APPLICATION FOR PILOT FLOOD

Case Number 1761, New Mexico Oil Conservation Commission

Application of Stanton Oil Company, Ltd. for an order Authorizing a Pilot Waterflood Project in the Turkey Tract Queen Sand Pool, Eddy County, New Mexico.

1. The present owner, Robert E. McKee, general contractor, has agreed to a change of ownership of the subject leases in favor of Stanton Oil Company, Ltd. for development of a secondary recovery waterflood project. A letter from Robert E. McKee acknowledging this agreement is submitted in evidence.

2. The location of subject leases is shown on the attached plat which is offered in evidence along with a tabulated description of each present oil well and lease location.

3. The proposed pilot flood area includes 151 acres in Section 34, T-18-S, R-29-E, and will contain 4 injection wells on unorthodox locations and could be expected to show increased production rates in two totally enclosed wells and six partially enclosed wells. The attached plat shows the proposed injection wells colored green, the producing wells expected to show results circled in brown, the totally enclosed pilot flood area colored in yellow, and the partially enclosed

pilot flood area colored in orange.

4. The expanded waterflood project would include 720 acres, or 18 forty acre drilling units and would contain 27 water injection wells and 20 producing wells.

5. Applicant proposes to flood the Queen Sand (Red Sand), Guadalupe Series, Permian Age found at an average depth in the Turkey Track Field area of 2080 feet. The reservior is a porosity development in a Terrace Type Structure and produces by a gas drive mechanism. The original bottom hole pressure is unknown. There are no offset operators producing from the proposed waterflood reservior, and it is our contention, therefore, that no adverse results will occur to other operators, due to the proposed flood program.

6. The proposed pilot waterflood area will enclose 40 acres and should effect an additional 111 acres. The reservior is estimated to have an average gross pay thickness of 21 feet. Based on core analysis data from the Wilson # 5 well, located in the totally enclosed portion of the flood area, the net pay thickness is calculated to be 54% of the gross pay thickness, or 11.3 feet. The net pay average porosity is 19.5%, the average horizontal permeability is 103 millidarcys, the average residual oil saturation is 19% of pore space, the estimated

average connate water saturation is 35% of pore space, and the oil gravity is 34° A.P.I.

7. The first well on the subject lease was the Spencer No. 1, 3-19-28 completed March 8, 1944. The discovery well is reported to have been completed in 1943. According to the New Mexico Oil Conservation Commission reports the subject combined leases have produced from the existing 19 wells a total of 263,000 barrels of oil to August 1, 1959. The production rate during July, 1959 was 2,762 barrels of oil, or 145 barrels per well per month. The production is declining at the rate of 4% per month during the first seven months of 1959, and the continued decline at this rate would result in an average production of 90 barrels per well per month by June, 1960. These leases are therefore in the stripper production stage as they would be producing less than 9% of the unit top allowable. The gas production from the lease at this time is sufficient only for lease operation and the water production rate amounts to less than 2% of the oil produced.

8. The source of proposed injection water is a red bed zone, in the Rustler formation which is found at a depth of 230 feet. At the present time two water supply wells have been drilled and completed in this zone and tests indicate that an adequate

supply of water will be available. If additional water should be required during the expansion of the waterflood project, several more wells will be completed. A chemical analysis of water sampled from this zone is submitted in evidence. Based on information taken from "Study and Interpretation of Natural Water", Geological Survey, Water Supply Paper 1473, U. S. Public Health Service (1946), this water is not suitable for human or stock consumption, nor is it suitable for irrigation purposes. The water is brackish and contains substancial quantities of sulfates.

9. The injection system will be closed and a minimum of treatment will be used as required to maintain control of chemical deposition, corrosion,bacteria and algae. The injection well pattern will require the unorthodox location of a well at or near each corner of the drilling units containing oil wells. In this manner the pattern will be a forty-acre five spot where the drilling unit contains one producer. It will provide for equity in the movement of secondary oil in that each lease will be producing oil swept from within its own boundries, thereby the royalty and other interest holders rights are adequately protected. This spacing will also provide the maximum recovery of secondary reserves by effective sweeping the largest number

of acres with the most efficient pattern. Therefore, the instigation of this pattern will promote conservation and prevent the waste of natural resources. The initial injection pressure is expected to be 600 psi which should allow the injection rates to be 250 barrels per day per well. The initial injection will be into the four wells drilled for that purpose, and all present producing wells will remain active producers. There will be no new producing wells drilled in the pilot flood area. The flood will be maintained in balance by the use of equal maximum well head pressures which will be regulated and maintained below the formation break down pressure.

10. For the 40 acres pilot flood area, it is estimated that the residual oil saturation, at abandonment will be 19% of pore space. It is estimated that the original oil in place for this 40 acre area was 271,200 barrels. It is further estimated that the ultimate additional oil that will be recovered as a direct result of this secondary recovery project will be 127,000 barrels from the 40 acre pilot area.

SUMMARY

A. Robert E. McKee as present owner and operator has entered into an agreement with Stanton Oil Company, Ltd. whereby Stanton Oil Company, Ltd. is to instigate a waterflood project on his leases.

B. The subject area is shown on the plat which has been submitted.

C. The unorthodox locations of the four water injection wells will protect the interest of offset owners, and will certainly not result in adverse effects to any other party.

D. The present production from the leases is in the stripper stage of production and is rapidly approaching the economic limit. A waterflood project is definitely necessary and will serve a useful purpose.

E. A secondary recovery program will promote conservation and prevent the waste of oil that would otherwise not be produced.

F. The commission is respectfully requested to grant this application for a pilot waterflood as it is certainly in the best interest of conservation.