

SWD

7/27/99

7/27/99



## RICHARDSON OPERATING COMPANY

1700 Lincoln, Suite 1700  
Denver, Colorado 80203 (303) 830-8000  
FAX (303) 830-8009

July 8, 1999

JUL 12

New Mexico Oil Conservation Division  
2040 South Pacheco  
Santa Fe, New Mexico 87505

Re: Application for Authorization to Inject  
San Juan County, New Mexico

Dear Mr. Ben Stone,

Richardson Operating Company (ROPCO) is requesting administrative approval for salt-water disposal into the Salty Dog No. 1 well. This well is not yet drilled but is scheduled to spud near the end of July. The well will be completed in the Blanco Mesaverde field, and will be located in the NE quarter of Sec. 1-T29N- R15W, San Juan County, New Mexico. ROPCO owns both the surface and 100 percent of the oil, gas, and mineral leasehold rights at this location.

There is only one existing well, the ROPCO Pittam Pond No. 1, located within one half mile of the proposed location for the Salty Dog No. 1. The Pittam Pond No. 1 is completed in the Pictured Cliffs formation at a depth of 570 feet and has a total wellbore depth of 660 feet. The wellbore does not penetrate the Mesaverde formations. Information from the State Engineer's Office in Aztec indicates there are nine shallow fresh water wells within one mile of the Salty Dog No. 1 location. Fresh water well data is attached.

Salt water disposal will be into the Mesaverde series Cliff House and Point Lookout formations at depths of approximately 2023' and 3121', respectively. Water analysis from both the Cliff House and Point Lookout will be provided upon completion of the well.

The disposal water will be Pictured Cliffs and Fruitland Coal produced water from wells located in various sections of Townships 29 and 30 North, and Ranges 14 and 15 West, San Juan County, New Mexico. The average daily injection rate is expected to be approximately 1400 BWPD at an average surface injection pressure of approximately 540 psig.

All available geologic and engineering data has been examined and there is no evidence of open faults or any other hydrologic connections between the disposal zone and any underground sources of drinking water. A statement of ROPCO's salt-water disposal intentions was posted in the Farmington Daily Times newspaper on Wednesday, July 7, 1999.

The Application for Authorization to Inject (Form C-108) and attachments are enclosed. If there are any questions or concerns regarding this application please contact Steve Smethie at 303-830-8000.

Sincerely,

Steve Smethie, Petroleum Consultant

## APPLICATION FOR AUTHORIZATION TO INJECT

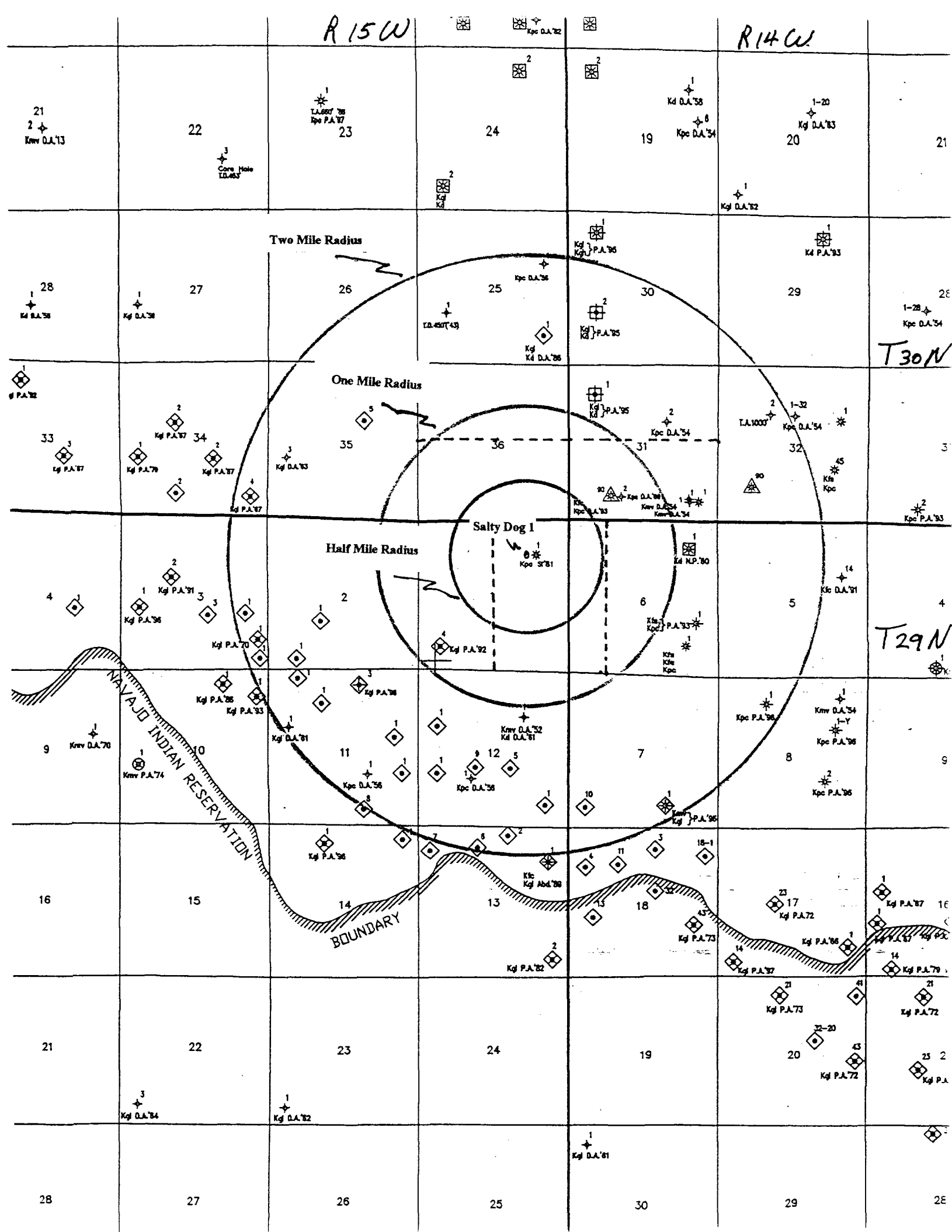
- I. PURPOSE: Disposal
- II. OPERATOR: Richardson Operating Company  
ADDRESS: 1700 Lincoln Street, Suite 1700, Denver, Colorado 80203  
CONTACT PARTY: Steve Smethie PHONE: 303-830-8000
- III. WELL DATA: See Attachment for the Salty Dog No. 1
- IV. Is this an expansion of an existing project? No.
- V. Map showing the "Area of Review" is attached.
- VI. No wells within the area of review penetrate the proposed injection zone.
- VII. Operation Data:  
To be determined by water analysis and step-rate tests. 2050 0.450
- VIII. The target zone is the Cliff House and Point Lookout formations of the Mesaverde series, each being thick sandstones of approximately 150 feet in thickness. The Mesaverde series begins at a depth of 1844 feet in the SW offset Pittam Pond No. 4 wellbore. There are no known sources of underground drinking water below the Cliff House formation in the area. There are potable water sands between 40 feet and 110 feet overlying the area. The log for the Pittam Pond No. 4 is attached.
- IX. Stimulation will consist of acidizing the formations and possibly a small fracture treatment if necessary.
- X. Logs will be provided when the well is completed.
- XI. See attached data pertaining to fresh water wells.
- XII. The geologic and engineering data have been examined and no evidence has been found of open faults or other hydrologic connection between the disposal zone and any underground source of drinking water.
- XIII. Proof of Notice:  
See enclosed certificate of publication.  
The injection rates and pressures are to be determined by step-rate tests.
- XIV. CERTIFICATION: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

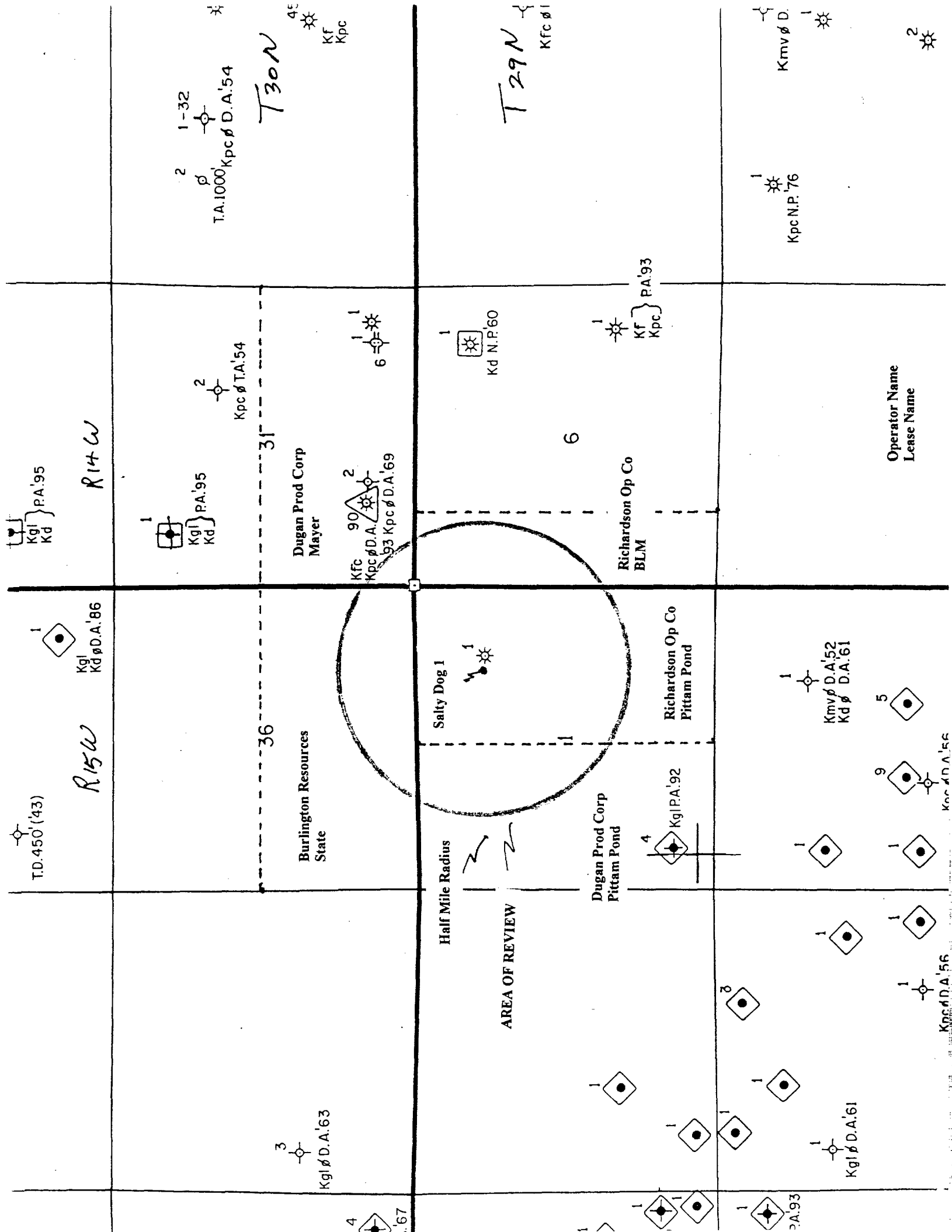
NAME: Steve Smethie TITLE: Agent  
SIGNATURE: Steve Smethie DATE: 7/8/99

**ILLEGIBLE**

R 15 W

R 14 W





## **NAMES AND ADDRESSES OF OFFSET OPERATORS**

Copies of this application are being sent by Certified Mail (Return Receipt) to each of the parties listed below, concurrent with the mailing of this application.

### **Leasehold Owners**

Dugan Production Corp.  
P. O. Box 420  
Farmington, NM 87499-0420

Burlington Resources Oil & Gas Company  
P. O. Box 4289  
Farmington, NM 87499-4289

Richardson Production Company  
1700 Lincoln Street, Suite 1700  
Denver, CO 80203

### **Surface Owner**

Richardson Production Company  
1700 Lincoln Street, Suite 1700  
Denver, CO 80203

Side 1

INJECTION WELL DATA SHEET

OPERATOR: RICHARDSON OPERATING COMPANY

WELL NAME & NUMBER: SALTY DOG SWD #1

WELL LOCATION: 1200 FNL & 1380' FEL

UNIT LETTER SECTION TOWNSHIP RANGE  
1 29 15

FOOTAGE LOCATION

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 9-7/8 Casing Size: 8-5/8, 24#  
Cemented with: 42 sx. or 50 ft<sup>3</sup>  
Top of Cement: Surface Method Determined:

Intermediate Casing

Hole Size: Casing Size:  
Cemented with: sx. or ft<sup>3</sup>  
Top of Cement: Method Determined:

Production Casing

Hole Size: 6-3/4 Casing Size: 5-1/2, 15.5#  
Cemented with: 185±100 sx. or 500 ft<sup>3</sup>  
Top of Cement: surface Method Determined:  
Total Depth: 3400'

Injection Interval

MV perfs: 2023-3300' feet to Perforated

(Perforated or Open Hole; indicate which)

# **INJECTION WELL DATA SHEET**

Tubing Size: 2-7/8", 6.4#, J-55 Lining Material: NONE

Type of Packer: 5-1/2" X 2-7/8" Tension Set

Packer Setting Depth: \_\_\_\_\_

Other Type of Tubing/Casing Seal (if applicable): \_\_\_\_\_

## **Additional Data**

1. Is this a new well drilled for injection? X Yes      No  
If no, for what purpose was the well originally drilled? \_\_\_\_\_

2. Name of the Injection Formation: Mesa Verde

3. Name of Field or Pool (if applicable): \_\_\_\_\_

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. \_\_\_\_\_

NO

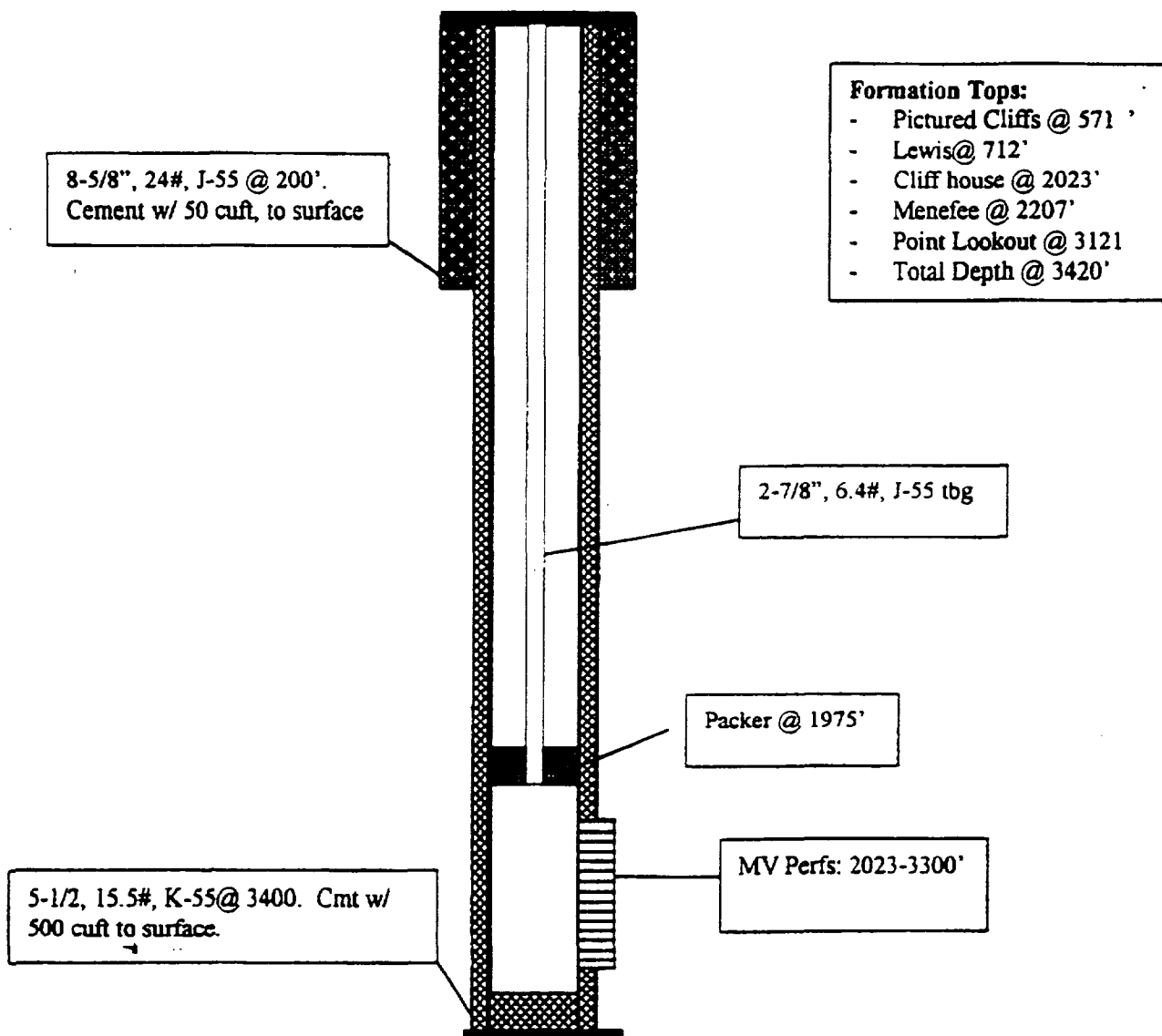
5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: \_\_\_\_\_

Pictured Cliffs - 570'

Gallup - 4700'

**Salty Dog SWD #1**  
1200' FNL & 1380' FEL  
Sec 1, T29N, R15W  
Blanco Mesa Verde

Elev: 5291' GR



ANS July '99



## Richardson Operating Company

Pittam Pond #1

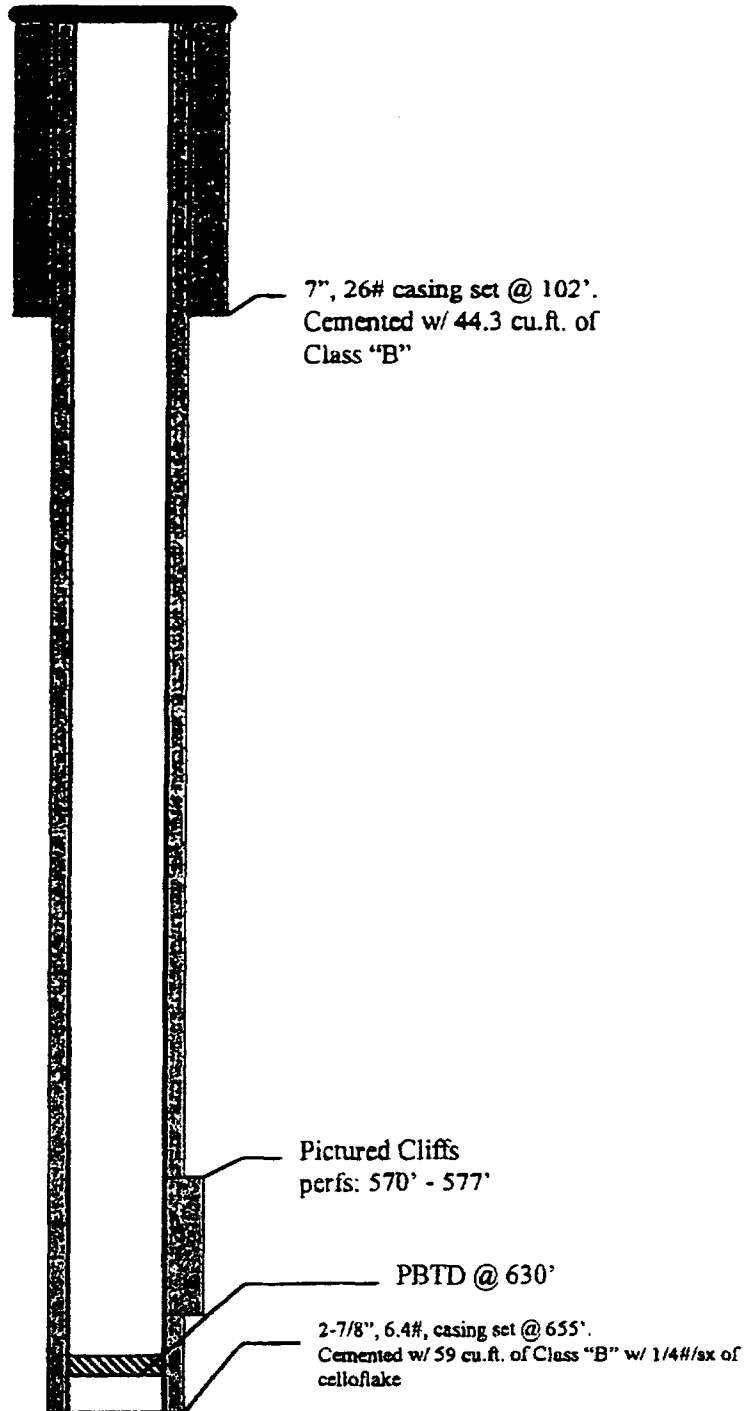
Sec 1 Twp 29N Rge 15W

1235' fml & 1215' fel

San Juan County, New Mexico

6/18/99 jet

Geology	
Field: Twin Mounds PC	
Fruitland:	422'
Pictured Cliffs:	554'



FW01W266

**BJ SERVICES COMPANY****WATER ANALYSIS #FW01W266****FARMINGTON LAB****GENERAL INFORMATION**

OPERATOR:	RICHARDSON OPERATING	DEPTH:	
WELL:	BUSHMAN FEDERAL 6-1	DATE SAMPLED:	10/19/98
FIELD:	SEC06/T29N/R14W	DATE RECEIVED:	10/20/98
SUBMITTED BY:	BRAD SALZMAN	COUNTY:	SAN JUAN
WORKED BY:	D. SHEPHERD	FORMATION:	PC/PC
PHONE NUMBER:		STATE:	NM

**SAMPLE DESCRIPTION**

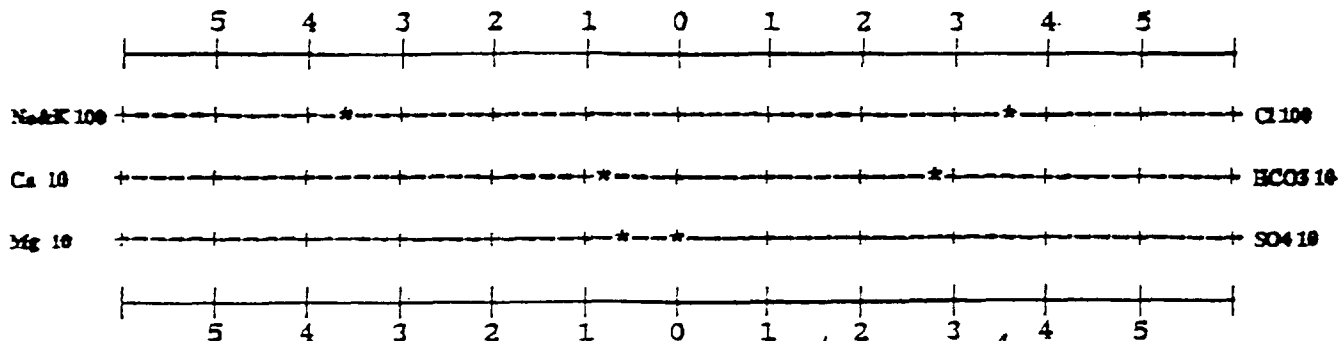
SAMPLE FOR ANALYSIS

**PHYSICAL AND CHEMICAL DETERMINATIONS**

SPECIFIC GRAVITY:	1.015	@ 74°F	PH:	7.49
RESISTIVITY (MEASURED ):	0.280	ohms @ 76°F		
IRON (FE++) :	0 ppm	SULFATE:	39 ppm	
CALCIUM:	158 ppm	TOTAL HARDNESS	710 ppm	
MAGNESIUM:	77 ppm	BICARBONATE:	1,719 ppm	
CHLORIDE:	12,574 ppm	SODIUM CHLORIDE(Calc)	20,685 ppm	
SODIUM+POTASS:	8,493 ppm	TOT. DISSOLVED SOLIDS:	23,536 ppm	
H2S: NO TRACE		POTASSIUM (PPM):	110 PPM	

**REMARKS**

SAMPLED FROM SEPERATOR

**STIFF TYPE PLOT (IN MEQ/L)**

ANALYST

*D. Shepherd*  
D. SHEPHERD

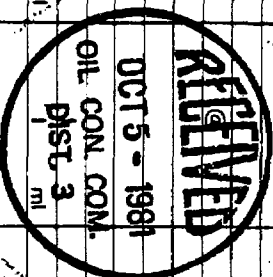




# INDUCTION • ELECTRIC LOG

15.30

COMPANY <u>DUGAN PRODUCTION CORPORATION</u>		WELL <u>PITTAM POND #4</u>	
FIELD <u>CHA CHA GALLUP</u>		County <u>SAN JUAN</u> State <u>M. MEX.</u>	
COMPANY <u>DUGAN PRODUCTION CORPORATION</u>	WELL <u>PITTAM POND #4</u>	FIELD <u>CHA CHA GALLUP</u>	COUNTY <u>SAN JUAN</u> STATE <u>NEW MEXICO</u>
Location <u>690' FSL &amp; 690' FWL</u>		Other Services: <u>13</u>	
Sec <u>1</u> Twp <u>29N</u> Rge <u>15W</u>	COMP. DENSITY		
Permanent Datum <u>GROUND LEVEL</u>	Elev. <u>5220'</u>	Elev. <u>K.B. 5232'</u>	D.F. <u>5220'</u>
Log Measured From <u>KELLY BUSHING, 12 Ft. Above Perm. Datum</u>	GL <u>5220'</u>		
Drilling Measured From <u>KELLY BUSHING</u>			
Date <u>9-26-81</u>	Run No. <u>ONE</u>		
Depth—Driller <u>4730'</u>	Depth—Welex <u>4734'</u>		
Btm. Log Inter. <u>4732'</u>	Top Log Inter. <u>200'</u>		
Casing—Driller <u>8-5/8" @ 222'</u>	Casing—Welex <u>8-5/8" @ 222'</u>		
Bit Size <u>7-7/8"</u>	Type Fluid in Hole <u>GEL/WATER</u>		
Dens. I Visc. <u>9.1   75</u>	pH   Fluid Loss <u>8.5   ml</u>		
Source of Sample <u>MUD PIT</u>	R <sub>m</sub> @ Meas. Temp. <u>5.9 @ 77°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 77°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 77°F</u>
R <sub>m</sub> @ Meas. Temp. <u>1.7 @ 77°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 77°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 77°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 77°F</u>
R <sub>m</sub> @ Meas. Temp. <u>3.1 @ 74°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 74°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 74°F</u>	R <sub>m</sub> @ Meas. Temp. <u>@ 74°F</u>
Source R <sub>m</sub> R <sub>mc</sub> <u>MEASURED</u>	R <sub>m</sub> @ BHT <u>2.80 @ 170°F</u>	R <sub>m</sub> @ BHT <u>@ 170°F</u>	R <sub>m</sub> @ BHT <u>@ 170°F</u>
Time Since Circ. <u>30 MINUTES</u>	Max. Rec. Temp. <u>170°F @ T.D.</u>	Equip. I Location <u>2892 IFARMINGTON I</u>	Recorded By <u>D. GURULE</u>
Witnessed By <u>MR. STEVE CLARK</u>			



Fold Here

Service Ticket No 098104 Remarks:

Change in Mud Type or Additional Samples

SCALE CHANGES

Date	Sample No.	Type Log	Depth	Scale Up Hole	Scale Down Hole
		IEL	4732'	NO CHANGES	

Depth—Driller	Type Fluid in Hole

Dens.	Visc.

pH	Fluid Loss

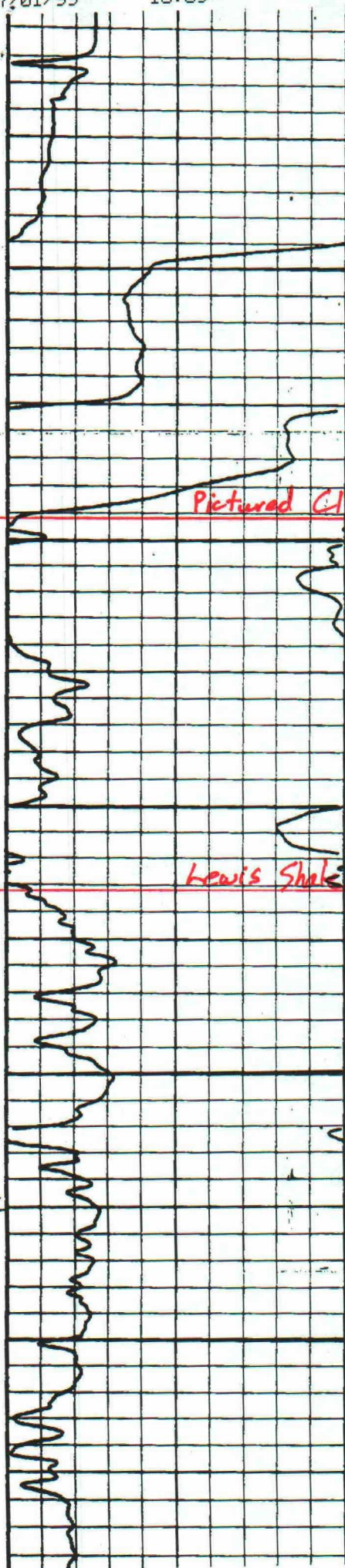
Source of Sample

EQUIPMENT DATA

R <sub>m</sub> @ Meas. Temp.	R <sub>m</sub> @ Meas. Temp.	R <sub>m</sub> @ Meas. Temp.	Source: R <sub>m</sub> R <sub>mc</sub>	R <sub>m</sub> @ BHT	R <sub>m</sub> BHT	R <sub>mc</sub> BHT	Run No.	Tool Type and No.	Pad Type	Tool Position	Other
@ 77°F	@ 77°F	@ 77°F		@ 77°F	@ 77°F	@ 77°F	ONE	M19 #28609		FREE	
@ 74°F	@ 74°F	@ 74°F		@ 74°F	@ 74°F	@ 74°F					
2.8 @ 170°F	@ 170°F	@ 170°F		@ 170°F	@ 170°F	@ 170°F					
.80 @ 170°F	@ 170°F	@ 170°F		@ 170°F	@ 170°F	@ 170°F					
1.40 @ 170°F	@ 170°F	@ 170°F		@ 170°F	@ 170°F	@ 170°F					

Welex does not guarantee the accuracy of any interpretation of log data, conversion of log data to physical rock parameters, or recommendations which may be given by Welex personnel or which may appear on the log or in any other form. Any user of such data, interpretations, conversions, or recommendations agrees that Welex is not responsible except where due to gross negligence or wilful misconduct, for any loss, damages, or expenses resulting from the use thereof.





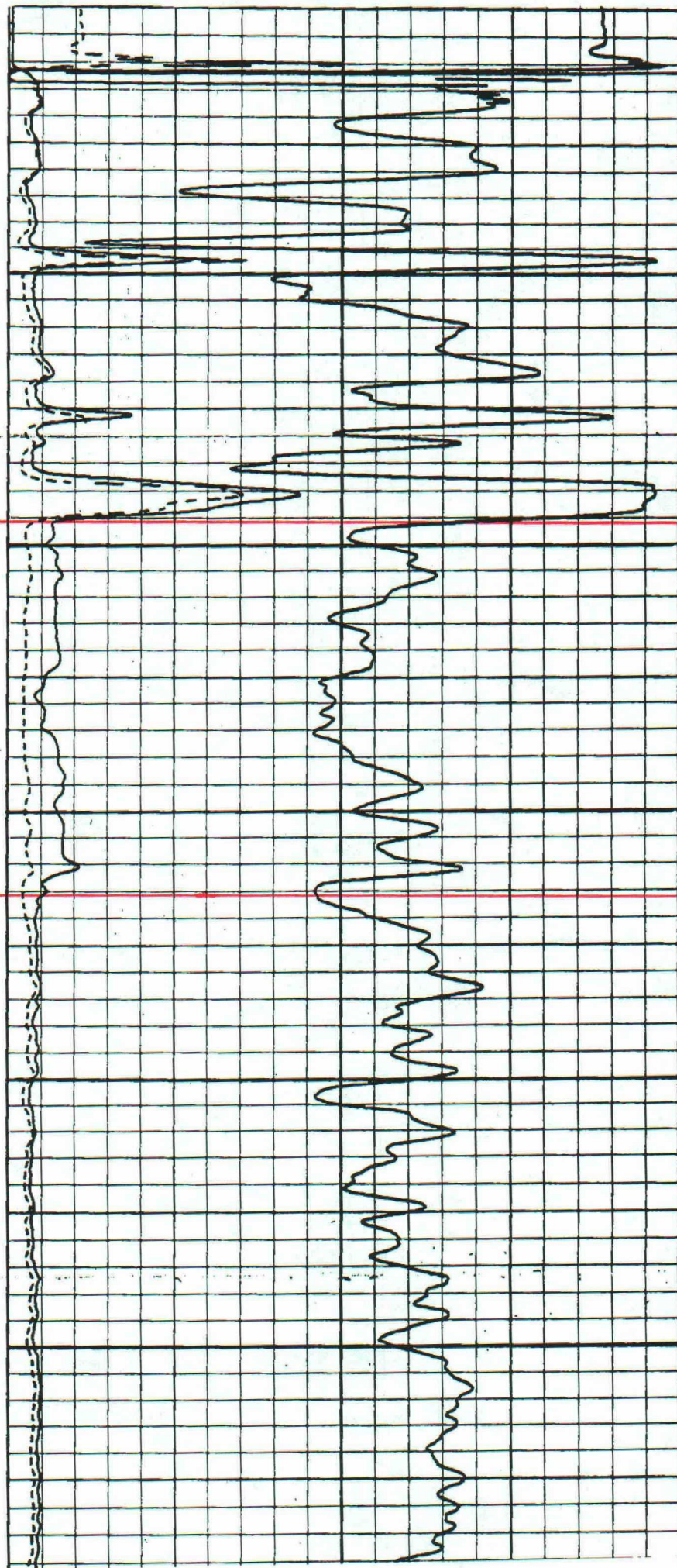
300.

400.

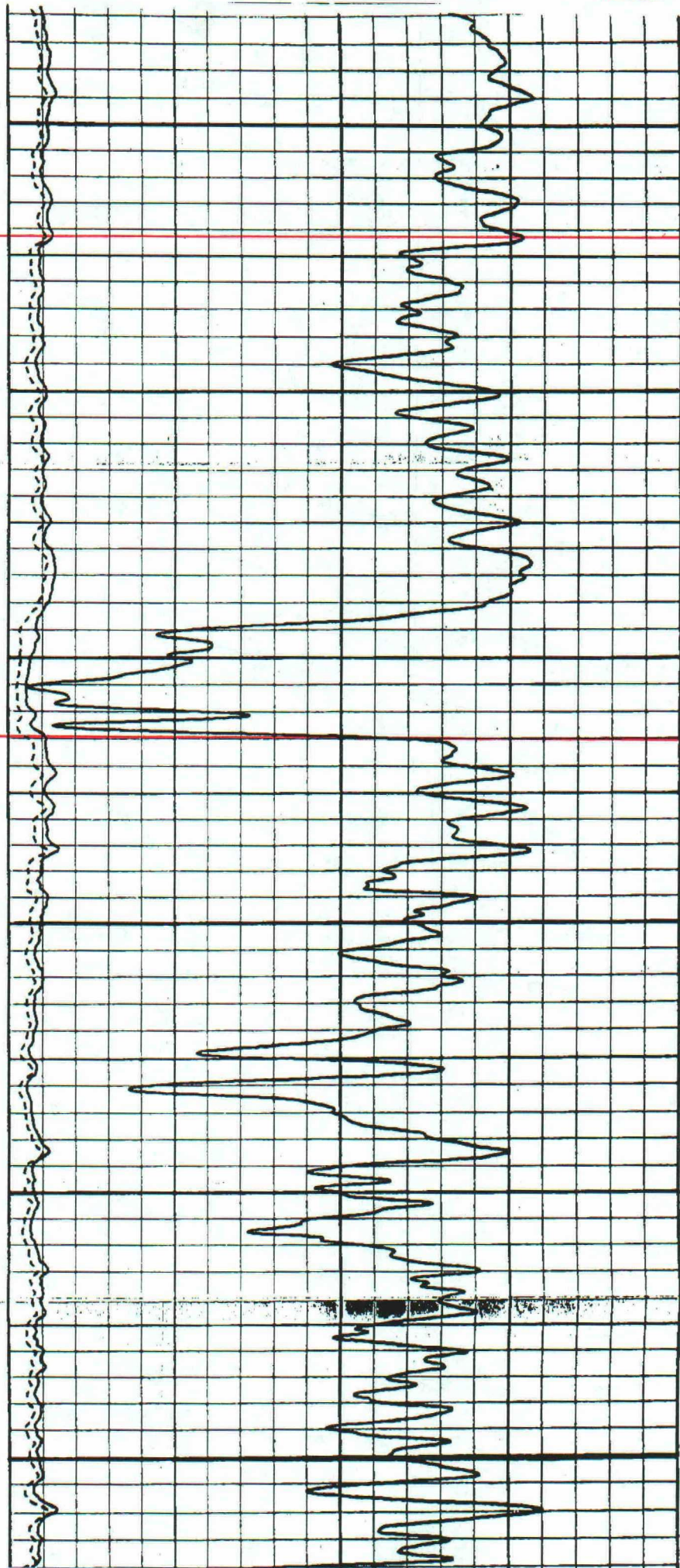
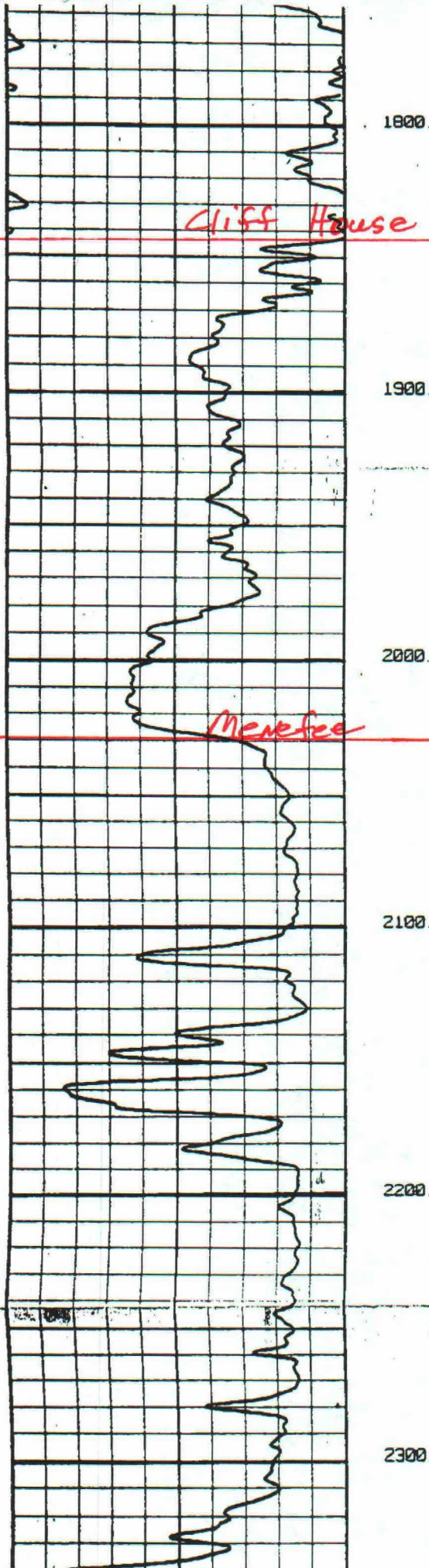
500.

600.

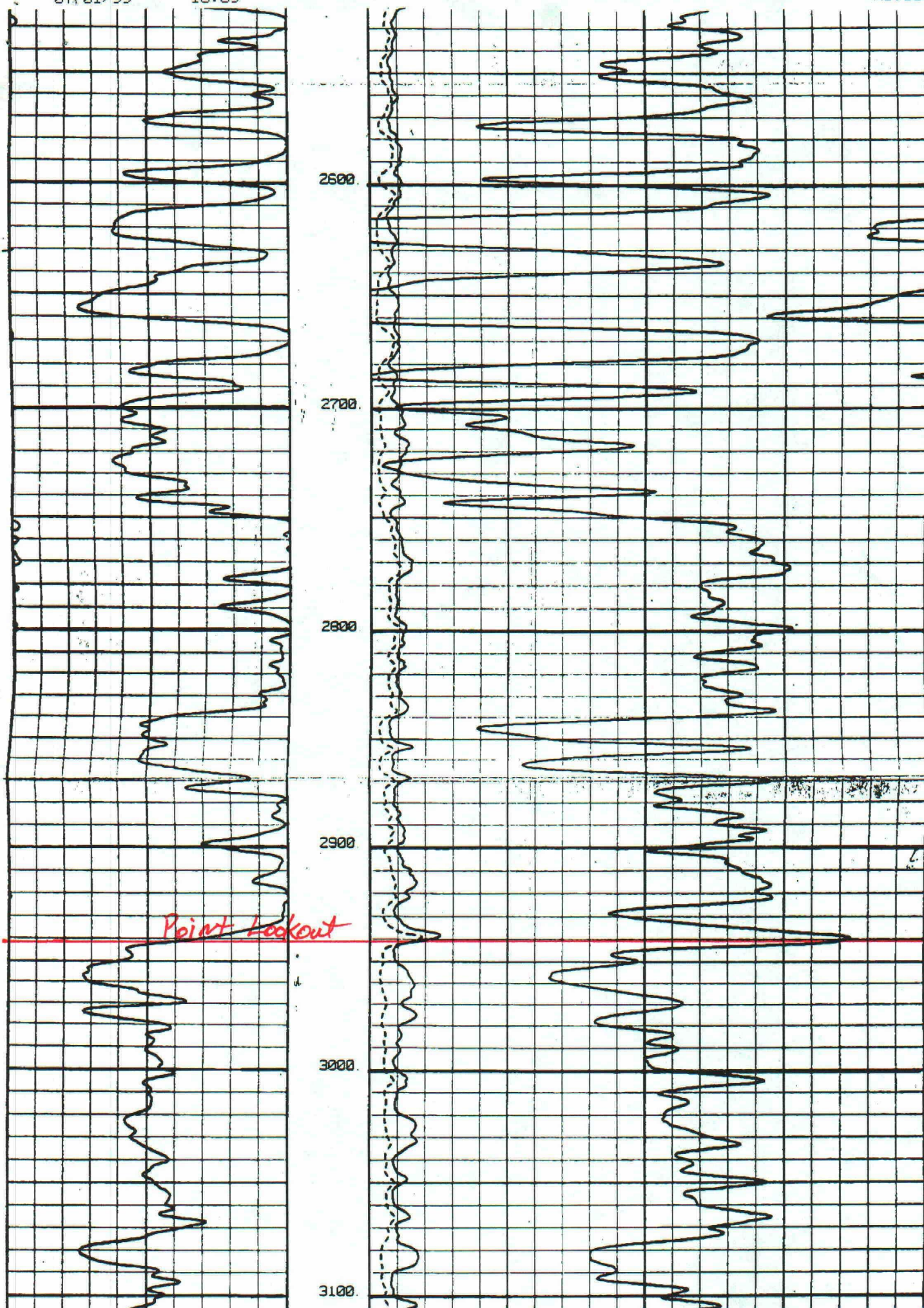
700.



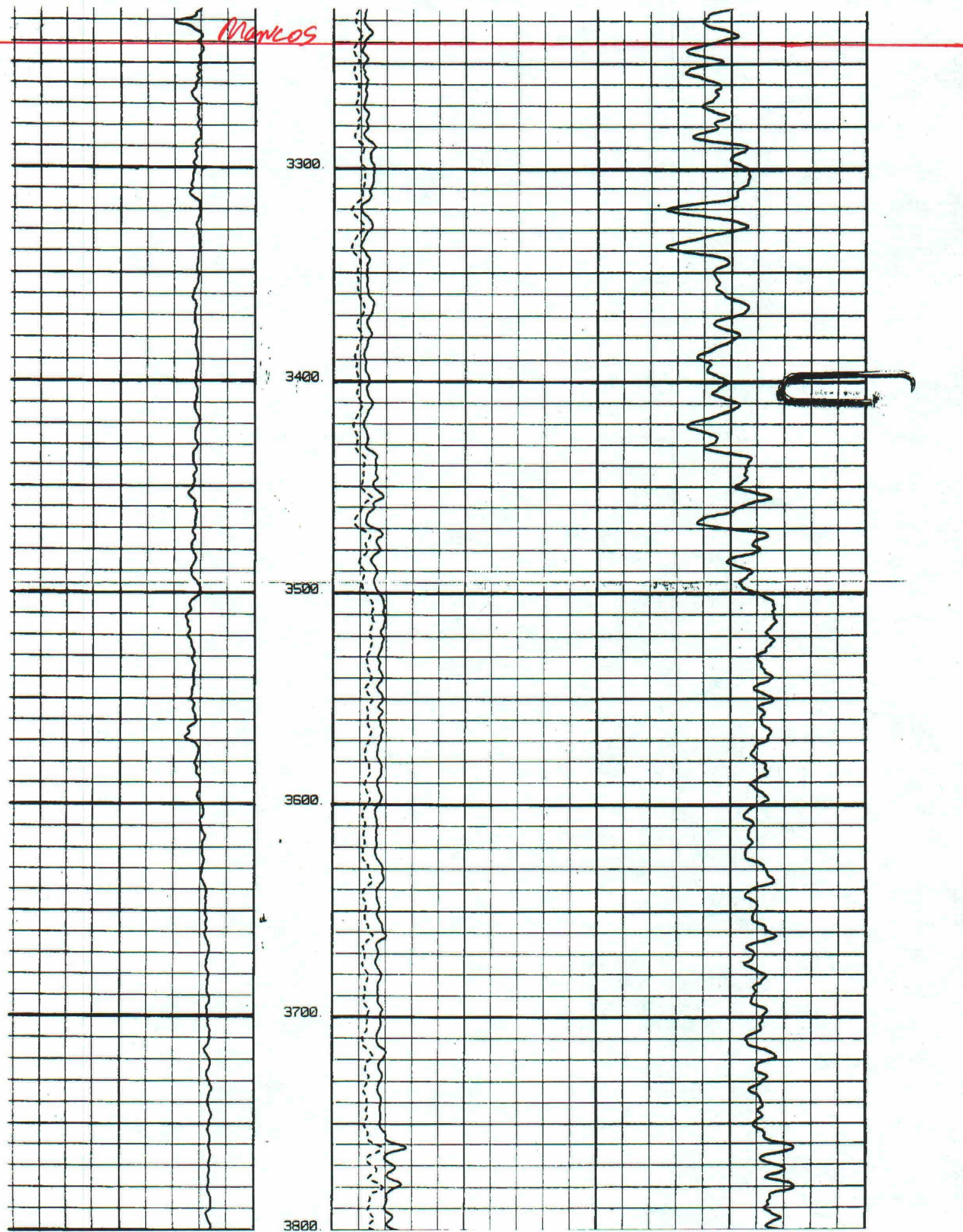












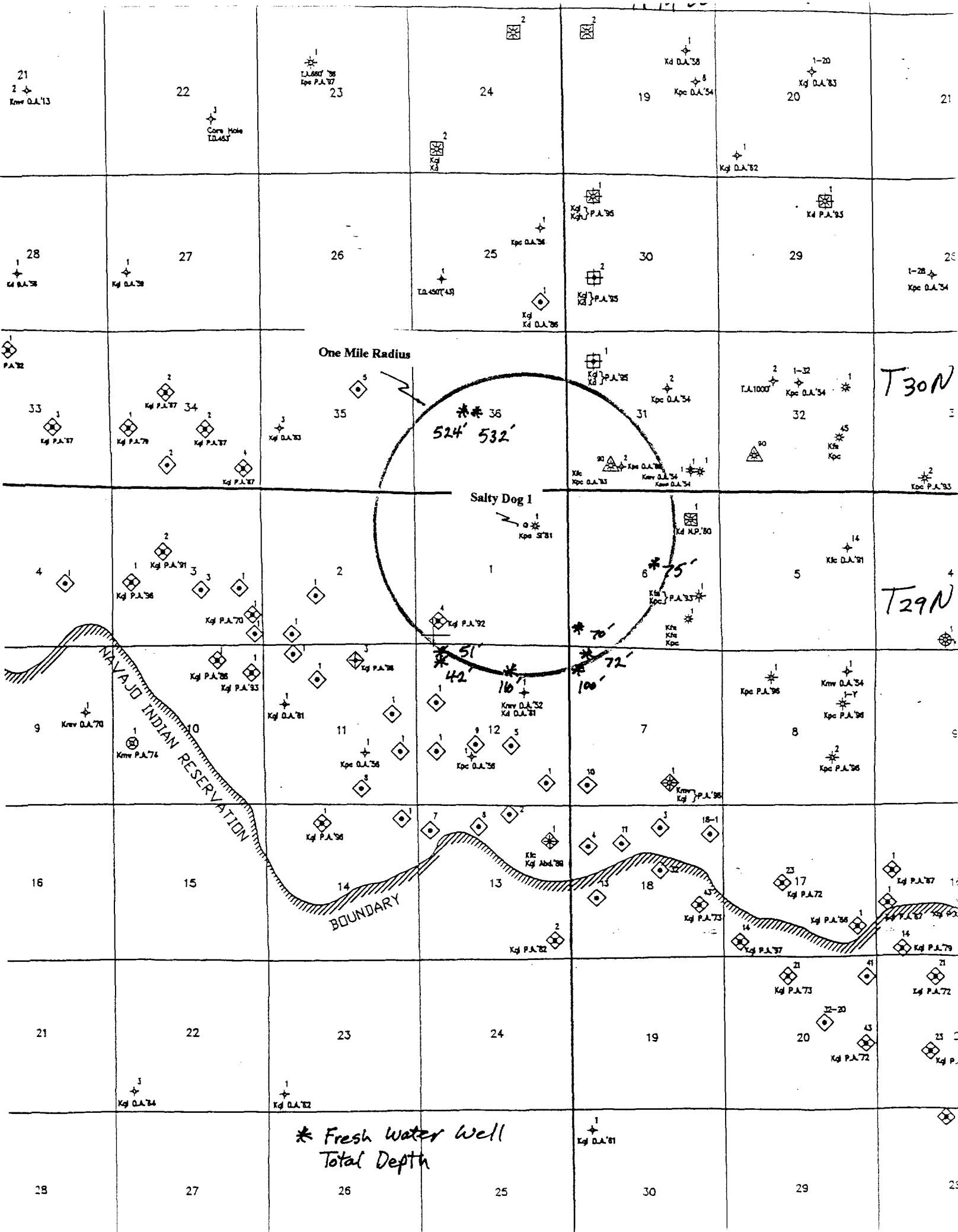


**Richardson Operating Company**  
**West Farmington Salt Water Disposal**

**SWD Well Name** Salty Dog No.1  
**Location** 1200' FNL & 1380' FEL  
**Sec-T-R** 1-29N-15W  
**County, State** San Juan, New Mexico  
**Disposal Formation** Cliff House and Point Lookout

**Fresh Water Wells w/in One Mile:**  
**(State Engineer Office)**

<u>Owner of Well</u>	<u>Address</u>	<u>City</u>	<u>Zip</u>	<u>Well</u>	<u>Well</u>	<u>Total</u>	<u>Completion</u>
			<u>Code</u>	<u>Spot</u>	<u>Location</u>	<u>Depth</u>	<u>Date</u>
					<u>Sec-T-R</u>	<u>Feet</u>	
David R. Knoll	Box 774	Kirtland	87417	E/2 NW NE	12-29N-15W	110	8/11/77
Jack Swearingen	Box 305	Kirtland	87417	SW NW NW	7-29N-14W	100	5/20/77
Western Coal Company	Box 1026	Albuquerque	87103	SW SE NW	36-30N-15W	524	4/11/78
Western Coal Company	Box 1026	Albuquerque	87103	SW SE NW	36-30N-15W	532	4/12/78
Paul Hansen	Box 822	Kirtland	87413	SW SW SW	6-29N-14W	70	7/5/81
Gordon A. Helmer	Box 1073	Kirtland	87417	NW NW	7-29N-14W	72	5/24/82
Dale Dailey	Box 1347	Kirtland	87417	W/2 SW NE	6-29N-14W	75	9/5/84
John Leo Kennedy	Box 571	Kirtland	87417	NE NW NW	12-29N-15W	51	10/30/86
Dan Booth	7881 Old Aztec Hwy	Flora Vista	87415	NE NW NW	12-29N-15W	42	11/11/86



One Mile Radius

\*\* 36  
524' 532'

Salty Dog 1

T30N

T29N

NAVAJO INDIAN RESERVATION

BOUNDARY

\* Fresh Water Well  
Total Depth



# Water Analysis Report

To: Western Gas Producers  
Submitted by: Halliburton Energy Services  
Attention: Paul Thompson  
Well Name: Fresh water well

Date: 7/6/99  
Date Rec: 7/2/99  
Report #: WF-990-0161  
Formation: Produced Water

*John Leo Kennedy, Kirtland, NM*

*NE NW NW Sec 12-T29N-R15W  
Total Depth of Well is 51'*

Specific Gravity	0.970	
pH	6.05	
Resistivity	12.48	@ 70° F
Iron (Fe)	0	Mg / L
Potassium (K)	0	Mg / L
Sodium (Na)	200	Mg / L
Calcium (Ca)	64	Mg / L
Magnesium (Mg)	15	Mg / L
Chlorides (Cl)	300	Mg / L
Sulfates (SO <sub>4</sub> )	0	Mg / L
Carbonates (CO <sub>3</sub> )	0.0	Mg / L
Bicarbonates (HCO <sub>3</sub> )	285	Mg / L
Total Dissolved Solids	864	Mg / L

  
Respectfully: Bill Loughridge

Title: Field Chemist II

Location: Farmington, NM

**NOTICE:**

This report is limited to the described sample tested. Any person using or relying on this report agrees that Halliburton shall not be liable for any loss or damage whether due to act or omission resulting from such report or its use

# AFFIDAVIT OF PUBLICATION

Ad No. 41438

COPY OF PUBLICATION

STATE OF NEW MEXICO

County of San Juan:

ALETHIA ROTH LISBERGER, being duly sworn says: That she is the Classified Manager of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication on the following day(s):

Thursday, July 7, 1999

and the cost of publication is: \$21.60

*Alethia Rothlisberger*

On 7-7-99 ALETHIA ROTH LISBERGER

appeared before me, whom I know personally to be the person who signed the above document.

*Christine P. Droy*  
My Commission Expires May 3, 2008.

918 Legals  
**PUBLIC NOTICE**

Richardson Operating Company will file an application on July 9, 1999, for approval to inject water, produced from other oil and gas wells, into the Mesaverde formation in the Salty Dog No. 1 located in the north half of the northeast quarter of Section 1, Township 29 North, Range 15 West, San Juan County, New Mexico, at a depth from 2000 feet to 3400 feet with surface injection pressure up to 540 pounds per square inch.

Surface owners and offset operators must file any objections or request for public hearing with the New Mexico Oil Conservation Division, 2040 South Pacheco Street, Santa Fe, New Mexico 87505 within 15 days of the date of this notice. The Richardson Operating Company contact person is Steve Smethie, 1700 Lincoln Street, Suite 1700, Denver, Colorado 80203, telephone 303-830-8000.

Legal No. 41438, published in The Daily Times, Farmington, New Mexico, Wednesday, July 7, 1999.