

Enviro-Chem, Inc.

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : G.P. II Energy

Lease : Grier

Well No. : Sample # 2 25% Produced

Lab No. : 181698.001 75% Fresh

Sample Loc. : 25p/75% F

Date Analyzed: 16-October-1998

Date Sampled : 09-October-1998

ANALYSIS

1. pH 6.780
2. Specific Gravity 60/60 F. 1.018
3. CaCO₃ Saturation Index 80 F. -0.477
140 F. -0.453

Dissolved Gases

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

MG/L EQ. WT. MEQ/L

Not Present
Not Determined
Not Determined

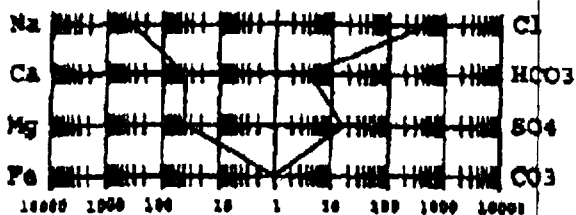
Cations

7. Calcium (Ca++) 834 / 20.1 = 41.49
8. Magnesium (Mg++) 442 / 12.2 = 36.23
9. Sodium (Na+) (Calculated) 379 / 23.0 = 16.48
10. Barium (Ba++) Not Determined 368.30

Anions

11. Hydroxyl (OH-) 0 / 17.0 = 0.00
12. Carbonate (CO₃--) 0 / 30.0 = 0.00
13. Bicarbonate (HCO₃-) 234 / 61.0 = 3.83
14. Sulfate (SO₄--) 750 / 48.0 = 15.63
15. Chloride (Cl-) 14,997 / 35.5 = 422.45
16. Total Dissolved Solids 25,636
17. Total Iron (Fe) 3
18. Total Hardness As CaCO₃ 3,903 / 10.2 = 0.11
19. Resistivity @ 75 F. (Calculated) 0.273 / cm.

LOGARITHMIC WATER PATTERN



Calcium Sulfate Solubility Profile



COMPOUND	EQ. WT. X	MEQ/L	mg/L
Ca(HCO ₃) ₂	81.04	3.83	310
CaSO ₄	68.07	15.37	1,046
CaCl ₂	55.50	22.29	1,237
Mg(HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCl ₂	47.62	36.23	1,725
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	363.93	21,273

*Milli Equivalents per Liter

This water is slightly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

ILLEGIBLE

Enviro-Chem, Inc.

WATER ANALYSIS REPORT

SAMPLE

Oil Co. : G.P. II Energy

Lease : Grier

Well No. : Sample # 1

Lab No. : 101698.001

50% Produced
50% Fresh

Sample Loc. : 80/30 E

Date Analyzed: 16-October-1998

Date Sampled : 09-October-1998

ANALYSIS

1. pH
2. Specific Gravity 60/60 F.
3. CaCO₃ Saturation Index

6.380
1.038
-0.416
+0.283

Dissolved Gases

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

Not Present
Not Determined
Not Determined

Cations

7. Calcium (Ca++)
8. Magnesium (Mg++)
9. Sodium (Na+)
10. Barium (Ba++)

(Calculated)

3.084
1.738
18.797
Not Determined

20.1 =
22.2 =
23.0 =

103.68
33.28
686.83

Anions

11. Hydroxyl (OH-)
12. Carbonate (CO₃=)
13. Bicarbonate (HCO₃-)
14. Sulfate (SO₄=)
15. Chloride (Cl-)

0
26.00
1.650
19.922

17.0 =
30.00 =
61.1 =
15.5 =

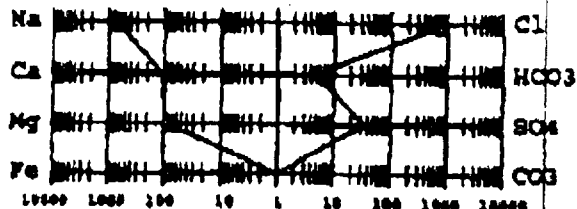
0.00
34.00
33.28
844.87

50.93g
2.883
0.161 /cm.

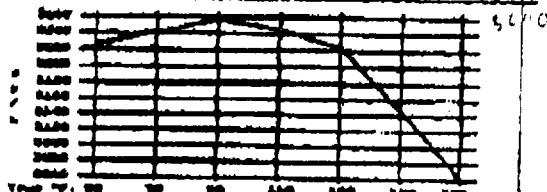
/ 18.2 =
0.28

16. Total Dissolved Solids
17. Total Iron (Fe)
18. Total Hardness As CaCO₃
19. Resistivity @ 75 F. (Calculated)

LOGARITHMIC WATER PATTERN



Calcium Sulfate Solubility Profile



COMPOUND	EQ. WT. %	*meq/L = mg/L.	
Ca(HCO ₃) ₂	81.04	4.39	355
CaSO ₄	68.07	33.81	2,302
CaCl ₂	55.50	65.48	3,634
Mg(HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCl ₂	47.62	93.28	4,442
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.48	686.11	40,110

This water is slightly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

ILLEGIBLE

915-570-4748
505 397 0012 P.04

P. 04

This water is slightly corrosive due to the pH observed on analysis. The corrosivity is increased by the content of mineral salts in solution.

Enviro-Chem, Inc. WATER ANALYSIS REPORT

SAMPLE

Oil Co. : G.P.II Energy
Lease : Griner
Well No. : Fresh Water
Lab No. : 101898.001

Sample Loc. :
Date Analyzed: 16-October-1998
Date Sampled : 09-October-1998

ANALYSIS

ILLEGIBLE

1. pH 8.460
2. Specific Gravity 60/60 F. 1.003
3. CaCO₃ Saturation Index 0.80 F. +0.260
0.140 F. -1.580

Dissolved Gases

4. Hydrogen Sulfide Not Present
5. Carbon Dioxide Not Determined
6. Dissolved Oxygen Not Determined

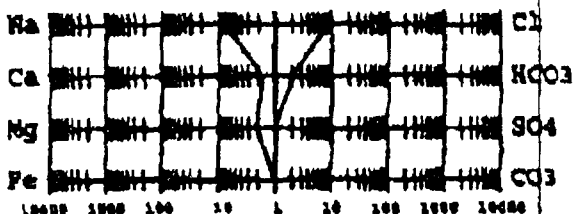
Cations

		MG/L	EQ. WT.	*MEQ/L
7. Calcium	[Ca ⁺⁺]	31	20.1	1.54
8. Magnesium	[Mg ⁺⁺]	23	12.2	1.90
9. Sodium	[Na ⁺]	177	23.0	7.70
10. Barium	[Ba ⁺⁺]	0	68.7	0.00
(Calculated)				

Anions

		MG/L	EQ. WT.	*MEQ/L
11. Hydroxyl	[OH ⁻]	0	17.0	0.00
12. Carbonate	[CO ₃ ⁼]	117	30.0	3.90
13. Bicarbonate	[HCO ₃ ⁻]	177	61.0	2.90
14. Sulfate	[SO ₄ ⁼]	300	48.0	6.25
15. Chloride	[Cl ⁻]	0	35.5	0.00
16. Total Dissolved Solids		595		
17. Total Iron (Fe)		142	18.2	0.08
18. Total Hardness as CaCO ₃				
19. Resistivity 875 F. (Calculated)		2.602	/cm.	

LOGARITHMIC WATER PATTERN



Calcium Sulfate Solubility Profile



COMPOUND	EQ. WT. X	*MEQ/L	mg/L.
Ca(HCO ₃) ₂	81.04	1.54	125
CaSO ₄	68.07	0.00	0
CaCl ₂	55.50	0.00	0
Mg(HCO ₃) ₂	73.17	0.37	27
MgSO ₄	60.19	0.92	56
MgCl ₂	47.62	0.75	36
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	7.70	450

*Milli Equivalents per Liter
This water is slightly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

Enviro-Chem, Inc. WATER ANALYSIS REPORT

SAMPLE

Oil Co. : S.P.II Energy
Lease : Oiler
Well No. : Water Tank Products H2O
Lab No. : 101698.081

Sample Loc. :
Date Analyzed: 16-October-1998
Date Sampled : 09-October-1998

ANALYSIS

ILLEGIBLE

1. pH 7.090
2. Specific Gravity 60/60 F. 1.068
3. CaCO₃ Saturation Index 80 F. +0.609
140 F. +1.529

Dissolved Gases

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

Not Present
Not Determined
Not Determined

Cations

7. Calcium (Ca++)
8. Magnesium (Mg++)
9. Sodium (Na+)
10. Barium (Ba++)

(Calculated)
Not Determined

mg/L Eq. Wt. *meq/L

4.168 / 20.1 = 207.36
1.580 / 12.2 = 129.51
29.433 / 23.0 = 1,279.83

Anions

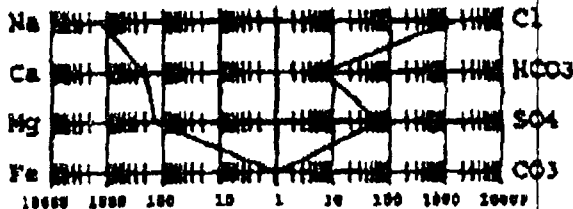
11. Hydroxyl (OH-)
12. Carbonate (CO₃=)
13. Bicarbonate (HCO₃-)
14. Sulfate (SO₄=)
15. Chloride (Cl-)

0 / 17.0 = 0.00
0 / 30.0 = 0.00
41.0 / 61.1 = 67.12
2,200.0 / 48.0 = 45,833.33
54,988 / 35.5 = 1,549.98

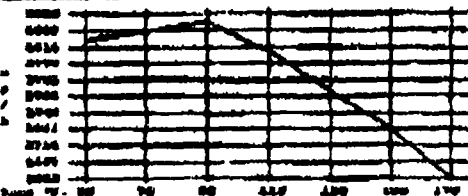
16. Total Dissolved Solids
17. Total Iron (Fe)
18. Total Hardness As CaCO₃
19. Resistivity @ 75 F. (Calculated)

93,483 / 10.2 = 9,165.00
15,913 / 10.2 = 1,560.10
0.101 / cm.

LOGARITHMIC WATER PATTERN



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION			
COMPOUND	MG. WT. X	*meq/L = mg/L.	
Ca(HCO ₃) ₂	81.04	6.79	550
CaSO ₄	68.07	59.43	4,045
CaCl ₂	55.50	141.14	7,834
Mg(HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCl ₂	47.62	129.51	6,167
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	1,278.30	74,730

This water is mildly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

Sulfate Solubility.