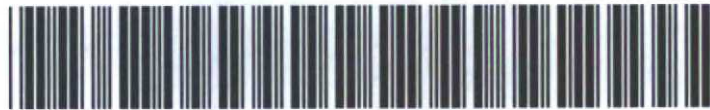




AE Order Number Banner

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



EXPLORING WHAT'S POSSIBLE

APACHE CORPORATION

P.O.Box 1849
Eunice, NM 88231
Phone 575.394.3159

Lou Wortham Central Battery AD Update Report

NMOCD Case #: 1R0811-2733

Unit Letter C, D, E & F, Section 11, Township 22S, Range 37E

Rice Environmental Consulting & Safety

P.O. Box 5630 Hobbs, NM 88241

Phone 575.393.4411 Fax 575.393.0293

November 29th, 2011

Mr. Geoffrey Leking

New Mexico Energy, Minerals, & Natural Resources

Oil Conservation Division, Environmental Bureau

1625 N. French Drive

Hobbs, New Mexico 88240

RE: UPDATE REPORT

Apache Corporation

Lou Wortham Central Battery AD (1R0811-2733): UL/C, D, E & F sec. 11

T22S R37E

Mr. Leking:

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 (Figure 2 and 3). Soil bores 1-5 were installed west of the Central Battery, and soil bores 6-12 were installed east of the Central Battery. Soil samples were taken every three feet as the bores were being installed. The samples were field tested for chlorides and screened in the field for hydrocarbons with a photo-ionization detector. Representative samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers (Appendix A). 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. SB-3 and SB-5 showed relatively low laboratory 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 and DRO readings peaked at 12 ft bgs with a GRO reading of 539 mg/kg and a DRO reading of 4,010 mg/kg and decreased to non-detect at 33 ft bgs. In SB-3, the DRO reading at the surface was 23.6 mg/kg, but 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 (Appendix B). 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. The two wells have been sampled twice since their installation (Figure 4). During the latest monitor well sampling event on August 16th, 2011, MW-1 had a laboratory chloride reading of 20,800 mg/L while MW-2 had a chloride laboratory reading of 22,000 mg/L (Appendix C).

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 (Figure 5-6). 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. The excavated soils were taken for disposal at an NMOCD approved facility. A total of 5,196 yards of soil were taken to Sundance Services for disposal. 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 ½ foot clay layer was placed at the base of the 21 ft bgs excavations, and 20-mil reinforced poly liners were laid on top of the clay. Then the poly liners were padded with 6 inches of sand to protect the liners from punctures. The 21 ft bgs excavations were backfilled with clean imported caliche to 5 ft bgs, the level of the surrounding excavations, and capped with clean imported sand to prepare the larger excavations for poly liners (Figure 7-8).

The imported sand and caliche were field tested for hydrocarbons with a photo-ionization detector. The readings for both samples were 0 ppm. The samples were then taken to a commercial laboratory for analysis of chlorides. Laboratory analysis of chlorides showed a result of 32 mg/kg for the imported caliche and non-detect for the imported sand (Appendix D).

At 5 ft bgs, a 20-mil reinforced poly liner was installed in both the west and east excavations. After they were installed the excavations were backfilled with clean imported sand. A sample of this imported sand was field tested for hydrocarbons with a photo-ionization detector. The reading for the sample was 0 ppm. Then it was taken to a commercial laboratory for chloride analysis. Laboratory chloride analysis returned a result of non-detect (Appendix E).

A total of 1,033 yards of imported caliche was used to backfill the 21 ft bgs excavations to 5 ft bgs and a total of 4,152 yards of imported sand was used to backfill the larger west and east excavations.

Soil amendments were added to the site and the site was seeded with a native vegetative mix on October 21st, 2011 (Appendix F). Photos of these activities can be found in Appendix G.

Recommendations

Based on the soil bore installations, there is some evidence that chlorides may have leached through the vadose zone and into the capillary fringe. Therefore, Apache will conduct quarterly monitor well sampling to determine the possible extent of chloride contamination beneath the site. Once it is determined whether chloride impacts have occurred to groundwater beneath the site, Apache will either suggest a groundwater remedy or request site termination.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder (575) 393-9174 or Natalie Gladden (575) 390-4186 if you have any questions or wish to discuss the site.

Sincerely,



Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

cc. Natalie Gladden, Apache Corp.
Glenn von Gonten, NMOCD
Edward J. Hansen, NMOCD

Attachments:

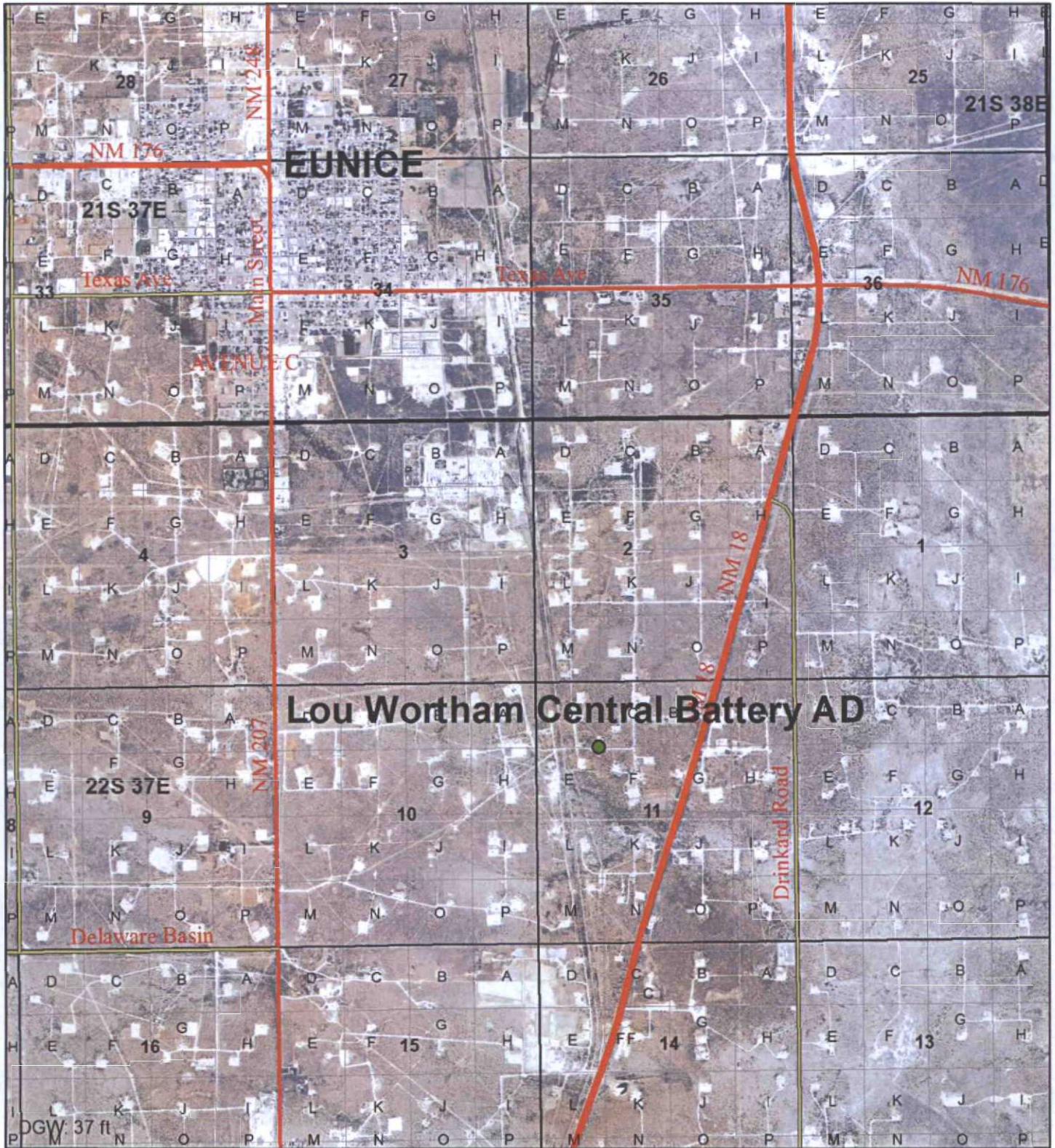
- Figure 1 – Site Location Map
- Figure 2 – Soil bore installation map (SB 1-5)
- Figure 3 – Soil bore installation map (SB 6-12)
- Figure 4 – MW Sampling Map
- Figure 5 – West Side Excavation
- Figure 6 – East Side Excavation
- Figure 7 – West Side Excavation Cross-Section
- Figure 8 – East Side Excavation Cross-Section
- Appendix A – Soil Bore Logs and Laboratory Confirmation
- Appendix B – Monitor Well Logs
- Appendix C – MW Sampling Data
- Appendix D – Imported Sand and Caliche Laboratory Confirmation
- Appendix E – Imported Sand Laboratory Confirmation
- Appendix F – Re-vegetation Form
- Appendix G – Photo Documentation



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

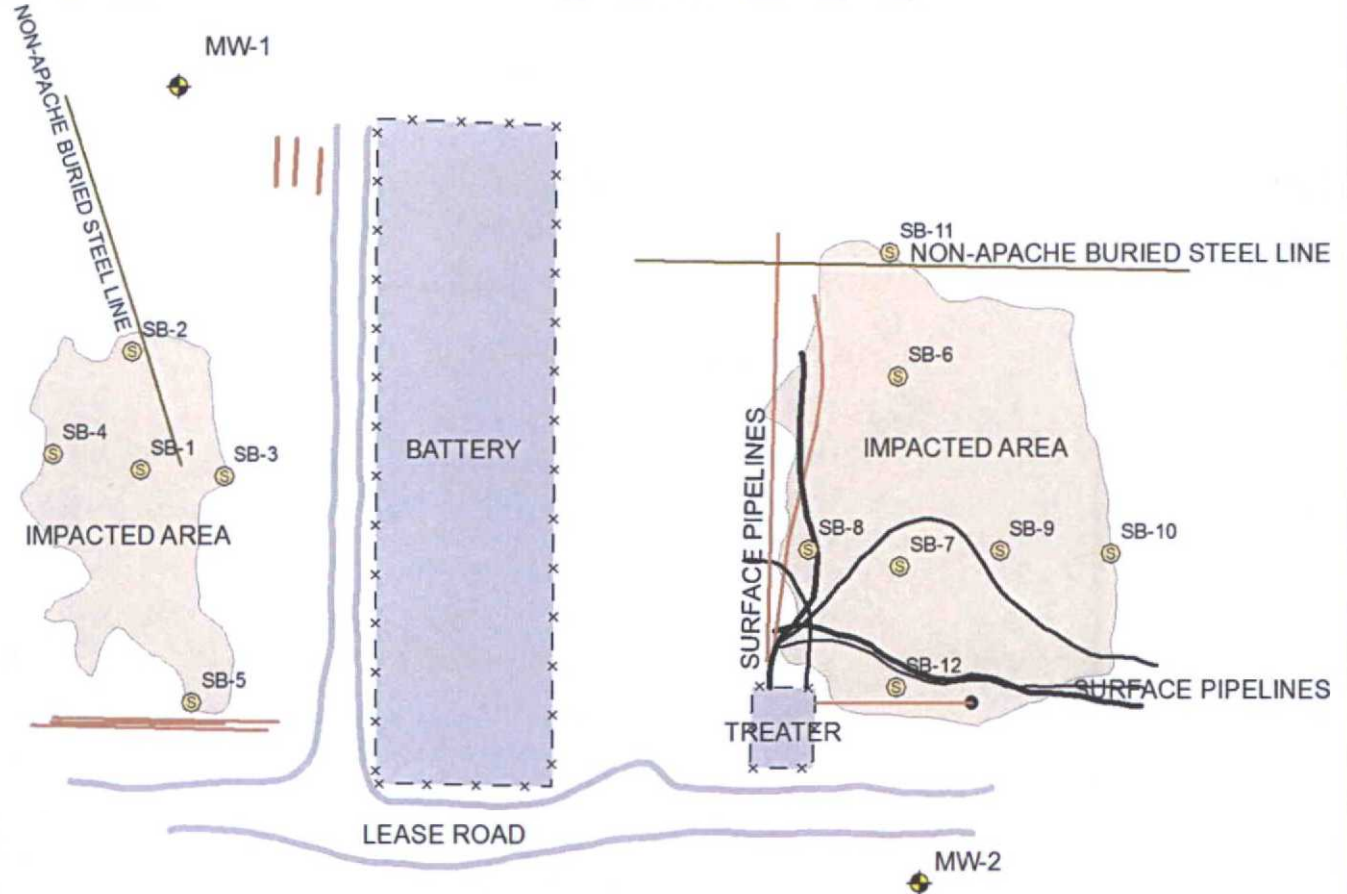


0 0.25 0.5 1
Miles

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

Soil Bore Installation

SB-1						SB-2						SB-3					
Depth	CI-	PID	LAB CI-	GRO	DRO	Depth	CI-	PID	LAB CI-	GRO	DRO	Depth	CI-	PID	LAB CI-	GRO	DRO
SS	149	22.5	<16	<50	95.4	SS	179	5.3	<16	<10	<10	SS	110	1	32	<10	23.6
3	717	265.4				3	343	3.3				3	175	0.3			
6	739	2889				6	306	1.7				6	288	0.2	320	<10	<10
9	617	4402				9	638	1.5				9	262	0.3			
12	729	4632	1640	539	4010	12	313	1.6				12	238	0.1	368	<10	<10
15	1719	95.7				15	826	1.3	1220	<10	<10						
18	2140	59.8				18	724	0.4									
21	2699	60.8				21	367	0.4									
24	2794	23.4	4400	<10	47.5	24	536	0.4									
27	2153	29.3				27	356	0.3									
30	1633	23.3				30	355	0.3									
33	2023	12	3360	<10	<10	33	703	0.4	896	<10	<10						



SB-4					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	129	0.8	<16	<10	48.8
3	262	0.4			
6	233	0.3			
9	1114	0.3	464	<10	<10
12	459	0.4			
15	448	0.5			
18	511	0.3			
21	530	0.3			
24	305	0.1			
27	579	0.1			
30	802	0.2			
33	993	0.4	992	<10	<10

SB-5					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	106	2	<16	<10	<10
3	117	0.6			
6	193	0.3			
9	331	0.3	336	<10	<10
12	305	0.3			
15	267	0.2			
18	240	0.2	208	<10	<10

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

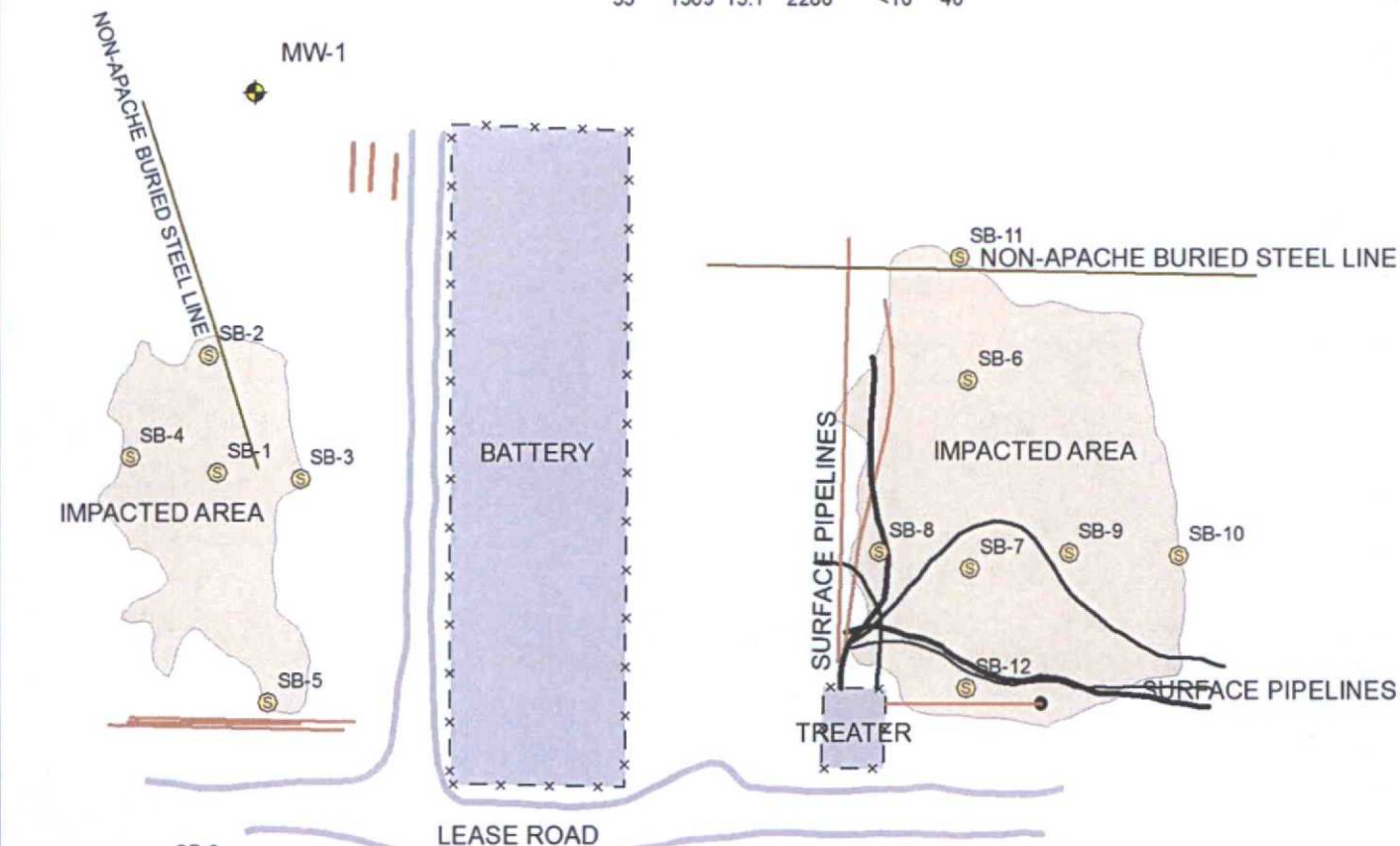
Drawing date: 8-5-11
Drafted by: L. Weinheimer

Soil Bore Installation

SB-6					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	104	0.2	<16	<50	300
3	115	0.6	16	<10	11.9
6	153	0.7	16	<10	11.8

SB-7					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	122	1.4	<16	<10	<10
3	167	26.5			
6	1069	1084	1600	1420	21300
9	1570	92.7			
12	1545	61.6			
15	1173	57.4			
18	1582	44	2680	<10	153
21	1332	68.1			
24	1322	70.7			
27	1459	20.5			
30	901	38.5			
33	1369	13.1	2280	<10	40

SB-8					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	120	6	16	<50	142
3	151	3.9			
6	169	3.3	32	<10	19.6
9	140	2.7	32	<10	<10



SB-9					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	138	3.8	<16	<10	<10
3	154	3.3			
6	308	348	416	680	14000
9	915	334	992	440	12500
12	1433	57.3			
15	1633	51.3			
18	1285	85.3			
21	1792	57.4			
24	1730	51.8			
27	2033	88.6			
30	1795	43.3			
33	1644	16.5	3000	<10	257

SB-10					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	133	4.5	<16	<10	<10
3	113	4.5			
6	207	3.9	32	<10	33
9	148	3.4	80	<10	<10

SB-11					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	146	3.2	<16	<10	17.8
3	122	2.6	16	<10	10.4
6	154	2.7	32	<10	28.2

SB-12					
Depth	CI-	PID	LAB CI-	GRO	DRO
SS	92	2.3	<16	<10	12.8
3	117	2.2	16	<10	<10
6	116	1.7	<16	<10	<10

DGW: 40 ft



Apache Lou Wortham Central Battery AD

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

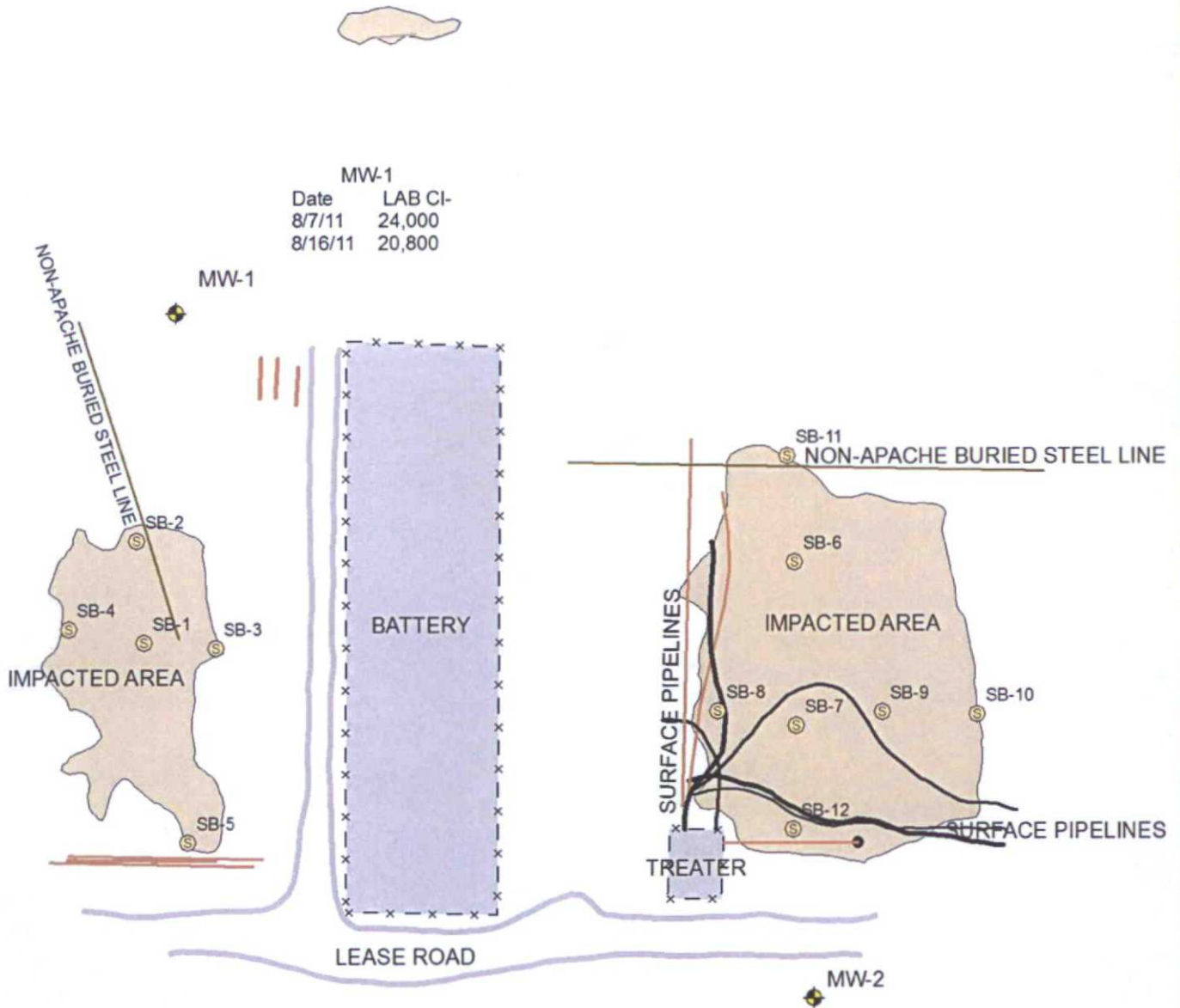
Figure 3



0 20 40 80
Feet

Drawing date: 8-5-11
Drafted by: L. Weinheimer

MW sampling data



DGW: 40 ft



Apache Lou Wortham Central Battery AD

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

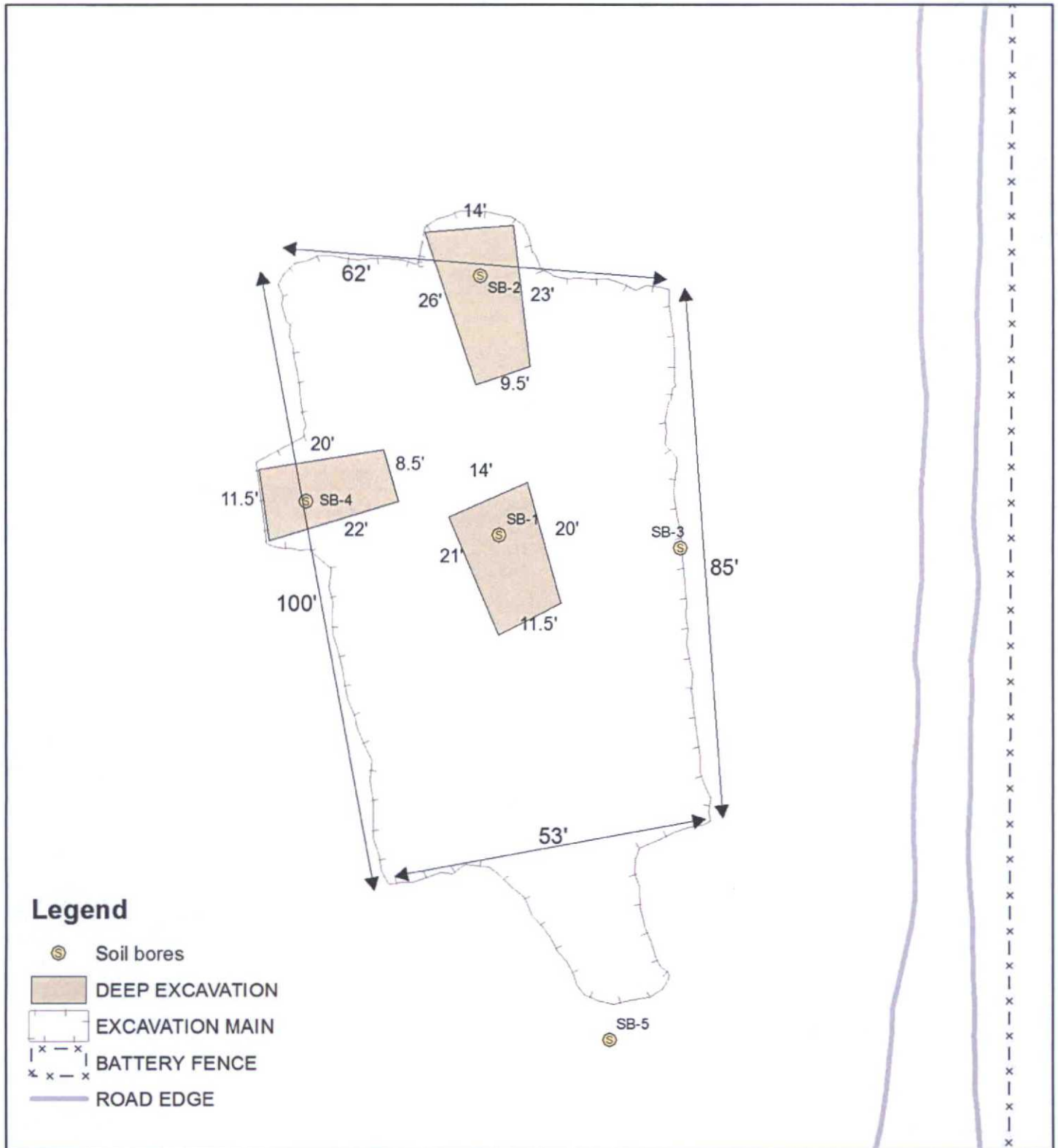
Figure 4



0 20 40 80
Feet

Drawing date: 8-17-11
Drafted by: L. Weinheimer

West Excavation



Legend

- Soil bores
- DEEP EXCAVATION
- EXCAVATION MAIN
- BATTERY FENCE
- ROAD EDGE



Apache Lou Wortham Central Battery AD

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

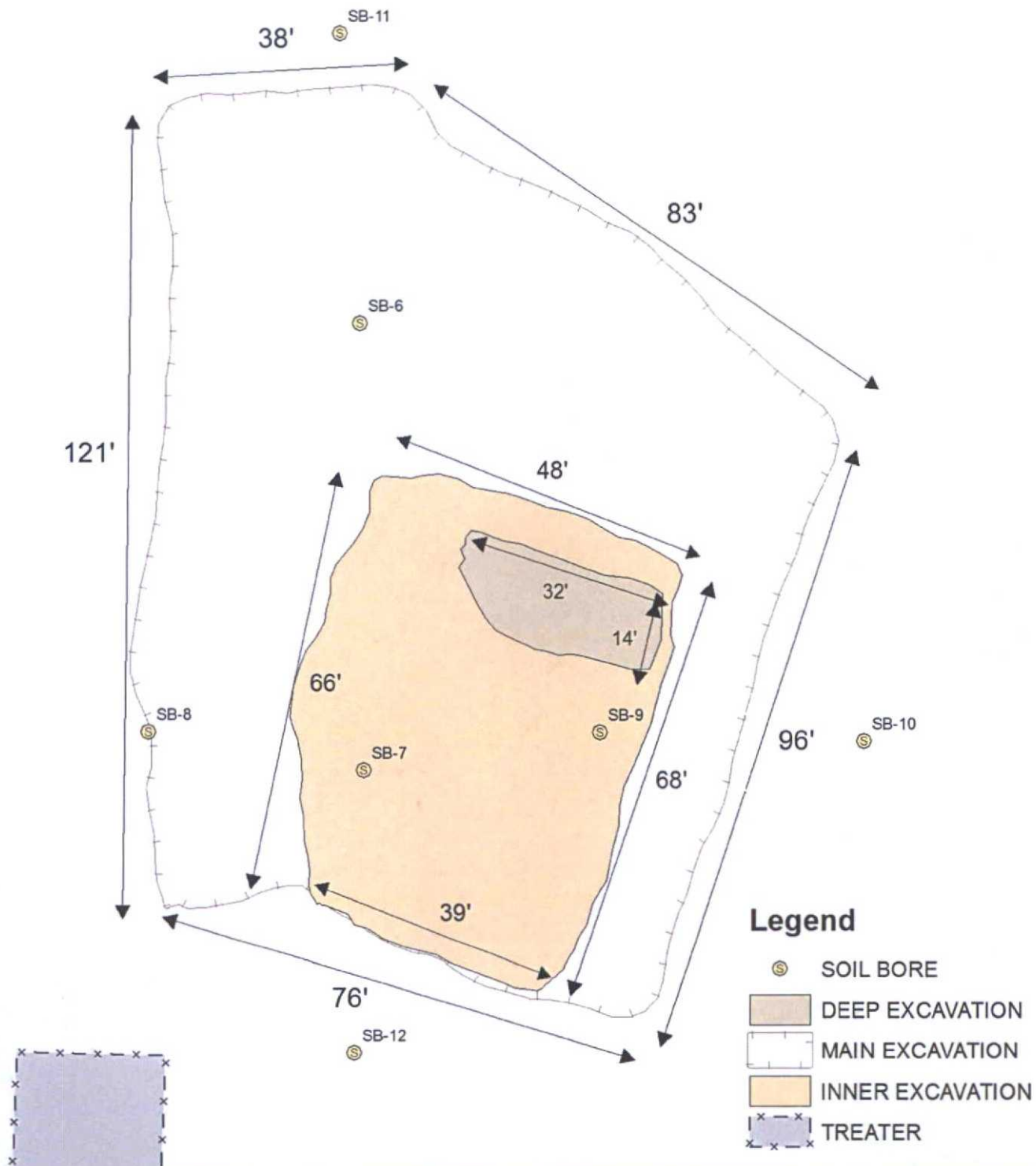
Figure 5



0 5 10 20
Feet

GPS date: 9/27/11 by TG
Drafted by: T. Grieco

East Excavation



Apache Lou Wortham Central Battery AD

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

Figure 6



0 5 10 20
Feet

GPS date: 9/27/11 by TG
Drafted by: T. Grieco

Apache Lou Wortham Central Battery
Unit 'C, D, E F', Sec. 11, T22S, R37E

West Excavation Cross-Section

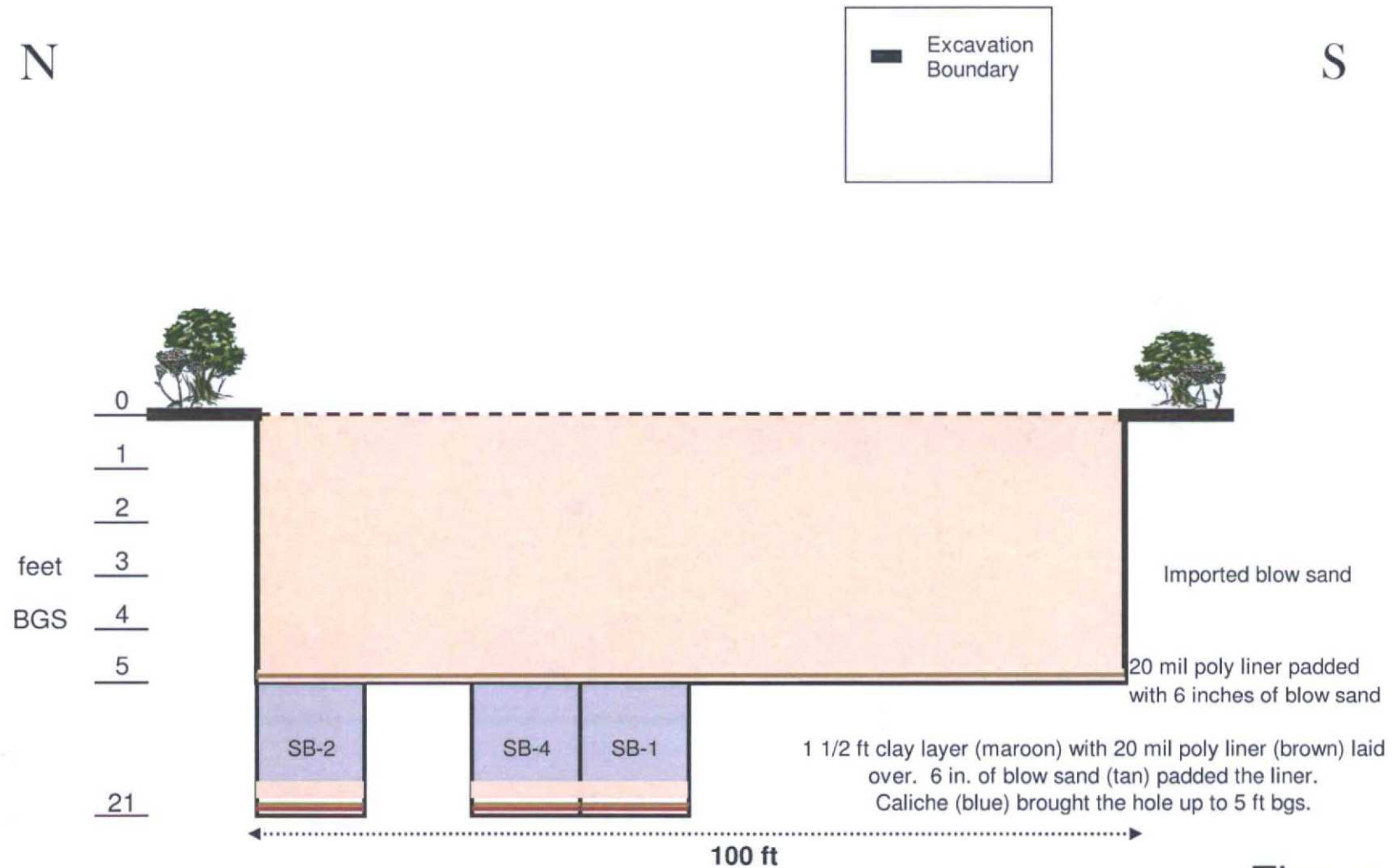


Figure 7

Apache Lou Wortham Central Battery AD
Unit 'C, D, E F', Sec. 11, T22S, R37E

East Excavation Cross-Section

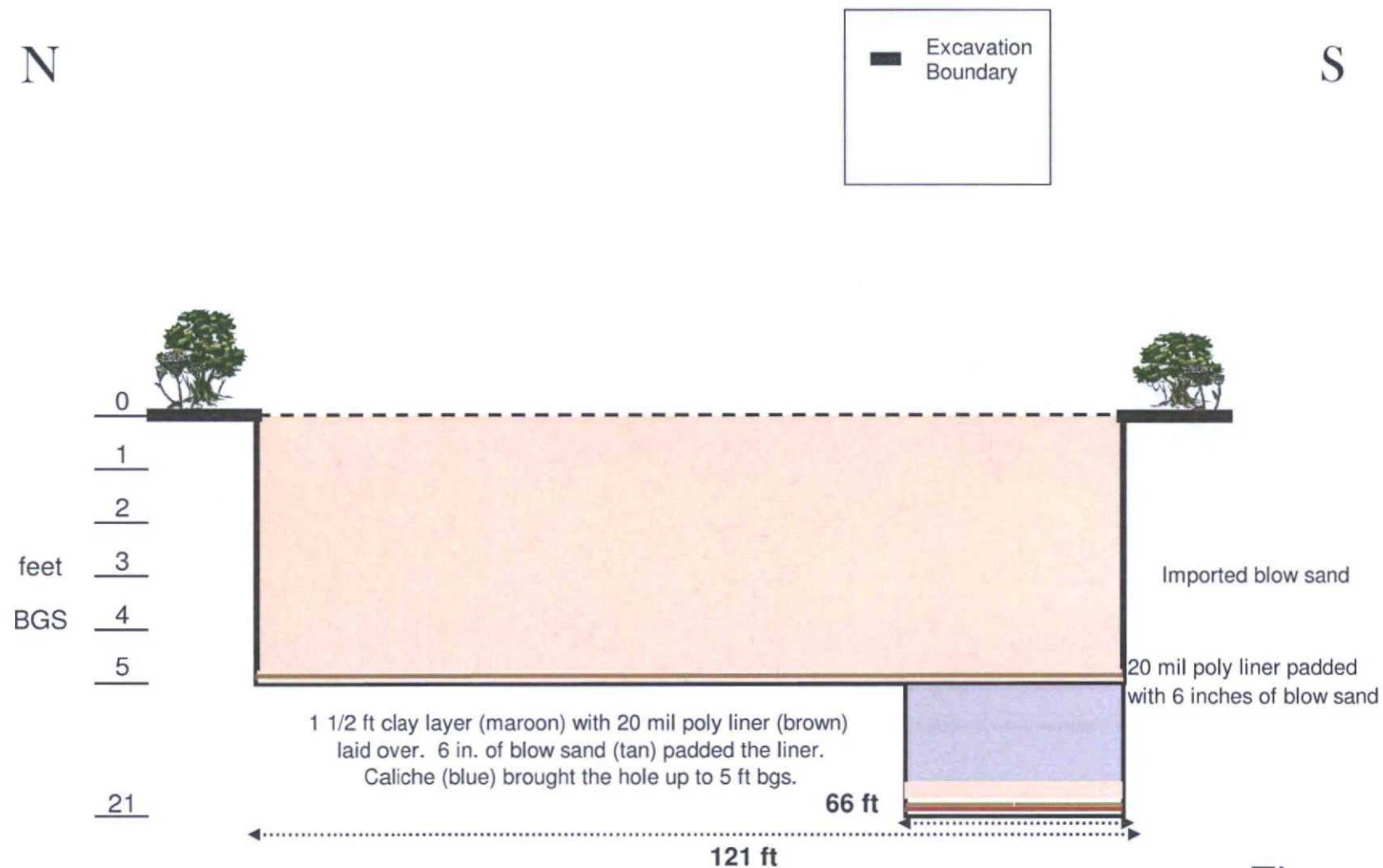


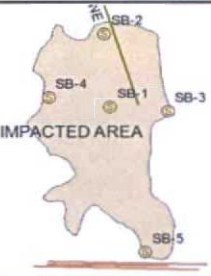

Figure 8



Appendix A

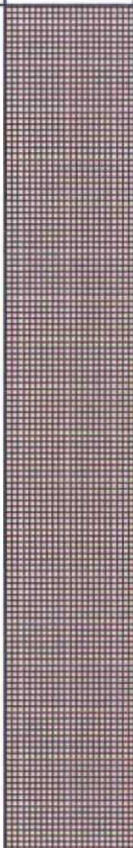


Soil Bore Logs and Laboratory Confirmation

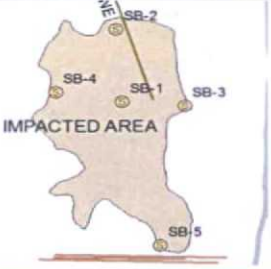

RICE Environmental Consulting and Safety (RECS)
P.O. Box 5630 Hobbs, NM 88241
Phone 575.393.4411 Fax 575.393.0293

Logger:	Tony Grieco			
Driller:	Harrison & Cooper, Inc.			
Drilling Method:	Air rotary		Company: Apache Corporation	
Start Date:	8/3/2011		Project Name: Lou Wortham Central Batt AD	
End Date:	8/3/2011	Well ID: SB-1		
Comments:		All samples from cuttings.		Project Consultant: RECS
DRAFTED BY: L. Weinheimer		Location: UL/D sec. 11 T22S R37E		Lat: 32°24'37.054"N
TD = 33 ft		GW = 37 ft		County: Lea
				Long: 103°8'18.685"W
				State: NM

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Brown/red slightly clayey silt, unconsolidated, dry, no odor or stain		
SS	149	CI- <16	22.5			
		GRO <50		Brown clayey silt, very weakly consolidated, damp strong odor, staining		
		DRO 95.4				
3 ft	717		265.4			
				Light tan, slightly clayey silt, scattered caliche fragments, unconsolidated, damp, strong odor, no stain		
6 ft	739		2889			
				Light tan slightly clayey silt, increase in caliche fragments, weakly consolidated, dry, strong odor		
9 ft	617		4402			
				Light tan slightly clayey silt, few small caliche fragments, unconsolidated, dry, decreasing odor		
12 ft	729	CI- 1640	4632			
		GRO 539		Light tan slightly clayey silt, few small caliche fragments, unconsolidated, dry, slight odor		
		DRO 4010				
15 ft	1719		95.7			
				Light tan slightly clayey silt, few small caliche fragments, unconsolidated, dry, slight odor		
18 ft	2140		59.8			
				Light tan slightly clayey silt, few small caliche fragments, unconsolidated, dry, slight odor		
21 ft	2699		60.8			

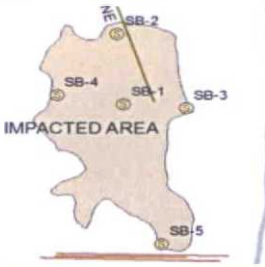






bentonite
seal

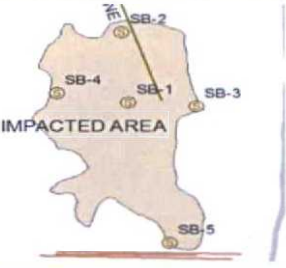

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction		
				Red/tan mixture of unconsolidated slightly clayey silt (50%) and larger fragments of moderately well consolidated. Clayey silt. Scattered caliche fragments. Very slight odor and dampness				
24 ft	2794	CI-4400	23.4					
		GRO <10		Red/tan mixture of caliche fragments (75% volume) and unconsolidated slightly clayey silt. Scattered silt clay masses of type noted above. Very slight odor, very slightly damp				
		DRO 47.5						
27 ft	2153		29.3					
				Red/tan predominantly, slightly clayey, unconsolidated to weakly consolidated silt/very fine sand. Scattered larger caliche fragments. No odor, slightly damp				
30 ft	1633		23.3					
				Red/tan predominantly, slightly clayey, unconsolidated to weakly consolidated silt/very fine sand. Scattered larger caliche fragments. No odor, slightly damp				
33 ft	2023	CI-3360	12					
		GRO <10						
		DRO <10						









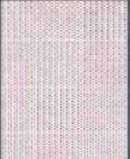



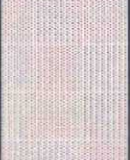



Logger:	Tony Grieco					
Driller:	Harrison & Cooper, Inc.					
Drilling Method:	Air rotary		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-2 Project Consultant: RECS			
Start Date:	8/3/2011		Location: UL/D sec. 11 T22S R37E Lat: 32°24'37.464"N Long: 103°8'18.711"W County: Lea State: NM			
End Date:	8/3/2011					
Comments:		All samples from cuttings.				
DRAFTED BY: L. Weinheimer		TD = 33 ft		GW = 37 ft		
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand, unconsolidated, dry, no odor or stain		
SS	179	CI- <16	5.3			
		GRO <10		Red slightly clayey silt, unconsolidated to weakly consolidated, dry, no odor or stain. Scattered caliche pieces		
		DRO <10				
3 ft	343		3.3			
				Tan, mixture of silt (50% volume) and larger fragments of caliche. Unconsolidated, dry, no stain or odor		
6 ft	306		2			
				Red/tan predominantly, slightly clayey silt with scattered caliche pieces. Unconsolidated to weakly consolidated. Dry, no odor or stain		
9 ft	638		2			
				Tan silt and abundant larger pieces of caliche, unconsolidated, dry, no stain or odor		
12 ft	313		1.6			
15 ft	826	CI- 1220	1.3			
		GRO <10				
		DRO <10				
18 ft	724		0.4			
				Tan silt, unconsolidated, dry, no stain or odor		
21 ft	367		0.4			

bentonite
seal





Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Tan slight red predominantly unconsolidated silt with some fragments of caliche. Slightly damp, no stain or odor		
24 ft	536		0.4			
27 ft	356		0.3			
				Red slight tan predominantly unconsolidated silt, scattered caliche fragments. Slightly damp, no stain or odor		
30 ft	355		0.3			
33 ft	703	CI- 896	0.4			
		GRO <10				
		DRO <10				

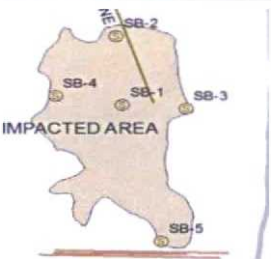

Logger:	Tony Grieco					
Driller:	Harrison & Cooper, Inc.					
Drilling Method:	Air rotary		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-3			
Start Date:	8/3/2011		Project Consultant: RECS Location: UL/D sec. 11 T22S R37E			
End Date:	8/3/2011			Lat: 32°24'37.024"N County: Lea Long: 103°8'18.339"W State: NM		
Comments:		All samples from cuttings. DRAFTED BY: L. Weinheimer TD = 12 ft GW = 37 ft				
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand, unconsolidated, dry, no odor or stain		 bentonite seal
SS	110	CI-32	1			
		GRO <10				
		DRO 23.6		Red slightly clayey silt, unconsolidated and weakly consolidated, dry, no odor or stain		
3 ft	175		0.3			
				Tan silt, unconsolidated, dry, no stain or odor		
6 ft	288	CI-320	0.2			
		GRO <10				
		DRO <10		Tan silt with caliche, unconsolidated, dry, no stain or odor		
9 ft	262		0.3			
12 ft	238	CI-368	0.1			
		GRO <10				
		DRO <10				

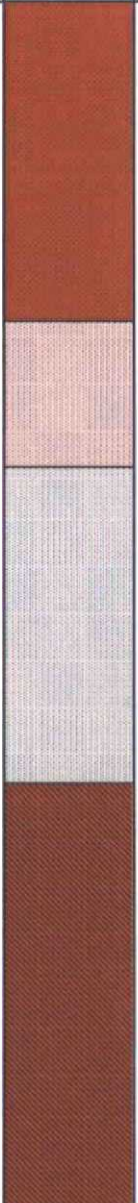
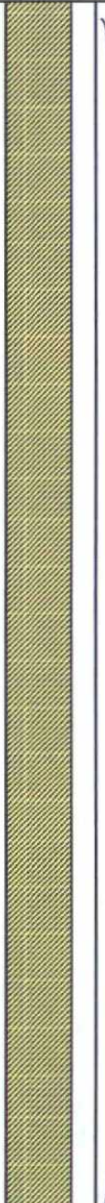
Logger:	Tony Grieco				
Driller:	Harrison & Cooper, Inc.				
Drilling Method:	Air rotary		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-4 Project Consultant: RECS		
Start Date:	8/3/2011		Location: UL/D sec. 11 T22S R37E Lat: 32°24'37.111"N Long: 103°8'19.041"W County: Lea State: NM		
End Date:	8/3/2011				
Comments:	All samples from cuttings.				
DRAFTED BY: L. Weinheimer					
TD = 33 ft		GW = 37 ft			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand, unconsolidated, no odor or stain		
SS	129	CI- <16	0.8			
		GRO <10		Red/tan mixture of slightly clayey unconsolidated silt and larger fragments of caliche. Dry, no stain or odor		
		DRO 48.8				
3 ft	262		0.4			
				Tan mixture of unconsolidated silt and larger fragments of caliche. No stain or odor, dry		
6 ft	233		0.3			
				Red silt/very fine sand, unconsolidated, no stain or odor		
9 ft	1114	CI- 464	0.3			
		GRO <10				
		DRO <10				
12 ft	459		0.4			
						
15 ft	448		0.5			
				Tan mixture of unconsolidated silt and larger fragments of caliche. No stain or odor, dry		
18 ft	511		0.3			
						
21 ft	530		0.3			

bentonite seal

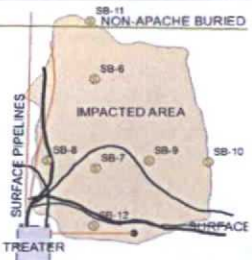

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
						
24 ft	305		0.1			
27 ft	579		0.1	Reddish tan unconsolidated slightly clayey silt/very fine sand with abundant fragments of well consolidated siltstone. Slightly damp, no stain or odor		
30 ft	802		0.2			
33 ft	993	CI- 992	0.4			
		GRO <10				
		DRO <10				

Logger:	Tony Grieco				
Driller:	Harrison & Cooper, Inc.		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-5		
Drilling Method:	Air rotary		Project Consultant: RECS		
Start Date:	8/3/2011		Location: UL/D sec. 11 T22S R37E		
End Date:	8/3/2011			Lat: 32°24'36.246"N Long: 103°8'18.488"W	
Comments: All samples from cuttings.		DRAFTED BY: L. Weinheimer TD = 18 ft GW = 37 ft		County: Lea State: NM	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand, unconsolidated, dry, no odor or stain		
SS	106	CI- <16	2			
		GRO <10		Red silt/very fine sand, weakly consolidated, dry, no odor or stain		
		DRO <10				
3 ft	117		0.6			
				Slightly reddish tan silt with abundant caliche fragments, unconsolidated, dry, no stain or odor		
6 ft	193		0.3			
				Tan silt with scattered small caliche fragments, unconsolidated, dry, no stain or odor		
9 ft	331	CI- 336	0.3			
		GRO <10				
		DRO <10				
12 ft	305		0.3			
				Red silt unconsolidated with abundant fragments of well consolidated siltstone. No stain or odor, dry		
15 ft	267		0.2			
18 ft	240	CI- 208	0.2			
		GRO <10				
		DRO <10				

Logger:	Tony Grieco		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		
Start Date:	8/3/2011		
End Date:	8/3/2011		
Comments:	All samples from cuttings.		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-6 Project Consultant: RECS Location: UL/C sec. 11 T22S R37E Lat: 32°24'37.335"N Long: 103°8'15.553"W County: Lea State: NM
DRAFTED BY: L. Weinheimer			
TD = 6 ft		GW = 37 ft	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Asphaltine cemented dark red silt/very fine sand, medium consolidated where cemented, otherwise unconsolidated. Dry, no odor		
SS	104	CI- <16	0.2			
		GRO <50				
		DRO 300				
3 ft	115	CI- 16	0.6	Red silt/very fine sand, unconsolidated to loosely consolidated, dry, no odor or stain		
		GRO <10				
		DRO 11.9				
6 ft	153	CI- 16	0.7			
		GRO <10				
		DRO 11.8				

Logger:	Tony Grieco		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		
Start Date:	8/4/2011		
End Date:	8/4/2011		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-7 Project Consultant: RECS Location: UL/C sec. 11 T22S R37E Lat: 32°24'36.69"N Long: 103°8'15.552"W County: Lea State: NM
Comments:		All samples from cuttings. DRAFTED BY: L. Weinheimer TD = 33 ft GW = 37 ft	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand, unconsolidated, dry, no stain or odor		
SS	122	CI- <16	1.4			
		GRO <10		Red silt/very fine sand, unconsolidated to weakly consolidated, dry, slight stain, slight odor		
		DRO <10				
3 ft	167		26.5			
				Red silt/very fine sand, unconsolidated, slightly damp, slight stain, strong odor		
6 ft	1069	CI- 1600	1084			
		GRO 1420		Red silt/very fine sand, unconsolidated, dry, no stain, slight odor. Scattered caliche fragments		
		DRO 21300				
9 ft	1570		92.7			
				Red silt/very fine sand, unconsolidated, dry, no stain, slight odor. Scattered caliche fragments		
12 ft	1545		61.6			
15 ft	1173		57.4			
				Red-tan silt/very fine sand, unconsolidated, dry, no stain, slight odor. Scattered caliche fragments, abundant very small caliche chips		
18 ft	1582	CI- 2680	44			
		GRO <10				
		DRO 153				
21 ft	1332		68.1			

bentonite
seal

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
24 ft	1322		70.7			
27 ft	1459		20.5	Red-tan silt/very fine sand, unconsolidated, dry, no stain, slight odor. Scattered caliche fragments, abundant very small caliche chips, increased percentage of larger fragments (25%)		
30 ft	901		38.5			
33 ft	1369	CI- 2280	13.1	Red-tan silt/very fine sand, unconsolidated, dry, no stain, slight odor. Scattered caliche fragments, abundant very small caliche chips, decreased percentage of larger fragments (10%)		
		GRO <10				
		DRO 40				

Logger:	Tony Grieco				
Driller:	Harrison & Cooper, Inc.				
Drilling Method:	Air rotary		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-8 Project Consultant: RECS		
Start Date:	8/4/2011		Location: UL/C sec. 11 T22S R37E Lat: 32°24'36.756"N Long: 103°8'15.931"W County: Lea State: NM		
End Date:	8/4/2011				
Comments:	All samples from cuttings.				
DRAFTED BY: L. Weinheimer					
TD = 9 ft		GW = 37 ft			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Dark red/brown silt/very fine sand, unconsolidated to medium consolidated with asphaltine cement. Dry, very stained but no odor		bentonite seal
SS	120	CI-16	6			
		GRO <50				
		DRO 142				
3 ft	151		3.9	Dark red silt/very fine sand, unconsolidated to medium consolidated, dry, little stain, no odor		
6 ft	169	CI-32	3.3			
		GRO <10				
		DRO 19.6				
9 ft	140	CI-32	2.7	Tan silt, unconsolidated, dry, no stain or odor, scattered larger caliche fragments		
		GRO <10				
		DRO <10				

Logger:	Tony Grieco		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		
Start Date:	8/4/2011		
End Date:	8/4/2011		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-9 Project Consultant: RECS Location: UL/C sec. 11 T22S R37E
Comments: All samples from cuttings. DRAFTED BY: L. Weinheimer TD = 33 ft GW = 37 ft		Lat: 32°24'36.741"N Long: 103°8'15.144"W County: Lea State: NM	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Dark red silt/very fine sand, unconsolidated to medium consolidated, dry, no stain or odor		
SS	138	CI- <16	3.8			
		GRO <10		Red silt/very fine sand, unconsolidated, dry, no stain or odor		
		DRO <10				
3 ft	154		3.3			
				Black silt, unconsolidated, oily wet, heavy stain, very strong odor		
6 ft	308	CI- 416	348			
		GRO 680		Red silt/very fine sand, unconsolidated, dry, slight stain, strong odor		
		DRO 14000				
9 ft	915	CI- 992	334			
		GRO 440		Red silt/very fine sand, unconsolidated, dry, slight stain, strong odor, slightly decreased odor		
		DRO 12500				
12 ft	1433		57.3			
				Red silt/very fine sand, unconsolidated, dry, odor, no stain		
15 ft	1633		51.3			
				Red silt/very fine sand, unconsolidated, dry, odor, no stain, slightly decreased odor		
18 ft	1285		85.3			

bentonite
seal

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
21 ft	1792		57.4	Tan silt, unconsolidated, dry, no stain, slight odor, scattered caliche fragments		
24 ft	1730		51.8			
27 ft	2033		88.6			
30 ft	1795		43.3			
33 ft	1644	CI-3000	16.5			
		GRO <10				
		DRO 257				

Logger:	Tony Grieco				
Driller:	Harrison & Cooper, Inc.				
Drilling Method:	Air rotary		Company: Apache Corporation		
Start Date:	8/4/2011		Project Name: Lou Wortham Central Batt AD Well ID: SB-10		
End Date:	8/4/2011	Project Consultant: RECS		Location: UL/C sec. 11 T22S R37E	
Comments:		All samples from cuttings.		Lat: 32°24'36.721"N County: Lea Long: 103°8'14.689"W State: NM	
DRAFTED BY: L. Weinheimer		TD = 9 ft		GW = 37 ft	

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand unconsolidated, dry, no odor or stain		
SS	133	CI- <16	4.5			
		GRO <10		Red silt/very fine sand, unconsolidated to medium consolidated, dry, no stain or odor		
		DRO <10				
3 ft	113		4.5			
6 ft	207	CI- 32	3.9	Tan silt, unconsolidated, dry, no odor or stain, scattered caliche fragments		bentonite seal
		GRO <10				
		DRO 33				
9 ft	148	CI- 80	3.4			
		GRO <10				
		DRO <10				

Logger:	Tony Grieco					
Driller:	Harrison & Cooper, Inc.					
Drilling Method:	Air rotary		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-11			
Start Date:	8/4/2011		Project Consultant: RECS			
End Date:	8/4/2011	Location: UL/C sec. 11 T22S R37E				
Comments:		All samples from cuttings. DRAFTED BY: L. Weinheimer TD = 6 ft GW = 37 ft		Lat: 32°24'37.776"N Long: 103°8'15.584"W County: Lea State: NM		
Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand unconsolidated, dry, no odor or stain		 bentonite seal
SS	146	CI- <16	3.2			
		GRO <10				
		DRO 17.8				
3 ft	122	CI- 16	2.6	Red silt/very fine sand, unconsolidated to medium consolidated, dry, no stain or odor		
		GRO <10				
		DRO 10.4				
6 ft	154	CI- 32	2.7			
		GRO <10				
		DRO 28.2				

Logger:	Tony Grieco			
Driller:	Harrison & Cooper, Inc.			
Drilling Method:	Air rotary		Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: SB-12	
Start Date:	8/4/2011		Project Consultant: RECS	
End Date:	8/4/2011	Location: UL/C sec. 11 T22S R37E		
Comments:		All samples from cuttings. DRAFTED BY: L. Weinheimer TD = 6 ft GW = 37 ft		Lat: 32°24'36.257"N Long: 103°8'15.567"W County: Lea State: NM

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Red silt/very fine sand unconsolidated, dry, no odor or stain		
SS	92	CI- <16	2.3			
		GRO <10				
		DRO 12.8				
3 ft	117	CI- 16	2.2	Red silt/very fine sand, unconsolidated to medium consolidated, dry, no stain or odor		bentonite seal
		GRO <10				
		DRO <10				
6 ft	116	CI- <16	1.7			
		GRO <10				
		DRO <10				

August 08, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: LOU WORTHAM BATTERY AD

Enclosed are the results of analyses for samples received by the laboratory on 08/04/11 8:50.

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 Hydrocarbons

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

Cardinal Laboratories is accredited 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

Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #1 SURFACE (H101617-01)

Chloride, SM4500CI-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/04/2011	ND	368	92.0	400	12.2	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	95.4	50.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 112 % 70-130

Surrogate: 1-Chlorooctadecane 125 % 70-130

Sample ID: SB #1 12' (H101617-02)

Chloride, SM4500CI-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1640	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	539	50.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	4010	50.0	08/07/2011	ND	193	96.5	200	2.13	

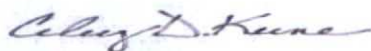
Surrogate: 1-Chlorooctane 119 % 70-130

Surrogate: 1-Chlorooctadecane 118 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #1 24' (H101617-03)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	4400	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	47.5	10.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 113 % 70-130

Surrogate: 1-Chlorooctadecane 125 % 70-130

Sample ID: SB #1 33' (H101617-04)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3360	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 119 % 70-130

Surrogate: 1-Chlorooctadecane 130 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #2 SURFACE (H101617-05)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	
Surrogate: 1-Chlorooctane		119 %	70-130						
Surrogate: 1-Chlorooctadecane		131 %	70-130						

Sample ID: SB #2 15' (H101617-06)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1220	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	
Surrogate: 1-Chlorooctane		116 %	70-130						
Surrogate: 1-Chlorooctadecane		128 %	70-130						

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #2 33' (H101617-07)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	896	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	
Surrogate: 1-Chlorooctane		113 %	70-130						
Surrogate: 1-Chlorooctadecane		125 %	70-130						

Sample ID: SB #3 SURFACE (H101617-08)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	23.6	10.0	08/07/2011	ND	193	96.5	200	2.13	
Surrogate: 1-Chlorooctane		110 %	70-130						
Surrogate: 1-Chlorooctadecane		121 %	70-130						

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #3 6' (H101617-09)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	320	16.0	08/04/2011	ND	448	112	400	3.64		
TPH 8015M		mg/kg		Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924		
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13		

Surrogate: 1-Chlorooctane 108 % 70-130

Surrogate: 1-Chlorooctadecane 119 % 70-130

Sample ID: SB #3 12' (H101617-10)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	368	16.0	08/04/2011	ND	448	112	400	3.64		
TPH 8015M		mg/kg		Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924		
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13		

Surrogate: 1-Chlorooctane 114 % 70-130

Surrogate: 1-Chlorooctadecane 124 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #4 SURFACE (H101617-11)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	48.8	10.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 112 % 70-130

Surrogate: 1-Chlorooctadecane 123 % 70-130

Sample ID: SB #4 9' (H101617-12)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	464	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 111 % 70-130

Surrogate: 1-Chlorooctadecane 122 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #4 33' (H101617-13)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	992	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 112 % 70-130

Surrogate: 1-Chlorooctadecane 124 % 70-130

Sample ID: SB #5 SURFACE (H101617-14)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	210	105	200	0.924	
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	193	96.5	200	2.13	

Surrogate: 1-Chlorooctane 111 % 70-130

Surrogate: 1-Chlorooctadecane 121 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #5 9' (H101617-15)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	336	16.0	08/04/2011	ND	448	112	400	3.64		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/07/2011	ND	217	109	200	2.47		
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	197	98.4	200	1.36		
Surrogate: 1-Chlorooctane			108 %	70-130						
Surrogate: 1-Chlorooctadecane			116 %	70-130						

Sample ID: SB #5 18' (H101617-16)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	208	16.0	08/04/2011	ND	448	112	400	3.64		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/07/2011	ND	217	109	200	2.47		
DRO >C10-C28	<10.0	10.0	08/07/2011	ND	197	98.4	200	1.36		
Surrogate: 1-Chlorooctane			106 %	70-130						
Surrogate: 1-Chlorooctadecane			111 %	70-130						

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #6 SURFACE (H101617-17)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	08/07/2011	ND	217	109	200	2.47	
DRO >C10-C28	300	50.0	08/07/2011	ND	197	98.4	200	1.36	

Surrogate: 1-Chlorooctane 107 % 70-130

Surrogate: 1-Chlorooctadecane 116 % 70-130

Sample ID: SB #6 3' (H101617-18)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	08/04/2011	ND	448	112	400	3.64	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/07/2011	ND	217	109	200	2.47	
DRO >C10-C28	11.9	10.0	08/07/2011	ND	197	98.4	200	1.36	

Surrogate: 1-Chlorooctane 102 % 70-130

Surrogate: 1-Chlorooctadecane 110 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/08/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/03/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB #6 6' (H101617-19)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	08/04/2011	ND	448	112	400	3.64		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/07/2011	ND	217	109	200	2.47		
DRO >C10-C28	11.8	10.0	08/07/2011	ND	197	98.4	200	1.36		
Surrogate: 1-Chlorooctane			111 %	70-130						
Surrogate: 1-Chlorooctadecane			120 %	70-130						

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

Z-01	One or more surrogates above historical limits.
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

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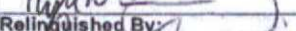
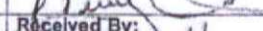

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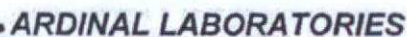
Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

<small>PLEASE NOTE: Usability and Damages, Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.</small>			
Relinquished By: 	Date: 8-4-11 Time: 7:30	Received By: 	Phone Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Add'l Phone #: Fax Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Add'l Fax #:
Relinquished By: 	Date: 8/4/11 Time: 8:50	Received By: 	REMARKS: email results Natalie.Gladden@usa.apachecorp.com; Zconder@rice-ecs.com; Bbaker@rice-ecs.com; hconder@rice-ecs.com; Lweinheimer@rice-ecs.com KPOORMAN@rice-ecs.com
Delivered By: (Circle One) Sampler - URS - Bus - Other:	Sample Condition Cool Intact <div style="display: flex; justify-content: space-around;"> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div> -10°C	CHECKED BY: (Initials) 	

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



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 14 of 14

August 09, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: LOU WORTHAM BATTERY AD

Enclosed are the results of analyses for samples received by the laboratory on 08/04/11 13:10.

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 Hydrocarbons

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

Cardinal Laboratories is accredited 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

Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 7 SURFACE (H101622-01)

Chloride, SM4500CI-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	<10.0	10.0	08/08/2011	ND	193	96.5	200	0.577	
Surrogate: 1-Chlorooctane	106 %	70-130							
Surrogate: 1-Chlorooctadecane	116 %	70-130							

Sample ID: SB 7 6' (H101622-02)

Chloride, SM4500CI-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1600	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	1420	100	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	21300	100	08/08/2011	ND	193	96.5	200	0.577	
Surrogate: 1-Chlorooctane	118 %	70-130							
Surrogate: 1-Chlorooctadecane	99.0 %	70-130							

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 7 18' (H101622-03)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2680	16.0	08/05/2011	ND	464	116	400	7.14		
TPH 8015M		mg/kg		Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358		
DRO >C10-C28	153	10.0	08/08/2011	ND	193	96.5	200	0.577		

Surrogate: 1-Chlorooctane 99.4 % 70-130

Surrogate: 1-Chlorooctadecane 110 % 70-130

Sample ID: SB 7 33' (H101622-04)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2280	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	40.0	10.0	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 106 % 70-130

Surrogate: 1-Chlorooctadecane 115 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 8 SURFACE (H101622-05)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	142	50.0	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 99.9 % 70-130

Surrogate: 1-Chlorooctadecane 107 % 70-130

Sample ID: SB 8 6' (H101622-06)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	19.6	10.0	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 107 % 70-130

Surrogate: 1-Chlorooctadecane 118 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 8 9' (H101622-07)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	<10.0	10.0	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 103 % 70-130

Surrogate: 1-Chlorooctadecane 107 % 70-130

Sample ID: SB 9 SURFACE (H101622-08)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	<10.0	10.0	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 117 % 70-130

Surrogate: 1-Chlorooctadecane 126 % 70-130

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Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 9 6' (H101622-09)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	416	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	680	100	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	14000	100	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 120 % 70-130

Surrogate: 1-Chlorooctadecane 118 % 70-130

Sample ID: SB 9 9' (H101622-10)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	992	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	440	100	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	12500	100	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 118 % 70-130

Surrogate: 1-Chlorooctadecane 104 % 70-130

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Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 9 33' (H101622-11)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3000	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/08/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	257	10.0	08/08/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 103 % 70-130

Surrogate: 1-Chlorooctadecane 112 % 70-130

Sample ID: SB 10 SURFACE (H101622-12)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	08/05/2011	ND	464	116	400	7.14	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	<10.0	10.0	08/09/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 96.4 % 70-130

Surrogate: 1-Chlorooctadecane 100 % 70-130

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Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 10 6' (H101622-13)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	08/05/2011	ND	448	112	400	0.00	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	33.0	10.0	08/09/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 106 % 70-130

Surrogate: 1-Chlorooctadecane 114 % 70-130

Sample ID: SB 10 9' (H101622-14)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	80.0	16.0	08/05/2011	ND	448	112	400	0.00	
TPH 8015M		mg/kg	Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	<10.0	10.0	08/09/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 112 % 70-130

Surrogate: 1-Chlorooctadecane 120 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 11 SURFACE (H101622-15)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	08/05/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: ab						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358		
DRO >C10-C28	17.8	10.0	08/09/2011	ND	193	96.5	200	0.577		

Surrogate: 1-Chlorooctane 119 % 70-130

Surrogate: 1-Chlorooctadecane 129 % 70-130

Sample ID: SB 11 3' (H101622-16)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	08/05/2011	ND	448	112	400	0.00	
TPH 8015M		mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358	
DRO >C10-C28	10.4	10.0	08/09/2011	ND	193	96.5	200	0.577	

Surrogate: 1-Chlorooctane 103 % 70-130

Surrogate: 1-Chlorooctadecane 113 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 11 6' (H101622-17)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	08/05/2011	ND	448	112	400	0.00		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358		
DRO >C10-C28	28.2	10.0	08/09/2011	ND	193	96.5	200	0.577		

Surrogate: 1-Chlorooctane 107 % 70-130

Surrogate: 1-Chlorooctadecane 115 % 70-130

Sample ID: SB 12 SURFACE (H101622-18)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	08/05/2011	ND	448	112	400	0.00		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358		
DRO >C10-C28	12.8	10.0	08/09/2011	ND	193	96.5	200	0.577		

Surrogate: 1-Chlorooctane 115 % 70-130

Surrogate: 1-Chlorooctadecane 121 % 70-130

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

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

 Received: 08/04/2011
 Reported: 08/09/2011
 Project Name: LOU WORTHAM BATTERY AD
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 08/04/2011
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Aaron Berry

Sample ID: SB 12 3' (H101622-19)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	16.0	16.0	08/05/2011	ND	448	112	400	0.00		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358		
DRO >C10-C28	<10.0	10.0	08/09/2011	ND	193	96.5	200	0.577		
Surrogate: 1-Chlorooctane	114 %	70-130								
Surrogate: 1-Chlorooctadecane	121 %	70-130								

Sample ID: SB 12 6' (H101622-20)

Chloride, SM4500Cl-B			mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	08/05/2011	ND	448	112	400	0.00		
TPH 8015M			mg/kg		Analyzed By: ab					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/09/2011	ND	196	97.8	200	0.358		
DRO >C10-C28	<10.0	10.0	08/09/2011	ND	193	96.5	200	0.577		
Surrogate: 1-Chlorooctane	110 %	70-130								
Surrogate: 1-Chlorooctadecane	117 %	70-130								

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Celey D. Keene, Lab Director/Quality Manager

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

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Celey D. Keene, Lab Director/Quality Manager



CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Apache				BILL TO				ANALYSIS REQUEST																					
Project Manager: Natalie Gladden				P.O. #:				<div style="display: flex; flex-direction: column; align-items: center;"> <div>Chlorides</div> <div>TPH 8015 M</div> <div>BTEX</div> <div>Texas TPH</div> <div>Complete Cations/Anions</div> <div>TDS</div> </div>																					
Address:				Company:																									
City:		State: NM Zip:		Attn:																									
Phone #:		Fax #:		Address:																									
Project #:		Project Owner:		City:																									
Project Name:				State: Zip:																									
Project Location: Lou Worham Battery AD				Phone #:																									
Sampler Name: Kyle Norman				Fax #:																									
FOR LAB USE ONLY																													
Lab I.D.		Sample I.D.		G/RAB OR (C)OMP.		# CONTAINERS		MATRIX		PRESERV.		SAMPLING																	
								GROUNDWATER																					
								WASTEWATER																					
								SOIL																					
								OIL																					
								SLUDGE																					
								OTHER:																					
								ACID/BASE:																					
								ICE / COOL																					
								OTHER:																					
												DATE		TIME															
H101622-1		SB7 Surface		G		1								8-4-11		8:00													
-2		SB7 6'		G		1								8-4-11		8:05													
-3		SB7 18'		G		1								8-4-11		8:10													
-4		SB7 33'		G		1								8-4-11		8:15													
-5		SB8 Surface		G		1								8-4-11		8:30													
-6		SB8 6'		G		1								8-4-11		8:35													
-7		SB8 9'		G		1								8-4-11		8:40													
-8		SB9 Surface		G		1								8-4-11		9:00													
-9		SB9 6'		G		1								8-4-11		9:05													
-10		SB9 9'		G		1								8-4-11		9:10													

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

Relinquished By:		Date: 8-4-11		Received By:		Phone Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Add'l Phone #:	
Time: 1:10p				[Signature]		Fax Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Add'l Fax #:	
Relinquished By:		Date:		Received By:		REMARKS: email results Natalie.Gladden@usa.apachecorp.com; Zconder@rice-ecs.com; Bbaker@rice-ecs.com; hconder@rice-ecs.com; Lweinheimer@rice-ecs.com knorman@rice-ecs.com			
		Time:							
Delivered By: (Circle One)				Sample Condition		CHECKED BY:			
Sampler - UPS - Bus - Other:				Cool Intact		(Initials)			
#26 50C				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No		[Signature]			

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



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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



Appendix B

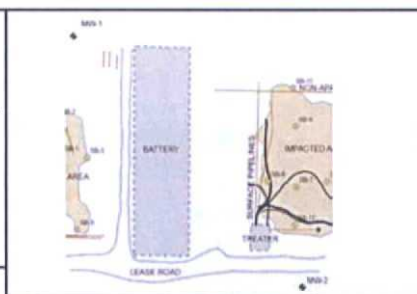
Monitor Well Logs

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

Logger:	Tony Grieco		
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air rotary		
Start Date:	8/3/2011		
End Date:	8/3/2011	Company: Apache Corporation Project Name: Lou Wortham Central Batt AD Well ID: MW-1 Project Consultant: RECS	
Comments: No sampling occurred on this well. Samples were taken for lithology only. All samples from cuttings. DRAFTED BY: L. Weinheimer TD = 46 ft GW = 37		Location: UL/D sec. 11 T22S R37E Lat: 32°24'38.386"N County: Lea Long: 103°8'18.525"W State: NM	

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
5 ft				Red clayey silt/very fine sand, unconsolidated to moderately consolidated, dry, no odor or stain		
10 ft				Red clayey silt/very fine sand, unconsolidated to moderately consolidated, slightly damp, no odor or stain		
15 ft				Red/tan clayey silt with abundant caliche fragments, unconsolidated, dry, no odor or stain		
20 ft				Tan silt, with abundant caliche fragments, unconsolidated, dry, no odor or stain		
25 ft				Tan silt, decrease in caliche fragments, unconsolidated, damp, no odor or stain		
30 ft				Tan silt, decrease in caliche fragments, unconsolidated, damp, no odor or stain		
35 ft				Tan silt, decrease in caliche fragments, unconsolidated, very damp, no odor or stain		
40 ft				NO SAMPLES TAKEN		
45 ft						
46 ft						

Logger: Tony Grieco
Driller: Harrison & Cooper, Inc.
Drilling Method: Air rotary
Start Date: 8/4/2011
End Date: 8/4/2011



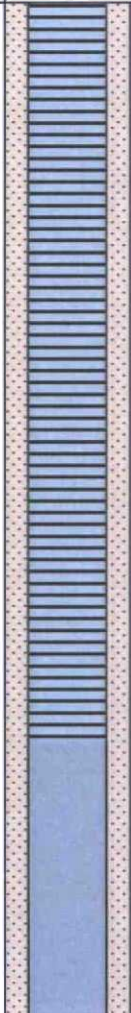
Company: Apache Corporation
Project Name: Lou Wortham Central Batt AD
Well ID: MW-2
Project Consultant: RECS

Comments:
 No sampling occurred on this well. Samples were taken for lithology only. All samples from cuttings. Red bed clay at 40 ft.
 DRAFTED BY: L. Weinheimer
 TD = 80 ft GW = 37

Location: UL/D sec. 11 T22S R37E
Lat: 32°24'35.581"N **County:** Lea
Long: 103°8'15.49"W **State:** NM

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
5 ft				Red silt/very fine sand, unconsolidated, dry, scattered caliche fragments, no odor or stain		
10 ft				Tan silt, unconsolidated, dry, no odor or stain		
15 ft				Tan silt and caliche fragments, unconsolidated, dry. Abundant fragments of moderately consolidated tan siltstone (30%), no odor or stain		
20 ft				Tan silt, unconsolidated, dry scattered caliche fragments, no odor or stain		
25 ft						
30 ft						
35 ft				Red silt/very fine sand, unconsolidated, damp, no stain or odor		
40 ft				NO SAMPLES TAKEN		

4 in PVC
 bentonite seal

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
45 ft				NO SAMPLES TAKEN		 sand pack
50 ft						
55 ft						
60 ft						
65 ft						
70 ft						
75 ft						
80 ft						



Appendix C

MW Sampling Data

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

August 16, 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 08/16/11 11:01.

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 Hydrocarbons

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

Cardinal Laboratories is accredited 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

Lab Director/Quality Manager

Analytical Results For:

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

Received:	08/16/2011	Sampling Date:	08/16/2011
Reported:	08/16/2011	Sampling Type:	Water
Project Name:	APACHE LOU WORTHAM CENTRAL BATT	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T22S-R37E-SEC11 UL/CDEF ~ LEA CTY,		

Sample ID: MONITOR WELL #1 (H101717-01)

Chloride, SM4500Cl-B		mg/L		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	20800	4.00	08/16/2011	ND	108	108	100	0.00	

Sample ID: MONITOR WELL #2 (H101717-02)

Chloride, SM4500Cl-B		mg/L		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	22000	4.00	08/16/2011	ND	108	108	100	0.00	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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

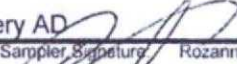
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

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.)

[illegible]



Appendix D

Imported Sand and Caliche Laboratory Confirmation

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

October 13, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: LOU WORTHAM CENTRAL BATTERY

Enclosed are the results of analyses for samples received by the laboratory on 10/11/11 8:05.

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 Hydrocarbons

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

Cardinal Laboratories is accredited 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

Lab Director/Quality Manager

Analytical Results For:

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

Received:	10/11/2011	Sampling Date:	10/10/2011
Reported:	10/13/2011	Sampling Type:	Soil
Project Name:	LOU WORTHAM CENTRAL BATTERY	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: CALICHE BACKFILL (H102180-01)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	10/11/2011	ND	448	112	400	3.64	

Sample ID: SAND BACKFILL (H102180-02)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/11/2011	ND	448	112	400	3.64	

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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

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Celey D. Keene, Lab Director/Quality Manager



CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325) 673-7020

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Apache Corp.				BILL TO				ANALYSIS REQUEST																	
Project Manager: Natalie Gladden				P.O. #:				<div style="display: flex; flex-direction: column; align-items: center;"> <div>Chlorides</div> <div>TPH 8015 M</div> <div>BTEX</div> <div>Texas TPH</div> <div>Complete Cations/Anions</div> <div>TDS</div> </div>																	
Address:				Company:																					
City:		State:		Zip:		Attn:																			
Phone #:		Fax #:		Address:																					
Project #:		Project Owner:		City:																					
Project Name: LOW WORTHAM CENTRAL BATTERY				State:																Zip:					
Project Location:				Phone #:																					
Sampler Name: TONY GRIECO				Fax #:																					
FOR LAB USE ONLY																									
Lab I.D.		Sample I.D.		(G)RAB OR (C)OMP. # CONTAINERS		MATRIX		PRESERV		SAMPLING															
						GROUNDWATER																			
						WASTEWATER																			
						SOIL																			
						OIL																			
						SLUDGE																			
						OTHER :																			
						ACID/BASE:																			
						ICE / COOL																			
						OTHER :																			
										DATE		TIME													
H102180				1		CAUCHE BACKFILL		✓				10/10/11		8:30		✓									
				2		SAND BACKFILL		✓				10/10/11		2:00		✓									

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

Relinquished By:		Date: 10-11-11		Received By:		Phone Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Add'l Phone #:	
		Time: 12:15				Fax Result: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Add'l Fax #:	
Relinquished By:		Date: 10-11-11		Received By:		REMARKS: email results natalie.gladden@apachecorp.com Zconder@rice-ecs.com; Bbaker@rice-ecs.com; hconder@rice-ecs.com; Lweinheimer@rice-ecs.com			
		Time: 0805							
Delivered By: (Circle One)									
Sampler - UPS - Bus - Other:		19°C		Sample Condition					
				Cool Intact					
				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
				CHECKED BY: (Initials)					

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

#26



Appendix E

Imported Sand Laboratory Confirmation

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

October 17, 2011

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: LOU WORTHAM LEASE

Enclosed are the results of analyses for samples received by the laboratory on 10/13/11 16:25.

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 Hydrocarbons

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

Cardinal Laboratories is accredited 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

Lab Director/Quality Manager

Analytical Results For:

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

Received: 10/13/2011
Reported: 10/17/2011
Project Name: LOU WORTHAM LEASE
Project Number: NONE GIVEN
Project Location: NOT GIVEN

Sampling Date: 10/13/2011
Sampling Type: Soil
Sampling Condition: ** (See Notes)
Sample Received By: Jodi Henson

Sample ID: IMPORTED SOIL (H102213-01)

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	10/15/2011	ND	432	108	400	3.64	

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

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

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Celey D. Keene, Lab Director/Quality Manager

[illegible]



Appendix F

Quality Procedures

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



PO Box 5630
Hobbs, NM 88241
Phone: (575) 393-4411
Fax: (575) 393-0293

REVEGETATION FORM

1. General Information

Site name: Apache Lou Wortham Central Battery AD						
U/L D & C	Section 11	Township 22S	Range 37E	County Lea	Latitude 32°24'37.091"N	Longitude 103°8'17.31"W
Contact Name: Bruce Baker						
Email: bbaker@rice-ecs.com						
Site size: 16,055 square feet			Map detail of site attached <input checked="" type="checkbox"/>			
Additional information:						

2. Soils

**Do not rip caliche subsoils; caliche rocks brought to the surface by ripping shall be removed.*

Salvaged from site <input type="checkbox"/>	Bioremediated <input type="checkbox"/>	Imported <input checked="" type="checkbox"/>	Blended <input type="checkbox"/>	Depth (in): 60 in	
Texture: sandy		Describe soil & subsoil: Sandy blow sand			
Soil prep methods: Rip <input type="checkbox"/>	Depth(in):	Disc <input checked="" type="checkbox"/>	Depth (in): 6 in	Rollerpack <input type="checkbox"/>	
Date completed: 10/21/11					

3. Bioremediation

Fertilizer <input type="checkbox"/>	Hay <input type="checkbox"/>	Other <input checked="" type="checkbox"/>
Type:		Describe: 5 bags of BioNhance
Lbs/acre:		


4. Seeding

**Attach seed bag tags to this form. Seed bag tags shall contain the site name and S-T-R.*

Custom seed mix <input checked="" type="checkbox"/>	Prescribed mix <input type="checkbox"/>	Seed mix name: 30 lbs Johnson seed mix, 30 lbs wheat	Seeding date: 10/21/2011
Broadcast <input checked="" type="checkbox"/>			
Method: hand operated seeder			
Soil conditions during seeding: Dry <input checked="" type="checkbox"/> Damp <input type="checkbox"/> Wet <input type="checkbox"/>			
Photos attached <input checked="" type="checkbox"/>		Observations:	
Number of photos:			

5. Certification

I hereby certify that the information in this form and attachments is true and complete to the best of my knowledge and belief.

Name: Oscar Frayre	Title: Environmental Tech	Date: 10/25/11
Signature: 		



Appendix G

Photo Documentation

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

Apache Lou Wortham Central Battery AD
Unit C, D, E & F, Section 11, T-22-S, R-37-E



Beginning west excavation, facing south
8/29/11



Beginning east excavation, facing northeast
8/31/11



Exporting soil, facing east
9/23/11



East side, 21 ft excavation complete, facing south
9/26/11



Importing clay, facing northwest
10/6/11



East side, clay layer completed in 21 ft excavation, facing northeast
10/6/11



West side, installing liner over clay layer, facing west
10/6/11



Padding the liner, facing north
10/7/11



East side, deeping main excavation to 5 ft, facing northwest
10/7/11



Importing caliche, facing east
10/7/11



East side, backfilling pit, facing southwest
10/10/11



East side, placing sand pad over caliche, facing Southeast
10/10/11



West side, backfilling 21 ft excavations, facing south
10/11/11



East side, liner installed at 5 ft, facing northwest
10/11/11



West side, liner installed at 5 ft, facing northeast
10/12/11



East side, excavation backfilled, facing northeast
10/14/11



West side, adding soil amendments, facing north
10/21/11



West side, seeding site, facing north
10/21/11



West excavation, disking the seed in, facing east
10/21/11



West side, excavation complete, facing west
10/21/11



East excavation, adding soil amendments, facing north
10/21/11



East side, seeding site, facing southwest
10/21/11



East side, disking the seed in, facing west
10/21/11



East side, excavation complete, facing northeast
10/21/11