1R - 428-59

WORKPLANS

Date:

6-8-10

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266.0745

June 8, 2010

Mr. Edward J. Hansen
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: **Rice Operating Company, Hobbs SWD System A-6 Vent Site: T-19-S, R-38-E, Section 6, Unit A, Lea County, New Mexico, (NMOCD CASE #1R428-59), Corrective Action Plan**

Mr. Hansen:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is submitting this Corrective Action Plan for the Hobbs A-6 Vent site. The investigation demonstrates that residual salt and hydrocarbons in the vadose zone will not with reasonable probability contaminate ground water or surface water, in excess of the standards in Subsections B and C of 19.15.30.9 NMAC through leaching, percolation or other transport mechanisms, or as the water table elevation fluctuates. A monitoring well located as close as possible to the former Vent site (about 85-feet down gradient) shows no evidence of ground water impairment. Revegetation of the site, our recommended corrective action, meets the mandate of NMOCD Rules for protection of surface water and the environment.

Background

The Hobbs A-6 Vent is located west of the city of Hobbs, New Mexico at T-19-S, R-38-E, Section 6, in Unit A. The NMOCD-approved Investigation Characterization Plan (ICP), dated April 4, 2008 (Attachment A) includes background information, a site vicinity map, and a regional ground water gradient map for this and six other nearby ROC sites.

Field Programs

As a part of the approved ICP, ROC installed and sampled five 10-foot deep backhoe trenches on July 31 and August 1, 2008 to delineate the vertical and horizontal extent of hydrocarbons and chloride in the soil. See Plate 1 for a summary map that includes results of the field chloride analyses and hydrocarbon screening data as well as a laboratory report for the soil samples used to verify the ROC field data.

Hicks Consultants supervised a deep soil and ground water sampling program to further delineate the extent and magnitude of media impact. On October 23, 2008, soil boring No. 1 (SB-1) was drilled adjacent to the center excavation to a depth of 49 feet. A down gradient monitoring well (MW-1) was installed on March 3, 2009 to evaluate the ground water conditions. ROC conducted field analysis of soil samples for chloride and volatile hydrocarbon vapors for both boring programs. Attachment B provides soil lithology logs which include the field chloride and hydrocarbon screening data and laboratory results.

MW-1 was developed on March 17, 2009 by pumping 36 gallons (12 well volumes) and ground water samples were recovered on March 31, as well as in June, September, and November of 2009. Attachment C provides the laboratory report and chain of custody documents for the soil boring and monitoring well sampling events.

MW-1 was installed as close as possible to the source area and approximately 50 feet further down gradient than proposed in the ICP. The operator of the nearby CO_2 gas pipeline would not provide clearance to the New Mexico One-Call program for a proposed monitoring well location within 30 feet of the pipeline right-of-way.

Results

The initial ROC assessment showed the highest chloride concentration (784 mg/kg) nine feet below the surface at the original vent location. The trenching shows that the horizontal extent of the chloride-impacted soil is less than 2,500 ft^2. Data from the 49-foot deep soil boring near the source area indicate that the maximum chloride concentrations (approximately 1,000 mg/kg) exist from 20 to 35 feet below the surface and decrease with depth from this point to ground water. At 40-42 feet below grade, laboratory chloride concentration was 656 mg/kg.

Field screening of hydrocarbon vapors in the soil identified concentrations greater than 1,000 ppm in center, west, and south excavations. Laboratory analysis of BTEX show maximum concentrations of benzene (0.4 mg/kg), toluene (0.329 mg/kg), ethylbenzene (24.5 mg/kg), and total xylenes (41.1 mg/kg) at 9 to 10 feet below the surface. The highest soil sample PID reading (3,738 ppm) and the highest benzene concentration (2.78 mg/kg) are in SB-1 at 40 to 42 feet below the surface, which is just above a hard sandstone formation. In SB-1, laboratory concentrations of regulated constituents show total BTEX is 17.8 mg/kg at 25 feet below grade and 63.1 mg/kg at 40-42 feet below grade.

A summary of the laboratory results from all of the soil sampling events are provided on Table 1 below. Plate 1 is a site map that shows the location of the soil boring and monitoring well relative to the initial excavations and provides the results of the field screening and laboratory data.

Table 1
Rice Operating Hobbs A-6 Vent Site
Laboratory Data - Soil Samples

Sample Location	Depth (feet)	Sample Date	PID (ppm)	Chloride (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	BTEX (mg/kg)
Center	9	7/31/08	1,091	784	<0.2	0.288	24.5	41.1	66.1
Center	10	7/31/08	932	368	<0.2	0.264	20.1	26.3	46.9
5-Ft North	3	7/31/08	56.2	160	--	--	--	--	--
	10	7/31/08	943	<16	0.4	<0.2	18.0	7.7	26.3
5-Ft East	5	7/31/08	630	400	<0.2	<0.2	<0.2	0.9	1.5
	10	7/31/08	917	336	<0.1	<0.1	<0.1	<0.3	0.6
5-Ft West	10	8/1/08	1,355	464	<0.2	0.329	16.4	27.1	44.0
5-Ft South	10	8/1/08	781	560	<0.2	0.271	2.89	15.3	18.7
SB-1	25	10/23/08	332	1,150	0.101	1.47	3.69	12.5	17.8
	40-42	10/23/08	3,738	656	2.78	3.26	12.4	44.7	63.1
MW-1	20	3/3/09	0.3	<16	--	--	--	--	--
	45-47	3/3/09	0.1	<16	--	--	--	--	--

Elevated chloride and hydrocarbon values based on field screening were not present in the soil from MW-1. Ground water sampling at MW-1 are equivalent to natural background conditions with respect to chloride and hydrocarbons (See Plate 1).

Simulation Modeling

We used the AMIGO tool (HYDRUS-1D model) to determine if un-saturated chloride transport through the vadose zone would cause the underlying ground water to exceed 250 mg/L chloride in the future. The input to the model employed field data from the site, nearby locations, and conservative input data for parameters that were not measured at or near the site.

In the absence of any corrective action by ROC, the simulation indicates that a maximum ground water chloride concentration of 233 mg/L will occur in the year 2037 (28 years from the sample date). Attachment D provides an explanation of the data used and results from the simulation at the Hobbs A-6 Vent site.

We used the VLEACH vadose zone model to determine if the benzene identified during the site assessment would cause the underlying ground water to exceed the regulatory standard. This modeling used benzene as a surrogate for all regulated hydrocarbons because past experience demonstrates that this constituent is not only the most mobile in the vadose zone but also has the lowest acceptable concentration limits in ground water. The input to the model employed field data from the site, nearby locations, and conservative default values for parameters that were not measured at or near the site.

The results of the simulation indicate that a maximum ground water benzene concentration of 0.003 mg/L could be (or has been) present immediately below the source area. Our evaluation of the shape of the simulation curve suggests that the benzene concentration in the ground water may have been higher in the past directly below the former vent, but any mass input was not sufficient to cause detection in the down gradient monitoring well. Four quarters of ground water monitoring show no detectible levels of benzene.

VLEACH is conservative of ground water quality because the model does not take into account the natural biological degradation of the hydrocarbons. Attachment D provides an explanation of the data used and results from the simulation at the Hobbs A-6 Vent site. A detailed description of the model and a free windows-based program download is available from the USEPA at http://www.epa.gov/ada/csmos/models/vleach.html.

Recommendations

The site data that documents the residual mass of salt and hydrocarbons in the vadose zone permit a conclusion that these constituents in the vadose zone will not with reasonable probability contaminate ground water or surface water, in excess of the standards in Subsection B and C of the 19.15.30.9 NMAC, through leaching, percolation or other transport mechanisms, or as the water table elevation fluctuates.

Our recommended corrective action for the site is re-vegetation of the ground surface to limit infiltration of precipitation and the subsequent migration of constituents of concern to ground

water. Upon documentation of re-seeding with an appropriate mix of native grasses we will submit a Termination Request for this site's regulatory file.

As four quarters of ground water sampling events at the down gradient monitoring well (MW-1) show no hydrocarbons above detection limits or chloride concentrations above WQCC Standards, ROC will plug and abandon this monitoring well after notification to NMOCD.

Please contact Hack Conder of ROC at 575-393-9174 if you have any questions concerning this submission. Thank you for your time and consideration.

Sincerely,
R.T Hicks Consultants, Ltd.

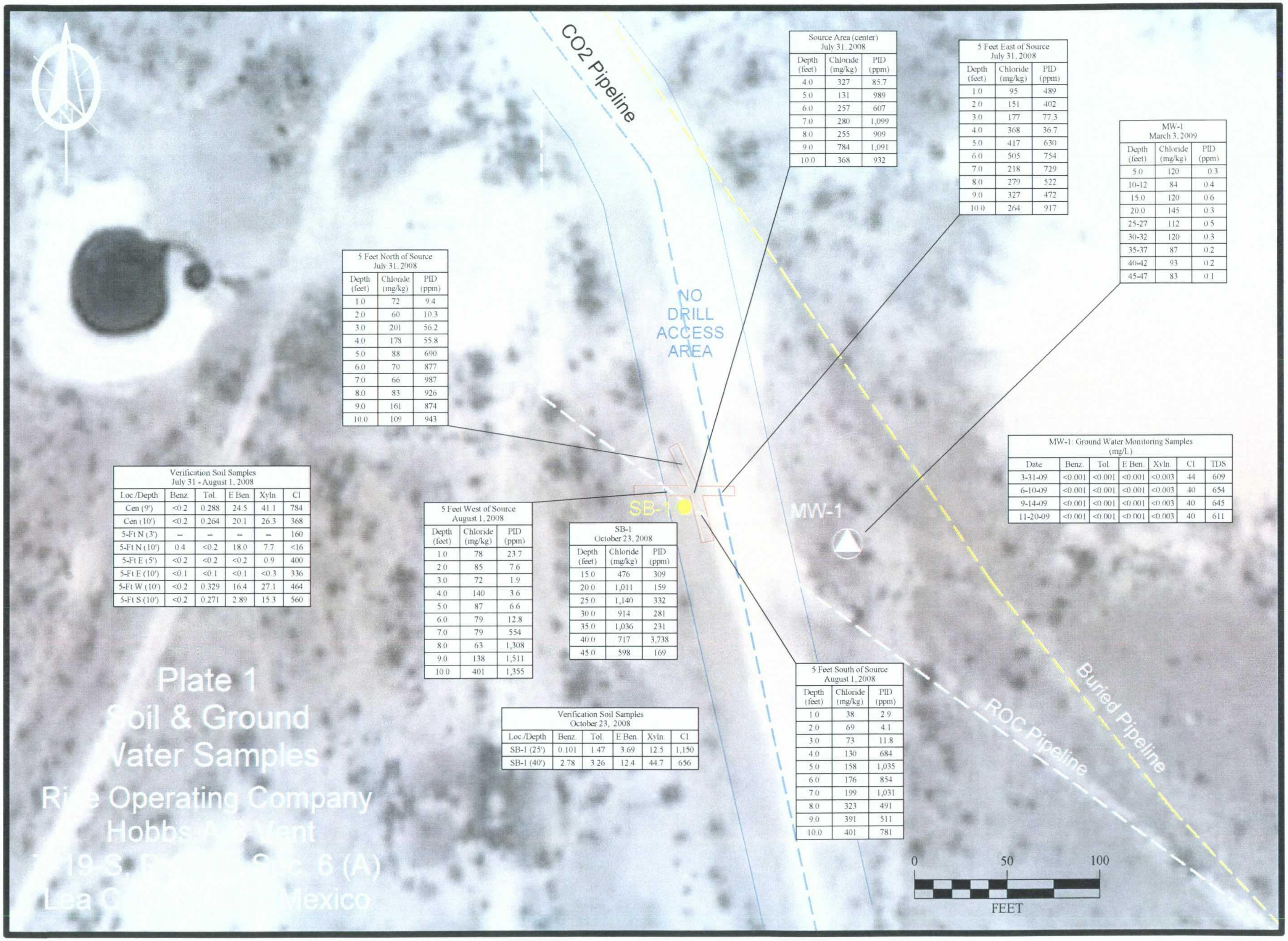
Dale T. Littlejohn

Dale T Littlejohn
Geologist

Copy: Hack Conder, ROC

Plates

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104



Source Area (center)
July 31, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
4.0	327	85.7
5.0	131	989
6.0	257	607
7.0	280	1,099
8.0	255	909
9.0	784	1,091
10.0	368	932

5 Feet East of Source
July 31, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1.0	95	489
2.0	151	402
3.0	177	77.3
4.0	368	36.7
5.0	417	630
6.0	505	754
7.0	218	729
8.0	279	522
9.0	327	472
10.0	264	917

MW-1
March 3, 2009

Depth (feet)	Chloride (mg/kg)	PID (ppm)
5.0	120	0.3
10-12	84	0.4
15.0	120	0.6
20.0	145	0.3
25-27	112	0.5
30-32	120	0.3
35-37	87	0.2
40-42	93	0.2
45-47	83	0.1

5 Feet North of Source
July 31, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1.0	72	9.4
2.0	60	10.3
3.0	201	56.2
4.0	178	55.8
5.0	88	690
6.0	70	877
7.0	66	987
8.0	83	926
9.0	161	874
10.0	109	943

MW-1: Ground Water Monitoring Samples
(mg/L)

Date	Benz.	Tol.	E Ben.	Xyln.	Cl	TDS
3-31-09	<0.001	<0.001	<0.001	<0.003	44	609
6-10-09	<0.001	<0.001	<0.001	<0.003	40	654
9-14-09	<0.001	<0.001	<0.001	<0.003	40	645
11-20-09	<0.001	<0.001	<0.001	<0.003	40	611

Verification Soil Samples
July 31 - August 1, 2008

Loc./Depth	Benz.	Tol.	E Ben	Xyln	Cl
Cen (9')	<0.2	0.288	24.5	41.1	784
Cen (10')	<0.2	0.264	20.1	26.3	368
5-Ft N (3')	–	–	–	–	160
5-Ft N (10')	0.4	<0.2	18.0	7.7	<16
5-Ft E (5')	<0.2	<0.2	<0.2	0.9	400
5-Ft E (10')	<0.1	<0.1	<0.1	<0.3	336
5-Ft W (10')	<0.2	0.329	16.4	27.1	464
5-Ft S (10')	<0.2	0.271	2.89	15.3	560

5 Feet West of Source
August 1, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1.0	78	23.7
2.0	85	7.6
3.0	72	1.9
4.0	140	3.6
5.0	87	6.6
6.0	79	12.8
7.0	79	554
8.0	63	1,308
9.0	138	1,511
10.0	401	1,355

SB-1
October 23, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
15.0	476	309
20.0	1,011	159
25.0	1,140	332
30.0	914	281
35.0	1,036	231
40.0	717	3,738
45.0	598	169

Verification Soil Samples
October 23, 2008

Loc./Depth	Benz.	Tol.	E Ben.	Xyln	Cl
SB-1 (25')	0.101	1.47	3.69	12.5	1,150
SB-1 (40')	2.78	3.26	12.4	44.7	656

5 Feet South of Source
August 1, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1.0	38	2.9
2.0	69	4.1
3.0	73	11.8
4.0	130	684
5.0	158	1,035
6.0	176	854
7.0	199	1,031
8.0	323	491
9.0	391	511
10.0	401	781

Attachment A

April 4, 2008

Investigation & Characterization Plan

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

April 4, 2008

Mr. Edward Hansen
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Investigation & Characterization Plan
Hobbs Salt Water Disposal System: A-6 Vent, E-29 Vent, Jct. E-33-2, Jct L-30, K-29 EOL, Jct. O-29-1 Vent, P-29 Vent
T18S, R38E, Sections 29, 30, 33 and T19S, R38E Section 6

Dear Mr. Hansen:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is pleased to submit this Investigation & Characterization Plan (ICP) for the seven junction box and vent sites within the Hobbs Salt Water Disposal System referenced above. Plate 1 is a map showing the sites relative to major roads in the area. Plate 2 shows the sites, nearby USGS monitoring wells and a regional potentiometric surface map.

The work elements proposed to characterize these sites sufficiently to develop and appropriate corrective action plan are presented below.

1. ROC will identify and document the location of all current and historic equipment and pipelines associated with each site.
2. ROC will use a backhoe with a 12-foot vertical reach to install a series of sampling trenches in order to recover soil samples and delineate the lateral extent (and potentially the vertical extent) of impacted soil.
3. If characterization by the backhoe is insufficient to define the extent and magnitude of past releases, ROC and Hicks Consultants will use a drilling rig to install one soil boring at the center of the source area to delineate the vertical extent of chloride in the soil.
4. Soil samples employed for delineation will be obtained from regular intervals below ground surface.
5. Representative soil samples will be sent to a laboratory to allow for verification of the field results.
6. General soil texture descriptions will be provided for each sample trench or boring.
7. The criteria to delineate the extent of impact during trenching as well as in a soil boring is 5 point chloride decline vs. depth, or:
   a. After three consecutive samples demonstrate <250 ppm chloride using field analyses and <100ppm total hydrocarbon vapors using the

headspace method (see attached ROC Quality Procedure in Appendix A), or

b. After five consecutive samples show a decreasing trend of chloride and hydrocarbons and the last sample shows chloride < 250 ppm and total hydrocarbon vapors <100 ppm (Appendix A).
c. Soil boring to capillary fringe should neither (a) or (b) apply

8. If the boring penetrates the capillary fringe, a monitoring well will be completed with a 2 or 4" diameter 25 feet down gradient from the source for use during possible corrective actions. Plate 2 presents a potentiometric surface map for the site area.
9. If field analysis of hydrocarbon vapors and observations of staining show that hydrocarbon impact is unlikely at the site or below 20-feet, collection of samples from cuttings may be substituted for split spoon sampling (chloride only).

The ROC trench characterization will be employed to identify the lateral extent of chloride at each site, if possible. If trenching does not fully characterize the lateral extent of chloride at each site, boreholes will be advanced 20 feet beyond the furthest trenches where the soil data has an average chloride concentration greater than 1,000 mg/kg. The total depth of borings installed to characterize lateral extent shall be 20 feet below ground surface with soil samples for delineation taken at 5 foot intervals.

Rice Operating Company (ROC) is the service provider (agent) for the Hobbs Saltwater Disposal System and has no ownership of any portion of pipeline, well, or facility. A consortium of oil producers who own the Hobbs System (System Partners) provide all operating capital on a percentage ownership/usage basis. Major projects require System Partner authorization for expenditures (AFE) approval and work begins as funds are received. We will implement the work outlined herein after NMOCD approval and subsequent authorization from the System Partners. The Hobbs SWD system is in abandonment.

For all environmental projects, ROC will choose a path forward that:

1. Protects public health.
2. Provides the greatest net environmental benefit.
3. Complies with NMOCD Rules.
4. Is supported by good science.

The last criteria employed when evaluating any proposed remedy or investigative work is confirming that there is a reasonable relationship between the benefits created by the proposed remedy or assessment and the economic and social costs.

Each site shall have three submissions or a combination of:

1. This Investigation and Characterization Plan (ICP), which is a proposal for data gathering, and site characterization and assessment (this submission).
2. Upon evaluation of the data and results from the ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP).
3. Finally, after implementing the remedy, a closure report with final documentation will be submitted.

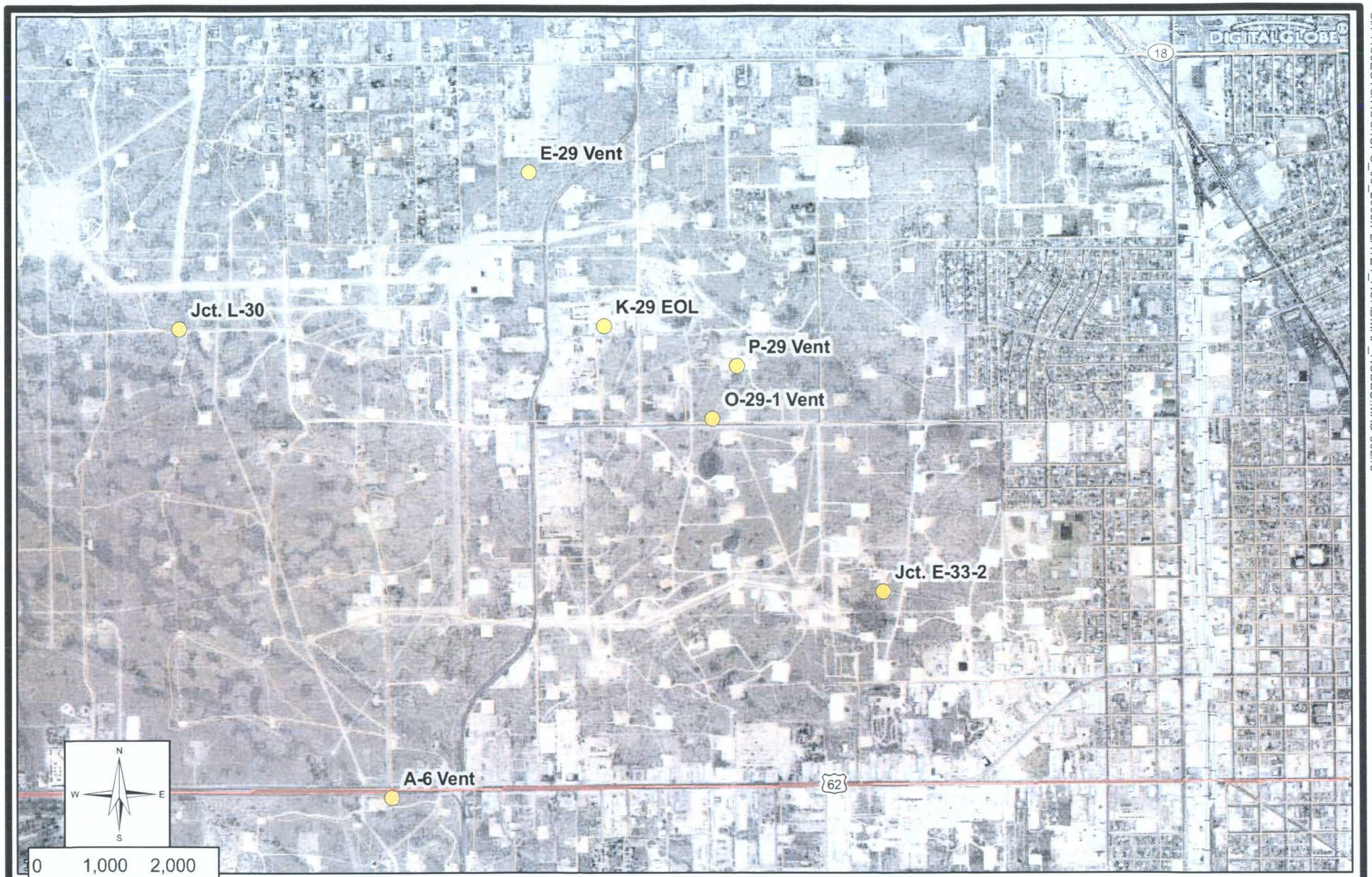
Following the site characterization described above, a Corrective Action Plan with the data and analysis supportive of a procedure for site closure will be submitted. Quality Procedures for characterization work are provided in Appendix A.

If you have any questions or comments regarding this ICP, please contact Kristin Pope of Rice Operating Company as she has reviewed and approved this submission.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Rice Operating Company



Explanation

ICP Site (Hobbs System)

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Site Environs Relative to Hobbs, NM	Plate 1
	Rice Operating Company: Hobbs System Investigation & Characterization Plan	April 2008

3/7/2008

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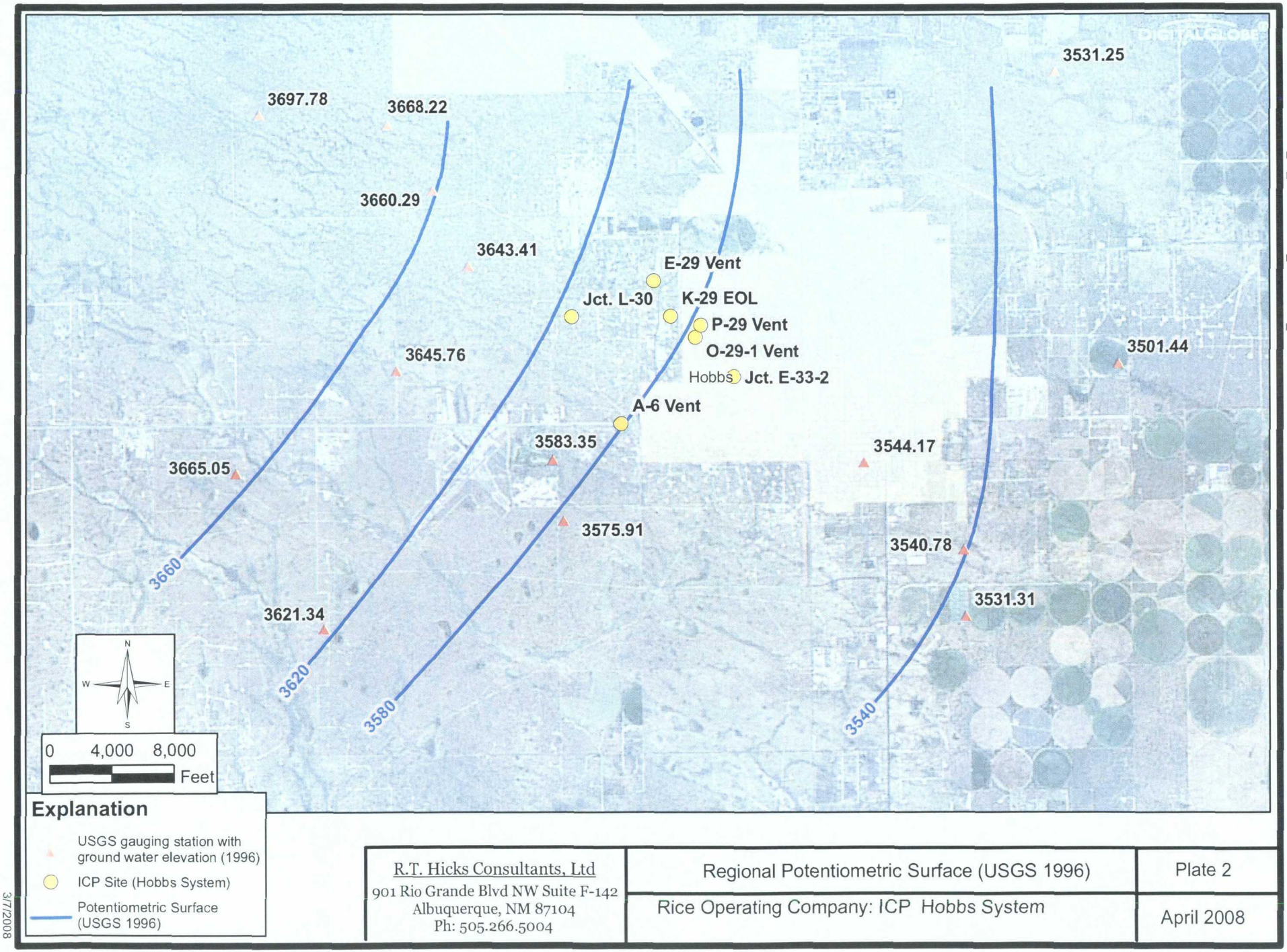

R.T. Hicks Consultants, Ltd
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Albuquerque, NM 87104
Ph: 505.266.5004

Regional Potentiometric Surface (USGS 1996)

Rice Operating Company: ICP Hobbs System

Plate 2

April 2008

S:/PROJECTS/ROC/ICPS_03_2008/PLATE2_POTENTIO_HOBBS.MXD 802//3

3/7/2008

Attachment B

Lithologic Logs

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

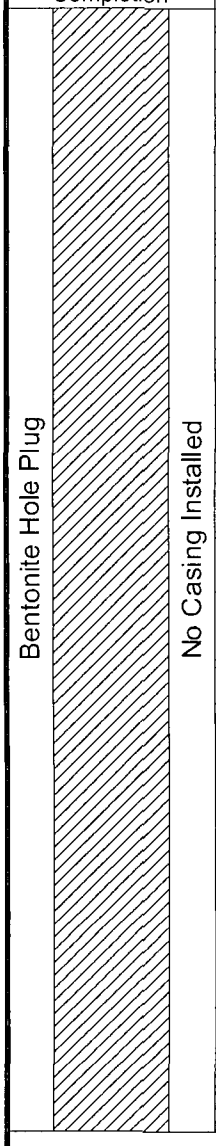
RT Hicks Consultants Ltd

P O Box 7624
Midland, Texas 79708
(432) 528-3878
(432) 689-4578 (fax)

LITHOLOGIC LOG (Soil Boring)

SOIL BORING NO.: SB-1
SITE ID: Hobbs SWD A-6
SURFACE ELEVATION: 3,635 (USGS)
CONTRACTOR: Harrison Cooper
DRILLING METHOD: Air-Rotary
INSTALLATION DATE: 10/22-23/08
WELL PLACEMENT: 5 ft SW of Marker
BORING LAT /LONG: Lat. 32° 41' 35.8" North, Long. 103° 10' 57.3"

TOTAL DEPTH: 49 Feet
CLIENT: Rice Operating Co.
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-18-S R-38-E 6 (A)
FIELD REP: D. Littlejohn
FILE NAME: \Hobbs SWD\A-6



Sample Data				Depth (feet)	Lithologic Description: LITHOLOGY, Color, grain size, sorting, rounding, special features
Type	% Rec	Cl (mg/kg)	PID (ppm)		
					SILT Dark brown.
Excav.	--	78	24		
Excav.	--	85	7.6		SILT Brown, with some gray to greeenish brown interbedded caliche, strong hydrocarbon odor.
Excav.	--	72	1.9		
Excav.	--	140	3.6		
Excav.	--	87	6.6	5	
Excav.	--	79	13		
Excav.	--	79	554		
Excav.	--	63	1,308		
Excav.	--	138	1,511		
Excav.	--	401	1,355	10	
					SILT & CALICHE (interbedded) Greenish brown, strong hydrocarbon odor.
Spoon	20%	476	309	15	
					SILT Gray, with some thin-bedded (interbedded) grayish brown sandstone and brown fine crystalline quartzite.
Cutting	--	1,011	159	20	
					SAND Black (discolored), medium grain, well sorted, sub-rounded, strong hydrocarbon odor.
Cutting	--	1,140	332	25	
Cutting	--	914	281	30	
					SAND Dark brown (less discoloration), medium grain, well sorted, sub-rounded, strong hydrocarbon odor.
Spoon	20%	1,036	231	35	
Spoon	60%	717	3,738	40	
Cutting	--	598	169	45	SANDSTONE grayish brown, fine grain, well sorted.
					SAND Dark brown, medium grain, well sorted, sub-rounded, moist.

TD = 49 Feet

Laboratory Results (mg/kg)
(July and September 2008)

Depth	Chloride	Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO
10 Ft	464	<0.2	0.329	16.4	27.1	1,430	4,310
25 Ft	1,150	0.101	1.47	3.69	12.5	614	4,790
40 Ft	656	2.78	3.26	12.4	44.7	2,180	5,510

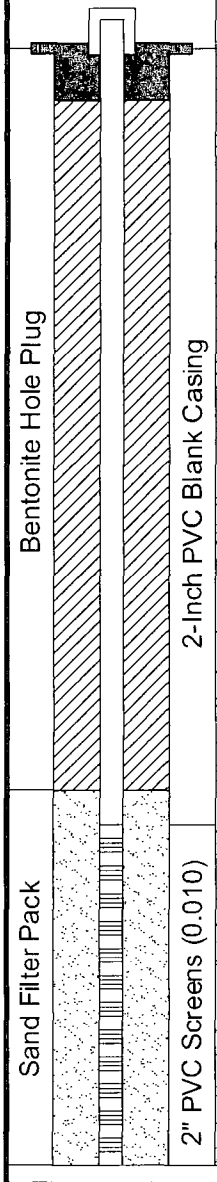
RT Hicks Consultants Ltd

P O Box 7624
Midland, Texas 79708
(432) 528-3878
(432) 689-4578 (fax)

LITHOLOGIC LOG (Monitoring Well)

SOIL BORING NO.: MW-1
SITE ID: Hobbs SWD A-6
SURFACE ELEVATION: 3,632 (USGS)
CONTRACTOR: Harrison Cooper
DRILLING METHOD: Air-Rotary
INSTALLATION DATE: 3/3/09
WELL PLACEMENT: 85 ft ESE of Marker
BORING LAT /LONG: Lat. 32° 41' 36.0" North, Long. 103° 10' 57.2"

TOTAL DEPTH: 65 Feet
CLIENT: Rice Operating Co.
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-18-S R-38-E 6 (A)
FIELD REP: D. Littlejohn
FILE NAME: \Hobbs SWD\A-6



Lithology	Sample Data: Type	% Rec	Cl (mg/kg)	PID (ppm)	Depth (feet)	Lithologic Description: LITHOLOGY, Color, grain size, sorting, rounding, special features
						SILTY CLAY Dark brown.
	Cutting	--	120	0.3	5	CALICHE Gray, very hard, with very little silt, no hydrocarbon odor.
	Spoon	80%	84	0.4	10	SILT & SAND, Light yellowish white, very fine grain, well sorted, angular quartz sand, no hydrocarbon odor.
	Cutting	--	120	0.6	15	
	Cutting	--	145	0.3	20	CALICHE Grayish white, hard, with some interbedded quartzite, no hydrocarbon odor.
	Spoon	100%	112	0.5	25	SAND Brown, medium grain, medium sorted, sub-angular, *some interbedded thin sandstone,no hydrocarbon odor.*
	Spoon	90%	120	0.3	30	
	Spoon	60%	87	0.2	35	Sandstone, thin bedded, hard.
	Spoon	80%	93	0.2	40	Sandstone, thin bedded, hard.
	Spoon	90%	83	0.1	45	
					50	*Saturated formation at 50 feet.*
					55	
					60	
					65	

TD = 65 Feet

Laboratory Results (March 3, 2009)	
Depth (feet)	Chloride (mg/kg)
20	<16
45-47	<16

Appendix C

Lab Data

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
112 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 03/22/10
Reporting Date: 03/26/10
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S-R38E-SEC6 A~ LEA CO., NM

Sampling Date: 03/17/10
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: ZL

LAB NUMBE SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE	03/24/10	03/24/10	03/24/10	03/24/10
H19508-1 MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
Quality Control	0.056	0.042	0.045	0.128
True Value QC	0.050	0.050	0.050	0.150
% Recovery	112	84.0	90.0	85.3
Relative Percent Difference	10.8	11.2	15.7	10.7

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

03/29/10
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
112 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 03/22/10
Reporting Date: 03/26/10
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S R38E SEC6 A ~ LEA COUNTY, NM

Sampling Date: 03/17/10
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: JH
Analyzed By: CK/HM

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		03/25/10	03/25/10	03/23/10
H19508-1	MONITOR WELL #1	40	146	661
Quality Control		500	38.7	NR
True Value QC		500	40.0	NR
% Recovery		100	96.7	NR
Relative Percent Difference		<0.1	17.0	0.9
METHOD: Standard Methods, EPA		4500-ClB	375.4	160.1

Not accredited for Chloride, Sulfate and TDS.

Chemist

03/29/10
Date

H19508 RICE

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

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company — PO#
Project Manager: Hack Conder	Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 — Fax#: (575)397-1471
Phone #: (575) 393-9174	Fax #: (575) 397-1471
Project #:	Project Name: Hobbs A-6 Vent
Project Location: T19S R38E Sec 6A ~ Lea County - New Mexico	Sampler Signature: Rozanne Johnson (575)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-500ml HDPE)	NONE	SAMPLING: DATE (2010)	TIME
H19538-1	Monitor Well #1	G	3	X				2				1		3-17	8:20

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X																	X	X	X	

ANALYSIS REQUEST
(Circle or Specify Method No.)

Relinquished by: Rozanne Johnson	Date: 3-22-10	Time: 15:15	Received by:
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff) Jodi Henson 3/22/10 15:15
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool: Yes ☑ No ☐ — Intact: Yes ☑ No ☐	CHECKED BY: (Initials)	

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

REMARKS:

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

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 11/23/09
Reporting Date: 11/24/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S R38E SEC6 A~ LEA CO., N.M.

Sampling Date: 11/20/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		11/24/09	11/24/09	11/23/09
H18786-1	MONITOR WELL #1	40	90.6	611
Quality Control		500	39.5	NR
True Value QC		500	40.0	NR
% Recovery		100	98.9	NR
Relative Percent Difference		< 0.1	3.3	4.2
METHOD: Standard Methods, EPA		4500-Cl B	375.4	160.1

Not accredited for Chloride, Sulfate and TDS.

Chemist

12/01/09
Date

H18786 RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 11/23/09
Reporting Date: 11/30/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S-R38E-SEC6 A~ LEA CO., NM

Sampling Date: 11/20/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBE SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE	11/25/09	11/25/09	11/25/09	11/25/09
H18786-1 MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
Quality Control	0.048	0.048	0.050	0.155
True Value QC	0.050	0.050	0.050	0.150
% Recovery	96.0	96.0	100	103
Relative Percent Difference	2.2	2.2	2.2	1.4

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

12/01/09
Date

H18786WBORG

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

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name:	BILL TO Company:	PO#
RICE Operating Company	RICE Operating Company	
Project Manager:	**Address:** (Street, City, Zip)	
Hack Conder	122 W Taylor Street ~ Hobbs, New Mexico 88240	
Address: (Street, City, Zip)	**Phone#:**	**Fax#:**
122 W Taylor Street ~ Hobbs, New Mexico 88240	(575) 393-9174	(575)397-1471
Phone #:	**Fax #:**	
(575) 393-9174	(575) 397-1471	
Project #:	**Project Name:**	
	Hobbs A-6 Vent	
Project Location:	**Sampler Signature:**	Rozanne Johnson (575)631-9310
T19S R38E Sec 6A ~ Lea County - New Mexico		rozanne@valornet.com

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-500ml HDPE)	NONE	SAMPLING: DATE (2009)	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
H18786-1	Monitor Well #1	G	3	X				2				1		11-20	11:50		X																X	X	X	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Rozanne Johnson	11/23/09	13:34		11/23/09	1:35
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff)	Date:	Time:

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

REMARKS:

Email Results to: hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

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

Sample Condition: Cool: Yes [✓] No [ ] Intact: Yes [✓] No [ ]

CHECKED BY: (Initials)

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 09/15/09
Reporting Date: 09/17/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S R38E SEC 6A ~ LEA CO., N.M.

Sampling Date: 09/14/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		09/17/09	09/17/09	09/16/09
H18257-1	MONITOR WELL #1	40	113	645
Quality Control		500	36.9	NR
True Value QC		500	40.0	NR
% Recovery		100	92.4	NR
Relative Percent Difference		2.0	0.3	1.3
METHOD: Standard Methods, EPA		4500-ClB	375.4	160.1

Not accredited for Chloride, Sulfate and TDS.

Chemist

09/21/09
Date

H18257 RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 09/15/09
Reporting Date: 09/17/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S-R38E-SEC6 A~ LEA CO., NM

Sampling Date: 09/14/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBER SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE	09/16/09	09/16/09	09/16/09	09/16/09
H18257-1 MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
Quality Control	0.052	0.052	0.051	0.156
True Value QC	0.050	0.050	0.050	0.150
% Recovery	104	104	102	104
Relative Percent Difference	<1.0	<1.0	<1.0	2.0

METHOD: EPA SW-846 8021

TEXAS NELAP ACCREDITATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

09/21/09
Date

H18257 WG BTEX

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

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # ____________

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company PO#:
Project Manager: Hack Conder	Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 Fax#: (575)397-1471
Phone #: (575) 393-9174	Fax #: (575) 397-1471
Project #:	Project Name: Hobbs A-6 Vent
Project Location: T19S R38E Sec 6A ~ Lea County - New Mexico	Sampler Signature: [signature] Rozanne Johnson (575)631-9310 rozanne@valornet.com

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE		PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-500ml HDPE)	NONE	SAMPLING: DATE (2009)	TIME
H18257-1	Monitor Well #1	G	3	X					2				1		9-14	11:35

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB #	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
H18257-1		X																	X	X	X	

Relinquished by: Rozanne Johnson [signature] Date: 9-15-2009 Time: 16:00	Received by: [signature] Date: 9-15-2009 Time: 16:01	Phone Results ☐ Yes ☐ No
		Fax Results ☐ Yes ☐ No Additional Fax Number:
Relinquished by: [signature] Date: 9/15/09 Time: 16:32	Received By: (Laboratory Staff) [signature] Date: 9/15/09 Time: 4:33	REMARKS: Email Results to: hconder@riceswd.com lweinheimer@riceswd.com rozanne@valornet.com
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No. CHECKED BY: (Initials) [initials]	

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/10/09
Reporting Date: 06/15/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S-R38E-SEC6 A~ LEA CO., NM

Sampling Date: 06/10/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE		06/12/09	06/12/09	06/12/09	06/12/09
H17605-1	MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
Quality Control		0.047	0.047	0.046	0.141
True Value QC		0.050	0.050	0.050	0.150
% Recovery		94.0	94.0	92.0	94.0
Relative Percent Difference		1.4	2.5	1.4	<1.0

METHOD: EPA SW-846 8021 B

TEXAS NELAP ACCREDITATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

Date 6/15/09

H17605WB.RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 06/10/09
Reporting Date: 06/16/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S R38E SEC6A ~ LEA CO., NM

Sampling Date: 06/10/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		06/11/09	06/14/09	06/12/09
H17605-1	MONITOR WELL #1	40	123	654
Quality Control		500	38.8	NR
True Value QC		500	40.0	NR
% Recovery		100	97.1	NR
Relative Percent Difference		< 0.1	2.3	3.3
METHOD: Standard Methods, EPA		4500-Cl B	375.4	160.1

Not accredited for chloride, sulfate and TDS.

Chemist

06-17-09
Date

H17605 RICE

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

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # _____

Company Name:	BILL TO Company:	PO#
RICE Operating Company	RICE Operating Company	
Project Manager:	**Address:** (Street, City, Zip)	
Hack Conder	122 W Taylor Street ~ Hobbs, New Mexico 88240	
Address: (Street, City, Zip)	**Phone#:**	**Fax#:**
122 W Taylor Street ~ Hobbs, New Mexico 88240	(575) 393-9174	(575)397-1471
Phone #:	**Fax #:**	
(575) 393-9174	(575) 397-1471	
Project #:	**Project Name:**	
	Hobbs A-6 Vent	
Project Location:	**Sampler Signature:**	Rozanne Johnson (575)631-9310
T19S R38E Sec 6A ~ Lea County - New Mexico		rozanne@valornet.com

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2-40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-500ml HDPE)	NONE	SAMPLING: DATE (2009)	TIME
H17605-1	Monitor Well #1	G	3	X				2				1		6-10	11:25

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
	X																	X	X	X	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Rozanne Johnson	6/10/2009	16:15			16:15
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff)	Date:	Time:
				6-10-2009	16:15

Delivered By: (Circle One)	Sample Condition		CHECKED BY:
Sampler - UPS - Bus - Other:	Cool: Yes / No	Intact: Yes / No	(Initials)

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

REMARKS:

Email Results to: hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

ANALYSIS REQUEST

(Circle or Specify Method No.)

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 04/03/09
Reporting Date: 04/07/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S-R38E-SEC6 A~ LEA CO., NM

Sampling Date: 03/31/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBEF SAMPLE ID	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE	04/06/09	04/06/09	04/06/09	04/06/09
H17189-1 MONITOR WELL #1	<0.001	<0.001	<0.001	<0.003
Quality Control	0.048	0.048	0.047	0.144
True Value QC	0.050	0.050	0.050	0.150
% Recovery	96.0	96.0	94.0	96.0
Relative Percent Difference	2.3	1.4	1.5	<1.0

METHOD: EPA SW-846 8021 B

TEXAS NELAP ACCREDITATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

04/07/09
Date

H17189RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 04/03/09
Reporting Date: 04/07/09
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: T19S-R38E-SEC6 A ~ LEA CO., NM

Sampling Date: 03/31/09
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: TR

LAB NO.	SAMPLE ID	Cl^- (mg/L)	SO_4 (mg/L)	TDS (mg/L)
Analysis Date:		04/03/09	04/03/09	04/03/09
H17189-1	MONITOR WELL #1	44	136	609
Quality Control		500	41.8	NR
True Value QC		500	40.0	NR
% Recovery		100	105	NR
Relative Percent Difference		< 0.1	< 0.1	<0.1
METHOD: Standard Methods, EPA		4500-Cl B	375.4	160.1

Chemist

Date 04/07/09

H17189 RICE

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

Cardinal Laboratories, Inc.

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #: _____

Company Name: RICE Operating Company	BILL TO Company: RICE Operating Company PO#:
Project Manager: Hack Conder	Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240
Address: (Street, City, Zip) 122 W Taylor Street ~ Hobbs, New Mexico 88240	Phone#: (575) 393-9174 Fax#: (575)397-1471
Phone #: (575) 393-9174	Fax #: (575) 397-1471
Project #:	Project Name: Hobbs A-6 Vent
Project Location: T19S-R38E-Sec5 A ~ Lea County - New Mexico	Sampler Signature:

LAB # (LAB USE ONLY)	FIELD CODE	(G)rab or (C)omp	# CONTAINERS	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL (2 40ml VOA)	HNO_3	$NaHSO_4$	H_2SO_4	ICE (1-1Liter HDPE)	NONE	SAMPLING: DATE (2009)	TIME	MTBE 8021B/502	BTEX 8021B/602	TPH 418.1/TX1005 / TX1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	Sulfates	Total Dissolved Solids	Chlorides	Turn Around Time ~ 24 Hours
H17184-1	Monitor Well #1	G	3	X				2				1		3-31	7:50		X																	X	X	X	

Relinquished by: Cathy Watkins	Date:	Time:	Received by: Date: 4/3/09 Time: 8:21
Relinquished by:	Date:	Time:	Received By: (Laboratory Staff) Date: Time:

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

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

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

CHECKED BY: (Initials)

REMARKS:

Email Results to: hconder@riceswd.com
lweinheimer@riceswd.com
rozanne@valornet.com

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 10/23/08
Reporting Date: 10/27/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT

Sampling Date: 10/23/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: AB/HM

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)	Cl* (mg/kg)
ANALYSIS DATE		10/25/08	10/25/08	10/24/08
H16183-1	SB #1 @ 25'	614	4,790	1,150
H16183-2	SB #1 @ 40'	2,180	5,510	656
Quality Control		597	537	510
True Value QC		500	500	500
% Recovery		119	107	102
Relative Percent Difference		17.8	9.4	2.0

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Cl: Std. Methods 4500-Cl'B
*Analyses performed on 1:4 w:v aqueous extracts.

Chemist

10/27/08
Date

H16183 TCL RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 10/23/08
Reporting Date: 10/27/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT

Sampling Date: 10/23/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: ZL

LAB NUMBER	SAMPLE ID	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS DATE		10/24/08	10/24/08	10/24/08	10/24/08
H16183-1	SB #1 @ 25'	0.101	1.47	3.69	12.5
H16183-2	SB #1 @ 40'	2.78	3.26	12.4	44.7
Quality Control		0.050	0.049	0.049	0.157
True Value QC		0.050	0.050	0.050	0.150
% Recovery		100	98.0	98.0	105
Relative Percent Difference		3.9	1.3	1.7	3.3

METHOD: EPA SW-846 8021B

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

10/27/08
Date

H16183 RICE

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 Company	**BILL TO**
Project Manager: Hack Conder	P.O. #:
Address: 122 West Taylor	Company:
City: Hobbs State: NM Zip: 88240	Attn:
Phone #: 393-9174 Fax #: 397-1471	Address:
Project #: Project Owner:	City:
Project Name: Hobbs A-6 vent	State: Zip:
Project Location: Hobbs A-6 vent	Phone #:
Sampler Name: Lara Weinheimer	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 8015M	BTEX*
H16183-1	SB #1 @ 25'	G	1			✓					✓		10-22-08	6:45	✓	✓	✓
-2	SB #1 @ 40'	G	1			✓					✓		10-23-08	9:00	✓	✓	✓

Relinquished By: L. Weinheimer	Date: 10-23-08 Time: 9:17	Received By:	Phone Result: ☐ Yes ☑ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☑ No Add'l Fax #:

REMARKS:
email results
*Added 10/24/08 as per Lara. ch
Hconder@riceswd.com; jpurvis@riceswd.com;
Lweinheimer@riceswd.com

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

Sample Condition: Cool ☑ Yes ☐ No; Intact ☐ Yes ☐ No
CHECKED BY: (Initials) MF 23

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

NEED SAMPLES BACK, PLEASE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/05/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT

Sampling Date: 07/31/08 & 08/01/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: AB/HM

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)	Cl* (mg/kg)
ANALYSIS DATE		08/01/08	08/01/08	08/04/08
H15651-1	SOURCE @ 9'	1,570	4,650	784
H15651-2	SOURCE @ 10'	1,150	5,970	368
H15651-3	5' N TRENCH @ 10'	1,150	5,270	< 16
H15651-4	5' N TRENCH @ 3'	98.6	5,490	160
H15651-5	5' E TRENCH @ 10'	503	1,660	336
H15651-6	5' E TRENCH @ 5'	679	4,660	400
H15651-7	5' W TRENCH @ 10'	1,430	4,310	464
H15651-8	5' S TRENCH @ 10'	918	4,740	560
Quality Control		507	489	500
True Value QC		500	500	500
% Recovery		101	97.8	100
Relative Percent Difference		1.2	12.2	< 0.1

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

Lab Director

08/05/08
Date

Copy of H15651TCL RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-1
Sample ID: SOURCE @ 9'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-1	Method Blank	QC	%Recov.	True Value QC
Benzene	<0.200	<0.002	0.056	112	0.050
Toluene	0.288	<0.002	0.060	120	0.050
Ethylbenzene	24.5	<0.002	0.053	106	0.050
m,p-Xylene	38.6	<0.004	0.118	118	0.100
o-Xylene	2.48	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	142
Toluene-d8	106
Bromofluorobenzene	134

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-1
Sample ID: SOURCE @ 9'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-1	Method Blank	QC	%Recov.	True Value QC
Naphthalene	23.2	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	142
Toluene-d8	106
Bromofluorobenzene	134

METHODS: EPA SW-846 8260

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-2
Sample ID: SOURCE @ 10'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-2	Method Blank	QC	%Recov.	True Value QC
Benzene	<0.200	<0.002	0.056	112	0.050
Toluene	0.264	<0.002	0.060	120	0.050
Ethylbenzene	20.1	<0.002	0.053	106	0.050
m,p-Xylene	25.3	<0.004	0.118	118	0.100
o-Xylene	0.956	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	120
Toluene-d8	106
Bromofluorobenzene	115

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

8/08/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-2
Sample ID: SOURCE @ 10'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-2	Method Blank	QC	%Recov.	True Value QC
Naphthalene	22.8	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	120
Toluene-d8	106
Bromofluorobenzene	115

METHODS: EPA SW-846 8260

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-3
Sample ID: 5' N TRENCH @ 10'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-3	Method Blank	QC	%Recov.	True Value QC
Benzene	0.400	<0.002	0.056	112	0.050
Toluene	<0.200	<0.002	0.060	120	0.050
Ethylbenzene	18.0	<0.002	0.053	106	0.050
m,p-Xylene	7.57	<0.004	0.118	118	0.100
o-Xylene	<0.200	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	116
Toluene-d8	120
Bromofluorobenzene	123

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-3
Sample ID: 5' N TRENCH @ 10'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-3	Method Blank	QC	%Recov.	True Value QC
Naphthalene	20.2	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	116
Toluene-d8	120
Bromofluorobenzene	123

METHODS: EPA SW-846 8260

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-5
Sample ID: 5' E TRENCH @ 10'

Analysis Date: 08/08/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-5	Method Blank	QC	%Recov.	True Value QC
Benzene	<0.100	<0.002	0.056	112	0.050
Toluene	<0.100	<0.002	0.060	120	0.050
Ethylbenzene	<0.100	<0.002	0.053	106	0.050
m,p-Xylene	<0.200	<0.004	0.118	118	0.100
o-Xylene	<0.100	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	98.7
Toluene-d8	105
Bromofluorobenzene	134

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-5
Sample ID: 5' E TRENCH @ 10'

Analysis Date: 08/08/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-5	Method Blank	QC	%Recov.	True Value QC
Naphthalene	<0.250	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	98.7
Toluene-d8	105
Bromofluorobenzene	134

METHODS: EPA SW-846 8260

Chemist

08/08/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-6
Sample ID: 5' E TRENCH @ 5'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-6	Method Blank	QC	%Recov.	True Value QC
Benzene	<0.200	<0.002	0.056	112	0.050
Toluene	<0.200	<0.002	0.060	120	0.050
Ethylbenzene	<0.200	<0.002	0.053	106	0.050
m,p-Xylene	0.686	<0.004	0.118	118	0.100
o-Xylene	<0.200	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	107
Toluene-d8	107
Bromofluorobenzene	107

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

8/08/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-6
Sample ID: 5' E TRENCH @ 5'

Analysis Date: 08/06/08
Sampling Date: 07/31/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-6	Method Blank	QC	%Recov.	True Value QC
Naphthalene	<0.500	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	107
Toluene-d8	107
Bromofluorobenzene	107

METHODS: EPA SW-846 8260

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-7
Sample ID: 5' W TRENCH @ 10'

Analysis Date: 08/06/08
Sampling Date: 08/01/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-7	Method Blank	QC	%Recov.	True Value QC
Benzene	<0.200	<0.002	0.056	112	0.050
Toluene	0.329	<0.002	0.060	120	0.050
Ethylbenzene	16.4	<0.002	0.053	106	0.050
m,p-Xylene	26.2	<0.004	0.118	118	0.100
o-Xylene	0.870	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	113
Toluene-d8	111
Bromofluorobenzene	108

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

08/08/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-7
Sample ID: 5' W TRENCH @ 10'

Analysis Date: 08/06/08
Sampling Date: 08/01/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-7	Method Blank	QC	%Recov.	True Value QC
Naphthalene	13.4	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	113
Toluene-d8	111
Bromofluorobenzene	108

METHODS: EPA SW-846 8260

Chemist

Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-8
Sample ID: 5' S TRENCH @ 10'

Analysis Date: 08/06/08
Sampling Date: 08/01/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-8	Method Blank	QC	%Recov.	True Value QC
Benzene	<0.200	<0.002	0.056	112	0.050
Toluene	0.271	<0.002	0.060	120	0.050
Ethylbenzene	2.89	<0.002	0.053	106	0.050
m,p-Xylene	12.6	<0.004	0.118	118	0.100
o-Xylene	2.65	<0.002	0.062	124	0.050

	% RECOVERY
Dibromofluoromethane	109
Toluene-d8	110
Bromofluorobenzene	108

METHODS: EPA SW-846 8260

TEXAS NELAP CERTIFICATION T104704398-08-TX FOR BENZENE, TOLUENE, ETHYL BENZENE, AND TOTAL XYLENES.

Chemist

08/09/08
Date

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: HACK CONDER
122 WEST TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

Receiving Date: 08/01/08
Reporting Date: 08/08/08
Project Number: NOT GIVEN
Project Name: HOBBS A-6 VENT
Project Location: HOBBS A-6 VENT
Lab Number: H15651-8
Sample ID: 5' S TRENCH @ 10'

Analysis Date: 08/06/08
Sampling Date: 08/01/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: CK

VOLATILES (mg/kg)	Sample Result H15651-8	Method Blank	QC	%Recov.	True Value QC
Naphthalene	14.0	<0.005	0.079	79.2	0.100

	% RECOVERY
Dibromofluoromethane	109
Toluene-d8	110
Bromofluorobenzene	108

METHODS: EPA SW-846 8260

Chemist

08/09/08
Date

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 Company	**BILL TO**
Project Manager: Hack Conder	P.O. #:
Address: 122 West Taylor	Company:
City: Hobbs State: NM Zip: 88240	Attn:
Phone #: 393-9174 Fax #: 397-1471	Address:
Project #: Project Owner:	City:
Project Name: Hobbs A-6 vent	State: Zip:
Project Location: Hobbs A-6 vent	Phone #:
Sampler Name: Lara Weinheimer	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	BTEX	Napthalene	TPH 8015 M
H13551-1	source @ 8'		1			✓					✓		7-31-08	11:18	✓	✓	✓	✓
-2	source @ 10'		1			✓					✓		7-31-08	11:19	✓	✓	✓	✓
-3	5' N trench @ 10'		1			✓					✓		7-31-08	12:53	✓	✓	✓	✓
-4	5' N trench @ 3'		1			✓					✓		7-31-08	1:10	✓			✓
-5	5' E trench @ 10'		1			✓					✓		7-31-08	2:03	✓	✓	✓	✓
-6	5' E trench @ 5'		1			✓					✓		7-31-08	2:11	✓	✓	✓	✓
-7	5' W trench @ 10'		1			✓					✓		8-1-08	9:22	✓	✓	✓	✓
-8	5' S trench @ 10'		1			✓					✓		8-1-08	8:20	✓	✓	✓	✓

*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: L. Weinheimer	Date: 8-1-08 Time: 2:15	Received By:	
Relinquished By:	Date: Time:	Received By:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	Sample Condition Cool - Intact ☑ Yes ☑ Yes ☐ No ☐ No	CHECKED BY: (Initials)	

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

REMARKS:

Napthalene on separate page. Need samples back, please. email results

Hconder@riceswd.com; jpurvis@riceswd.com; Lweinheimer@rice.swd.com

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

Appendix D

Model Explanations

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Input and Results of the AMIGO Simulation Performed at the Rice Operating Co. Hobbs A-6 Vent Site

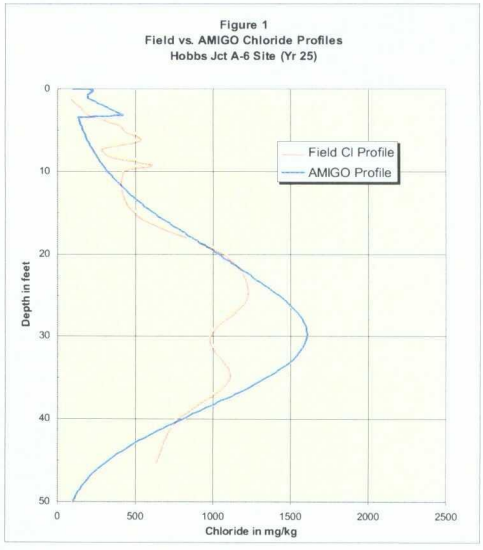
The specific parameters used in the simulation at the site are presented in the table below.

Table 1 - Parameters Employed in AMIGO tool for the Hobbs A-6 Vent Site

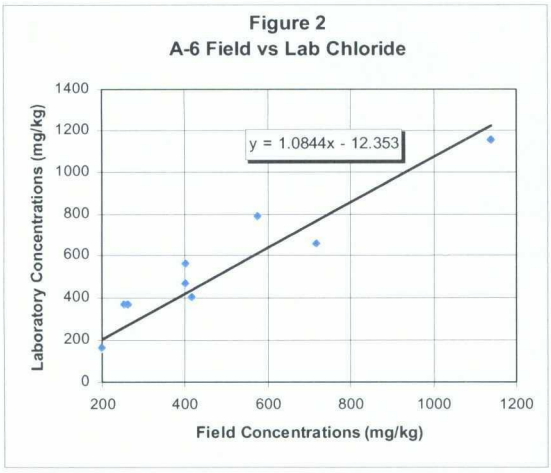
Model Parameter	Value	Source of Value
Climate (non-smoothed)	1946 - 1992	Pearl, NM Station
Input for distant or hypothetical well (ft)	NA	Not Required
Background Chloride in Aquifer (mg/L)	50	Results MW-1
Aquifer Porosity (unitless)	0.25	Prof. Judgment Conservative Assumption
Groundwater Table Depth (ft)	50	Measurement MW-1
Aquifer Thickness (ft)	30	Professional Judgment Conservative Assumption
Slope of Water Table	0.0035	Regional Map (Attachment A)
Hydraulic Conductivity (ft/d)	80	Musharrafieh 1999
Average Chloride Load (kg/m^2)	19.0	Worst-Case Profile Match to Measured Site Data
Max length of spill in dir. of GW flow (ft)	50	Site Data
Plant Uptake Trigger (%)	1.0	Prof. Judgment Conservative Assumption
Surface Layer	Caliche	Site Data
Soil Profile	Med. Sand	Site Data

Musharrafieh and Chudnoff (1999) predict that the saturated thickness of the aquifer beneath the site will remain at least 50 feet until the year 2040. Data from similar sites show that, unlike hydrocarbons, chloride that enters the upper portion of an aquifer will become distributed throughout the entire saturated thickness within a relatively short travel distance from the source. The arbitrary selection of a 10-foot thick mixing zone (used as a default value for hydrocarbon sites) is unrealistic where the constituent of concern is chloride. In our opinion, a simulation using the 30-foot thickness of the aquifer is conservative for this site.

The AMIGO tool assumes a single surface spill is the initial source of chloride that is observed in the subsurface. In order to ensure an accurate calibration of the model to the historic spill which occurred at the Hobbs A-6 Vent site, we compared each year of the simulated profile with the field data until a conservative match was achieved. A favorable but conservative match to the field data was achieved using the year 25 simulation and the calculated chloride mass-load for the worst-case area of the release as demonstrated in Figure 1.



The red curve on Figure 1 is the profile using the maximum field chloride analysis for each depth sampled from the excavations (2 to 10 feet) and SB-1 (below 10 feet). The field (titration) concentrations were then adjusted based on a correction determined

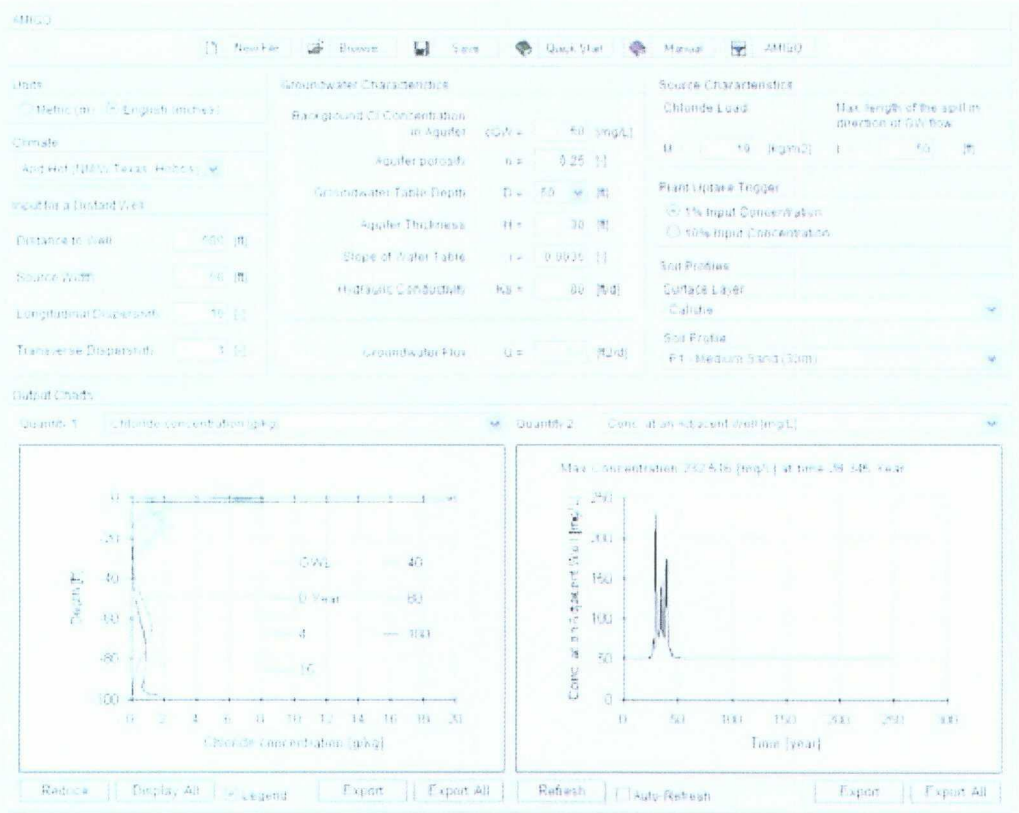


by comparing the field chloride concentrations with the duplicate laboratory sample concentrations as shown in Figure 2.

The blue curve in Figure 1 is the predicted chloride profile at year 25 of the simulation using a chloride load of 19.0 kg/m^2 (calculated from site data). Because the AMIGO simulation used the highest chloride area to represent the entire site it is considered a conservative input parameter.

The results of the simulation are shown below on the AMIGO ground water output chart which has been copied directly from the model results screen. It indicates that chloride concentrations in the ground water below the site, using the "worst-case" chloride load, will reach a maximum concentration of 232.5 mg/L (below standards) in 28 years from the data recovery date if no further corrective actions are taken. We believe the simulated concentration in ground water is a "worst-case" prediction because of the conservative input parameters used in the model.

Figure 3
AMIGO Ground Water Output Chart for Hobbs A-6 Vent Site



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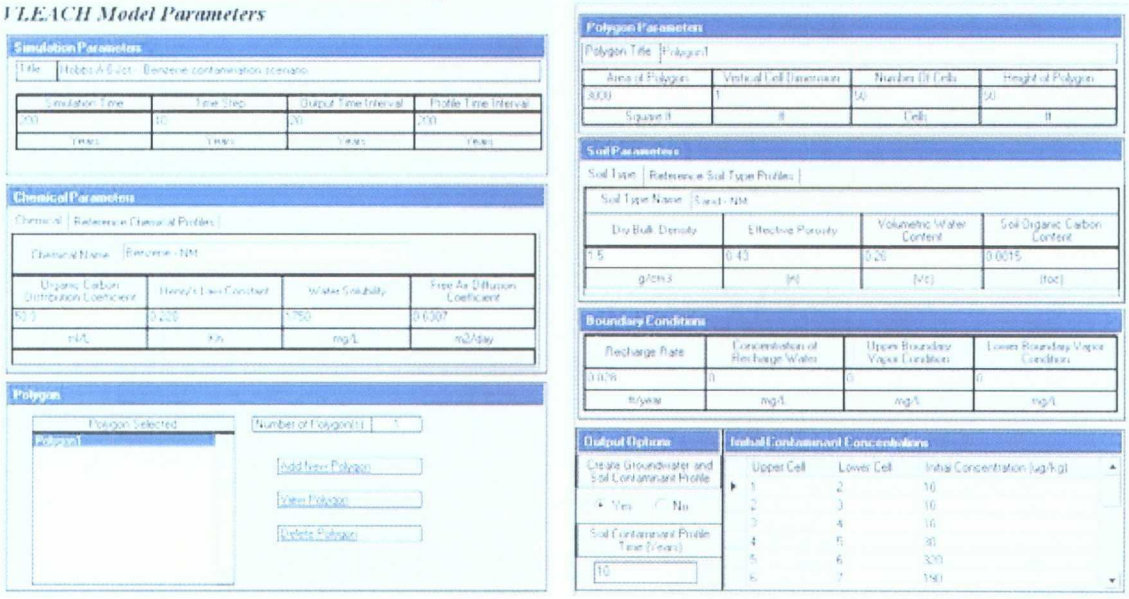
Input and Results of the VLEACH Simulation Performed at the Rice Operating Co. Hobbs A-6 Vent Site

The specific parameters used in the simulation and diffusion to ground water equation at the site are presented in the table and figures below.

Table 1 – Common Parameters Employed in the VLEACH model for the Hobbs A-6 Vent Site

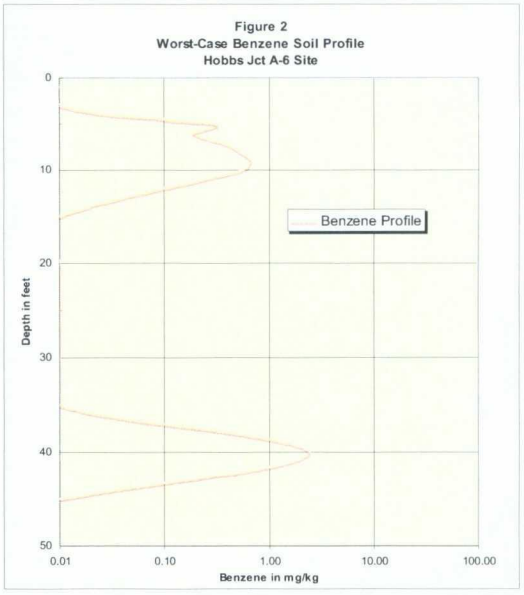
Model Parameter	Value	Source of Value
Benzene & Xylene Chemical Parameters	Chemical Specific	NMED June 2006 Soil Screening Levels Document
Spill Area (ft^2)	3,000	Site Measurement
Groundwater Table Depth (ft)	50	Site Measurement (MW-1)
Vadose Zone Soil Bulk Density (g/cm^3)	1.5	NMED June 2006 Document
Vadose Zone Porosity (unitless)	0.43	NMED June 2006 Document
Volumetric Water Content (%)	0.26	NMED June 2006 Document
Vadose Zone Soil Organic Content (f_{oc})	0.0015	NMED June 2006 Document
Recharge Rate (ft/year)	0.131	Musharrafieh 1999
Benzene & Xylene Concentrations (ug/kg)	Chemical Specific	Worst-Case Hydrocarbon Profile (Excavations & SB-1)
Slope of Water Table	0.0035	Regional Map (Attachment A)
Hydraulic Conductivity (ft/d)	80	Musharrafieh 1999
Max width perpendicular to direction of GW flow (ft)	50	Site Measurement
Aquifer Porosity (unitless)	0.25	Prof. Judgment Conservative Assumption
Mixing zone depth in aquifer	6.6	Prof. Judgment Conservative Assumption

Figure 1 - Actual Input Screens from the VLEACH Model Program for the Benzene Run



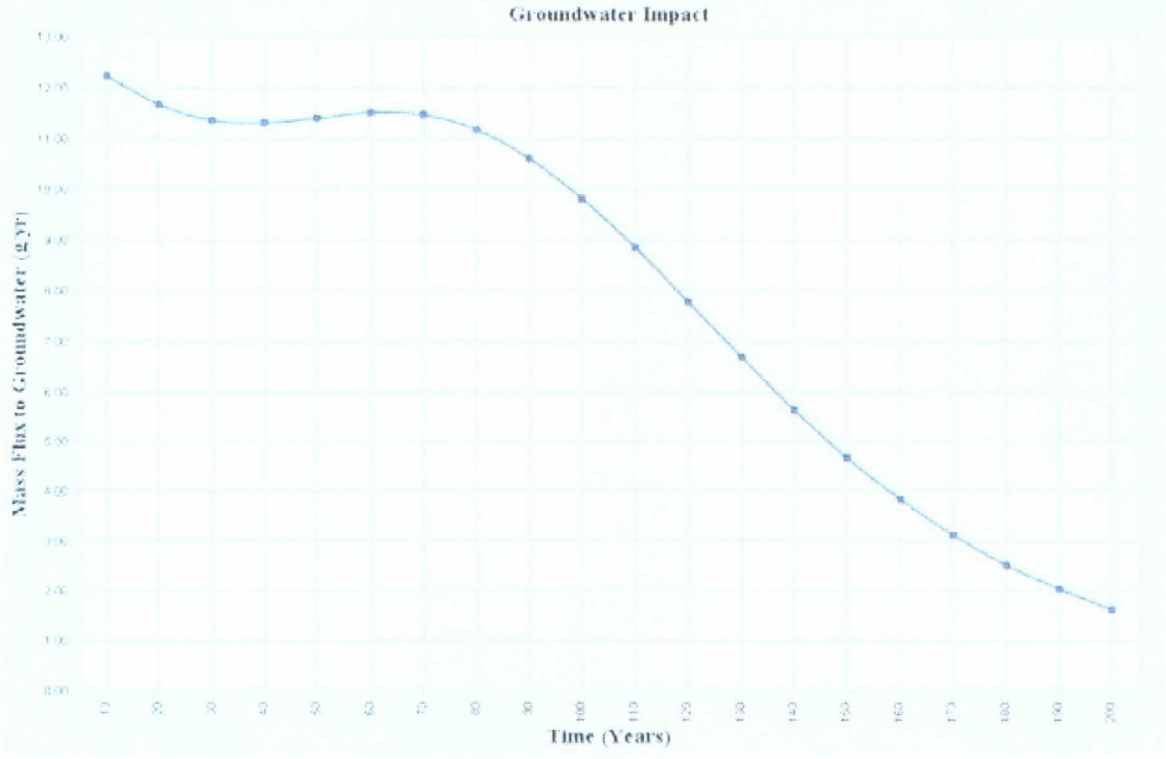
Simulation Time, Time Step, Output Time Interval, and Profile Time Interval were selected to provide the clearest presentation of the results based on the time required to identify the maximum impact to groundwater.

As a conservative measure, a "worst-case" hydrocarbon soil profile was constructed by taking the highest benzene concentration from each sampled depth as shown in Figure 2. Sampling depths for which laboratory results were available were estimated from the field screening data. The benzene values from this profile were conservatively assumed to be present across the entire 3,000 ft² area.



The results from the VLEACH modeling relative to this assessment are provided as a graph that presents the subsurface impact as Mass Flux to Ground Water in grams/year (g/yr) as a function of future time as shown below:

Figure 3
Results of VLEACH Vadose Model for Benzene



In order to compare the modeled results to the NMED ground water standard, the VLEACH output data required a conversion from g/yr to mg/L. This was performed by calculating the annual recharge (flux) volume from the spill area and the annual ground water flow volume below the spill area as shown:

Recharge is defined as: $Flux_{flow}(L/yr) = A \times R \times 29.317$ where,

A = spill area (ft^2)
R = recharge rate (ft/yr), and
29.317 = conversion factor from ft^3 to liters

Groundwater flow is defined as: $GW_{flow}(L/yr) = \left(\frac{k \times i}{\theta_T}\right) \times T_{aq} \times W \times 29.317$ where,

k = hydraulic conductivity of the aquifer (ft/yr)
i = groundwater gradient (ft/ft)
θ_T = porosity of the aquifer
T_{aq} = aquifer mixing zone thickness (ft) and,
W = length of the spill area (ft) perpendicular to the ground water gradient direction

The relationship between the annual recharge volume and the annual ground water flow volume was used to calculate the predicted ground water concentration for the initial (year zero) time and the maximum impact year time for the constituent of concern as demonstrated on the table below:

	Present Impact Data				Maximum Impact Data				NM
Chemical of Concern	Year	Impact (g/yr)	Leachate Conc. (mg/L)	GW Conc. (mg/L)	Year	Impact (g/yr)	Leachate Conc. (mg/L)	GW Conc. (mg/L)	Water Quality (mg/L)
Benzene	0	13	5.4	0.003	0	13	5.4	0.003	0.01