NEW MEXICO OIL CONSERVATION COMMISSION

Form C-122
Revised 12-1-55

MULTI-POINT BACK PRESSURE TEST FOR GAS WELLS

Pool **South Vacuum** Formation **McKee** County **Lea**

Initial **X** Annual ____ Special ____ Date of Test **10-27-58**

Company **The Pure Oil Company** Lease **South Vacuum Unit** Well No. **2-35**

Unit **I** Sec. **35** Twp. **18-S** Rge. **35-E** Purchaser **Phillips Petroleum Company**

Liner ~~Casing~~ **5"** Wt. **17.93** I.D. **4.276** Set at **13881** Perf. **13620** To **13823**

Tubing **2** Wt. **4.70** I.D. **1.995** Set at **13622** Perf. **Open Ended** To ____

Gas Pay: From **13620** To **13823** L **13722** xG **0.801** -GL **11000** Bar.Press. **30.18" Hg.**

Producing Thru: Casing ____ Tubing **X** Type Well **G. O. Dual**
Single-Bradenhead-G. G. or G.O. Dual

Date of Completion: **9-28-58** Packer **Guiberson Hookwall** Reservoir Temp. **200° F**

OBSERVED DATA

Tested Through ~~(Prover)~~ ~~(Choke)~~ (Meter) Type Taps **Flange**

| No. | Flow Data (Prover) (Line) Size | Flow Data (Choke) (Orifice) Size | Flow Data Press. psig | Flow Data Diff. $h_w$ | Flow Data Temp. °F. | Tubing Data Press. psig | Tubing Data Temp. °F. | Casing Data Press. psig | Casing Data Temp. °F. | Duration of Flow Hr. |
|---|---|---|---|---|---|---|---|---|---|---|
| SI | | | | | | 3498 | 78 | Packer | | 64 |
| 1. | 4.026 | 2.000 | 26 | 11 | 44 | 368 | 76 | | | 9 |
| 2. | 4.026 | 2.000 | 26 | 11 | 44 | 211 | 76 | | | 3 |
| 3. | 4.026 | 2.000 | 26 | 11 | 45 | 110 | 75 | | | 3 |
| 4. | 4.026 | 2.000 | 26 | 11 | 45 | 82 | 75 | | | 3 |
| 5. | 4.026 | 2.000 | 26 | 11 | 44 | 53 | 75 | | | 24 |

FLOW CALCULATIONS

| No. | Coefficient (24-Hour) | $\sqrt{h_w p_f}$ | Pressure psia | Flow Temp. Factor $F_t$ | Gravity Factor $F_g$ | Compress. Factor $F_{pv}$ | Rate of Flow Q-MCFPD @ 15.025 psia |
|---|---|---|---|---|---|---|---|
| 1. | 25.580 | 20.8 | ~~26~~ 39.2 | 1.0157 | 0.9325 | | 502.0 |
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| 3. | 25.580 | 20.8 | ~~26~~ 39.2 | 1.0157 | 0.9325 | | 502.0 |
| 4. | 25.580 | 20.8 | ~~26~~ 39.2 | 1.0157 | 0.9325 | | 502.0 |
| 5. | 25.580 | 20.8 | ~~26~~ 39.2 | 1.0157 | 0.9325 | | 502.0 |

PRESSURE CALCULATIONS

Gas Liquid Hydrocarbon Ratio **22,300** cf/bbl.
Gravity of Liquid Hydrocarbons **56.3 @ 60** deg.
$F_c$ **9.936** $(1-e^{-s})$ **0.570**

Specific Gravity Separator Gas **0.688**
Specific Gravity Flowing Fluid **0.801**
$P_c$ **3498** 3511.2 $P_c^2$ ~~12236~~ 12,329.

| No. | $P_w$ $P_t$ (psia) | $P_t^2$ | $F_cQ$ | $(F_cQ)^2$ | $(F_cQ)^2$ $(1-e^{-s})$ | $P_w^2$ | $P_c^2-P_w^2$ | Cal. $P_w$ | $\frac{P_w}{P_c}$ |
|---|---|---|---|---|---|---|---|---|---|
| 1. | 368 384.2 | 135.2 | 4975 4988 | 24.75 24.88 | 13.10 14.18 | 148.3 ~~149.38~~ | 12088 | 384.5 | 10.72 |
| 2. | 211 224.2 | 44.5 | 4975 | 24.75 | 13.10 | 57.6 ~~64.80~~ | 12178 | 240.0 | 6.85 |
| 3. | 110 123.2 | 12.1 | 4975 | 24.75 | 13.10 | 25.2 ~~29.86~~ | 12211 | 158.0 | 4.51 |
| 4. | 82 95.2 | 6.72 | 4975 | 24.75 | 13.10 | 19.8 ~~23.24~~ | 12216 | 141.0 | 4.04 |
| 5. | 53 66.2 | 2.81 | 4975 | 24.75 | 13.10 | 15.91 ~~18.34~~ | 12220 | 126.0 | 3.61 |

Absolute Potential: **502** MCFPD; n = **00**

COMPANY **The Pure Oil Company**

ADDRESS **Box 2107, Fort Worth, Texas**

AGENT and TITLE **L. M. Williams** **Production Engineer**

WITNESSED **W. J. Littlejohn**

COMPANY **The Pure Oil Company**

REMARKS

EXHIBIT 9

## INSTRUCTIONS

This form is to be used for reporting multi-point back pressure tests on gas wells in the State, except those on which special orders are applicable. Three copies of this form and the back pressure curve shall be filed with the Commission at Box 871, Santa Fe.

The log log paper used for plotting the back pressure curve shall be of at least three inch cycles.

## NOMENCLATURE

Q = Actual rate of flow at end of flow period at W. H. working pressure ($P_w$). MCF/da. @ 15.025 psia and 60° F.

$P_c$ = 72 hour wellhead shut-in casing (or tubing) pressure whichever is greater. psia

$P_w$ = Static wellhead working pressure as determined at the end of flow period. (Casing if flowing thru tubing, tubing if flowing thru casing.) psia

$P_t$ = Flowing wellhead pressure (tubing if flowing through tubing, casing if flowing through casing.) psia

$P_f$ = Meter pressure, psia.

$h_w$ = Differential meter pressure, inches water.

$F_g$ = Gravity correction factor.

$F_t$ = Flowing temperature correction factor.

$F_{pv}$ = Supercompressability factor.

n = Slope of back pressure curve.

Note: If $P_w$ cannot be taken because of manner of completion or condition of well, then $P_w$ must be calculated by adding the pressure drop due to friction within the flow string to $P_t$.