

MARTIN YATES, III
1912 - 1985
FRANK W. YATES
1936 - 1986



105 SOUTH FOURTH STREET
ARTESIA, NEW MEXICO 88210

TELEPHONE (505) 748-1471

S. P. YATES
CHAIRMAN OF THE BOARD
JOHN A. YATES
PRESIDENT
PEYTON YATES
EXECUTIVE VICE PRESIDENT
RANDY G. PATTERSON
SECRETARY
DENNIS G. KINSEY
TREASURER

June 19, 1995

State of New Mexico
Energy, Minerals and Natural Resources Dept.
Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505

RECEIVED

JUN 23 1995

Oil Conservation Division

Re: Flamenco Federal #1
Sec. 24 - T22S - R31E

David Ross AIT #1
Sec. 35 - T22S - R31E

Dear Sir:

Enclosed you will find the information you requested for the above listed wells.

Enclosed are the initial date of operation, measured or metered injection volumes, cumulative monthly injection pressures, and injected fluid density .

If you have any further question or need assistance please call.

Sincerely,

Liana Curry
Production Clerk

LC/pe
Enclosures

DAVID ROSS AIT #1

Initial Date of Operation: 7/4/91

Injected Fluid Density: 1.165

Flamenco Federal #1

Initial Date of Operation: 7/3/91

Injected Fluid Density: 1.180

DAVID ROSS AIT #1		
		BARRELS
DATE	PRESSURE	INJECTED
July 1991	500	4,045
August 1991	735	30,971
September 1991	690	32,250
October 1991	845	37,679
November 1991	175	38,602
December 1991	190	37,811
January 1992	180	41,464
February 1992	400	57,880
March 1992	291	50,632
April 1992	260	53,468
May 1992	290	47,805
June 1992	318	51,887
July 1992	329	57,946
August 1992	413	85,862
September 1992	518	96,119
October 1992	561	89,666
November 1992	608	79,144
December 1992	624	93,598
January 1993	739	129,361
February 1993	745	112,648
March 1993	879	127,743
April 1993	897	113,262
May 1993	900	102,137
June 1993	900	107,829
July 1993	900	107,658
August 1993	800	111,220
September 1993	850	104,939
October 1993	800	112,909
November 1993	800	69,651
December 1993	705	51,480
January 1994	755	56,141
February 1994	685	41,792
March 1994	694	47,757
April 1994	673	46,212
May 1994	589	51,373
June 1994	690	48,523
July 1994	699	68,799
August 1994	744	77,675
September 1994	800	83,519
October 1994	800	95,119
November 1994	817	82,733
December 1994	820	84,073

January 1995	800	47,662
February 1995	841	82,315
March 1995	883	97,696
April 1995	884	93,949
Total barrels injected to date		3,343,004



STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

June 8, 1995

Yates Petroleum Corporation
105 South Fourth Street
Artesia, New Mexico 88210

Attention: Mr. Jim Brown

Dear Jim:

I received a call recently from a Mr. Keith McCamey with the New Mexico Environment Department. Mr. McCamey was conducting some research on oilfield activities relating to WIPP. He inquired about the source water that is being injected into the David Ross "AIT" Federal Well No. 1 (H-35-22S-31E). I advised him that according to information contained within the permit file, the source water is from the Delaware formation. An analysis of such water indicates it contains total dissolved solids in the range of 115,832. He advised me that he had seen documents which shows that water of considerably different composition was being injected into the subject well.

Please be advised that an analysis of all source water being injected into the well is required to be on file with the Division. At your earliest convenience, please supply the Division an updated list of all source water and corresponding analysis being disposed of in the well. If you have any questions, please contact me at (505) 827-8184.

Sincerely,

A handwritten signature in cursive script, reading "David Catanach".

David Catanach
Engineer

xc: File-SWD-419

MARTIN YATES, III
1912 - 1985
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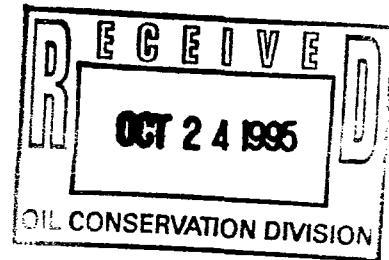
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TREASURER

October 20, 1995

Sub-419

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 S. Pacheco
Santa Fe, NM 87505



Attn: Mr. William J. LeMay

Re: David Ross AIT Federal #1 SWD
Sec. 35, T22S, R31E

Dear Mr. LeMay:

Attached for your information and files is a copy of the water analysis from each lease that supplies source water to the David Ross AIT Federal #1 SWD. Also attached is a water analysis from the David Ross SWD battery. Please accept our apology for the delay in gathering and submitting this data to you.

We have scheduled a radioactive tracer survey for Thursday, October 26 and have notified Mr. Tim Gum of the same so he can arrange to witness the tracer survey.

Please call me at 505-748-4182 if you have any questions or need additional information.

Sincerely,

Brian Collins
Engineer

Attachments

xc: Geology Wellfile
Engineering Wellfile
NMOCD Artesia: Mr. Tim Gum
NMOCD Santa Fe: Mr. David Catanach
Mike Slater
Jim Brown
Randy Patterson

Source Water Summary
David Ross AIT Federal #1 SWD
35-T22S-R31E
Eddy County, New Mexico

Lease	Location	Chlorides, mg/l	Operator
David Ross SWD	35-22S-31E	178,068	Yates Petroleum
9-1	9-23S-31E	179,772	Santa Fe Energy
9-7	9-23S-31E	161,028	Santa Fe Energy
Medano A	16-23S-31E	164,010	Yates Petroleum
Medano B	16-23S-31E	182,754	Yates Petroleum
17-3	17-23S-31E	181,050	Santa Fe Energy
17-4	17-23S-31E	175,938	Santa Fe Energy
Pauline	32-23S-31E	188,292	Yates Petroleum
Sterling Silver 33	33-23S-31E	179,346	Santa Fe Energy
Sterling Silver 34	34-23S-31E	172,104	Santa Fe Energy
Saffron	2-23S-32E	166,992	Yates Petroleum
Amanda	11-23S-32E	172,530	Yates Petroleum
Continental	28-23S-32E	19,383	Yates Petroleum
Pronghorn AHO	6-23S-33E	95,850	Yates Petroleum
Pronghorn AAP	8-23S-33E	171,678	Yates Petroleum
Lily ALY	3-24S-31E	169,122	Yates Petroleum
Adeline	6-24S-31E	188,292	Yates Petroleum
Palladium 7-1	7-24S-31E	186,162	Santa Fe Energy
Squires ALR	7-24S-31E	184,458	Yates Petroleum
Cotton Draw	23-24S-31E	178,920	Yates Petroleum
Paduca	23-25S-32E	159,750	Yates Petroleum
Almost Texas	2-26S-31E	158,046	Yates Petroleum
Arapaho AKP	29-26S-33E	164,862	Yates Petroleum

DAVID ROSS SWD BATTERY

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : DAVID ROSS Analysis No. : 007
 Well : SWD
 Sample Pt. : TANK

35-22s-31e

ANALYSIS		mg/L		* meq/L
-----		----		-----
1. pH	5.5			
2. H2S	0 PPM			
3. Specific Gravity	1.185			
4. Total Dissolved Solids		286806.1		
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	85.0	HCO3	1.4
12. Chloride	Cl	178068.0	Cl	5023.1
13. Sulfate	SO4	0.0	SO4	0.0
14. Calcium	Ca	22240.0	Ca	1109.8
15. Magnesium	Mg	4022.4	Mg	330.9
16. Sodium (calculated)	Na	82390.7	Na	3583.8
17. Iron	Fe	NR		
18. Barium	Ba	NR		
19. Strontium	Sr	NR		
20. Total Hardness (CaCO3)		72100.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter		Compound	Equiv wt	X meq/L	=	mg/L
-----						-----
1110 *Ca <----- *HCO3	1	Ca(HCO3)2	81.0	1.4		113
----- /----->		CaSO4	68.1			
331 *Mg -----> *SO4	0	CaCl2	55.5	1108.4		61504
----- <-----/		Mg(HCO3)2	73.2			
3584 *Na -----> *Cl	5023	MgSO4	60.2			
-----		MgCl2	47.6	330.9		15754
Saturation Values Dist. Water 20 C		NaHCO3	84.0			
CaCO3 13 mg/L		Na2SO4	71.0			
CaSO4 * 2H2O 2090 mg/L		NaCl	58.4	3583.8		209435
BaSO4 2.4 mg/L						

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
 SHAWNA MATTHEWS

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: DAVID ROSS	Analysis No.	: 007
Well	: SWD	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. = -0.2 at 60 deg. F or 16 deg. C
S.I. = -0.2 at 80 deg. F or 27 deg. C
S.I. = -0.2 at 100 deg. F or 38 deg. C
S.I. = -0.2 at 120 deg. F or 49 deg. C
S.I. = -0.2 at 140 deg. F or 60 deg. C

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

S = 568 at 60 deg. F or 16 deg C
S = 632 at 80 deg. F or 27 deg C
S = 672 at 100 deg. F or 38 deg C
S = 689 at 120 deg. F or 49 deg C
S = 700 at 140 deg. F or 60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

SOURCE WELL BATTERIES

WATER ANALYSIS REPORT

Company : SANTA FE Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : 9-1 Analysis No. : 020
 Well : BATTERY
 Sample Pt. : TANK 9-236-31c

ANALYSIS		mg/L	* meq/L
-----		----	-----
1.	pH	5.5	
2.	H2S	0 PPM	
3.	Specific Gravity	1.195	
4.	Total Dissolved Solids	289808.2	
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	24.0	HCO3 0.4
12.	Chloride Cl	179772.0	Cl 5071.1
13.	Sulfate SO4	125.0	SO4 2.6
14.	Calcium Ca	24400.0	Ca 1217.6
15.	Magnesium Mg	3562.3	Mg 293.1
16.	Sodium (calculated) Na	81924.8	Na 3563.5
17.	Iron Fe	NR	
18.	Barium Ba	NR	
19.	Strontium Sr	NR	
20.	Total Hardness (CaCO3)	75600.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
+-----+	-----	-----	-----
1218 *Ca <----- *HCO3	Ca(HCO3)2	81.0 0.4	32
/----->	CaSO4	68.1 2.6	177
293 *Mg -----> *SO4	CaCl2	55.5 1214.6	67396
<-----/	Mg(HCO3)2	73.2	
3563 *Na -----> *Cl	MgSO4	60.2	
+-----+	MgCl2	47.6 293.1	13952
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4 3563.5	208251
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: 9-1	Analysis No.	: 020
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I.	=	-0.7	at	60 deg. F	or	16 deg. C
S.I.	=	-0.7	at	80 deg. F	or	27 deg. C
S.I.	=	-0.7	at	100 deg. F	or	38 deg. C
S.I.	=	-0.7	at	120 deg. F	or	49 deg. C
S.I.	=	-0.7	at	140 deg. F	or	60 deg. C

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

S	=	513	at	60 deg. F	or	16 deg C
S	=	571	at	80 deg. F	or	27 deg C
S	=	607	at	100 deg. F	or	38 deg C
S	=	622	at	120 deg. F	or	49 deg C
S	=	632	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : SANTA FE
 Address : ARTESIA, NM
 Lease : 9-7
 Well : BATTERY
 Sample Pt. : TANK

Date : 10/19/95
 Date Sampled : 10/18/95
 Analysis No. : 019

9-235-31e

ANALYSIS	mg/L	* meq/L
-----	----	-----
1. pH	5.6	
2. H ₂ S	0	
3. Specific Gravity	1.170	
4. Total Dissolved Solids	259113.9	
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 73.0	HCO ₃ 1.2
12. Chloride	Cl 161028.0	Cl 4542.4
13. Sulfate	SO ₄ 25.0	SO ₄ 0.5
14. Calcium	Ca 21000.0	Ca 1047.9
15. Magnesium	Mg 3802.9	Mg 312.9
16. Sodium (calculated)	Na 73185.0	Na 3183.3
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO ₃)	68100.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
-----	-----	-----	-----	-----
1048 *Ca <----- *HCO ₃	Ca(HCO ₃) ₂	81.0	1.2	97
/----->	CaSO ₄	68.1	0.5	35
313 *Mg -----> *SO ₄	CaCl ₂	55.5	1046.2	58053
<-----/	Mg(HCO ₃) ₂	73.2		
3183 *Na -----> *Cl	MgSO ₄	60.2		
	MgCl ₂	47.6	312.9	14894
Saturation Values Dist. Water 20 C	NaHCO ₃	84.0		
CaCO ₃ 13 mg/L	Na ₂ SO ₄	71.0		
CaSO ₄ * 2H ₂ O 2090 mg/L	NaCl	58.4	3183.3	186034
BaSO ₄ 2.4 mg/L				

REMARKS:

----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: 9-7	Analysis No.	: 019
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.2	at	60 deg. F	or	16 deg. C
S.I. =	-0.2	at	80 deg. F	or	27 deg. C
S.I. =	-0.2	at	100 deg. F	or	38 deg. C
S.I. =	-0.2	at	120 deg. F	or	49 deg. C
S.I. =	-0.2	at	140 deg. F	or	60 deg. C

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

S =	639	at	60 deg. F	or	16 deg C
S =	710	at	80 deg. F	or	27 deg C
S =	755	at	100 deg. F	or	38 deg C
S =	775	at	120 deg. F	or	49 deg C
S =	788	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : MEDANO A Analysis No. : 006
 Well : BATTERY 16-23s-31e
 Sample Pt. : TANK

ANALYSIS		mg/L	* meq/L
1. pH	5.5		
2. H2S	0 PPM		
3. Specific Gravity	1.185		
4. Total Dissolved Solids		264143.0	
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	73.0	HCO3 1.2
12. Chloride	Cl	164010.0	Cl 4626.5
13. Sulfate	SO4	200.0	SO4 4.2
14. Calcium	Ca	20960.0	Ca 1045.9
15. Magnesium	Mg	3972.9	Mg 326.9
16. Sodium (calculated)	Na	74927.0	Na 3259.1
17. Iron	Fe	NR	
18. Barium	Ba	NR	
19. Strontium	Sr	NR	
20. Total Hardness (CaCO3)		68700.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
1046 *Ca <----- *HCO3	Ca(HCO3)2	81.0	1.2	97
/----->	CaSO4	68.1	4.2	283
327 *Mg -----> *SO4	CaCl2	55.5	1040.5	57740
<-----/	Mg(HCO3)2	73.2		
3259 *Na -----> *Cl	MgSO4	60.2		
	MgCl2	47.6	326.9	15560
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3259.1	190463
BaSO4 2.4 mg/L				

REMARKS:
 ----- ANDY MILLER

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: MEDANO A	Analysis No.	: 006
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.3	at	60 deg. F	or	16 deg. C
S.I. =	-0.3	at	80 deg. F	or	27 deg. C
S.I. =	-0.3	at	100 deg. F	or	38 deg. C
S.I. =	-0.3	at	120 deg. F	or	49 deg. C
S.I. =	-0.3	at	140 deg. F	or	60 deg. C

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

S =	635	at	60 deg. F	or	16 deg C
S =	707	at	80 deg. F	or	27 deg C
S =	752	at	100 deg. F	or	38 deg C
S =	771	at	120 deg. F	or	49 deg C
S =	784	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : MEDANO B Analysis No. : 002
 Well : BATTERY 16-235-31e
 Sample Pt. : TANK

ANALYSIS	mg/L	* meq/L
-----	----	-----
1. pH	5.5	
2. H2S	0 PPM	
3. Specific Gravity	1.205	
4. Total Dissolved Solids	293207.3	
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 12.0	HCO3 0.2
12. Chloride	Cl 182754.0	Cl 5155.3
13. Sulfate	SO4 25.0	SO4 0.5
14. Calcium	Ca 25640.0	Ca 1279.4
15. Magnesium	Mg 4874.7	Mg 401.0
16. Sodium (calculated)	Na 79901.5	Na 3475.5
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	84100.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
+-----+				
1279 *Ca <----- *HCO3	Ca(HCO3)2	81.0	0.2	16
/----->	CaSO4	68.1	0.5	35
401 *Mg -----> *SO4	CaCl2	55.5	1278.7	70956
<-----/	Mg(HCO3)2	73.2		
3475 *Na -----> *Cl	MgSO4	60.2		
+-----+	MgCl2	47.6	401.0	19092
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3475.5	203108
BaSO4 2.4 mg/L				

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: MEDANO B	Analysis No.	: 002
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I.	=	-0.9	at	60 deg.	F or	16 deg.	C
S.I.	=	-1.0	at	80 deg.	F or	27 deg.	C
S.I.	=	-1.0	at	100 deg.	F or	38 deg.	C
S.I.	=	-1.0	at	120 deg.	F or	49 deg.	C
S.I.	=	-1.0	at	140 deg.	F or	60 deg.	C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : SANTA FE Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : 17-3 Analysis No. : 017
 Well : BATTERY
 Sample Pt. : TANK 17-23s-31e

ANALYSIS		mg/L		* meq/L
-----		----		-----
1. pH	5.6			
2. H2S	0 PPM			
3. Specific Gravity	1.200			
4. Total Dissolved Solids		291597.6		
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	12.2	HCO3	0.2
12. Chloride	Cl	181050.0	Cl	5107.2
13. Sulfate	SO4	0.0	SO4	0.0
14. Calcium	Ca	25480.0	Ca	1271.5
15. Magnesium	Mg	3514.5	Mg	289.1
16. Sodium (calculated)	Na	81540.9	Na	3546.8
17. Iron	Fe	NR		
18. Barium	Ba	NR		
19. Strontium	Sr	NR		
20. Total Hardness (CaCO3)		78100.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter		Compound	Equiv wt	X meq/L	= mg/L

1271 *Ca <----- *HCO3	0	Ca(HCO3)2	81.0	0.2	16
/----->		CaSO4	68.1		
289 *Mg -----> *SO4	0	CaCl2	55.5	1271.3	70542
<-----/		Mg(HCO3)2	73.2		
3547 *Na -----> *Cl	5107	MgSO4	60.2		
-----		MgCl2	47.6	289.1	13764
Saturation Values Dist. Water 20 C		NaHCO3	84.0		
CaCO3 13 mg/L		Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L		NaCl	58.4	3546.8	207275
BaSO4 2.4 mg/L					

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: 17-3	Analysis No.	: 017
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.9	at	60 deg. F	or	16 deg. C
S.I. =	-0.9	at	80 deg. F	or	27 deg. C
S.I. =	-0.9	at	100 deg. F	or	38 deg. C
S.I. =	-0.9	at	120 deg. F	or	49 deg. C
S.I. =	-0.9	at	140 deg. F	or	60 deg. C

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

S =	486	at	60 deg. F	or	16 deg C
S =	541	at	80 deg. F	or	27 deg C
S =	575	at	100 deg. F	or	38 deg C
S =	590	at	120 deg. F	or	49 deg C
S =	599	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : SANTA FE Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : 17-4 Analysis No. : 018
 Well : BATTERY
 Sample Pt. : TANK 17-236-31e

ANALYSIS		mg/L	* meq/L
1. pH	5.5		
2. H2S	0 PPM		
3. Specific Gravity	1.200		
4. Total Dissolved Solids		282297.4	
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	12.2	HCO3 0.2
12. Chloride	Cl	175938.0	Cl 4963.0
13. Sulfate	SO4	75.0	SO4 1.6
14. Calcium	Ca	24080.0	Ca 1201.6
15. Magnesium	Mg	4849.4	Mg 399.0
16. Sodium (calculated)	Na	77342.8	Na 3364.2
17. Iron	Fe	NR	
18. Barium	Ba	NR	
19. Strontium	Sr	NR	
20. Total Hardness (CaCO3)		80100.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
1202 *Ca <----- *HCO3	Ca(HCO3)2	81.0 0.2	16
/----->	CaSO4	68.1 1.6	106
399 *Mg -----> *SO4	CaCl2	55.5 1199.8	66579
<-----/	Mg(HCO3)2	73.2	
3364 *Na -----> *Cl	MgSO4	60.2	
	MgCl2	47.6 399.0	18993
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4 3364.2	196603
BaSO4 2.4 mg/L			

REMARKS:
 ----- ANDY MILLER



SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: 17-4	Analysis No.	: 018
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I.	=	-1.0	at	60 deg. F	or	16 deg. C
S.I.	=	-1.0	at	80 deg. F	or	27 deg. C
S.I.	=	-1.0	at	100 deg. F	or	38 deg. C
S.I.	=	-1.0	at	120 deg. F	or	49 deg. C
S.I.	=	-1.0	at	140 deg. F	or	60 deg. C

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

S	=	524	at	60 deg. F	or	16 deg C
S	=	583	at	80 deg. F	or	27 deg C
S	=	620	at	100 deg. F	or	38 deg C
S	=	636	at	120 deg. F	or	49 deg C
S	=	646	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group	Respectfully submitted, SHAWNA MATTHEWS
------------------------------------	--

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : PAULINE Analysis No. : 005
 Well : BATTERY 32-23g-31e
 Sample Pt. : TANK

ANALYSIS	mg/L	* meq/L
1. pH	5.5	
2. H2S	0 PPM	
3. Specific Gravity	1.200	
4. Total Dissolved Solids	304430.0	
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 36.0	HCO3 0.6
12. Chloride	Cl 188292.0	Cl 5311.5
13. Sulfate	SO4 300.0	SO4 6.2
14. Calcium	Ca 24560.0	Ca 1225.5
15. Magnesium	Mg 3198.1	Mg 263.1
16. Sodium (calculated)	Na 88043.8	Na 3829.7
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	74500.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
1226 *Ca <----- *HCO3	Ca(HCO3)2	81.0	0.6	48
/----->	CaSO4	68.1	6.2	425
263 *Mg -----> *SO4	CaCl2	55.5	1218.7	67626
<-----/	Mg(HCO3)2	73.2		
3830 *Na -----> *Cl	MgSO4	60.2		
	MgCl2	47.6	263.1	12525
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3829.7	223805
BaSO4 2.4 mg/L				

REMARKS:
 ----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: PAULINE	Analysis No.	: 005
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.5	at	60 deg. F	or	16 deg. C
S.I. =	-0.5	at	80 deg. F	or	27 deg. C
S.I. =	-0.5	at	100 deg. F	or	38 deg. C
S.I. =	-0.5	at	120 deg. F	or	49 deg. C
S.I. =	-0.5	at	140 deg. F	or	60 deg. C

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

S =	491	at	60 deg. F	or	16 deg C
S =	546	at	80 deg. F	or	27 deg C
S =	581	at	100 deg. F	or	38 deg C
S =	595	at	120 deg. F	or	49 deg C
S =	605	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : SANTA FE Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : STRELING SILVER 33 Analysis No. : 015
 Well : BATTERY
 Sample Pt. : TANK 33-236-31e

ANALYSIS	mg/L	* meq/L
1. pH	5.5	
2. H2S	0 PPM	
3. Specific Gravity	1.200	
4. Total Dissolved Solids	289914.9	
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 24.0	HCO3 0.4
12. Chloride	Cl 179346.0	Cl 5059.1
13. Sulfate	SO4 50.0	SO4 1.0
14. Calcium	Ca 20520.0	Ca 1024.0
15. Magnesium	Mg 3171.1	Mg 260.9
16. Sodium (calculated)	Na 86803.7	Na 3775.7
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	64300.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
1024 *Ca <----- *HCO3	Ca(HCO3)2	81.0	0.4	32
/----->	CaSO4	68.1	1.0	71
261 *Mg -----> *SO4	CaCl2	55.5	1022.5	56739
<-----/	Mg(HCO3)2	73.2		
3776 *Na -----> *Cl	MgSO4	60.2		
	MgCl2	47.6	260.9	12420
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3775.7	220653
BaSO4 2.4 mg/L				

REMARKS:

----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: STRELING SILVER 33	Analysis No.	: 015
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.8	at	60 deg. F	or	16 deg. C
S.I. =	-0.8	at	80 deg. F	or	27 deg. C
S.I. =	-0.8	at	100 deg. F	or	38 deg. C
S.I. =	-0.8	at	120 deg. F	or	49 deg. C
S.I. =	-0.8	at	140 deg. F	or	60 deg. C

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

S =	619	at	60 deg. F	or	16 deg C
S =	688	at	80 deg. F	or	27 deg C
S =	732	at	100 deg. F	or	38 deg C
S =	750	at	120 deg. F	or	49 deg C
S =	762	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : SANTA FE Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : STERLING SILVER 34 Analysis No. : 016
 Well : BATTERY
 Sample Pt. : TANK 34-234-31e

ANALYSIS	mg/L	* meq/L
1. pH	5.6	
2. H2S	0 PPM	
3. Specific Gravity	1.185	
4. Total Dissolved Solids	277611.5	
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 12.2	HCO3 0.2
12. Chloride	Cl 172104.0	Cl 4854.8
13. Sulfate	SO4 50.0	SO4 1.0
14. Calcium	Ca 21560.0	Ca 1075.8
15. Magnesium	Mg 3390.4	Mg 278.9
16. Sodium (calculated)	Na 80494.8	Na 3501.3
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	67800.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
1076 *Ca <----- *HCO3	Ca(HCO3)2	81.0 0.2	16
/----->	CaSO4	68.1 1.0	71
279 *Mg -----> *SO4	CaCl2	55.5 1074.6	59630
<-----/	Mg(HCO3)2	73.2	
3501 *Na -----> *Cl	MgSO4	60.2	
	MgCl2	47.6 278.9	13279
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4 3501.3	204616
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: STERLING SILVER 34	Analysis No.	: 016
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-1.0	at	60 deg. F	or	16 deg. C
S.I. =	-1.0	at	80 deg. F	or	27 deg. C
S.I. =	-1.0	at	100 deg. F	or	38 deg. C
S.I. =	-1.0	at	120 deg. F	or	49 deg. C
S.I. =	-1.0	at	140 deg. F	or	60 deg. C

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

S =	602	at	60 deg. F	or	16 deg C
S =	670	at	80 deg. F	or	27 deg C
S =	712	at	100 deg. F	or	38 deg C
S =	730	at	120 deg. F	or	49 deg C
S =	742	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : YATES PETROLEUM Date : 10/19/95
Address : ARTESIA, NM Date Sampled : 10/18/95
Lease : SAFFRON Analysis No. : 021
Well : BATTERY
Sample Pt. : TANK 2-23s-32e

ANALYSIS		mg/L		* meq/L
-----		----		-----
1. pH	5.8			
2. H2S	0 PPM			
3. Specific Gravity	1.175			
4. Total Dissolved Solids		269133.8		
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	36.0	HCO3	0.6
12. Chloride	Cl	166992.0	Cl	4710.6
13. Sulfate	SO4	0.0	SO4	0.0
14. Calcium	Ca	18400.0	Ca	918.2
15. Magnesium	Mg	3922.7	Mg	322.7
16. Sodium (calculated)	Na	79783.2	Na	3470.3
17. Iron	Fe	NR		
18. Barium	Ba	NR		
19. Strontium	Sr	NR		
20. Total Hardness (CaCO3)		62100.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter		Compound	Equiv wt	X meq/L	= mg/L

918	*Ca <----- *HCO3	Ca(HCO3)2	81.0	0.6	48
	/----->	CaSO4	68.1		
323	*Mg -----> *SO4	CaCl2	55.5	917.6	50916
	<-----/	Mg(HCO3)2	73.2		
3470	*Na -----> *Cl	MgSO4	60.2		
		MgCl2	47.6	322.7	15363
		NaHCO3	84.0		
		Na2SO4	71.0		
		NaCl	58.4	3470.3	202807
Saturation Values Dist. Water 20 C					
CaCO3	13 mg/L				
CaSO4 * 2H2O	2090 mg/L				
BaSO4	2.4 mg/L				

REMARKS:
----- ANDY MILLER

SCALE TENDENCY REPORT

Company	: YATES PETROLEUM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: SAFFRON	Analysis No.	: 021
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.4	at	60 deg. F	or	16 deg. C
S.I. =	-0.4	at	80 deg. F	or	27 deg. C
S.I. =	-0.4	at	100 deg. F	or	38 deg. C
S.I. =	-0.4	at	120 deg. F	or	49 deg. C
S.I. =	-0.4	at	140 deg. F	or	60 deg. C

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

S =	718	at	60 deg. F	or	16 deg C
S =	799	at	80 deg. F	or	27 deg C
S =	849	at	100 deg. F	or	38 deg C
S =	871	at	120 deg. F	or	49 deg C
S =	886	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : AMANDA Analysis No. : 012
 Well : BATTERY 11-235-32e
 Sample Pt. : TANK

ANALYSIS	mg/L	* meq/L
1. pH	5.6	
2. H2S	0 PPM	
3. Specific Gravity	1.185	
4. Total Dissolved Solids	277279.3	
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 36.0	HCO3 0.6
12. Chloride	Cl 172530.0	Cl 4866.9
13. Sulfate	SO4 50.0	SO4 1.0
14. Calcium	Ca 23800.0	Ca 1187.6
15. Magnesium	Mg 4217.7	Mg 347.0
16. Sodium (calculated)	Na 76645.6	Na 3333.9
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	76800.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
1188 *Ca <----- *HCO3	Ca(HCO3)2	81.0 0.6	48
/----->	CaSO4	68.1 1.0	71
347 *Mg -----> *SO4	CaCl2	55.5 1186.0	65811
<-----/	Mg(HCO3)2	73.2	
3334 *Na -----> *Cl	MgSO4	60.2	
	MgCl2	47.6 347.0	16519
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4 3333.9	194831
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
 SHAWNA MATTHEWS



SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: AMANDA	Analysis No.	: 012
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.4	at	60 deg. F	or	16 deg. C
S.I. =	-0.5	at	80 deg. F	or	27 deg. C
S.I. =	-0.5	at	100 deg. F	or	38 deg. C
S.I. =	-0.5	at	120 deg. F	or	49 deg. C
S.I. =	-0.5	at	140 deg. F	or	60 deg. C

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

S =	539	at	60 deg. F	or	16 deg C
S =	600	at	80 deg. F	or	27 deg C
S =	638	at	100 deg. F	or	38 deg C
S =	654	at	120 deg. F	or	49 deg C
S =	665	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : CONTINENTAL Analysis No. : 011
 Well : BATTERY 28-235-32e
 Sample Pt. : TANK

ANALYSIS		mg/L		* meq/L
-----		----		-----
1. pH	6.6			
2. H2S	1 PMM			
3. Specific Gravity	1.025			
4. Total Dissolved Solids		33026.7		
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	366.0	HCO3	6.0
12. Chloride	Cl	19383.0	Cl	546.8
13. Sulfate	SO4	625.0	SO4	13.0
14. Calcium	Ca	1080.0	Ca	53.9
15. Magnesium	Mg	219.6	Mg	18.1
16. Sodium (calculated)	Na	11353.1	Na	493.8
17. Iron	Fe	NR		
18. Barium	Ba	NR		
19. Strontium	Sr	NR		
20. Total Hardness (CaCO3)		3601.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter		Compound	Equiv wt X meq/L	= mg/L
-----+	-----+	-----	-----	-----
54 *Ca <----- *HCO3	6	Ca(HCO3)2	81.0 6.0	486
/----->		CaSO4	68.1 13.0	886
18 *Mg -----> *SO4	13	CaCl2	55.5 34.9	1935
<-----/		Mg(HCO3)2	73.2	
494 *Na -----> *Cl	547	MgSO4	60.2	
-----+	-----+	MgCl2	47.6 18.1	860
Saturation Values Dist. Water 20 C		NaHCO3	84.0	
CaCO3 13 mg/L		Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L		NaCl	58.4 493.8	28859
BaSO4 2.4 mg/L				

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
 SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: CONTINENTAL	Analysis No.	: 011
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.1	at	60 deg. F	or	16 deg. C
S.I. =	-0.0	at	80 deg. F	or	27 deg. C
S.I. =	0.0	at	100 deg. F	or	38 deg. C
S.I. =	0.1	at	120 deg. F	or	49 deg. C
S.I. =	0.2	at	140 deg. F	or	60 deg. C

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

S =	3401	at	60 deg. F	or	16 deg C
S =	3588	at	80 deg. F	or	27 deg C
S =	3686	at	100 deg. F	or	38 deg C
S =	3711	at	120 deg. F	or	49 deg C
S =	3718	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : PRONGHORN ~~ATTO~~ AHO Analysis No. : 014
 Well : BATTERY
 Sample Pt. : TANK 6-235-33e

ANALYSIS		mg/L	* meq/L
-----		----	-----
1. pH	6.0		
2. H2S	4 PPM		
3. Specific Gravity	1.100		
4. Total Dissolved Solids		159486.3	
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	976.0	HCO3 16.0
12. Chloride	Cl	95850.0	Cl 2703.8
13. Sulfate	SO4	1100.0	SO4 22.9
14. Calcium	Ca	4400.0	Ca 219.6
15. Magnesium	Mg	950.2	Mg 78.2
16. Sodium (calculated)	Na	56210.1	Na 2445.0
17. Iron	Fe	NR	
18. Barium	Ba	NR	
19. Strontium	Sr	NR	
20. Total Hardness (CaCO3)		14900.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
+-----+			
220 *Ca <----- *HCO3	Ca(HCO3)2	81.0 16.0	1297
/----->	CaSO4	68.1 22.9	1559
78 *Mg -----> *SO4	CaCl2	55.5 180.7	10025
<-----/	Mg(HCO3)2	73.2	
2445 *Na -----> *Cl	MgSO4	60.2	
+-----+	MgCl2	47.6 78.2	3721
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4 2445.0	142885
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER



SCALE TENDENCY REPORT -----

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: PRONGHORN ATTO	Analysis No.	: 014
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	0.4	at	60 deg. F	or	16 deg. C
S.I. =	0.4	at	80 deg. F	or	27 deg. C
S.I. =	0.5	at	100 deg. F	or	38 deg. C
S.I. =	0.5	at	120 deg. F	or	49 deg. C
S.I. =	0.6	at	140 deg. F	or	60 deg. C

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

S =	3170	at	60 deg. F	or	16 deg C
S =	3466	at	80 deg. F	or	27 deg C
S =	3655	at	100 deg. F	or	38 deg C
S =	3744	at	120 deg. F	or	49 deg C
S =	3808	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLEUM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : PRONGHORN AAP Analysis No. : 022
 Well : BATTERY
 Sample Pt. : TANK 8-23s-33e

ANALYSIS		mg/L		* meq/L
-----		----		-----
1. pH	5.8			
2. H2S	0 PPM			
3. Specific Gravity	1.160			
4. Total Dissolved Solids		275336.2		
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	85.0	HCO3	1.4
12. Chloride	Cl	171678.0	Cl	4842.8
13. Sulfate	SO4	0.0	SO4	0.0
14. Calcium	Ca	16560.0	Ca	826.3
15. Magnesium	Mg	6010.2	Mg	494.5
16. Sodium (calculated)	Na	81003.0	Na	3523.4
17. Iron	Fe	NR		
18. Barium	Ba	NR		
19. Strontium	Sr	NR		
20. Total Hardness (CaCO3)		66100.0		

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter		Compound	Equiv wt X meq/L	= mg/L

826 *Ca <----- *HCO3	1	Ca(HCO3)2	81.0	1.4
/----->		CaSO4	68.1	
494 *Mg -----> *SO4	0	CaCl2	55.5	825.0
<-----/		Mg(HCO3)2	73.2	
3523 *Na -----> *Cl	4843	MgSO4	60.2	
		MgCl2	47.6	494.5
Saturation Values Dist. Water 20 C		NaHCO3	84.0	
CaCO3 13 mg/L		Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L		NaCl	58.4	3523.4
BaSO4 2.4 mg/L				205908

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLEUM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: PRONGHORN AAP	Analysis No.	: 022
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.0	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. =	-0.0	at	140 deg. F	or	60 deg. C

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

S =	781	at	60 deg. F	or	16 deg C
S =	868	at	80 deg. F	or	27 deg C
S =	923	at	100 deg. F	or	38 deg C
S =	946	at	120 deg. F	or	49 deg C
S =	962	at	140 deg. F	or	60 deg C

Petro-lite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : LILY "ALY" Analysis No. : 008
 Well : BATTERY 3-24s-31e
 Sample Pt. : TANK

ANALYSIS	mg/L	* meq/L
1. pH	5.6	
2. H2S	0 PPM	
3. Specific Gravity	1.085	
4. Total Dissolved Solids	264096.9	
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 48.0	HCO3 0.8
12. Chloride	Cl 169122.0	Cl 4770.7
13. Sulfate	SO4 0.0	SO4 0.0
14. Calcium	Ca 2300.0	Ca 114.8
15. Magnesium	Mg 16189.6	Mg 1331.9
16. Sodium (calculated)	Na 76437.3	Na 3324.8
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	72400.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
+-----+				
115 *Ca <----- *HCO3	Ca(HCO3)2	81.0	0.8	64
/----->	CaSO4	68.1		
1332 *Mg -----> *SO4	CaCl2	55.5	114.0	6325
<-----/	Mg(HCO3)2	73.2		
3325 *Na -----> *Cl	MgSO4	60.2		
+-----+	MgCl2	47.6	1331.9	63406
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3324.8	194302
BaSO4 2.4 mg/L				

REMARKS:
 ----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: LILY "ALY"	Analysis No.	: 008
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. = -1.4 at 60 deg. F or 16 deg. C
 S.I. = -1.4 at 80 deg. F or 27 deg. C
 S.I. = -1.4 at 100 deg. F or 38 deg. C
 S.I. = -1.4 at 120 deg. F or 49 deg. C
 S.I. = -1.3 at 140 deg. F or 60 deg. C

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

S = 3830 at 60 deg. F or 16 deg C
 S = 4151 at 80 deg. F or 27 deg C
 S = 4345 at 100 deg. F or 38 deg C
 S = 4427 at 120 deg. F or 49 deg C
 S = 4481 at 140 deg. F or 60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : ADELINE Analysis No. : 003
 Well : BATTERY 6-24s-31e
 Sample Pt. : TANK

ANALYSIS	mg/L	* meq/L
1. pH	5.5	
2. H2S	0 PPM	
3. Specific Gravity	1.200	
4. Total Dissolved Solids	303346.6	
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 36.0	HCO3 0.6
12. Chloride	Cl 188292.0	Cl 5311.5
13. Sulfate	SO4 0.0	SO4 0.0
14. Calcium	Ca 25080.0	Ca 1251.5
15. Magnesium	Mg 3830.0	Mg 315.1
16. Sodium (calculated)	Na 86108.6	Na 3745.5
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	78400.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
+-----+	+-----+	+-----+	+-----+
1251 *Ca <----- *HCO3 1	Ca(HCO3)2	81.0	0.6 48
----- /-----> -----	CaSO4	68.1	
315 *Mg -----> *SO4 0	CaCl2	55.5	1250.9 69413
----- <-----/ -----	Mg(HCO3)2	73.2	
3745 *Na -----> *Cl 5311	MgSO4	60.2	
+-----+	+-----+	+-----+	+-----+
	MgCl2	47.6	315.1 15000
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3745.5 218886
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: ADELINE	Analysis No.	: 003
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.5	at	60 deg. F	or	16 deg. C
S.I. =	-0.5	at	80 deg. F	or	27 deg. C
S.I. =	-0.5	at	100 deg. F	or	38 deg. C
S.I. =	-0.5	at	120 deg. F	or	49 deg. C
S.I. =	-0.5	at	140 deg. F	or	60 deg. C

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

S =	476	at	60 deg. F	or	16 deg C
S =	529	at	80 deg. F	or	27 deg C
S =	562	at	100 deg. F	or	38 deg C
S =	576	at	120 deg. F	or	49 deg C
S =	586	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : SANTA FE Date : 10/19/95
 Address : ARTESIA Date Sampled : 10/18/95
 Lease : PLADDIUM 7 FEDERAL#1 Analysis No. : 001
 Well : BATTERY 7-24-3/e
 Sample Pt. : TANK

ANALYSIS		mg/L	* meq/L
-----		----	-----
1. pH	5.4		
2. H2S	0 PPM		
3. Specific Gravity	1.205		
4. Total Dissolved Solids		303388.1	
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	36.0	HCO3 0.6
12. Chloride	Cl	186162.0	Cl 5251.4
13. Sulfate	SO4	0.0	SO4 0.0
14. Calcium	Ca	23600.0	Ca 1177.6
15. Magnesium	Mg	88.6	Mg 7.3
16. Sodium (calculated)	Na	93501.5	Na 4067.1
17. Iron	Fe	NR	
18. Barium	Ba	NR	
19. Strontium	Sr	NR	
20. Total Hardness (CaCO3)		59300.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
-----	-----	-----	-----
1178 *Ca <----- *HCO3	Ca(HCO3)2	81.0 0.6	48
/----->	CaSO4	68.1	
7 *Mg -----> *SO4	CaCl2	55.5 1177.1	65315
<-----/	Mg(HCO3)2	73.2	
4067 *Na -----> *Cl	MgSO4	60.2	
	MgCl2	47.6 7.3	347
	NaHCO3	84.0	
	Na2SO4	71.0	
	NaCl	58.4 4067.1	237679

Saturation Values Dist. Water 20 C

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

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
 SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: SANTA FE	Date	: 10/19/95
Address	: ARTESIA	Date Sampled	: 10/18/95
Lease	: PLADDIUM 7 FEDERAL #	Analysis No.	: 001
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I.	=	-0.6	at	60 deg. F	or	16 deg. C
S.I.	=	-0.6	at	80 deg. F	or	27 deg. C
S.I.	=	-0.7	at	100 deg. F	or	38 deg. C
S.I.	=	-0.7	at	120 deg. F	or	49 deg. C
S.I.	=	-0.7	at	140 deg. F	or	60 deg. C

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

S	=	528	at	60 deg. F	or	16 deg C
S	=	588	at	80 deg. F	or	27 deg C
S	=	625	at	100 deg. F	or	38 deg C
S	=	640	at	120 deg. F	or	49 deg C
S	=	651	at	140 deg. F	or	60 deg C

Petroliite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : SQUIRE "ALR" Analysis No. : 004
 Well : BATTERY
 Sample Pt. : TANK 7-24s-31e

ANALYSIS	mg/L	* meq/L
1. pH	5.5	
2. H2S	0 PPM	
3. Specific Gravity	1.200	
4. Total Dissolved Solids	297323.3	
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 48.0	HCO3 0.8
12. Chloride	Cl 184458.0	Cl 5203.3
13. Sulfate	SO4 50.0	SO4 1.0
14. Calcium	Ca 25000.0	Ca 1247.5
15. Magnesium	Mg 3611.3	Mg 297.1
16. Sodium (calculated)	Na 84152.0	Na 3660.5
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	77300.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
1248 *Ca <----- *HCO3	Ca(HCO3)2	81.0	0.8	64
/----->	CaSO4	68.1	1.0	71
297 *Mg -----> *SO4	CaCl2	55.5	1245.7	69123
<-----/	Mg(HCO3)2	73.2		
3661 *Na -----> *Cl	MgSO4	60.2		
	MgCl2	47.6	297.1	14144
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3660.5	213922
BaSO4 2.4 mg/L				

REMARKS:

----- ANDY MILLER

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: SQUIRE "ALR"	Analysis No.	: 004
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I.	=	-0.4	at	60 deg. F	or	16 deg. C
S.I.	=	-0.4	at	80 deg. F	or	27 deg. C
S.I.	=	-0.4	at	100 deg. F	or	38 deg. C
S.I.	=	-0.4	at	120 deg. F	or	49 deg. C
S.I.	=	-0.4	at	140 deg. F	or	60 deg. C

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

S	=	488	at	60 deg. F	or	16 deg C
S	=	544	at	80 deg. F	or	27 deg C
S	=	578	at	100 deg. F	or	38 deg C
S	=	592	at	120 deg. F	or	49 deg C
S	=	602	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : COTTON DRAW Analysis No. : 010
 Well : BATTERY
 Sample Pt. : TANK 23-244-31e

ANALYSIS	mg/L	* meq/L
1. pH	5.4	
2. H2S	0 PPM	
3. Specific Gravity	1.200	
4. Total Dissolved Solids	287257.9	
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 61.0	HCO3 1.0
12. Chloride	Cl 178920.0	Cl 5047.1
13. Sulfate	SO4 100.0	SO4 2.1
14. Calcium	Ca 26680.0	Ca 1331.3
15. Magnesium	Mg 4486.8	Mg 369.1
16. Sodium (calculated)	Na 77010.1	Na 3349.7
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	85100.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
1331 *Ca <----- *HCO3	Ca(HCO3)2	81.0	1.0	81
/----->	CaSO4	68.1	2.1	142
369 *Mg -----> *SO4	CaCl2	55.5	1328.3	73705
<-----/	Mg(HCO3)2	73.2		
3350 *Na -----> *Cl	MgSO4	60.2		
	MgCl2	47.6	369.1	17573
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3349.7	195758
BaSO4 2.4 mg/L				

REMARKS:
 ----- ANDY MILLER

SCALE TENDENCY REPORT

Company : YATES PETROLUEM Date : 10/19/95
Address : ARTESIA, NM Date Sampled : 10/18/95
Lease : COTTON DRAW Analysis No. : 010
Well : BATTERY Analyst : SHAWNA MATTHEWS
Sample Pt. : TANK

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

S.I. = -0.3 at 60 deg. F or 16 deg. C
S.I. = -0.4 at 80 deg. F or 27 deg. C
S.I. = -0.4 at 100 deg. F or 38 deg. C
S.I. = -0.4 at 120 deg. F or 49 deg. C
S.I. = -0.4 at 140 deg. F or 60 deg. C

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

S = 464 at 60 deg. F or 16 deg C
S = 517 at 80 deg. F or 27 deg C
S = 549 at 100 deg. F or 38 deg C
S = 563 at 120 deg. F or 49 deg C
S = 572 at 140 deg. F or 60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : PADUCA Analysis No. : 009
 Well : BATTERY 23-25s-32e
 Sample Pt. : TANK

ANALYSIS		mg/L	* meq/L
-----		----	-----
1. pH	5.6		
2. H2S	0		
3. Specific Gravity	1.170		
4. Total Dissolved Solids		257038.3	
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	109.0	HCO3 1.8
12. Chloride	Cl	159750.0	Cl 4506.3
13. Sulfate	SO4	375.0	SO4 7.8
14. Calcium	Ca	24480.0	Ca 1221.6
15. Magnesium	Mg	3829.6	Mg 315.1
16. Sodium (calculated)	Na	68494.7	Na 2979.3
17. Iron	Fe	NR	
18. Barium	Ba	NR	
19. Strontium	Sr	NR	
20. Total Hardness (CaCO3)		76900.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
+-----+	-----	-----	-----
1222 *Ca <----- *HCO3	Ca(HCO3)2	81.0 1.8	145
/----->	CaSO4	68.1 7.8	531
315 *Mg -----> *SO4	CaCl2	55.5 1212.0	67252
<-----/	Mg(HCO3)2	73.2	
2979 *Na -----> *Cl	MgSO4	60.2	
+-----+	MgCl2	47.6 315.1	14998
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4 2979.3	174112
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: PADUCA	Analysis No.	: 009
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	0.0	at	60 deg. F	or	16 deg. C
S.I. =	0.0	at	80 deg. F	or	27 deg. C
S.I. =	0.0	at	100 deg. F	or	38 deg. C
S.I. =	0.0	at	120 deg. F	or	49 deg. C
S.I. =	0.0	at	140 deg. F	or	60 deg. C

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

S =	549	at	60 deg. F	or	16 deg C
S =	610	at	80 deg. F	or	27 deg C
S =	649	at	100 deg. F	or	38 deg C
S =	666	at	120 deg. F	or	49 deg C
S =	677	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLEUM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : ALMOST TEXAS Analysis No. : 023
 Well : BATTERY
 Sample Pt. : TANK 2-26s-31e

ANALYSIS	mg/L	* meq/L
1. pH	5.6	
2. H2S	1 PPM	
3. Specific Gravity	1.170	
4. Total Dissolved Solids	255544.8	
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 97.0	HCO3 1.6
12. Chloride	Cl 158046.0	Cl 4458.3
13. Sulfate	SO4 0.0	SO4 0.0
14. Calcium	Ca 18160.0	Ca 906.2
15. Magnesium	Mg 2756.7	Mg 226.8
16. Sodium (calculated)	Na 76485.2	Na 3326.9
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	56700.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt X meq/L	= mg/L
906 *Ca <----- *HCO3	Ca(HCO3)2	81.0	1.6 129
/----->	CaSO4	68.1	
227 *Mg -----> *SO4	CaCl2	55.5	904.6 50196
<-----/	Mg(HCO3)2	73.2	
3327 *Na -----> *Cl	MgSO4	60.2	
	MgCl2	47.6	226.8 10796
Saturation Values Dist. Water 20 C	NaHCO3	84.0	
CaCO3 13 mg/L	Na2SO4	71.0	
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	3326.9 194423
BaSO4 2.4 mg/L			

REMARKS:

----- ANDY MILLER

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLEUM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: ALMOST TEXAS	Analysis No.	: 023
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.2	at	60 deg. F	or	16 deg. C
S.I. =	-0.2	at	80 deg. F	or	27 deg. C
S.I. =	-0.2	at	100 deg. F	or	38 deg. C
S.I. =	-0.2	at	120 deg. F	or	49 deg. C
S.I. =	-0.2	at	140 deg. F	or	60 deg. C

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

S =	751	at	60 deg. F	or	16 deg C
S =	835	at	80 deg. F	or	27 deg C
S =	888	at	100 deg. F	or	38 deg C
S =	911	at	120 deg. F	or	49 deg C
S =	927	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

WATER ANALYSIS REPORT

Company : YATES PETROLUEM Date : 10/19/95
 Address : ARTESIA, NM Date Sampled : 10/18/95
 Lease : ARAPHO AKP Analysis No. : 013
 Well : BATTERY
 Sample Pt. : TANK 29-26s-33e

ANALYSIS	mg/L	* meq/L
-----	----	-----
1. pH	5.6	
2. H2S	0 PPM	
3. Specific Gravity	1.180	
4. Total Dissolved Solids	264604.5	
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 36.0	HCO3 0.6
12. Chloride	Cl 164862.0	Cl 4650.6
13. Sulfate	SO4 125.0	SO4 2.6
14. Calcium	Ca 30200.0	Ca 1507.0
15. Magnesium	Mg 3323.3	Mg 273.4
16. Sodium (calculated)	Na 66058.2	Na 2873.3
17. Iron	Fe NR	
18. Barium	Ba NR	
19. Strontium	Sr NR	
20. Total Hardness (CaCO3)	89100.0	

PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter	Compound	Equiv wt	X meq/L	= mg/L
-----	-----	-----	-----	-----
1507 *Ca <----- *HCO3	Ca(HCO3)2	81.0	0.6	48
/----->	CaSO4	68.1	2.6	177
273 *Mg -----> *SO4	CaCl2	55.5	1503.8	83445
<-----/	Mg(HCO3)2	73.2		
2873 *Na -----> *Cl	MgSO4	60.2		
-----	MgCl2	47.6	273.4	13016
Saturation Values Dist. Water 20 C	NaHCO3	84.0		
CaCO3 13 mg/L	Na2SO4	71.0		
CaSO4 * 2H2O 2090 mg/L	NaCl	58.4	2873.3	167918
BaSO4 2.4 mg/L				

REMARKS:

----- ANDY MILLER

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Respectfully submitted,
SHAWNA MATTHEWS

PETROLITE

SCALE TENDENCY REPORT

Company	: YATES PETROLUEM	Date	: 10/19/95
Address	: ARTESIA, NM	Date Sampled	: 10/18/95
Lease	: ARAPHO AKP	Analysis No.	: 013
Well	: BATTERY	Analyst	: SHAWNA MATTHEWS
Sample Pt.	: TANK		

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

S.I. =	-0.4	at	60 deg. F	or	16 deg. C
S.I. =	-0.4	at	80 deg. F	or	27 deg. C
S.I. =	-0.4	at	100 deg. F	or	38 deg. C
S.I. =	-0.4	at	120 deg. F	or	49 deg. C
S.I. =	-0.4	at	140 deg. F	or	60 deg. C

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

S =	431	at	60 deg. F	or	16 deg C
S =	480	at	80 deg. F	or	27 deg C
S =	510	at	100 deg. F	or	38 deg C
S =	523	at	120 deg. F	or	49 deg C
S =	532	at	140 deg. F	or	60 deg C

Petrolite Oilfield Chemicals Group

Respectfully submitted,
SHAWNA MATTHEWS