

COMPUTERIZED DATA ANALYSIS

DECEMBER 14, 1971

GENTLEMEN:

THE ENCLOSED TEST APPEARS TO BE A GOOD MECHANICAL DRILL STEM TEST DURING WHICH THE TOOLS DID FUNCTION PROPERLY. THE FORMATION PRODUCED ENOUGH RESERVOIR FLUID FOR PROPER IDENTIFICATION. RESERVOIR PRESSURE DRAWDOWN WAS SUFFICIENT AND AN ADEQUATE 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. IT IS SUGGESTED ON FUTURE TESTS IN THIS FORMATION, IN THIS AREA THAT THE INITIAL SHUT-IN BE AT LEAST 60 MINUTES.

1. FLOW RATE: A FLOW RATE OF 503 BBLs/DAY OF TOTAL LIQUID WAS NOTED DURING THIS TEST.
2. RESERVOIR PRESSURE: EXTRAPOLATION OF THE FINAL SHUT-IN PRESSURE BUILD-UP INDICATES A MAXIMUM RESERVOIR PRESSURE OF 4563 P.S.I.G. AT RECORDER DEPTH.
3. PERMEABILITY: THE CALCULATED TRANSMISSIBILITY FACTOR OF 723.8 MD.-FT./CP. INDICATES AN AVERAGE EFFECTIVE PERMEABILITY TO TOTAL LIQUID OF 12.4 MD. FOR THE REPORTED 35 FOOT TEST INTERVAL. THE CALCULATIONS WERE BASED ON A SLOPE OF 113 P.S.I./LOG CYCLE OBTAINED FROM THE FINAL SHUT-IN BUILD-UP PLOT. IT WAS ASSUMED FOR THESE CALCULATIONS : (A) THE 48.1° API AT 60° F. OIL CONTAINED 84 CU.FT./BBL. OF ORIGINAL DISSOLVED GAS (B) VISCOSITY 0.55 CP., (C) FORMATION VOLUME FACTOR 1.092 BBL/BBL. THESE FIGURES WERE OBTAINED FROM THE AVAILABLE TECHNICAL LITERATURE.
4. WELL BORE DAMAGE: THE CALCULATED ESTIMATED DAMAGE RATIO OF 6.19 INDICATES THAT MAJOR 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 6.19 TIMES IF THE WELL BORE DAMAGE ALONE WERE REMOVED.
5. RADIUS OF INVESTIGATION: THE CALCULATED RADIUS OF INVESTIGATION OF THIS TEST IS 230 FEET BASED ON AN ASSUMED POROSITY OF 10%, COMPRESSIBILITY OF 10.0×10^{-6} , AND OTHER ASSUMPTIONS MADE IN NUMBER 3 ABOVE.
6. GENERAL COMMENTS: THE FORMATION EXHIBITS THE CHARACTERISTICS OF RELATIVELY GOOD PERMEABILITY EFFECTIVE TO THE RESERVOIR FLUID AND INDICATES THE PRESENCE OF WELL BORE DAMAGE.

THE BIG QUESTION ON A COMPLETION IN THIS ZONE APPEARS TO BE THE FORMATION WATER. IF THE WATER CAN BE ISOLATED AND THEN THE DAMAGE REMOVED, THE ZONE SHOULD PROVIDE A PRACTICAL COMPLETION.