1R - 428-53

REPORTS

DATE:

June 15, 2009

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

RECEIVED
2009 JUN 16 PM 1 09

June 15, 2009

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

RE: **Hobbs SWD System P-29 Vent Site: T-18-S, R-38-E, Section 29, Unit P**
NMOCD CASE #: 1R428-53
Termination Request

Dear Mr. Jones:

On behalf of Rice Operating Company (ROC), R.T. Hicks Consultants, Ltd. is submitting this termination request for the Hobbs P-29 Vent regulatory file. The investigation demonstrated that neither chloride nor hydrocarbons are present in the vadose zone in quantities that represent a threat to ground water quality.

Background
The Hobbs SWD P-29 Vent Site is located west of the city of Hobbs at T-18-S, R-38-E, Section 29, in Unit P, and chloride concentrations above background levels were found in soil during vent site abandonment excavations that were conducted in September of 2002. The NMOCD-approved Investigation Characterization Plan (ICP), dated April 4, 2008, is provided as Attachment A to this letter. The ICP includes background information and a site vicinity map for this and six other nearby ROC sites.

Field Program
As a part of the approved ICP, ROC installed and sampled five 8- to 9-foot deep backhoe trenches on June 16, 2008 to delineate the vertical and horizontal extent of chloride in the soil. Attachment B presents a summary map prepared by ROC that includes results of the field chloride analyses and hydrocarbon screening data as well as a laboratory report for the soil samples used to verify the ROC field data. The results of this initial assessment indicate that the highest chloride concentrations (578 to 612 mg/kg) are present at two to five feet below the surface and at a distance of 5 feet from the east and the west of the original excavation. Laboratory results demonstrate that none of the soil samples taken from the deepest point of each excavation exceeded 224 mg/kg chloride. The horizontal extent of the chloride-impacted soil is approximately 400 ft^2.

Field screening of hydrocarbons in the soil were identified at concentrations greater than 100 ppm in center (source area) and north excavations. Readings from the center excavation decreased from 172 ppm at a depth of 5 feet to 5.8 ppm at a depth of 9 feet. PID readings from the north excavation increased

from four to eight feet below the surface to a maximum of 116 ppm. Analysis of BTEX was performed on the deepest sample from each excavation. None of the results exceeded the laboratory detection limits.

Hicks Consultants supervised a deep soil sampling program to delineate the vertical extent of impacted soil. On October 22, 2008, soil boring No. 1 (SB-1) was installed adjacent to the north excavation. Plate 1 shows the location of the soil boring relative to the initial excavation and sampling trenches. Soil samples were collected and field screened by ROC for chloride and hydrocarbons.

Attachment C provides a soil lithology log including the field chloride and hydrocarbon screening data. Attachment D provides the laboratory report and chain of custody for verification of field data.

Results
Data from the 60-foot deep soil boring indicate that the chloride concentrations range from 136 to 518 mg/kg with no particular trend relative to depth that would indicate a specific release. The data is most likely the result of several small releases that may have occurred over the life of P-29 Vent.

The highest soil sample PID reading (12.1 ppm) from SB-1 was below the maximum concentration observed from the adjacent excavation. Since the excavation sample was verified to be below the laboratory detection level, it can be assumed that no regulated hydrocarbons are present in soil at concentrations that represent a threat to fresh water, human health, or the environment.

Simulation Modeling
We used the AMIGO tool (HYDRUS-1D model) to simulate the potential impact to ground water due to chloride transport through the vadose zone. The input to the model employed field data from the site, nearby locations, and conservative input data for parameters that were not measured at or near the site. The results of the simulation indicate that the ground water below the site will not exceed 83 mg/L (below WQCC standards) if no further corrective actions are taken. Attachment E provides a list of the specific parameters used in the simulation at the P-29 site.

Re-Vegetation
Attachment F presents documentation of seeding the site with native plant seeds. On April 28, 2009, ROC prepared the surface and seeded the site with 1.25 lbs. of Lea county Mix, 1.0 lbs. Blue Grama and 4.0 lbs. Heavy Recleaned Race Horse Oats.

Recommendations
Based on the soil boring information, we conclude that this site is in compliance with the mandates of Part 29 such that the remaining chloride-impacted soil

does not and will not endanger public health or the environment. We recommend termination of the regulatory file.

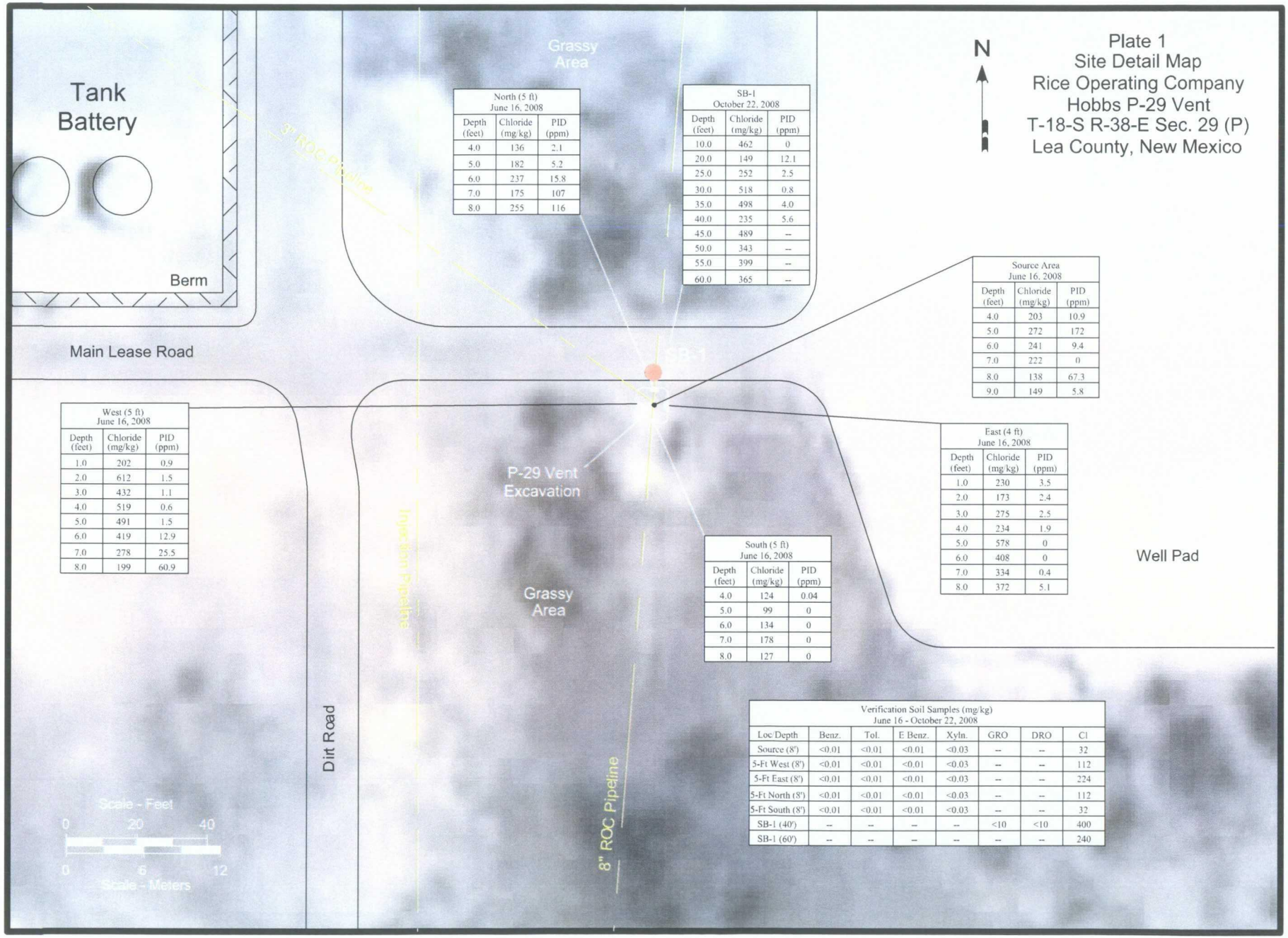
Please contact Hack Conder of ROC at 575-393-9174 if you have any questions concerning this submission. Thank you for your time and consideration.

ROC is the service provider (agent) for the Hobbs Salt Water Disposal System and has no ownership of any portion of pipeline, well or facility. The Hobbs SWD System is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

Sincerely,
R.T Hicks Consultants, Ltd.

Dale T Littlejohn
Geologist

Copy: Hack Conder, ROC
NMOCD Hobbs
Edward J. Hansen, NMOCD Santa Fe



North (5 ft)
June 16, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
4.0	136	2.1
5.0	182	5.2
6.0	237	15.8
7.0	175	107
8.0	255	116

SB-1
October 22, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
10.0	462	0
20.0	149	12.1
25.0	252	2.5
30.0	518	0.8
35.0	498	4.0
40.0	235	5.6
45.0	489	--
50.0	343	--
55.0	399	--
60.0	365	--

Source Area
June 16, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
4.0	203	10.9
5.0	272	172
6.0	241	9.4
7.0	222	0
8.0	138	67.3
9.0	149	5.8

West (5 ft)
June 16, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1.0	202	0.9
2.0	612	1.5
3.0	432	1.1
4.0	519	0.6
5.0	491	1.5
6.0	419	12.9
7.0	278	25.5
8.0	199	60.9

East (4 ft)
June 16, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
1.0	230	3.5
2.0	173	2.4
3.0	275	2.5
4.0	234	1.9
5.0	578	0
6.0	408	0
7.0	334	0.4
8.0	372	5.1

South (5 ft)
June 16, 2008

Depth (feet)	Chloride (mg/kg)	PID (ppm)
4.0	124	0.04
5.0	99	0
6.0	134	0
7.0	178	0
8.0	127	0

Verification Soil Samples (mg/kg)
June 16 - October 22, 2008

Loc/Depth	Benz.	Tol.	E Benz.	Xyln.	GRO	DRO	Cl
Source (8')	<0.01	<0.01	<0.01	<0.03	--	--	32
5-Ft West (8')	<0.01	<0.01	<0.01	<0.03	--	--	112
5-Ft East (8')	<0.01	<0.01	<0.01	<0.03	--	--	224
5-Ft North (8')	<0.01	<0.01	<0.01	<0.03	--	--	112
5-Ft South (8')	<0.01	<0.01	<0.01	<0.03	--	--	32
SB-1 (40')	--	--	--	--	<10	<10	400
SB-1 (60')	--	--	--	--	--	--	240

ATTACHMENT A
Investigation Characterization Plan

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

April 4, 2008

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

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

Dear Mr. Hansen:

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

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

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

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

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

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

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

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

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

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

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

Each site shall have three submissions or a combination of:

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

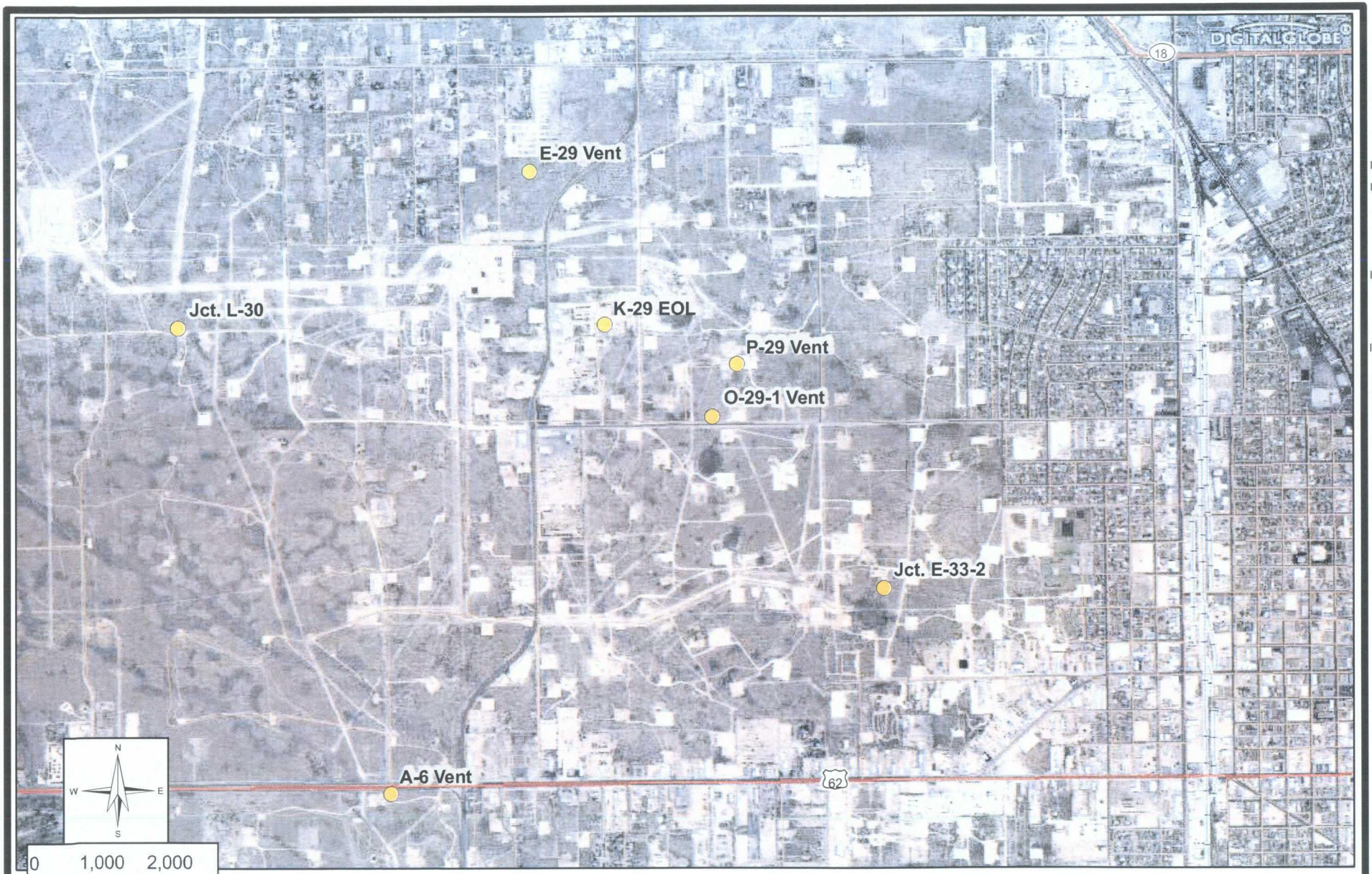
Following the site characterization described above, a Corrective Action Plan with the data and analysis supportive of a procedure for site closure will be submitted. Quality Procedures for characterization work are provided in Appendix A.

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

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Rice Operating Company



Explanation

ICP Site (Hobbs System)

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

3/7/2008

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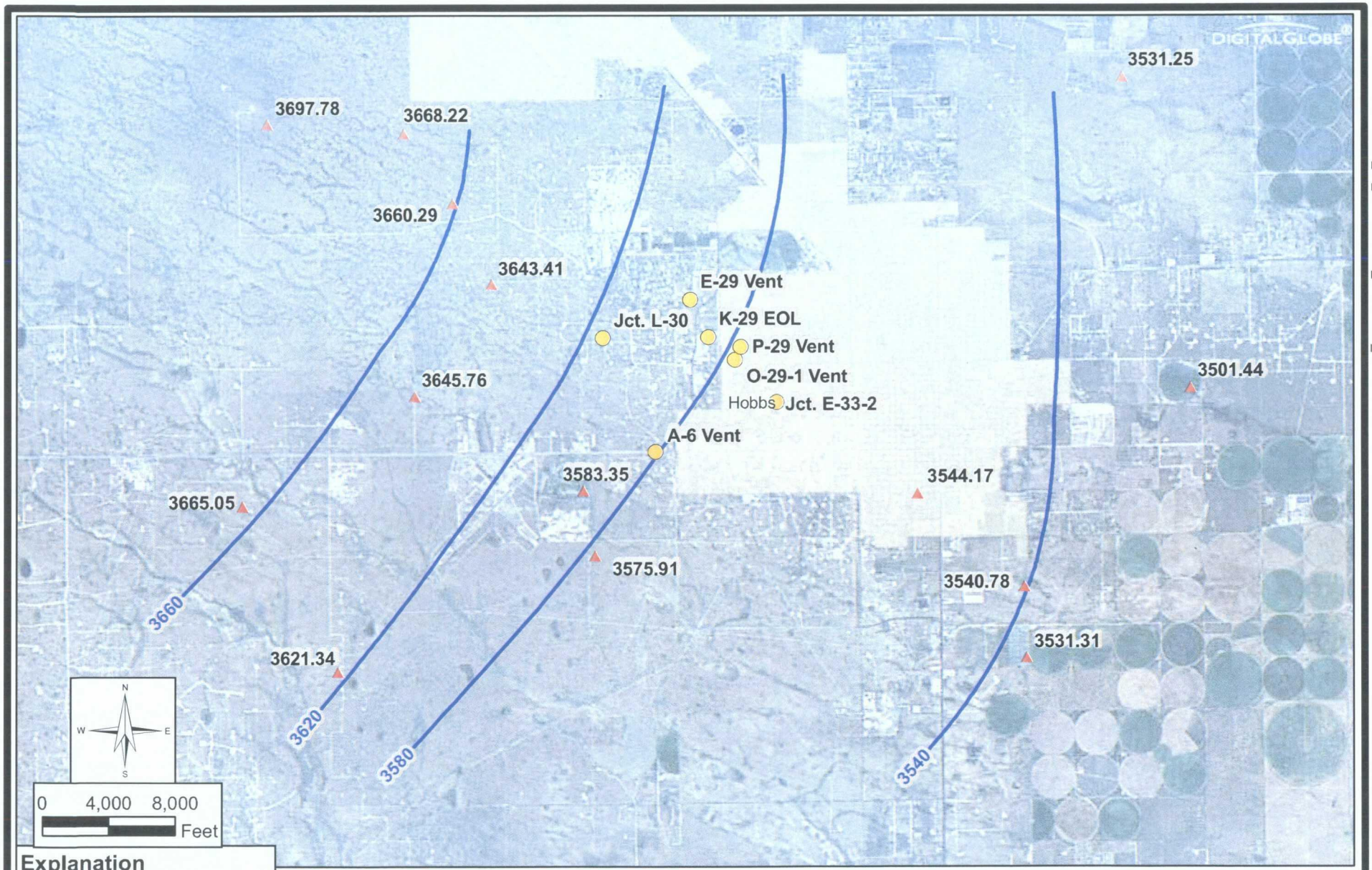


Explanation

- USGS gauging station with ground water elevation (1996)
- ICP Site (Hobbs System)
- Potentiometric Surface (USGS 1996)

R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Regional Potentiometric Surface (USGS 1996) | Plate 2

Rice Operating Company: ICP Hobbs System | April 2008

3/7/2008

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

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

Appendix A

Rice Operating Company

QUALITY PROCEDURE - 03
Sampling and Testing Protocol - Chloride Titration Using .282 Normal Silver Nitrate Solution

1.0 Purpose
This procedure is to be used to determine the concentration of chloride in soil.

2.0 Scope
This procedure is to be used as the standard field measurement for soil chloride concentrations.

3.0 Sample Collection and Preparation

3.1 Collect at least 80 grams of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. Ifnecessary, prepare a composite sanlple for soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.2 The soil sample(s) shall be immediately inserted into a one-quart or large polyethylene freezer bag. Care should be taken to insure that no cross-contamination occurs between the soil sample and the collection tools or sample processing equipment.

3.3 The sealed sample bag should be massaged to break up any clods.

4.0 Sample Preparation

4.1 Tare a clean glass vial having a minimum 40 ml capacity. Add at least 10 grams of the soil sample and record the weight.

4.2 Add at least 10 grams of reverse osmosis water to the soil sample and shake for 20 seconds.

4.3 Allow the sample to set for a period of5 minutes or until the separation of soil and water.

4.4 Carefully pour the free liquid extract from the sample through a paper filter into a clean plastic cup if necessary.

5.0 Titration Procedure

5.1 Using a graduated pipette, remove 10 ml extract and dispense into a clean plastic cup.

5.2 Add 2-3 drops potassium chromate (K_2CrO_4) to mixture.

5.3 If the sample contains any sulfides (hydrogen or iron sulfides are common to oilfield soil samples) add 2-3 drops of hydrogen peroxide (H_2O_2) to mixture.

5.4 Using a 10 ml pipette, carefully add 0.282 normal silver nitrate (one drop at a time) to the sample while constantly agitating it. Stop adding silver nitrate when the solution begins to change from yellow to red. Be consistent with endpoint recognition.

5.5 Record the ml of silver nitrate used.

6.0 Calculation
To obtain the chloride concentration, insert measured data into the following formula:

$$\frac{0.282 \times 35{,}450 \times \text{ml } AgNO_3}{\text{ml water extract}} \times \frac{\text{grams of water in mixture}}{\text{grams of soil in mixture}}$$

Using Step 5.0, determine the chloride concentration of the RO water used to mix with the soil sample. Record this concentration and subtract it from the formula results to find the net chloride in the soil sample.

Record all results on the delineation form.

Appendix A
ICP- A-6 Vent, E-29 Vent, Jct. E-33-2, Jct L-30, K-29 EOL, Jct. O-29-1 Vent, P-29 Vent

Rice Operating Company

QUALITY PROCEDURE -07
Sampling and Testing Protocol for VOC in Soil

1.0 Purpose
This procedure is to be used to determine the concentrations of Volatile Organic Compounds in soils.

2.0 Scope
This procedure is to be used as the standard field measurement for soil VOC concentrations. It is not to be used as a substitute for full spectrographic speciation of organic compounds.

3.0 Procedure

3.1 Sample Collection and Preparation

3.1.1 Collect at least 500 g. of soil from the sample collection point. Take care to insure that the sample is representative of the general background to include visible concentrations of hydrocarbons and soil types. If necessary, prepare a composite sample of soils obtained at several points in the sample area. Take care to insure that no loose vegetation, rocks or liquids are included in the sample(s).

3.1.2 The soil sample(s) shall be immediately inserted into a one-quart or larger polyethylene freezer bag and sealed. When sealed, the bag should contain a nearly equal space between the soil sample and trapped air. Record the sample name and the time that the sample was collected on the Field Analytical Report Form.

3.1.3 The sealed samples shall be allowed to set for a minimum of five minutes at a temperature of between 10-15 Celsius, (59-77° F). The sample temperatures may be adjusted by cooling the sample in ice, or by heating the sample within a generally controlled environment such as the inside of a vehicle. The samples should not be placed directly on heated surfaces or placed in direct heat sources such as lamps or heater vents.

3.1.4 The sealed sample bag should be massaged to break up any clods, and to provide the soil sample with as much exposed surface area as practically possible.

3.2 Sampling Procedure

3.2.1 The instrument to be used in conducting VOC concentration testing shall be an Environmental Instruments 13471 OVM / Datalogger or a similar pro-type instrument. (Device will be identified on VOC Field
Test Report Form.) Prior to use, the instrument shall be zeroed-out in accordance with the appropriate maintenance and calibration procedure outlined in the instrument operation manual. The PID device will be calibrated each day it's used.

3.2.2 Carefully open one end of the collection bag and insert the probe tip into the bag taking care that the probe tip not touch the soil sample or the sidewalls of the bag.

3.2.3 Set the instrument to retain the highest result reading value. Record the reading onto the Field Test Report Form.

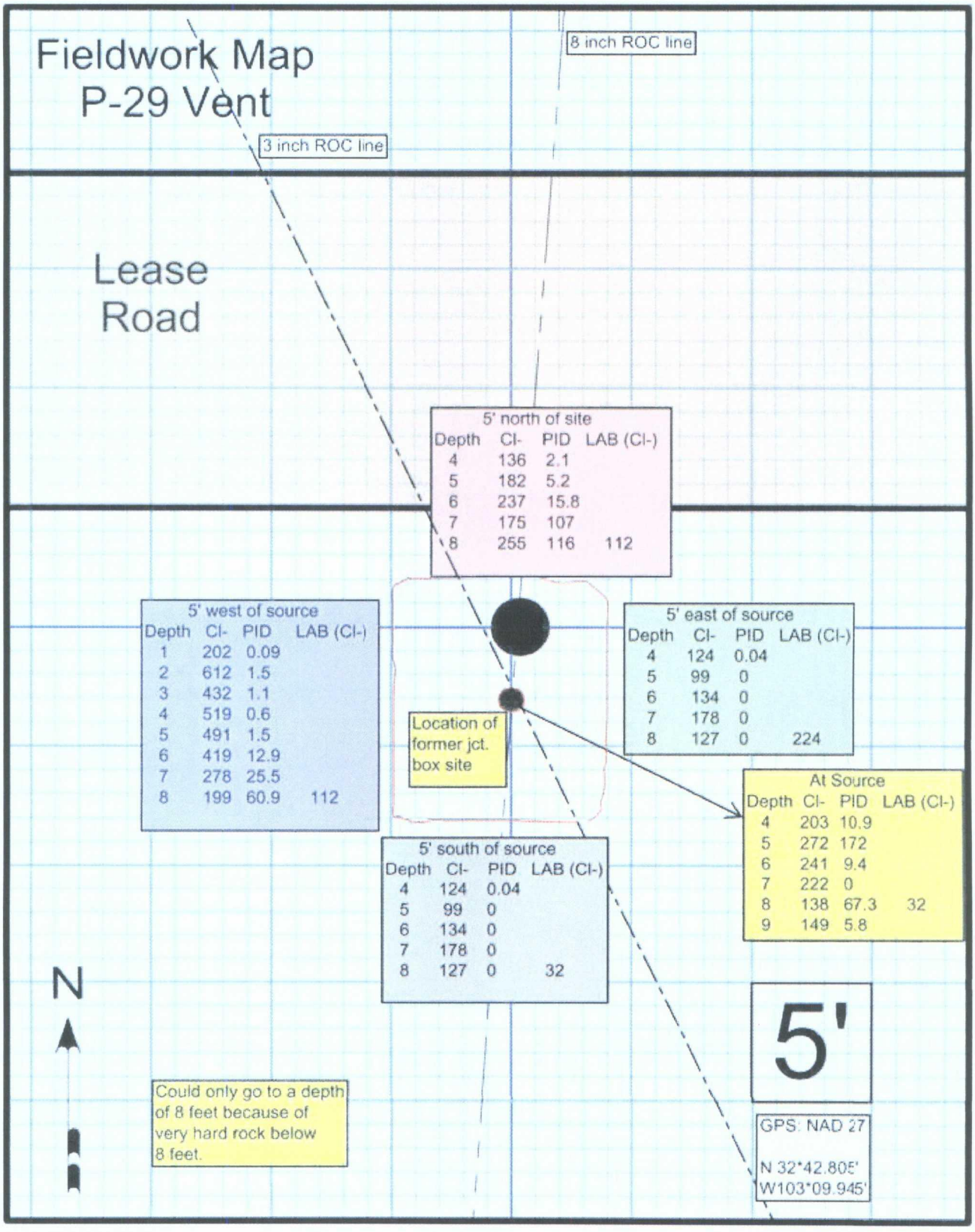
3.2.4 If the instrument provides a reading exceeding 100 ppm, proceed to conduct BTEX Speciation in accordance with QP-O2 and QP-O6. If the reading is 100 ppm or less, NMOCD BTEX guideline has been met and no further testing fur BTEX is necessary. File the Field Test Report Form in the project file.

4.0 Clean-up

After testing, the soil samples shall be returned to the sampling location, and the bags collected for off-site disposal, IN NO CASE SHALL THE SAME BAG BE USED TWICE. EACH SAMPLE CONTAINER MUST BE DISCARDED AFTER EACH USE.

ATTACHMENT B

Summary of Trench Assessment (Horizontal Delineation)
Conducted by ROC in June 2008


Fieldwork Map
P-29 Vent
8 inch ROC line
3 inch ROC line
Lease
Road
5' north of site
Depth Cl- PID LAB (Cl-)
4 136 2.1
5 182 5.2
6 237 15.8
7 175 107
8 255 116 112
5' west of source
Depth Cl- PID LAB (Cl-)
1 202 0.09
2 612 1.5
3 432 1.1
4 519 0.6
5 491 1.5
6 419 12.9
7 278 25.5
8 199 60.9 112
5' east of source
Depth Cl- PID LAB (Cl-)
4 124 0.04
5 99 0
6 134 0
7 178 0
8 127 0 224
Location of former jct. box site
At Source
Depth Cl- PID LAB (Cl-)
4 203 10.9
5 272 172
6 241 9.4
7 222 0
8 138 67.3 32
9 149 5.8
5' south of source
Depth Cl- PID LAB (Cl-)
4 124 0.04
5 99 0
6 134 0
7 178 0
8 127 0 32
N
5'
Could only go to a depth of 8 feet because of very hard rock below 8 feet.
GPS: NAD 27
N 32°42.805'
W103°09.945'

ATTACHMENT C

Lithology Log from Soil Boring (Vertical Delineation)
Conducted by ROC and RTH in October 2008

RT Hicks Consultants Ltd

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

LITHOLOGIC LOG (Soil Boring)

SOIL BORING NO.: SB-1 | TOTAL DEPTH: 60 Feet
SITE ID: Hobbs SWD P-29 | CLIENT: Rice Operating Co.
SURFACE ELEVATION: 3,646 (USGS) | COUNTY: Lea County
CONTRACTOR: Harrison Cooper | STATE: New Mexico
DRILLING METHOD: Air-Rotary | LOCATION: T18-S R38-E 29 (P)
INSTALLATION DATE: 10/22/08 | FIELD REP: D. Littlejohn
WELL PLACEMENT: 3' N of N Trench | FILE NAME: \Hobbs SWD\P-29
BORING LAT /LONG: Lat. 32° 42' 48.7" North, Long. 103° 09' 57.9"

No Surface Completion: Bentonite Hole Plug

No Casing Installed

Lithology	Sample Data: Type	% Rec	Cl (mg/kg)	PID (ppm)	Depth (feet)	Lithologic Description: LITHOLOGY, Color, grain size, sorting, rounding, special features
						SILT Brown with some caliche from road.
	Excav.	--	136	2.1		CALICHE Grayish white, with some light brown silt.
	Excav.	--	182	5.2	5	
	Excav.	--	237	15.8		
	Excav.	--	175	107		
	Excav.	--	255	116		
						SILT Light grayish brown, with some caliche.
	Cutting	--	462	0	10	CALICHE White to grayish white, with some silt, too hard to sample with split spoon.
						SILT & CALICHE Grayish brown, slight hydrocarbon odor.
					15	
						SILT Light grayish white, with interbedded caliche.
	Cutting	--	149	12.1	20	QUARTZITE & SANDSTONE Grayish brown, fine crystilline, very hard, with interbedded soft grayish white sandy silt.
	Cutting	--	252	2.5	25	
	Spoon	15%	518	0.8	30	SAND Light brown, fine grain, well sorted, sub-rounded, with some thin bedded sandstone.
	Spoon	20%	498	4.0	35	
	Spoon	10%	235	5.6	40	SAND Light brown, fine to medium grain, poorly sorted, angular.
	Cutting	--	489	--	45	SAND Light brown, fine grain, medium sorted, angular.
	Cutting	--	343	--	50	
	Cutting	--	399	--	55	
	Cutting	--	365	--	60	

TD = 60 Feet

Laboratory Results (10-22-08)

Depth (feet)	Chloride (mg/kg)	GRO (mg/kg)	DRO (mg/kg)
40	400	<10	<10
60	240	--	--

ATTACHMENT D

Laboratory Reports and Chain-of-Custody Documentation

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: LARA WEINHEIMER
122 WEST TAYLOR
HOBBS, NM 88240

Receiving Date: 10/22/08
Reporting Date: 10/23/08
Project Number: NOT GIVEN
Project Name: HOBBS P-29 VENT
Project Location: HOBBS P-29 VENT

Analysis Date: 10/23/08
Sampling Date: 10/22/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: HM

LAB NO.	SAMPLE ID	Cl⁻ (mg/kg)
H16169-1	SB #1 @ 40'	400
H16169-2	SB #1 @ 60'	240
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods	4500-ClB

Note: Analyses performed on 1:4 w:v aqueous extracts.

Chemist

10-24-08
Date

H16169 RICE

CARDINAL LABORATORIES

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

ANALYTICAL RESULTS FOR
RICE OPERATING COMPANY
ATTN: LAURA WEINHEIMER
122 W. TAYLOR
HOBBS, NM 88240

Receiving Date: 10/22/08
Reporting Date: 10/23/08
Project Number: NOT GIVEN
Project Name: HOBBS P-29 VENT
Project Location: HOBBS P-29 VENT

Sampling Date: 10/22/08
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: ML
Analyzed By: AB

LAB NUMBER	SAMPLE ID	GRO (C_6-C_{10}) (mg/kg)	DRO (>C_{10}-C_{28}) (mg/kg)
ANALYSIS DATE		10/23/08	10/23/08
H16169-1	SB#1 @ 40'	<10.0	<10.0
Quality Control		590	511
True Value QC		500	500
% Recovery		118	102
Relative Percent Difference		1.4	0.5

METHODS: TPH GRO & DRO: EPA SW-846 8015 M

Chemist

10/24/08
Date

H16169 T. RICE

CARDINAL LABORATORIES

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: Roc
Project Manager:
Address: 122 W. Taylor
City: Hobbs State: NM Zip: 88240
Phone #: 575-393-9174 Fax #:
Project #: Project Owner:
Project Name: Hobbs P-29 vent
Project Location: Hobbs P-29 vent
Sampler Name: Lara Weinheimer

BILL TO

P.O. #:
Company:
Attn:
Address:
City:
State: Zip:
Phone #:
Fax #:

Lab I.D. (FOR LAB USE ONLY)	Sample I.D.	(G)RAB OR (C)OMP	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	ACID/BASE	ICE / COOL	OTHER	DATE	TIME	Chlorides	TPH 8015 M
H16169-1	SB #1 @ 40'	G	1			✓					✓		10-22-08	9:23	✓	✓
-2	SB #1 @ 60'	G	1			✓					✓		10-22-08	10:16	✓	

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

Relinquished By: [signature] Date: 10-22-08 Time: 3:45 Received By: [signature]
Relinquished By: Date: Time: Received By:

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

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

CHECKED BY: (Initials) [initials]

Phone Result: ☐ Yes ☑ No Add'l Phone #:
Fax Result: ☐ Yes ☑ No Add'l Fax #:
REMARKS: email results to
Hcowder @ ricesud.com
Jpurvis @ ricesud.com
Lweinheimer @ ricesud.com

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

ATTACHMENT E

Summary Description of the AMIGO Vadose Zone Screening Model and Site Simulation Results

R. T. HICKS CONSULTANTS, LTD. ATTACHMENT E

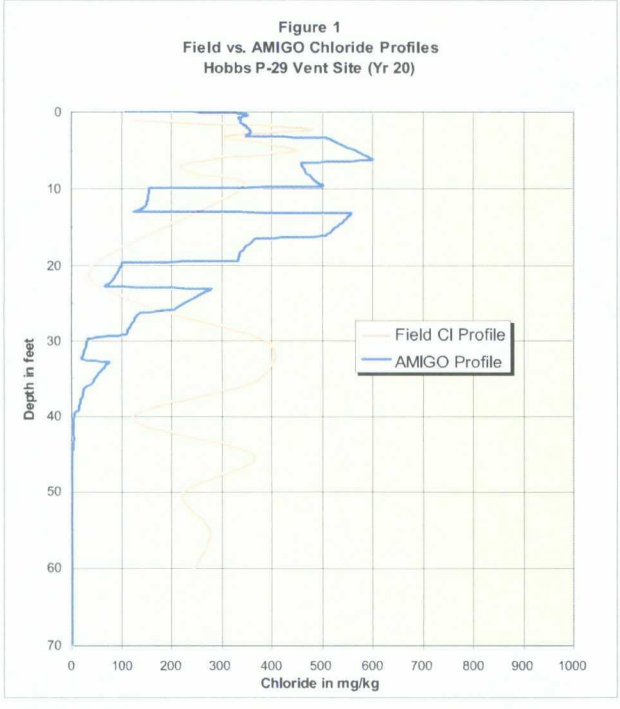
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266.0745

Input and Results of the AMIGO Simulation Performed at the Rice Operating Company Hobbs P-29 Site

The specific parameters used in the simulation at the P-29 site are presented in the table below.

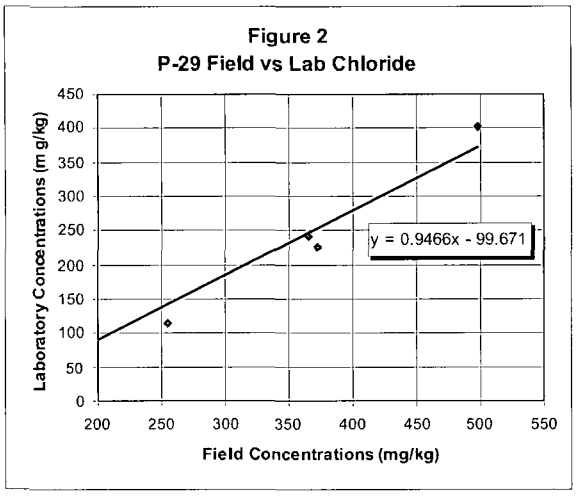
Table 1 - Parameters Employed in AMIGO tool for P-29

Model Parameter	Value	Source of Value
Climate (non-smoothed)	1946 - 1992	Pearl, NM Station
Input for distant or hypothetical well (ft)	NA	Not Required
Background Chloride in Aquifer (mg/L)	80	NM WAIDS, PTTC
Aquifer Porosity (unitless)	0.25	Sample Description
Groundwater Table Depth (ft)	60	Site Borings, F-29 Site
Aquifer Thickness (ft)	30	Professional Judgment Conservative Assumption
Slope of Water Table	0.0035	2007 ROC Water Table Data Section 29
Hydraulic Conductivity (ft/d)	80	Musharrafieh 1999
Average Chloride Load (kg/m^2)	5.1	Calc. from Site Data using Mass-load (x3)
Max length of spill in dir. of GW flow (ft)	20	Site Data
Plant Uptake Trigger (%)	1.0	Prof. Judgment Conservative Assumption
Surface Layer	Caliche	Site Data
Soil Profile (sandy clay:caliche:sand ratio)	1:1:1	Boring Log



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

The AMIGO tool assumes a single surface spill is the initial source of chloride that is observed in the subsurface. In order to ensure an accurate calibration of the model to the historic spill which occurred at the Hobbs P-29 site, we compared each year of the simulated profile with the field data until a conservative match was achieved. A favorable but conservative match to the field data was



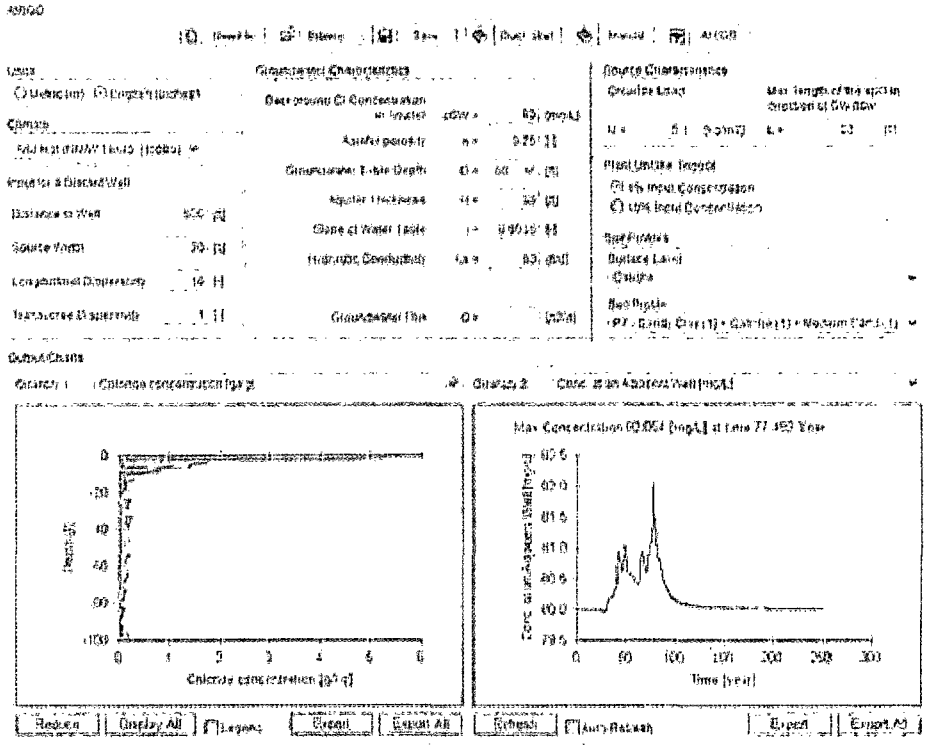
achieved using the year 20 simulation and multiplying the calculated chloride mass-load by 3 as demonstrated in Figure 1.

The red curve on Figure 1 is the profile using the maximum field chloride analysis for each depth sampled from the trenches (1 to 8 feet) and SB-1 (below 10 feet). The field (titration) concentrations were then adjusted based on a correction determined by comparing the field chloride concentrations with the duplicate laboratory sample concentrations as shown in Figure 2.

The blue curve in Figure 1 is the predicted chloride profile at year 20 of the simulation using a chloride load of 5.1 kg/m^2 (calculated from site data). Because the AMIGO simulation predicts higher chloride concentrations than documented by field data, this use of 5.1 kg/m^2 is a conservative input parameter.

The results of the simulation are shown below on the AMIGO ground water output chart which has been copied directly from the model results screen. It indicates that the ground water below the site will not exceed 83 mg/L (below WQCC standards) if no further corrective actions are taken. We believe the simulated concentration in ground water is a "worst-case" prediction because of the conservative input parameters used in the model.

Figure 3
AMIGO ground water output chart for P-29 Vent Site



ATTACHMENT F

Photo-Documentation of Site Re-Seeding Activities

HOBBS P-29 VENT

(1.25 lbs Lea County Mix + 1.0 lbs Blue Grama + 4.0 lbs Oats)

IMPORTING AND SPREADING SOIL

SEEDING

Hansen, Edward J., EMNRD

From: Hack Conder [hconder@riceswd.com]
Sent: Monday, September 21, 2009 3:00 PM
To: Hansen, Edward J., EMNRD
Subject: FW: P&A and Soil Bores Backfilled.

Ed,

Our company policy for plugging and abandoning of wells and soil bores for ROC for the past several years is as follows, all monitor wells and soil bores were plugged with bentonite chips and water to the surface.

Thanks

Hack Conder
Enviromental Manager
Rice Operating Company
575-393-9174
fax 575-397-1471