well, MW-2, is a 4 inch monitor well, while the up gradient monitor well, MW-1, is a 2 inch monitor well.

Beginning on August 29th, 2011, two excavations, one on the west side and one on the east side were dug with the approval of the NMOCD District 1 Office. The west excavation was dug to 100 ft x 62 ft x 5 ft deep and the east excavation was dug to 121 ft x 83 ft x 5 feet deep. One additional area in the east excavation and three additional areas within the west excavation were dug to 21 ft bgs. At the base of these 21 ft bgs excavations, liners were installed to inhibit the downward migration of chlorides. A 1.5 foot clay layer was placed at the base of the 21 ft bgs excavations, and 20-mil reinforced poly liners were properly seated on top of the clay. The site was backfilled to 5 ft bgs where a 20-mil reinforced poly liner was installed throughout both the west and east excavations. The excavations were then backfilled with imported, clean sand. Soil amendments were added to the site and the site was seeded with a native vegetative mix on October 21st, 2011.

Since their installation, the two monitor wells have been sampled three times, most recently on November 16th, 2011 (Figure 2). From the monitor well sampling conducted at the site, it is evident that chloride levels coming onto the site are higher than those leaving the site suggesting the site has an up gradient source of contamination (Appendix A). Based on data found in the NMOCD website, there is evidence of an up gradient chloride contamination source which has impacted the surrounding area (Figure 3 and 4). These results indicate that this location and the surrounding area have pre-existing groundwater quality impairment, and that the effects of the Lou Central Battery AD are inconsequential. In addition, the liners installed at the site and the re-vegetation of the surface will inhibit chloride migration through the vadose zone to the aquifer. Since the up gradient monitor well shows higher chloride readings than the source well, and liners have been installed at the site which will inhibit chloride migration, the site will not contribute to the degradation of the aquifer. Therefore, RECS requests that the site be granted ‘remediation termination’ status of the regulatory file.

Upon NMOCD’s approval of the Termination Request, both monitor wells will be plugged and abandoned with a 1-3% bentonite/concrete slurry with a three foot concrete cap.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder − RECS at (575) 393-9174 or Natalie Gladden − Apache Corp. (575) 394-1503 if you have any questions or wish to discuss the site.

Sincerely,

Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

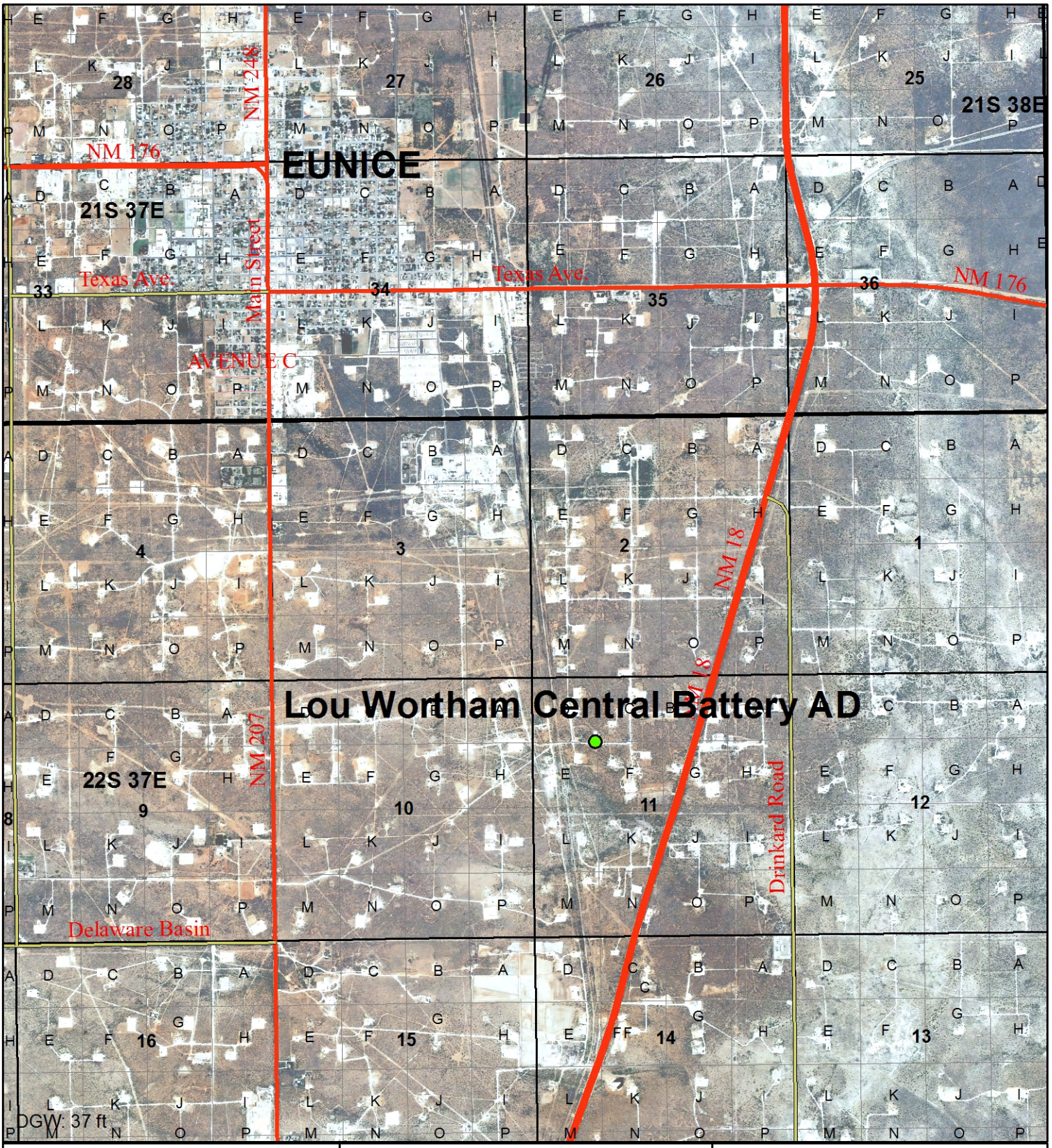
Attachments:

- Figure 1 – Site Location Map
- Figure 2 – Monitor Well Sampling Data
- Figure 3 – Up Gradient Chloride Contamination Source Map
- Figure 4 – Potentiometric Map
- Appendix A – Laboratory Confirmation

# Figures

**RICE Environmental Consulting and Safety (RECS)**
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

# Site Map




RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

***Apache***
***Lou Wortham***
***Central Battery AD***

**NMOCD Case #: 1R0811-2733**

**LEGALS: UL/C, D, E & F**
**sec. 11 T22S R37E**

## Figure 1

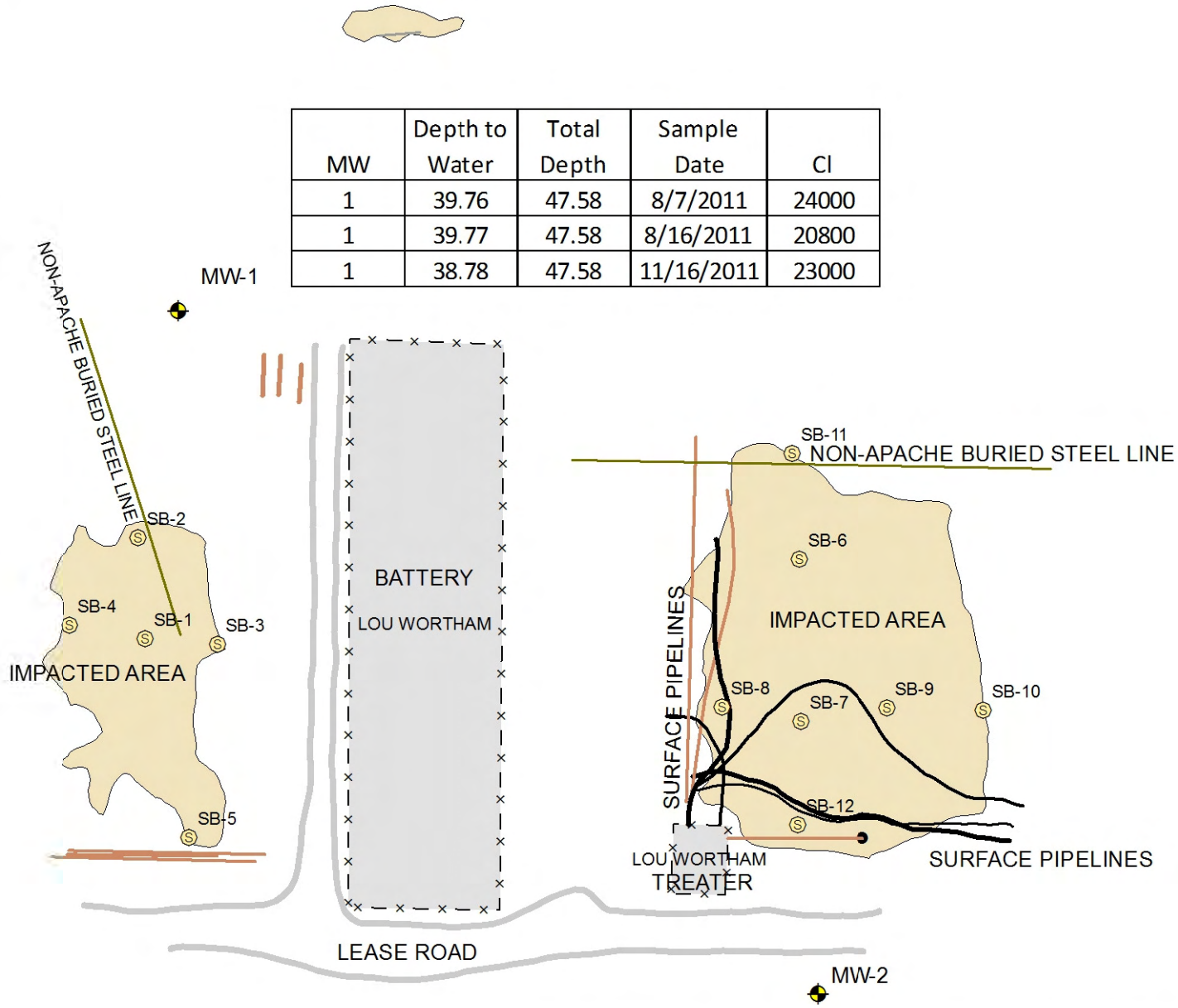
N
W E
S

0 0.25 0.5 1 Miles

Drawing date: 8-18-11
Drafted by: L. Weinheimer

# Monitor Well Sampling Data

| MW | Depth to Water | Total Depth | Sample Date | Cl |
|---|---|---|---|---|
| 1 | 39.76 | 47.58 | 8/7/2011 | 24000 |
| 1 | 39.77 | 47.58 | 8/16/2011 | 20800 |
| 1 | 38.78 | 47.58 | 11/16/2011 | 23000 |




| MW | Depth to Water | Total Depth | Sample Date | Cl |
|---|---|---|---|---|
| 2 | 41.64 | 82.65 | 8/7/2011 | 23200 |
| 2 | 41.67 | 82.65 | 8/16/2011 | 22000 |
| 2 | 41.69 | 82.65 | 11/16/2011 | 19200 |

DGW: 40 ft

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

***Apache Lou Wortham Central Battery AD***

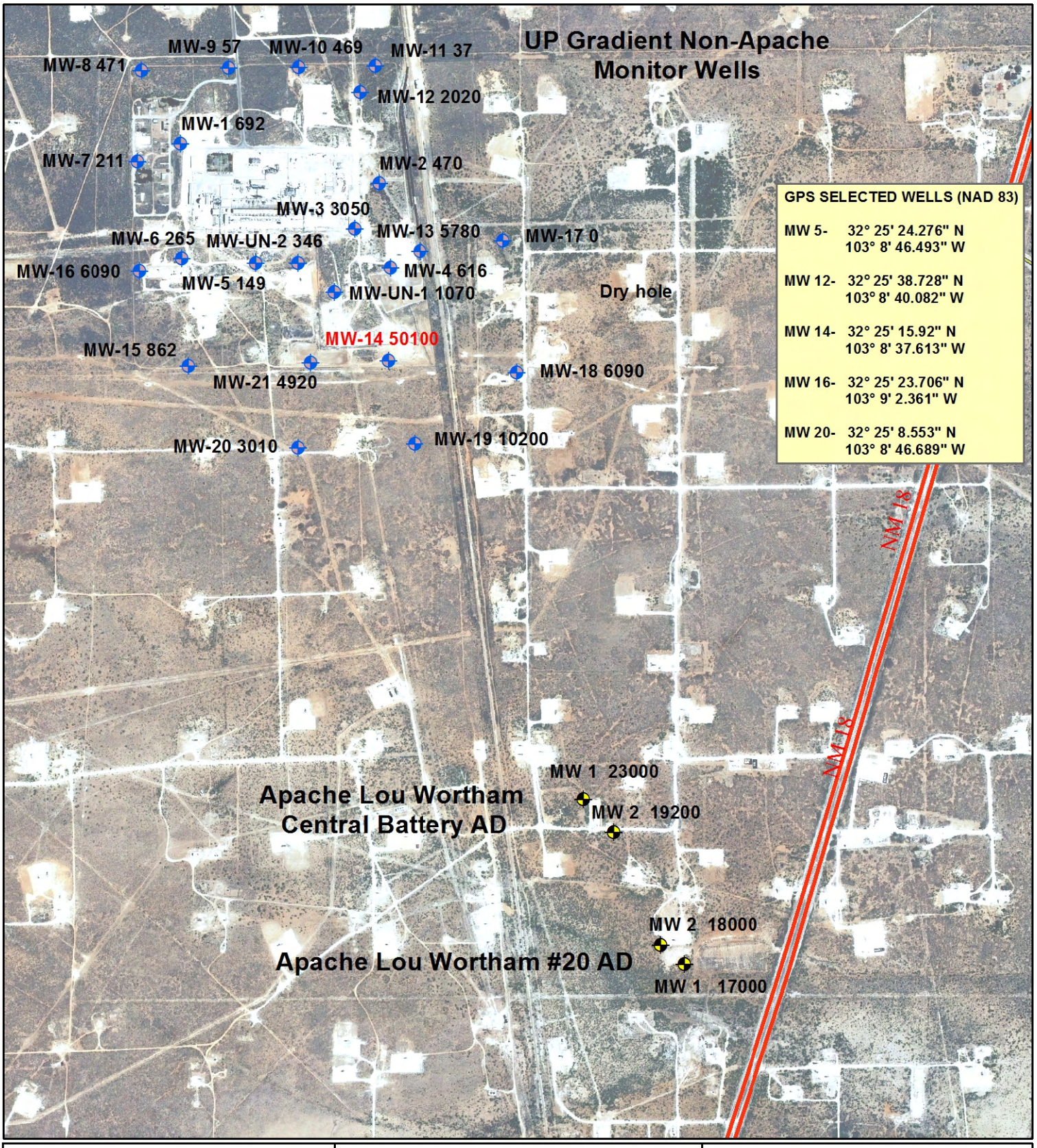
**LEGALS: UL/C,D,E,F sec. 11 T22S R37E**

Figure 2

N W E S

0 20 40 80 Feet

Drawing date: 1-6-12
Drafted by: L. Weinheimer




RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

# *Regional Chloride Concentrations*

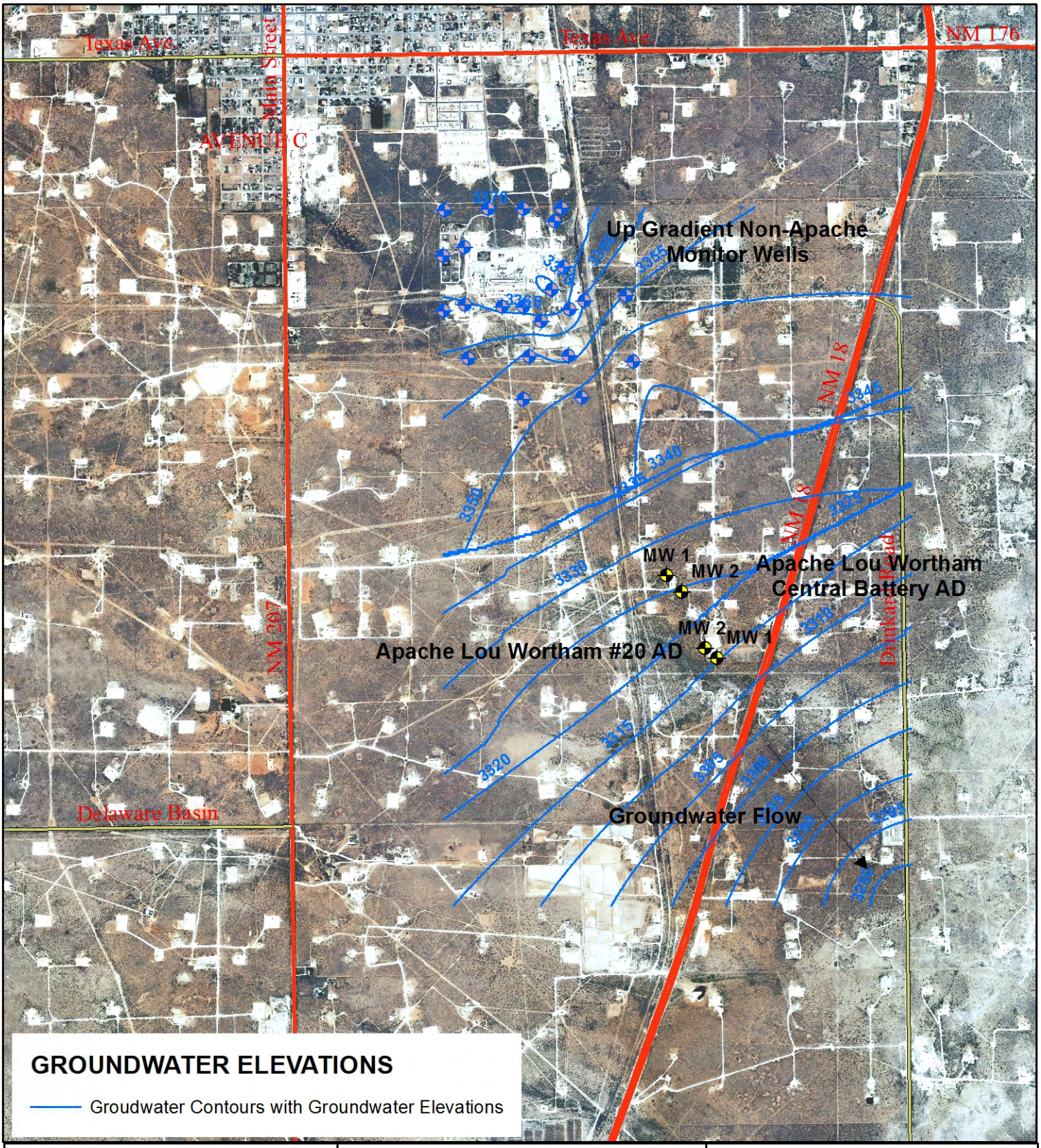
LEGALS: sec. 2, 3, 10 & 11
T22S R37E

Figure 3

N W E S

0 500 1,000 2,000 Feet

Drawing date: 1-5-12
Drafted by: L. Weinheimer & T. Grieco




RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

# *Regional Potentiometric Map*

**LEGALS: sec. 2, 3, 10 & 11 T22S R37E**

Figure 4

N W E S

0 875 1,750 3,500 Feet

Drawing date: 1-5-11
Drafted by: L. Weinheimer

# Appendix A
Laboratory Confirmation

**RICE Environmental Consulting and Safety (RECS)**
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

CARDINAL Laboratories

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

November 18, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE LOU WORTHAM CENTRAL BATTERY AD

Enclosed are the results of analyses for samples received by the laboratory on 11/17/11 14:26.

Cardinal Laboratories is accredited through Texas NELAP for:

| | |
|---|---|
| Method SW-846 8021 | Benzene, Toluene, Ethyl Benzene, and Total Xylenes |
| Method SW-846 8260 | Benzene, Toluene, Ethyl Benzene, and Total Xylenes |
| Method TX 1005 | Total Petroleum Hydorcarbons |

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

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 (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:*

APACHE - EUNICE
NATALIE GLADDEN
P. O. BOX 1849
EUNICE NM, 88231
Fax To: 394-2425

| | | | |
|---|---|---|---|
| Received: | 11/17/2011 | Sampling Date: | 11/16/2011 |
| Reported: | 11/18/2011 | Sampling Type: | Water |
| Project Name: | APACHE LOU WORTHAM CENTRAL BATT | Sampling Condition: | Cool & Intact |
| Project Number: | NONE GIVEN | Sample Received By: | Jodi Henson |
| Project Location: | T22S-R37E-SEC11 UL/CDEF ~ LEA CTY, | | |

### Sample ID: MONITOR WELL #1 (H102505-01)

**Chloride, SM4500Cl-B** **mg/L** **Analyzed By: HM**

| Analyte | Result | Reporting Limit | Analyzed | Method Blank | BS | % Recovery | True Value QC | RPD | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **23000** | 4.00 | 11/18/2011 | ND | 104 | 104 | 100 | 3.77 | |

### Sample ID: MONITOR WELL #2 (H102505-02)

**Chloride, SM4500Cl-B** **mg/L** **Analyzed By: HM**

| Analyte | Result | Reporting Limit | Analyzed | Method Blank | BS | % Recovery | True Value QC | RPD | Qualifier |
|---|---|---|---|---|---|---|---|---|---|
| **Chloride** | **19200** | 4.00 | 11/18/2011 | ND | 104 | 104 | 100 | 3.77 | |

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 |





Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

101 East Marland - Hobbs, New Mexico 88240
Tel (575) 393-2326
Fax (575) 393-2476

# Cardinal Laboratories, Inc.

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

| | |
|---|---|
| Company Name: Apache | BILL TO Company: Apache PO# |
| Project Manager: Hack Conder, Rice Env Consulting Safety | Address: (Street, City, Zip) |
| Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240 | Phone#: Fax#: |
| Phone #: (575) 393-9174 | Fax #: (575) 397-1471 |
| Project #: | Project Name: Apache Lou Wortham Central Battery AD |
| Project Location: T22S-R37E-Sec11 UL/CDEF ~ Lea County New Mexico | Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com |

**ANALYSIS REQUEST**
(Circle or Specify Method No.)

| LAB # (LAB USE ONLY) | FIELD CODE | (G)rab or (C)omp | # CONTAINERS | MATRIX: WATER | SOIL | AIR | SLUDGE | PRESERVATIVE METHOD: HCL (2-40ml VOA) | $HNO_3$ | $NaHSO_4$ | $H_2SO_4$ | ICE (1-1Liter HDPE) | NONE | SAMPLING: DATE (2011) | TIME | MTBE 8021B/602 | BTEX 8021B/602 | TPH 418.1/TX1005 / TX1005 Extended (C35) | PAH 8270C | Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7 | TCLP Metals Ag As Ba Cd Cr Pb Se Hg | TCLP Volatiles | TCLP Semi Volatiles | TCLP Pesticides | RCI | GC/MS Vol. 8260B/624 | GC/MS Semi. Vol. 8270C/625 | PCB's 8082/608 | Pesticides 8081A/608 | BOD, TSS, pH | Moisture Content | Cations (Ca, Mg, Na, K) | Anions (Cl, SO4, CO3, HCO3) | Sulfates | Total Dissolved Solids | Chlorides | Turn Around Time ~ 24 Hours |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H102505 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Monitor Well #1 | G | 1 | X | | | | | | | | 1 | | 11-16 | 9:05 | | | | | | | | | | | | | | | | | | | | | X | |
| 2 | Monitor Well #2 | G | 1 | X | | | | | | | | 1 | | 11-16 | 10:45 | | | | | | | | | | | | | | | | | | | | | X | |

| | | | |
|---|---|---|---|
| Relinquished by: Rozanne Johnson | Date: 11-17-2011 | Time: 14:25 | Received by: Jodi Henson | Date: 11/17/11 | Time: 14:26 |
| Relinquished by: | Date: | Time: | Received By: (Laboratory Staff) | Date: | Time: |

| | | | | |
|---|---|---|---|---|
| Phone Results | | Yes | | No |
| Fax Results | | Yes | | No Additional Fax Number: |

**REMARKS:**

**Email Results to:** hconder@riceswd.com
kjones@riceswd.com
iweinheimer@rice-ecs.com
rozanne@valornet.com

| Delivered By: (Circle One) | Sample Condition | Cool | Intact | CHECKED BY: |
|---|---|---|---|---|
| Sampler - UPS - Bus - Other: | 1° C Yes / No | Yes / No | Yes / No | (Initials) |