1R - 479

REPORTS

DATE:

2006

ENVIRONMENTAL LAB OF

12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Kristin Farris-Pope

Rice Operating Co.

122 W. Taylor

Hobbs, NM 88240

Project: Vacuum Jct. N-6-1

Project Number: None Given

Location: T18S-R35E-Sec6L/N, Lea Co., NM

Lab Order Number: 6H25015

Report Date: 09/05/06

Rice Operating Co.
122 W. Taylor
Hobbs NM, 88240

Project: Vacuum Jct. N-6-1
Project Number: None Given
Project Manager: Kristin Farris-Pope

Fax: (505) 397-1471

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Monitor Well #1	6H25015-01	Water	08/25/06 12:45	08-25-2006 15:22
Monitor Well #2	6H25015-02	Water	08/25/06 11:35	08-25-2006 15:22
Monitor Well #3	6H25015-03	Water	08/25/06 10:05	08-25-2006 15:22
Monitor Well #4	6H25015-04	Water	08/25/06 08:20	08-25-2006 15:22

Rice Operating Co.
122 W. Taylor
Hobbs NM, 88240

Project: Vacuum Jct. N-6-1
Project Number: None Given
Project Manager: Kristin Farris-Pope

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Organics by GC

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1 (6H25015-01) Water									
Benzene	ND	0.00100	mg/L	1	EH62909	08/29/06	08/29/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*100 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*94.8 %*	*80-120*		"	"	"	"	
Monitor Well #2 (6H25015-02) Water									
Benzene	ND	0.00100	mg/L	1	EH62909	08/29/06	08/29/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*102 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*84.2 %*	*80-120*		"	"	"	"	
Monitor Well #3 (6H25015-03) Water									
Benzene	ND	0.00100	mg/L	1	EH62909	08/29/06	08/29/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*98.2 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*93.5 %*	*80-120*		"	"	"	"	
Monitor Well #4 (6H25015-04) Water									
Benzene	ND	0.00100	mg/L	1	EH62909	08/29/06	08/30/06	EPA 8021B	
Toluene	ND	0.00100	"	"	"	"	"	"	
Ethylbenzene	ND	0.00100	"	"	"	"	"	"	
Xylene (p/m)	ND	0.00100	"	"	"	"	"	"	
Xylene (o)	ND	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*81.8 %*	*80-120*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*81.0 %*	*80-120*		"	"	"	"	

Rice Operating Co. 122 W. Taylor Hobbs NM, 88240	Project: Vacuum Jct. N-6-1 Project Number: None Given Project Manager: Kristin Farris-Pope	Fax: (505) 397-1471

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1 (6H25015-01) Water									
Total Alkalinity	**250**	2.00	mg/L	1	EH63106	08/31/06	08/31/06	EPA 310.1M	
Chloride	**21900**	250	"	500	EH63019	08/28/06	08/28/06	EPA 300.0	
Total Dissolved Solids	**36200**	10.0	"	1	EH62916	08/28/06	08/30/06	EPA 160.1	
Sulfate	**550**	250	"	500	EH63019	08/28/06	08/28/06	EPA 300.0	
Monitor Well #2 (6H25015-02) Water									
Total Alkalinity	**182**	2.00	mg/L	1	EH63106	08/31/06	08/31/06	EPA 310.1M	
Chloride	**21.0**	5.00	"	10	EH63019	08/28/06	08/28/06	EPA 300.0	
Total Dissolved Solids	**278**	10.0	"	1	EH62916	08/28/06	08/30/06	EPA 160.1	
Sulfate	**34.4**	5.00	"	10	EH63019	08/28/06	08/28/06	EPA 300.0	
Monitor Well #3 (6H25015-03) Water									
Total Alkalinity	**176**	2.00	mg/L	1	EH63106	08/31/06	08/31/06	EPA 310.1M	
Chloride	**19.5**	2.50	"	5	EH63019	08/28/06	08/28/06	EPA 300.0	
Total Dissolved Solids	**288**	10.0	"	1	EH62916	08/28/06	08/30/06	EPA 160.1	
Sulfate	**35.6**	2.50	"	5	EH63019	08/28/06	08/28/06	EPA 300.0	
Monitor Well #4 (6H25015-04) Water									
Total Alkalinity	**150**	2.00	mg/L	1	EH63106	08/31/06	08/31/06	EPA 310.1M	
Chloride	**32.4**	5.00	"	10	EH63019	08/28/06	08/28/06	EPA 300.0	
Total Dissolved Solids	**332**	10.0	"	1	EH62916	08/28/06	08/30/06	EPA 160.1	
Sulfate	**39.8**	5.00	"	10	EH63019	08/28/06	08/28/06	EPA 300.0	

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Rice Operating Co. 122 W. Taylor Hobbs NM, 88240	Project: Vacuum Jct. N-6-1 Project Number: None Given Project Manager: Kristin Farris-Pope	Fax: (505) 397-1471

Total Metals by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Monitor Well #1 (6H25015-01) Water									
Calcium	**1810**	40.5	mg/L	500	EH62802	08/28/06	08/28/06	EPA 6010B	
Magnesium	**355**	1.80	"	50	"	"	"	"	
Potassium	**61.4**	3.00	"	"	"	"	"	"	
Sodium	**10400**	43.0	"	1000	"	"	"	"	
Monitor Well #2 (6H25015-02) Water									
Calcium	**56.7**	0.810	mg/L	10	EH62802	08/28/06	08/28/06	EPA 6010B	
Magnesium	**8.22**	0.360	"	"	"	"	"	"	
Potassium	**2.55**	0.600	"	"	"	"	"	"	
Sodium	**25.5**	0.430	"	"	"	"	"	"	
Monitor Well #3 (6H25015-03) Water									
Calcium	**52.3**	0.810	mg/L	10	EH62802	08/28/06	08/28/06	EPA 6010B	
Magnesium	**7.06**	0.360	"	"	"	"	"	"	
Potassium	**2.05**	0.600	"	"	"	"	"	"	
Sodium	**19.7**	0.430	"	"	"	"	"	"	
Monitor Well #4 (6H25015-04) Water									
Calcium	**57.1**	0.810	mg/L	10	EH62802	08/28/06	08/28/06	EPA 6010B	
Magnesium	**7.42**	0.360	"	"	"	"	"	"	
Potassium	**2.13**	0.600	"	"	"	"	"	"	
Sodium	**24.8**	0.430	"	"	"	"	"	"	

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122 W. Taylor	Project Number: None Given	
Hobbs NM, 88240	Project Manager: Kristin Farris-Pope	

Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH62909 - EPA 5030C (GC)										
Blank (EH62909-BLK1)				Prepared & Analyzed: 08/29/06						
Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	*42.1*		*ug/l*	*40.0*		*105*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*32.7*		*"*	*40.0*		*81.8*	*80-120*			
LCS (EH62909-BS1)				Prepared & Analyzed: 08/29/06						
Benzene	0.0499	0.00100	mg/L	0.0500		99.8	80-120			
Toluene	0.0528	0.00100	"	0.0500		106	80-120			
Ethylbenzene	0.0490	0.00100	"	0.0500		98.0	80-120			
Xylene (p/m)	0.113	0.00100	"	0.100		113	80-120			
Xylene (o)	0.0530	0.00100	"	0.0500		106	80-120			
Surrogate: a,a,a-Trifluorotoluene	*43.9*		*ug/l*	*40.0*		*110*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*46.1*		*"*	*40.0*		*115*	*80-120*			
Calibration Check (EH62909-CCV1)				Prepared & Analyzed: 08/29/06						
Benzene	52.7		ug/l	50.0		105	80-120			
Toluene	56.2		"	50.0		112	80-120			
Ethylbenzene	55.8		"	50.0		112	80-120			
Xylene (p/m)	115		"	100		115	80-120			
Xylene (o)	57.3		"	50.0		115	80-120			
Surrogate: a,a,a-Trifluorotoluene	*44.7*		*"*	*40.0*		*112*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*46.4*		*"*	*40.0*		*116*	*80-120*			
Matrix Spike (EH62909-MS1)	**Source: 6H25012-04**			Prepared: 08/29/06 Analyzed: 08/30/06						
Benzene	0.0489	0.00100	mg/L	0.0500	ND	97.8	80-120			
Toluene	0.0506	0.00100	"	0.0500	ND	101	80-120			
Ethylbenzene	0.0510	0.00100	"	0.0500	ND	102	80-120			
Xylene (p/m)	0.117	0.00100	"	0.100	ND	117	80-120			
Xylene (o)	0.0538	0.00100	"	0.0500	ND	108	80-120			
Surrogate: a,a,a-Trifluorotoluene	*45.7*		*ug/l*	*40.0*		*114*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*47.4*		*"*	*40.0*		*118*	*80-120*			

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Organics by GC - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH62909 - EPA 5030C (GC)										
Matrix Spike Dup (EH62909-MSD1)	**Source: 6H25012-04**			Prepared: 08/29/06 Analyzed: 08/30/06						
Benzene	0.0472	0.00100	mg/L	0.0500	ND	94.4	80-120	3.54	20	
Toluene	0.0489	0.00100	"	0.0500	ND	97.8	80-120	3.22	20	
Ethylbenzene	0.0471	0.00100	"	0.0500	ND	94.2	80-120	7.95	20	
Xylene (p/m)	0.107	0.00100	"	0.100	ND	107	80-120	8.93	20	
Xylene (o)	0.0500	0.00100	"	0.0500	ND	100	80-120	7.69	20	
Surrogate: a,a,a-Trifluorotoluene	*41.2*		*ug/l*	*40.0*		*103*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*44.1*		*"*	*40.0*		*110*	*80-120*			

Rice Operating Co.
122 W. Taylor
Hobbs NM, 88240

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Project Manager: Kristin Farris-Pope

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General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH62916 - Filtration Preparation										
Blank (EH62916-BLK1)				Prepared: 08/28/06 Analyzed: 08/29/06						
Total Dissolved Solids	ND	10.0	mg/L							
Duplicate (EH62916-DUP1)	**Source: 6H25010-01**			Prepared: 08/28/06 Analyzed: 08/29/06						
Total Dissolved Solids	2480	10.0	mg/L		2580			3.95	5	
Duplicate (EH62916-DUP2)	**Source: 6H25013-01**			Prepared: 08/28/06 Analyzed: 08/29/06						
Total Dissolved Solids	1350	10.0	mg/L		1400			3.64	5	
Batch EH63019 - General Preparation (WetChem)										
Blank (EH63019-BLK1)				Prepared & Analyzed: 08/28/06						
Sulfate	ND	0.500	mg/L							
Chloride	ND	0.500	"							
LCS (EH63019-BS1)				Prepared & Analyzed: 08/28/06						
Sulfate	10.1	0.500	mg/L	10.0		101	80-120			
Chloride	10.2	0.500	"	10.0		102	80-120			
Calibration Check (EH63019-CCV1)				Prepared & Analyzed: 08/28/06						
Sulfate	12.0		mg/L	10.0		120	80-120			
Chloride	9.87		"	10.0		98.7	80-120			
Duplicate (EH63019-DUP1)	**Source: 6H24003-01**			Prepared & Analyzed: 08/28/06						
Sulfate	225	5.00	mg/L		227			0.885	20	
Chloride	94.7	5.00	"		102			7.42	20	
Duplicate (EH63019-DUP2)	**Source: 6H25013-01**			Prepared & Analyzed: 08/28/06						
Sulfate	40.5	10.0	mg/L		40.9			0.983	20	
Chloride	420	10.0	"		418			0.477	20	

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General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH63019 - General Preparation (WetChem)										
Matrix Spike (EH63019-MS1)		**Source: 6H24003-01**		Prepared & Analyzed: 08/28/06						
Chloride	204	5.00	mg/L	100	102	102	80-120			
Sulfate	338	5.00	"	100	227	111	75-125			
Matrix Spike (EH63019-MS2)		**Source: 6H25013-01**		Prepared & Analyzed: 08/28/06						
Chloride	645	10.0	mg/L	200	418	114	80-120			
Sulfate	239	10.0	"	200	40.9	99.0	75-125			
Batch EH63106 - General Preparation (WetChem)										
Blank (EH63106-BLK1)				Prepared & Analyzed: 08/31/06						
Total Alkalinity	ND	2.00	mg/L							
LCS (EH63106-BS1)				Prepared & Analyzed: 08/31/06						
Bicarbonate Alkalinity	190	2.00	mg/L	200		95.0	85-115			
Duplicate (EH63106-DUP1)		**Source: 6H24003-01**		Prepared & Analyzed: 08/31/06						
Total Alkalinity	150	2.00	mg/L		156			3.92	20	
Reference (EH63106-SRM1)				Prepared & Analyzed: 08/31/06						
Total Alkalinity	254		mg/L	250		102	90-110			

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Total Metals by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EH62802 - 6010B/No Digestion										
Blank (EH62802-BLK1)				Prepared & Analyzed: 08/28/06						
Calcium	ND	0.0810	mg/L							
Magnesium	ND	0.0360	"							
Potassium	ND	0.0600	"							
Sodium	ND	0.0430	"							
Calibration Check (EH62802-CCV1)				Prepared & Analyzed: 08/28/06						
Calcium	1.97		mg/L	2.00		98.5	85-115			
Magnesium	2.13		"	2.00		106	85-115			
Potassium	1.74		"	2.00		87.0	85-115			
Sodium	1.84		"	2.00		92.0	85-115			
Duplicate (EH62802-DUP1)	**Source: 6H25010-01**			Prepared & Analyzed: 08/28/06						
Calcium	267	4.05	mg/L		251			6.18	20	
Magnesium	81.9	1.80	"		77.6			5.39	20	
Potassium	7.20	0.600	"		7.76			7.49	20	
Sodium	396	2.15	"		409			3.23	20	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	*Sample results reported on a dry weight basis*
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Raland K Tuttle Date: 9/5/2006

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

Environmental Lab of Texas

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kristin Farris Pope kpope@riceswd.com
Company Name: RICE Operating Company
Company Address: 122 W. Taylor Street
City/State/Zip: Hobbs, New Mexico 88240
Telephone No: (505) 393-9174 Fax No: (505) 397-1471
Sampler Signature: Rozanne Johnson (505) 631-9310
Email: rozanne@valornet.com

Project Name: Vacuum Junction N-6-1
Project Number:
Project Loc: T18S-R35E-Sec6L/N, Lea County NM
PO Number:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	Preservative: HNO_3	Preservative: HCl (2) 40 ml glass vials	Preservative: NaOH	Preservative: H_2SO_4	Preservative: None (1) 1 Liter HDPE	Preservative: Other (Specify)	Matrix: Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: TCLP:	Analyze For: TOTAL: TPH: 418.1 8015M 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 80218/6030	RCI	N.O.R.M.	Total Dissolved Solids			RUSH TAT (Pre-Schedule)	Standard TAT
6H25015																															
-01	Monitor Well #1	8/25/2006	12:45	3	X		2			1		X						X	X					X			X				X
-02	Monitor Well #2	8/25/2006	11:35	3	X		2			1		X						X	X					X			X				X
-03	Monitor Well #3	8/25/2006	10:05	3	X		2			1		X						X	X					X			X				X
-04	Monitor Well #4	8/25/2006	8:20	3	X		2			1		X						X	X					X			X				X

Special Instructions:

PLEASE Email RESULTS TO: kpope@riceswd.com; mfranks@riceswd.com
rozanne@valornet.com

Sample Containers Intact? (Y) N
Labels on container? (Y) N
Custody Seals: Containers / Cooler
Temperature Upon Receipt: 1.0 °C
Laboratory Comments: not frozen

Relinquished by:	Date	Time	Received by:	Date	Time
Rozanne Johnson	8-25-06	13:10	James Johnson	8-25-06	13:11
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
James Johnson	8-25-06	15:22	Roland Leo	8-25-06	1522

Date/ Time: 08-25-06 @ 1522

Lab ID # : 6H25015

Initials: JMM

Sample Receipt Checklist

					Client Initials
#1	Temperature of container/ cooler?	(Yes)	No	1.0 °C	
#2	Shipping container in good condition?	(Yes)	No		
#3	Custody Seals intact on shipping container/ cooler?	(Yes)	No	Not Present	
#4	Custody Seals intact on sample bottles/ container?	(Yes)	No	Not Present	
#5	Chain of Custody present?	(Yes)	No		
#6	Sample instructions complete of Chain of Custody?	(Yes)	No		
#7	Chain of Custody signed when relinquished/ received?	(Yes)	No		
#8	Chain of Custody agrees with sample label(s)?	(Yes)	No	ID written on Cont./ Lid	
#9	Container label(s) legible and intact?	(Yes)	No	Not Applicable	
#10	Sample matrix/ properties agree with Chain of Custody?	(Yes)	No		
#11	Containers supplied by ELOT?	(Yes)	No		
#12	Samples in proper container/ bottle?	(Yes)	No	See Below	
#13	Samples properly preserved?	(Yes)	No	See Below	
#14	Sample bottles intact?	(Yes)	No		
#15	Preservations documented on Chain of Custody?	(Yes)	No		
#16	Containers documented on Chain of Custody?	(Yes)	No		
#17	Sufficient sample amount for indicated test(s)?	(Yes)	No	See Below	
#18	All samples received within sufficient hold time?	(Yes)	No	See Below	
#19	VOC samples have zero headspace?	(Yes)	No	Not Applicable	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken:

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

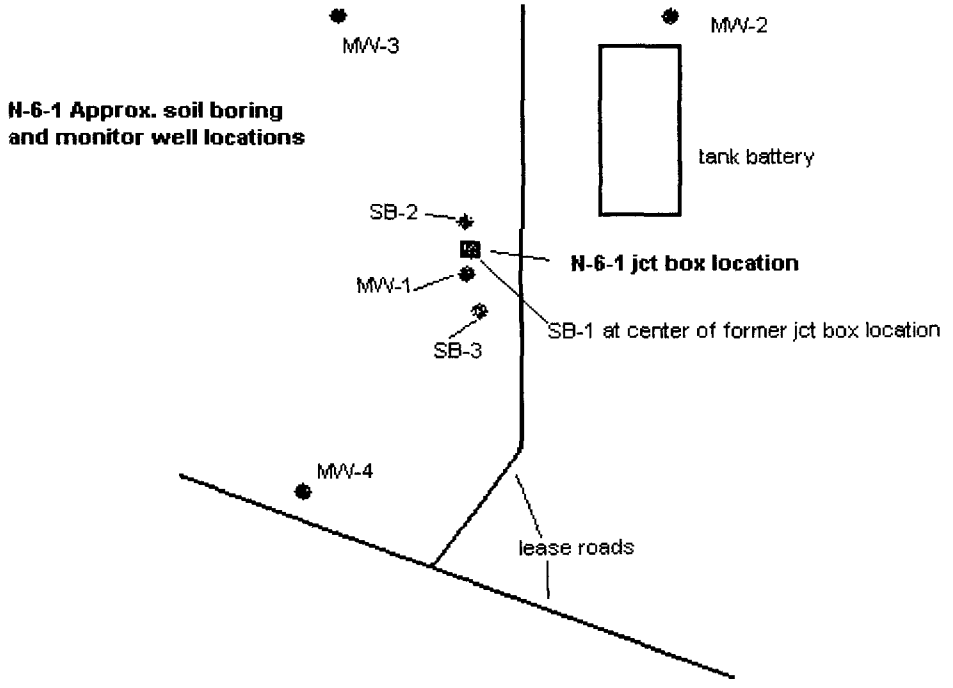
Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

Client: Rice Operating

RICE Operating Company
Vacuum SWD System
N-6-1 leak

June 19, 20, 22, 2006



Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **MW-1**
Date: 6/19/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.
Monitor well screened interval : top 104 ft below ground surface
bottom 124 "

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description	Well Schematic
0					light gray sand	solid pipe
5	1042	1344	987.0	non-detect	light gray caliche	"
10	367		9.4		"	"
15	198		59.5		"	"
20	389		185.0		"	"
25	299		14.3		"	"
30	246		8.2		"	"
35	133		4.5		"	"
40	239	160	9.5	non-detect	light brown sand	"
45	260		4.1		"	"
50	224		0.0		"	"
55	145		0.0		"	"
60	237		0.0		brown sand	"
65	199		0.0		"	"
70	160		0.0		"	"
75	204		0.0		"	"
80	261		0.0		"	"
85	484		0.0		"	"
90	1231	1248	0.0	non-detect	brown sand w/ light gray mottles	"
95	1474		0.0		brown sand w/ gray and red mottles	"
100	1823		0.0		"	"
105	2001		0.0		"	screen
110	2467		0.0		"	"
115	2663		0.0		"	"
120	1032		0.0		" (moist)	"
125						

Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **MW-2**
Date: 6/19/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.
Monitor well screened interval : top 104 ft below ground surface
bottom 124 "

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description	Well Schematic
0					light gray sand	solid pipe
5	169		0.6		light gray caliche	"
10	121		0.0		"	"
15	110		0.0		"	"
20	83		0.0		"	"
25	59		0.0		"	"
30	58		0.0		tan sand	"
35	61		0.0		"	"
40	55		0.0		"	"
45	58		0.0		"	"
50	61		0.0		"	"
55	59		0.0		" (sandstone layer 58 to 60 ft)	"
60	29		0.0		brown sand	"
65	57		0.0		"	"
70	59		0.0		"	"
75	58		0.0		olive brown sand	"
80	55		0.0		"	"
85	58		0.0		"	"
90	57		0.0		"	"
95	56		0.0		" (w/ small, friable light gray concretions)	"
100	89		0.0		"	"
105	83		0.0		light brown hard sandstone	screen
110	30		0.0		"	"
115	45	<16	0.0	non-detect	light brown sand	"
120	29		0.0		" (moist)	"
125						

Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **MW-3**
Date: 6/20/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.
Monitor well screened interval : top 104 ft below ground surface
bottom 124 "

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description	Well Schematic
0					light gray sand	solid pipe
5					light gray caliche	"
10	92		0.0		"	"
15					"	"
20	56		0.0		light tan fine sand	"
25					"	"
30	85		0.0		"	"
35					"	"
40	85		0.0		"	"
45					"	"
50	29		0.0		"	"
55					"	"
60	29		0.0		hard light tan sandstone	"
65					brown sand	"
70	27		0.0		"	"
75					"	"
80	28	<16	0.0	non-detect	"	"
85					"	"
90					"	"
95					"	"
100					"	"
105					"	screen
110					"	"
115					"	"
120					"	"
125						

Note: Due to flowing sands below 80 ft, no soil samples were taken below this depth.

Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **MW-4**
Date: 6/20/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.
Monitor well screened interval : top 104 ft below ground surface
bottom 124 "

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description	Well Schematic
0					light gray sand	solid pipe
5					light gray caliche	"
10	27		0.0		"	"
15					"	"
20	28		0.0		"	"
25					"	"
30	29		0.0		brown sand	"
35					"	"
40	28		0.0		"	"
45					"	"
50	29		0.0		light brown sand	"
55					hard light tan sandstone	"
60	28		0.0		light brown sand	"
65					"	"
70	28		0.0		light reddish brown sand	"
75					"	"
80	28		0.0		olive brown sand	"
85					"	"
90	28	<16	0.0	non-detect	"	"
95					"	"
100					"	"
105					"	"
110					"	screen
115					"	"
120					"	"

Note: Due to flowin sands below 80 ft, no soil samples were taken below this depth.

Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **SB-1**
Location: atop former junction box
Date: 6/19/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description
0					dark brown loam
5	486		10.3		light gray caliche
10	166		2317.0		"
15	182	16	4897.0	non-detect	"
20	113		3710.0		"
25	112		1182.0		"
30	138		2310.0		gray caliche
35	509		1149.0		"
40	680		1818.0		light brown sand
45	761		1810.0		"
50	707		1318.0		"
55	629		1113.0		hard light tan sandstone
60	1285		509.0		light brown sand
65	1101		37.7		"
70	1032		13.7		"
75	927		7.5		"
80	1078		9.2		"
85	1028		20.1		"
90	1002		8.1		"
95	899		2.9		"
100	887		5.9		"
105	1351		11.8		"
110	2014		19.6		"
115	1949		2.3		"
120	2413	2687	1.5	non-detect	"

Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **SB-2**
Location: approx. 20 ft northeast of former junction box
Date: 6/22/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description
0					light tan sand and caliche
5	992		0.0		"
10	1915		0.0		"
15	1977		0.0		tan sand
20	1657		0.0		"
25	895		0.0		"
30	419		1.0		"
35	709		0.0		"
40	801	880	3.5	non-detect	"
45	693		0.1		"
50	892		0.0		"
55	474		0.2		"
60	769		1.4		hard light tan sandstone
65	1061		0.0		brown sand
70	950		0.0		"
75	943		0.0		"
80	1107		0.0		"
85	1300		0.1		"
90	1337		0.2		"
95	1083		0.4		"
100	1050		0.0		olive brown sand
105	1166		0.3		"
110	1315		0.0		"
115	1390	1951	0.0		"
120					"

Soil Boring Log
RICE Operating Company
Vacuum SWD System
N-6-1 leak

Identification: **SB-3**
Location: approx. 20 ft northwest of former junction box
Date: 6/22/2006
Driller: Ken Cooper (Harrison and Cooper, Inc.)
Drill method: Air Rotary
Logged by: L. Peter Galusky, Jr.

Depth (ft)	Field Chloride Test (ppm)	Lab Chloride Test (ppm)	Field OVM test (ppm)	Lab BTEX test (ppm)	Cutting Description
0					light tan sand and caliche
5	1567		4.3		"
10	172		0.0		"
15	91		3.0		tan sand
20	782		1.5		"
25	1240		1.2		"
30	1292		0.3		"
35	1424		0.3		"
40	1386		2.2		"
45	1721	2351	1.0	non-detect	"
50	1367		0.6		"
55	1549		0.4		"
60	1849		0.2		hard light tan sandstone
65	1519		0.0		brown sand
70	1994		0.0		"
75	1226		0.0		"
80	1097		0.0		"
85	1195		0.0		"
90	1358		0.0		"
95	1411		0.0		"
100	1262		0.0		olive brown sand
105	1259		0.0		"
110	1209		0.0		"
115	1217	1504	0.0		"
120					"

RICE Operating Company
Vacuum SWD System
N-6-1 leak

L. Peter Galusky, Jr. Ph.D., P.G.
Consulting Hydrogeologist

December 12th, 2005

Mr. Wayne Price
New Mexico Energy, Minerals, & Natural Resources
Oil Conservation Division, Environmental Bureau
1220 S. St. Francis Drive
Santa Fe, New Mexico 87504

RE: **Investigation and Characterization Plan**
Vacuum N-6-1 Produced Water Discharge, UL N Sec 6 T18S R35E

CERTIFIED MAIL, RETURN RECEIPT 7005 0390 0002 9898 2655

Mr. Price:

RICE Operating Company (ROC) has retained L. Peter Galusky, Jr. Ph.D. to address potential environmental concerns at the above-referenced site. ROC is the service provider (operator) for the Vacuum 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 Partners, who provide all operating capital on a percentage ownership/usage basis. Environmental projects of this magnitude require System Partner AFE approval, and work begins as funds are received. In general, project funding is not forthcoming until NMOCD approves the work plan. Therefore, your timely review of this submission would be greatly appreciated.

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

- protects public health,
- provides the greatest net environmental benefit,
- complies with NMOCD Rules, and
- is supported by good science.

Each site shall generally have three submissions, as described below:

1. **This** Investigation and Characterization Plan (**ICP**) **is a proposal** for data gathering and site characterization and assessment.

2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP) if this is warranted.

3. Finally, after implementing the remedy, a Closure Report with final documentation will be submitted.

Background and Previous Work

On April 7th , 2003 Rice Operating Company (ROC) discovered an accidental discharge of approximately 150 bbls of produced water at the referenced site, located approximately 2 miles SSE of Buckeye, NM; (*please see Appendix A for site and location maps*). The produced water was released because of a gasket blow-out at a junction box. The gasket was replaced, and the junction box was returned to service. Soil samples collected on May 19th, 2003 using a hand-auger at the point of release indicated chlorides in excess of 10,000 ppm (using field titration kits) to a depth of 2 feet below the surface. On August 20th, 2003 soils were sampled using a backhoe, and chloride concentrations were measured (using field titration kits) above 5,000 ppm to the limit of excavation at 12 ft below the surface.

This release affected approximately 200 square feet of soil material near the ground surface, based upon visual observation. Groundwater depth was estimated to be 95 ft below the surface, based upon records of the NM State Engineer.

On April 18th, 2004, the junction box was removed and soils beneath it were excavated to a depth of 7 feet. A clay liner of approximately 1 foot in thickness was placed at the bottom of the excavation, and a new junction box was installed.

Please see Appendix B for the correspondence record with OCD, as well as the results and photographs from preliminary soils evaluation, and schematics of junction box replacement.

The surface (ecological) impact of this release was relatively small. However, as the potential for groundwater contamination exists, this warrants further evaluation for chlorides and petroleum hydrocarbons, the constituents of concern. Therefore, ROC proposes additional investigative work, as outlined in the Investigation and Characterization Plan (ICP) below, to more definitively evaluate the extent of contamination caused by the release, and to then evaluate the potential for groundwater degradation.

The release site is located approximately 120 ft southeast of Marathon's Warn battery. The topography is gently sloping toward the southeast. Soils on the site are mapped (as KU) in the Lea County Soil Survey[1] as belonging to the Kimbrough-Lea complex. These are characterized by sandy loam to clay loam to a depth of one to three and a half feet, and this is underlain by several feet of calcium indurated caliche. Groundwater is estimated to occur at a depth of approximately 95 feet, occurring in unconsolidated Tertiary alluvium of the Ogallala Formation[2].

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[1] USDA SCS. Soil Survey of Lea County, New Mexico. Issued January, 1974.

[2] New Mexico Bureau of Geology & Mineral Resources. 1982. Circular 175 – Western extent of the Ogallala Formation in New Mexico.

It should be noted that the source of this impact is historical. There is no longer a threat of continued, compounded impact at this site as the source of the release has been corrected, the junction eliminated, and the Vacuum SWD System is no longer in service.

Investigation and Characterization Plan

Task 1 - Collect Regional Hydrogeological Data

Published maps and reports of surficial geology, soils, hydrogeology and ecosystem characteristics will be reviewed and summarized to provide a context and baseline from which to evaluate the results of subsequent analysis. State and county records of water wells will be reviewed and summarized to identify downgradient receptors which could potentially be affected.

Task 2 - Evaluate Concentrations of Constituents of Concern in Soil (and Ground Water)

Soils samples will be taken from a sufficient number of selected representative locations and depths in order to quantify the areal extent and depth of contamination with respect to chlorides and hydrocarbons. Soil samples will be taken and tested for chlorides, using field titration methods, and for BTEX, using EPA-standard PID methodology. A small sub-set of samples at key locations (such as the total sampled depth, apparent "hot spots", etc.) will be sent to a commercial laboratory for verification/calibration of the field tests, according to standard EPA sampling and laboratory methods.

A limited number of monitoring wells may be constructed in selected, representative locations, generally where WQCC standards are exceeded within 10+/- feet of the water table and where the location of such wells will useful for hydrogeological analysis . All such monitoring wells will be constructed (with the annular space sealed with bentonite) per standard EPA methodology.

Task 3 - Evaluate Risk of Groundwater Impact

The data gathered from this study will be summarized and presented in simple and clear graphs and maps. This will provide a means for an intuitive evaluation of the apparent potential for groundwater impacts. Additionally, simple spreadsheet vadose zone /or groundwater dilution models may be used as a supplemental, interpretive tool. The information thus obtained from this work will be evaluated to determine if there exists any substantial risk for groundwater impacts resulting from this release of produced water.

If the evaluation demonstrates that residual constituents pose no threat to ground water quality, then only a surface restoration plan will be proposed to OCD. If, as a result of this work, it is believed that this produced water leak does pose a present or future risk of impacting groundwater quality, then a *risk-based* corrective action plan (CAP) will be developed and proposed to OCD which addresses the identified risks.

I appreciate the opportunity to work with you on this project. Please call either myself, at the number below, or Kristin Farris Pope (ROC) at 505-393-9174, if you have any questions or wish to discuss these matters.

Thank you for your consideration.

Sincerely,

L. Peter (**Pete**) Galusky, Jr. Ph.D., P.G.
Consulting Hydrogeologist

505 N. Big Spring, Suite 404
Midland, Texas 70701
Tel: 432-967-2128
E-mail: lpg@texerra.com
Web site: www.texerra.com

cc: CDH, KFP, file

attachments: site maps, correspondence and photos as noted in the Appendix

Appendix A – Site Map

Figure 1 – Satellite photo (15,000 ft view) of N-6-1 ROC produced water release[3].

[3] From www.earth.google.com .

RICE *Operating Company*

122 West Taylor • Hobbs, New Mexico 88240
Phone: (505)393-9174 • Fax: (505) 397-1471

January 19, 2004

COF

Paul Sheeley
NMOCD Hobbs Office
1625 N. French Drive
Hobbs, New Mexico

Re: Vacuum SWD System
UL N Sec. 6 T18S R35E
Lea County, New Mexico

Dear Mr. Paul Sheeley:

Rice Operation Company (ROC) discovered an accidental discharge on April 7, 2003. The release consisted of 150 bbls, which affected 200 square feet. ROC now wishes to notify the NMOCD of the future actions to be taken at this site.

On August 20, 2003 a vertical delineation was done with a backhoe. ROC trenched down to 12' bgs sampling at every foot. At 12' bgs, a field test showed the chloride numbers remained consistent with 5000 ppm. The depth to groundwater is 89 feet. ROC has now determined the impact is out of the scope of the Generic Spill and Leak plan, and may have the potential of groundwater impact. ROC notified NMOCD Environmental Bureau Chief Roger Anderson on 1/16/04.

Because this sites impact is beyond the scope of the ROC Generic Spill Work Plan, it will be prioritized and placed on the major project list for further characterization and if necessary, remediation. ROC will notify NMOCD and or submit a RBCA once the plan of action has been determined.

ROC requests approval of this C-141 as the Final Report. If you have any questions please call me at the above referenced number.

Sincerely,

Joe Gatts
Environmental Technician

Hand Delivery
to OCD
1/19/04

District I
P.O. Box 1980, Hobbs, NM 88241-1980
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
2040 South Pacheco
Santa Fe, NM 87505
OPERATOR'S MONTHLY REPORT

Form C-141
Originated 2/13/97

Submit 2 copies to Appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR ☐Initial Report ☒Final Report

Name	Contact
Rice Operating Company	Joe Gatts
Address 122 West Taylor Hobbs, NM 88240	Telephone No. 505-393-9174
Facility Name Vacuum	Facility Type SWD Disposal Line

Surface Owner	Mineral Owner	Lease No.
State		

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South line	Feet from the	East/West Line	County
N	6	T18S	R35E					LEA

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Produced Water	150 bbls	130 bbls
Source of Release	**Date and Hour of Occurrence**	**Date and Hour of Discovery**
Pipeline	unknown	04/07/2003
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	**If YES, To Whom?** Possibly Paul Sheeley	
By Whom? Chris Rodriguez	**Date and Hour** Personal changes at time of discharge please check your files.	
Was a Watercourse Reached? ☐ Yes ☒No	**If YES, Volume Impacting the Watercourse.**	

If a Watercourse was Impacted, Describe Fully. (Attach Additional Sheets If Necessary)

Describe Cause of Problem and Remedial Action Taken. (Attach Additional Sheets If Necessary)
A three-inch gasket blew out on flange. Removed flange replaced gasket.

Describe Area Affected and Cleanup Action Taken. (Attach Additional Sheets If Necessary)
The released consisted of 150 bbls, which affected 200 square feet. Vertical delineation was done with a backhoe up to 12' bgs. It has been determined that the impact is out of the scope of ROC's Generic spill and leak plan, and may have the potential of groundwater impact. This site will prioritized and placed on the major project list for further characterization and if necessary, remediation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and /or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and /or regulations.

Signature: Joe Gatts	OIL CONSERVATION DIVISION	
Printed Name: Joe Gatts	Approved by District Supervisor:	
Title: Environmental Technician	Approval Date:	Expiration Date:
Date: 01/19/04 Phone: 505-393-9174	Conditions of Approval:	Attached ☐

Hand Delivery
OCD 1/19/04

Vacuum N-6-1 Produced Water Release

Vacuum N-6-1 leak

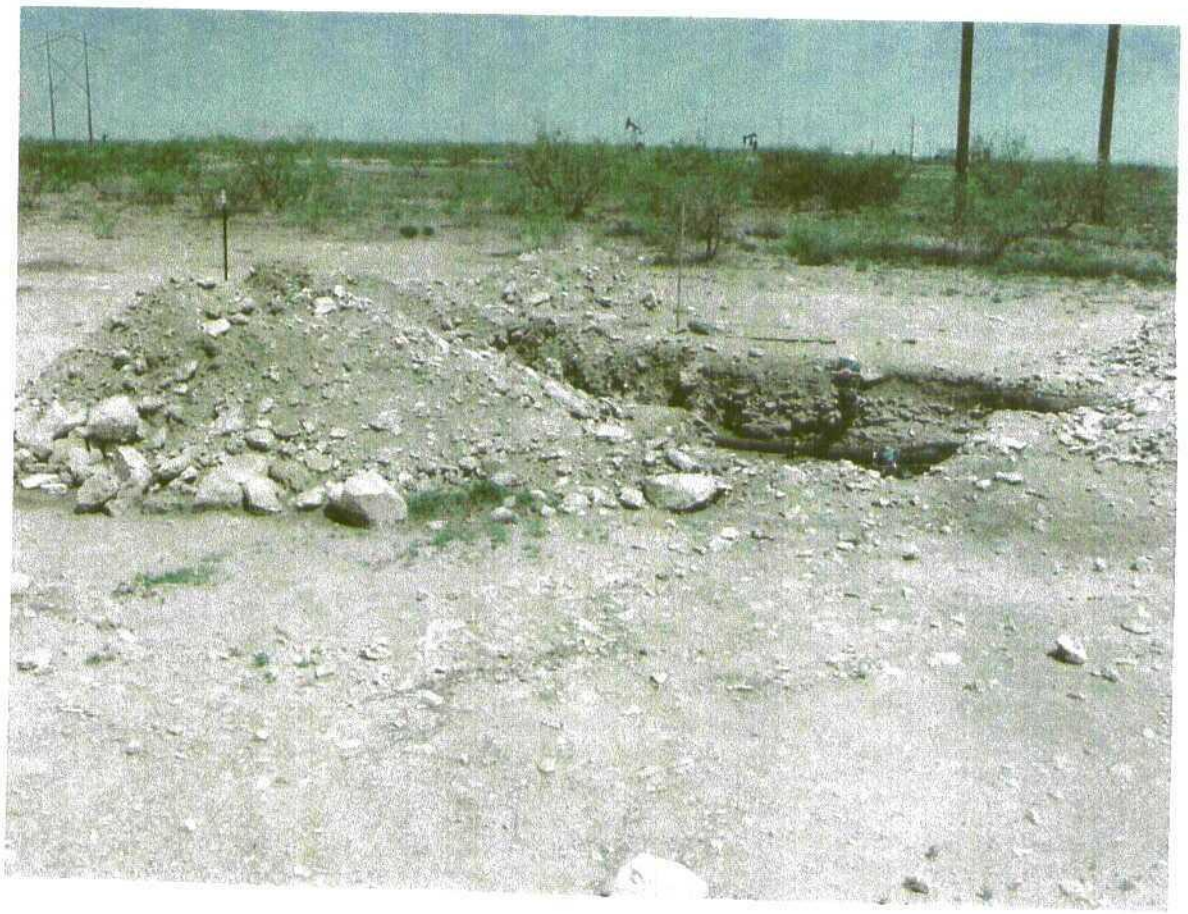
August 20, 2003

unit 'N', sec. 6, T18S, R35E

delineation at junction using a backhoe
groundwater at 95 ft

ft BGS	Soil Type	Hydrocarbon Odor	[Cl⁻] ppm
3	gray caliche	slight	3054
5	gray caliche	strong	4589
6	gray caliche	strong	4627
7	grayish-blue caliche	strong	3563
8	grayish-blue caliche	strong	5514
9	grayish-blue caliche	very strong	4037
10	grayish-blue caliche	strong	8640
11	grayish-blue caliche	strong	8993
12	grayish-blue caliche	strong	4753

7-25-03



7-25-03