

COMPUTERIZED DATA ANALYSIS


FEBRUARY 28, 1975

GENTLEMEN:

THE ENCLOSED TEST APPEARS TO BE A GOOD MECHANICAL DRILL STEM TEST DURING WHICH THE TOOLS DID FUNCTION PROPERLY. THE FORMATION DID NOT PRODUCE ENOUGH RESERVOIR FLUID FOR PROPER IDENTIFICATION. RESERVOIR PRESSURE DRAWDOWN WAS SUFFICIENT AND AN ADEQUATE FINAL SHUT-IN BUILD-UP DID OCCUR FOR RELIABLE QUANTITATIVE ANALYSIS. AFTERFLOW WAS STILL IN EFFECT ON THE INITIAL SHUT-IN BUILD-UP TO THE EXTENT THAT THE PLOT IS CONSIDERED UNRELIABLE FOR ANALYSIS.

1. FLOW RATE: AN AVERAGE FLOW RATE OF 768 MCF/DAY OF GAS WAS NOTED DURING THIS TEST.
2. RESERVOIR PRESSURE: EXTRAPOLATION OF THE FINAL SHUT-IN PRESSURE BUILD-UP INDICATES A MAXIMUM RESERVOIR PRESSURE OF 4952 P.S.I.G. AT RECORDER DEPTH. EXTRAPOLATION OF THE INITIAL SHUT-IN BUILD-UP PLOT WOULD NOT BE REALISTIC DUE TO INSUFFICIENT TIME.
3. PERMEABILITY: THE CALCULATED TRANSMISSIBILITY FACTOR OF 244.53 MD.-FT./CP. INDICATES AN AVERAGE EFFECTIVE PERMEABILITY TO GAS OF .303 MD. FOR THE REPORTED 20 FOOT TEST INTERVAL. THE CALCULATIONS WERE BASED ON A SLOPE OF 3,362,304 P.S.I.²/LOG CYCLE OBTAINED FROM THE FINAL SHUT-IN BUILD-UP PLOT. IT WAS ASSUMED FOR THESE CALCULATIONS: (A) GAS GRAVITY 0.70 (B) VISCOSITY .025 CP. (C) AND GAS DEVIATION FACTOR .99. THESE FIGURES WERE OBTAINED FROM THE AVAILABLE TECHNICAL LITERATURE.
4. WELL BORE DAMAGE: THE CALCULATED ESTIMATED DAMAGE RATIO OF 1.70 INDICATES THAT MINOR WELL BORE DAMAGE IS PRESENT AT THE TIME AND CONDITIONS OF THIS TEST. THIS VALUE INFERS THAT THE RATE OF PRODUCTION OBSERVED AT THE FORMATION FACE DURING THIS TEST MAY BE INCREASED 1.70 TIMES IF THE WELL BORE DAMAGE ALONE WERE REMOVED.
5. RADIUS OF INVESTIGATION: THE CALCULATED RADIUS OF INVESTIGATION OF THIS TEST IS 57 FEET BASED ON AN ASSUMED POROSITY OF 10%, COMPRESSIBILITY OF 1.24×10^{-4} , AND OTHER ASSUMPTIONS MADE IN NUMBER 3 ABOVE.
6. GENERAL COMMENTS: THE FORMATION EXHIBITS THE CHARACTERISTICS OF RELATIVELY LOW PERMEABILITY EFFECTIVE TO THE RESERVOIR FLUID AND INDICATES THE PRESENCE OF WELL BORE DAMAGE.

REMOVAL OF WELL BORE DAMAGE SHOULD PROVIDE THE ABOVE INCREASE IN FLOW CAPACITY.


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INTERPRETATION AND
EVALUATION DEPARTMENT

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SUN STATE #1; LEA COUNTY, NEW MEXICO
TEST #2; 11500' TO 11800'

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