

PETROLITE

WATER ANALYSIS REPORT

Company : POGO PRODUCING (OXY)
 Address : MIDLAND TX
 Lease : RED TANK FED.
 Well : 23-1
 Sample Pt. : WELL

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

ANALYSIS		mg/L	* meq/L
-----		----	-----
1.	pH	5.9	
2.	H ₂ S	0	
3.	Specific Gravity	1.155	
4.	Total Dissolved Solids	243572.9	
5.	Suspended Solids	NR	
6.	Dissolved Oxygen	NR	
7.	Dissolved CO ₂	NR	
8.	Oil In Water	NR	
9.	Phenolphthalein Alkalinity (CaCO ₃)		
10.	Methyl Orange Alkalinity (CaCO ₃)		
11.	Bicarbonate	HCO ₃ 48.8	HCO ₃ 0.8
12.	Chloride	Cl 151230.0	Cl 4266.0
13.	Sulfate	SO ₄ 250.0	SO ₄ 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 (CaCO ₃)	59100.0	

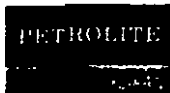
PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter				Compound Equiv wt X meq/L = mg/l			
840	*Ca <-----	*HCO3	1	Ca(HCO3)2	81.0	0.8	65
	/----->			CaSO4	68.1	5.2	354
341	*Mg ----->	*SO4	5	CaCl2	55.5	834.3	46296
	<-----/			Mg(HCO3)2	73.2		
3091	*Na ----->	*Cl	4266	MgSO4	60.2		
				MgCl2	47.6	340.6	16215
Saturation Values Dist. Water 20 C				NaHCO3	84.0		
CaCO3		13 mg/L		Na2SO4	71.0		
CaSO4 * 2H2O		2090 mg/L		NaCl	58.4	3091.1	180643
BaSO4		2.4 mg/L					

REMARKS: L. MALLETT -FILE

Petrolite Oilfield Chemicals Group

Respectfully submitted,
L. MALLETT



Petrolite Corporation
510 West Texas
Artesia, NM 88210-2041

TRETOLITE DIVISION

(505) 746-3588
Fax (505) 746-3580

Reply to:
P.O. Box FF
Artesia, NM
88211-7531

WATER ANALYSIS REPORT

Company : POGO PRODUCING
Address : MIDLAND, TX
Lease : RT 23
Well : #1
Sample Pt. : WELLHEAD

Date : 3/17/94
Date Sampled : 3/16/94
Analysis No. : 627

ANALYSIS		mg/L		* meq/L
-----		----		-----
1. pH	5.8			
2. H2S	NEG			
3. Specific Gravity	1.175			
4. Total Dissolved Solids		259409.6		
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	122.0	HCO3	2.0
12. Chloride	Cl	160815.0	Cl	4536.4
13. Sulfate	SO4	250.0	SO4	5.2
14. Calcium	Ca	17720.0	Ca	884.2
15. Magnesium	Mg	4067.9	Mg	334.7
16. Sodium (calculated)	Na	76434.7	Na	3324.7
17. Iron	Fe	NR		
18. Barium	Ba	NR		
19. Strontium	Sr	NR		
20. Total Hardness (CaCO3)		61000.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter		Compound	Equiv wt	X meq/L	= mg/L
-----		-----	-----	-----	-----
884	*Ca <----- *HCO3	Ca (HCO3) 2	81.0	2.0	162
	/----->	CaSO4	68.1	5.2	354
335	*Mg -----> *SO4	CaCl2	55.5	877.0	48666
	<-----/	Mg (HCO3) 2	73.2		
3325	*Na -----> *Cl	MgSO4	60.2		
		MgCl2	47.6	334.7	15932
Saturation Values Dist. Water 20 C		NaHCO3	84.0		
	CaCO3 13 mg/L	Na2SO4	71.0		
	CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3324.7	194295
	BaSO4 2.4 mg/L				

REMARKS:

Petrolite Oilfield Chemicals Group

Respectfully submitted,
A. MILLER

SCALE TENDENCY REPORT

Company	: POGO PRODUCING	Date	: 3/17/94
Address	: MIDLAND, TX	Date Sampled	: 3/16/94
Lease	: RT 23	Analysis No.	: 627
Well	: #1	Analyst	: A. MILLER
Sample Pt.	: WELLHEAD		

STABILITY INDEX CALCULATIONS
(Stiff-Davis Method)
CaCO₃ Scaling Tendency

S.I. =	0.1	at	60 deg. F	or	16 deg. C
S.I. =	0.1	at	80 deg. F	or	27 deg. C
S.I. =	0.1	at	100 deg. F	or	38 deg. C
S.I. =	0.1	at	120 deg. F	or	49 deg. C
S.I. =	0.1	at	140 deg. F	or	60 deg. C

CALCIUM SULFATE SCALING TENDENCY CALCULATIONS
(Skillman-McDonald-Stiff Method)
Calcium Sulfate

S =	764	at	60 deg. F	or	16 deg. C
S =	849	at	80 deg. F	or	27 deg. C
S =	903	at	100 deg. F	or	38 deg. C
S =	941	at	140 deg. F	or	60 deg. C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
A. MILLER



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Carlsbad Resource Area Headquarters

P. O. Box 1778

Carlsbad, New Mexico 88220

IN REPLY REFER TO

3162

April 7, 1994

OPERATOR: Pogo Producing Company Lease No. NM-69375

WELL NO. & NAME Red Tank 23 Federal #1

LOCATION: SE 1/4 SE 1/4, Sec. 23, T. 22 S., R. 32 E., Eddy County, N.M.
Lea

The check list below indicates the information needed before your Waste or Salt Water Disposal method can be approved:

Brushy Canyon/Bone Spring Name(s) of formation(s) producing water on the lease.

150 Total BBLS Amount of water produced from each formation in barrels per day.

Attached A water analysis of produced water from each zone showing at least the total dissolved solids, pH, and the concentrations of chlorides and sulfates.

500 BBL F.G. Tank How water is stored on the lease.

6" Poly Line How water is moved to disposal facility.

Pogo Producing Co. Operator's name, well name and location, by 1/4, section, township and range, of the disposal facility. If the disposal facility is an approved disposal system, the operator's name and the name of the disposal system should suffice.
Red Tank 28 Fed. #3 SWD

Supervisory Petroleum Engineer Technician