

MORROW



CAPROCK LABORATORIES, INC.

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WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Marathon Oil Company
Lease : Winston Federal
Well No. :
Job No. : 9407010

Sample Loc. : Separator Sight Glass
Date Sampled : 08-July-1994
Attention : Noel Garza
Analysis No. : 07010-2

ANALYSIS

- | | | |
|----|--|--------|
| 1. | pH | 6.550 |
| 2. | Specific Gravity 60/60 F. | 1.009 |
| 3. | CaCO ₃ Saturation Index @ 80 F. | -0.303 |
| | @ 140 F. | +0.817 |

MG/L EQ. WT. *MEQ/L

Dissolved Gases

- | | | |
|----|------------------|----------------|
| 4. | Hydrogen Sulfide | 10.8 |
| 5. | Carbon Dioxide | Not Determined |
| 6. | Dissolved Oxygen | Not Determined |

Cations

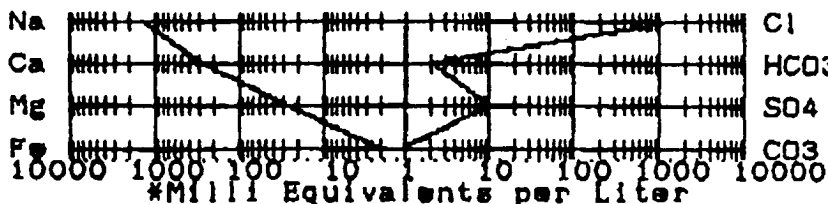
- | | | | | |
|-----|-------------------------------|---------------------|----------|----------|
| 7. | Calcium (Ca ⁺⁺) | 5,451 | / 20.1 = | 271.19 |
| 8. | Magnesium (Mg ⁺⁺) | 340 | / 12.2 = | 27.87 |
| 9. | Sodium (Na ⁺) | (Calculated) 32,955 | / 23.0 = | 1,432.83 |
| 10. | Barium (Ba ⁺⁺) | Not Determined | | |

Anions

- | | | | | |
|-----|--|------------|----------|----------|
| 11. | Hydroxyl (OH ⁻) | 0 | / 17.0 = | 0.00 |
| 12. | Carbonate (CO ₃ ⁻²) | 0 | / 30.0 = | 0.00 |
| 13. | Bicarbonate (HCO ₃ ⁻) | 134 | / 61.1 = | 2.19 |
| 14. | Sulfate (SO ₄ ⁻²) | 540 | / 48.8 = | 11.07 |
| 15. | Chloride (Cl ⁻) | 60,879 | / 35.5 = | 1,717.72 |
| 16. | Total Dissolved Solids | 100,399 | | |
| 17. | Total Iron (Fe) | 38 | / 18.2 = | 2.08 |
| 18. | Total Hardness As CaCO ₃ | 15,013 | | |
| 19. | Resistivity @ 75 F. (Calculated) | 0.092 /cm. | | |

LOGARITHMIC WATER PATTERN

*meq/L.



PROBABLE MINERAL COMPOSITION

COMPOUND	EQ. WT. X	*meq/L	= mg/L.
Ca(HCO ₃) ₂	81.04	2.19	178
CaSO ₄	68.07	11.07	753
CaCl ₂	55.50	257.94	14,315
Mg(HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCL ₂	47.82	27.87	1,327
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	1,431.91	83,710

Calculated Calcium Sulfate solubility in this brine is 2,539 mg/L. at 90 F.

James J. Ruth
Analyst

Remarks and Comments: