

**1R - 425-86**

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# **WORKPLANS**

**Date:**

**4-16-12**

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

Texerra LLC

RECEIVED OGD

2012 APR 25 A 11: 17

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20055 Laredo Lane Monument, Colorado 80132

Tel: 719-339-6791 E-mail: lpg@texerra.com

April 16<sup>th</sup>, 2012

**Mr. Edward Hansen**

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

**RE: Corrective Action Plan**

Rice Operating Company – Vacuum SWD System  
Vacuum N-28-2 vent (Formerly Vacuum K-28-2 vent)  
NMOCD Case Number: 1R425-86. UL/N, Sec. 28, T17S, R35E

Sent via Certified U.S. Mail w/ Return Receipt No. 7011 0110 0001 5863 4875

Mr. Hansen:

RICE Operating Company (ROC) has retained Texerra to address potential environmental concerns at the above-referenced site in the abandoned Vacuum Salt Water Disposal (SWD) system. This report summarizes work to date completed according to the Investigation and Characterization Plan of May 3<sup>rd</sup>, 2011, and OCD approved on June 9<sup>th</sup>, 2011, for this site and presents a Corrective Action Plan (CAP) to ensure the protection of groundwater resources.

The location of the Vacuum N-28-2 vent site is given in Figure 1. A summary of soil boring analyses from samples taken to date is given in Figures 2a&b. Copies of laboratory analyses are given in the Appendix.

The depth to groundwater is estimated to be approximately 68 ft bgs. High levels of residual soil chlorides were found in all of the ten soil borings taken. Field PID readings indicated residual soil petroleum hydrocarbons in several locations, but these tended to diminish with depth.

It should be noted that site is located within the immediate vicinity of oil field facilities having a long history with apparent surface spillage (Figures 3 to 8) and that the elevated levels of residual soil chlorides are likely due to activities not directly caused by ROC operations. Nevertheless, in order to protect groundwater quality from the potential migration of residual soil chlorides ROC proposes the following actions to serve as a Corrective Action Plan (CAP) for this project. *These measures will provide protection beyond the impacts directly caused by past operation of the Vacuum N-28-2 vent.*

## Vacuum N-28-2 vent

ROC will:

### *Install a 20-mil Reinforced Sub-surface Infiltration Barrier and Restore the Ground Surface*

- Excavate the area encompassed by the soil borings (55 by 61 ft as shown in Figures 2a&b) to a depth of approximately 3 ft bgs (limited by the presence of hard rock).
- Install a 20-mil, reinforced poly liner over a 6 inch layer of clean blow sand and pad this with another 6 inch layer of the same.
- The excavation will then be backfilled with soil that chlorides measure less than 500 mg/kg and PID hydrocarbons measure less than 100 ppm. Excavated soil will be evaluated for use as backfill, and any soil requiring disposal will be properly disposed of at a NMOCD approved facility.
- Restore the ground surface to natural contours and seed with a blend of native vegetation mix.

### *Report the Course and Results of Work to NMOCD*

- Provide a brief report to NMOCD with photographs summarizing the course of these corrective actions and a request for remediation termination. Please note that we do not anticipate the need for, nor propose to, install any monitor wells as our proposed liner system will provide effective protection of groundwater from residual chlorides at this former ROC junction box. It is likely that any chlorides in groundwater above natural baseline levels are caused by historical sources up-gradient of and surrounding this former junction box. Figures 3 through 8 historical aerial photos show historic, non-ROC facilities surrounding the location of this former box. This is particularly clear in the 1966 and 1949 historical aerial photos.

ROC is the service provider (agent) 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 Parties, who provide all operating capital on a percentage ownership/usage basis.

We appreciate your consideration of this ICP report. Please do not hesitate to contact either Hack Conder of Rice Operating Company or myself if you have any questions or need additional information.

Sincerely,



L. Peter Galusky, Jr. Ph.D.

Copy: Rice Operating Company

Vacuum N-28-2 vent

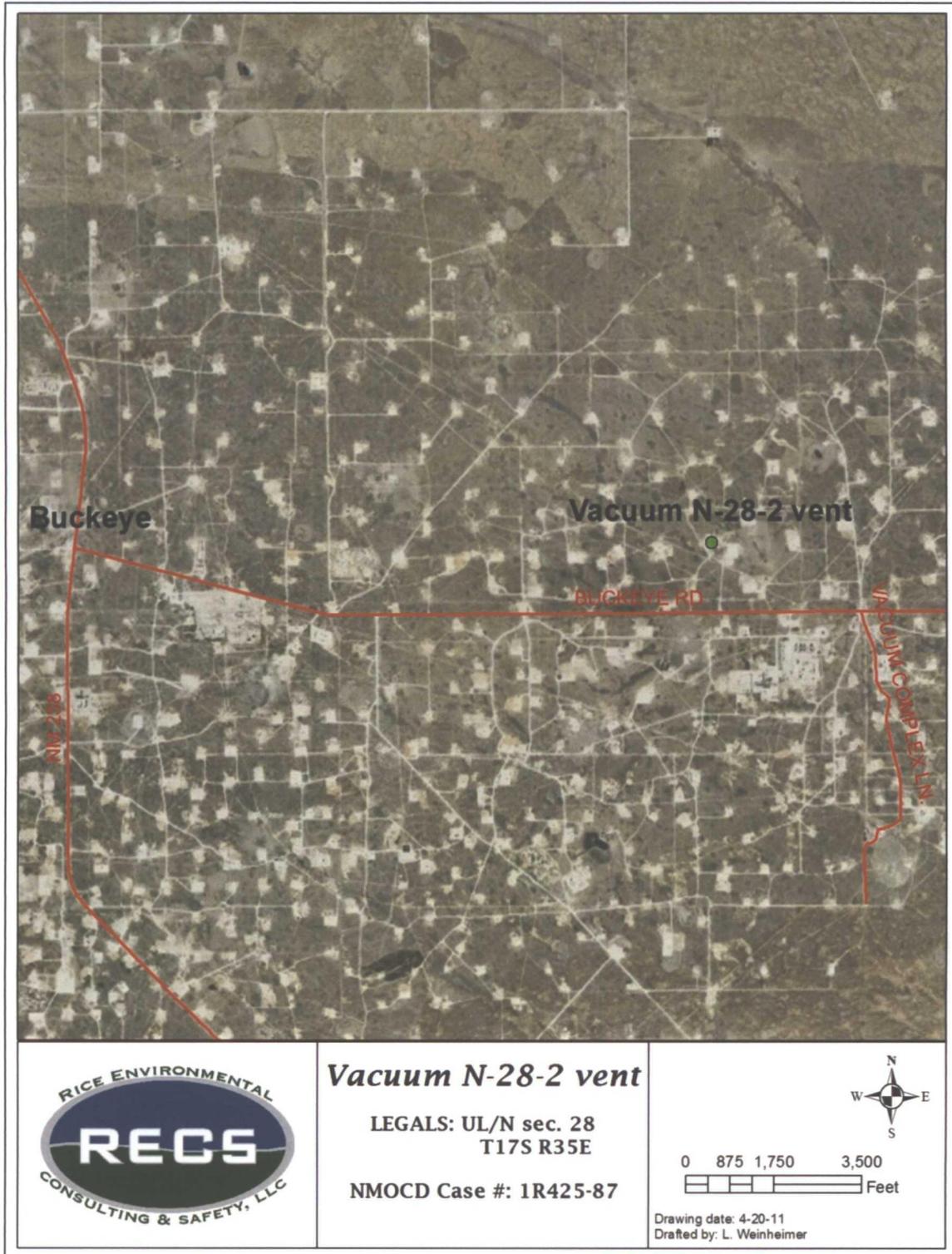


Figure 1 – Vacuum N-28-2 vent location.

### Soil Bore Installation

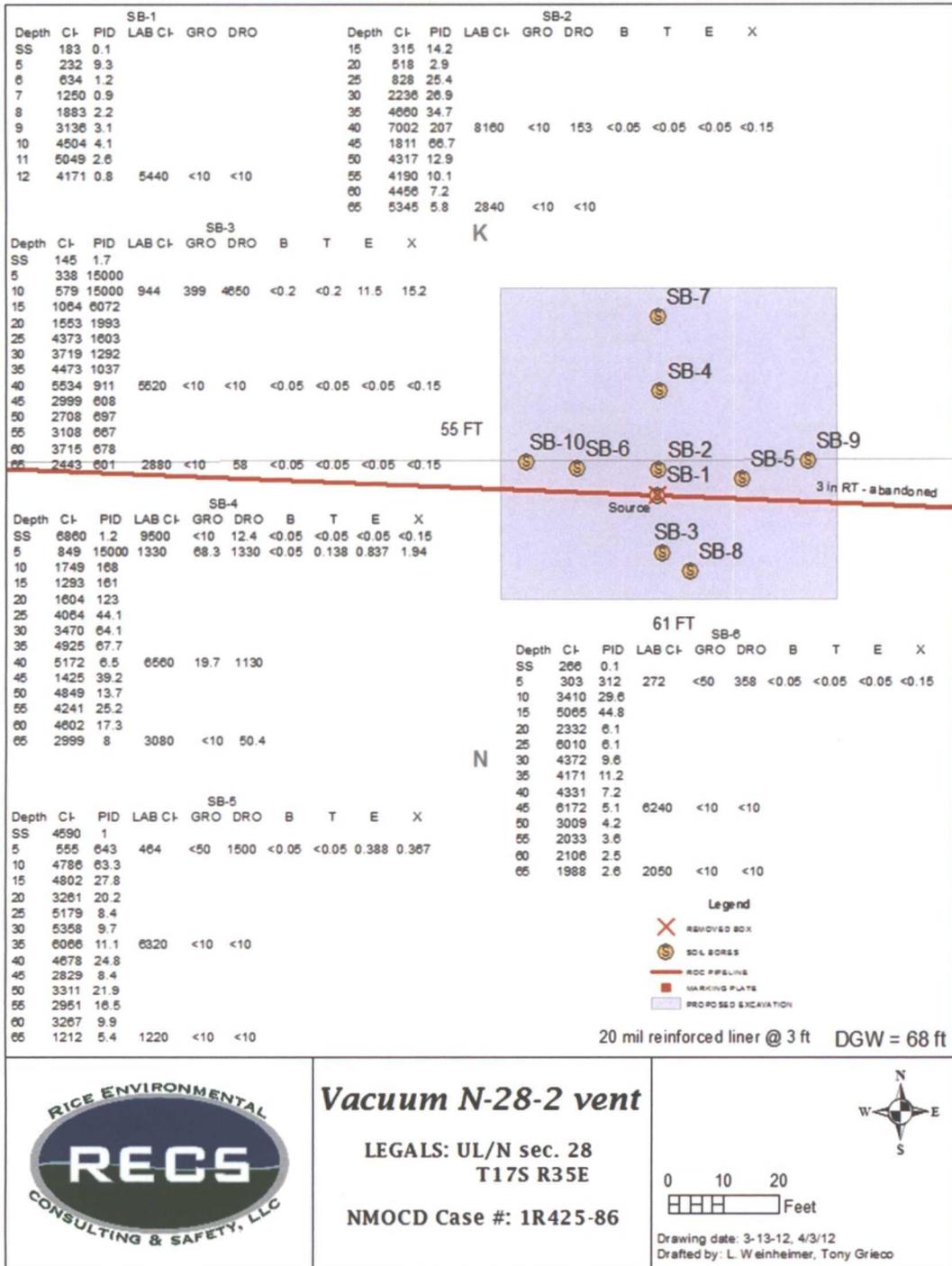
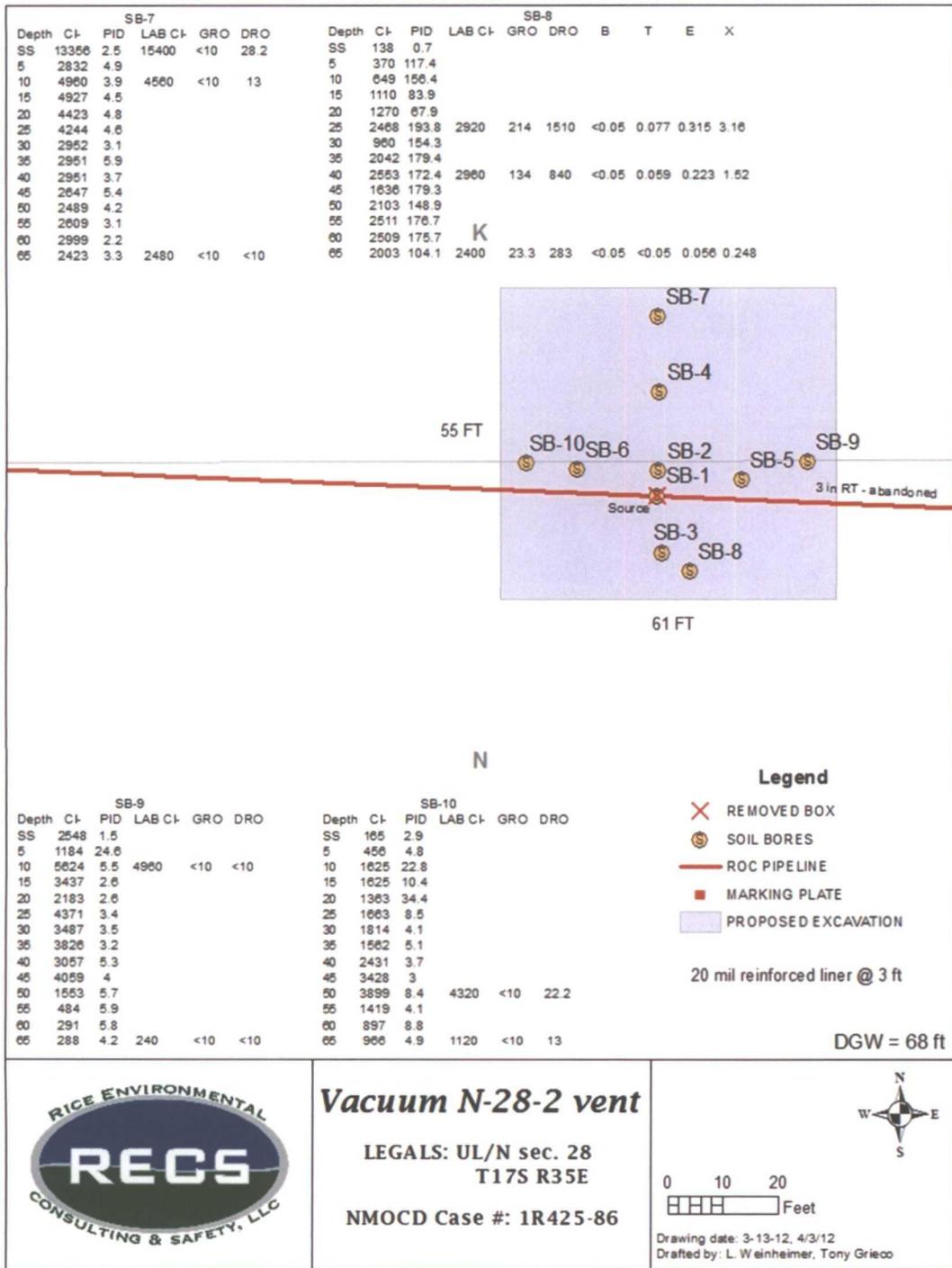


Figure 2a – Summary of soil chloride and petroleum hydrocarbon concentrations from samples taken in June 2011.

# Soil Bore Installation



**Figure 2b** – Summary of soil chloride and petroleum hydrocarbon concentrations from samples taken in March 2012.

2011

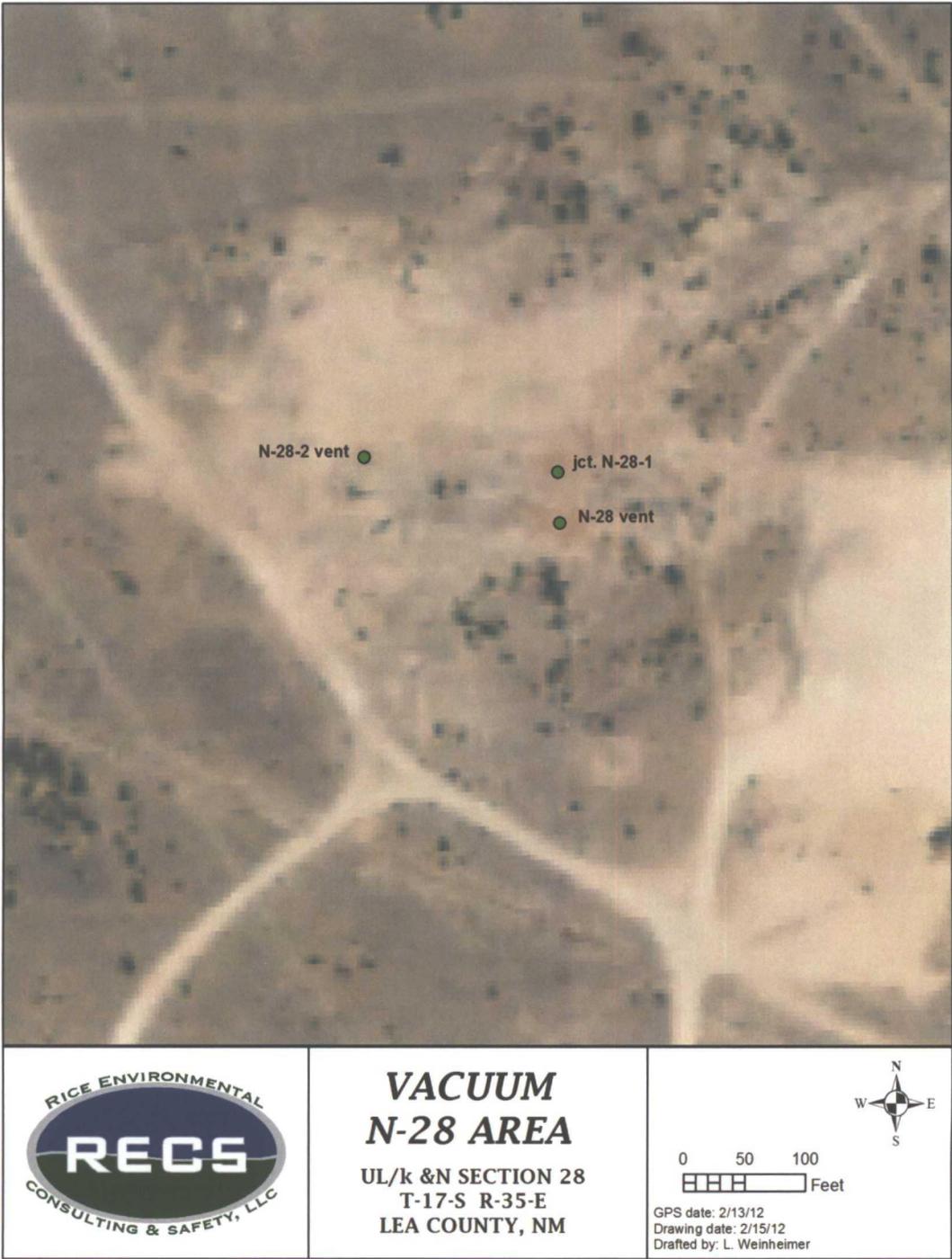


Figure 3 – Aerial of Vacuum N-28-2 vent location in 2011.

2009



Figure 4 – Aerial of Vacuum N-28-2 vent location in 2009.

2005



Figure 5 – Aerial of Vacuum N-28-2 vent location in 2005.

1978

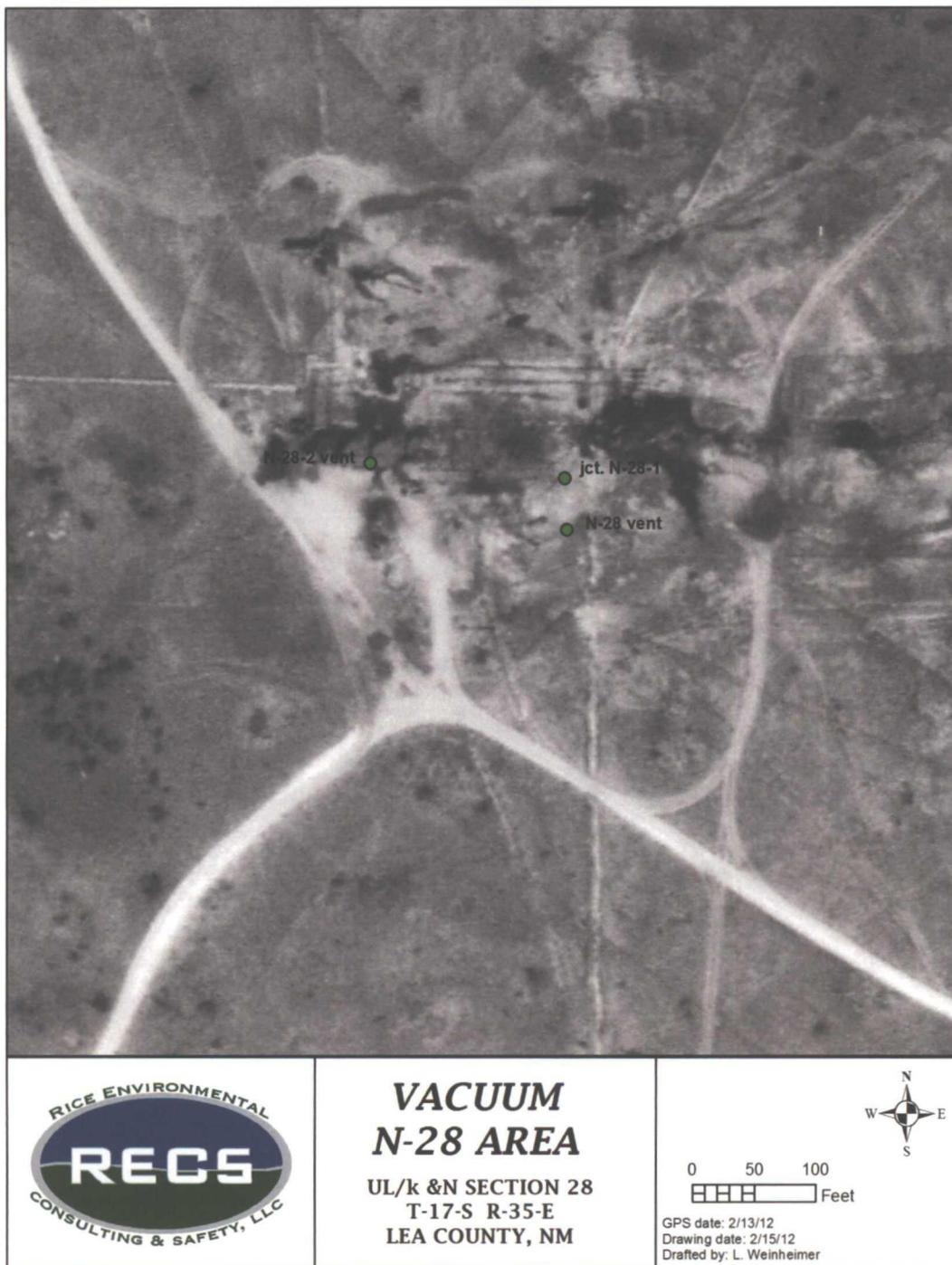


Figure 6 – Aerial of Vacuum N-28-2 vent location in 1978.

1966

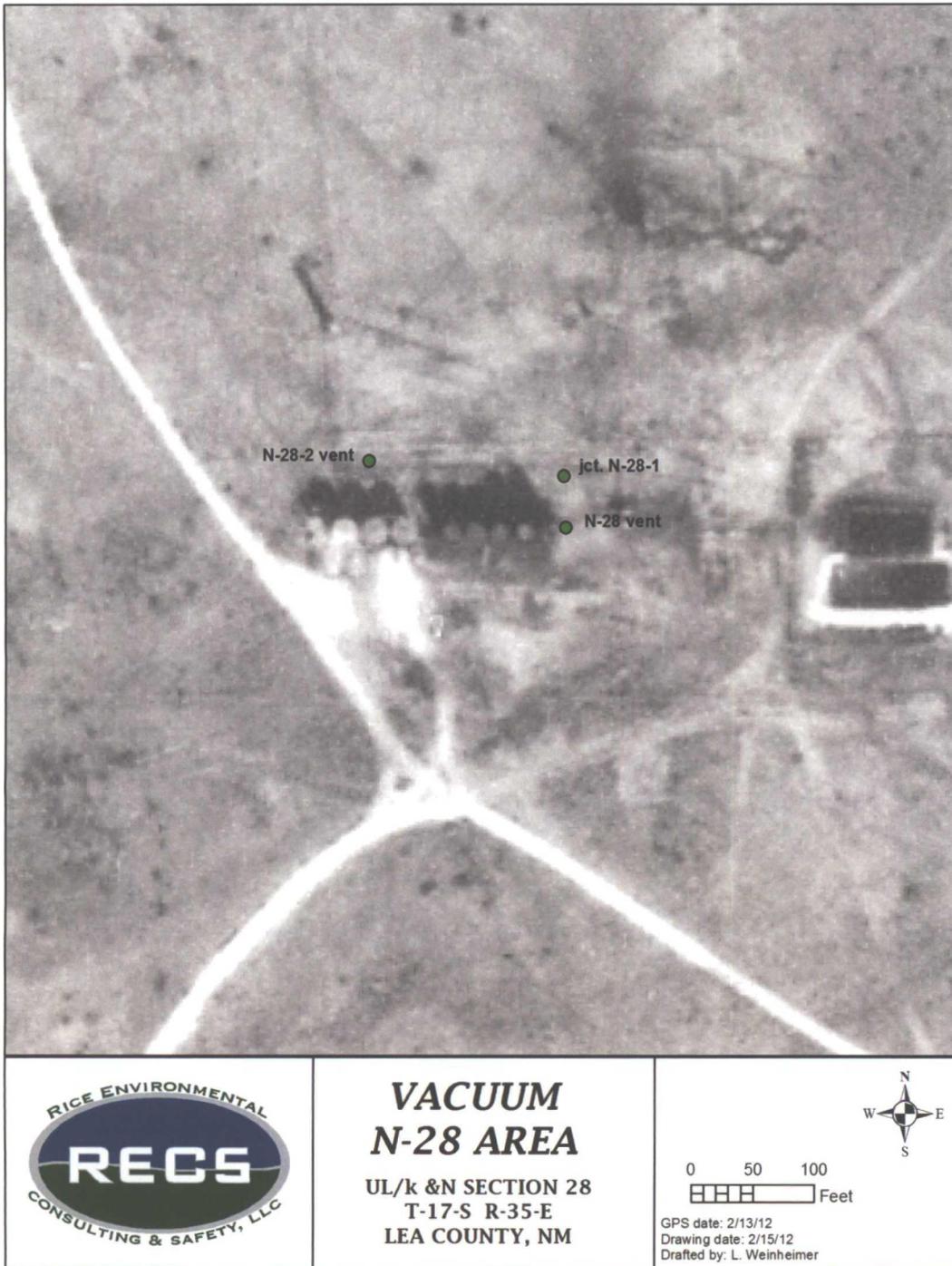


Figure 7 – Aerial of Vacuum N-28-2 vent location in 1966.

1949

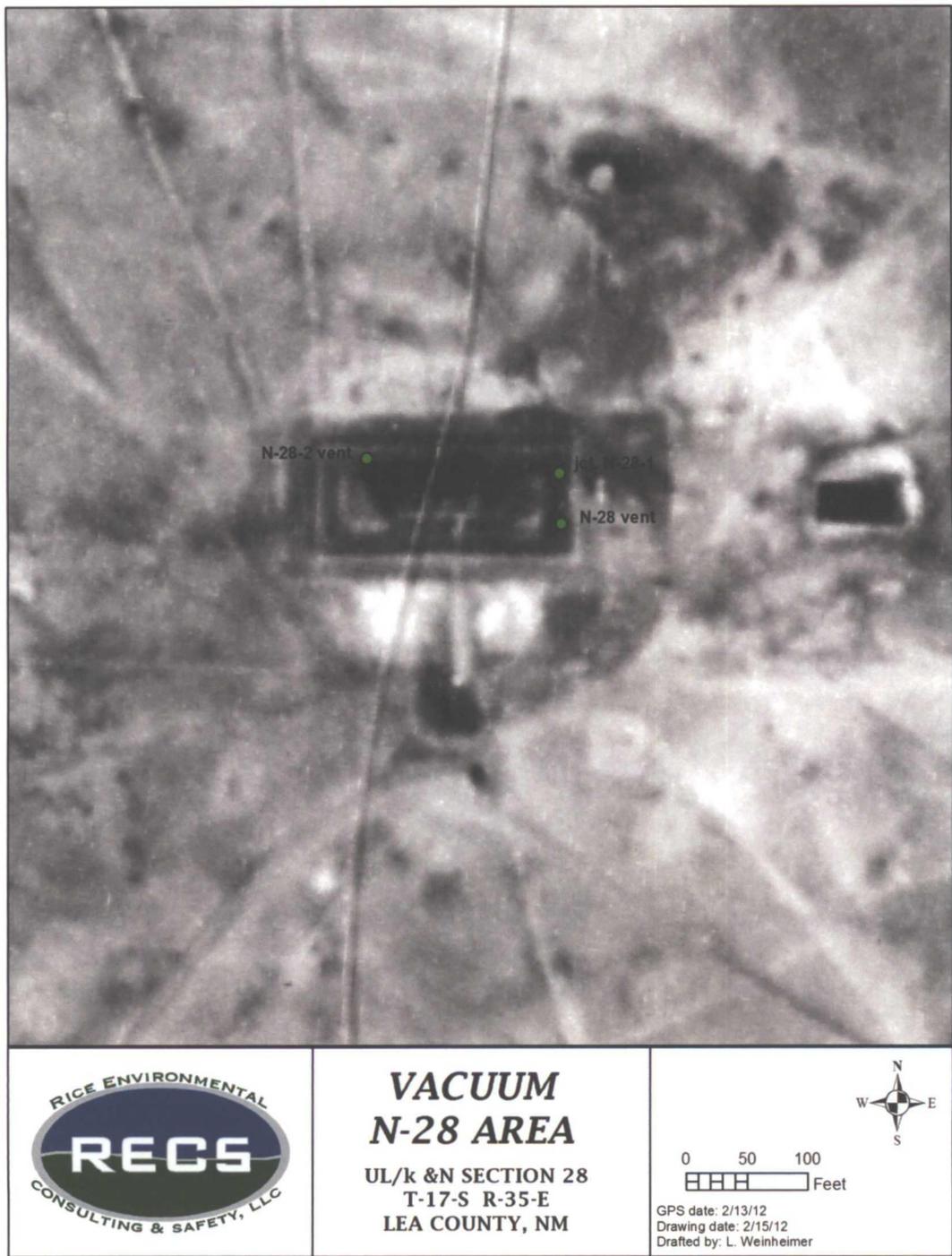


Figure 8 – Aerial of Vacuum N-28-2 vent location in 1949.

# Vacuum N-28-2 Vent

## Appendix – Soil Analysis Laboratory Reports



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

June 20, 2011

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

RE: VACUUM N-28-2 VENT

Enclosed are the results of analyses for samples received by the laboratory on 06/09/11 10:10.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, looped initial "C".

Celey D. Keene  
Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 2 @ 40' (H101194-01)**

BTX 8260B		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/13/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.050	0.050	06/13/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	<0.050	0.050	06/13/2011	ND	2.32	116	2.00	8.13		
Total Xylenes*	<0.150	0.150	06/13/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 100 % 80-120  
 Surrogate: Toluene-d8 104 % 80-120  
 Surrogate: 4-Bromofluorobenzene 114 % 80-120

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	8160	16.0	06/11/2011	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/14/2011	ND	216	108	200	1.49		
DRO >C10-C28	153	10.0	06/14/2011	ND	203	102	200	7.13		

Surrogate: 1-Chlorooctane 123 % 70-130  
 Surrogate: 1-Chlorooctadecane 139 % 70-130

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Vacuum N-28-2 Vent



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**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 2 @ 65' (H101194-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>2840</b>	16.0	06/11/2011	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/14/2011	ND	216	108	200	1.49		
DRO >C10-C28	<10.0	10.0	06/14/2011	ND	203	102	200	7.13		
Surrogate: 1-Chlorooctane	111 %	70-130								
Surrogate: 1-Chlorooctadecane	131 %	70-130								

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager

Vacuum N-28-2 Vent



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**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 3 @ 10' (H101194-03)**

BTEX 8260B		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.200	0.200	06/13/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.200	0.200	06/13/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	11.5	0.200	06/13/2011	ND	2.32	116	2.00	8.13		
<b>Total Xylenes*</b>	<b>15.2</b>	0.600	06/13/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 96.5 % 80-120  
 Surrogate: Toluene-d8 101 % 80-120  
 Surrogate: 4-Bromofluorobenzene 111 % 80-120

Chloride, SM4500C1-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>944</b>	16.0	06/11/2011	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>399</b>	50.0	06/14/2011	ND	216	108	200	1.49		
<b>DRO &gt;C10-C28</b>	<b>4650</b>	50.0	06/14/2011	ND	203	102	200	7.13		

Surrogate: 1-Chlorooctane 123 % 70-130  
 Surrogate: 1-Chlorooctadecane 130 % 70-130

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 3 @ 40' (H101194-04)**

BTEX 82608		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/13/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.050	0.050	06/13/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	<0.050	0.050	06/13/2011	ND	2.32	116	2.00	8.13		
Total Xylenes*	<0.150	0.150	06/13/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 107 % 80-120  
 Surrogate: Toluene-d8 108 % 80-120  
 Surrogate: 4-Bromofluorobenzene 117 % 80-120

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	5520	16.0	06/11/2011	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/14/2011	ND	216	108	200	1.49		
DRO >C10-C28	<10.0	10.0	06/14/2011	ND	203	102	200	7.13		

Surrogate: 1-Chlorooctane 123 % 70-130  
 Surrogate: 1-Chlorooctadecane 143 % 70-130

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 3 @ 65' (H101194-05)**

BTEX 82608		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/13/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.050	0.050	06/13/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	<0.050	0.050	06/13/2011	ND	2.32	116	2.00	8.13		
Total Xylenes*	<0.150	0.150	06/13/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 94.1 % 80-120  
 Surrogate: Toluene-d8 95.1 % 80-120  
 Surrogate: 4-Bromofluorobenzene 104 % 80-120

Chloride, SM4500C1-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2880	16.0	06/11/2011	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/14/2011	ND	216	108	200	1.49		
DRO >C10-C28	58.0	10.0	06/14/2011	ND	203	102	200	7.13		

Surrogate: 1-Chlorooctane 111 % 70-130  
 Surrogate: 1-Chlorooctadecane 127 % 70-130

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager

Vacuum N-28-2 Vent



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**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 4 @ SURFACE SAMPLE (H101194-06)**

BTEX 8260B		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/14/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.050	0.050	06/14/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	<0.050	0.050	06/14/2011	ND	2.32	116	2.00	8.13		
Total Xylenes*	<0.150	0.150	06/14/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 97.4 % 80-120  
 Surrogate: Toluene-d8 102 % 80-120  
 Surrogate: 4-Bromofluorobenzene 110 % 80-120

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	9500	16.0	06/11/2011	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/13/2011	ND	224	112	200	12.3		
DRO >C10-C28	12.4	10.0	06/13/2011	ND	206	103	200	13.9		

Surrogate: 1-Chlorooctane 104 % 70-130  
 Surrogate: 1-Chlorooctadecane 110 % 70-130

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



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**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 4 @ 5' (H101194-07)**

BTEX 8021B		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/20/2011	ND	1.89	94.5	2.00	3.65		
Toluene*	<b>0.138</b>	0.050	06/20/2011	ND	2.00	100	2.00	4.10		
Ethylbenzene*	<b>0.837</b>	0.050	06/20/2011	ND	2.02	101	2.00	3.90		
Total Xylenes*	<b>1.94</b>	0.150	06/20/2011	ND	6.00	100	6.00	4.06		

Surrogate: 4-Bromofluorobenzene (PIL) 106 % 70-130

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<b>1330</b>	16.0	06/11/2011	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<b>68.3</b>	50.0	06/13/2011	ND	142	70.9	200	1.47		
DRO >C10-C28	<b>1330</b>	50.0	06/13/2011	ND	148	73.9	200	3.69		

Surrogate: 1-Chlorooctane 87.0 % 70-130

Surrogate: 1-Chlorooctadecane 78.5 % 70-130

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/20/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 4 @ 65' (H101194-08)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>3080</b>	16.0	06/11/2011	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/13/2011	ND	142	70.9	200	1.47		
<b>DRO &gt;C10-C28</b>	<b>50.4</b>	10.0	06/13/2011	ND	148	73.9	200	3.69		
Surrogate: 1-Chlorooctane	81.5 %	70-130								
Surrogate: 1-Chlorooctadecane	92.3 %	70-130								

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Notes and Definitions**

- Z-01            One or more surrogates above historical limits.
- ND             Analyte NOT DETECTED at or above the reporting limit
- RPD            Relative Percent Difference
- \*\*             Samples not received at proper temperature of 6°C or below.
- \*\*\*            Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
                  Samples reported on an as received basis (wet) unless otherwise noted on report

---

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\*=Accredited Analyte

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A handwritten signature in cursive script that reads "Celey D. Keene".

---

Celey D. Keene, Lab Director/Quality Manager



# Vacuum N-28-2 Vent



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

June 17, 2011

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

RE: VACUUM N-28-2 VENT

Enclosed are the results of analyses for samples received by the laboratory on 06/09/11 10:10.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, prominent "C" and "K".

Celey D. Keene  
Lab Director/Quality Manager

Page 1 of 4



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

**Analytical Results For:**

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

Received:	06/09/2011	Sampling Date:	06/08/2011
Reported:	06/17/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 4 @ 40' (H101195-01)**

Chloride, SM4500Cl-B		mg/kg	Analyzed By: HM							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>6560</b>	16.0	06/11/2011	ND	416	104	400	0.00		
TPH 8015M		mg/kg	Analyzed By: AB							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>GRO C6-C10</b>	<b>19.7</b>	10.0	06/14/2011	ND	216	108	200	1.49		
<b>DRO &gt;C10-C28</b>	<b>1130</b>	10.0	06/14/2011	ND	203	102	200	7.13		
<i>Surrogate: 1-Chlorooctane</i>		<i>128%</i>	<i>70-130</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>139%</i>	<i>70-130</i>							

Cardinal Laboratories

\*=Accredited Analyte

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 client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be 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 the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



**Notes and Definitions**

- Z-01            One or more surrogates above historical limits.
- ND             Analyte NOT DETECTED at or above the reporting limit
- RPD            Relative Percent Difference
- \*\*             Samples not received at proper temperature of 6°C or below.
- \*\*\*            Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
- Samples reported on an as received basis (wet) unless otherwise noted on report

---

Cardinal Laboratories

\*=Accredited Analyte

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A handwritten signature in cursive script that reads "Celey D. Keene".

---

Celey D. Keene, Lab Director/Quality Manager



# Vacuum N-28-2 Vent



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

June 17, 2011

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

RE: VACUUM N-28-2 VENT

Enclosed are the results of analyses for samples received by the laboratory on 06/10/11 16:20.

Cardinal Laboratories is accredited through Texas NELAP for:

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

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

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

A handwritten signature in black ink that reads "Coley D. Keene". The signature is written in a cursive style with a large, prominent "C" at the beginning.

Celey D. Keene  
Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	06/10/2011	Sampling Date:	06/09/2011
Reported:	06/17/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 5 @ 5' (H101214-01)**

BTEX 8260B		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/14/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.050	0.050	06/14/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	<b>0.388</b>	0.050	06/14/2011	ND	2.32	116	2.00	8.13		
Total Xylenes*	<b>0.367</b>	0.150	06/14/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 97.6 % 80-120  
 Surrogate: Toluene-d8 104 % 80-120  
 Surrogate: 4-Bromofluorobenzene 115 % 80-120

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<b>464</b>	16.0	06/15/2011	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<50.0	50.0	06/16/2011	ND	206	103	200	5.32		
DRO >C10-C28	<b>1500</b>	50.0	06/16/2011	ND	187	93.3	200	5.61		

Surrogate: 1-Chlorooctane 91.3 % 70-130  
 Surrogate: 1-Chlorooctadecane 98.8 % 70-130

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	06/10/2011	Sampling Date:	06/09/2011
Reported:	06/17/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 5 @ 35' (H101214-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	6320	16.0	06/15/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/16/2011	ND	206	103	200	5.32		
DRO >C10-C28	<10.0	10.0	06/16/2011	ND	187	93.3	200	5.61		
Surrogate: 1-Chlorooctane		82.5 %	70-130							
Surrogate: 1-Chlorooctadecane		102 %	70-130							

**Sample ID: SB 5 @ 65' (H101214-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1220	16.0	06/15/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/16/2011	ND	206	103	200	5.32		
DRO >C10-C28	<10.0	10.0	06/16/2011	ND	187	93.3	200	5.61		
Surrogate: 1-Chlorooctane		78.0 %	70-130							
Surrogate: 1-Chlorooctadecane		92.2 %	70-130							

Cardinal Laboratories

\*=Accredited Analyte

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	06/10/2011	Sampling Date:	06/09/2011
Reported:	06/17/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 6 @ 5' (H101214-04)**

BTEX 8260B		mg/kg		Analyzed By: CMS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	06/14/2011	ND	2.21	111	2.00	7.93		
Toluene*	<0.050	0.050	06/14/2011	ND	2.24	112	2.00	7.82		
Ethylbenzene*	<0.050	0.050	06/14/2011	ND	2.32	116	2.00	8.13		
Total Xylenes*	<0.150	0.150	06/14/2011	ND	6.54	109	6.00	8.53		

Surrogate: Dibromofluoromethane 101 % 80-120  
 Surrogate: Toluene-d8 105 % 80-120  
 Surrogate: 4-Bromofluorobenzene 112 % 80-120

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	272	16.0	06/15/2011	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<50.0	50.0	06/16/2011	ND	206	103	200	5.32		
DRO >C10-C28	358	50.0	06/16/2011	ND	187	93.3	200	5.61		

Surrogate: 1-Chlorooctane 79.1 % 70-130  
 Surrogate: 1-Chlorooctadecane 76.8 % 70-130

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

# Vacuum N-28-2 Vent



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

### Analytical Results For:

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

Received:	06/10/2011	Sampling Date:	06/09/2011
Reported:	06/17/2011	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

#### Sample ID: SB 6 @ 45' (H101214-05)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	6240	16.0	06/15/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/16/2011	ND	206	103	200	5.32		
DRO >C10-C28	<10.0	10.0	06/16/2011	ND	187	93.3	200	5.61		
Surrogate: 1-Chlorooctane	76.2 %	70-130								
Surrogate: 1-Chlorooctadecane	92.5 %	70-130								

#### Sample ID: SB 6 @ 65' (H101214-06)

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2050	16.0	06/15/2011	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AB						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	06/16/2011	ND	206	103	200	5.32		
DRO >C10-C28	<10.0	10.0	06/16/2011	ND	187	93.3	200	5.61		
Surrogate: 1-Chlorooctane	80.6 %	70-130								
Surrogate: 1-Chlorooctadecane	100 %	70-130								

Cardinal Laboratories

\*=Accredited Analyte

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*Celey D. Keene*

Celey D. Keene, Lab Director/Quality Manager



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

**Notes and Definitions**

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

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Cardinal Laboratories

\*=Accredited Analyte

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A handwritten signature in cursive script that reads "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager



# Vacuum N-28-2 Vent



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

March 06, 2012

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

RE: VACUUM N-28-2 VENT

Enclosed are the results of analyses for samples received by the laboratory on 03/01/12 13:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

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

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

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

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style with a large, prominent initial 'C'.

Celey D. Keene  
Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	03/01/2012	Sampling Date:	03/01/2012
Reported:	03/06/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 7 @ SURFACE (H200548-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>15400</b>	16.0	03/02/2012	ND	432	108	400	0.00		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/03/2012	ND	192	96.2	200	3.12		
<b>DRO &gt;C10-C28</b>	<b>28.2</b>	10.0	03/03/2012	ND	157	78.5	200	2.75		
<i>Surrogate: 1-Chlorooctane</i>		97.0 %	55.5-154							
<i>Surrogate: 1-Chlorooctadecane</i>		98.2 %	57.6-158							

**Sample ID: SB 7 @ 10' (H200548-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>4560</b>	16.0	03/02/2012	ND	416	104	400	0.00		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/05/2012	ND	206	103	200	15.5		
<b>DRO &gt;C10-C28</b>	<b>13.0</b>	10.0	03/05/2012	ND	195	97.3	200	8.29		
<i>Surrogate: 1-Chlorooctane</i>		92.6 %	55.5-154							
<i>Surrogate: 1-Chlorooctadecane</i>		95.6 %	57.6-158							

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

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

Received:	03/01/2012	Sampling Date:	03/01/2012
Reported:	03/06/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 7 @ 65' (H200548-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2480	16.0	03/02/2012	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/05/2012	ND	206	103	200	15.5		
DRO >C10-C28	<10.0	10.0	03/05/2012	ND	195	97.3	200	8.29		

Surrogate: 1-Chlorooctane      107 %      55.5-154  
 Surrogate: 1-Chlorooctadecane      117 %      57.6-158

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- S-HI High surrogate recovery was confirmed as a matrix effect by a second analysis.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager



# Vacuum N-28-2 Vent



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

March 09, 2012

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

RE: VACUUM N-28-2 VENT

Enclosed are the results of analyses for samples received by the laboratory on 03/02/12 12:20.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

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

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

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

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene".

Celey D. Keene  
Lab Director/Quality Manager



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

**Analytical Results For:**

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

Received:	03/02/2012	Sampling Date:	03/02/2012
Reported:	03/09/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 8 @ 25' (H200561-01)**

BTX 8021B		mg/kg		Analyzed By: AP				S-04	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/07/2012	ND	1.88	93.8	2.00	4.76	
Toluene*	<b>0.077</b>	0.050	03/07/2012	ND	2.04	102	2.00	4.10	
Ethylbenzene*	<b>0.315</b>	0.050	03/07/2012	ND	2.09	104	2.00	3.65	
<b>Total Xylenes*</b>	<b>3.16</b>	0.150	03/07/2012	ND	6.54	109	6.00	3.57	

Surrogate: 4-Bromofluorobenzene (PIL) 159 % 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>2920</b>	16.0	03/05/2012	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>214</b>	50.0	03/06/2012	ND	195	97.4	200	24.4	
<b>DRO &gt;C10-C28</b>	<b>1510</b>	50.0	03/06/2012	ND	196	98.2	200	16.7	

Surrogate: 1-Chlorooctane 124 % 55.5-154

Surrogate: 1-Chlorooctadecane 157 % 57.6-158

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**Analytical Results For:**

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

Received:	03/02/2012	Sampling Date:	03/02/2012
Reported:	03/09/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 8 @ 40' (H200561-02)**

BTEX 8021B		mg/kg		Analyzed By: AP				S-04	
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/07/2012	ND	1.88	93.8	2.00	4.76	
Toluene*	0.059	0.050	03/07/2012	ND	2.04	102	2.00	4.10	
Ethylbenzene*	0.223	0.050	03/07/2012	ND	2.09	104	2.00	3.65	
<b>Total Xylenes*</b>	<b>1.52</b>	<b>0.150</b>	<b>03/07/2012</b>	<b>ND</b>	<b>6.54</b>	<b>109</b>	<b>6.00</b>	<b>3.57</b>	

Surrogate: 4-Bromofluorobenzene (PIL) 139 % 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2960	16.0	03/05/2012	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	134	50.0	03/06/2012	ND	195	97.4	200	24.4	
DRO >C10-C28	840	50.0	03/06/2012	ND	196	98.2	200	16.7	

Surrogate: 1-Chlorooctane 114 % 55.5-154

Surrogate: 1-Chlorooctadecane 133 % 57.6-158

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**Analytical Results For:**

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

Received:	03/02/2012	Sampling Date:	03/02/2012
Reported:	03/09/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 8 @ 65' (H200561-03)**

BTEX 8021B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	03/07/2012	ND	1.85	92.4	2.00	13.7	
Toluene*	<0.050	0.050	03/07/2012	ND	2.02	101	2.00	13.5	
Ethylbenzene*	<b>0.056</b>	0.050	03/07/2012	ND	2.07	103	2.00	13.1	
<b>Total Xylenes*</b>	<b>0.248</b>	0.150	03/07/2012	ND	6.52	109	6.00	12.4	

Surrogate: 4-Bromofluorobenzene (PIL) 127 % 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>2400</b>	16.0	03/05/2012	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>GRO C6-C10</b>	<b>23.3</b>	10.0	03/06/2012	ND	195	97.4	200	24.4	
<b>DRO &gt;C10-C28</b>	<b>283</b>	10.0	03/06/2012	ND	196	98.2	200	16.7	

Surrogate: 1-Chlorooctane 103 % 55.5-154

Surrogate: 1-Chlorooctadecane 110 % 57.6-158

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**Analytical Results For:**

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

Received:	03/02/2012	Sampling Date:	03/02/2012
Reported:	03/09/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 9 @ 10' (H200561-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	4960	16.0	03/05/2012	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/07/2012	ND	164	82.1	200	5.85		
DRO >C10-C28	<10.0	10.0	03/07/2012	ND	219	110	200	5.58		

Surrogate: 1-Chlorooctane 91.6 % 55.5-154

Surrogate: 1-Chlorooctadecane 104 % 57.6-158

**Sample ID: SB 9 @ 65' (H200561-05)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	240	16.0	03/05/2012	ND	432	108	400	3.77		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/07/2012	ND	164	82.1	200	5.85		
DRO >C10-C28	<10.0	10.0	03/07/2012	ND	219	110	200	5.58		

Surrogate: 1-Chlorooctane 98.3 % 55.5-154

Surrogate: 1-Chlorooctadecane 107 % 57.6-158

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Celey D. Keene, Lab Director/Quality Manager

Vacuum N-28-2 Vent



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

**Analytical Results For:**

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

Received:	03/02/2012	Sampling Date:	03/02/2012
Reported:	03/09/2012	Sampling Type:	Soil
Project Name:	VACUUM N-28-2 VENT	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 10 @ 50' (H200561-06)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>4320</b>	16.0	03/05/2012	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/08/2012	ND	224	112	200	6.30		
<b>DRO &gt;C10-C28</b>	<b>22.2</b>	10.0	03/08/2012	ND	184	91.8	200	2.48		

Surrogate: 1-Chlorooctane 105 % 55.5-154  
 Surrogate: 1-Chlorooctadecane 110 % 57.6-158

**Sample ID: SB 10 @ 65' (H200561-07)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1120</b>	16.0	03/05/2012	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	03/08/2012	ND	224	112	200	6.30		
<b>DRO &gt;C10-C28</b>	<b>13.0</b>	10.0	03/08/2012	ND	184	91.8	200	2.48		

Surrogate: 1-Chlorooctane 116 % 55.5-154  
 Surrogate: 1-Chlorooctadecane 114 % 57.6-158

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Celey D. Keene, Lab Director/Quality Manager



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**Notes and Definitions**

- S-04            The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- ND             Analyte NOT DETECTED at or above the reporting limit
- RPD            Relative Percent Difference
- \*\*              Samples not received at proper temperature of 6°C or below.
- \*\*\*             Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C
- Samples reported on an as received basis (wet) unless otherwise noted on report

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A handwritten signature in black ink that reads "Celey D. Keene".

---

Celey D. Keene, Lab Director/Quality Manager



## Hansen, Edward J., EMNRD

---

**From:** Laura Pena <lpena@riceswd.com>  
**Sent:** Wednesday, May 09, 2012 11:41 AM  
**To:** Hansen, Edward J., EMNRD  
**Cc:** Hack Conder; Katie Jones; L Peter Galusky Jr  
**Subject:** Vacuum N-28 vent, jct. N-28-1, and N-28-2 vent Plats  
**Attachments:** Vacuum N-28 vent and N-28-1 ALL SB data and Proposed Liner 5-9-12.jpg; Vacuum N-28 vent, N-28-2 vent and N-28-1 OUTSIDE SB DATA 5-9-12.jpg

Mr. Hansen,

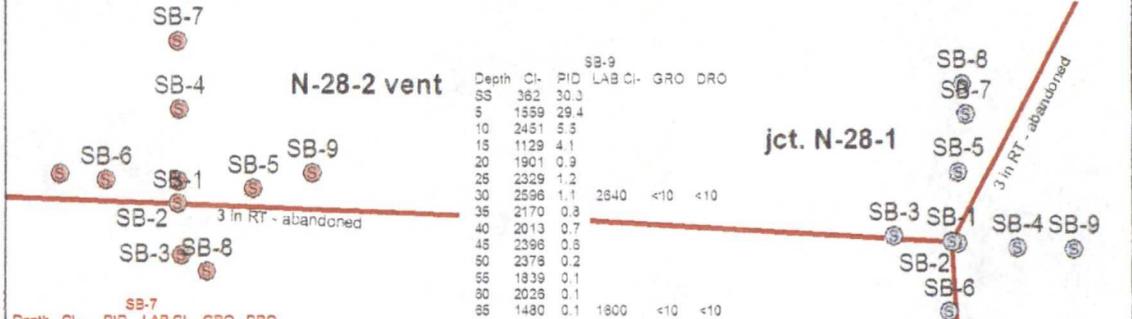
Attach are the plats for Vacuum N-28 vent (1R425-85), Jct. N-28-1 (1R425-87), and N-28-2 vent (1R425-86) as discussed during the May 1, 2012 meeting between NMOCD and Rice Operating Company.

- One plat depicts the relationship of N-28 vent and jct. N-28-1 to each other with soil data and the proposed liner.
- The other plat depicts all 3 sites and the relationships between them with all outside soil data.

If you have any questions or require more information, please do not hesitate to contact Hack Conder at (575) 631-6432.

Thank you,  
Laura Peña

SB-6										SB-3					SB-8							
Depth	Cl-	PID	LAB Cl-	GRO	DRO	B	T	E	X	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	
SS	288	0.1								SS	1023	0					SS	224	0			
5	303	312	272	<50	358	<0.05	<0.05	<0.05	<0.15	5	1835	4.7					5	392	0.2			
10	3410	29.8								10	1864	3.8					10	1315	0.8			
15	5055	44.8								15	3290	2.9	3200	<10	<10	15	2435	0.4				
20	2332	8.1								20	3029	2.8					20	1119	0.8			
25	6010	8.1								25	2442	2.8					25	3049	0.2	3240	<10	<10
30	4372	9.8								30	2417	3.2					30	2420	0.2			
35	4171	11.2								35	1140	0.1					35	1820	0.2			
40	4331	7.2								40	1781	0.2					40	983	0.2			
45	6172	5.1	8240	<10	<10					45	184	0.2					45	421	0.2			
50	3009	4.2								50	182	0.1					50	258	0.2			
55	2033	3.8								55	178	0	84	<10	<10	55	144	0.2	32	<10	<10	
60	2106	2.5																				
65	1988	2.8	2050	<10	<10																	



SB-7						SB-9					SB-8										
Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO				
SS	138	0.7				SS	2548	1.5				SS	344	1.2							
5	370	117.4				5	1184	24.8				5	615	1.1							
10	849	158.4				10	5824	5.5	4980	<10	<10	10	298	0.2							
15	1110	83.9				15	3437	2.8				15	888	0.3							
20	1270	87.9				20	2183	2.8				20	860	0.1							
25	2468	193.8	2920	214	1510	<0.05	0.077	0.315	3.18	25	1434	0.1	1500	<10	<10	25	1434	0.1	1500	<10	<10
30	960	154.3				25	4371	3.4				30	572	0.1							
35	2042	179.4				30	3487	3.5				35	390	0							
40	2553	172.4	2960	134	840	<0.05	0.059	0.223	1.52	35	3823	3.2				40	303	0			
45	1838	178.3				40	3057	5.3				45	538	0							
50	2103	148.9				45	4059	4				50	421	0.1							
55	2511	178.7				50	1553	5.7				55	296	0.4							
60	2509	175.7				55	484	5.9				60	281	0.4							
65	2003	104.1	2400	23.3	283	<0.05	<0.05	0.058	0.248	60	291	5.8				65	211	0.1	180	<10	<10
						65	288	4.2	240	<10	<10										

SB-7						SB-4					SB-5					SB-8											
Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO				
SS	13368	2.5	15400	<10	28.2	SS	173	0.3				SS	990	1.2				SS	170	0.1							
5	2832	4.9				1	1054	0.3				1	1303	0.4				1	180	0.1							
10	4980	3.9	4580	<10	13	2	1083	0.4				2	1520	0.7				2	180	3.2							
15	4927	4.5				3	823	0.4				3	1544	0.8				3	287	218	368	136	1740	<0.05	<0.05	2.41	1.82
20	4423	4.8				4	596	0.1				4	1885	0.1				4	286	74.4							
25	4244	4.6				5	894	0.1				5	3102	0.4				5	288	142							
30	2952	3.1				6	983	0				6	3864	0.2				6	582	102							
35	2951	5.9				7	2973	0				7	4909	1.4	3580	<10	<10	7	2016	95.1	2240	179	2430				
40	2951	3.7				8	5039	0	3680	<10	<10	8	4544	0.6				8	1213	91.1							
45	2847	5.4				9	4312	0				9	2516	0.4				9	1294	87.1							
50	2489	4.2				10	4858	0				10	728	0.2				10	1491	88.7							
55	2809	3.1				11	4848	0				11	715	0.1				11	1738	71.9							
60	2999	2.2				12	2503	0				12	738	0.1				12	1123	88.9							
65	2423	3.3	2480	<10	<10	15	1001	0				15	449	0.1				15	853	107							
						20	884	0				20	615	0				20	1471	8.1							
						25	1723	0				25	795	0				25	681	0.1							
						30	1472	0				30	254	0				30	351	0							
						35	1078	0				35	778	0				35	255	0							
						40	705	0				40	148	0	32	<10	<10	40	148	0	64	<10	<10				
						45	541	0																			
						50	257	0																			
						55	143	0.7	48	<10	<10																

- Legend**
- SOIL BORES
  - VACUUM N-28 VENT
  - VACUUM JCT. N-28-1
  - VACUUM N-28-2 VENT
  - ROC PIPELINES

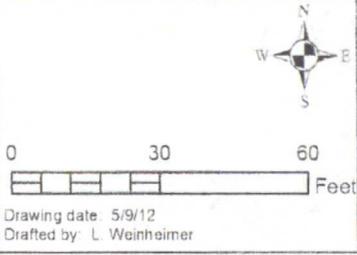


**VACUUM N-28 VENT**  
 NMOCD Case #: 1R425-85

**VACUUM JCT. N-28-1**  
 NMOCD Case #: 1R425-87

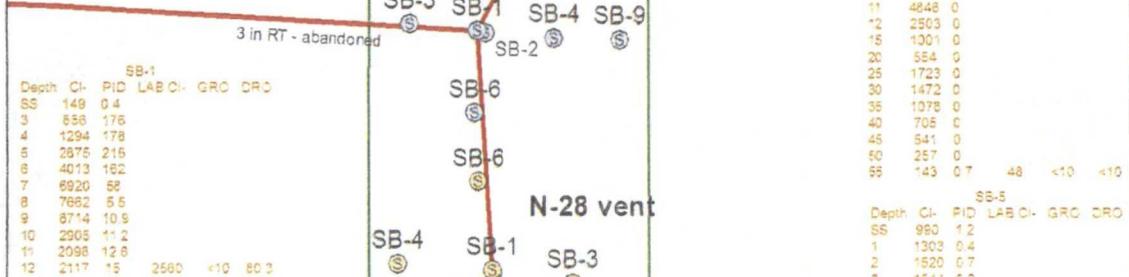
**VACUUM N-28-2 VENT**  
 NMOCD Case #: 1R425-86

LEGALS: UL/N&K sec. 28  
 T-17-S R-35-E



SB-1						SB-2						SB-3						SB-4					
Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	183	0.1				15	4900	11.9	4800	<10	<10	5	1023	0				5	345	0.1			
3	581	120.6				20	1573	2.4				5	1835	4.7				5	385	5.7			
4	888	53.7				25	3822	4.2				10	1864	3.8				10	803	7.7			
5	1908	12.5				30	3458	2.8				15	3290	2.9	3200	<10	<10	15	1388	8.1			
6	5498	3.7				35	3463	2.1				20	3029	2.8				20	1749	3.1			
7	5828	2.9				40	2622	4.7				25	2442	2.8				25	3728	2.7	4000	<10	<10
8	8249	8.1				45	1872	3.9				30	2417	3.2				30	3504	2.1			
9	8224	1.5				50	924	4.1				35	1140	0.1				35	3019	2			
10	8182	1.2				55	770	0.7				40	1781	0.2				40	2259	1.1			
11	7835	0.5				80	895	1.3				45	184	0.2				45	914	2.4			
12	6958	0.7	7400	<10	<10	65	852	1.2	928	<10	<10	50	182	0.1				50	897	4.2			
												55	178	0	84	<10	<10	55	535	0.9			
												60	521	1.3				60	521	1.3			
												65	452	1	432	<10	<10	65	452	1	432	<10	<10

SB-5						SB-6						SB-7						SB-8					
Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	3295	0.2				SS	224	0				SS	1298	0.4				SS	344	1.2			
5	4157	1.2	4560	<10	<10	5	392	0.2				5	2473	0.3	2200	<10	12.3	5	815	1.1			
10	1669	2.2				10	1315	0.8				10	1828	0.3				10	298	0.2			
15	1384	3.2				15	2435	0.4				15	1535	0.2				15	688	0.3			
20	1515	4.9				20	1119	0.6				20	1418	0.1				20	860	0.1			
25	2083	6.7				25	3049	0.2	3240	<10	<10	25	1216	0				25	1434	0.1	1500	<10	<10
30	1559	1.3				30	2420	0.2				30	909	0				30	572	0.1			
35	1251	1.2				35	1820	0.2				35	839	0				35	390	0			
40	1166	1.1				40	983	0.2				40	824	0.7				40	303	0			
45	857	1.1				45	421	0.2				45	681	0.9				45	538	0			
50	728	1				50	256	0.2				50	533	1.4				50	421	0.1			
55	608	0.9				55	144	0.2	32	<10	<10	55	454	1.4				55	296	0.4			
60	517	0.2										60	400	0.4				60	261	0.4			
65	528	0.1	480	<10	<10							65	401	0.8	480	<10	<10	65	211	0.1	180	<10	<10



SB-1						SB-2						SB-3						SB-4						SB-5						SB-6													
Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO								
SS	149	0.4				SS	568	12.9				SS	119	0				SS	170	0.1				SS	980	1.2				SS	170	0.1											
3	656	176				3	867	4.8	980	<10	<10	1	305	0.5				1	180	0.1				1	1302	0.4				1	180	0.1											
4	1294	178				5	395	6.2				2	293	0.4				2	189	0.2				2	1520	0.7				2	189	0.2											
6	2875	215				25	300	2.9				3	281	0.1				3	287	2.9	368	136	1740	<0.05	<0.05	2.41	1.82	3	1544	0.3				3	287	2.9	368	136	1740	<0.05	<0.05	2.41	1.82
6	4013	162				35	255	2.1				4	336	0.1				4	286	7.4				4	1655	0.1				4	286	7.4											
7	6920	52				40	170	2	32	<10	<10	5	596	0				5	288	1.42				5	3102	0.4				5	288	1.42											
8	7682	5.5										6	895	0				6	563	10.2				6	3684	0.2				6	563	10.2											
9	8714	10.9										7	765	0				7	4929	1.4	3580	<10	<10	7	4929	1.4	3580	<10	<10	7	4929	1.4	3580	<10	<10								
10	2905	11.2										8	1151	0	1170	<10	<10	8	4544	0.6				8	4544	0.6				8	4544	0.6											
11	2098	12.6										9	366	0.1				9	2516	0.4				9	2516	0.4				9	2516	0.4											
12	2117	15	2560	<10	80.3							10	728	0.2				10	728	0.2				10	728	0.2				10	728	0.2											

SB-1						SB-2						SB-3						SB-4						SB-5						SB-6					
Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO	Depth	Cl-	PID	LAB Cl-	GRO	DRO
SS	119	0				SS	119	0				SS	119	0				SS	119	0				SS	119	0				SS	119	0			
1	305	0.5				1	305	0.5				1	305	0.5				1	305	0.5				1	305	0.5				1	305	0.5			
2	293	0.4				2	293	0.4				2	293	0.4				2	293	0.4				2	293	0.4				2	293	0.4			
3	281	0.1				3	281	0.1				3	281	0.1				3	281	0.1				3	281	0.1				3	281	0.1			
4	336	0.1				4	336	0.1				4	336	0.1				4	336	0.1				4	336	0.1				4	336	0.1			
5	596	0				5	596	0				5	596	0				5	596	0				5	596	0				5	596	0			
6	895	0				6	895	0				6	895	0				6	895	0				6	895	0				6	895	0			
7	765	0				7	765	0				7	765	0				7	765	0				7	765	0				7	765	0			
8	1151	0	1170	<10	<10	8	1151	0	1170	<10	<10	8	1151	0	1170	<10	<10	8	1151	0	1170	<10	<10	8	1151	0	1170	<10	<10	8	1151	0	1170	<10	<10
9	366	0.1				9	366	0.1				9	366	0.1				9	366	0.1				9	366	0.1				9	366	0.1			
10	732	0				10	732	0				10	732	0				10	732	0				10	732	0				10	732	0			
11	400	0				11	400	0				11	400	0				11	400	0				11	400	0				11	400	0			
12	425	0	224	<10	<10	12	425	0	224	<10	<10	12	425	0	224	<10	<10	12	425	0	224	<10	<10	12	425	0	224	<10	<10	12	425	0	224	<10	<10

## VACUUM N-28 VENT

NMOCD Case #: 1R425-85

## VACUUM JCT. N-28-1

NMOCD Case #: 1R425-87

LEGALS: UL/N&K sec. 28  
T-17-S R-35-E

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Drafted by: L. Weinheimer