

MULTIPOINT AND ONE POINT BACK PRESSURE TEST FOR GAS WELL

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MAR 07 1986

O. C. D.

ARTESIA, OFFICE

|                                                                                                                                   |                                    |                                     |                                        |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------|----------------------------------------|
| Type Test<br>4-POINT <input checked="" type="checkbox"/> Initial <input type="checkbox"/> Annual <input type="checkbox"/> Special |                                    | Test Date<br>2-26-86                |                                        |
| Company<br>LIBERTY OIL & GAS                                                                                                      |                                    | Connection<br>PIPELINE              |                                        |
| Pool<br>BURTON FLATS - <i>Atoka</i>                                                                                               |                                    | Formation<br>ATOKA                  |                                        |
| Completion Date<br>2-26-86                                                                                                        |                                    | Total Depth<br>11616' 11,620        | Plug Back TD<br>11100' 11,130          |
| Elevation<br>3265                                                                                                                 |                                    | Farm or Lease Name<br>DORIS FEDERAL |                                        |
| Csg. Size<br>5.500"                                                                                                               | Wt.<br>17.00                       | Set At<br>11618'                    | Perforations:<br>From 10952' To 11030' |
| Thq. Size<br>2.3750                                                                                                               | Wt.<br>4.70                        | Set At<br>10770'                    | Perforations:<br>From To               |
| Type Well - Single - Brndenhead - G.G. or G.O. Multiple<br>SINGLE                                                                 |                                    | Packer Set At<br>10770'             | County<br>EDDY                         |
| Producing Thru<br>TUBING                                                                                                          | Reservoir Temp. °F<br>180 @ 10991' | Mean Annual Temp. °F<br>60°         | Base. Press. - P <sub>g</sub><br>13.20 |
| State<br>NEW MEXICO                                                                                                               |                                    |                                     |                                        |
| L<br>10991'                                                                                                                       | H<br>10991'                        | G <sub>g</sub><br>0.603             | % CO <sub>2</sub><br>0.44              |
| % N <sub>2</sub><br>1.81                                                                                                          | % H <sub>2</sub> S<br>0            | Prover<br>0                         | Meter Run<br>3.1                       |
| Taps<br>FLANGE                                                                                                                    |                                    |                                     |                                        |

| FLOW DATA |                        |   |                 |                    |                         | TUBING DATA |                    | CASING DATA |                    | Duration<br>of<br>Flow |             |
|-----------|------------------------|---|-----------------|--------------------|-------------------------|-------------|--------------------|-------------|--------------------|------------------------|-------------|
| NO.       | Prover<br>Line<br>Size | X | Orifice<br>Size | Press.<br>p.s.i.g. | Diff.<br>h <sub>w</sub> | Temp.<br>°F | Press.<br>p.s.i.g. | Temp.<br>°F | Press.<br>p.s.i.g. |                        | Temp.<br>°F |
| SI        |                        |   |                 |                    |                         |             | 2720               | 62          |                    |                        | 72.0        |
| 1.        | 3.07                   | X | 0.750           | 535                | 4.0                     | 69          | 2635               | 62          |                    |                        | 1.0         |
| 2.        | 3.07                   | X | 0.750           | 535                | 8.0                     | 67          | 2580               | 62          |                    |                        | 1.0         |
| 3.        | 3.07                   | X | 0.750           | 535                | 16.0                    | 65          | 2470               | 62          |                    |                        | 1.0         |
| 4.        | 3.07                   | X | 0.750           | 540                | 34.0                    | 64          | 2294               | 62          |                    |                        | 1.0         |
| 5.        |                        |   |                 |                    |                         |             |                    |             |                    |                        |             |

| RATE OF FLOW CALCULATIONS |                          |                  |                            |                                        |                                     |                                               |                         |
|---------------------------|--------------------------|------------------|----------------------------|----------------------------------------|-------------------------------------|-----------------------------------------------|-------------------------|
| NO.                       | Coefficient<br>(24 Hour) | $\sqrt{h_w P_m}$ | Pressure<br>P <sub>m</sub> | Flow Temp.<br>Factor<br>F <sub>t</sub> | Gravity<br>Factor<br>F <sub>g</sub> | Super<br>Compress.<br>Factor, F <sub>pv</sub> | Rate of Flow<br>Q, Mcfd |
| 1                         | 2.67                     | 46.83            | 548.2                      | 0.9915                                 | 1.2878                              | 1.0436                                        | 167                     |
| 2                         | 2.67                     | 66.22            | 548.2                      | 0.9933                                 | 1.2878                              | 1.0443                                        | 236                     |
| 3                         | 2.67                     | 93.65            | 548.2                      | 0.9952                                 | 1.2878                              | 1.0450                                        | 335                     |
| 4                         | 2.67                     | 137.15           | 553.2                      | 0.9962                                 | 1.2878                              | 1.0458                                        | 492                     |
| 5                         |                          |                  |                            |                                        |                                     |                                               |                         |

| NO. | P <sub>g</sub> | Temp. °R | T <sub>r</sub> | Z     | Gas Liquid Hydrocarbon Ratio | A.P.I. Gravity of Liquid Hydrocarbons | Specific Gravity Separator Gas | Specific Gravity Flowing Fluid | Critical Pressure | Critical Temperature | Mcft/ubl.<br>Deg. |
|-----|----------------|----------|----------------|-------|------------------------------|---------------------------------------|--------------------------------|--------------------------------|-------------------|----------------------|-------------------|
| 1   | 0.82           | 529      | 1.50           | 0.918 | 0                            | 0                                     | 0.603                          | X X X X X X X X                | 671               | 354                  | 0.603             |
| 2   | 0.82           | 527      | 1.49           | 0.917 |                              |                                       | X X X X X                      |                                |                   |                      |                   |
| 3   | 0.82           | 525      | 1.48           | 0.916 |                              |                                       |                                |                                |                   |                      |                   |
| 4   | 0.82           | 524      | 1.48           | 0.914 |                              |                                       |                                |                                |                   |                      |                   |
| 5   |                |          |                |       |                              |                                       |                                |                                |                   |                      |                   |

| NO. | P <sub>1</sub> <sup>2</sup> | P <sub>w</sub> | P <sub>2</sub> <sup>2</sup> | P <sub>2</sub> <sup>2</sup> - P <sub>w</sub> <sup>2</sup> |
|-----|-----------------------------|----------------|-----------------------------|-----------------------------------------------------------|
| 1   |                             | 2648           | 7010                        | 457                                                       |
| 2   |                             | 2594           | 6727                        | 740                                                       |
| 3   |                             | 2484           | 6170                        | 1297                                                      |
| 4   |                             | 2308           | 5329                        | 2138                                                      |
| 5   |                             |                |                             |                                                           |

(1)  $\frac{P_c^2}{P_2^2 - P_w^2} = 3.4931$  (2)  $\left[ \frac{P_2^2}{P_2^2 - P_w^2} \right]^n = 2.3981$

AOF = Q  $\left[ \frac{P_2^2}{P_2^2 - P_w^2} \right]^n = 1179$

Post ID-2  
3-14-86  
Comp. Atoka

|                      |      |                  |                |                 |          |             |
|----------------------|------|------------------|----------------|-----------------|----------|-------------|
| Absolute Open Flow   | 1179 | Mcfd @ 15.025    | Angle of Slope | 55.0            | Slope, n | 0.699       |
| Remarks:             |      |                  |                |                 |          |             |
| Approved By Division |      | Conducted By:    |                | Calculated By:  |          | Checked By: |
|                      |      | BENNETT & CATHEY |                | RICHARD TOWNLEY |          |             |