

LAW OFFICES OF
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J. P. WHITE BUILDING
ROSWELL, NEW MEXICO

JACK M. CAMPBELL
JOHN F. RUSSELL

TELEPHONES
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MAIN 2-4642

October 26, 1959

New Mexico Oil Conservation Commission
Capitol Building
Santa Fe, New Mexico

RE: Case No. 1787
State-wide Rules Governing the
Operation of Waterflood Projects

Gentlemen:

Pursuant to the Commission's ruling that parties to the captioned case might have 15 days following the hearing in which to submit comments, we have been authorized by Newmont Oil Company, whom we represent, to advise the Commission as to their views relative to the matter.

1. Newmont Oil Company is in full agreement with that portion of the rules proposed by Mr. Nutter pertaining to administrative procedures in the expansion of waterflood projects. It is felt that the procedures as set out in the proposed rule definitely provide a "built in" restriction on the rate of expansion of waterflood projects in that they require proof of substantial stimulation as a result of the waterflood effort before any expansion will be authorized. While this provision causes some delay, we feel that it is a much better method of restricting the rate of growth of waterflood projects than is the effort to restrict producing rates.

2. Based upon its experience and the opinion of its engineers, Newmont is of the definite opinion that restriction of the production rate in a waterflood project will cause a loss of ultimate recovery of oil and that any rules or orders which restrict this rate are not in the interest of good conservation practices. The only reason presented for the proposed rule was that waterflood oil in excess of what would normally be allowed might result in a serious impact upon primary exploration and primary production in the state. This concern was expressed at a time when two projects, admittedly exceptional in their nature, were at their peak of pro-

duction and, as testimony revealed, were leveling off and would commence a marked decline in the near future. Newmont does not believe that waterflood production from these projects or those contemplated in the future, above the allowable normal unit production, will create a threat to primary exploration or production sufficient to justify the serious risk of loss of ultimate recovery of oil and a decline in the interest in secondary recovery in the State of New Mexico.

3. It is the opinion of Newmont that the rules proposed by Mr. Nutter, as he conceded under cross-examination, do not have sufficient flexibility to apply to the many conditions which occur in actual waterflood development. It is not safe or proper to assume that all waterflood projects can or will be unitized and the proposed rule, if it is to work fairly, makes such an assumption. At the very least, any state-wide rule should contain specific provision for exceptions in order that projects not unitized or not developed on 40-acre spacing or planned in any other manner than the conventional 5-spot pattern, may be operated in the interest of prevention of waste and protection of correlative rights.

4. Newmont feels that the proposal submitted by Humble at the conclusion of the hearing is undesirable for several reasons. This proposal obviously restricts waterflood production to an even greater extent than does the proposal by Mr. Nutter. As has been indicated, Newmont believes that any such restriction will create waste. The rule proposed by Humble would also provide for fluctuating allowables depending on the normal unit allowable in any month. It is the considered opinion of Newmont that this may cause severe damage to the reservoir by interruption or change in producing rate and will have serious wasteful results. Humble's proposal that their rule apply to existing waterflood projects would, in our opinion, be most inequitable and would have the effect of applying what we consider to be a rule contrary to good conservation practices upon a retroactive basis and would seriously affect development of secondary reserves for the State of New Mexico.

5. Newmont believes that it is virtually impossible to design rigid regulations which may be applied to the wide differences which exist in contractual arrangements, spacing, reservoir characteristics and development patterns in the State's waterflood projects.

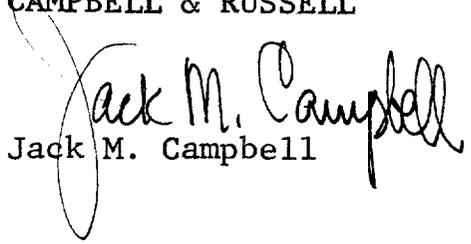
October 26, 1959

Newmont recommends that the present system be continued with administrative procedures set up to reduce the work load on the Commission and the operators.

We very much appreciate the opportunity of expressing these views to the Commission and we congratulate the Commission for its patience and diligence in this very important matter of conservation and development of secondary oil reserves which can play such an important part in the future of New Mexico.

Very truly yours,

CAMPBELL & RUSSELL


Jack M. Campbell

JMC:np

cc: The Honorable John Burroughs
Governor of New Mexico
Santa Fe, New Mexico

Mr. Murray E. Morgan
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Mr. A. L. Porter, Jr.
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Newmont Oil Company
1125 Ft. Worth Natl. Bank Bldg.
Fort Worth 2, Texas

AMBASSADOR OIL CORPORATION

3109 WINTHROP AVENUE

P. O. Box 9338

FORT WORTH 7, TEXAS

F. KIRK JOHNSON
PRESIDENT

October 22, 1959

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.
Secretary-Director

Re: Comments on Waterflood Rules Proposed by
Humble Oil and Refining Company at the
October 14 Waterflood Hearing

Gentlemen:

The time you have allowed for comments on the proposed rules has been most helpful since most of us had not seen this proposal prior to the hearing. We are very appreciative of the interest you have taken pertaining to waterflooding in New Mexico and also of the fair and unbiased manner in which you conducted all of the hearings. In order for us to properly comment on the Humble proposed rules, we feel we must preface our comments with some observations we made during the waterflood hearing.

It was our understanding the main reason for calling a statewide waterflood hearing was to determine the effect water flood production might be having on the total state oil market and allowables, and the effect waterflood production might be having on incentive of primary producers and drillers within the state. Producing stripper waterfloods at capacity has been called controversial in some quarters mainly because it was thought there was considerable disagreement within the producing industry as to its necessity. From the number and type of statements made at the conclusion of the waterflood hearing, it is evident there is practically no controversy as to the necessity of producing stripper-type waterfloods at capacity. The only controversy appears to be between Humble and the rest of the oil industry. Many of the large primary producers in the state who do not have one barrel of waterflood production, stood up and stated it was their belief that if stripper floods were not permitted to operate on a capacity basis, not only waste would occur but an operator could not protect his correlative rights unless he operated under unitized projects. It is interesting to note very few fields conducting waterflood operations are operated on a unitized basis. These operators are not only large primary

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producers but do a large percentage of the primary drilling. They feel, almost to a man, that the small excess waterflood production above yardstick is having no effect on primary drilling and development.

Another interesting observation is the attitude of the major crude purchasers of oil in the State of New Mexico. They were practically unanimous in stating that capacity allowables are necessary in stripper waterflooding and only one or two stated they thought proration rules should be applied, and then only with a provision for permitting capacity when such was necessary to prevent waste and protect correlative rights. It is also quite interesting to note that Humble, who has taken such an adamant stand on this matter, buys no crude oil (to the best of my knowledge) within the confines of the state.

Now as to the rules suggested by Humble--in the first place it was apparent from their interpretation of actual field performance that they have not had sufficient experience in flooding stripper reservoirs to propose workable waterflood rules. This inexperience is also confirmed by their inability to even recognize the basic differences between a stripper waterflood and a pressure maintenance type of operation. Humble has proposed a project allowable on a somewhat lower basis than that proposed by the Commission. Putting such an allowable on a waterflood project will only work if, due to the characteristics of the reservoir itself, it is not capable of producing that amount of production. The Commission proposal might take care of 80% of future flooding in New Mexico, but the Humble proposal would probably take care of less than 25% of the future flooding in New Mexico. In order to prevent waste and protect correlative rights, there would have to be far more exception hearings on the Humble rule than on the proposed Commission rule.

In summation, we do not believe the general effect of the Humble rule would be in the best interest of the State of New Mexico or to the oil producing industry. It is clearly evident that no waste is being incurred under present regulations and methods of operating floods in New Mexico and that waterflood production is having little or no adverse effect on the statewide allowable. The present method of requiring an initial waterflood hearing and then not permitting expansion of the pilot area until response is received outside of it appears to be more than an ample "brake" to prevent any possible flood of oil on the market. We do feel that rather than have a hearing for flood expansion, it could be done more efficiently on an administrative basis, saving both the Commission and operators money and time. We also request the Commission to include in any rules which they might prepare that an operator be required to inject water into a depleted

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producing formation at or near capacity, and also that he pump his producing wells at capacity in order to prevent waste.

I am sure the industry appreciates the time you have taken in reviewing stripper waterflooding within the State of New Mexico and as in the past, we truly believe you will come up with a decision that will be fair and equitable to both the State of New Mexico and all those companies who are operating within your state.

Respectfully submitted,



Kenneth L. Smith
Vice President

KLS/ms

cc: Mr. Jack Campbell
Campbell & Russell
J. P. White Building
Roswell, New Mexico

E. BRUCE STREET

P. O. BOX 1110
GRAHAM, TEXAS

MAIL OFFICE CCC

October 21, 1959

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Mr. Pete Porter
New Mexico Oil & Gas Commission
Santa Fe, New Mexico

Dear Mr. Porter:

The hearing in Roswell demonstrated one of the most important assets that the oil industry has in New Mexico and that is, a regulatory body willing to hear at length the controversial position that inevitably arise within a dynamic growing area. I wish to commend you, Murry Morgan, and the Governor for your nonpartisan and through study of the question of capacity type allowables for waterfloods in New Mexico.

Humble made the most interesting, dramatic, and massive presentation that I have ever seen made and as Frank Homesley of Humble indicated, he thought Gulf, Sinclair, Texaco, Continental, and the other companies should develop their talents to other phases of scientific investigations as there was no question as to Humble's position. Maybe he is right - time will tell.

One of these unanswered questions to me is why reservoirs under a natural effective water drive recover 70 to 80 per cent of oil in place, and the best that a secondary recovery project has ever been able to do, including primary, is an estimated 40 to 50 per cent of oil in place. These questions are for better brains than mine, and I will be content to operate the best I can under the rules established by your commission.

With kindest regards,

Yours truly,



E. Bruce Street

EBS/rb

P R O P O S E D R U L E

RULE 701. INJECTION OF FLUIDS INTO RESERVOIRS

A. Permit for Injection Required

The injection of gas, liquefied petroleum gas, air, water, or any other medium into any reservoir for the purpose of maintaining reservoir pressure or for the purpose of secondary recovery or the injection of water into any formation for the purpose of water disposal shall be permitted only by order of the Commission after notice and hearing, unless otherwise provided herein.

B. Method of Making Application

Application for hearing to obtain authority for the injection of gas, liquefied petroleum gas, air, water, or any other medium into any formation for any reason shall include the following:

1. A plat showing the location of the proposed injection well(s) and the location of all other wells within a radius of two miles of said proposed injection well(s), and the formation from which said wells are producing or have produced. The plat shall also indicate the lessees, if any there be, within said two-mile radius.
2. The log of the proposed injection well(s) if same is available.
3. A description of the proposed injection well(s) casing program.
4. Such other pertinent information as the name and depth of the zone or formation into which injection will be made, the kind of fluid to be injected, the anticipated amounts to be injected, and the source of said injection fluid.

C. Salt Water Disposal Wells

(Rule 701(c) remains the same in its entirety.)

D. Pressure Maintenance Projects

1. Pressure maintenance projects are defined as those projects in which fluids are injected into the producing horizon in an effort to build-up and/or maintain the reservoir pressure in an area which has not reached the "stripper" state of depletion.
2. The project area and the allowable formula for pressure maintenance projects shall be fixed by the Commission on an individual basis after notice and hearing.

E. Water Flood Projects

1. Water flood projects are defined as those projects in which water is injected into a producing horizon in sufficient quantities and under sufficient pressure to stimulate the production of oil from other wells in the area, and shall be limited to those areas in which the wells have reached an advanced state of depletion and are regarded as what is commonly referred to as "stripper" wells.
2. The project area of a water flood project shall comprise the 40-acre tracts upon which injection wells are located plus all 40-acre tracts which directly or diagonally offset the injection tracts and have producing wells completed on them.
3. The maximum allowable assigned to any water flood project area shall be determined by multiplying the number of 40-acre tracts in the project area times the Area Allowable

Factor times the 40-acre proportional factor for the pool. The allowable assigned to any water flood project area in which there are 40-acre tracts containing more than one well shall be increased by an amount of oil equal to 0.333 times the Area Allowable Factor for each such additional well on a 40-acre tract, provided however, that the additional allowable for any such 40-acre tract shall not exceed the Area Allowable Factor.

The project area allowable may be produced from any well or wells in the project area in any proportion.

Nothing herein contained shall be construed as prohibiting the assignment of special allowables to wells in buffer zones, after notice and hearing.

4. The Area Allowable Factor for the counties of Lea, Eddy, Chaves, and Roosevelt shall be 42. The Area Allowable Factor for the counties of San Juan, Rio Arriba, Sandoval, and McKinley shall be 52.

5. Water flood projects shall be expanded and additional wells placed on injection only upon authority from the Commission after notice and hearing or by administrative procedure in accordance with the following:

In order for a well in a water flood project to be eligible for administrative approval for conversion to water injection, it must be established to the satisfaction of the Secretary-Director of the Commission that the proposed water injection well has experienced a substantial response to water injection or is directly offset by a producing well which has experienced

such response, and that the proposed injection well is located on a water injection pattern which will result in a thorough and efficient sweep of oil by the water flood.

To obtain administrative approval for the conversion of any well to water injection, applicant shall submit to the Commission in triplicate a request for such administrative approval, setting forth therein all the facts pertinent to the need for conversion of additional wells to water injection, and attaching thereto Commission Form C-116, showing production tests of the affected well or wells both before and after stimulation by water flood. Applicant shall also attach plats of the water flood project area and immediate surrounding area, indicating thereon the owner of each lease and the location of all water injection wells and producing wells, and shall submit evidence that a copy of the application to convert additional wells to water injection has been sent to each operator offsetting the proposed injection well and to the State Engineer.

The Secretary-Director may, if in his opinion there is need for conversion of additional wells to water injection, authorize such conversion without notice and hearing, provided that no offset operator nor the State Engineer objects to the proposed conversion within fifteen (15) days. The Secretary-Director may grant immediate approval of the proposed conversion upon receipt of waivers of objection from all operators offsetting the proposed injection well and from the State Engineer.

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF NORTOX OIL & GAS COMPANY FOR AN ORDER PROVIDING FOR THE WATERFLOODING AND OTHER METHODS OF UNITIZED MANAGEMENT, OPERATION AND FURTHER DEVELOPMENT OF THE OIL AND GAS PROPERTIES AND THE THURMAN SAND UNDERLYING THE FOLLOWING DESCRIBED LAND: WEST 8.60 ACRES OF LOT 7, LOT 8, ALL IN SECTION 20; AND LOT 6 IN SECTION 29; TOGETHER WITH RIPARIAN RIGHTS AND ACCRETED LANDS THEREUNTO BELONGING; AND THE N/2 OF THE NW/4 OF SECTION 28; AND THE NE/4 OF THE SE /4 OF SECTION 20; AND THE NORTH 10 ACRES OF E/2 OF THE SE/4 OF THE NE/4 OF SECTION 29; AND THE NW /4 OF THE SW/4 OF SECTION 21, ALL IN TOWNSHIP 5 NORTH, RANGE 6 EAST, PONTOTOC COUNTY, OKLAHOMA; AND THE SE/4 OF THE NW/4 AND S/2 OF THE SW/4 OF THE NE/4 OF SECTION 29; AND LOT 2, WITH RIPARIAN RIGHTS AND ACCRETIONS THERETO, SECTION 29; AND THE EAST 13.34 ACRES OF LOT 4 IN SECTION 20; AND LOT 1, APPROXIMATELY 53 ACRES OUT OF THE NORTHEAST CORNER OF SECTION 29, ALL IN TOWNSHIP 5 NORTH, RANGE 6 EAST, SEMINOLE COUNTY, OKLAHOMA.

CAUSE CD NO. 12379

OR DER NO. 40245

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 31st day of July, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma, the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

James W. George, Attorney, appeared for the applicant, the Nortox Oil & Gas Company; Ferrill H. Rogers, Conservation Attorney, and L. D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sollers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner proceeded to hear the cause and has filed his report herein, recommending that the application be granted; the report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of Nortox Oil & Gas Company for an order approving the creation of and creating the Byng, Conservation and Wetly Fields Thurman Sand Unit, herein called "Thurman Sand Unit", and prescribing a plan of unitization for such unit, said plan having as its purpose the unitized management, operation and further development of a portion of the common source of supply covered thereby and underlying lands in Seminole County and Pontotoc County, Oklahoma, pursuant to the provisions of Senate Bill 203 of the 1951 Legislature, being Sections 287.1 to 287.15, inclusive, Oklahoma Statutes 1951.

2. That notice of hearing of said Application has been duly and properly given in all respects as required by law and the Commission has jurisdiction of the subject matter and of the persons interested therein, and has jurisdiction to enter an order in this cause; that no opposition to the granting of the application was made at the hearing.

3. That the unit area for the Thurman Sand Unit, which applicant desires to unitize under the provisions of the law referred to, consists of the following described tracts of land in Seminole County and Pontotoc County, Oklahoma, to-wit:

West 8.60 Acres of Lot 7, Lot 8, all in Section 20; and Lot 6 in Section 29; together with riparian rights and accreted lands thereunto belonging; and the N/2 of the NW/4 of Section 28; and the NE/4 of the SE/4 of Section 20; and the North 10 Acres of E/2 of the SE/4 of the NE/4 of Section

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No.

CASE

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29; and the NW/4 of the SW/4 of Section 21, all in Township 5 North, Range 6 East, Pontotoc County, Oklahoma; and the SE/4 of the NW/4 and S/2 of the SW/4 of the NE/4 of Section 29; and Lot 2, with riparian rights accretions thereto, Section 29; and the East 13.34 Acres of Lot 4 in Section 20; and Lot 1, approximately 53 Acres out of the Northeast corner of Section 29, all in Township 5 North, Range 6 East, Seminole County, Oklahoma,

which said lands are delineated upon plat included in the Plan of Unitization attached to the application. The plat referred to as Exhibit "A" in the Plan of Unitization pertains to the Thurman Sand Unit, and said plat is adopted and made a part hereof by reference thereto.

4. That the unit area hereinabove described is underlain by a portion of a common source of supply of oil and gas known as the Thurman Sand; the portion of such common source of supply within the unit area has been defined and determined to be productive of oil and gas by actual drilling operations.

That the unitized management, operation and further development of the Thurman Sand common source of supply in the unit area is reasonably necessary in order to effectively carry on pressure maintenance or repressuring operations or water-flooding operations, or any combination thereof, or any other form of joint effort calculated to substantially increase the ultimate recovery of oil and gas from the common source of supply; that one or more of said unitized methods of operation as applied to said common source of supply in the unit area are feasible, will prevent waste and will, with reasonable probability, result in the increased recovery of substantially more oil and gas from said common source of supply underlying the unit area than would otherwise be recovered; that the estimated additional cost of conducting such operations will not exceed the value of the additional oil and gas so recovered; the evidence shows that substantial quantities of oil will be recovered from said common source of supply under the unitized methods of operations contemplated, and such amounts will not be recoverable otherwise.

6. That the proposed unit and the adoption of one or more unitized methods of operation is for the common good and will result in the general advantage of the owners of the oil and gas rights within the common source of supply affected.

7. That the size and shape of the unit area of said unit is such as may be reasonably required for the successful and efficient conduct of the unitized method of methods of operation for which the unit is created, and that such unit and the conduct of unitized operations thereunder will have no material adverse effect upon the common source of supply or other common sources of supply, if any, within or without the unit area.

8. That the Plan of Unitization, filed herein and presented to the Commission for approval, is made a part hereof by reference thereto, is suited to the needs and requirements of the unit designated in said Plan as the Thurman Sand Unit; that the terms and provisions of said Plan of Unitization are adequate and are proper to effectuate and accomplish the purposes of the statute hereinabove referred to; that said Plan contains fair, reasonable and equitable provisions for: (a) the efficient unitized management and control of the further development and operation of the unit area for the recovery of oil and gas from the portion of the common source of supply affected; (b) a division of interest or formula for the apportionment and allocation of the unit production among and to the several separate owned tracts within the unit area such as will reasonably permit persons otherwise entitled to share in or benefit by the production from such separately owned tracts to produce or receive, in lieu thereof, their fair, equitable and reasonable share of the unit production or other benefits thereof; (c) the manner in which the unit and the further development and operation of the unit area shall or may be financed and the basis, terms and conditions on which the cost and expense thereof shall be apportioned among and assessed against the tracts and interests made chargeable therewith, including a detailed accounting procedure governing all charges and credits incidental to such operations, and the procedure for carrying or otherwise financing lessees who are unable to promptly meet their financial obligations in connection with the unit; (d) the procedure and basis upon which wells, equipment and other properties of the several lessees within the unit area are to be taken over and used for unit operations, including the method of arriving at the compensation therefor or of otherwise proportionately equalizing or adjusting the

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

APPLICATION OF WILCOX OIL COMPANY FOR AUTHORITY TO WATERFLOOD THE BUTCHER SAND UNDERLYING THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER (SW/4 NE/4) AND THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER (SE/4 NE/4) AND THE SOUTH HALF (S/2) OF SECTION THIRTY-FIVE (35), TOWNSHIP FIFTEEN NORTH (15N), AND THE NORTH HALF OF THE NORTHEAST QUARTER (N/2 NE/4) AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (NE/4 NE/4) AND THE WEST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (W/2 NE/4 NE/4) AND THE WEST HALF OF THE WEST HALF OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (W/2 W/2 E/2 NE/4) OF SECTION TWO (2) TOWNSHIP FOURTEEN NORTH (14N), ALL OF THE ABOVE DESCRIBED LANDS BEING IN RANGE ELEVEN (11) EAST, OSAGE COUNTY, OKLAHOMA.

CAUSE NO. 12433

ORDER NO. 40413

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 3rd day of September, 1939, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cornsight, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Frank E. Turner, Attorney, appeared for the applicant, Wilcox Oil Company; Ferrill H. Rogers, Conservation Attorney, and Lester D. Keyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

F I N D I N G S

1. That this is an application of Wilcox Oil Company for permission and authority to waterflood in the Butcher Sand underlying the SW/4 NE/4 and the SE/4 NE/4 and the S/2 Section 35, Township 15 North, Range 11 East and the N/2 NE/4 and the NE/4 NE/4 and the W/2 NE/4 NE/4 and the W/2 W/2 E/2 NE/4 NE/4 of Section 2, Township 14 North, Range 11 East, Osage County, Oklahoma.
2. That the Commission has jurisdiction over the subject matter herein; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.
3. That the applicant is the owner and operator of oil and gas leases on the above described land on which some 70 wells were drilled and completed in the Butcher sand found at the approximate depth of 2260 feet in about the year 1919 and all of said wells produced to depletion and were abandoned.
4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be cased to or through the sand and cemented.
4. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

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BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 57 CASE

O R D E R

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Wilcox Oil Company be and it is hereby, permitted and authorized to operate a waterflood in the Dutcher Sand underlying the SW/4 NE/4 and the SE/4 NW/4 and the S/2 of Section 25, Township 15 North, Range 11 East, and the N/2 NW/4 and the NW/4 NE/4 and the W/2 NE/4 NE/4 and the W/2 W/2 E/2 NE/4 NE/4 of Section 2, Township 14 North, Range 11 East, Okmulgee County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the State.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 3rd day of September, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones
Ray C. Jones, Chairman

Wilburn Cartwright
Wilburn Cartwright, Vice-Chairman

Harold Freeman
Harold Freeman, Commissioner

ATTEST:

Gene B. Mitchell
Secretary

Case 1787
Humble E & H Co
Oct. 1959 hearing

FIELD WATER-FLOOD PROPERTIES

Characteristics	Range of Values (9 water floods)	Representative Water Flood
Water-Flood Pattern	5-spot	5-spot
Areal Extent, acres	20, 40, 80	20
Net Stratum Thickness, ft	4-30	10
Porosity, %	14-33	20
Absolute Permeability, md	16-339	16-116
Connate Water Saturation, %	20-50	30
Residual Oil Saturation, %	26-2	20
Water-Oil Density Difference, gm/cc	0.15-0.30	0.20
Water Viscosity, cp	0.48-0.95	0.50
Oil Viscosity, cp	0.46-10	0.50, 2.17
Interfacial Tension, dyne/cm	25-35	25

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
HUMBLE EXHIBIT No. 1
CASE 1787