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PAN AMERICAN PETROLEUM CORPORATION
## USG SECTION 19 WELL NO. 17
## COMMUNICATION TEST
## AUGUST 9, 1967

*I 19 - 29 - 16*

**Injection Interval:**

    Top: 2157' = 9-5/8' csg. seat
    Base: 3100' = Top of cement behind 7" csg.

**Observed Data:**

    Specific Gravity of Gas = .700 (est.) = G
    Specific Gravity of Oil = .788
    Measured Wellhead Pressure = 882 psia = $P_c$
    Wellhead Temperature = 60° F. (520° Rankine) = $T_w$
    Reservoir Temperature = 150° F. (610° Rankine) = $T_s$
    Gravity of Crude = 48°
    Injection Pressure = 310 psi

**Sonolog Results:**

    Joints to Fluid = 22
    Feet to Fluid = 675'
    Average Joint = 30.71'

**Calculations - Casing Pressure at Fluid Level:**

    Fluid Level = H = 675'
    Temperature = T = 540° R.
    Compressibility Factor = Z = .825 (Estimated then verified by result)
    TZ = 446
    GH = 473
    $e^s$ = 1.041 (s = .0375 TZ/GH)
    $P_f^2 = e^s P_c^2$ = 809.8 x 1000
    Pressure at Fluid Level = $P_f$ = 900 psia

**Calculations - Top of Interval:**

    Casing Pressure at Fluid Level = 900 psia
    H = 2157 - 675 = 1482
    BHP (csg) at 2157 = 900 + .433 x 1482 = 1541 psia
    Annulus Pressure at 2157'
    Specific Gravity = 1.0635 (salt water)
    2157 x .433 x 1.0635 + 310 = 1303 psia

Calculations - Bottom of Interval:

Casing Pressure at 3100' = 900 / (3100 - 675) x .433
                         = 900 / 1050 = 1950 psia

Annulus Pressure at 3100' = 3100 x .433 x 1.0635 / 310
                          = 1428 / 350 = 1778 psia

Therefore, pressure on inside of 7" casing is in excess of the annulus pressure at both the top and bottom of the injection interval, thereby indicating no communication.