

# Permian Treating Chemicals

## WATER ANALYSIS REPORT

### SAMPLE

Oil Co.: Coastal Oil & Gas  
 Lease: Sawyer  
 Well No.: Marr #3 NE/SE Sec 33-795-R37E  
 Salesman: LRA Co. NM

Sample Loc.:  
 Date Analyzed: 04-January-1996  
 Date Sampled:

### ANALYSIS

1. pH 5.840
2. Specific Gravity 60/60 F. 1.155
3. CaCO<sub>3</sub> Saturation Index 8.140 F. +2.738

#### Dissolved Gases

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

#### Cations

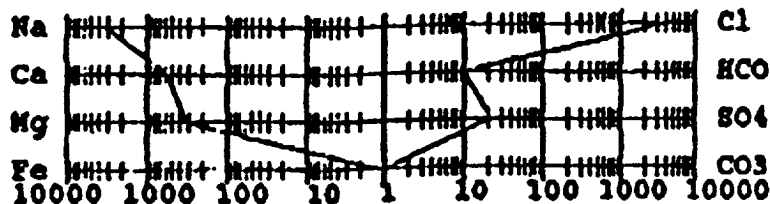
|              |                     | MG/L           | EQ. WT.  | *MEQ/L   |
|--------------|---------------------|----------------|----------|----------|
| 7. Calcium   | {Ca <sup>++</sup> } | 11,023         | / 20.1 = | 548.36   |
| 8. Magnesium | {Mg <sup>++</sup> } | 1,850          | / 12.2 = | 318.85   |
| 9. Sodium    | {Na <sup>+</sup> }  | 71,489         | / 23.0 = | 3,108.22 |
| 10. Barium   | {Ba <sup>++</sup> } | Not Determined |          |          |

#### Anions

|                                         |                                  | MG/L       | EQ. WT.  | *MEQ/L   |
|-----------------------------------------|----------------------------------|------------|----------|----------|
| 11. Hydroxyl                            | {OH <sup>-</sup> }               | 0          | / 17.0 = | 0.00     |
| 12. Carbonate                           | {CO <sub>3</sub> <sup>2-</sup> } | 0          | / 30.0 = | 0.00     |
| 13. Bicarbonate                         | {HCO <sub>3</sub> <sup>-</sup> } | 596        | / 61.1 = | 9.75     |
| 14. Sulfate                             | {SO <sub>4</sub> <sup>2-</sup> } | 1,050      | / 48.8 = | 21.52    |
| 15. Chloride                            | {Cl <sup>-</sup> }               | 135,968    | / 35.5 = | 3,942.76 |
| 16. Total Dissolved Solids              |                                  | 228,015    |          |          |
| 17. Total Iron (Fe)                     |                                  | 1          | / 18.2 = | 0.05     |
| 18. Total Hardness As CaCO <sub>3</sub> |                                  | 43,539     |          |          |
| 19. Resistivity @ 75 F. (Calculated)    |                                  | 0.001 /cm. |          |          |

#### LOGARITHMIC WATER PATTERN

#### PROBABLE MINERAL COMPOSITION



#### Calcium Sulfate Solubility Profile



| COMPOUND                           | EQ. WT. | *MEQ/L   | mg/L    |
|------------------------------------|---------|----------|---------|
| Ca(HCO <sub>3</sub> ) <sub>2</sub> | 81.04   | 9.75     | 791     |
| CaSO <sub>4</sub>                  | 68.07   | 21.52    | 1,465   |
| CaCl <sub>2</sub>                  | 55.50   | 517.09   | 28,698  |
| Mg(HCO <sub>3</sub> ) <sub>2</sub> | 73.17   | 0.00     | 0       |
| MgSO <sub>4</sub>                  | 60.19   | 0.00     | 0       |
| MgCl <sub>2</sub>                  | 47.62   | 318.85   | 15,184  |
| NaHCO <sub>3</sub>                 | 84.00   | 0.00     | 0       |
| NaSO <sub>4</sub>                  | 71.03   | 0.00     | 0       |
| NaCl                               | 58.46   | 3,106.82 | 181,625 |

\*Milli Equivalents per Liter

This water is somewhat corrosive due to the pH observed on analysis.  
 The corrosivity is increased by the content of mineral salts, and the presence of H<sub>2</sub>S in solution.