

## STEP-RATE TEST

SHUGART "B" WELL NO. 1  
470' FSL and 660' FWL  
Section 11, T-18-S, R-31-E  
Tamano (Bone Spring) Field  
Eddy County, New Mexico

Date: May 1, 1991

Purpose: Conduct Step-Rate and 21 day injectivity tests on Bone Spring Carbonate Reservoir

Elevations: KB: 3,740' GL: 3,725'

Total Depth: 9,007' PBTD: 8,960' DV-Tool: 7,506'

Surface Casing: 13-3/8", 48#, H-40 ST&C casing set at 754'. Cemented with a total of 635 sacks. Circulated 143 sacks.

Intermediate Casing: 8-5/8", 24# and 32#, K-55 Lt&C and ST&C casing set at 2,703'. Cemented with a total of 1,250 sacks. Circulated 300 sacks.

Production Casing: 5-1/2", 15.5# and 17#, LT&C casing set at 9,005'. 15.5# from surface to 6,812', 17# from 6,812' to 9,005'. DV-Tool at 7,506'. Cemented first stage with 360 sacks of Class H, second stage cemented with 1,540 sacks of Class H.

BHA/Production Tubing: 2-3/8" mud anchor, seating nipple at 8,253', 10 joints of 2-3/8" tubing, 5-1/2" TAC, 259 joints of 2-3/8", 4.6#, J-55. EUE tubing.

Perforations: Second Bone Spring Carbonate at 7,963'-71', 7,974'-81', 8,072'-8,170', 8,190'-95' and 8,215'-28'.

1. Spot four steam-cleaned frac tanks and fill with fresh water (City of Carlsbad).
2. MIRU PU. Kill well if necessary.
3. Unbeam well, remove stuffing box and install rod BOP. POOH combination 7/8" and 3/4" Norris 97 rods with a 2" x 1-1/4" x 16' x 18' x 20' RHBC pump.
4. ND wellhead. NU BOP with 2-3/8" pipe rams in place. Release TAC and POOH with tubing.
5. RIH with 2 joints of 2-3/8" tubing bull-plugged, SN, 1 jt 2-3/8" tbg slotted sub, 2 joints of 2-3/8" tubing, and a 2-3/8" x 5-1/2" production/treating packer on 2-3/8" production tubing. Land slotted sub at 8,090'. Set packer. RDMO PU.
6. RIH with MOC pressure bomb to 8,090'. Run build-up for 48 hours.
7. POOH with bomb. Midland Engineering personnel will check BHP reading. If pressure has not reached average reservoir pressure, obtain static BHP every 24 hours until average reservoir pressure is obtained.
8. Contact NMOCD 24 hours before starting Step-Rate Test.
9. RU service company to frac tanks and wellhead.
10. Load tubing with fresh water. RIH with service company pressure bomb and tag bull plug. Pull tension in cable. Monitor surface and BHP.
11. Establish injection rate of 0.025 BPM (36 BPD).