1R - 426-215

WORKPLANS

Date:

10-17-13

Rice Environmental Consulting & Safety
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

CERTIFIED MAIL
RETURN RECEIPT NO. 7011 2000 0002 0285 5148

October 17th, 2013

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 Jct. N-20 (1R426-215): UL/N sec. 20 T21S 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 miles northwest of Eunice, New Mexico at UL/N sec. 20 T21S R37E as shown on the Site Location Map and Geographical Location Map (Figure 1 and Figure 2). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 99 +/- feet.

In 2007, ROC initiated work on the former BD N-20 junction box. The site was delineated using a backhoe to form a 25 ft x 25 ft x 12 ft deep excavation and soil samples were screened at regular intervals for both hydrocarbons and chlorides. From the excavation, the four-wall composite, the bottom composite and the blended backfill were taken to a commercial laboratory for analysis. Laboratory tests of the four-wall composite showed a chloride reading of 1,070 mg/kg and a gasoline range organics (GRO) and a diesel range organics (DRO) reading of non-detect. The bottom composite showed a chloride laboratory reading of 2,000 mg/kg and a GRO and DRO reading of non-detect. The backfill sample showed a chloride laboratory reading of 944 mg/kg, a GRO reading of non-detect and a DRO reading of 10.1 mg/kg.

The excavated soil was blended on site and used to backfill the excavation to 6 ft bgs. At 6 – 5 ft bgs, a 1 ft thick clay layer was installed and properly seated into the excavation. The remaining blended soil was used to backfill the excavation to ground surface and

contour it to the surrounding location. An identification plate was placed on the surface of the site to mark its location for future environmental considerations. The site was then seeded with a blend of native vegetation. A new water-tight junction box was installed 25 ft north of the former junction box site.

To further delineate the site, two soil bores were installed on April 18th, 2007. SB-1 was installed at the source of the former junction box and SB-2 was installed 15 ft east of the former junction box. While the bores were being advance, samples were taken every 5 ft and field tested for chlorides and hydrocarbons. The deepest sample from each bore, located at 75 ft bgs, was taken to a commercial laboratory for analysis. SB-1 returned a laboratory chloride result of 624 mg/kg and SB-2 returned a laboratory chloride result of 752 mg/kg.

NMOCD was notified of potential groundwater impact on July 25th, 2008 and a junction box disclosure report was submitted to NMOCD with all the 2008 junction box closures and disclosures.

On August 5th, 2013, an Investigation and Characterization Plan (ICP) was submitted to NMOCD and approved on August 21st, 2013. As part of the ICP, a total of 8 additional soil bores (SB 3-10) were installed at the site (Figure 3 and Figure 4). As the bores were advanced, samples were taken every 5 ft and field tested for chlorides and hydrocarbons. Representative samples were taken to a commercial laboratory for confirmatory analysis (Appendix A). SB-3 returned a laboratory chloride reading of 2,720 mg/kg at 20 ft bgs, which decreased to 320 mg/kg at 95 ft bgs. SB-4 returned a laboratory chloride reading of 3,880 mg/kg, which decreased to 336 mg/kg at 95 ft bgs. SB-5 returned laboratory chloride readings of 1,840 mg/kg at 30 ft bgs, 2,000 mg/kg at 80 ft bgs and 944 mg/kg at 95 ft bgs. SB-6 returned a laboratory chloride reading of 3,840 mg/kg at 20 ft bgs, which decreased to 384 mg/kg at 95 ft bgs. SB-7 returned a laboratory chloride reading of 2,200 mg/kg at 25 ft bgs, which decreased to 64 mg/kg at 55 ft bgs. SB-8 returned a laboratory chloride reading of 1,800 mg/kg at 10 ft bgs, which decreased to 128 mg/kg at 30 ft bgs. Chloride concentrations in SB-9 were all below 48 mg/kg. SB-10 returned a laboratory chloride reading of 1,220 mg/kg at 10 ft bgs, which decreased to 144 mg/kg at 30 ft bgs. GRO and DRO readings at all depth in all bores were non-detect.

Corrective Action Plan

Based on the soil bore data, RECS recommends that ROC install a 20-mil reinforced poly liner measuring 71 ft x 103 ft at a depth of approximately 4-5 ft bgs (Figure 3). This liner will extend 10 ft beyond the last soil bore to the North, East and West, and will stop at the edge of the lease road to the south. There is a cattle guard located on that lease that ROC cannot remove due to safety concerns. The liner will overlay the previously installed 25 ft x 25 ft clay liner at 6 -5 ft bgs. The poly 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 reading below 100 ppm. Excavated soil will be evaluated for use as backfill and any soils requiring disposal will be properly disposed of at a NMOCD approved facility.

Upon completion of backfilling, the site will be seeded with a native vegetative mix and soil amendments will be added as necessary. Vegetation provides an infiltration barrier for the site, since plants capture water through their roots thereby reducing the amount of water traveling through the vadose zone to groundwater.

In order to determine what affect the residual chlorides may have had on the groundwater quality below the site, RECS recommends that ROC install a near-source monitor well (MW-1) located south of the lease road (Figure 3). To determine if there is an up-gradient source of contaminates coming onto the site, MW-2 will be installed approximately 100 ft up-gradient of the site. The monitor wells will be installed after the liner installation is completed, and will be sampled quarterly. Once the monitor wells at the site have been analyzed for chloride and TPH readings, ROC will either submit a groundwater remedy to NMOCD to address groundwater quality at the site or submit a 'remediation termination' request for site closure.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-2967 or me 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 – Geographical Location Map
- Figure 3 – Soil Bore Installation, Proposed Liner and MW Installation
- Figure 4 – Soil Bore Installation, Proposed Liner and MW Installation
- Appendix A – Soil Bore Installation Documentation

Figures

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

Site Location Map

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

BD Jct. N-20

Legals: UL/N sec. 20
T-21-S R-37-E
LEA COUNTY, NM

NMOCD Case #: 1R426-215

Figure 1

N
W E
S

0 0.25 0.5 Miles

Drawing date: 8/1/13
Drafted by: L. Weinheimer

Geographical Location Map

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

RECS

BD Jct. N-20

Legals: UL/N sec. 20
T-21-S R-37-E
LEA COUNTY, NM

NMOCD Case #: 1R426-215

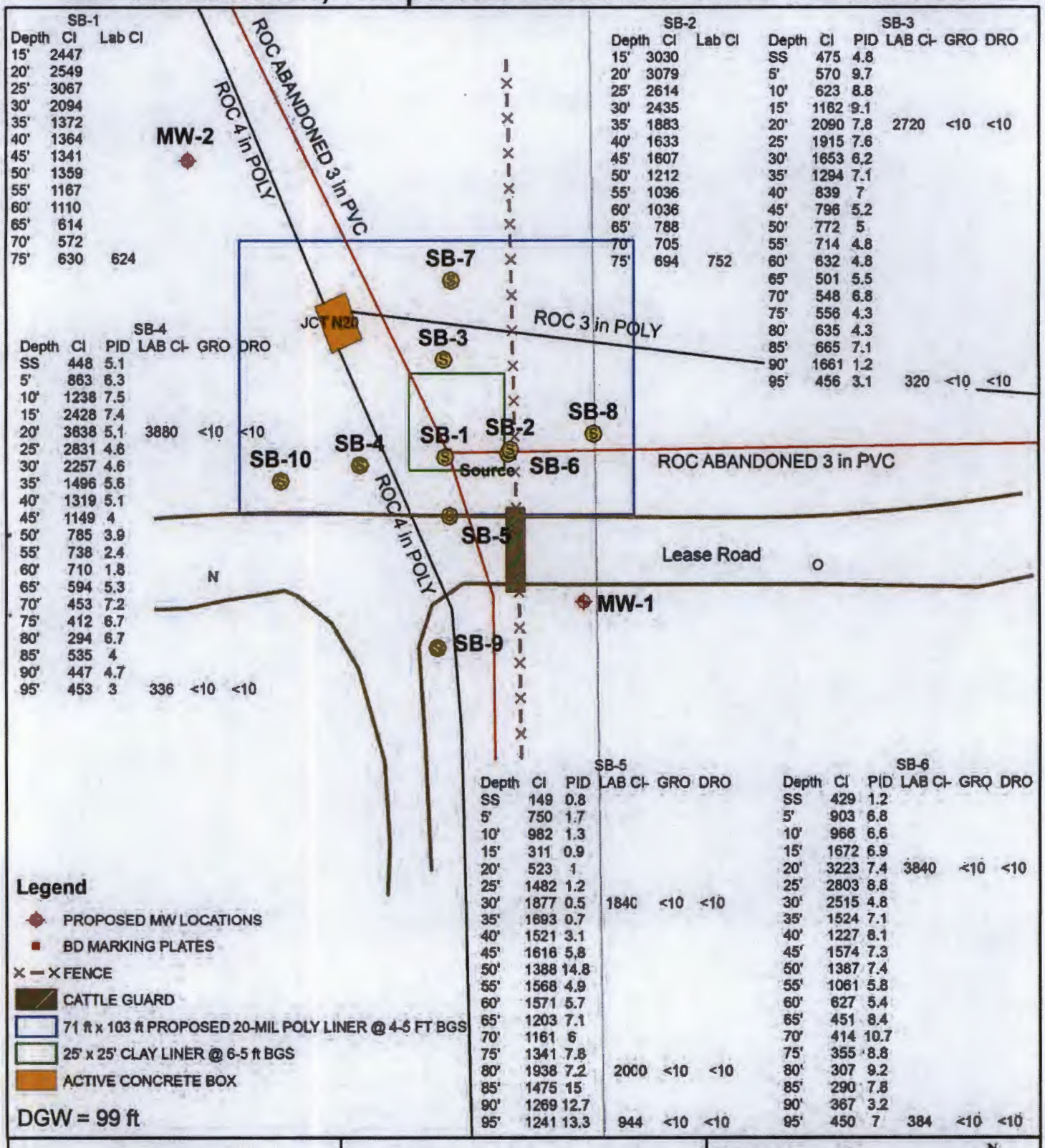
Figure 2

N W E S

0 0.1 0.2 Miles

Drawing date: 8/1/13
Drafted by: L. Weinheimer

SB Installation, Proposed Liner and MW Installation



SB-1

Depth	Cl	Lab Cl
15'	2447	
20'	2549	
25'	3067	
30'	2094	
35'	1372	
40'	1364	
45'	1341	
50'	1359	
55'	1167	
60'	1110	
65'	614	
70'	572	
75'	630	624

SB-2

Depth	Cl	Lab Cl
15'	3030	
20'	3079	
25'	2614	
30'	2435	
35'	1883	
40'	1633	
45'	1607	
50'	1212	
55'	1036	
60'	1036	
65'	788	
70'	705	
75'	694	752

SB-3

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	475	4.8			
5'	570	9.7			
10'	623	8.8			
15'	1162	9.1			
20'	2090	7.8	2720	<10	<10
25'	1915	7.6			
30'	1653	6.2			
35'	1294	7.1			
40'	839	7			
45'	796	5.2			
50'	772	5			
55'	714	4.8			
60'	632	4.8			
65'	501	5.5			
70'	548	6.8			
75'	556	4.3			
80'	635	4.3			
85'	665	7.1			
90'	1661	1.2			
95'	456	3.1	320	<10	<10

SB-4

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	448	5.1			
5'	863	6.3			
10'	1238	7.5			
15'	2428	7.4			
20'	3638	5.1	3880	<10	<10
25'	2831	4.6			
30'	2257	4.6			
35'	1496	5.6			
40'	1319	5.1			
45'	1149	4			
50'	785	3.9			
55'	738	2.4			
60'	710	1.8			
65'	594	5.3			
70'	453	7.2			
75'	412	6.7			
80'	294	6.7			
85'	535	4			
90'	447	4.7			
95'	453	3	336	<10	<10

SB-5

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	149	0.8			
5'	750	1.7			
10'	982	1.3			
15'	311	0.9			
20'	523	1			
25'	1482	1.2			
30'	1877	0.5	1840	<10	<10
35'	1693	0.7			
40'	1521	3.1			
45'	1616	5.8			
50'	1388	14.8			
55'	1568	4.9			
60'	1571	5.7			
65'	1203	7.1			
70'	1161	6			
75'	1341	7.8			
80'	1938	7.2	2000	<10	<10
85'	1475	15			
90'	1269	12.7			
95'	1241	13.3	944	<10	<10

SB-6

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	429	1.2			
5'	903	6.8			
10'	966	6.6			
15'	1672	6.9			
20'	3223	7.4	3840	<10	<10
25'	2803	8.8			
30'	2515	4.8			
35'	1524	7.1			
40'	1227	8.1			
45'	1574	7.3			
50'	1387	7.4			
55'	1061	5.8			
60'	627	5.4			
65'	451	8.4			
70'	414	10.7			
75'	355	8.8			
80'	307	9.2			
85'	290	7.8			
90'	367	3.2			
95'	450	7	384	<10	<10

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC

BD Jct. N-20

Legals: UL/N sec. 20
T-21-S R-37-E
LEA COUNTY, NM

NMOCD Case #; 1R426-215

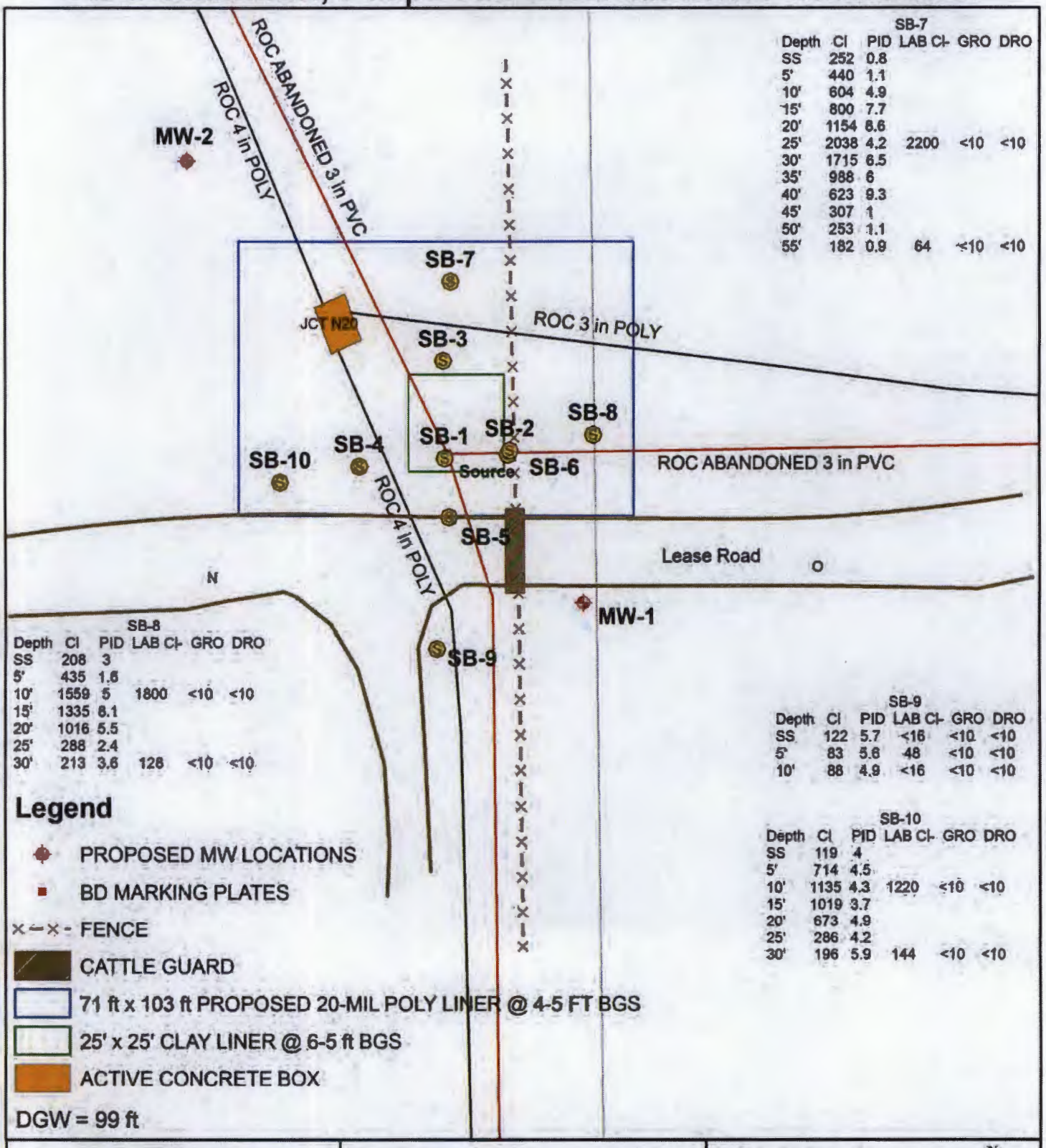
Figure 3

N W E S

0 30 60 Feet

Drawing date: 10/7/13
Drafted by: L. Weinheimer

SB Installation, Proposed Liner and MW Installation



SB-7

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	252	0.8			
5'	440	1.1			
10'	604	4.9			
15'	800	7.7			
20'	1154	8.6			
25'	2038	4.2	2200	<10	<10
30'	1715	6.5			
35'	988	6			
40'	623	9.3			
45'	307	1			
50'	253	1.1			
55'	182	0.9	64	<10	<10

SB-8

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	208	3			
5'	435	1.6			
10'	1559	5	1800	<10	<10
15'	1335	8.1			
20'	1016	5.5			
25'	288	2.4			
30'	213	3.6	128	<10	<10

SB-9

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	122	5.7	<16	<10	<10
5'	83	5.6	48	<10	<10
10'	88	4.9	<16	<10	<10

SB-10

Depth	Cl	PID	LAB Cl-	GRO	DRO
SS	119	4			
5'	714	4.5			
10'	1135	4.3	1220	<10	<10
15'	1019	3.7			
20'	673	4.9			
25'	286	4.2			
30'	196	5.9	144	<10	<10

Legend

- PROPOSED MW LOCATIONS
- BD MARKING PLATES
- FENCE
- CATTLE GUARD
- 71 ft x 103 ft PROPOSED 20-MIL POLY LINER @ 4-5 FT BGS
- 25' x 25' CLAY LINER @ 6-5 ft BGS
- ACTIVE CONCRETE BOX

DGW = 99 ft

RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS

BD Jct. N-20

Legals: UL/N sec. 20
T-21-S R-37-E
LEA COUNTY, NM

NMOCD Case #: 1R426-215

Figure 4

N W E S

0 30 60 Feet

Drawing date: 10/7/13
Drafted by: L. Weinheimer

Appendix A

Soil Bore Installation Documentation

RICE Environmental Consulting and Safety (RECS)
P.O. Box 2948 Hobbs, NM 88241
Phone 575.393.2967

Logger:	Edward Cesareo		**Project Name:** BD Jct. N-20 **Well ID:** SB-3
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/29/2013		
End Date:	8/29/2013		

Comments: SB-3 is 24 ft north of the former junction box site. All samples were from cuttings.

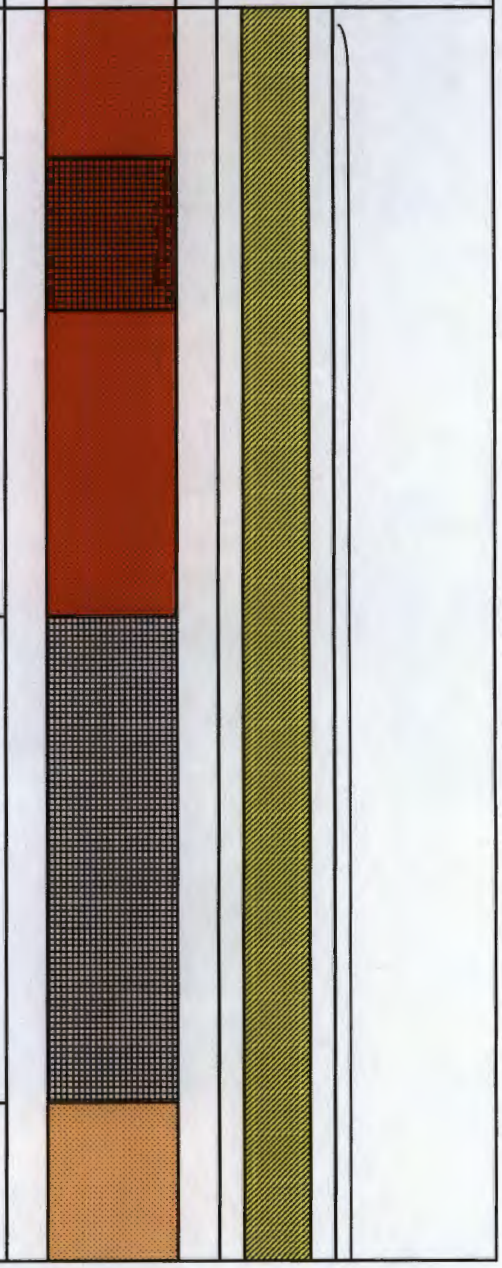
DRAFTED BY: L. Weinheimer

TD = 95 ft GW = 99 ft

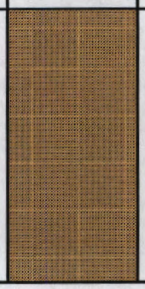
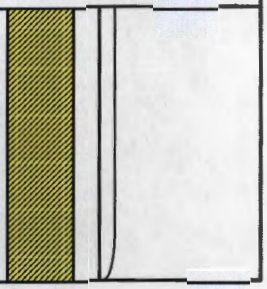
Location: UL/N sec. 20 T21S R37E

Lat: 32°27'32.024"N **Long:** 103°11'6.834"W **County:** Lea **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				RED SAND
SS	475		4.8	
				RED SAND AND SOME CLAY
5 ft	570		9.7	
				RED SAND
10 ft	623		8.8	
15 ft	1162		9.1	
				TAN SAND AND SOME CLAY
20 ft	2090	Cl- 2720	7.8	
		GRO <10		
		DRO <10		
25 ft	1915		7.6	
30 ft	1653		6.2	
				TAN AND RED SAND
35 ft	1294		7.1	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND		bentonite seal
40 ft	839		7			
45 ft	796		5.2			
50 ft	772		5			
55 ft	714		4.8			
60 ft	632		4.8			
				TAN AND RED SAND WITH PEA GRAVEL		
65 ft	501		5.5			
70 ft	548		6.8			
75 ft	556		4.3			
80 ft	635		4.3			
85 ft	665		7.1			
90 ft	1661		1.2			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND WITH PEA GRAVEL		
95 ft	456	Cl-320	3.1			
		GRO <10				
		DRO <10				

Logger:	Edward Cesareo		**Project Name:** BD Jct. N-20 **Well ID:** SB-4
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/29/2013		
End Date:	8/29/2013		

Comments: SB-4 is 23 ft west of the former junction box site. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 95 ft GW = 99 ft

Location: UL/N sec. 20 T21S R37E

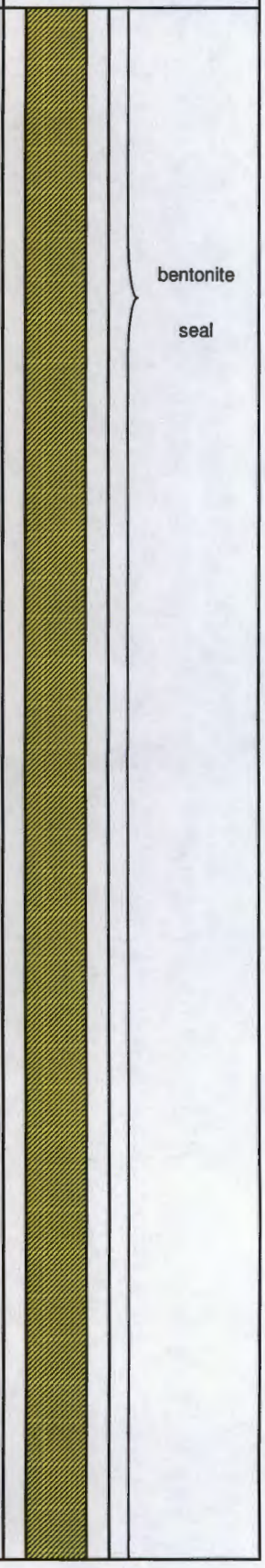
Lat: 32°27'31.763"N **County:** Lea

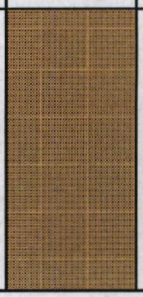
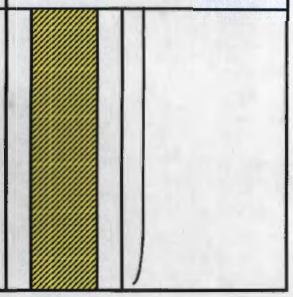
Long: 103°11'7.093"W **State:** NM

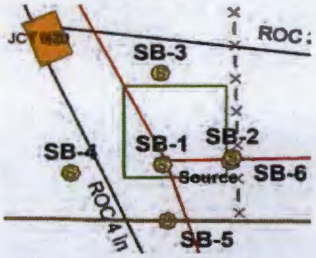
Depth (feet)	Chloride field tests	LAB	PID	Description
				RED SAND
SS	448		5.1	
				RED SAND AND SOME CLAY
5 ft	863		6.3	
				RED SAND
10 ft	1238		8	
15 ft	2428		7	
				TAN SAND AND SOME CLAY
20 ft	3638	Cl- 3880	5.1	
		GRO <10		
		DRO <10		
25 ft	2831		4.6	
30 ft	2257		4.6	
				TAN AND RED SAND
35 ft	1496		5.6	

Lithology

Well Construction

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND		
40 ft	1319		5.1			
45 ft	1149		4			
50 ft	785		3.9			
55 ft	738		2.4			
60 ft	710		1.8			
				TAN AND RED SAND WITH PEA GRAVEL		
65 ft	594		5.3			
70 ft	453		7.2			
75 ft	412		6.7			
80 ft	294		6.7			
85 ft	535		4			
90 ft	447		4.7			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND WITH PEA GRAVEL		
95 ft	453	Cl-336	3			
		GRO <10				
		DRO <10				

Logger:	Edward Cesareo		**Project Name:** BD Jct. N-20 **Well ID:** SB-5
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/30/2013		
End Date:	8/30/2013		

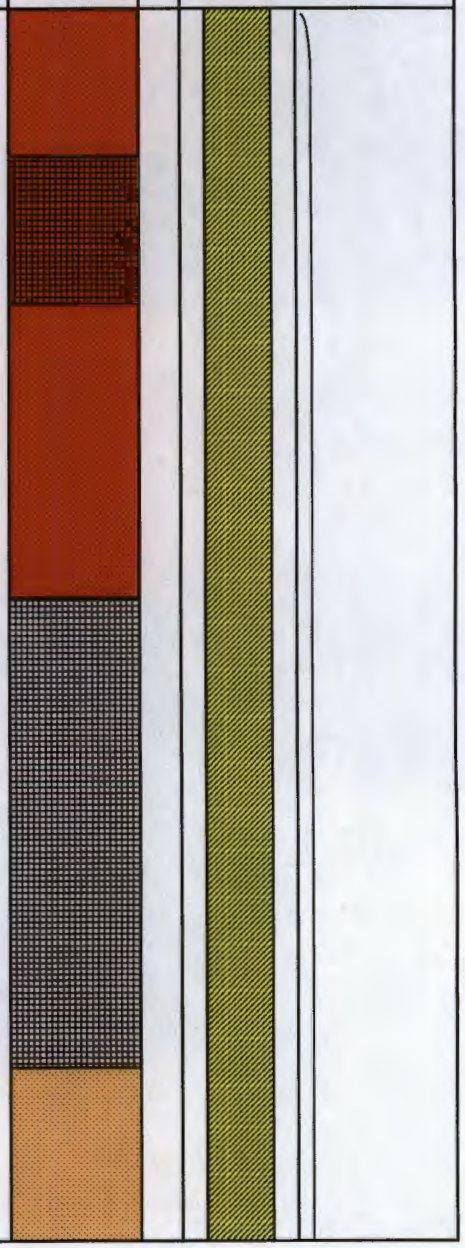
Comments: SB-5 is 16 ft south of the former junction box site. All samples were from cuttings.
DRAFTED BY: L. Weinheimer

TD = 95 ft GW = 99 ft

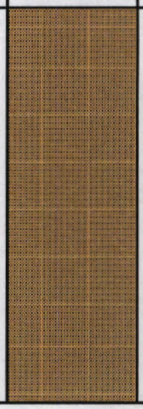
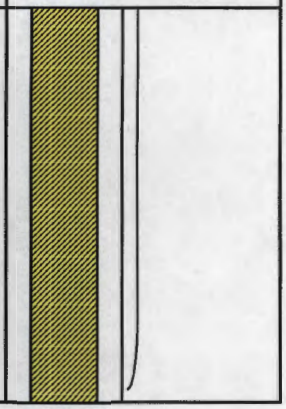
Location: UL/N sec. 20 T21S R37E

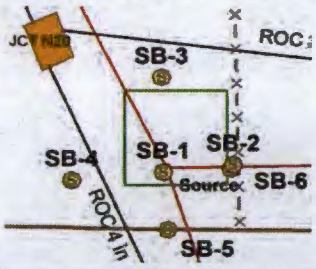
Lat: 32°27'31.631"N **Long:** 103°11'6.812"W **County:** Lea **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				RED SAND
SS	149		0.8	
				RED SAND AND SOME CLAY
5 ft	750		1.7	
				RED SAND
10 ft	982		1.3	
15 ft	311		0.9	
				TAN SAND AND SOME CLAY
20 ft	523		1	
25 ft	1482		1.2	
30 ft	1877	Cl- 1840	0.5	
		GRO <10		TAN AND RED SAND
		DRO <10		
35 ft	1693		0.7	



Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND		bentonite seal
40 ft	1521		3.1			
45 ft	1616		5.8			
50 ft	1388		14.8			
55 ft	1568		4.9			
60 ft	1571		5.7			
				TAN AND RED SAND WITH PEA GRAVEL		
65 ft	1203		7.1			
70 ft	1161		6			
75 ft	1341		7.8			
80 ft	1938	Cl- 2000	7.2			
		GRO <10				
		DRO <10				
85 ft	1475		15			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND WITH PEA GRAVEL		
90 ft	1269		12.7			
95 ft	1241	Cl-944	13.3			
		GRO <10				
		DRO <10				

Logger:	Edward Cesareo		**Project Name:** BD Jct. N-20 **Well ID:** SB-6
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air rotary		
Start Date:	8/30/2013		
End Date:	8/30/2013		

Comments: SB-6 is 16 ft east of the former junction box site. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 95 ft GW = 99 ft

Location: UL/N sec. 20 T21S R37E

Lat: 32°27'31.782"N **County:** Lea

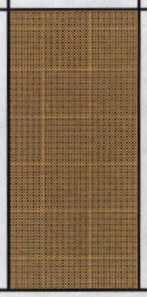
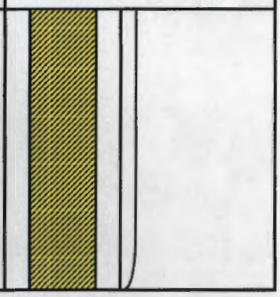
Long: 103°11'6.633"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				RED SAND
SS	429		1.2	
				RED SAND AND SOME CLAY
5 ft	903		6.8	
				RED SAND
10 ft	966		6.6	
15 ft	1672		6.9	
				TAN SAND AND SOME CLAY
20 ft	3223	Cl- 3840	7.4	
		GRO <10		
		DRO <10		
25 ft	2803		8.8	
30 ft	2515		4.8	
				TAN AND RED SAND
35 ft	1524		7.1	

Lithology

Well Construction

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND		bentonite seal
40 ft	1227		8.1			
45 ft	1574		7.3			
50 ft	1387		7.4			
55 ft	1061		5.8			
60 ft	627		5.4			
				TAN AND RED SAND WITH PEA GRAVEL		
65 ft	451		8.4			
70 ft	414		10.7			
75 ft	355		8.8			
80 ft	307		9.2			
85 ft	290		7.8			
90 ft	367		3.2			

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				TAN AND RED SAND WITH PEA GRAVEL		
95 ft	450	Cl-384	7			
		GRO <10				
		DRO <10				

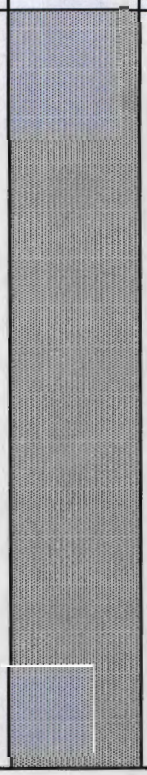
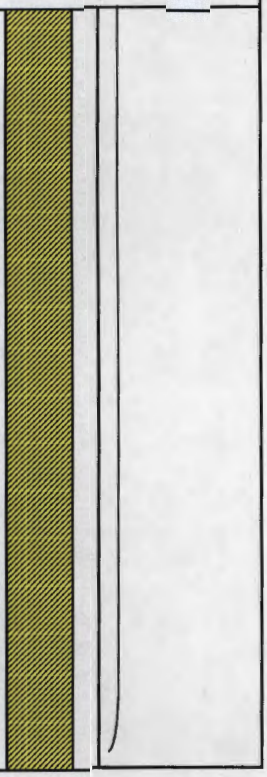
Logger:	Edward Cesareo		**Project Name:** BD Jct. N-20 **Well ID:** SB-7
Driller:	Harrison & Cooper, Inc.		
Drilling Method:	Air Rotary		
Start Date:	9/23/2013		
End Date:	9/23/2013		**Project Consultant:** RECS
Comments: SB-7 is 44 ft north of the former junction box site. All samples were from cuttings. **DRAFTED BY: L. Weinheimer** TD = 55 ft GW = 99 ft			**Location:** UL/N sec. 20 T21S R37E **Lat:** 32°27'32.225"N **County:** Lea **Long:** 103°11'6.809"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				BROWN SAND
SS	252		0.8	
				RED SAND
5 ft	440		1.1	
				CALICHE
10 ft	604		4.9	
15 ft	800		7.7	
20 ft	1154		8.6	
25 ft	2038	Cl- 2200	4.2	
		GRO <10		
		DRO <10		
30 ft	1715		6.5	
35 ft	988		6	

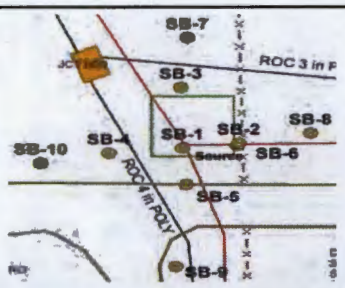
Lithology

Well Construction

bentonite seal

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
				CALICHE		
40 ft	623		9.3			
45 ft	307		1			
50 ft	253		1.1			
55 ft	182	Cl-64	0.9			
		GRO <10				
		DRO <10				

Logger:	Edward Cesareo
Driller:	Harrison & Cooper, Inc.
Drilling Method:	Air Rotary
Start Date:	9/23/2013
End Date:	9/23/2013



RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS

Project Name: BD Jct. N-20 **Well ID:** SB-8

Project Consultant: RECS

Comments: SB-8 is 38 ft east of the former junction box site. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 30 ft GW = 99 ft

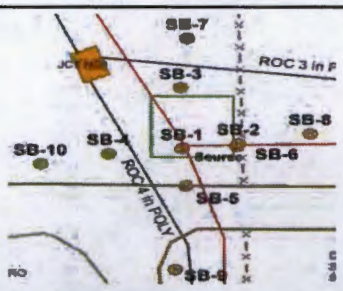
Location: UL/N sec. 20 T21S R37E

Lat: 32°27'31.832"N **County:** Lea

Long: 103°11'6.372"W **State:** NM

Depth (feet)	Chloride field tests	LAB	PID	Description	Lithology	Well Construction
SS	208		3	RED SAND		
5 ft	435		1.6			
10 ft	1559	Cl- 1800	5			
		GRO <10				
		DRO <10				
15 ft	1335		8.1			
20 ft	1016		5.5	CALICHE		
25 ft	288		2.4			
30 ft	213	Cl- 128	3.6			
		GRO <10				
		DRO <10				

bentonite seal

Logger:	Edward Cesareo		RICE ENVIRONMENTAL CONSULTING & SAFETY, LLC — RECS
Driller:	Harrison & Cooper, Inc.		**Project Name:** BD Jct. N-20 **Well ID:** SB-9
Drilling Method:	Air Rotary		**Project Consultant:** RECS
Start Date:	9/23/2013		
End Date:	9/23/2013		

Comments: SB-9 is 51 ft south of the former junction box site. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

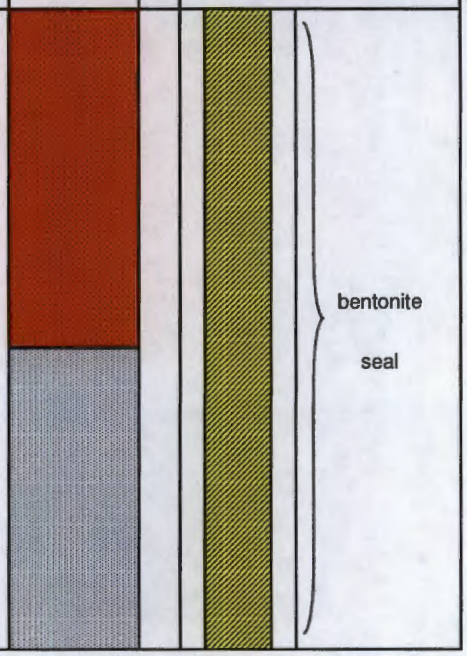
TD = 10 ft GW = 99 ft

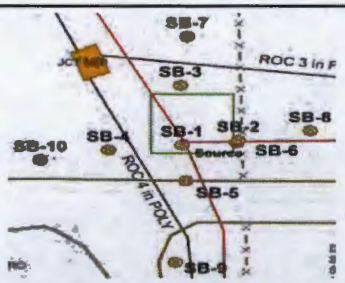
Location: UL/N sec. 20 T21S R37E

Lat: 32°27'31.721"N **County**: Lea

Long: 103°11'7.336"W **State**: NM

Depth (feet)	Chloride field tests	LAB	PID	Description
				RED SAND
SS	122	Cl- <16	5.7	
		GRO <10		
		DRO <10		
5 ft	83	Cl- 48	5.6	
		GRO <10		CALICHE
		DRO <10		
10 ft	88	Cl- <16	4.9	
		GRO <10		
		DRO <10		



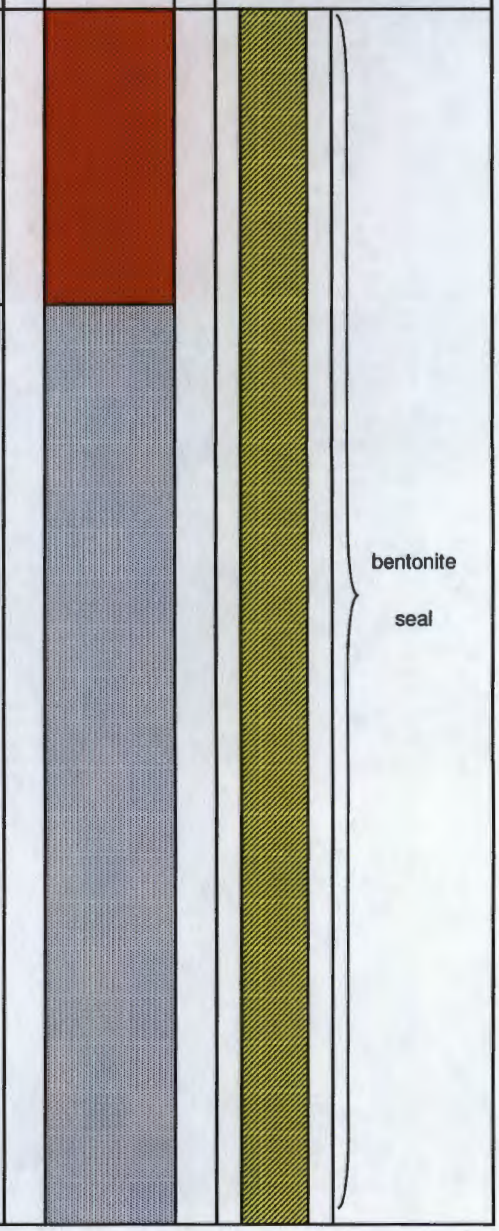
Logger:	Edward Cesareo		**Project Name:** BD Jct. N-20 **Well ID:** SB-10
Driller:	Harrison & Cooper, Inc.		**Project Consultant:** RECS
Drilling Method:	Air Rotary		**Location:** UL/N sec. 20 T21S R37E
Start Date:	9/23/2013		**Lat:** 32°27'31.721"N **County:** Lea
End Date:	9/23/2013		**Long:** 103°11'7.336"W **State:** NM

Comments: SB-10 is 44 ft west of the former junction box site. All samples were from cuttings.

DRAFTED BY: L. Weinheimer

TD = 30 ft GW = 99 ft

Depth (feet)	Chloride field tests	LAB	PID	Description
SS	119		4	RED SAND
5 ft	714		4.5	
10 ft	1135	Cl- 1220	4.3	
		GRO <10		
		DRO <10		
15 ft	1019		3.7	
20 ft	673		4.9	CALICHE
25 ft	286		4.2	
30 ft	196	Cl- 144	5.9	
		GRO <10		
		DRO <10		



CARDINAL Laboratories

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

September 04, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD JCT. N-20

Enclosed are the results of analyses for samples received by the laboratory on 08/29/13 15:50.

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:

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

Received:	08/29/2013	Sampling Date:	08/29/2013
Reported:	09/04/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #3 20' (H302090-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2720**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*79.2 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*76.5 %*	*63.6-154*

Sample ID: SB #3 95' (H302090-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**320**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*82.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*80.7 %*	*63.6-154*

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:

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

Received:	08/29/2013	Sampling Date:	08/29/2013
Reported:	09/04/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #4 20' (H302090-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3880**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*95.7 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*95.8 %*	*63.6-154*

Sample ID: SB #4 95' (H302090-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**336**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*97.6 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*97.0 %*	*63.6-154*

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

CARDINAL LABORATORIES

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	RICE Operating	**BILL TO**	
Project Manager:	Katie Jones	**P.O. #:**	
Address:	112 W. Taylor	**Company:**	
City:	Hobbs **State:** NM **Zip:** 88240	**Attn:**	
Phone #:	**Fax #:**	**Address:**	
Project #:	**Project Owner:**	**City:**	
Project Name:		**State:** **Zip:**	
Project Location:	BD JCT. N-20 T-19-S/R-37-E	**Phone #:**	
Sampler Name:	Edward Cesareo	**Fax #:**	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	**Sample I.D.**	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	**DATE**	**TIME**	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS					
H302090	BD JCT. N-20 T-19-S/R-37-E																							
1	SB#3 20'	G	1			✓					✓		8-29-13	12:05	✓	✓								
2	SB#3 95'	G	1			✓					✓			12:10	✓	✓								
3	SB#4 20'	G	1			✓					✓			3:00	✓	✓								
4	SB#4 95'	G	1			✓					✓			3:05	✓	✓								

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

Relinquished By:	**Date:** 8-29-13	**Received By:**	Phone Result: ☐ Yes ☑ No Add'l Phone #:
	Time: 3:50		Fax Result: ☐ Yes ☑ No Add'l Fax #:
Relinquished By:	**Date:**	**Received By:**	REMARKS:
	Time:		email results hconder@rice-ecs.com; Lweinheimer@rice-ecs.com; kjones@riceswd.com; Lpena@riceswd.com; knorman@rice-ecs.com; ecesareo@rice-ecs.com

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

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

CHECKED BY: (Initials) GN

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

#54

CARDINAL Laboratories

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

September 04, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD JCT. N-20

Enclosed are the results of analyses for samples received by the laboratory on 08/30/13 12:30.

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:

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

Received:	08/30/2013	Sampling Date:	08/30/2013
Reported:	09/04/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #5 30' (H302097-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1840**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*85.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*86.0 %*	*63.6-154*

Sample ID: SB #5 80' (H302097-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2000**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*89.7 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*90.4 %*	*63.6-154*

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:

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

Received:	08/30/2013	Sampling Date:	08/30/2013
Reported:	09/04/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #5 95' (H302097-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**944**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*86.1 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*89.9 %*	*63.6-154*

Sample ID: SB #6 20' (H302097-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**3840**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M mg/kg **Analyzed By: AR/**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	197	98.4	200	0.223	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	189	94.3	200	1.30	

Surrogate: 1-Chlorooctane	*92.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*96.3 %*	*63.6-154*

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:

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

Received:	08/30/2013	Sampling Date:	08/30/2013
Reported:	09/04/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB #6 95' (H302097-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**384**	16.0	09/03/2013	ND	400	100	400	3.92	

TPH 8015M **mg/kg** **Analyzed By: CK**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/03/2013	ND	193	96.6	200	0.952	
DRO >C10-C28	<10.0	10.0	09/03/2013	ND	188	93.9	200	1.17	

Surrogate: 1-Chlorooctane	*103 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*105 %*	*63.6-154*

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

CARDINAL LABORATORIES

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	RICE Operating	**BILL TO**	
Project Manager:	Katie Jones	**P.O. #:**	
Address:	112 W. Taylor	**Company:**	
City:	Hobbs **State:** NM **Zip:** 88240	**Attn:**	
Phone #:	**Fax #:**	**Address:**	
Project #:	**Project Owner:**	**City:**	
Project Name:		**State:** **Zip:**	
Project Location:	BD JCT. N-20 T-19-S/R-37-E	**Phone #:**	
Sampler Name:	Edward Cesareo	**Fax #:**	

FOR LAB USE ONLY				MATRIX							PRESERV.			SAMPLING		ANALYSIS REQUEST										
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS						
H302097	BD JCT. N-20 T-19-S/R-37-E																									
1	SB#5 30'	G	1			✓					✓		8-30-13	9:30	✓	✓										
2	SB#5 80'	G	1			✓					✓			9:40	✓	✓										
3	SB#5 95'	G	1			✓					✓			9:35	✓	✓										
4	SB#6 20'	G	1			✓					✓			11:20	✓	✓										
5	SB#6 95'	G	1			✓					✓			11:25	✓	✓										

Relinquished By:	**Date:** 8-30-13	**Received By:**	Phone Result: ☐ Yes ☑ No Add'l Phone #:
	Time: 12:30		Fax Result: ☐ Yes ☑ No Add'l Fax #:
Relinquished By:	**Date:**	**Received By:**	REMARKS: email results hconder@rice-ecs.com; Lweinheimer@rice-ecs.com; kjones@riceswd.com; Lpena@riceswd.com; knorman@rice-ecs.com; ecesareo@rice-ecs.com
	Time:		

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

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

CHECKED BY: (Initials)

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

#54

CARDINAL Laboratories

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

September 26, 2013

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: BD JCT. N-20

Enclosed are the results of analyses for samples received by the laboratory on 09/23/13 16:30.

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:

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

Received:	09/23/2013	Sampling Date:	09/23/2013
Reported:	09/26/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E		

Sample ID: SB #7 25' (H302311-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2200**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*100 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*99.5 %*	*63.6-154*

Sample ID: SB #7 55' (H302311-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*99.3 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*92.3 %*	*63.6-154*

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:

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

Received:	09/23/2013	Sampling Date:	09/23/2013
Reported:	09/26/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E		

Sample ID: SB #8 10' (H302311-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1800**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*99.0 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*96.5 %*	*63.6-154*

Sample ID: SB #8 30' (H302311-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*99.9 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*95.6 %*	*63.6-154*

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:

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

Received:	09/23/2013	Sampling Date:	09/23/2013
Reported:	09/26/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E		

Sample ID: SB #9 SURFACE (H302311-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*109 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*107 %*	*63.6-154*

Sample ID: SB #9 5' (H302311-06)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**48.0**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*110 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*110 %*	*63.6-154*

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:

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

Received:	09/23/2013	Sampling Date:	09/23/2013
Reported:	09/26/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E		

Sample ID: SB #9 10' (H302311-07)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*92.2 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*93.0 %*	*63.6-154*

Sample ID: SB #10 10' (H302311-08)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**1220**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*104 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*105 %*	*63.6-154*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	09/23/2013	Sampling Date:	09/23/2013
Reported:	09/26/2013	Sampling Type:	Soil
Project Name:	BD JCT. N-20	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	T21S R37E		

Sample ID: SB #10 30' (H302311-09)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**144**	16.0	09/25/2013	ND	416	104	400	3.92	

TPH 8015M mg/kg **Analyzed By: MS**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/24/2013	ND	197	98.5	200	4.00	
DRO >C10-C28	<10.0	10.0	09/24/2013	ND	193	96.3	200	6.98	

Surrogate: 1-Chlorooctane	*99.5 %*	*65.2-140*
Surrogate: 1-Chlorooctadecane	*101 %*	*63.6-154*

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

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	RICE Operating	BILL TO	
Project Manager:	Katie Jones	P.O. #:	
Address:	112 W. Taylor	Company:	
City:	Hobbs State: NM Zip: 88240	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name:		State: Zip:	
Project Location:	BD JCT. N-20 T-21-S/ R-37-E	Phone #:	
Sampler Name:	Edward Cesareo	Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
H302311																				
1	SB#7 25'	G	1			✓					✓		9-23-13	9:45						
2	SB#7 55'	G	1			✓					✓			9:50	✓	✓				
3	SB#8 10'	G	1			✓					✓			10:45	✓	✓				
4	SB#8 30'	G	1			✓					✓			10:50	✓	✓				
5	SB#9 Surface	G	1			✓					✓			11:40	✓	✓				
6	SB#9 5'	G	1			✓					✓			11:45	✓	✓				
7	SB#9 10'	G	1			✓					✓			11:50	✓	✓				
8	SB#10 10'	G	1			✓					✓			1:30	✓	✓				
9	SB#10 30'	G	1			✓					✓			1:35	✓	✓				

Relinquished By: Edward Cesareo	Date: 9-23-13 Time: 9:30	Received By: Jodi Henson	
Relinquished By:	Date: Time:	Received By:	

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

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

CHECKED BY: (Initials) CH

Phone Result:	☐ Yes ☑ No	Add'l Phone #:	
Fax Result:	☐ Yes ☑ No	Add'l Fax #:	

REMARKS:

email results
hconder@rice-ecs.com; Lweinheimer@rice-ecs.com;
kjones@riceswd.com; Lpena@riceswd.com;
knorman@rice-ecs.com; ecesareo@rice-ecs.com

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

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