



PO Box 2948 | Hobbs, NM 88241 | Phone 575.393.2967

June 14, 2018

Bradford Billings

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

**RE: Investigation and Characterization Plan (ICP)
Rice Operating Company – BD SWD System
BD C-28 EOL (Pogo Manda EOL) (1R426-219): UL/C, Sec. 28, T22S, R37E**

Mr. Billings:

RICE Operating Company (ROC) has retained Basin Environmental Service Technologies (BEST) to address potential environmental concerns at the above-referenced site in the BD Salt Water Disposal (SWD) system.

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

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

- Protects public health,
- Provides the greatest net environmental benefit,
- Complies with NMOCD Rules, and
- Is supported by good science.

Each site shall generally have three submissions:

1. This Investigation and Characterization Plan (ICP) is proposed for gathering data and site characterization and assessment.
2. Upon evaluating the data and results from the ICP, a recommended remedy will be submitted in a Corrective Action Plan (CAP), if warranted.
3. Finally, after implementing the remedy, a Termination Request with final documentation will be submitted.

Background and Previous Work

The site is located approximately 4.5 miles southeast of Eunice, New Mexico at UL/C, Sec. 28, T22S, R37E as shown on the Geographical Location Map and the Area Map. NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 65 feet below ground surface (bgs). A junction box disclosure report (Appendix) was submitted to NMOCD with all the 2008 junction box closures and disclosures.

In 2007, ROC initiated work on the former C-28 EOL junction box. The site was delineated using a backhoe to form a 30 ft x 30 ft x 12 ft deep excavation and soil samples were screened at regular intervals for hydrocarbons and chlorides. From the excavation, a 4-wall composite sample and a bottom composite sample and a remediated soils sample were sent to a commercial laboratory for analysis. The 4-wall composite returned a chloride reading of 1,220 mg/kg and a Gasoline Range Organics (GRO) reading non-detect and a Diesel Range Organics (DRO) reading of non-detect. The bottom composite sample returned a chloride reading of 1,180 mg/kg, a GRO reading of non-detect and a DRO reading of non-detect. The excavated soil was blended on site and a representative sample was sent to a commercial laboratory for analysis. The sample returned a chloride reading of 976 mg/kg, a GRO reading of non-detect and a DRO reading of non-detect. The excavation was backfilled with blended soils (36 cubic feet was disposed of at an OCD-approved facility), then a one-foot compacted clay liner was installed at 6 feet bgs and the remainder of the excavation was backfilled with the blended soil. Imported clean soils were used to top the excavation and contoured to the surrounding area. A new water-tight junction box was installed 100 feet south of the site.

ROC proposes additional investigative work at the site to determine if there is potential for groundwater degradation from residual constituents at the site.

Proposed Work Elements

1. Conduct vertical and lateral delineation of residual chlorides and hydrocarbons from samples taken using a drill rig, hand augur and/or backhoe.
 - a. Vertical sampling will be conducted until the following criteria are met in the field.
 - i. Three samples in which the chloride concentration decreases, and the third sample has a chloride concentration of ≤ 600 ppm; and,
 - ii. Three samples in which PID readings decrease and the third sample has a PID reading of ≤ 100 ppm; or,
 - iii. The sampling reaches the capillary fringe.
 - b. Lateral sampling will be conducted until the following criteria are met in the field.
 - i. A decrease is observed in chloride concentrations between lateral bores at similar depths; and,

June 14, 2018

- ii. A chloride concentration of ≤ 600 ppm is observed in a lateral surface sample; or,
 - iii. Safety concerns impede further lateral delineation
- 2. If warranted, install a monitor well to provide direct measurement of the potential groundwater impact at the site. (All monitor wells will be installed by EPA, NMOCD, and industry standards.)
- 3. Evaluate the risk of groundwater impact based on the information obtained.

If the evaluation of the site shows no threat to groundwater from residual constituents, then only a vadose zone remedy will be undertaken. However, if groundwater shows impact from residual chlorides, a CAP will be developed to address these concerns.

Please contact me at (505) 920-4965 or Katie Jones Davis at (575) 393-9174 if you have any questions or wish to discuss this site. Thank you for your time and consideration.

Sincerely,



Edward J. Hansen
Senior Hydrologist
BEST

enclosures

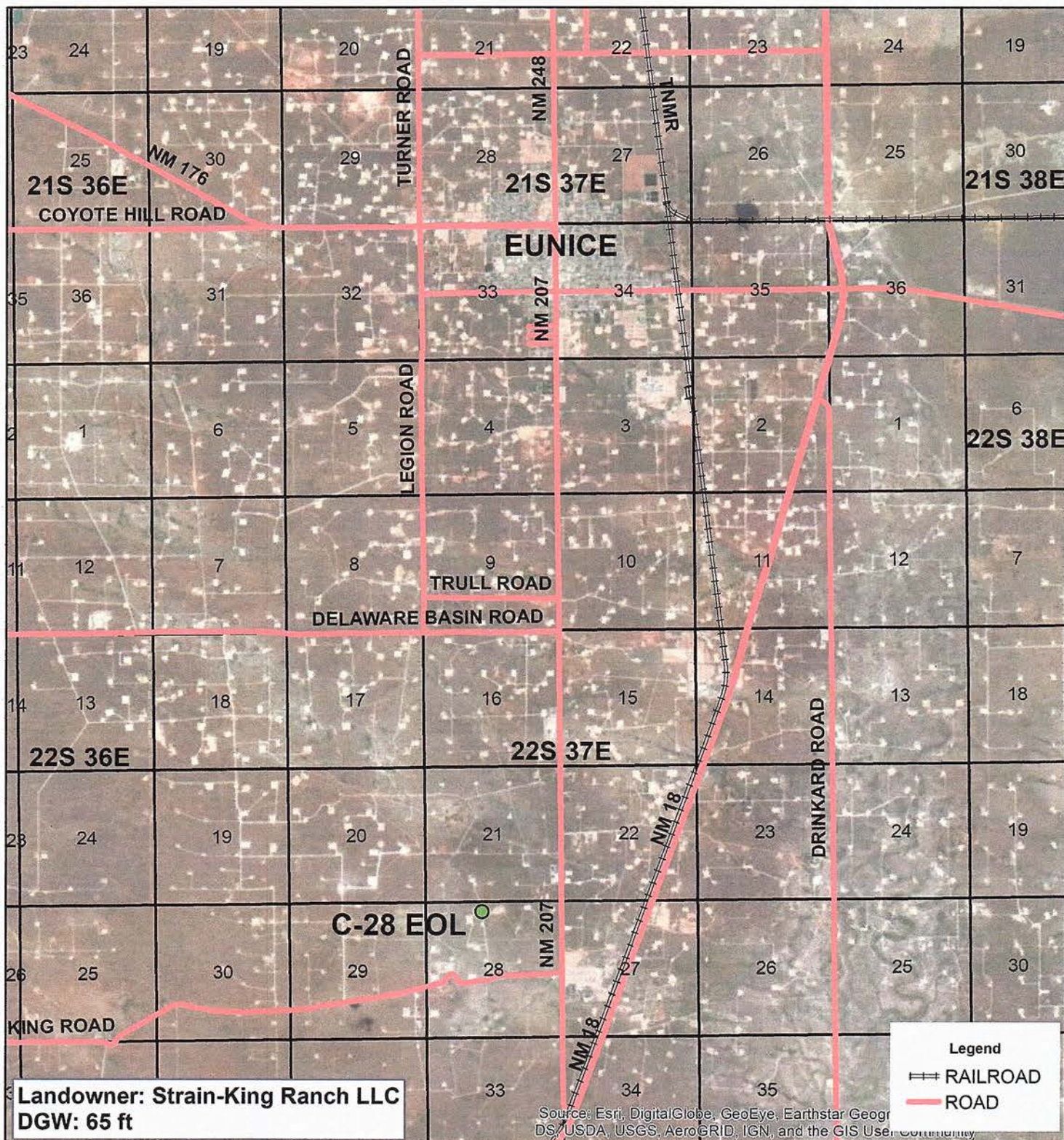
Figures

Basin Environmental Service Technologies (BEST)

P.O. Box 2948, Hobbs, NM 88241

Phone: 575-393-2967

Geographic Location



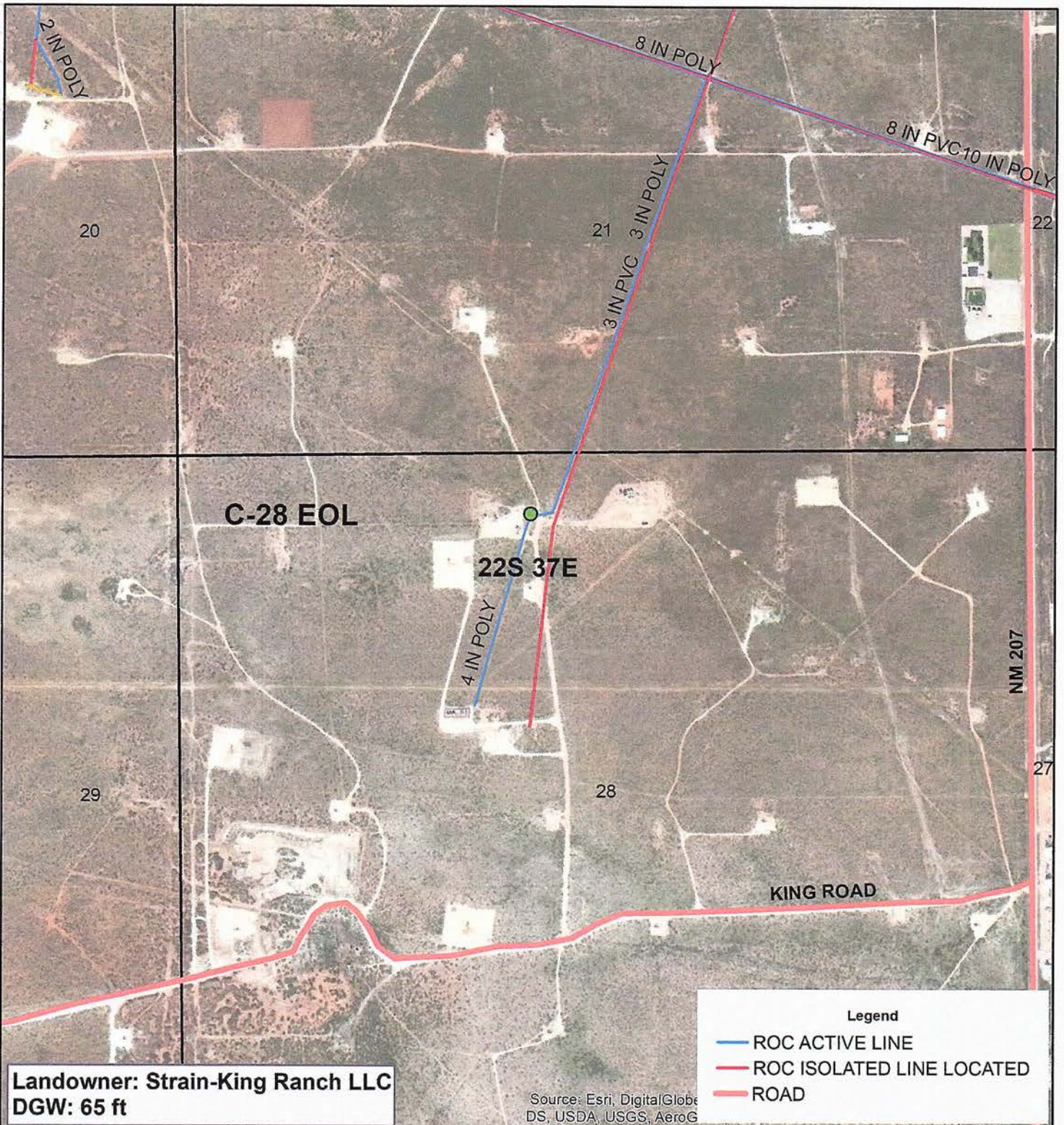
BD
C-28 EOL
 1R426-219
 UL C SECTION 28
 T-22-S R-37-E
 LEA COUNTY, NM

GPS: 32.369055 -103.169415

0 0.5 1
 Miles

Drawing date: 5/30/18
 Drafted by: T. Grieco

Area Map



Basin Environmental
Effective Solutions
Service Technologies

BD
C-28 EOL
1R426-219

UL C SECTION 28
T-22-S R-37-E
LEA COUNTY, NM

GPS: 32.369055 -103.169415

0 500 1,000
Feet

Drawing date: 5/30/18
Drafted by: T. Grieco





BD
C-28 EOL
 1R426-219

UL C SECTION 28
T-22-S R-37-E
LEA COUNTY, NM

GPS: 32.369055 -103.169415

0 10 20
 Feet

GPS date: 6/1/18 TG
 Drawing date: 6/4/18
 Drafted by: T. Grieco



Disclosure Report

Basin Environmental Service Technologies (BEST)

P.O. Box 2948, Hobbs, NM 88241

Phone: 575-393-2967

**RICE OPERATING COMPANY
JUNCTION BOX DISCLOSURE* REPORT**

BOX LOCATION

SWD SYSTEM	JUNCTION	UNIT	SECTION	TOWNSHIP	RANGE	COUNTY	BOX DIMENSIONS - FEET		
Blinebry-Drinkard (BD)	Pogo Manda EOL	C	28	22S	37E	Lea	Length 5'	Width 5'	Depth 5'
							moved 100 ft south		

LAND TYPE: BLM _____ STATE _____ FEE LANDOWNER Millard Deck OTHER _____

Depth to Groundwater 65 feet NMOCD SITE ASSESSMENT RANKING SCORE: 10

Date Started 7/17/2007 Date Completed 11/27/2007 OCD Witness no

Soil Excavated 400 cubic yards Excavation Length 30 Width 30 Depth 12 feet

Soil Disposed 36 cubic yards Offsite Facility Sundance Location Eunice, NM

FINAL ANALYTICAL RESULTS: Sample Date 10/26/2007 Sample Depth 12 ft

Procure 5-point composite sample of bottom and 4-point composite sample of sidewalls. TPH and Chloride laboratory test results completed by using an approved lab and testing procedures pursuant to NMOCD guidelines.

Sample Location	PID (field) ppm	GRO mg/kg	DRO mg/kg	Chloride mg/kg
4-WALL COMP.	0.0	<10.0	<10.0	1220
BOTTOM COMP.	0.0	<10.0	<10.0	1180
BACKFILL	0.0	<10.0	<10.0	976

CHLORIDE FIELD TESTS

LOCATION	DEPTH	mg/kg
4-wall comp.	n/a	938
bottom comp.	12'	839
backfill comp.	n/a	952
vertical delineation trench 20 ft south of junction (source)	1'	114
	2'	76
	3'	414
	4'	125
	5'	76
	6'	81
	7'	743
	8'	937
	9'	951
	10'	1341
	11'	1230
	12'	1957

General Description of Remedial Action: This junction was addressed under the pipeline replacement/upgrade program. A new, watertight junction box was installed 100 ft south of the former. After the former box was removed, an investigation was conducted using a backhoe to collect soil samples at regular intervals producing a 30x30x12-ft-deep hole. Each sample was field tested for chloride concentrations, which yielded elevated levels that did not relent with depth. Organic vapors were measured using a PID, which yielded low concentrations. Representative composite samples were sent to a commercial laboratory for analysis. The excavated soil was blended on-site and returned to the excavation up to 6 ft below ground surface. At 6-5 ft BGS, a 1-ft-thick clay barrier was installed. The remaining fill was used to backfill the excavation to ground surface. Imported, clean top soil was used to top cap the site and to contour to the surrounding area. An identification plate was placed on the surface at the former junction box site to mark the presence of the clay below. On 11/28/2007, the site was seeded with a blend of native vegetation and is expected to return to a productive capacity at a normal rate. NMOCD was notified of potential groundwater impact on 8/5/2008.

ADDITIONAL EVALUATION IS MEDIUM PRIORITY

enclosures: photos, cross-section, lab results, PID screenings, chloride curve

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

SITE SUPERVISOR Roy Rascon SIGNATURE not available COMPANY RICE OPERATING COMPANY

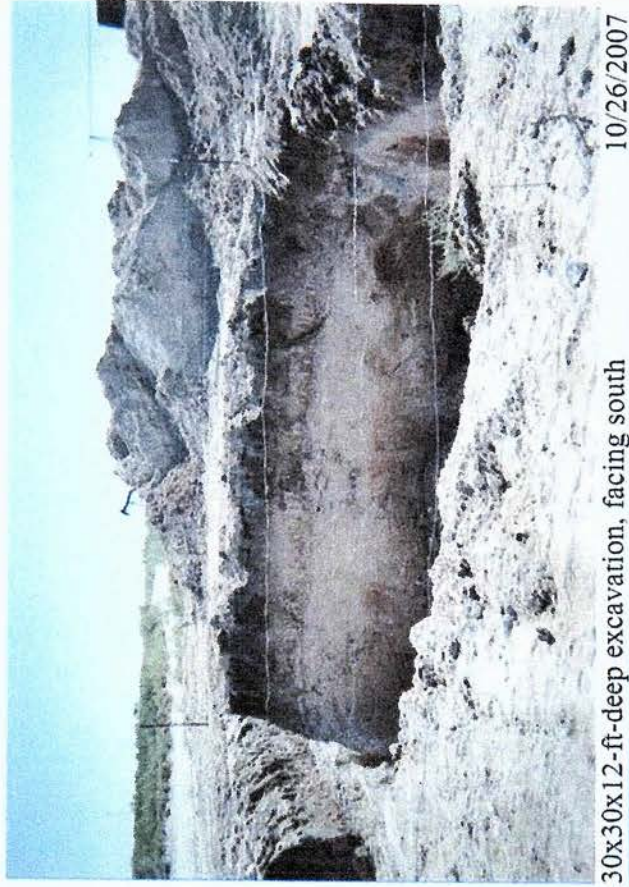
REPORT ASSEMBLED BY Katie Jones INITIAL KJ

PROJECT LEADER Larry Bruce Baker Jr. SIGNATURE Larry Bruce Baker Jr. DATE 8-5-08

*This site is a "DISCLOSURE." It will be placed on a prioritized list of similar sites for further consideration.

BD Pogo Manda EOL

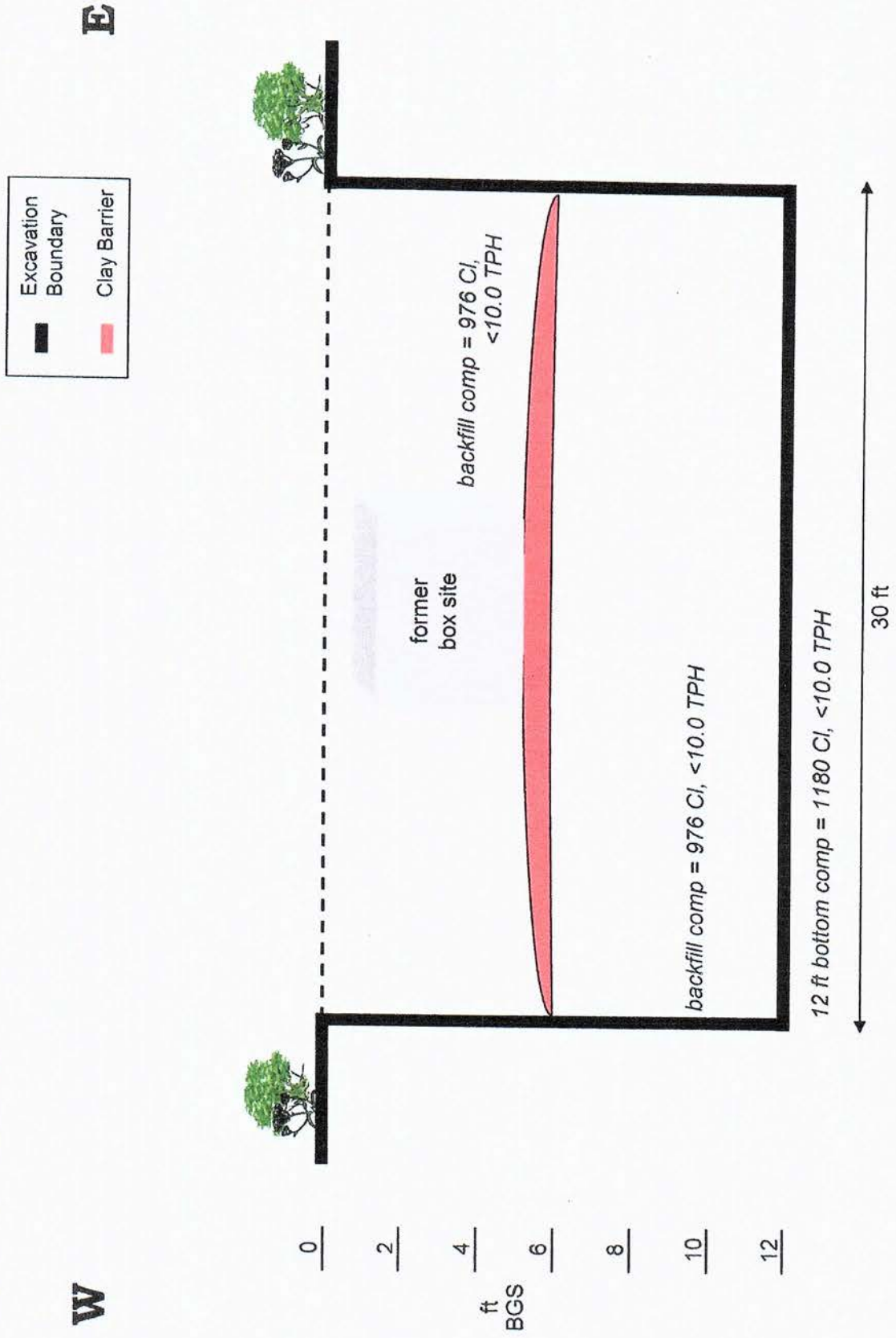
Unit C, Section 28, T22S, R37E



BD Pogo Manda EOL

Unit C, Section 28, T22S, R37E

Excavation Cross-Section





PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

COPY

ANALYTICAL RESULTS FOR
RICE OPERATING CO.
ATTN: ROY RASCON
122 W. TAYLOR
HOBBS, NM 88240
FAX TO: (575) 397-1471

NOV 02 2007

Receiving Date: 10/26/07
Reporting Date: 10/30/07
Project Number: NOT GIVEN
Project Name: BD POGO MANDA EOL
Project Location: NOT GIVEN

Sampling Date: 10/26/07
Sample Type: SOIL
Sample Condition: COOL & INTACT
Sample Received By: SB
Analyzed By: CK/KS

LAB NUMBER SAMPLE ID		GRO (C ₆ -C ₁₂) (mg/kg)	DRO (>C ₁₂ -C ₂₈) (mg/kg)	CI* (mg/kg)
ANALYSIS DATE		10/26/07	10/26/07	10/30/07
H13592-1	5 PT BTTM COMP @ 12' BGS	<10.0	<10.0	1180
H13592-2	4 WALL COMP @ 30x30x12	<10.0	<10.0	1220
H13592-3	BLENDED BACKFILL 5 PT	<10.0	<10.0	976
Quality Control		420	381	500
True Value QC		500	500	500
% Recovery		84.0	76.2	100
Relative Percent Difference		8.5	12.1	<0.1

METHODS: TPH GRO & DRO: EPA SW-846 8015 M; Std. Methods 4500-CIB

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

Cheryl D. Skene
Chemist

10/30/07
Date

H13592TCL Rice

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 services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



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

COPY

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

BILL TO										ANALYSIS REQUEST									
Company Name: RICE OVER, CO.										P.O. #:									
Project Manager: DOY R. PASON										Company:									
Address: 1000 W. 10TH ST										Attn:									
City: ABILENE										Address:									
Phone #: (325) 293-9774										City:									
State: NM										State:									
Zip: 79601										Zip:									
Fax #: (325) 293-9774										Phone #:									
Project Owner:										Fax #:									
Project Name: 3L 8050. MARCH 201																			
Project Location:																			
Sampler Name: DOY R. PASON																			
Lab I.D.	Sample I.D.	(G) RAB OR (COMP)	# CONTAINERS	MATRIX	PRESERV.	SAMPLING	DATE	TIME											
14-3592-1	5 PT EVIDENCE COMP 3L 8050	1	1	WASTEWATER	✓	✓	10-26-07	1020	✓										
2	1000 W 10TH ST 3L 8050	1	1	SLUDGE	✓	✓	10-26-07	1045	✓										
3	1000 W 10TH ST 3L 8050	1	1	SOIL	✓	✓	10-26-07	1320	✓										
				GROUNDWATER															
				OTHER															
				ACID/BASE															
				ICE / COOL															
				OTHER															

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 analysis. Analysis including those for negligence and/or other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable analysis. If not received by Cardinal by date for resolution of consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates, or third parties, shall be deemed waived. Cardinal's responsibility of storage and handling of samples shall be based upon any of the above stated reasons or otherwise.

Relinquished By: DOY R. PASON Date: 10-26-07 Time: 2:47

Received By: DOY R. PASON Date: 10-26-07 Time: 2:47

Delivered By: (Circle One) DOY R. PASON Date: 10-26-07 Time: 2:47

Sampler: UPS - Bus - Other: SPB

REMARKS: E-mail to JUVENIS & REASON AT RICE OVER, CO. OK

Phone Result: ☒ Yes ☐ No Add'l Phone #:

Fax Result: ☒ Yes ☐ No Add'l Fax #:

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

RICE OPERATING COMPANY

122 West Taylor Hobbs, NM 88240

PHONE: (505) 393-9174 FAX: (505) 397-1471

PID METER CALIBRATION & FIELD REPORT FORM

CK.
MODEL
NO.

X

MODEL: PGM 7600

SERIAL NO: 110-013676

MODEL: PGM 7600

SERIAL NO: 110-013744

MODEL: PGM 7600

SERIAL NO: 110-012383

MODEL: PGM 7600

SERIAL NO: 110-012920

SK 107

SERIAL NO: 008011

GAS COMPOSITION: ISOBUTYLENE 100PPM / AIR: BALANCE

COPY

LOT NO : 07-3353	EXPIRATION DATE: 4-4-09
FILL DATE: 10-4-07	METER READING ACCURACY: 100.0

ACCURACY : +/- 2%

SYSTEM	JUNCTION	UNIT	SECTION	TOWN SHIP	RANGE
BD	POGO MANDA EOL	C	28	22S	37E

SAMPLE ID	PID	SAMPLE ID	PID
btm sp#1 @ 12'bgs	0		
btm sp#2 @ 12'bgs	0		
btm sp#3 @ 12'bgs	0		
btm sp#4 @ 12'bgs	0		
btm sp#5 @ 12'bgs	0		
5pt btm comp @ 12'bgs	0		
n wall comp @ 5'n	0		
s wall comp @ 25's	0		
e wall comp @ 20'e	0		
w wall comp @ 10'e	0		
4 wall comp @ 30x30	0		
blended backfill 5pt comp.	0		

I verify that I have calibrated the above instrument in accordance to the manufacture operation manual.

SIGNATURE:

Ray R. Hanson

DATE: 10-26-07

CHLORIDE CONCENTRATION CURVE

RICE Operating Company

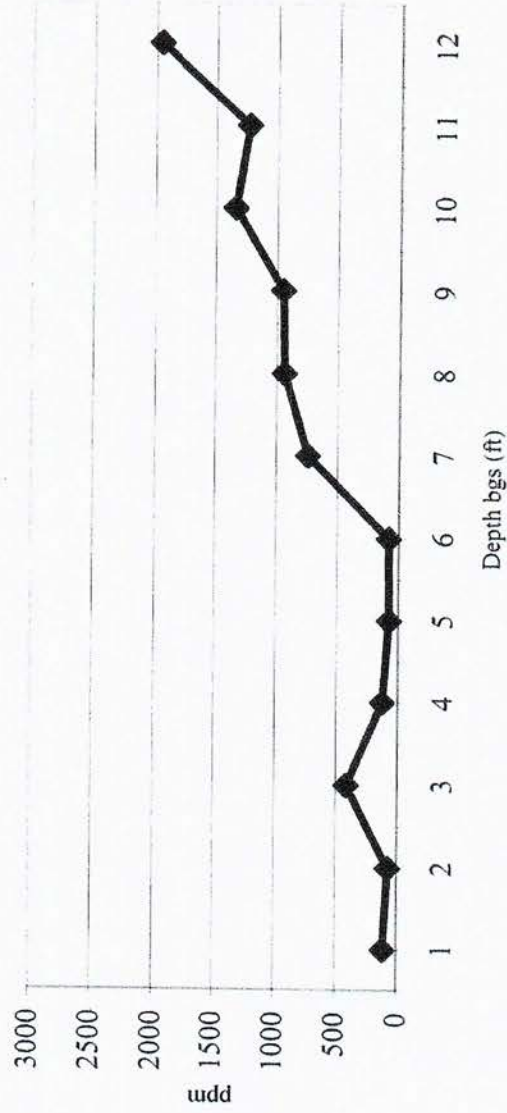
BD Pogo Manda EOL

unit 'C', Sec. 28, T22S, R37E

Backhoe samples at 20 ft south of the junction (source)

Depth bgs (ft)	[Cl ⁻] ppm
1	114
2	76
3	414
4	125
5	76
6	81
7	743
8	937
9	951
10	1341
11	1230
12	1957

Chloride Concentration vs. Depth



Groundwater = 65 ft

Current Photodocumentation

Basin Environmental Service Technologies (BEST)

P.O. Box 2948, Hobbs, NM 88241

Phone: 575-393-2967



Facing south

6-1-18



Facing east

6-1-18