# 1R - 426 - 28

# WORKPLANS

Date: 5-7-12

#### Rice Environmental Consulting & Safety

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

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RETURN RECEIPT NO. 7008 1140 0001 3070 5788

May 7<sup>th</sup>, 2012

#### Mr. Edward Hansen

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

#### RE: ICP Report and Corrective Action Plan (CAP) Rice Operating Company – BD SWD System BD B-16 (1R426-28): UL/B sec. 16 T22S R37E

Mr. Hansen:

RICE Operating Company (ROC) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site in the BD Salt Water Disposal (SWD) system. ROC is the service provider (agent) for the BD SWD System and has no ownership of any portion of the pipeline, well, or facility. The system is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

#### **Background and Previous Work**

The site is located approximately 2.5 miles south of Eunice, New Mexico at UL/B, Sec. 16, T22S, R37E as shown on the Site Location Map (Figure 1). Groundwater at this site is located approximately 78 +/- feet below ground surface (bgs).

In 2002, ROC initiated work on the former BD B-16 junction box prior to it being replaced by a new, watertight junction box at the site. The site was delineated using a backhoe and soil samples were screened at regular intervals for both hydrocarbons and chlorides. The excavation reached dimensions of 20 x 20 x 17 feet bgs where composite samples were collected for laboratory verification. Laboratory tests of the site showed chloride readings of 144 mg/kg for the remediated backfill, 3,200 mg/kg in the sidewall composite and 4,200 mg/kg on the bottom composite. Gasoline range organics (GRO) showed non-detect in the remediated backfill and bottom composite and 36.3 mg/kg in the sidewall composite. Diesel range organics (DRO) measured 18.2 mg/kg in the remediated backfill, 869 mg/kg in the sidewall composite, and 434 mg/kg in the bottom composite. At 17 feet bgs, a 1 ft thick clay layer was installed to inhibit further chloride migration. The soils were blended on site and the remediated soil was returned to the excavation and contoured to the surrounding landscape. NMOCD was notified of potential groundwater impact on January 31<sup>st</sup>,

2003, and a junction box disclosure report was submitted to NMOCD with all the 2002 junction box closures and disclosures. An Investigation and Characterization Plan (ICP) was submitted to the NMOCD on July 7<sup>th</sup>, 2010 and approved on July 15<sup>th</sup>, 2010. The plan proposed additional investigation of the soils surrounding the former junction box and the installation of monitoring well(s) to delineate groundwater quality.

#### **ICP Investigative Results**

As per the ICP, six soil bores were advanced through the former junction box site on July 28<sup>th</sup>, 2010 (Figure 2). ROC personnel field tested the soil for chlorides and screened in the field with a photo-ionization detector (PID) for hydrocarbons. Representative samples from the bore were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers (Appendix A). Laboratory chloride readings showed that in each soil bore, the chloride values decreased with depth with the peak chloride readings between 40 and 60 ft bgs in all soil bores. SB-1 decreased from 4,560 mg/kg at 60 ft to 256 mg/kg at 80 ft bgs, SB-2 decreased from 4,120 mg/kg at 60 ft to 688 mg/kg at 75 ft bgs, SB-3 decreased from 1,960 mg/kg at 60 ft to 448 mg/kg at 75 ft bgs, SB-4 decreased from 6,640 mg/kg at 75 ft bgs and SB-6 decreased from 2,960 mg/kg at 15 ft to 384 mg/kg at 75 ft bgs. All samples had GRO and DRO readings of non-detect.

On October 26<sup>th</sup>, 2010, two monitor wells were installed at the site to a depth of 90 ft (Figure 2). MW-1, the near-source monitor well, and MW-2, the up gradient monitor well, were field tested for chlorides and screened in the field with a photo-ionization detector (PID) for hydrocarbons. Two samples from MW-1 were taken to a commercial laboratory for confirmation of field numbers and returned laboratory chloride readings of 880 mg/kg at 20 ft bgs and 16 mg/kg at 75 ft bgs. Both samples had GRO and DRO readings of non-detect (Appendix B).

The monitor wells have been sampled quarterly since their installation (Figure 3). The most recent (January  $27^{th}$ , 2012) groundwater samples tested 260 mg/L in the near-source well (MW-1) and 220 mg/L in the up-gradient well (MW-2). Both monitor wells had BTEX levels of non-detect (Appendix C).

On January 28<sup>th</sup>, 2011, due to time restraints and resource management, a trench was installed 10 ft north of SB-6 (Figure 2). Representative samples from the trench were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. Laboratory readings showed chloride numbers of 1,070 mg/kg at 3 ft bgs and 592 mg/kg at 5 ft bgs. Laboratory readings for GRO and DRO showed non-detect (Appendix A).

Five additional soil bores were installed at the site on March 22<sup>nd</sup> and 23<sup>rd</sup>, 2011 (Figure 2). Representative samples from SB-7 and SB-11 were taken to a commercial laboratory for confirmation of chloride and hydrocarbon field numbers. Laboratory readings in SB-7 showed chloride numbers of 1,180 mg/kg at 5 ft bgs, 608 mg/kg at 40 ft bgs and 160 mg/kg at 55 ft bgs. Laboratory readings in SB-11 showed chloride readings of 576 mg/kg at 5 ft bgs and 96 mg/kg at 25 ft bgs. Laboratory readings for GRO and DRO showed non-detect in both soil bores (Appendix A).

#### Recommendations

RECS submits the following as a Corrective Action Plan.

- Six quarters of monitoring well sampling shows no impact to groundwater. The two monitor wells evidence laboratory chloride values near or below WQCC standards with the near-source well showing a chloride reading of 260 mg/L and the up gradient monitor well showing a chloride reading of 220 mg/L. Since the site shows no groundwater impact, ROC proposes to plug and abandon both monitor wells with a 1-3% bentonite/concrete slurry with a 3 ft cement cap. A letter from Arc Environmental is included as Appendix D, and gives a description of the aquifer located beneath this site.
- The site has an existing clay liner measuring 20 ft x 20 ft at 17 ft bgs. ROC proposes to install a 20-mil, reinforced poly liner at 4-5 ft bgs measuring 77 ft x 76 ft (Figure 4). The extended liner will cover all the soil bore points, the north trench, and the existing liner installed at 17 ft bgs. The liner will provide a barrier that will inhibit the downward migration of chlorides to groundwater. The soils placed above the liner will have a laboratory chloride reading no greater than 500 mg/kg and a field PID measurement below 100 ppm. Excavated soil will be evaluated for use as backfill, and any soil requiring disposal will be properly disposed of at a NMOCD approved facility.
- The surface soils over and surrounding the site will be prepared with soil amendments, as needed, and then seeded with a native vegetative mix. Vegetation above the liner will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

Upon completion of the CAP work elements, we anticipate ROC will submit a written report which will include a request for "remediation termination" and the closure of the regulation file.

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

Sincerely,

ACWA

Lara Weinheimer Project Scientist RECS (575) 441-0431

Attachments:

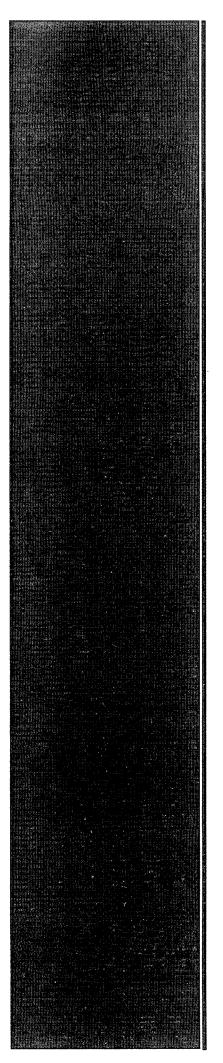
Figure 1 – Site Location map Figure 2 – Soil Bore and Monitor Well Data plat Figure 3 – Monitor well sampling plat Figure 4 – Proposed liner plat

Appendix A – Soil bore installation and laboratory analysis

Appendix B – Monitor well installation

Appendix C – Monitor well sampling laboratory analysis

Appendix D – Aquifer description



# Figures

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

# Site Location

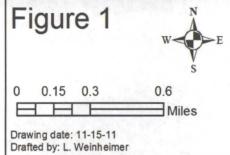




BD B-16

NMOCD Case #: 1R426-28

Legals: UL/B sec. 16 T22S R37E



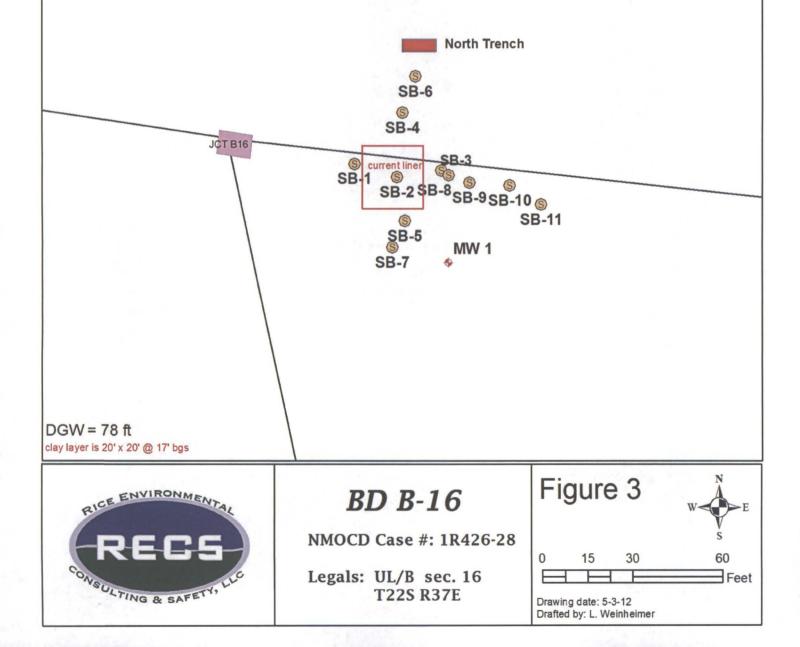
# Soil Bore and Monitor Well Data

Depth         CI-         PID         LAB         CI-         GRO         Dep           5         535         0         5         10         5         5           10         525         0         10         15         659         10           15         659         0         15         20         900         0.1         880         <10         <10         20           25         762         0         25         30         353         0         30         35         30         30         35         50	MW-2         SB-1           th Cl- PID         Depth         Cl- PID         LAB Cl- GRO           138         0         20         614         3.9           391         0         25         943         8.2           183         0.5         30         880         3.6           168         0.5         35         692         4.8           236         0.6         40         2506         8.3           147         0         45         1776         3           182         0         50         1897         3.2           180         0         60         3285         2.4         4560         <10           176         0         65         1155         3.2          <11           180         0         60         3285         2.4         4560         <10           176         0         65         1155         3.2          <17         <17         <17         <17         <180         2.73         5.4         256         <10           168         0          N         trench           <11	5 1509 0.5 10 1949 0.1 15 1930 0.6 20 400 0.9 25 616 0.7 30 1214 0.9 35 524 0.4 40 2331 0.6 <10 45 1573 0.5 50 2249 0.8 55 2674 0.8 60 3452 0.9 4120 <10 <10 <10 65 1297 0.6 70 1554 0.3 75 681 0.5 688 <10 <10 O
SB-3           Depth         CI-         PID         LAB         CI-         GRO         DRO           5         1607         0.2           10         1411         0.1           15         1358         0.1           20         724         0.1           25         745         0.4           30         726         0.3           35         649         0.1           40         1520         0.2           45         1429         0.3           50         1505         0.1           55         1778         0.2           60         1801         0.1         1960<<10	MW 2 1 145 12 2 175 4.1 3 864 1.9 1070 <10 <10 4 445 3.5 5 578 1.6 592 <10 <10 SB-6 SB-6 SB-4 SB-3 ROC 4 in po	SB-4 Depth CI- PID LAB CI- GRO DRO 5 1575 0.6 10 3174 0.5 15 3340 0.5 20 2914 0.2 25 1924 0.4 30 1203 0.3 35 834 0.4 40 5699 0.3 6640 <10 <10 45 2046 0.3 50 1410 0.2 55 2498 0.1 60 2508 0.1 65 1302 0 70 1239 0 75 1314 0 1490 <10 <10
Depth         CI-         PID         LAB         CI-         GRO         DRO           5         1580         0.8         10         2788         0.8         113         0.6           10         2788         0.8         15         2113         0.6         10         10           20         2229         0.6         10         10         10         10         10           30         1041         0.6         10         10         10         10         10           35         523         0.6         40         2903         0.4         4320         <10	SB-2 SB-8 SB-9 SB-10 SB-5 SB-5 MW 1 SB-7 SB-6 SB-8	SB-11         Depth         CI-         PID         LAB         GRO         DRO         5         510         1.1         576         <10         <10         10         503         1.1         11         15         330         3.7         20         380         3.1         25         247         1.9         96         <10         <10         <10         <10         503         1.1         15         330         3.7         20         380         3.1         25         247         1.9         96         <10         <10         <10         SB-9         SB-10         SB-9         SB-10         Depth         CI-         PID         5         1360         3.3         5         626         3.5         5         626         3.5
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	10       781       2.6       10       494       3.6         15       885       2.2       15       987       3         20       769       1.5       20       688       3         25       1398       1.1       25       628       3.7         30       1173       1       30       548       2.5         35       370       1       35       502       2         40       1616       0.8       40       1905       1.7         45       1261       2.1       50       1247       1.7         55       1047       1.1       60       1081       1.4
RICE ENVIRONMENTAL	BD B-16	Figure 2
CONSULTING & SAFETY, LLC	Legals: UL/B sec. 16 T22S R37E NMOCD Case #: 1R426-28	V S 0 15 30 60 Drawing date: 11-15-11 Drafted by: L. Weinheimer

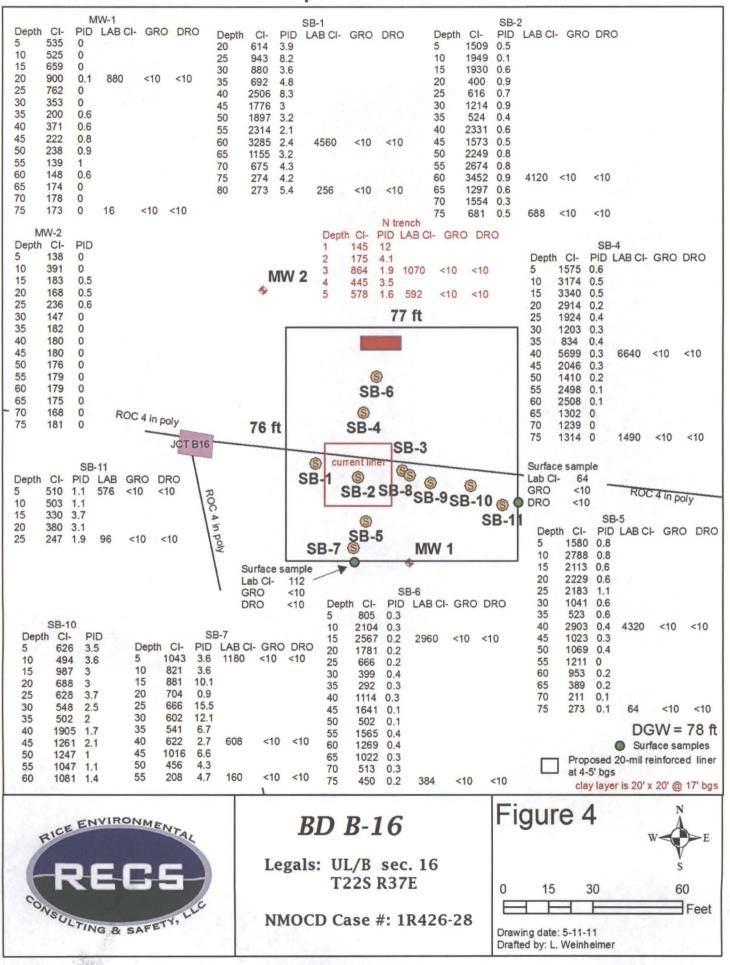
## Monitor well sampling

199	Depth to	Total						Ethyl	Total	
MW	Water	Depth	Sample Date	CI	TDS	Benzene	Toluene	Benzene	Xylenes	Sulfate
	78.23	91.84	11/10/2010	264	1100	< 0.001	< 0.001	< 0.001	< 0.003	295
	78.23	91.86	1/21/2011	284	1110	< 0.001	< 0.001	< 0.001	< 0.003	247
MW-1	78.19	91.86	4/20/2011	248	1070	< 0.001	< 0.001	< 0.001	< 0.003	249
IVIV-T	78.24	91.86	7/27/2011	256	1070	< 0.001	< 0.001	< 0.001	< 0.003	226
	78.28	91.86	10/21/2011	260	1080	< 0.001	< 0.001	< 0.001	< 0.003	431
	78.16	91.86	1/27/2012	260	1080	<0.001	< 0.001	<0.001	< 0.003	242
	Depth to	Total				2.22		Ethyl	Total	
MW	Water	Depth	Sample Date	CI	TDS	Benzene	Toluene	Benzene	Xylenes	Sulfate
	79.22	92.08	11/10/2010	200	987	< 0.001	<0.001	<0.001	<0.003	314
	79.21	92.1	1/21/2011	212	997	< 0.001	<0.001	<0.001	<0.003	272
MW-2	78.18	92.1	4/20/2011	208	1020	<0.001	<0.001	<0.001	< 0.003	265
10100-2	78.25	92.1	7/27/2011	212	976	< 0.001	<0.001	<0.001	< 0.003	267
	78.33	92.1	10/21/2011	216	1010	<0.001	<0.001	<0.001	< 0.003	510
	78.11	92.1	1/27/2012	220	1040	<0.001	< 0.001	<0.001	< 0.003	281





### **Proposed liner**



# Appendix A Soil bore installation and laboratory analysis

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

Dril Consu Drilling	ller: Ha	ara Weinhe arrison & Co RECS Air Rotar 7/28/2010	ooper y	58-4 58-4 58-4 58-1 58-2 58-3 58-5	RECE ENVIRONMENT			, u.e		
	Date:	7/28/2010 All sam Draft	ples fro the f	om cuttings. Located 15' west of ormer junction box site. .ara Weinheimer DGW = 78 ft	Loc	ject Name: BD B-16	L/B sec. 16	Well ID: SB-1 3 sec. 16 T22S R37E "County: Lea		
Depth (feet)	chloride field tests	LAB	PID	Description		Lithology	Well C	construction		
				Light orangey brown very fine sand with sandstone. Dry. No odor.						
20 ft	614		3.9							
25 ft	943		8.2							
				Orangey brown very fine sand with sandstone. Slightly moist. No odor.						
30 ft	880		3.6							
35 ft	692		4.8							
				Light orangey brown very fine sand with substantial caliche. Dry. No						
40 ft	2506		8.3	odor.						
45 ft	1776		3	Light brown very fine sand with sandstone. Slightly moist. No odor.						
45 11	1770		5					bentonite		
50 ft	1897		3.2					seal		
				Orangey brown very fine sand. Slightly moist. No odor.	1					
55 ft	2314		2.1							
60 ft	3285	CI- 4560 GRO	2.4							
		<10 DRO <10								

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
65 ft	1155		3.2			
	1					
	11			· · · · · · · · · · · · · · · · · · ·		
70 ft	675		4.3			
75 ft	274		4.2			
	1.					
		01				
80 ft	273	CI- 256	5.4			
		GRO <10		이 집 것 같은 것		
		DRO <10				

		Lara Weinl Harrison & RECS	Cooper	58-4 		RICE	EC	STAL		
	Method	Air Rot		\$8-1 <sup>®</sup> 58-2 <sup>®</sup> 58-3 <sup>®</sup>	CONSULTING & SAFETY,			10		
	Date:	7/28/20		SB-5				Y, LL		
	Date:	7/28/20		0 12.5 25 50	Pre	oject Name:		Well ID:		
Comm				rom cuttings. Located at source	1	BD B-16		SB-2		
				former junction box site.	Lo			6 T22S R37E		
	TD =			ara Weinheimer DGW = 78 ft	Lat	t: N32°23'53.0 ng: W 103°9'5	27"	County: Lea State: NM		
Depth (feet)	chloride field test		PID	Description		Lithology	Well C	Construction		
1										
5 ft	1509		0.5							
				Brown very fine sand with caliche. Dry. No odor.						
10 ft	1949	-	0.1							
		-	-							
15 ft	1930		0.6							
		-	-	Light orangey brown very fine sand with sandstone. Slightly moist. No						
20 ft	400		0.9	odor.						
		-								
25 ft	616		0.7							
				Orangey brown very fine sand with sandstone. Slightly moist. No odor.						
30 ft	1214		0.9							
35 ft	524		0.4							
				Light orangey brown very fine sand with sandstone. Dry. No odor.				bentonite		
40 ft	2331		0.6					seal		
45 ft	1573		0.5							

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
50 ft	2249		0.8			
				Orangey brown very fine sand with sandstone. Slightly moist. No odor.		
55 ft	2674		0.8			
60 ft	3452	CI- 4120 GRO	0.9			
		<10 DRO				
65 ft	1297	<10	0.6			
				Orangey brown very fine sand.		
70.0	4554			Slightly moist. No odor.		
70 ft	1554		0.3			
75 ft	681	CI- 688 GRO	0.5			
		<10 DRO <10				

Log	ger:	Lara	a Weinhe	imer	\$B-6	Γ	RICE	ENVI	RONMENT	41
Dril	ler:	Harr	rison & Co	ooper	\$B-4					
Consu	ultant:		RECS		SB-1 SB-3	1		ŁΕ	.C5	
Drilling	Method		Air Rotar	У	\$8-2 35-3		CONST			LLC
Start	Date:		7/28/2010	D	SB-5	CONSULTING & SAFETY, LLC				
End	Date:		7/28/2010	D	0 12.5 25 50	Pro	oject Name:			/ell ID:
Comm		A			m cuttings. Located 14 ft east of	1	BD B-1	6	1.1	SB-3
0.00					ormer junction box site.	Lo			sec. 16	T22S R37E
			Draft		ara Weinheimer		t: N32°23'53.			ounty: Lea
	TD =	75			DGW = 78  ft		ng: W 103°9			tate: NM
Depth	chlorid	-								
(feet)	field tes		LAB	PID	Description		Lithology	3	Well Co	onstruction
										$\cap$
		+								
5 ft	1,607			0.2						
		+								
					Prown yory fine cond with calleba					
					Brown very fine sand with caliche. Dry. No odor.					
					Dry. No odor.					
10 ft	1,411			0.1						
						1				
		+								
15 ft	1,358			0.1						
10 11	1,000	+		0.1						
					Light grant and brown stars find and					
					Light orangey brown very fine sand	1				
		-			with sandstone. Dry. No odor.					
20 ft	724			0.1						
	1. 1. 1.				Light granges, brown your fine good					
		-			Light orangey brown very fine sand with sandstone particles. Dry. No					
					odor.					
25 ft	745			0.4	0001.					
	1.10	-		0.1						
				-	Orangey brown very fine sand with					
					sandstone. Slightly moist. No odor.					
00.0	700			0.0	Sandotorior olignity molat. No odor.					
30 ft	726	-+		0.3						
		-								
35 ft	649			0.1						
					Linkt and the second					
		-+			Light orangey brown very fine sand					
		$\square$			with sandstone particles. Dry. No odor.					bentonite
40 ft	1,520			0.2	odor.					seal
-10 11	1,020	+		0.2						Sedi
					Light brown war fire card. Of the					
					Light brown very fine sand. Slightly moist. No odor.					
		+								
45 ft	1,429			0.3				1		

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
1						
50 ft	1,505		0.1			
54				Orangey brown very fine sand. Slightly moist. No odor.		
55 ft	1,778		0.2			
60 ft	1,801	Cl- 1960	0.1			
		GRO <10				
		DRO <10				
65 ft	540		0.2			
70 ft	554		0.2			
		CI-				
75 ft	456	448 GRO <10	0.1			
		DRO <10				

Log Dril Consu	ler:	Lara Weinhe Harrison & Co RECS		58-4 58-4 58-4		RICE E	ECS
Drilling		Air Rotar	v	SB-1 SB-2 SB-3		CONVE	
Start		7/28/201		SB-5		GULTI	NG & SAFETY, LLC
End	Date:	7/28/2010	D	0 12.5 25 50	Pro	ject Name:	Well ID:
Comm	ents:	All samp	les fro	m cuttings. Located 20 ft north of	1	BD B-16	
				ormer junction box site.			_/B sec. 16 T22S R37E
	-		ted by: L	ara Weinheimer	La	: N32º23'53.2	33" County: Lea
	TD =	100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100		DGW = 78 ft	LO	ng: W 103°9'5	0.989" State: NM
Depth (feet)	chloride field test		PID	Description		Lithology	Well Construction
5 ft	1575		0.6				
				Light orangey brown very fine sand	1		
10 ft	3174		0.5	with caliche. Dry. No odor.			
15.4	0040		0.5		10		
15 ft	3340		0.5				
		_					
20 ft	2914		0.2				
25 ft	1924		0.4		10		
				Orangey brown very fine sand with sandstone. Slightly moist. No odor.			
30 ft	1203		0.3				
35 ft	834		0.4				
				Light orangey brown very fine sand with sandstone particles. Dry. No			bentonite
40 ft	5699	CI- 6640	0.3	odor.			seal
		GRO <10					
		DRO <10		Light brown very fine sand. Slightly moist. No odor.			
45 ft	2046		0.3				

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
1.2						
50 ft	1410		0.2			
				Orangey brown very fine sand. Slightly moist. No odor.		
55 ft	2498		0.1			
60 ft	2508		0.1			
65 ft	1302		0			
70 ft	1239		0			
75 ft	1314	CI- 1490 GRO	0			
		<10 DRO <10				

Logg	ger:	Lara Weinhe	imer	SB-6	RICE	ENVIRONMENTAL				
Drill		Harrison & C	ooper	\$B-4		COC				
Consu		RECS		(D) 018 TOL	R	ELS				
Drilling		Air Rotar		SB-2 00-0	CONSUL	TING & SAFETY, LLC				
Start	Date:	7/28/201	0	58-5 0 12.5 25 50						
End I		7/28/201			Project Name:	Well ID:				
Comme	ents:	All samp		m cuttings. Located 15 ft south of	BD B-16					
	TD =			ormer junction box site. .ara Weinheimer DGW = 78 ft	Location: U Lat: N32°23'52.8 Long: W 103°9'5					
Depth	chloride		PID	Description	Lithology	Well Construction				
(feet)	field test	S								
5 ft	1580		0.8							
				Light orangey brown very fine sand with caliche. Dry. No odor.						
10 ft	2788		0.8	with caliche. Dry. No odor.						
15 ft	2113		0.6							
20 ft	2229		0.6							
25 ft	2183		1.1							
And And	A	-		Orangey brown very fine sand with sandstone. Dry. No odor.						
30 ft	1041		0.6							
35 ft	523		0.6							
				Light orangey brown very fine sand with sandstone. Dry. No odor.		bentonite				
40 ft	2903	CI- 4320 GRO	0.4			seal				
		<10 DRO <10								

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
45 ft	1023	Ç.,	0.3			
50 ft	1069		0.4			
55 ft	1211		0	Orangey brown very fine sand. Slightly moist. No odor.		
60 ft	953		0.2			
65 ft	389		0.2			
70 ft	211		0.1			
75 ft	273	CI- 64 GRO <10	0.1			
		DRO <10				

Logger:     Lara Weinheimer       Driller:     Harrison & Cooper       Consultant:     RECS       Drilling Method     Air Rotary		ooper y	SB-6 SB-4 SB-4 SB-2 SB-2 SB-3 SB-2 SB-3 SB-2 SB-3 SB-6 SB-6 SB-6 SB-6 SB-6 SB-6 SB-6 SB-6	RECS CONSULTING & SAFETY, LLC									
End I	the fe		oles fro the f	m cuttings. Located 32 ft north of ormer junction box site. ara Weinheimer DGW = 78 ft	Project Name:         Well ID:           BD B-16         SB-6           Location:         UL/B sec. 16 T22S R37           Lat: N32°23'53.357"         County: Le.           Long: W 103°9'50.935"         State: NM								
Depth (feet)	chloride field tests	LAB	PID	Description		Lithology		nstruction					
5 ft	805		0.3	Light orangey brown very fine sand with caliche particles. Dry. No odor.									
10 ft	2104	CI-	0.3	Light orangey tan very fine sand with caliche. Dry. No odor.									
15 ft	2567	2960 GRO <10 DRO <10	0.2	Light orangey brown very fine sand with caliche particles. Dry. No odor.									
20 ft	1781		0.2										
25 ft	666		0.2										
30 ft	399		0.4										
35 ft	292		0.3	Orangey brown very fine sand with sandstone. Dry. No odor.									
40 ft	1114		0.3					bentonite seal					
				Light brown very fine sand with sandstone. Dry. No odor.									
45 ft	1641		0.1										

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
50 ft	502		0.1			
55 ft	1565		0.4	Orangey brown very fine sand. Slightly moist. No odor.		
60 ft	1269		0.4			
65 ft	1022		0.3			
70 ft	513		0.3			
75 ft	450	CI- 384 GRO <10	0.2			
		DRO <10				

To Provide Land



August 4, 2010

Hack Conder Rice Operating Company 112 West Taylor Hobbs, NM 88240

Re: BD Jct. B-16

Enclosed are the results of analyses for sample number H20448, received by the laboratory on 07/28/10 at 4:55 pm.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

Cardinal Laboratories is accredited though the State of Colorado Department of Public Health and Environment for:

Method	EPA 552.2
Method	EPA 552.2 EPA 524.2
Method	EPA 524.2

Haloacetic Acids (HAA-5) Total Trihalomethanes (TTHM) Regulated VOCs (V2, V3)

Accreditation applies to public drinking water matrices.

Total Number of Pages of Report: 4 (includes Chain of Custody)

Sincerely.

Celey D/Keene Laboratory Director



ANALYTICAL RESULTS FOR RICE OPERATING COMPANY ATTN: HACK CONDER 112 W. TAYLOR HOBBS, NM 88240

Receiving Date: 07/28/10 Reporting Date: 08/04/10 Project Number: NOT GIVEN Project Name: BD JCT B-16 Project Location: BD JCT B-16 Sampling Date: 07/28/10 Sample Type: SOIL Sample Condition: COOL & INTACT Sample Received By: JH Analyzed By: AB/HM

GRO DRO (C<sub>6</sub>-C<sub>10</sub>) (>C<sub>10</sub>-C<sub>28</sub>) Cl<sup>+</sup> (mg/kg) (mg/kg) (mg/kg)

LAB NUMBER SAMPLE ID

ANALYSIS D	ATE	08/03/10	08/03/10	07/30/10
H20448-1	SB-1_@_60'	<10.0	<10.0	4,560
H20448-2	SB-1 @ 80'	<10.0	<10.0	256
H20448-3	SB-2@60'	<10.0	<10.0	4,120
H20448-4	SB-2 @ 75'	<10.0	<10.0	688
H20448-5	SB-3 @ 60'	<10.0	<10.0	1,960
H20448-6	(SB-3 @)75'	<10.0	<10.0	448
H20448-7	SB-4 @ 40'	<10.0	<10.0	6,640
H20448-8	SB-4 @ 75'	<10.0	<10.0	1,490
H20448-9	SB-5 @ 40'	<10.0	<10.0	4,320
H20448-10	SB-5 @ 75'	<10.0	<10.0	64
H20448-11	SB-6 @ 15'	<10.0	<10.0	2,960
H20448-12	SB-6 @ 75'	<10.0	<10.0	384
Quality Contr	ol	429	432	520
True Value Q	Ċ	500	500	500
% Recovery	· · · · · · · · · · · · · · · · · · ·	85.8	86.4	104
Relative Perc	ent Difference	4.2	1.8	3.8

METHODS: TPH GRO & DRO: EPA SW-846/8015 M; CI: Std. Methods 4500-CIB \*Analyses performed on 1:4 w:v aqueous extracts.

Reported on wet weight.

hemist

Date

H20448 TCL RICE

PLEASE NOTE: Liability and Damages; Cardinal's liability and client's exclusive remedy for any calm arising, whether based in contract or ton, shall be limited to the amount paid by client for analyse all claims; including those for negligence and any other cause whatsoever shall be deemed waived unless made in witting and received by Cardinal within thirty (30) days after completion of the applicab service. In no event shall Cardinal be lable for incidental or consequential damages. Including, whole limitation, business interruptions; loss of use, or loss of profits incurred by client, its subsidiant affiliates or successors arising out of or related to the performance of services harounder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Result relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ARDINAL LABORATORIES

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

Company Name: Rice Operating Company							BILL TO ANALYSIS REQUEST																			
Project Manager: Hack Conder							P.O. #													,						
Address: 122									Coi	mpa	ny:			;					ŝ							
City: Hobbs	n an	State: NM	Zip	):'8E	240				Att	n:	-		•	-	·	:			Б			I			1	
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† Cardinal cannot accept verbal changes: Please fax written changes to 505-393-2476.

ARDINAL LABORATORIES

#### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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Company Name	Rice Operating Company						-				11 50						ANA	YSIS	RE	QUE	ST			•
Project Manager	Hack Conder						F	P.O.	#:			•												
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Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER Sole	<u>oit</u>	SLUDGE	OUHER :: ACID/BASE	ICE / COOL	OTHER:	DATE	TIME		<b>1</b>			Complete Cations/Anions		· · ·					
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# **CARDINAL** Laboratories

February 02, 2011

Bruce Baker Rice Operating Company 112 W. Taylor Hobbs, NM 88240

RE: BD B-16 JCT 22/37

Enclosed are the results of analyses for samples received by the laboratory on 01/31/11 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 Hydorcarbons

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celux D.Kune

Celey D. Keene Lab Director/Quality Manager

# **CARDINAL** Laboratories

#### Analytical Results For:

Rice Operating Company Bruce Baker 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	01/31/2011	Sampling Date:	01/28/2011
Reported:	02/02/2011	Sampling Type:	Soil
Project Name:	BD B-16 JCT 22/37	Sampling Condition:	Cool & Intact
Project Number:	NOT GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

#### Sample ID: DELINEATION TRENCH @ 3' (H100208-01)

Chloride, SM4500CI-B	mg,	kg	Analyze	d By: LR					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1070	16.0	02/02/2011	ND	416	104	400	3.77	
TPH 8015M	mg,	/kg	Analyze	d By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/01/2011	ND	255	102	250	7.26	
DRO >C10-C28	<10.0	10.0	02/01/2011	ND	227	90.9	250	3.97	
Surrogate: 1-Chlorooctane	91.2	% 70-130	1					-	
Surrogate: 1-Chlorooctadecane	93.7	% 70-130							

#### Sample ID: DELINEATION TRENCH @ 5' (H100208-02)

Chloride, SM4500CI-B	mg	/kg	Analyze	d By: LR					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	592	16.0	02/02/2011	ND	416	104	400	3.77	
TPH 8015M	mg	/kg	Analyze	d By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/01/2011	ND	255	102	250	7.26	
DRO >C10-C28	<10.0	10.0	02/01/2011	ND	227	90.9	250	3.97	
Surrogate: 1-Chlorooctane	101	% 70-130	)		· · · · · ·			· · · ···	
Surrogate: 1-Chlorooctadecane	103	% 70-130	)						

#### **Cardinal Laboratories**

#### \*=Accredited Analyte

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lug Vine

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 SM4500CI-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

Page 3 of 4

#### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

NEED SAMPLES BACK, PLEASE

Page 4 of 4

ARDINAL LABORATORIES

(505) 393-2326 FAX (505) 393-2	4/0	13	25)	5/3-	100	1 7/	47	(325	-										 				_
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Project Manager: Bruce Baker							Ρ.Ο	). #:															
Address: 122 West Taylor							Co	mpa	ny:_	_							S				1	1	
City: Hobbs State: NM	Zip	: 88	3240	)			Att	n:									<u> </u>						
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Project Name: BD B-16 JCT 22.37							Sta	te:		_ 2	Zip:		Chlorides	15	×	TPH	Cations/Anions				l		
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Dell	vered By: (Circle One)		Sample Condition	CHECKED BY:			· · · · · · · · · · · · · · · · · · ·
	).	U	Cool Intact	(laritiala)	l weinheimer@	ricesw	d.com kjones@riceswd.com
Sam	oler - HPS - Bus - Other:		Tes Zires			,100011	a.com njon oce nood na com
				_ ym			

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

#26

Logger: Driller: Drilling M Start Date End Date Comme	Method: te: e: ents: All sa	the fo DRA 55 ft	oper, Inc. y 11 from ci ormer ju FTED BY	sB-6 sB-4 sB-3 sB-1 sB-2 sB-8 sB-9 sB-10 sB-11 sB-5 sB-7 MW 1 uttings. Located 23 ft south of unction box site. ': L. Weinheimer DGW = 78 ft	Pro Lo	oject Name: BD B-16 oject Consulta cation: UL/B s t: 32°23'52.809 ng: 103°9'51.	ant: REC sec. 16 T 5"N 036"W	Well ID: SB-7 SS 22S R37E County: LEA State: NM
(feet)	field tes	IIAR	PID	Description		Lithology	Well	Construction
				Brown fine sand with small caliche				
5 ft	1043	Cl- 1180	3.6		12			
		GRO <10		5- 5- 5- 5- 5- 5- 5- 5- 5- 5- 5- 5- 5- 5				
		DRO						
10 ft	821	<10	3.6					
10 11	021	-	0.0	1	i.			
				Tan to brown fine sand with small caliche				
15 ft	881		10.1	Caliche				
		1						
20 ft	704	_	0.9					
				Brown medium sand with large				
				caliche frag	1			
25 ft	666		15.5					
30 ft	602		12.1					bentonite
				Too to yook yoon, first and with small				seal
				Tan to red very fine sand with small caliche fragments				
35 ft	541		6.7					
		CI-						
40 ft	622	608 GRO	2.7		-			
	-	<10						
		DRO <10		Tan very fine sand				
45 ft	1016		6.6					

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
50 ft	456		4.3	Light red very fine sand		
55 ft	208	CI- 160 GRO <10	4.7			
		DRO <10				

Logger:		Jord	dan Woo	odfin	\$B-6 \$B-4		RIGE		
Driller: Drilling N			n & Coo Air rotar	per, Inc. y	SB-4 SB-3 SB-1 SB-2 SB-2 SB-8 SB-9 SB-10 S	Dr		TING & SAFETY,	
Start Date	e:	3	3/22/201 3/22/201	1	SB-5 SB-7 SB-7 SB-7	Pre	oject Name: BD B-16 oject Consulta	Vell ID: SB-8	
			on box	site. T	uttings. Located 17 ft east of his bore was not sent to the lab. : L. Weinheimer		cation: UL/B set		S R37E County: LEA
	TD	= 75 1	ft		DGW = 78 ft	Lo	ng: 103°9'50.8	11"W	State: NM
Depth (feet)	chlori field te		LAB	PID	Description		Lithology	Well C	onstruction
5 ft	1320	)		1.2	Brown medium sand with caliche				
10 ft	1372	2		1.1			FERENCIP 88888889000000000		
15 ft	1082	2		1.1					
20 ft	938			1.1					
					Tan very fine sand with caliche				
25 ft	586			1.2					
30 ft	776			1.6					
35 ft	674			1.7					bentonite
40 ft	642			1.1					seal

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
				Tan very fine silty sand		
45 ft	1895		1.0			
50 ft	1068		0.9			
55 ft	1315		1.0			
60 ft	1924		1.0	Red very fine silty sand		
65 ft	834		1.0			
70 ft	581		1.0			
75 ft	457		1.0			

th	Method: te: ents: All sa e former ju TD =	nction box DRA 40 ft	per, Inc. y 1 from cu c site. T	sB-6 sB-4 sB-3 sB-1 sB-2 sB-3 sB-5 sB-7 MW 1 uttings. Located 24 ft east of This bore was not sent to the lab. : L. Weinheimer DGW = 78 ft	Pro Loc Lat	F	<u>int: REC:</u> ec. 16 T2 "N	Well ID: SB-9
Depth (feet)	chloride field test		PID	Description		Lithology	Well	Construction
				Tan to red very fine sand				
5 ft	1360		3.3					
10 ft	781		2.6					
				-				
				Tan very fine sand with caliche				
15 ft	885		2.2					
00.4	700		4.5					
20 ft	769		1.5					bentonite
		+						seal
25 ft	1398		1.1					
30 ft	1173		1					
		_		Tan to red very fine sand				
35 ft	370	_	1					
		_						
40 ft	1616		0.8					
								D

Logger: Driller: Drilling M Start Date End Date Comme the Depth	Method: e: ents: All s e former j	larriso samp junct = 60	ion box DRAI ft	per, Inc. y 1 1 from c site. T FTED BY	sB-6 sB-4 sB-3 sB-1 sB-2 sB-8 sB-9 sB-10 sB-11 sB-5 sB-7 MW 1 uttings. Located 37 ft east of This bore was not sent to the lab. t': L. Weinheimer DGW = 78 ft	Lat: 32°	Vell ID: SB-10 SB-10 SR37E County: LEA State: NM			
(feet)			PID	Description	Lith	ology	Well C	II Construction		
5 ft 10 ft 15 ft	626 494 987			3.5 3.6	Tan fine silty sand with small caliche fragments					
20 ft	688			3	Light brown fine silty sand with small					
25 ft	628			3.7	caliche fragments					
2011	020			0.7						
									1.	
<b>30 ft</b> 548		2.5					bentonite seal			
35 ft	502			2						
		1905 1.7			Light red very fine sand					
40 ft	1905			1.7					12635	
					Tan very fine sand (moist)					

Depth (feet)			Description	Lithology	Well Construction	
50 ft	1247		1.7			
55 ft	1047		1.1	Red very fine sand (moist)		
60 ft	1081		1.4			

Logger: Driller: Drilling N	Method:		rdan Woo on & Cooj Air rotar	per, Inc.	SB-6 SB-4 SB-3 SB-1 SB-2 SB-8 SB-9 SB-10 SB-10 SB-11 SB-11	Project Name: Well ID:									
Start Dat	e:		3/23/201	1	58-5	1	BD B-16		SB-11						
End Date	:	1.00	3/23/201	1	SB-7 MW 1	Pre	oject Consult								
Comme	ents: All s	sample	es are fr	rom cutt	ings. Located 49 ft east of		cation: UL/B								
					ction box site.										
				TED BY:	L. Weinheimer		t: 32°23'52.93		County: LEA						
		= 25	tt		DGW = 78 ft	Lo	ng: 103°9'50.	458"W	State: NM						
Depth (feet)	chlor field to		LAB	PID	Description		Lithology	Well	Construction						
5 ft 10 ft	510		CI- 576 GRO <10 DRO <10	1.1											
15 ft	33(	0		3.7	Tan fine silty sand with caliche				bentonite seal						
20 ft	380	0		3.1											
25 ft	24	7	CI- 96 GRO <10 DRO <10	1.9											



March 28, 2011

Hack Conder Rice Operating Company 112 W. Taylor Hobbs, NM 88240

RE: BD JCT B-16 (SOIL)

Enclosed are the results of analyses for samples received by the laboratory on 03/23/11 8:06.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Rice Operating Company Hack Conder 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	03/23/2011	Sampling Date:	03/22/2011
Reported:	03/28/2011	Sampling Type:	Soil
Project Name:	BD JCT B-16 (SOIL)	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	BD JCT B-16		

## Sample ID: SB 7 @ 5 FT. (H100557-01)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1180	16.0	03/26/2011	ND	416	104	400	0.00	
TPH 8015M	mg/kg		Analyze	d By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	03/26/2011	ND	209	105	200	1.25	
DRO >C10-C28	<10.0	10.0	03/26/2011	ND	206	103	200	1.28	
Surrogate: 1-Chlorooctane	105	% 70-130	,						
Surrogate: 1-Chlorooctadecane	102 % 70-130								

#### Sample ID: SB 7 @ 40 FT. (H100557-02)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	608	16.0	03/26/2011	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: AB					
Analyte	Result Reporting Limi		Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	03/26/2011	ND	209	105	200	1.25	
DRO >C10-C28	<10.0	10.0	03/26/2011	ND	206	103	200	1.28	
Surrogate: 1-Chlorooctane	106	% 70-130							
Surrogate: 1-Chlorooctadecane	103	% 70-130							

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#### \*=Accredited Analyte

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Celez D. Kune

Celey D. Keene, Lab Director/Quality Manager



Rice Operating Company Hack Conder 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	03/23/2011	Sampling Date:	03/22/2011
Reported:	03/28/2011	Sampling Type:	Soil
Project Name:	BD JCT B-16 (SOIL)	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	BD JCT B-16		

#### Sample ID: SB 7 @ 55 FT. (H100557-03)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	03/26/2011	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: AB			<u> </u>		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0 10.0		03/26/2011	ND	209	105	<sup>-</sup> 200	1.25	
DRO >C10-C28	<10.0	10.0	03/26/2011	ND	206	103	200	1.28	
Surrogate: 1-Chlorooctane	113	% 70-130							
Surrogate: 1-Chlorooctadecane	110	% 70-130							

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Celeg D. Kune

Celey D. Keene, Lab Director/Quality Manager



#### **Notes and Definitions**

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	ND	Analyte NOT DETECTED at or above the reporting limit
***         Insufficient time to reach temperature.           -         Chloride by SM4500Cl-B does not require samples be received at or below 6°C	RPD	Relative Percent Difference
- Chloride by SM4500CI-B does not require samples be received at or below 6°C	**	Samples not received at proper temperature of 6°C or below.
	***	Insufficient time to reach temperature.
Samples reported on an as received basis (wet) unless otherwise noted on report	-	Chloride by SM4500CI-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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#### \*=Accredited Analyte

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Celing D. Kune

Celey D. Keene, Lab Director/Quality Manager

### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ARDINAL LABORATORIES

	(505) 393-2326 PAX (505) 393-24				, 013	-10	U I						~												
Company Name: Rice Operating Company					BILL TO								ANALYSIS REQUEST												
Project Manager: Hack Conder						P	2.0	#:									40								
Address: 122	West Taylor			نىسىك			-	Company;						ļ,	.			S	$\odot$						
City: Hobbs	ity: Hobbs State: NM Zip: 88240							Attn:										or	Thru		1				
hone #: 575-393-9174 Fax #: 575-397-1471						A	dd	ress	•							j į	ц Ц								
Project #::	Project Owner	6		-				c	ity			••••			Σ		T	s//	ğ						
Project Name: I	3D.jčtť.B-16							s	tat	e:		Zip:	-	ğ	5	×	<u>م</u>	0 Ú	ğ					1	
Project Locatio	n: BD/Jct B-16							P	hö	në #			•	Chlorides	TPH 8015 M	BTEX	Texas TPH	ati	Extended						
Sampler Name:	Jordan Woodfin				•			_		#:		• •		물		E E	xa	С О	Ш		;				
FOR LAB USE ONLY		· _ 2	1		1	MAT	RIX		<b>۴</b>	RES	ERV	SAMPLI	NG	<b>O</b>			Le	fe	Σ						
Lab I.D.	Sample I.D.	(G)RAB.OR (C)OMP.	# CONTAINERS	ROUN	WASTEWATER	SOIL	OIL	SLUDGE		ACID/BASE:	OTHER:	DATE	TIME .					Complete Cations/Anions	TPH 8015						
HIDD557-1	SB 7.@ 511.	,	Ĭ			$\checkmark$						3/22/11	(02:30)	1	1							· · ·			
2	SB 7 @ 40ft	_	1		1	1				1		3/22/11	02:45	1	1										
3	SB 7 @:55ft	<u> </u>	1			<u>/</u>		<u> </u>			1	3/22/11	03:00	1	<u>/</u>										
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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

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Relinguished By	Date: Received By:	Phone Result:  Ves Ø No  Add'  Phone #:-
and the second	3/23/11	Fax Result: 🗆 Yes 💋 No 🛛 Add'I Fax #:
Jordan Woodfin	Time 30	REMARKS:
Relinquished By:	Date Des / Received By:	email results
	2021 In In I	All read
	A B THE CARLE YO M	A FRANCE AND A REAL AND A
Delivered By (Circle One)-	Sample Condition	CHECKED BY: Hoonder@riceswd.com; jwoodfin@rice-ecs.com;
Delivered By ALLIPCIe One	NE I Fili I Maria Alla Sal	
Sampler - UPS Bus Other:		(http://www.secondecom/lines/l
Sampler - OFS - Bus - Otter.		

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

NEED SAMPLES BACK, PLEASE



March 29, 2011

Hack Conder Rice Operating Company 112 W. Taylor Hobbs, NM 88240

RE: BD JCT B-16 (SOIL)

Enclosed are the results of analyses for samples received by the laboratory on 03/24/11 8:40.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Kune

Celey D. Keene Lab Director/Quality Manager



Rice Operating Company Hack Conder 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	03/24/2011	Sampling Date:	03/23/2011
Reported:	03/29/2011	Sampling Type:	Soil
Project Name:	BD JCT B-16 (SOIL)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	BD JCT B-16		

#### Sample ID: SB 11 @ 5' (H100564-01)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	576	16.0	03/29/2011	ND	416	104	400	0.00		
TPH 8015M	mg,	/kg	Analyze	d By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/27/2011	ND	219	110	200	2.79		
DRO >C10-C28	<10.0	10.0	03/27/2011	ND	224	112	200	1.19		
Surrogate: 1-Chlorooctane	94.1	% 70-130								
Surrogate: 1-Chlorooctadecane	85.9	% 70-130								

#### Sample ID: SB 11 @ 25' (H100564-02)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	96.0	16.0	03/29/2011	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: AB					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	03/27/2011	ND	219	110	200	2.79	
DRO >C10-C28	<10.0	10.0	03/27/2011	ND	224	112	200	1.19	
Surrogate: 1-Chlorooctane	107	% 70-130	, .						
Surrogate: 1-Chlorooctadecane	103	% 70-130	ł						

#### **Cardinal Laboratories**

#### \*=Accredited Analyte

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Celey D. Kune

Celey D. Keene, Lab Director/Quality Manager



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#### **Notes and Definitions**

i	ND	Analyte NOT DETECTED at or above the reporting limit
	RPD	Relative Percent Difference
1	**	Samples not received at proper temperature of 6°C or below.
1	***	Insufficient time to reach temperature.
	-	Chloride by SM4500CI-B does not require samples be received at or below $6^{\circ}C$
		Samples reported on an as received basis (wet) unless otherwise noted on report

#### **Cardinal Laboratories**

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Celey D. Kune

Celey D. Keene, Lab Director/Quality Manager

Page 3 of 4

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ARDINAL LABORATORIES

Rice Operating Company								HIN			LL TO				ANALYSIS, REQUEST									
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State: NM	Žip	: 88	324(	): .			Attn:					ŀ				ы По	5							
Phone #: 575-393-9174 Fax #: 575-397-1471					Ac	Idra	ss:								<u>i</u> u	러		,						
Project Owne	ř:						City			1	Σ		T	S/P	j.									
Project #: Project Owner: Project Name: BD Jct B-16						State: Zip:			les es	S.	1	ā	ü	p										
Project Location: BD. Jct B-16						PÌ	one	• #:	7			1.5	0	Ш	) –	Catic	ter			:				
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Sample I.D.	RAB.OR (C)	# CONTAINERS	<b>GROUNDWATER</b>	WASTEWATER		SLUDGE.	OTHER!	ACID/BASE:	ICE / COOL	OTHER:	DATE.	TIME			· · ·		Comple	TPH 8015						•
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	West Taylor State: NM 93-9174 Fax #:575-39 Project Owner D Jct B-16 Jordan Woodfin Sample I.D.	Hack Conder West Taylor 93-9174 Fax #: 575-397-1 Project Owner: D Jct B-16 Jordan Woodfin Sample I.D.	Hack Conder         West Taylor         State:: NM       Zip: 86         93-9174       Fax #: 575-397-147.1         Project Owner:       Project Owner:         D Jct B-16       Jordan Woodfin         Sample I.D.       Woodfin         SB 11 @ 5'       1	Hack Conder         West Taylor         State:: NM       Zip: 88240         93-9174       Fax #: 575-397-147.1         93-9174       Fax #: 575-397-147.1         Project Owner:       Project Owner:         D Jct B-16       Sample I.D.         Sample I.D.       August Structure         SB 11 @ 5'       1	Hack Conder         West Taylor         State: NM       Zip: 88240         93-9174       Fax #: 575-397-147.1         Project Owner:         ID Jct B-16         Jordan Woodfin         Sample I.D.         SB 11 @ 5'	Hack Conder         West Taylor         State:: NM       Žip: 88240         93-9174       Fax #: 575-397-147.1         93-9174       Fax #: 575-397-147.1         Project Owner:       Project Owner:         D Jct B-16       Sample I.D.         Sample I.D.       August Stress	Hack Conder         West Taylor         State: NM       Zip: 88240         93-9174       Fax #: 575-397-147.1         Project Owner:       Project Owner:         D Jct B-16	Hack Conder       P.1         West Taylor       Co         State: NM       Zip: 88240         93-9174       Fax #: 575-397-147.1         Yeroject Owner:       Cli         D Jet B-16       State         Sample I.D.       Matrix:         Woodfin       Fax         Sample I.D.       Matrix:         SB 11 @ 5'       Y	Hack Conder       P.O.#         West Taylor       Comp         State: NM       Zip: 88240         93-9174       Fax #: 575-397-147.1         Yroject Owner:       City:         D Jot B-16       State:         ISBD Jot B-16       Phone         Jordan Woodfin       Fax #:         Sample I.D.       Wattrix         SB 11 @ 5'       1	Hack Conder       P.O. #:         West Taylor       Company         State:: NM       Žip: 88240         93-9174       Fax #: 575-397-147.1         OJ Jct B-16       State:         ID Jct B-16       Phone #:         Jordan Woodfin       Fax #:         Sample I.D.       AWO (D) WO (D) W	Hack Conder       P.O. #:         West Taylor       Company:         State: NM       Žip: 88240         93-9174       Fax #: 575-397-147.1         93-9174       Fax #: 575-397-147.1         93-9174       Fax #: 575-397-147.1         Project Owner:       City:         D Jct B-16       State:         BD Jct B-16       Phone #:         Jordan Woodfin       Fax #:         Sample I.D.       Addross         BB 11 @ 5'       1	Hack Conder       P.O.#:         West Taylor       Company:         State:: NM       Zip: 88240         93-9174       Fax #: 575-397-147.1         93-9174       Fax #: 575-397-147.1         Project Owner:       City:         D Jct B-16       State:: Zip:         ID Jct B-16       State:: Zip:         Jordan Woodfin       Fax #:         Sample I.D.       State: Sample I.D.         ID Jct B-16       ID Jct B-16         Sample I.D.       ID Jct B-16         ID Jct B-16       Phone #:         Fax #:       Fax #:         Dordan Woodfin       Fax #:         Sample I.D.       ID Jct B-16         ID Jct B-16       ID Jct B-16         Jordan Woodfin       Fax #:         Sample I.D.       ID Jct B-16         ID Jct B-16       ID Jct B-16         Sample I.D.       ID Jct B-16         ID Jct B-16       ID Jct B-16         ID Jct B-17       ID Jct B-16	Hack Conder       P.O.#:         West:Taylor       Company:         State::NM       Žip: 88240         93-9174       Fax #: 575-397-147.1         93-9174       Fax #: 575-397-147.1         Project Owner:       City:         D Jct B-16       State:         State:       Zip:         Project Owner:       City:         D Jct B-16       State:         Jordan Woodfin       Fax #:         Sample I.D.       Natrix:         PRESERV       SAMPLING         Ward of the state       Sample I.D.         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Antrix         BS 11 @ 5       1	Hack Conder     P.O.#:       West Taylor     Company:       State: NM Zip: 88240     Attn:       93-9174     Fax #: 575-397-147.1       Project Owner:     City:       D Jot B-16     State:: Zip:       Phone #:       Jordan Woodfin       Sample I.D.       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Wastring         SB 11 @.5'       T</td><td>Hack Conder       P.O.#:         West Taylor       Company::         State:: NM       Zip: 88240         Attn::       Address:         93-9174       Fax #: 575-397-147.1         Address:       City:         'Project Owner:       City:         'D' Jct B-16       State:         'BD Jct B-16       State:         'SBD.Jct B-16       Phone #:         Jordan Woodfin       Fax #:         'BLEN       PRESERV         Sample I.D.       'BLEN' B-10''         'B11 @:5'       'I</td></t<>	Hack Conder       P.O. #:         West Taylor       Company:         State::NM       Zip: 88240         Attn:       Address:         93-9174       Fax #: 575-397-147.1         Address:       City:         :Project Owner:       City:         :D Jot B-16       State:         ::BD.Jot B-16       Phone #:         Jordan Woodfin       Fax #:         Wastring       Wastring         Wastring       Wastring         Wastring       Wastring         Sample I.D.       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101 East Marland, Hobbs, NM: 88240 2111 Beechwood, Abilene, TX 79603

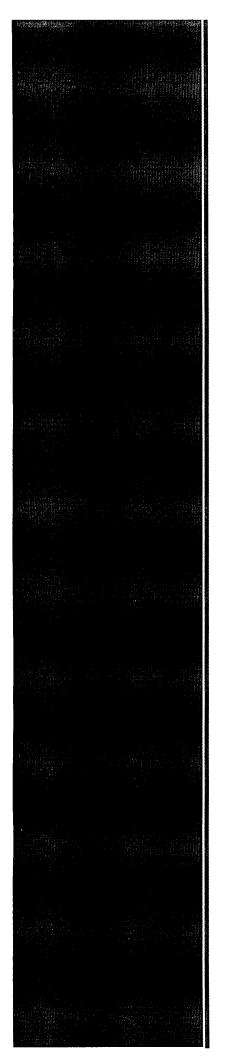
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325)673-7020

PLEASE NOTE: Usuality and Domages, Cardinate liability and clean's acclusive remerity for any claim arising whether based in centrat or tort, shell be imited to the amount puid by the clean's for applicable is a special strain and any star cause, what were shall be demined walved unless made in writing and received by Cardinal within 30 days a fair completion of the applicable is arised to include the interview of the applicable is arised in a strain and any star cause, what were shall be demined walved unless made in writing and received by Cardinal within 30 days a fair completion of the applicable is arised to include the interview of the applicable is arised to any strain and the interview of any strain and the interview of the arised to arise in the strain and any strain strained in the strain and any strain strained in the strained interview of any strained interview. It is a strained in the interview of the arised and any strained interview of the arised and any strained interview of the arised and any strained interview of the above strained residue and any strained interview of the above strained residue interview of the above strained residue of the strained and any strained any strained and any strained any strain

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	Jordan Woodfin		Fax Result: 🖸 Yes 🖾 No 🛛 Add'l Fax #
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- <b>1</b>	1 m ( X - 0.40) M	IN AUNDONC	Hconder@riceswd.com; jwoodfin@rice-ecs.com;
	Delivered By: (Circle One)	Sample Condition CHECKED BY:	
		Cool Intact Yes D Yes No No	Lweinheimer@rice-ecs.com kjones@riceswd.com
	Sampler - UPS - Bus - Other:	Yes Yes	

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

NEED SAMPLES BACK, PLEASE



# Appendix B Monitor well installation

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

Logger:Jordan WoodfinDriller:Harrison & Cooper, Inc.Drilling Method:Air rotaryStart Date:10/26/2010End Date:10/26/2010Comments:Located 36 ft south eastDBAFTED BY:					, MW 2 58-4 <sup>°</sup> 58-4 <sup>°</sup>	RECS							
					SB-1 5B-2 SB-3 SB-6 SB-6 MW 1	Project Name: Well ID: BD B-16 MW Project Consultant: RECS Location: UL/B sec. 16 T22S R37							
Depth	TD =	= 90 ft			DGW = 78 ft		ng: 103°9'50.8	B16"V		County: LEA State: NM			
(feet)	field tes		AB	PID	Description		Lithology	V	Vell C	onstruction			
5 ft	535			0.0	Tan very fine sand with small calcihe fragments		•			on surface			
10 ft	525			0.0									
15 ft	659			0.0									
20 ft	900		CI- 880 GRO <10 DRO	0.1									
25 ft	762		<10	0.0									
30 ft	353			0.0	light brown fine sand with small caliche fragments	the second s			PVC	– bentonite			
35 ft	200			0.6		and the second			2 in F	seal			
40 ft	371			0.6									

0.8 0.8 0.9 0.9 1.0 1.0	light brown very fine sand red very fine sand red very fine sand (moist)		
0.9	red very fine sand		
1.0			
	red very fine sand (moist)		
0.6	red very fine sand (moist)		
		-	
0.0			
0.0	red very fine sand		
Cl- 16 0.0			
<10 DRO			sand
	NO SAMPLES TAKEN		pack
	16 0.0 GRO <10	16 0.0 GRO <10 DRO <10	16         0.0           GRO

Logger:Jordan WoodfinDriller:Harrison & Cooper, Inc.Drilling Method:Air rotaryStart Date:10/26/2010End Date:10/26/2010Comments:Located 64 ft north west		MW 2 58-4 <sup>8</sup> 58-4	RECS							
		10 10	SB-1 <sup>°</sup> SB-2 <sup>°</sup> SB-3 <sup>°</sup> SB-5 <sup>°</sup> MW 1	Pro	bject Name: BD B-16 bject Consulta cation: UL/B	ant: RECS	Well ID: MW-2 S 22S B37E			
	TD = 90	DRAF		L. Weinheimer DGW = 78 ft	Lat: 32°23'53.643"N         County: L           Long: 103°9'51.371"W         State: NM					
Depth (feet)	chloride fiel tests	d LAB	PID	Description		Lithology	Well C	construction		
				Tan very fine sand with small caliche fragments.						
5 ft	138		0.0					a series and		
				Brown fine sand with small caliche fragments						
10 ft	391		0.0							
15 ft 183		0.5	Light brown fine sand with small							
20 ft	168	8	0.5		caliche fragments					
25 ft	236		0.6							
30 ft	147		0.0				2 in PVC			
				Brown fine sand with small caliche				bentonite seal		
35 ft	182		0.0	. fragments						
40 ft	D ft 180 0.0									
				Tan very fine sand						
45 ft	180		0.0							

Depth (feet)	chloride field tests	LAB	PID	Description	Lithology	Well Construction
50 ft	176		0.0			
55 ft	179		0.0			
60 ft	179		0.0			
65 ft	175		0.0	Reddish brown very fine sand		
70 ft	168		0.0			
75 ft	181		0.0	NO SAMPLES TAKEN		
80 ft				NO SAMPLES TAKEN		sand pack
85 ft						
90 ft						

# **CARDINAL** Laboratories

October 28, 2010

Hack Conder Rice Operating Company 112 W. Taylor Hobbs, NM 88240

RE: BD JCT B-16

Enclosed are the results of analyses for samples received by the laboratory on 10/27/10 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 Hydorcarbons

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celuz D.Keine

Celey D. Keene Lab Director/Quality Manager

# **CARDINAL** Laboratories

#### Analytical Results For:

**Rice Operating Company** Hack Conder 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	10/27/2010	Sampling Date:	10/26/2010
Reported:	10/28/2010	Sampling Type:	Soil
Project Name:	BD JCT B-16	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	BD JCT B-16		

#### Sample ID: MW - 1 @ 20' (H021149-01)

Chloride, SM4500CI-B	mg,	/kg	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	880	16.0	10/27/2010	ND	416	104	400	3.92	
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	10/27/2010	ND	168	84.1	200	2.09	
DRO >C10-C28	<10.0	10.0	10/27/2010	ND	221	111	200	0.403	
Surrogate: 1-Chlorooctane	105	% 70-130	· ··· · ···						
Surrogate: 1-Chlorooctadecane	99.9	% 70-130							

#### Sample ID: MW - 1 @ 75' (H021149-02)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	Analyzed By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	16.0	16.0	10/27/2010	ND	416	104	400	3.92	
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	10/27/2010	ND	168	84.1	200	2.09	
DRO >C10-C28	<10.0	10.0	10/27/2010	ND	221	111	200	0.403	
Surrogate: 1-Chlorooctane	102	% 70-130	1						
Surrogate: 1-Chlorooctadecane	96.9	% 70-130	1						

#### **Cardinal Laboratories**

\*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and clent'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 lable 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.

Vinelin

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

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luz Seine

Celey D. Keene, Lab Director/Quality Manager

#### CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ARDINAL LABORATORIES

Company Name		. <b>.</b>				. E73	- Ti -	B	ILL TO		1				ANAL	YSIS	S RE	QUE	ST			
Project Manage	r: Hack Conder		<del>.</del> "			Р.С	). #:-								:							
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City: Hobbs	Stat	e: NM	Zip:	88	240	Att	n:								0 U							
Phone #: 575-3		: 575-397	-14	71		Ad	dres	ś:			1				, i							:
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	n: BD Jct B-16					Ph	one	ŧ::			Chlorides	801	BTEX	Texas: TPH	atič							
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FOR LAB USE ONLY	r		ŕ		MATRIX		PRE	SER	SAMPL	NG	<b></b>	TPH	;	ିତ୍ର	e				· ·			
Lab I,D.	Sample I.D.	-	(G)RAB OR (C)OMP	# CONTAINERS	GROUNDWATER WASTEWATER SOIL OIL SLUDGE	OTHER:	ACID/BASE:		DATE	TIME					Complete Cations/Anions	•			•			
12.1.149.1	MW-1:@ 20ft	<u></u>	÷.	1		•		<u>/ </u> _	- 10/26/10		1	1								l		·
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#### 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

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

NEED SAMPLES BACK, PLEASE

# Appendix C Monitor well sampling laboratory analysis

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



February 03, 2012

Hack Conder Rice Operating Company 112 W. Taylor Hobbs, NM 88240

RE: BD JCT B-16

Enclosed are the results of analyses for samples received by the laboratory on 01/31/12 16:15.

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 <a href="https://www.tceq.texas.gov/field/ga/lab">www.tceq.texas.gov/field/ga/lab</a> accredited 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. Keine

Celey D. Keene Lab Director/Quality Manager



Rice Operating Company Hack Conder 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	01/31/2012	Sampling Date:	01/27/2012
Reported:	02/03/2012	Sampling Type:	Water
Project Name:	BD JCT B-16	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T22S R37E SEC16 B-LEA CTY., NM		

#### Sample ID: Monitor Well #1 (H200236-01)

BTEX 8260B	mg/	L	Analyze	d By: CMS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	02/01/2012	ND	0.024	120	0.0200	12.2	
Toluene*	<0.001	0.001	02/01/2012	ND	0.019	96.6	0.0200	11.1	
Ethylbenzene*	<0.001	0.001	02/01/2012	ND	0.020	99.0	0.0200	10.9	
Total Xylenes*	<0.003	0.003	02/01/2012	ND	0.061	102	0.0600	11.3	
Surrogate: Dibromofluoromethane	135 9	59.8-16	1				11		
Surrogate: Toluene-d8	88.0	% 75.2-11	5						
Surrogate: 4-Bromofluorobenzene	87.9	% 53.7-12	0	,					
Chloride, SM4500CI-B	mg/	L	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	260	4.00	02/01/2012	ND	112	112	100	4.57	
Sulfate 375.4	mg/	L	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	242	10.0	02/02/2012	ND	18.9	94.5	20.0	3.64	
TDS 160.1	mg/	L	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	1080	5.00	02/01/2012	ND	255	106	240	0.964	

#### **Cardinal Laboratories**

#### \*=Accredited Analyte

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Celeg D. Kune

Celey D. Keene, Lab Director/Quality Manager



Rice Operating Company Hack Conder 112 W. Taylor Hobbs NM, 88240 Fax To: (575) 397-1471

Received:	01/31/2012	Sampling Date:	01/27/2012
Reported:	02/03/2012	Sampling Type:	Water
Project Name:	BD JCT B-16	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T22S R37E SEC16 B-LEA CTY., NM		

#### Sample ID: Monitor Well #2 (H200236-02)

BTEX 8260B	mg,	′L	Analyze	d By: CMS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.001	0.001	02/01/2012	ND	0.024	120	0.0200	12.2	
Toluene*	<0.001	0.001	02/01/2012	ND	0.019	96.6	0.0200	11.1	
Ethylbenzene*	<0.001	0.001	02/01/2012	ND	0.020	99.0	0.0200	10.9	
Total Xylenes*	<0.003	0.003	02/01/2012	ND	0.061	102	0.0600	11.3	
Surrogate: Dibromofluoromethane	135	% 59.8-16	51						
Surrogate: Toluene-d8	88.7	% 75.2-11	5						
Surrogate: 4-Bromofluorobenzene	90.4	% 53.7-12	0						
Chloride, SM4500Cl-B	mg/	۲L	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride*	220	4.00	02/01/2012	ND	112	112	100	4.57	
Sulfate 375.4	mg/	'L	Analyze	d By: HM					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Sulfate*	281	10.0	02/02/2012	ND	18.9	94.5	20.0	3.64	
TDS 160.1	mg/	۲ <b>ـ</b> ـــــــــــــــــــــــــــــــــــ	Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
TDS*	1040	5.00	02/01/2012	ND	255	106	240	0.964	

#### **Cardinal Laboratories**

#### \*=Accredited Analyte

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Celeg D. Kune

Celey D. Keene, Lab Director/Quality Manager



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

THE .

#### **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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#### \*=Accredited Analyte

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Celey D. Kene

Celey D. Keene, Lab Director/Quality Manager

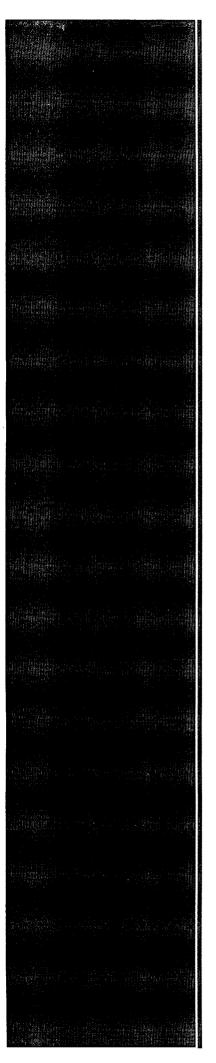
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# Appendix D

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

## Arc Environmental

P. O. Box 1772 Lovington, New Mexico 88260 (575) 631-9310 Rozanne Johnson ~ rozanne@valornet.com

April 23, 2012

#### **NOTES**

The following summarizes the field activities at the RICE BD B-16, Lea County T22S, R37E, Sec 16 Unit Letter B:

- There are two 2-inch monitor wells drilled at the site. A Solinist Water Level Meter is used during each sampling event to check the depth to water prior to pumping the wells. The meter indicated on January 27, 2012 water within monitor well 1 at a depth of 78.16 with the total depth of the well of 91.86 feet, giving 13.69 feet (2.19 gallons) of water within the well bore. Monitor well 2 was 78.11 feet to water with the total depth of the well at 92.10 feet, giving 13.99 feet (2.23 Gallons) of water within the well bore.
- The wells were pumped at 0.25 gallons per minute, with a draw down averaging 7.5 feet, until 10 gallons (which is 4.5 well volumes) of water has been purged from each well bore and the field parameters have stabilized. The wells recover to within 10 percent of the original depth in just over an hour or about 0.12 feet per minute. Following well recovery the wells are sampled with a bailer. The wells continue to produce some fine clay silt material during each sampling event.
- The site is located in the eastern Eunice Plain area of Lea County, which is underlain by a hard caliche surface and is covered by a thin layer of reddishbrown dune sand. The dominant vegetation is bear grass, mesquite and grama grass. Cattle ranchers and oil production activities currently use the area.
- ➢ In this arid region the rate of recharge is very slow due to small rainfall amounts, the porosity of the formation consisting of low permeable rock and a presence of clay, which leaves sediments that are thinly saturated or dry. There is little underground flow of water in the area, again due to the formation.

Sincerely, Arc Environmental Rozanne Johnson Rozanne Johnson

Electronic Copy:

Hack Conder Katie Jones