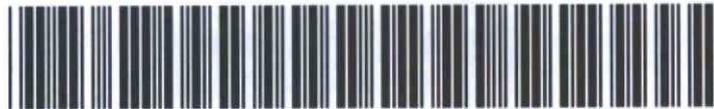




# AE Order Number Banner

## Report Description

This report shows an AE Order Number in Barcode format for purposes of scanning. The Barcode format is Code 39.



**App Number: pGRL1404157488**

**1RP - 2733**

**APACHE CORP**

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 Apache Corporation	Contact Natalie Gladden
Address PO Box 1849 Eunice, NM 88231	Telephone No. 575-390-4186
Facility Name Lou Wortham Central Battery	Facility Type Production Battery
Surface Owner Irvin Boyd	Mineral Owner State of NM
API No. 30-025-30285	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
C, D, E, F	11	22S	37E	1244	North	1255	West	Lea

Latitude 32°24'36.888"N Longitude 103°8'17.555"W

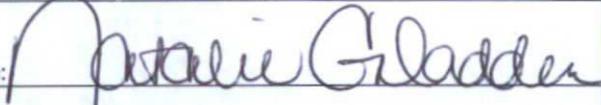
**NATURE OF RELEASE**

Type of Release Historical Contamination	Volume of Release Unknown	Volume Recovered 0
Source of Release Closed loop system	Date and Hour of Occurrence Unknown	Date and Hour of Discovery 07/01/2011
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.*		

Describe Cause of Problem and Remedial Action Taken.\*  
Apache purchased Marathon in 2009 when the contamination was discovered both at the battery. The landowner started stating concerns, therefore lead to the investigation of the surface, soil, vadose and ground water contamination.

Describe Area Affected and Cleanup Action Taken.\* On August 3<sup>rd</sup> and 4<sup>th</sup>, 2011, 12 soil bores and 2 MWs were installed at the site. Representative samples of the bores were taken to a commercial laboratory for analysis. Based on the bore data, two excavations, one on the west side (100 ft x 62 ft x 5 ft) and one on the east side (121 ft x 83 ft x 5 ft) of the battery were dug starting on August 29<sup>th</sup>, 2011 per NMOCD District 1 Office. One additional area in the east excavation and three additional areas within the west excavation were dug to 21 ft. At the base of the 21 ft excavations, 20-mil poly liners were installed to inhibit the downward migration of chlorides. A 1 1/2 foot clay layer was placed at the base of the 21 ft excavations. These excavations were backfilled to 5 ft bgs where 20-mil poly liners were placed in both the west and east excavations. The excavations were then backfilled, soil amendments added and then seeded. The monitor wells were sampled quarterly and showed an up-gradient source of chloride contamination. The up-gradient monitor well shows higher chloride readings than the source well.

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: 	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Natalie Gladden	Approved by Environmental Specialist:	
Title: EHS Environmental Tech	Approval Date:	Expiration Date:
E-mail Address: natalie.gladden@apachecorp.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 07-1-11 Phone: 575-390-4186		

\* Attach Additional Sheets If Necessary

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Facility Name Lou Wortham #20	Facility Type Production

Surface Owner Irvin Boyd	Mineral Owner State of NM	API No. 30-025-30285
--------------------------	---------------------------	----------------------

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	11	22S	37E	2310	FNL	2000	FWL	Lea

Latitude 32°24'25.104"N Longitude 103°8'9.328"W

**NATURE OF RELEASE**

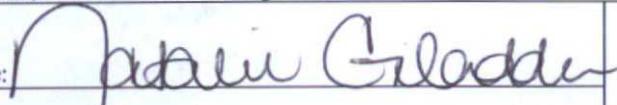
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API No. 30-025-30285	

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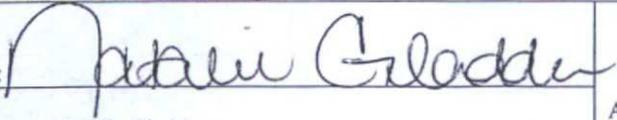
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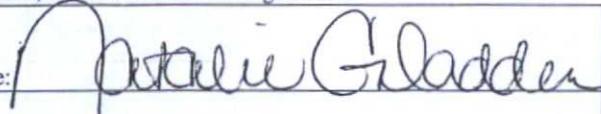
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Printed Name: Natalie Gladden	Approved by Environmental Specialist:	
Title: EHS Environmental Tech	Approval Date:	Expiration Date:
E-mail Address: natalie.gladden@apachecorp.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 07-1-11 Phone: 575-390-4186		

\* Attach Additional Sheets If Necessary

## Rice Environmental Consulting & Safety

P.O. Box 5630 Hobbs, NM 88241  
Phone 575.393.4411 Fax 575.393.0293

CERTIFIED MAIL  
RETURN RECEIPT NO. 7011 2000 0002 0285 5018

April 19<sup>th</sup>, 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 3<sup>rd</sup> and 4<sup>th</sup>, 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

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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 29<sup>th</sup>, 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 21<sup>st</sup>, 2011.

Since their installation, the two monitor wells have been sampled three times, most recently on November 16<sup>th</sup>, 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.

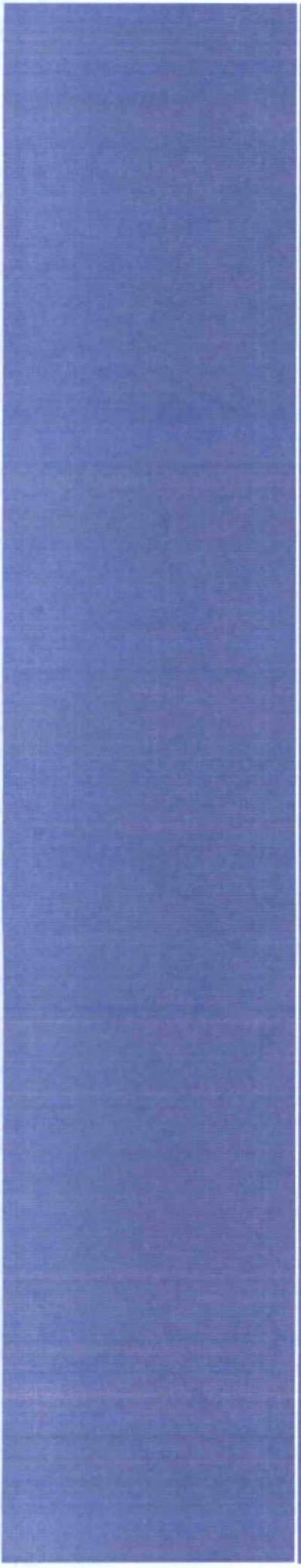
Sincerely,

A handwritten signature in black ink, appearing to read 'L. Weinheimer', with a long, sweeping horizontal flourish extending to the right.

Lara Weinheimer  
Project Scientist  
RECS  
(575) 441-0431

Attachments:

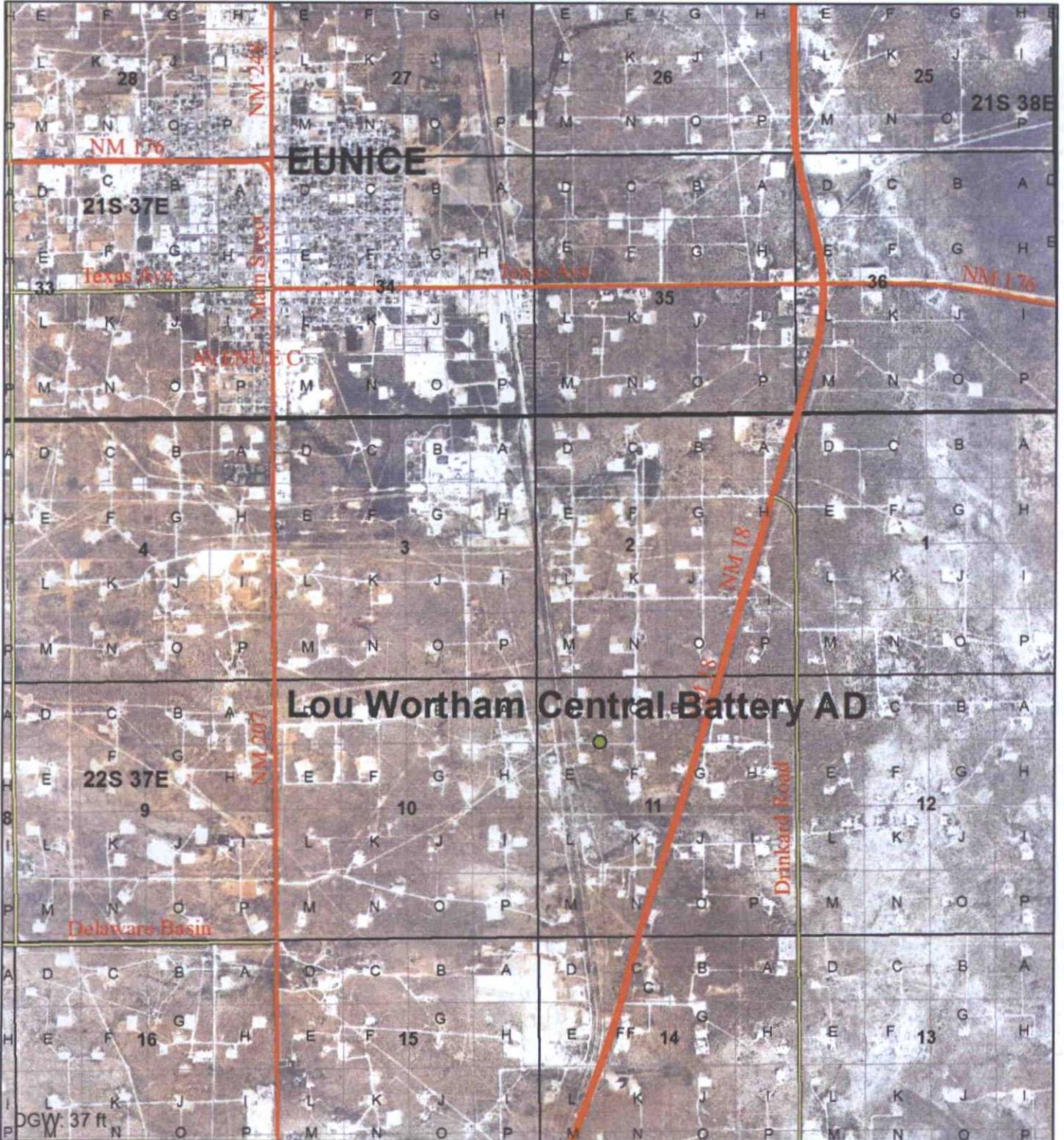
- Figure 1 – Site Location Map
- Figure 2 – Monitor Well Sampling Data
- Figure 3 – Up Gradient Chloride Contamination Source Map
- Figure 4 – Potentiometric Map
- Appendix A – Laboratory Confirmation



# Figures

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

# Site Map

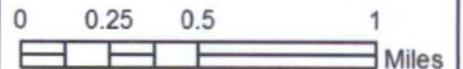


## Apache Lou Wortham Central Battery AD

NMOCD Case #: 1R0811-2733

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

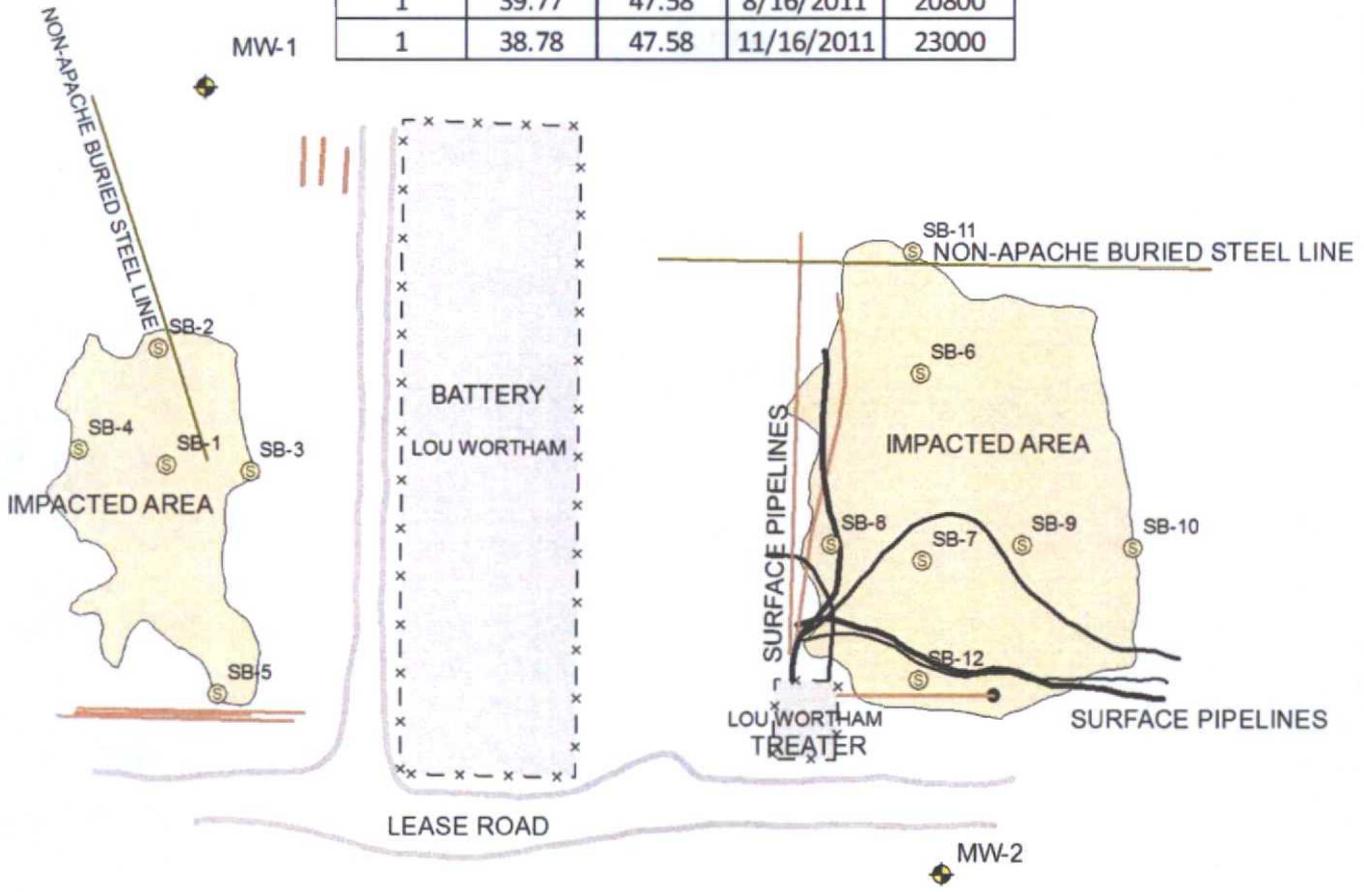
## Figure 1



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



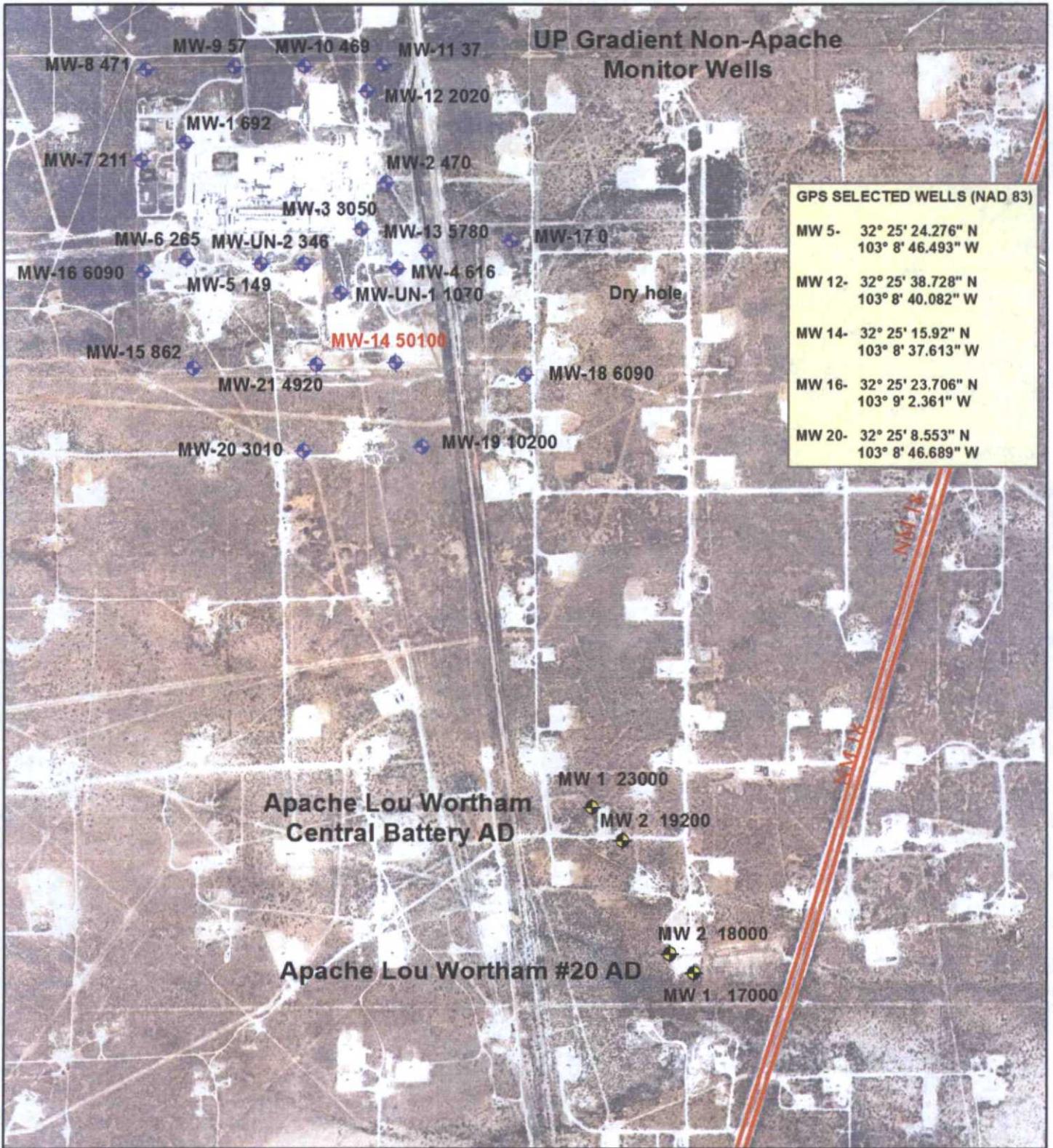
**Apache  
Lou Wortham  
Central Battery AD**

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

**Figure 2**

0 20 40 80 Feet

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



## Regional Chloride Concentrations

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

Figure 3



0 500 1,000 2,000  
Feet

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