

# TRETOLITE®

Chemicals and Services

PETROLITE

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## WATER ANALYSIS REPORT

Company : YATES PETROLEUM Date : 10/28/92  
Address : ARTESIA, NEW MEXICO Date Sampled : 10/25/92  
Lease : LUSK AHB Field # 1-B Analysis No. : 206  
Well : SWD  
Sample Pt. : TANK 35-19-32

| ANALYSIS                              |       | mg/L     | * meq/L   |
|---------------------------------------|-------|----------|-----------|
| -----                                 |       | ----     | -----     |
| 1. pH                                 | 6.0   |          |           |
| 2. H2S                                | 9 PPM |          |           |
| 3. Specific Gravity                   | 1.105 |          |           |
| 4. Total Dissolved Solids             |       | 172108.4 |           |
| 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  | 122.0    | HCO3 2.0  |
| 12. Chloride                          | Cl    | 103305.0 | Cl 2914.1 |
| 13. Sulfate                           | SO4   | 4000.0   | SO4 83.3  |
| 14. Calcium                           | Ca    | 10320.0  | Ca 515.0  |
| 15. Magnesium                         | Mg    | 3091.5   | Mg 254.3  |
| 16. Sodium (calculated)               | Na    | 51269.9  | Na 2230.1 |
| 17. Iron                              | Fe    | 0.0      |           |
| 18. Barium                            | Ba    | 0.0      |           |
| 19. Strontium                         | Sr    | 0.0      |           |
| 20. Total Hardness (CaCO3)            |       | 38500.0  |           |

## PROBABLE MINERAL COMPOSITION

| *milli equivalents per Liter       | Compound  | Equiv wt | X meq/L | = mg/L |
|------------------------------------|-----------|----------|---------|--------|
| +-----+                            |           |          |         |        |
| 515 *Ca <----- *HCO3               | Ca(HCO3)2 | 81.0     | 2.0     | 162    |
| ----->                             | CaSO4     | 68.1     | 83.3    | 5669   |
| 254 *Mg -----> *SO4                | CaCl2     | 55.5     | 429.7   | 23842  |
| -----<-----/                       | Mg(HCO3)2 | 73.2     |         |        |
| 2230 *Na -----> *Cl                | MgSO4     | 60.2     |         |        |
| +-----+                            | MgCl2     | 47.6     | 254.3   | 12108  |
| Saturation Values Dist. Water 20 C | NaHCO3    | 84.0     |         |        |
| CaCO3 13 mg/L                      | Na2SO4    | 71.0     |         |        |
| CaSO4 * 2H2O 2090 mg/L             | NaCl      | 58.4     | 2230.1  | 130327 |
| BaSO4 2.4 mg/L                     |           |          |         |        |

## REMARKS:

----- L. MALLETT / FILE

Petrolite Oilfield Chemicals Group

Respectfully submitted,  
STEVE TIGERT

# SCALE TENDENCY REPORT

|            |                       |              |                |
|------------|-----------------------|--------------|----------------|
| Company    | : YATES PETROLEUM     | Date         | : 10/28/92     |
| Address    | : ARTESIA, NEW MEXICO | Date Sampled | : 10/25/92     |
| Lease      | : LUSK                | Analysis No. | : 206          |
| Well       | : SWD                 | Analyst      | : STEVE TIGERT |
| 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. = | -0.1 | 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. = | 0.1  | at | 160 deg. F | or | 71 deg. C |

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

|     |      |    |            |    |           |
|-----|------|----|------------|----|-----------|
| S = | 1735 | at | 60 deg. F  | or | 16 deg. C |
| S = | 1919 | at | 80 deg. F  | or | 27 deg. C |
| S = | 2038 | at | 100 deg. F | or | 38 deg. C |
| S = | 2093 | at | 120 deg. F | or | 49 deg. C |
| S = | 2101 | at | 160 deg. F | or | 71 deg. C |

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