JOHNSTON

Schlumberger

computerized data analysis

COMPANY HARPER OIL COMPANY WELL ~~MERLIN~~ STATE #1 TEST NO. 1 COUNTY LEA STATE NEW MEXICO

F.R. # 19486 D

LTR

Job separation sheet

JOHNSTON
Schlumberger

COMPUTERIZED DATA ANALYSIS

AUGUST 27, 1979

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 ADEQUATE SHUT-IN BUILD-UPS DID OCCUR FOR RELIABLE QUANTITATIVE ANALYSIS. RESERVOIR PARAMETERS WERE CALCULATED BY THE MC KINLEY METHOD.

1. FLOW RATE: A FLOW RATE OF 39 BBLS/DAY OF OIL WAS NOTED DURING THIS TEST, ASSUMING ALL RECOVERY WAS DISPLACED BY OIL.

2. RESERVOIR PRESSURE: EXTRAPOLATION OF THE INITIAL SHUT-IN PRESSURE BUILD-UP INDICATES A MAXIMUM RESERVOIR PRESSURE OF 3054 P.S.I.G. AT RECORDER DEPTH. EXTRAPOLATION OF THE FINAL SHUT-IN PRESSURE BUILD-UP INDICATES A MAXIMUM RESERVOIR PRESSURE OF 3073 P.S.I.G. AT RECORDER DEPTH. THE DIFFERENCE BETWEEN THE INITIAL AND FINAL SHUT-IN PRESSURE OF +19 P.S.I.G. IS INSIGNIFICANT.

3. PERMEABILITY: THE CALCULATED TRANSMISSIBILITY FACTOR OF 3.8 MD.-FT./CP. INDICATES AN AVERAGE EFFECTIVE PERMEABILITY TO OIL OF 0.19 MD. FOR THE REPORTED 12 FOOT NET INTERVAL. THE CALCULATIONS WERE BASED ON A MC KINLEY SLOPE OF 1882 P.S.I./LOG CYCLE OBTAINED FROM THE FINAL SHUT-IN BUILD-UP PLOT. IT WAS ASSUMED FOR THESE CALCULATIONS: (A) THE 47.9° API AT 60° F. OIL CONTAINED 216 CU.FT./BBL. OF ORIGINAL DISSOLVED GAS (B) VISCOSITY 0.60 CP. (C) FORMATION VOLUME FACTOR 1.13 BBL/BBL. THESE FIGURES WERE OBTAINED FROM THE AVAILABLE TECHNICAL LITERATURE.

4. WELL BORE DAMAGE: THE CALCULATED DAMAGE RATIO OF 0.44 INDICATES THAT NO WELL BORE DAMAGE IS PRESENT AT THE TIME AND CONDITIONS OF THIS TEST.

5. RADIUS OF INVESTIGATION: THE CALCULATED RADIUS OF INVESTIGATION OF THIS TEST IS 22 FEET BASED ON AN ASSUMED POROSITY OF 10%, COMPRESSIBILITY OF 8.0 X 10^{-6}, 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 ABSENCE OF WELL BORE DAMAGE.

THE CONTOUR OF THE SHUT-IN BUILD-UP CURVES MAY BE THE EFFECT OF MORE THAN ONE PRODUCING ZONE IN THE TEST INTERVAL AND ALSO THE EFFECT OF A DECREASE IN TRANSMISSIBILITY AWAY FROM THE WELL BORE.

Dennis Myren

DENNIS MYREN
RESERVOIR EVALUATION
DEPARTMENT

HARPER OIL COMPANY
MEDLIN STATE #1; LEA COUNTY, NEW MEXICO
TEST #1; 9930' TO 10015'
SEC. 17-T12S-R34E

FIELD REPORT # 19486 D