1R - 2627

REPORTS

DATE:

11-5-12

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

CERTIFIED MAIL
RETURN RECEIPT NO. 7007 2560 0003 0320 5471

November 5th, 2012

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

RE: **CAP Report for Groundwater**
Apache Corporation
NMGSAU 1631 (1R-2627): UL/J sec. 32 T19S R37E

Mr. Hansen:

Apache Corporation (Apache) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site.

Background and Previous Work

The site is located approximately 1 mile southwest of Monument at UL/J, Sec. 32, T19S, R37E in Lea County, NM (Figure 1). A leak was discovered at the site on September 28th, 2010. An unknown amount of produced water was released from the injection line collar. According to monitor well sampling data at the site, groundwater is located at approximately 14 ft below ground surface (bgs).

Excavation of the site began on September 28th, 2010. The site was excavated to 38 ft x 96 ft x 18 ft deep to remove the saturated soils to a NMOCD approved disposal facility. The depth of saturated soils reached 14 ft 8 inches bgs at which point the capillary fringe of the aquifer was encountered. On October 7th, 2010, three (3) soil bores were drilled at the site to determine the extent of impact. RECS personnel field tested the soil for chloride and tested for hydrocarbons using a photo-ionization detector (PID). Representative samples were submitted to a commercial laboratory for chloride and TPH analyses. The site was backfilled to 4.5 ft bgs, where a 20-mil, reinforced liner was installed with 6 inches of blow sand placed below and above the liner for padding.

On October 12th, 2010, the initial C-141 was submitted to NMOCD-District 1 and was approved. Subsequently, the remaining excavation at the site was backfilled with clean, imported soil, and the site was contoured to the surrounding landscape. On October 16th, 2010, amendments were incorporated into the soil surface, and the site was seeded.

On October 25th, 2010, MW-1 was installed 45 ft southeast of the line break. On December 21st, 2010, MW-2 was installed 56 ft NNW of the line break, and on April

13th, 2011, MW-3 was installed 199 ft SE of the line break (Figure 2). The monitor wells have been sampled quarterly since their installation (Appendix A).

On October 11th, 2011, a Corrective Action Plan (CAP) was submitted to NMOCD. The CAP was approved by NMOCD on October 17th, 2011. RECS recommended that a three month groundwater source removal and test pumping program be conducted to determine if groundwater remediation could be achieved quickly. The pumping program would also assist in the evaluation of groundwater restoration methods. Water retrieved from the existing 4-inch monitoring well (MW-1) would be used for production operations. Based on the program results, a remedy for the site would be determined.

On August 14th, 2012, a Corrective Action Plan for Groundwater was submitted to NMOCD. The CAP was approved by NMOCD on August 15th, 2012. RECS detailed the groundwater and chloride extraction totals of the test pumping program. RECS recommended that, as a groundwater remedy, the test pumping program remain in use until groundwater reaches near-background levels of chloride.

Since the groundwater source removal and pumping program began on April 10th, 2012, a total of 2,725 barrels of groundwater have been removed from the site. Given the most recent laboratory chloride readings 970 mg/L in MW-1, the volume of groundwater removal indicates that 420 kg of chloride have been removed. In order to maintain integrity of the system and avoid possible utility and/or environmental damages, the pumping system at the site will be shut in throughout the winter months and will resume in the spring of 2013. As stated in the CAP for Groundwater, approved in August 2012, Apache will continue the pumping program until the chloride concentrations decrease to near-background levels.

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

Sincerely,

Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

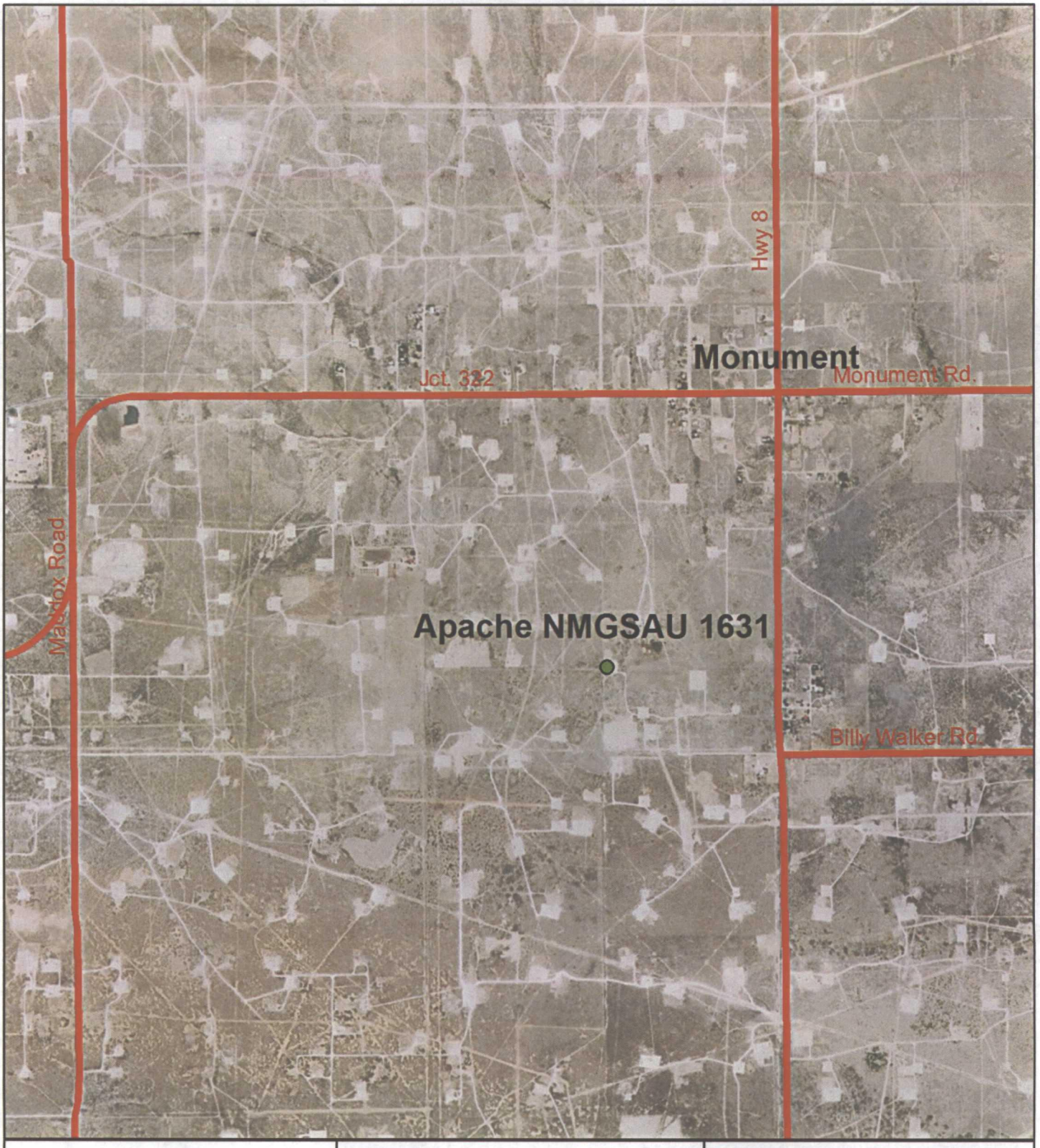
Attachments:

Figure 1: Site Map
Figure 2: Site Plat with Monitor Well Sampling Data
Appendix A: Laboratory Results

Figures

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

Site Map



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC
RECS

Apache NMGSAU 1631

LEGALS:UL/J sec. 32
T19S R37E

Case #: 1R-2627

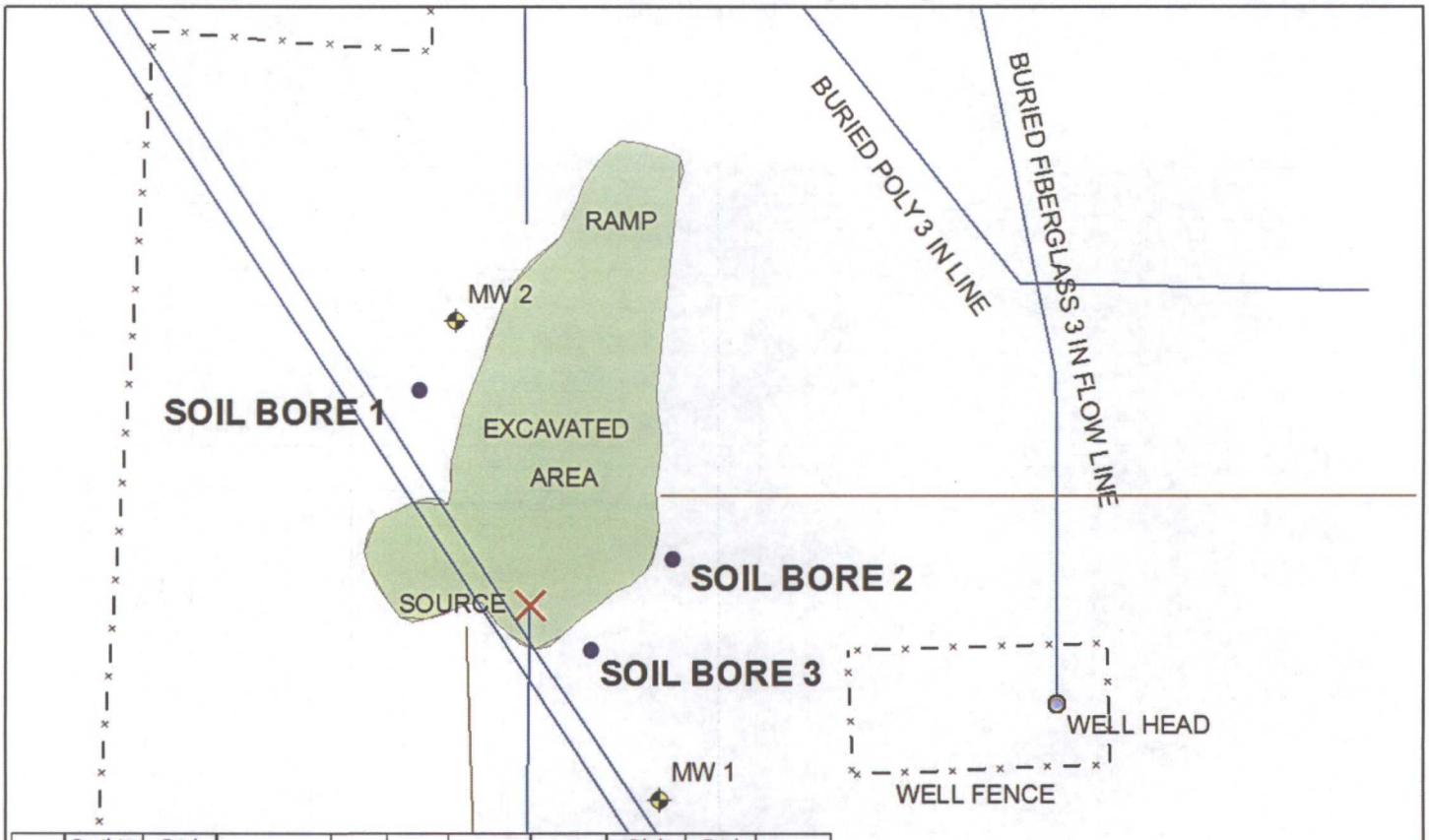
Figure 1

N
W E
S

0 750 1,500 3,000
Feet

Drawing date: 5-10-11
Drafted by: L. Weinheimer

Monitor Well Sampling Data



MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
1	13.84	50.35	11/3/2010	6400	12700	0.015	0.001	0.004	0.01	1120
	13.83	50.35	1/6/2011	3250	6600	0.007	<0.001	0.002	0.006	697
	13.86	50.36	5/19/2011	2420	4770	<0.001	<0.001	<0.001	<0.003	531
	13.81	50.35	9/1/2011	860	2060	<0.001	<0.001	<0.001	<0.003	232
	13.99	50.35	11/18/2011	1480	3150	<0.001	<0.001	<0.001	<0.003	344
	13.87	50.35	3/6/2012	1280	2730	<0.001	<0.001	<0.001	<0.003	363
	XXX	50.35	6/20/2012	540	1420	<0.001	<0.001	<0.001	<0.003	116
	XXX	50.35	9/25/2012	970	2190	<0.001	<0.001	<0.001	<0.003	190

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
2	13.47	61.15	1/6/2011	320	878	<0.001	<0.001	<0.001	<0.003	81.1
	13.52	61.15	5/19/2011	296	907	<0.001	<0.001	<0.001	<0.003	67.1
	13.68	61.15	9/1/2011	284	785	<0.001	<0.001	<0.001	<0.003	75.7
	13.69	61.15	11/18/2011	308	860	<0.001	<0.001	<0.001	<0.003	64.1
	13.58	61.15	3/6/2012	280	907	<0.001	<0.001	<0.001	<0.003	68.8
	13.78	61.15	6/20/2012	280	920	<0.001	<0.001	<0.001	<0.003	64
	13.81	61.15	9/25/2012	268	853	<0.001	<0.001	<0.001	<0.003	63.8

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
3	18.69	30.05	5/19/2011	300	903	<0.001	<0.001	<0.001	<0.003	69.6
	18.7	30.05	9/1/2011	308	845	<0.001	<0.001	<0.001	<0.003	84.8
	17.93	30.05	11/18/2011	380	954	<0.001	<0.001	<0.001	<0.003	78.6
	18.06	30.05	3/6/2012	324	989	<0.001	<0.001	<0.001	<0.003	77.3
	18.43	30.05	6/20/2012	296	922	<0.001	<0.001	<0.001	<0.003	70
	18.58	30.05	9/25/2012	288	938	<0.001	<0.001	<0.001	<0.003	70.5

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

Apache NMGSAU 1631

Legals: UL/J sec. 32 T19S R37E

Case #: 1R-2627

Figure 2

N W E S

0 25 50 Feet

Projection: NAD 83/STATE PLANE
Drawing date: 10-25-12
Drafted by: L. Weinheimer

Appendix A

Laboratory Results

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

CARDINAL Laboratories

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

October 09, 2012

NATALIE GLADDEN

APACHE - EUNICE

P. O. BOX 1849

EUNICE, NM 88231

RE: APACHE NMGSAU 1631-ACCIDENTAL DISCHARGE

Enclosed are the results of analyses for samples received by the laboratory on 09/28/12 15:03.

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/28/2012	Sampling Date:	09/25/2012
Reported:	10/09/2012	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

Sample ID: MONITOR WELL #1 (H202377-01)

BTEX 8021B mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	10/01/2012	ND	0.020	100	0.0200	1.08	
Toluene*	<0.001	0.001	10/01/2012	ND	0.021	107	0.0200	1.21	
Ethylbenzene*	<0.001	0.001	10/01/2012	ND	0.021	106	0.0200	1.11	
Total Xylenes*	<0.003	0.003	10/01/2012	ND	0.064	107	0.0600	1.42	

Surrogate: 4-Bromofluorobenzene (PID *100 %* *89.5-126*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**970**	4.00	10/08/2012	ND	100	100	100	3.92	

Sulfate 375.4 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**190**	10.0	10/05/2012	ND	20.9	105	20.0	13.1	

TDS 160.1 mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**2190**	5.00	10/02/2012	ND	269	112	240	0.456	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/28/2012	Sampling Date:	09/25/2012
Reported:	10/09/2012	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI:	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H202377-02)

BTEX 8021B mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	10/01/2012	ND	0.020	100	0.0200	1.08	
Toluene*	<0.001	0.001	10/01/2012	ND	0.021	107	0.0200	1.21	
Ethylbenzene*	<0.001	0.001	10/01/2012	ND	0.021	106	0.0200	1.11	
Total Xylenes*	<0.003	0.003	10/01/2012	ND	0.064	107	0.0600	1.42	

Surrogate: 4-Bromofluorobenzene (PID *101 %* *89.5-126*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**268**	4.00	10/08/2012	ND	100	100	100	3.92	

Sulfate 375.4 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**63.8**	10.0	10/05/2012	ND	20.9	105	20.0	13.1	

TDS 160.1 mg/L Analyzed By: HM

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**853**	5.00	10/02/2012	ND	269	112	240	0.456	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/28/2012	Sampling Date:	09/25/2012
Reported:	10/09/2012	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Amanda Ponce
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

Sample ID: MONITOR WELL #3 (H202377-03)

BTEX 8021B mg/L **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	10/01/2012	ND	0.020	100	0.0200	1.08	
Toluene*	<0.001	0.001	10/01/2012	ND	0.021	107	0.0200	1.21	
Ethylbenzene*	<0.001	0.001	10/01/2012	ND	0.021	106	0.0200	1.11	
Total Xylenes*	<0.003	0.003	10/01/2012	ND	0.064	107	0.0600	1.42	

Surrogate: 4-Bromofluorobenzene (PID *101 %* *89.5-126*

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	**288**	4.00	10/08/2012	ND	100	100	100	3.92	

Sulfate 375.4 mg/L **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	**70.5**	10.0	10/05/2012	ND	20.9	105	20.0	13.1	

TDS 160.1 mg/L **Analyzed By: HM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**938**	5.00	10/02/2012	ND	269	112	240	0.456	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

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

Celey D. Keene, Lab Director/Quality Manager

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

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #: _____

Company Name: Apache	BILL TO Company: Apache — PO#
Project Manager: Hack Conder, Rice Env Consulting Safety	Address: (Street, City, Zip)
Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: Fax#:
Phone #: (575) 393-9174	Fax #: (575) 397-1471
Project #:	Project Name: Apache NMGSAU 1631-Accidental Discharge
Project Location: T19S-R37E-Sec32 J ~ Lea County New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY) H102377	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-1Liter HDPE)	NONE	SAMPLING: DATE (2012)	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
1	Monitor Well #1	G	3	X				2				1		9-25	10:55		X																X	X	X	
2	Monitor Well #2	G	3	X				2				1		9-25	14:05		X																X	X	X	
3	Monitor Well #3	G	3	X				2				1		9-25	11:50		X																X	X	X	

Relinquished by: Rozanne Johnson	Date: 9-27-12	Time: 15:02	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff)	Date: 9/28/12	Time: 15:03

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

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

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

CHECKED BY: (Initials)

REMARKS:

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