1R - 2627

WORKPLANS

Date:

8-14-12

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

CERTIFIED MAIL
RETURN RECEIPT NO. 7011 2000 0002 0285 5056

August 14th, 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: **Corrective Action Plan (CAP) 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, New Mexico at UL/J, Sec. 32, T19S, R37E as shown on the Site Location Map (Figure 1). A leak was discovered at the site on September 28th, 2010. Produced water was released from the collar of the injection line and an unknown amount of water was released. Based on monitor well sampling at the site, depth to groundwater is determined to be +/- 14 ft bgs.

Beginning on September 28th, 2010, the site was excavated to 38 ft x 96 ft x 18 ft deep to remove the saturated soils and the soils were taken to Sundance Services for disposal. The saturated soils extended to a depth of 14 ft 8 inches where the capillary fringe of the aquifer was encountered. On October 7th, 2010, three soil bores were drilled to determine the extent of the contamination at the site. RECS personnel field tested the soil for chlorides and field screened each sample for hydrocarbons using a photo-ionization detector (PID). All samples from the bores were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. In all three soil bores, the laboratory chloride readings were very low throughout the bores until 12 ft bgs, where the chloride numbers became elevated above 1000 mg/kg. Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) were non-detect in all three bores at all depths. The site was backfilled to 4.5 ft bgs where a 20-mil, reinforced liner was installed throughout the excavation. A 6 inch pad of blow sand was placed below and above the liner for liner protection.

On October 12th, 2010, Apache submitted the initial C-141 to NMOCD-District 1, which was approved by Larry Johnson the same day. The site was then backfilled on October

15th, 2010 with clean, imported soil. Soil amendments were added to the site and the site was seeded with native vegetation on October 16th, 2010.

On October 25th, 2010, MW-1 was installed 45 ft southeast of the line break. MW-2 was installed on December 21st, 2010, 56 ft NNW of the line break, and MW-3 was installed on April 13th, 2011, 199 ft SE of the line break. The monitor wells have been sampled quarterly since their installation (Figure 2). Sampling events on MW-1 showed initial chloride and TDS readings well above WQCC standards; however, the constituents are decreasing over time. In addition, initial well sampling showed slight levels of BTEX in the water that have now dissipated.

During the most recent monitor well sampling event on June 20th, 2012, MW-2, the up gradient well, and MW-3, the down gradient well, showed chloride readings slightly above WQCC standards with a chloride reading of 280 mg/L in MW-2 and 296 mg/L in MW-3 (Appendix A). The two chloride readings are indicative of background concentrations in the area and suggest that there is an up gradient chloride source in this area.

On October 11th, 2011, a Corrective Action Plan (CAP) was sent to NMOCD and was approved on October 17th, 2011. In the CAP, RECS recommended that Apache conduct a three month groundwater source removal and test pumping program. The purpose of the pumping program was to determine if groundwater could be restored within a short period of time and assist in the evaluation of groundwater restoration methods. Water removed from the existing 4-inch monitoring well (MW-1) would be used for production operations (e.g. pipeline and well maintenance). Based on the groundwater source removal and pumping program, Apache would analyze the data to determine a groundwater remedy for the site. An Extension Request to conduct this groundwater source removal and test pumping program was submitted to NMOCD on February 8th, 2012 and was approved on February 9th, 2012. NMOCD approved the request for extension of the submittal until August 9th, 2012.

The groundwater source removal and test pumping program began at the site on April 10th, 2012. During the testing process, a total of 1,551 barrels of groundwater have been removed from the site. Given the average laboratory chloride readings of MW-1, 1,551 barrels of groundwater equates to 130 kg of chloride.

Corrective Action Plan for Groundwater

Since the groundwater source removal and test pumping program began at the site, the chloride readings in MW-1 from the quarterly monitor well sampling data have dropped 58%. To facilitate the chlorides continued reduction, RECS recommends that Apache maintain the source removal and pumping program until such a time that chlorides have decreased to near background levels.

Upon the completion of the groundwater remedy, Apache will submit a written report that will include a request for 'remediation termination' of the regulatory file.

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

Sincerely,

Lara Weinheimer
Project Scientist
RECS
(575) 441-0431

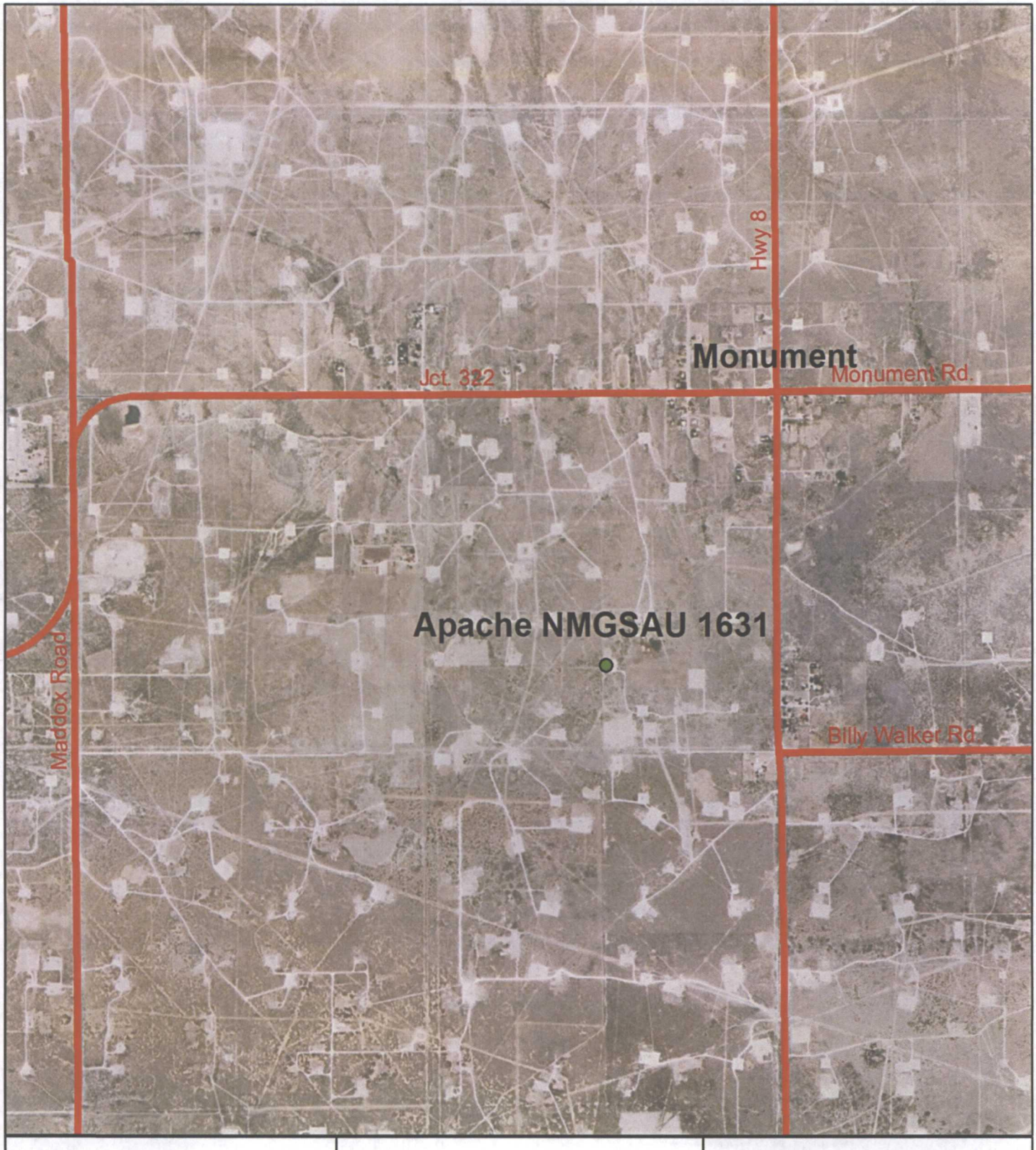
Attachments:

Figure 1 – Site Location Map
Figure 2 – MW Sampling Data Map
Appendix A – MW Sampling Data Lab

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 RECS CONSULTING & SAFETY, LLC

Apache NMGSAU 1631

LEGALS:UL/J sec. 32 T19S R37E

Case #: 1R-2627

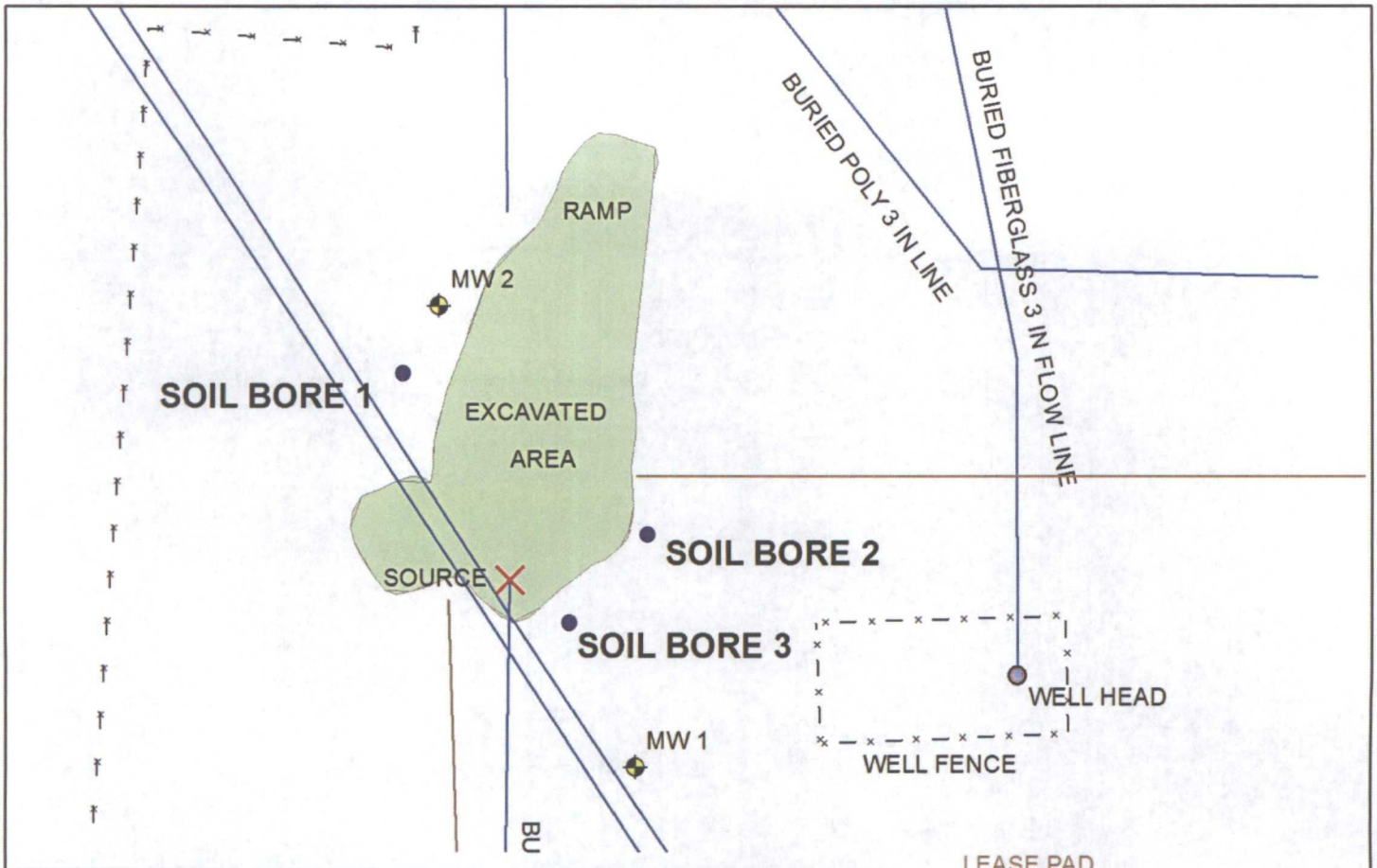
Figure 1

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
MW-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

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
MW-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

MW	Depth to Water	Total Depth	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate
MW-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

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: 7-27-12
Drafted by: L. Weinheimer

Appendix A

MW Sampling Data Lab

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

June 28, 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 06/26/12 8:58.

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:	06/26/2012	Sampling Date:	06/20/2012
Reported:	06/28/2012	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

Sample ID: MONITOR WELL #1 (H201440-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	06/26/2012	ND	0.047	93.2	0.0500	0.501	
Toluene*	<0.001	0.001	06/26/2012	ND	0.046	91.4	0.0500	1.35	
Ethylbenzene*	<0.001	0.001	06/26/2012	ND	0.047	94.5	0.0500	2.28	
Total Xylenes*	<0.003	0.003	06/26/2012	ND	0.140	93.3	0.150	3.05	

Surrogate: 4-Bromofluorobenzene (PID *107 %* *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*	**540**	4.00	06/27/2012	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*	**116**	10.0	06/28/2012	ND	21.4	107	20.0	0.844	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**1420**	5.00	06/26/2012	ND	272	113	240	1.83	

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:	06/26/2012	Sampling Date:	06/20/2012
Reported:	06/28/2012	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

Sample ID: MONITOR WELL #2 (H201440-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	06/26/2012	ND	0.047	93.2	0.0500	0.501	
Toluene*	<0.001	0.001	06/26/2012	ND	0.046	91.4	0.0500	1.35	
Ethylbenzene*	<0.001	0.001	06/26/2012	ND	0.047	94.5	0.0500	2.28	
Total Xylenes*	<0.003	0.003	06/26/2012	ND	0.140	93.3	0.150	3.05	

Surrogate: 4-Bromofluorobenzene (PID *106 %* *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*	**280**	4.00	06/27/2012	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*	**64.0**	10.0	06/28/2012	ND	21.4	107	20.0	0.844	

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**920**	5.00	06/26/2012	ND	272	113	240	1.83	

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:	06/26/2012	Sampling Date:	06/20/2012
Reported:	06/28/2012	Sampling Type:	Water
Project Name:	APACHE NMGSAU 1631-ACCIDENTAL DI:	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	T19S-R37E-SEC32 J-LEA CTY., NM		

Sample ID: MONITOR WELL #3 (H201440-03)

BTEX 8021B mg/L Analyzed By: ZZZ

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	06/26/2012	ND	0.047	93.2	0.0500	0.501	
Toluene*	<0.001	0.001	06/26/2012	ND	0.046	91.4	0.0500	1.35	
Ethylbenzene*	<0.001	0.001	06/26/2012	ND	0.047	94.5	0.0500	2.28	
Total Xylenes*	<0.003	0.003	06/26/2012	ND	0.140	93.3	0.150	3.05	

Surrogate: 4-Bromofluorobenzene (PIL *105 %* *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*	**296**	4.00	06/27/2012	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*	**70.0**	10.0	06/28/2012	ND	21.4	107	20.0	0.844	

TDS 160.1 mg/L Analyzed By: AP

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	**922**	5.00	06/26/2012	ND	272	113	240	1.83	

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

Cardinal Laboratories

*=Accredited Analyte

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) 120140	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		6-20	15:35		X																X	X	X	
2	Monitor Well #2	G	3	X				2				1		6-20	15:15		X																X	X	X	
3	Monitor Well #3	G	3	X				2				1		6-20	12:55		X																X	X	X	

Relinquished by: Rozanne Johnson	Date: Time:	Received by:	Date: 6/21/12 Time: 8:30
Relinquished by:	Date: 6/21/12 Time: 8:58	Received By: (Laboratory Staff) Jodi Henson	Date: 6/26/12 Time: 8:58
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool: Yes ✓ No; Intact: Yes ✓ No	CHECKED BY: (Initials)	

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

REMARKS:

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

#26