ENERGY AND MINERALS DEPARTMENT

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501

FORM C-108
Revised 7-1-81

APPLICATION FOR AUTHORIZATION TO INJECT POGO PRODUCING COMPANY

I. Purpose: ☐ Secondary Recovery ☐ Pressure Maintenance ☒ Disposal ☐ Storage
Application qualifies for administrative approval? ☒ yes ☐ no

II. Operator: POGO PRODUCING COMPANY

Address: P. O. Box 10340, Midland, Texas, 79702

Contact party: Richard L. Wright Phone: 915/682-6822

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ☐ yes ☒ no
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

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: Bill F. Halepeska Title Agent (P. E.)

Signature: Bill F. Halepeska Date: 03/03/93

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

AOR: 0 TOTAL

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

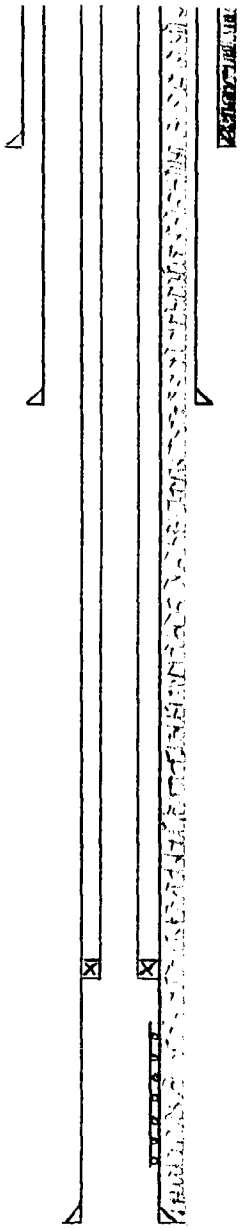
Pogo Producing Company

FORM C-108

ITEM III-A

INJECTION WELL DATA SHEET

SCHEMATIC



surface casing

size 8 5/8 in.; depth 850 ft.

cemented w/ 450 sx.

intermediate casing

size NA in.; depth

cemented w/ sx.

injection packer 5½" @ 5900'
Guiberson Uni-VI

injection tubing

size 2 7/8 in.; set at 5900 ft.

injection interval
4975-5600'

long string casing

size 5½ in.; depth 6000 ft.

cemented w/ 1800 sx.

TABULAR DATA

(1). LEASE: Red Tank "28" Federal WELL # 9

LOCATION: Sec. 28 TWP 22-S Range 32-E

County Lea

Footage 1400' FSL, 2310' FEL

(2). CASING STRINGS:

Surface Casing

Size 8 5/8" Depth 850' Cemented w/ 450 sx.

TOC surf. Determined by circulating

Hole size 11"

Intermediate Casing

Size NA Depth _____ Cemented w/ _____ sx.

TOC _____ Determined by _____

Hole size _____

Long String

Size 5½" Depth 6000' Cemented w/ 1800 sx.

TOC surf. Determined by circulating

Hole size 7 7/8"

Injection interval, from 4975 to 5600 ft.

(3). INJECTION TUBING STRING:

Size 2 7/8 in., ~~coated~~/lined with PVC

Setting depth 4900 ft.

(4) INJECTION PACKER:

Size 5½ in.; Make/Model Guiberson, Uni-VI

Setting depth 4900 ft.

FORM C-108

Pogo Producing Company

ITEM III-B

INJECTION WELL DATA

(1). Injection formation: Bell Canyon (Lower)

Field/Pool: Red Tank, West (Delaware)

(2). Injection interval, from 4975 ft. to 5600 ft.

Perforated XX Open Hole _____

(3). Original purpose well drilled -- for salt water disposal

(4). Other perforated intervals; _____ Yes XX No

Squeezed with NA sx., or isolated by _____

(5). Oil or gas productive zone(s):

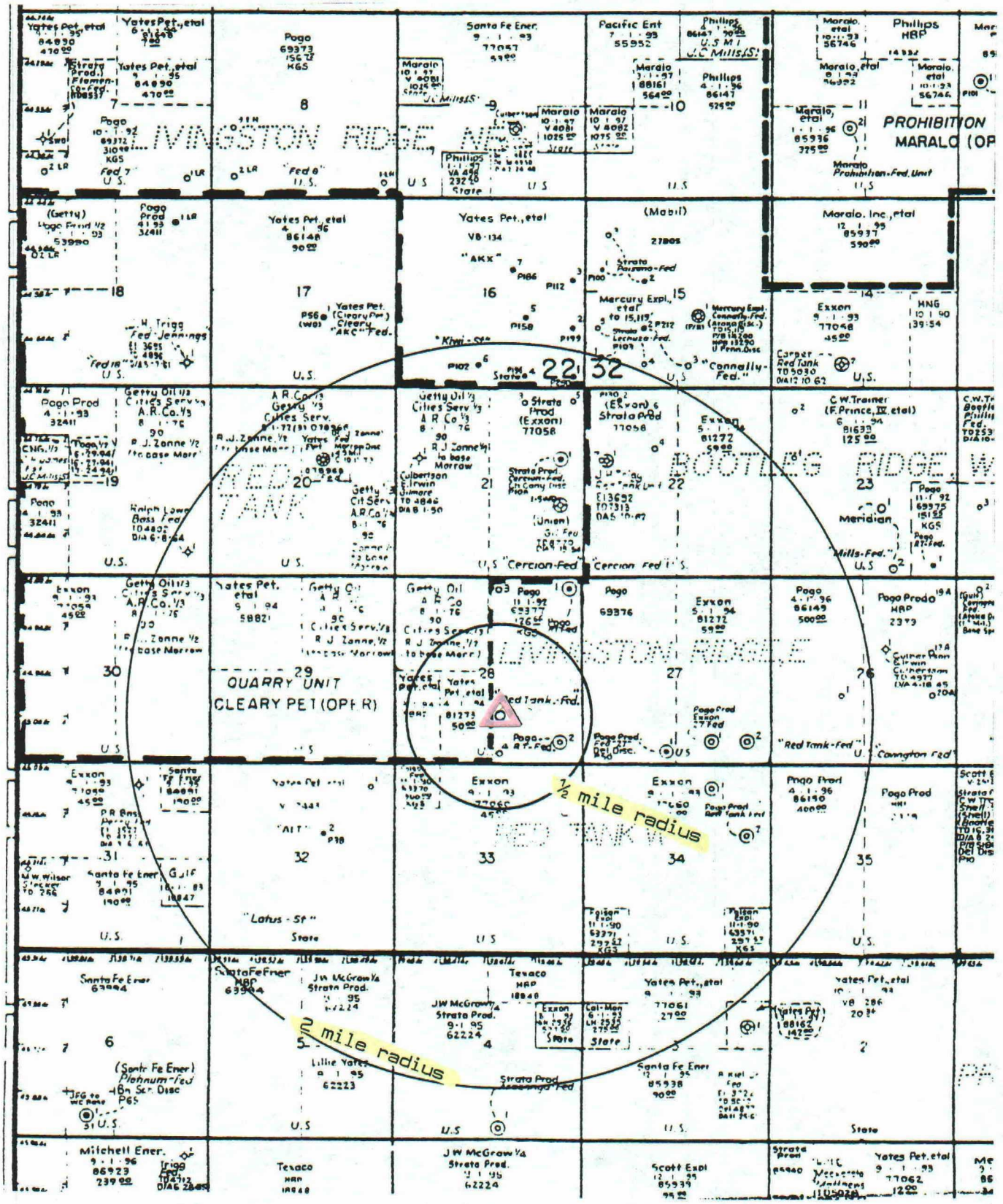
Next higher: none

Next lower: Lower Delaware (Brushy Canyon) at 7070'

FORM C-108, ITEM V

IDENTIFICATION MAP

POGO PRODUCING COMPANY
RED TANK "28" FEDERAL #9
Section 28, TWP 22-S, R 32-E
Lea County, New Mexico



FORM C-108

Pogo Producing Company

ITEM VI

WELL DATA - AREA OF REVIEW

(1). Location: NO WELLS CURRENTLY INSIDE ½ MILE RADIUS

Operator: _____ Lease: _____ Well # ____

Well type: Oil _____ Gas _____ D&A _____ Total depth _____ ft.

Date drilled: _____

Completion Data: _____

_____

_____

_____

Plugged _____ Date: _____ (Schematic attached)

FORM C-108

Pogo Producing Company

ITEM VII

OPERATIONAL DATA

(1). Average anticipated injection rate - 500 BPD, anticipated maximum rate - 2000 BPD

(2). Closed system

(3). Estimated average injection pressure - 500 psi
Estimated maximum pressure - 995 psi

(4). Source(s) of injection fluids:
Produced water from Brushy Canyon and Bone Spring zones in Pogo's nearby wells
Analysis of waters attached, Exhibits 1 and 2

(5). Analysis of injection zone water attached, Exhibit 3
Data source: Corbin Delaware; 31-17-33
Roswell Geological Soc. Symposium

FORM C-108

Pogo Producing Company

ITEM VIII

GEOLOGICAL DATA

INJECTION ZONE

Lithological description: sandstone, lt. gray, fine to v.fine grained, poorly consolidated, silty, poor calc. cem.

Geological name: Bell Canyon (Delaware)

Zone thickness: 850 ft.; Depth: 5600 ft. base

FRESH WATER SOURCES

Geological name: Santa Rosa

Depth to bottom of zone: ± 650 ft.

ITEM IX

STIMULATION PROGRAM (Proposed)

ACIDIZE:

Volume: 3000 gal. Type acid: 15% HCl/Pentol 100

Rate: 5 BPM; Misc. 90 Ball Sealers

FRACTURE:

Fluid volume: 30,000 gal.; Type: Gelled Water

Prop type: 20/40 sand Volume (#): 15,000

Rate: 18 BPM; Conductor: 2 7/8 in.

Misc. 5 equal stages with Ball Sealers

FORM C-108 Pogo Producing Company

ITEM X

Well to be drilled; log submitted from Red Tank "28" Fed. #1 to NE

ITEM XI

Chemical analysis from fresh water well located in Sec. 14 - 22 - 31 at WIPP Site, Eddy County, sample taken 5/24/78 (Exhibit 4)

ITEM XII

Various engineering data and area well logs reveal no evidence that there might exist hydrologic connection between the intended injection zone (Bell Canyon) at 4975' and probable fresh water zone (Santa Rosa) above 650'.

FORM C-108, ITEM VII(4)

EXHIBIT I

ANALYSIS - BRUSHY CANYON
PRODUCED WATER

POGO PRODUCING COMPANY
RED TANK "28" FEDERAL #9
Section 28, TWP 22-S, R 32-E
Lea County, New Mexico

16010 Barker's Point Lane • Houston, Texas 77079
713 558-5200 • Telex: 4620346 • FAX: 713 589-4737

apply to: P.O. Box FF
Artesia, New Mexico 88210
(505) 746-3588 Phone
(505) 746-3580 Fax

WATER ANALYSIS REPORT

Company : POGO PRODUCING
Address : MIDLAND, TEXAS
Lease : RED TANK FED. 28
Well : #1 Brushy Canyon(Del)
Sample Pt. : WELLHEAD

Date : 01/08/93
Date Sampled : 01/04/93
Analysis No. : 005

	ANALYSIS		mg/L		* meq/L
1.	pH	6.2			
2.	H2S	3 PPM			
3.	Specific Gravity	1.160			
4.	Total Dissolved Solids		279018.4		
5.	Suspended Solids		NR		
6.	Dissolved Oxygen		NR		
7.	Dissolved CO2		80 PPM		
8.	Oil In Water		NR		
9.	Phenolphthalein Alkalinity (CaCO3)				
10.	Methyl Orange Alkalinity (CaCO3)		60.0		
11.	Bicarbonate	HCO3	73.2	HCO3	1.2
12.	Chloride	Cl	170409.6	Cl	4807.9
13.	Sulfate	SO4	1000.0	SO4	20.8
14.	Calcium	Ca	16881.7	Ca	842.4
15.	Magnesium	Mg	1186.3	Mg	97.6
16.	Sodium (calculated)	Na	89409.6	Na	3889.1
17.	Iron	Fe	58.0		
18.	Barium	Ba	NR		
19.	Strontium	Sr	NR		
20.	Total Hardness (CaCO3)		47042.3		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter

842	*Ca <----- *HCO3	1
	/------->	
98	*Mg -----> *SO4	21
	<----------/	
3889	*Na -----> *Cl	4807

Saturation Values Dist. Water 20 C
CaCO3 13 mg/L
CaSO4 * 2H2O 2090 mg/L
BaSO4 2.4 mg/L

Compound	Equiv wt	X meq/L	= mg/L
Ca(HCO3)2	81.0	1.2	97
CaSO4	68.1	20.8	1417
CaCl2	55.5	820.4	45523
Mg(HCO3)2	73.2		
MgSO4	60.2		
MgCl2	47.6	97.6	4646
NaHCO3	84.0		
Na2SO4	71.0		
NaCl	58.4	3889.1	227277

REMARKS:
L. MALLETT / FILE

Petrolite Oilfield Chemicals Group

Respectfully submitted,
ROZANNE JOHNSON

FORM C-108, ITEM VII(4)

EXHIBIT 2

ANALYSIS - BONE SPRING (UP)
PRODUCED WATER

POGO PRODUCING COMPANY
RED TANK "28" FEDERAL #9
Section 28, TWP 22-S, R 32-E
Lea County, New Mexico

TER ANALYSIS REPORT

Date : 1-23-93
Date Sampled : 1-22-93
Analysis No. : 006

Lease : RED TANK FED.
Well : 23-1 Bone Spring
Sample Pt. : WELL

	ANALYSIS		mg/L		* meq/L
1.	pH	5.9			
2.	H2S	0			
3.	Specific Gravity	1.155			
4.	Total Dissolved Solids		243572.9		
5.	Suspended Solids		NR		
6.	Dissolved Oxygen		NR		
7.	Dissolved CO2		NR		
8.	Oil In Water		NR		
9.	Phenolphthalein Alkalinity (CaCO3)				
10.	Methyl Orange Alkalinity (CaCO3)				
11.	Bicarbonate	HCO3	48.8	HCO3	0.8
12.	Chloride	Cl	151230.0	Cl	4266.0
13.	Sulfate	SO4	250.0	SO4	5.2
14.	Calcium	Ca	16840.0	Ca	840.3
15.	Magnesium	Mg	4140.2	Mg	340.6
16.	Sodium (calculated)	Na	71063.9	Na	3091.1
17.	Iron	Fe	0.0		
18.	Barium	Ba	0.0		
19.	Strontium	Sr	0.0		
20.	Total Hardness (CaCO3)		59100.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter

840	*Ca <----- *HCO3	1
	/------->	
341	*Mg -----> *SO4	5
	<----------/	
3091	*Na -----> *Cl	4266

Saturation Values Dist. Water 20 C

CaCO3	13 mg/L
CaSO4 * 2H2O	2090 mg/L
BaSO4	2.4 mg/L

Compound	Equiv wt	X meq/L	= mg/L
Ca(HCO3)2	81.0	0.8	65
CaSO4	68.1	5.2	354
CaCl2	55.5	834.3	46296
Mg(HCO3)2	73.2		
MgSO4	60.2		
MgCl2	47.6	340.6	16215
NaHCO3	84.0		
Na2SO4	71.0		
NaCl	58.4	3091.1	180643

REMARKS: L. MALLETT -FILE

Petrolite Oilfield Chemicals Group

Respectfully submitted,
L. MALLETT

FORM C-108, ITEM VII(5)

EXHIBIT 3

ANALYSIS - INJECTION ZONE
PRODUCED WATER

POGO PRODUCING COMPANY
RED TANK "28" FEDERAL #9
Section 28, TWP 22-S, R 32-E
Lea County, New Mexico

d Name: Corbin Delaware
Location: NE¼ Sec. 31, T.17 S., R. 33 E.
County & State: Lea Co., N. Mex.

COMPLETION DATE: March 31, 1960

TYPICAL CORE ANALYSIS OF A PAY INTERVAL IN THIS FIELD: No cores taken

Perm. in millidarcys		% Porosity	Liquid Saturation (% of pore space)	
Horizontal	Vertical		Water	Oil

OTHER SHOWS ENCOUNTERED IN THIS FIELD: None

TRAP TYPE: Stratigraphic, sand pinchout
NATURE OF OIL: 37.8° gravity, sweet
NATURE OF GAS: sweet
NATURE OF PRODUCING ZONE WATER: Salt Resistivity: ohm-meters @ °F.

	Total Solids	Na+K	Ca	Mg	Fe	SO_4	Cl	CO_3	HCO_3	OH	H_2S
ppm		47,700	6160	2060	100	1500	89,400		160		neg

INITIAL FIELD PRESSURE: Unknown
TYPE OF DRIVE: Unknown
NORMAL COMPLETION PRACTICES: Set through, perforate & sand frac.

PRODUCTION DATA:

Year	Type	No. of wells @ yr. end		Production Oil in barrels Gas in MMCF	
		Producing	Shut in or Abnd.	Annual	Cumulative
1956	oil				
	gas				
1957	oil				
	gas				
1958	oil				
	gas				
1959	oil				
	gas				
1960*	oil	0	1 **	631.5	631.5
	gas				

* 1960 Figure is production to July 1, 1960.
** well shut in on April 19, 1960.

FORM C-108, ITEM XI

ANALYSIS - SANTA ROSA WATER

POGO PRODUCING COMPANY
RED TANK "28" FEDERAL #9
Section 28, TWP 22-S, R 32-E
Lea County, New Mexico

EXHIBIT 4

Chemical and radiochemical analyses of water from test hole H-5

Water produced from the Santa Rosa Sandstone, sample taken 5/24/78

Alkalinity Field (mg/l as HCO3)	200
Bicarbonate FET-FLD (mg/l as HCO3)	240
Nitrogen, NO2 + NO3 Dissolved (mg/l as N)	0.36
Hardness (mg/l as CACO3)	150
Hardness, noncarbonate(mg/l as CACO3)	150
Calcium Dissolved (mg/l as CA)	56
Magnesium, Dissolved (mg/l as MG)	51
Sodium, Dissolved (mg/l as NA)	280
Potassium, Dissolved (mg/l as K)	25
Chloride, Dissolved (mg/s as CL)	120
Sulfate, Dissolved (mg/l as SO4)	530
Fluoride, Dissolved (mg/l as F)	1.2
Silica, Dissolved (mg/l as SIO2)	11.0
Boron, Dissolved (ug/l as B)	890
Solids Residue at 105 Deg C, Dissolved (mg/l)	1200