

Case Number

4288

Application
Transcripts.

Small Exhibits

ETC.

dearnley-meier

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1970

EXAMINER HEARING

IN THE MATTER OF:

Application of Wood, McShane and
Thams-Colorado for an unorthodox
oil well location and waterflood
expansion, Lea County, New Mexico.

Case No. 4288

BEFORE: Daniel S. Nutter, Examiner.

TRANSCRIPT OF HEARING

MR. NUTTER: Call next case, 4288.

MR. HATCH: Case 4288. Application of Wood, McShane and Thams-Colorado for an unorthodox oil well location and waterflood expansion, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for the Applicant.

I have one witness I would like to have sworn.

(Witness sworn).

(Whereupon, Applicant's Exhibit A was marked for identification).

JOE B. MCSHANE, JR.

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Joe B. McShane, Jr.

Q Mr. McShane, are you one of the partners in Wood, McShane and Thams-Colorado?

A Yes, I am.

Q Are you a petroleum engineer?

A Yes, I am.

Q Have you ever testified before the Oil Conservation Commission of New Mexico and made your qualifications a matter of record?

A Yes, I have.

Q Subsequent to that time, have you been registered as a professional engineer in the State of New Mexico?

A Yes, sir. I was registered as a petroleum production engineer in the State of New Mexico several years ago.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kellahin) Mr. McShane, briefly, what is proposed by the Applicant in the case before the Commission at this time?

A The application by Wood, McShane and Thams-Coronado to the Oil Conservation Commission of New Mexico is for the approval of an unorthodox well location to be used for production purposes.

The subsequent conversion of produced wells to water injection and the administrative procedure for further development of additional producing wells.

Q For the benefit of the Examiner, would you

briefly review the current status of the Langlie-Mattix Pool waterflood on the "M" State Lease?

A Yes, sir, I will. The "M" State Lease was acquired by Wood, McShane and Thams-Colorado from Humble Oil and Refining on December 1, 1969. That is to say, the operating rights were acquired.

There are now twenty-one active producing wells in the Queen Sand waterflood area on the "M" State Lease. During November, 1969, these wells produced **seventy-nine** hundred thirty-three barrels of oil; seventeen thousand eight hundred fifty-one barrels of water.

The attached plat, Exhibit No. 2 --

Q That is attached to what has been marked as Exhibit A, is it not?

A Yes. Exhibit No. 2 provides that each of the producing well locations, three figures; the upper left-hand figure is the oil production in barrels per day. The upper right-hand figure is the water production in barrels per day and the lower figure at the bottom is the cumulative oil production -- both primary and secondary -- to December 1, 1969.

Also, there are nineteen active injection wells in the Queen Sand on the "M" State Lease. During October,

1969, these wells took one hundred four thousand ninety-eight barrels of injection water at an average well head pressure of fifteen hundred PSI.

Shown on Exhibit 3, at each of the injection well locations, in the upper left-hand, the water injection for the month of October; the upper right-hand, the well head pressure average during the month of October, 1969, and the lower figure or the bottom figure is the cumulative water injected into that well since the waterflood began.

I would like to point out that thirty-one of these active wells, both producers and injectors, are completed through perforations in two and seven-eighths casing cemented through the pay section. Slim hole or 1.9 O. D. tubing is used in both injection wells and producers.

Q Now, would you review the production and injection history of this waterflood program?

A Humble Oil and Refining Company began water injection into six wells on the 19th of November, 1963, as a pilot waterflood operation.

These wells numbered twenty-three, twenty-six, twenty-eight, thirty-one and thirty-seven and thirty-eight

were authorized for conversion to injection by the Oil Conservation Commission, Case No. 2879, Order No. R-2556. If I may, these wells are shown on Exhibit No. 1, somewhat in the center of the plat, and they have been -- the triangle casing on the well location has been filled in with orange.

This double 5-spot was the pilot area for this flood. The flood was expanded in 1965, after approval by the Oil Conservation Commission in Case 3219, Order No. R-2891.

The present eighty-acre 5-spot flood pattern is shown on the plat, Exhibit 1, with each 5-spot outlined in orange. I would like to point out that some of these 5-spots, of course, are not exactly eighty acres because of the spacing of the wells and the location of injectors.

Q But, in general, it has been developed on an eighty-acre 5-spot?

A That is correct and that is its current condition.

Q Now, do you have some information on the production and injection rates?

A Yes, I do. A tabulation showing oil and gas and water production, along with injection rates and

pressures by months from November, 1963 through November, 1969, is presented as Exhibit No. 4.

The additional injection, or should we say the commencing of waterflooding in this lease was November, 1963. So, this tabulation provides monthly records for the life of the flood.

Exhibit No. 5 is a group of curves plotted from the above data on semi-log paper. This data provides the production and injection history of the lease for the life of the flood.

I apologize for the appearances of this curve. We were unable to obtain the original of this on the short notice that we had from Humble, so, therefore, we have made a copy of a copy. I believe that it's legible, however.

Q Now, have you made a study of the wells surrounding the proposed new injection well?

A Yes, sir. Referring again to Exhibit No. 1, a study of the four wells, number twenty-seven, twenty-eight, thirty-eight and thirty-nine -- excuse me. Let me refer to Exhibit No. 6.

The Exhibit No. 6 shows the proposed well location, No. sixty-three, and the four surrounding wells. Well number sixty-three is shaded in orange. The study of

the four wells surrounding the proposed new producer, No. sixty-three, has been made to provide information about primary and secondary recoveries to date.

Primary recovery from these four wells to 1-1-1964 was eighty thousand, eight hundred ninety-seven barrels. The extrapolated future primary from 1-1-64 to economic limit was thirty thousand, one hundred and twenty barrels; resulting in an ultimate primary from the four wells of one hundred eleven thousand seventeen gross barrels.

This is equal to approximately twenty-seven thousand seven hundred fifty barrels per well or 36.5 barrels per acre foot.

Q Did you have any core information available to you?

A None of these four wells were cored. However, a nearby well, No. 19 was cored, and the core data is provided. The average net pay thickness was 19.0 feet. The average net pay porosity was 13.3 percent. The average measured water saturation was 39.5 percent. The estimated water saturation was 35.0 percent. The estimated oil saturation 65.0 percent.

Q Were you able to correlate your log core

information with the logs available to you?

A Yes. Well No. 19 was logged and the other four wells mentioned above were logged. There was good correlation between logs and a net pay thickness was picked from this correlation.

Q So, your information you just gave as to pay thickness, porosity, water saturation, and so forth, is your judgement of what you would find at the location of the No. 63 well?

A Yes, sir, to the best of our current ability.

Q Have you made a calculation of the stock tank oil in place in that area?

A Based on the above data, the calculations indicate the original stock tank oil in place to be 422 barrels per acre foot. The ultimate primary recovery is calculated to be 36.5 barrels per acre foot or 8.6 percent of the original stock tank oil in place.

Assuming that secondary recovery will be equal to one times ultimate primary recovery, the eighty-acre flood pattern now in operation would recover a total of one hundred eleven thousand barrels primary and secondary oil per eighty-acre 5-spot.

Q What are the future plans of the Applicant in

this case in the event this applications is approved?

A Future plans have been developed based on certain assumptions. The 8.6 percent of original stock tank oil in place primary recovery would suggest that the primary recovery well density of forty acres was not adequate.

Solution gas drive reservoirs of this type should be expected to recover approximately fifteen percent of the original stock tank oil in place. If the calculated ultimate primary recoveries, based on fifteen percent of the original stock tank oil in place would indicate an effective drainage of 57.3 percent of forty acres or 22.9 net acres.

If, through infield drilling and forty-acre 5-spot, the calculated primary of fifteen percent and secondary equal to primary could be produced, then an eighty-acre tract would produce one hundred ninety-one thousand five hundred twenty barrels. This would be an additional recovery of eighty thousand five hundred twenty barrels. If a secondary recover of more than one to one could be achieved, then a substantial increase would occur in the additional recovery.

Q Now, how will you propose to complete your

producing wells? I note some of the wells in the pool are presently slim hole completions. Will you continue with that?

A No, sir. We would propose that the new producer, No. 63 and others that would follow, would be drilled and completed using four and a half, five and a half or seven inch production casing.

This would allow the production of large volumes of fluid usually encountered in waterflood production. An additional benefit of the new wells would be the ability to use standard completion techniques and standard down hole equipment as well as normal procedures for protection against scale and corrosion.

Q Now, on the conversion of your producing wells to water injection, how will they be completed?

A The existing producers will be converted to water injection wells through coated 1.9 O. D. tubing and packer. The annular space would be filled with treated water.

Q A pressure gauge at the surface?

A Yes. This is the same technique used on the present injection wells.

Q Now, referring again to Exhibit No. 6, does that show the proposed location of future wells in the forty-acre

pattern?

A Yes, sir, it does. Exhibit No. 6 shows existing wells both producers and injectors connected by blue lines and the areas generally enclosed would be the forty-acre 5-spots.

The circles inside of each of the areas would be the approximate location and number of future producing wells.

Q Now, at the present time, it is your intention only to drill the No. 63 well and gather data and information on the basis of that before you go into any further expansion; is that correct?

A Yes, sir; that is correct. As you can see by this testimony, the situation has not proven. It is proposed and the first well will be used as a guide in economics and feasibility for future wells.

Q Now, for that purpose, do you ask that the Commission include in its order an administrative procedure for further expansion of this program by the drilling of the additional wells?

A Yes, sir, we do. The No. 63 well, should it perform as we expect, would certainly lend credence to the expansion of the additional wells on the project and

it is estimated that if the proposed forty-acre flood pattern were fully developed, it would produce an additional seven hundred sixty-five thousand barrels of gross oil.

This additional oil is based on a one to one recovery. That is, secondary equal to primary.

Q Now, just for the information of the Examiner, what is the source of water you are presently injecting in this flood?

A Our water source is the lower San Andres reservoir below forty-four hundred feet.

Q Is the water being treated?

A Yes, the water is being treated.

Q All your injection is through internally coated tubing; is that correct?

A Yes, sir; that is correct.

Q Do you recycle the water that is being produced?

A All produced water is being recycled.

Q In your opinion, will there be sufficient water available for the continued expansion of this project as you propose?

A Yes, sir, there is.

Q Would you summarize briefly the proposal that

has been made by the Applicant in this case?

A In summary, it is estimated that the proposed forty-acre flood pattern will produce an additional seven hundred sixty-five thousand barrels of gross oil. This seven hundred sixty-five thousand barrels of oil is not otherwise recoverable.

Thereby, the New Mexico Oil Conservation Commission will prevent waste by approval of this application.

Q Would you give the precise location of the No. 63 well you propose to drill?

A Yes, sir. The No. 63 well location is twenty-seven hundred forty feet from the south line and twelve hundred eighty feet from the east line of Section 30, Township 22 South, Range 37 East.

Q After the completion of this well, will you convert the numbers twenty-seven and thirty-nine wells to injection?

A It is planned when wells numbers twenty-seven and thirty-nine reach, should we say, subeconomic production conditions, that they will be converted to water injection, thereby providing a forty-acre 5-spot around the No. 63 location.

Q Now, you also ask for an administrative procedure

for conversion of producing wells to injection or from injection to production, whether the wells have received a response from the waterflood project or not; is that correct?

A Yes, sir, that is.

Q That would be an exception of the present rules of the Commission?

A Yes, it is a request for an exception.

Q Was Exhibit A, together with Exhibit Numbers two through six inclusively, prepared by you or under your supervision?

A Yes, sir, they were.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibit A.

MR. NUTTER: Applicant's Exhibit A will be admitted in evidence.

MR. KELLAHIN: That completes the presentation, Mr. Nutter.

MR. NUTTER: Are there any questions of this witness? He may be excused.

(Witness excused).

MR. NUTTER: Do you have anything futher, Mr. Kellahin?

MR. KELLAHIN: That's all, Mr. Nutter.

MR. NUTTER: Does anyone have anything they wish to offer in Case 4288? We will take the case under advisement.

I N D E X

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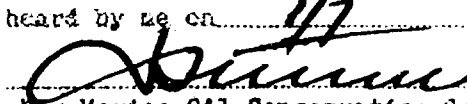
STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

I, GLENDA BURKS, Court Reporter in and for
 the County of Bernalillo, State of New Mexico, do here-
 by certify that the foregoing and attached Transcript of
 Hearing before the New Mexico Oil Conservation Commission
 was reported by me; and that the same is a true and correct
 record of the said proceedings to the best of my knowledge,
 skill and ability.


 Notary Public

My Commission Expires:

March 12, 1973

I do hereby certify that the foregoing is
 a complete record of the proceedings in
 the Examiner hearing of Case No. 4288
 heard by me on 4/7/70

 Examiner
 New Mexico Oil Conservation Commission

**BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO**

**IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:**

**CASE No. 4288
Order No. R-3910**

**APPLICATION OF WOOD, McSHANE AND
THAMS-COLORADO FOR AN UNORTHODOX
OIL WELL LOCATION AND WATERFLOOD
EXPANSION, LEA COUNTY, NEW MEXICO.**

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 7, 1970, at Santa Fe, New Mexico, before Examiner Daniel S. Mutter.

NOW, on this 14th day of January, 1970, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicants, Wood, McShane and Thams-Colorado, are now the operators of the State "M" Lease Waterflood Project, Langlie-Mattix Pool, Lea County, New Mexico, formerly operated by Humble Oil & Refining Company and approved by Commission Order No. R-2556 and extended by Order No. R-2891.

(3) That the applicants seek authority to drill their Well No. 63, a producing oil well, at an unorthodox location 2740 feet from the South line and 1280 feet from the East line of Section 30, Township 22 South, Range 37 East, NMPM, Lea County, New Mexico, as an infill well in said State "M" Lease Waterflood Project.

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CASE No. 4288
Order No. R-3910

(4) That the proposed unorthodox location is necessary to provide an efficient oil producing pattern.

(5) That the applicants also seek the establishment of an administrative procedure whereby the Secretary-Director of the Commission may authorize additional producing wells and injection wells at orthodox and unorthodox locations within said State "M" Lease Waterflood Project area as may be necessary to complete an efficient production and injection pattern.

(6) That approval of the requested administrative procedure will afford the applicants the opportunity to produce their just and equitable share of the oil in the Langlie-Mattix Pool, provided said wells are drilled no closer than 330 feet to the outer boundary of the subject lease nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary.

(7) That the subject waterflood project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations, provided however, that the showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicants, Wood, McShane and Thams-Colorado, are hereby authorized to drill their Well No. 63, a producing oil well, at an unorthodox location 2740 feet from the South line and 1280 feet from the East line of Section 30, Township 22 South, Range 37 East, NMPM, Langlie-Mattix Pool, Lea County, New Mexico, as an infill well in their State "M" Lease Waterflood Project.

(2) That the subject waterflood project shall continue to be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations;

PROVIDED HOWEVER, that the Secretary-Director of the Commission may approve such additional producing wells and injection wells at orthodox and unorthodox locations within the State "M" Lease Waterflood Project area as may be necessary to complete an efficient production and injection pattern; provided said wells are drilled no closer than 330 feet to the outer boundary

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Order No. R-3910

of the subject lease nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary, and provided that the application therefor has been filed in accordance with Rule 701 B of the Commission Rules and Regulations. The showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

(3) That the subject waterflood project shall continue to be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations insofar as said rules are not inconsistent with this order.

(4) That monthly progress reports of the subject waterflood project shall continue to be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

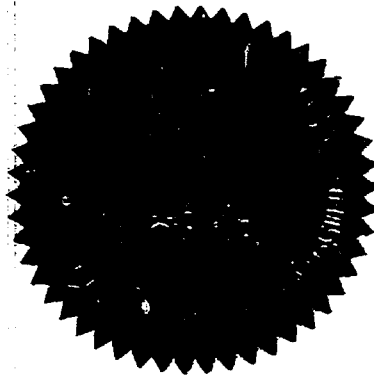
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARGO, Chairman


ALEX J. ARMIJO, Member


A. L. PORTER, Jr., Member & Secretary



esr/

Docket No. 1-70

DOCKET: EXAMINER HEARING - WEDNESDAY - JANUARY 7, 1970

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or
A. L. Porter, Jr., Alternate Examiners:

CASE 4286: Application of Gulf Oil Corporation for an exception to Order No. R-3221, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Order No. R-3221, as amended, which order prohibits the disposal of water produced in conjunction with the production of oil on the surface of the ground in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico. Said exception would be for applicant's Littlefield "AB" Federal Lease, located in Section 22, Township 18 South, Range 31 East, Shugart Field, Eddy County, New Mexico. Applicant seeks authority to dispose of salt water produced by wells on said lease in unlined surface pits in said Section 22.

CASE 4287: Application of Continental Oil Company, for a waterflood expansion and unorthodox injection well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Forest Donahue Waterflood Project, Forest Pool, by the injection of water through one additional well located at an unorthodox location 1960 feet from the North line and 1450 feet from the West line of Section 35, Township 16 South, Range 29 East, Eddy County, New Mexico.

CASE 4288: Application of Wood, McShane and Thams-COLORADO for an unorthodox oil well location and waterflood expansion, Lea County, New Mexico. Applicants, in the above-styled cause, seek authority to drill their Well No. 63, a producing oil well, at an unorthodox location 2740 feet from the South line and 1280 feet from the East line of Section 30, Township 22 South, Range 37 East, as an infill well in the Humble Oil & Refining Company State "M" Lease Waterflood Project, Langlie-Battix Pool, Lea County, New Mexico. Applicants further seek to expand said project by the conversion to water injection of their Wells Nos. 27 and 39 located, respectively, in Units H and J of said Section 30. Applicants also seek a procedure whereby additional producing wells and injection wells at orthodox and unorthodox locations in said project may be approved administratively.

January 7, 1970 - Examiner Hearing

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Docket No. 1-70

CASE 4289: Application of Getty Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from the Justis-Blinbry and Justis-Tubb Drinkard Pools in the wellbore of its State "BB" Well No. 2 located in Unit D of Section 2, Township 25 South, Range 37 East, Lea County, New Mexico.

CASE 4290: Application of Getty Oil Company for a non-standard oil proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of an 80-acre non-standard proration unit comprising the SE/4 NE/4 and the NE/4 SE/4 of Section 29, Township 18 South, Range 38 East, Hobbs-Drinkard Pool, Lea County, New Mexico, said unit to be dedicated to a well to be drilled at a standard location in the NE/4 SE/4 of said Section 29.

CASE 3993: (Reopened)

In the matter of Case No. 3993 being reopened pursuant to the provisions of Order No. R-3644, which order established 160-acre spacing units for the North Baum-Upper Pennsylvanian Pool, Lea County, New Mexico, for a one-year period. All interested parties may appear and show cause why said pool should not be developed on less than 160-acre units and why the proportional factor of 4.77 assigned to the pool should or should not be retained.

CASE 4202: (Reopened)

In the matter of Case 4202 being reopened at the request of the applicant, Mobil Oil Corporation. Applicant, in the original hearing of this case, sought permission to institute a water-flood project in the Langlie Mattix Queen Unit Area, Langlie-Mattix Pool, by the injection of water into the Queen sand formation through 17 injection wells at orthodox and unorthodox locations in Sections 10, 11, 14, 15, 22, and 23, Township 25 South, Range 37 East, Lea County, New Mexico. The Commission, by Order No. R-3823, authorized the applicant to inject water through 16 wells and denied the applicant authority to inject water through the proposed injection Well No. 14 to be drilled 660 feet from the North line and 1220 feet from the West line of said Section 14. Applicant seeks authority to now complete said Well No. 14 as a water injection well, alleging that negotiations for the acquisition or inclusion of acreage offsetting said Well No. 14 have not been successful, that failure to inject water through the well will result in the loss of approximately 200,000 barrels of oil, and that said injection will not violate the correlative rights of the offset operation.

- CASE 4291: Application of Atlantic Richfield Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Yates formation in the perforated and open-hole interval from 2892 feet to 3164 feet in its W. B. Hanagan Well No. 4 located 2173 feet from the South and West lines of Section 12, Township 25 South, Range 36 East, Jalmat Pool, Lea County, New Mexico.
- CASE 4292: Application of Continental Oil Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the consolidation of two existing non-standard gas proration units into one 320-acre non-standard unit comprising the S/2 N/2 and the SE/4 of Section 1, Township 22 South, Range 36 East, Eumont Gas Pool, Lea County, New Mexico, to be dedicated to its Lockhart B-1 Wells Nos. 4 and 6, located in Units G and P, respectively, of said Section 1. Applicant further seeks authority to produce the allowable assigned to said unit from either of the aforesaid wells in any proportion.
- CASE 4778: (Continued from the December 17th Examiner Hearing and will be dismissed).
Application of Anne Burnett Windfohr, dba Windfohr Oil Company, for an exception to Order No. R-3221, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Order No. R-3221, as amended, which order prohibits the disposal of water produced in conjunction with the production of oil on the surface of the ground in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico. Said exception would be for applicant's Gissler B Wells Nos. 11 and 12, located, respectively, in Units J and I of Section 23, Township 17 South, Range 30 East, Jackson-Abo Pool, Eddy County, New Mexico. Applicant seeks authority to dispose of salt water produced by said wells in unlined surface pits in the vicinity of said wells.
- CASE 4279: (Continued from the December 17th Examiner Hearing and will be dismissed).
Application of Anne Burnett Windfohr, dba Windfohr Oil Company, for an exception to Order No. R-3221, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Order No. R-3221, as amended, which order prohibits the disposal of water produced in conjunction with the production of oil on the surface of the ground in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico. Said exception would be for applicant's Gissler B Well No. 4 located in Unit B of Section 8, Township 17 South, Range 30 East, Grayburg-Jackson Pool, Eddy County, New Mexico. Applicant seeks authority to dispose of salt water produced by said well in an unlined surface pit in the vicinity of said well.

APPLICATION OF WOOD, McSHANE & THAMS - COLORADO

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

CASE NO. 4288

DOCKET NO. 1-70

WEDNESDAY, JANUARY 7, 1970

SANTA FE, NEW MEXICO

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
App EXHIBIT NO. A
CASE NO. 4288

APPLICATION OF WOOD, McSHANE AND THAMS - COLORADO
FOR AN UNORTHODOX OIL WELL LOCATION AND WATERFLOOD
EXPANSION, LEA COUNTY, NEW MEXICO

CASE NO. 4288

DOCKET NO. 1-70

HEARD BY DANIEL S. NUTTER, EXAMINER, OR A. L. PORTER, JR.,
ALTERNATE EXAMINER

This is an application by Wood, McShane & Thams - Colorado, a partnership, to the Oil Conservation Commission of New Mexico for approval of an unorthodox well location to be used for production purposes, conversion of producing wells to water injection, and administrative procedure for further development.

I. Current Status of Langlie Mattix Pool
Waterflood M State Lease

There are 21 active producing wells in the Queen Sand in the waterflood area on the M State Lease. During November 1969, these wells produced 7,933 barrels of oil and 17,851 barrels of water. The attached plat, exhibit #2 provides well numbers and daily oil and water production during November 1969 and cumulative oil production for each well to December 1, 1969.

There are 19 active injection wells in the Queen Sand on the M State Lease. During October 1969, these wells took 104,098 barrels of injection water at an average well head pressure of 1500 psi. Shown on exhibit #3 are the well numbers and injection rate, well head pressure and cumulative water injected to 1 November 1969.

Thirty one of these active wells are completed through perforations in 2 7/8" casing cemented through the pay section. Slim hole (1.9 inch O. D.) tubing is used both in the injection wells and producers.

II. Production and Injection History Of the Waterflood Program

Humble Oil and Refining Company began water injection into six wells on 19 November, 1963 as a pilot flood operation. These wells numbered 23, 26, 28, 31, 37 and 38 were authorized for conversion to injection by the Oil Conservation Commission Case No. 2879, Order No. R-2556. These six wells are shown circled in orange on the plat exhibit #1. The flood was expanded in 1965 after approval by the Oil Conservation Commission in Case 3219, Order No. R-2891. The present 80 acre five spot flood pattern is shown on the plat exhibit #1, with each 5-spot outlined in orange.

A tabulation showing oil, gas and water production along with injection rates and pressures by months from November 1963 through November 1969 is presented as exhibit #4. The exhibit #5 is a group of curves plotted from the above data on semi-log paper. This data provides the production and injection history of the lease for the life of the flood.

A study of the four wells numbered 27, 28, 38 and 39 which surround the proposed new producer #63 has been made to provide

information about primary and secondary recoveries. Primary recovery from these four wells to 1/1/64 was 80,897 barrels. Extrapolated future primary from 1/1/64 to economic limit was 30,120 barrels resulting in an ultimate primary from the four wells of 111,017 gross barrels. This is equal to 27,750 barrels per well, or 36.5 B/Ac-ft.

The core analysis from a near by well #19, and log data indicates the following reservoir conditions in the area of the proposed #63 well:

Average Net Pay Thickness	19.0 feet
Average Net Pay Porosity	13.3%
Average Measured Water Saturation	39.5%
Estimated Water Saturation	35.0%
Estimated Oil Saturation	65.0%

Calculations indicate the original stock tank oil in place to be 422 barrels per acre foot. Ultimate primary recovery is calculated to be 36.5 barrels per acre foot or 8.6% of the original stock tank oil in place. Assuming that secondary recovery will be equal to one times ultimate primary recovery, the 80 acre flood pattern now in operation should recover a total of 111,000 barrels primary and secondary per 80 acre five spot.

III. Future Plans for Development of 40 Acre Waterflood Pattern

The 8.6% of OSTOIP primary recovery would suggest that, the primary recovery well density of 40 acres was not adequate.

Solution gas drive reservoirs of this type should be expected to recover approximately 15% of OSTOIP. Calculated ultimate primary recoveries, based on 15% of OSTOIP would indicate an effective drainage of 57.3% of 40 acres, or 22.9 net acres. If through infield drilling and 40 acre five spots the calculated primary of 15% and secondary equal to primary could be produced, then an 80 acre tract would produce 191,520 barrels. The additional recovery would equal 80,520 barrels. A secondary recovery of more than one to one would substantially increase the additional recovery.

It should be noted that each new producer drilled will be completed using $4\frac{1}{2}$ " , $5\frac{1}{2}$ " or 7" production casing. This will allow the production of large volumes of fluid usually encountered in waterflood production. An additional benefit of the new wells would be the ability to use standard completion techniques and down hole equipment as well as normal procedures for protection against scale and corrosion.

Existing producers will be converted to water injection wells through coated 1.9" O. D. tubing and packer. This will provide for increased injection rate per unit area which in turn should increase production rates. The exhibit #6 attached is a plat showing the proposed expanded 40 pattern. Well #63 is shaded in orange on the plat. The proposed 40 acre pattern will be developed only as satisfactory results and economics dictate.

IV. Summary

It is estimated that the proposed 40 acre flood pattern when fully developed will produce an additional 765,000 gross barrels of oil. This 765,000 barrels of oil is not

otherwise recoverable, thereby the New Mexico Oil Conservation Commission will prevent waste by approval of this application.

Wood, McShane & Thams - Colorado, is the operator of the Humble Oil and Refining Company "M" State waterflood project.

The operator proposes to drill their well No. 63 at a location 2740 feet from the South line, and 1280 feet from the East line of Section 30, Township 22 South, Range 37 East, N.M.P.M., for production from the Queen formation of the Langlie Mattix Pool, in the State "M" waterflood project.

The operator further proposes to convert, at some future date, producing wells Nos. 27 and 39 for water injection providing a forty-acre five-spot injection pattern rather than the existing 80-acre five-spot pattern.

The Operator further applies to the Oil Conservation Commission for an order providing for administrative approval for the drilling of further wells at unorthodox locations within the Langlie Mattix State "M" waterflood project under such rules as the Commission deems proper, with further provision for an administrative procedure for the conversion of producing wells to injection, or from injection to production, whether such wells have received a response from the waterflood project or not.

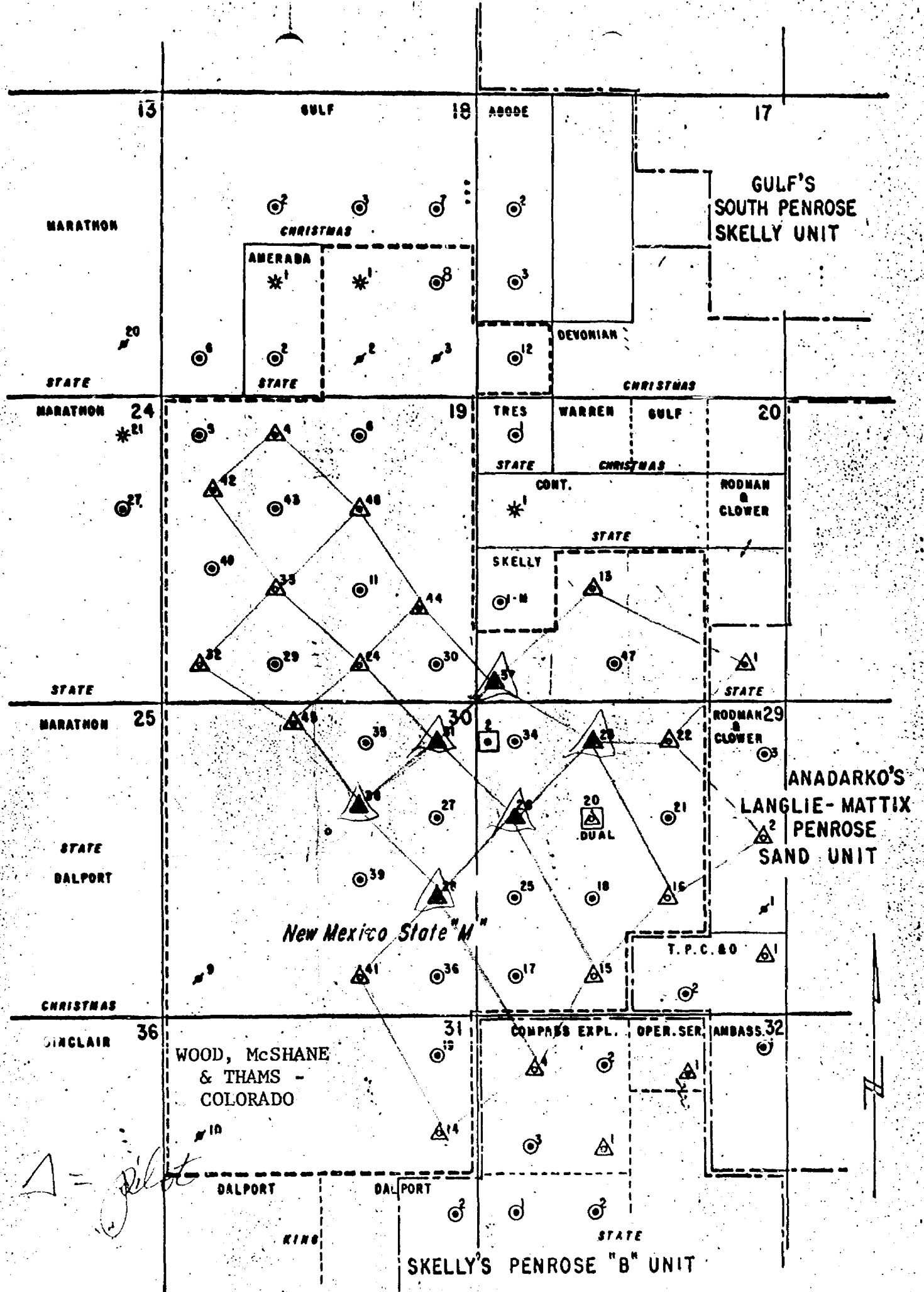
Respectfully submitted,

WOOD, McSHANE & THAMS - COLORADO

By B. Oliver Wood
B. Oliver Wood, P. E.

By Joe B. McShane
Joe B. McShane, P. E.

REGISTERED PROFESSIONAL ENGINEERS



- LEGEND -

- Producing Wells
- Water Injection Wells
- Water Source Wells
- Gas Wells
- P. & A. Wells

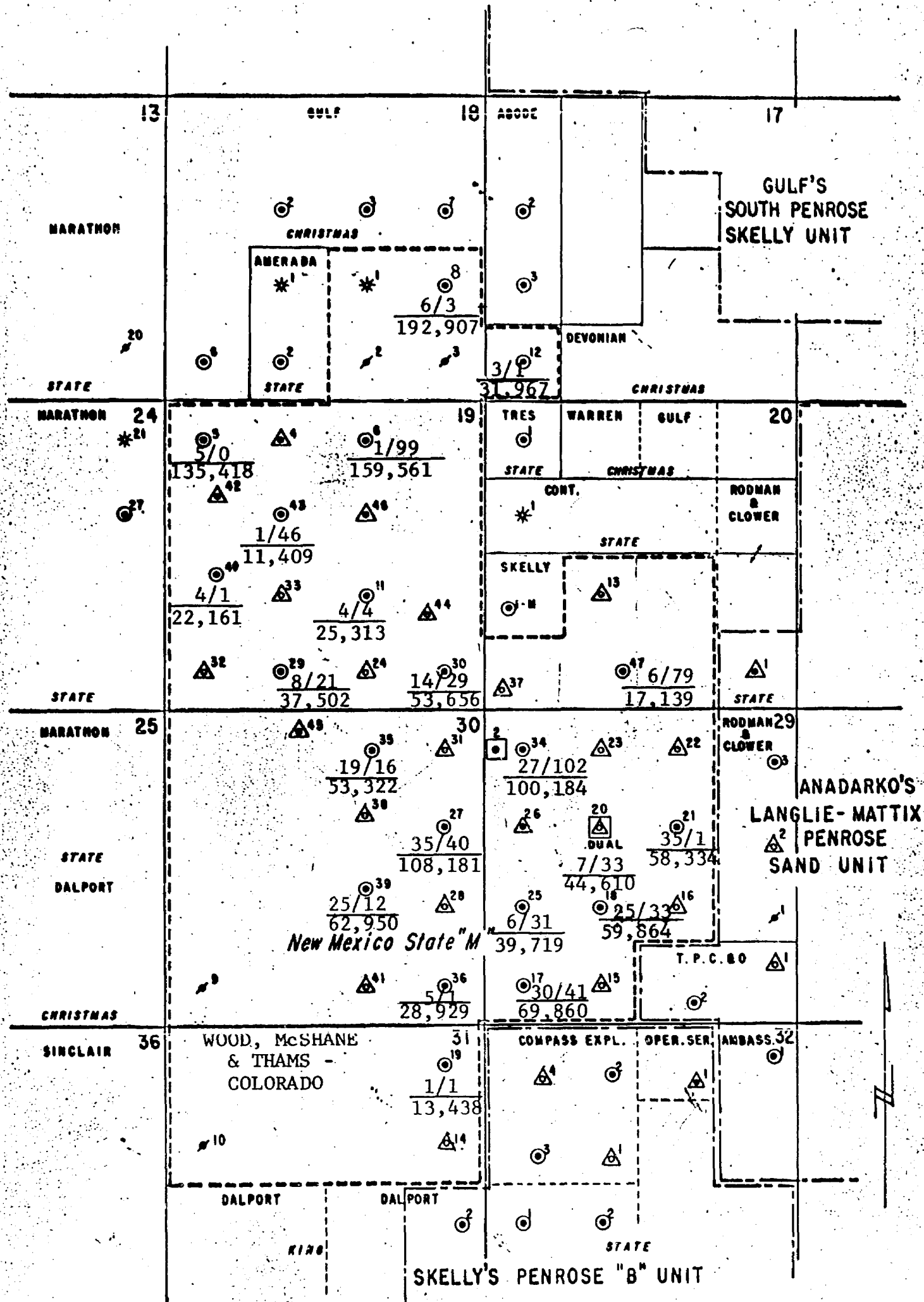
----- State "M" Lease
----- Unit Lines

EXHIBIT NO. 1

WOOD, McSHANE & THAMS - COLORADO

New Mexico M State Lease
Langlie Mattix Pool
Lea County, New Mexico

PRESENT 80 ACRE
PATTERN



T 22 S - R 37 E

- LEGEND -

- ⊙ Producing Wells
- △ Water Injection Wells
- Water Source Wells
- * Gas Wells
- P. & A. Wells

----- State "M" Lease
 --- Unit Lines

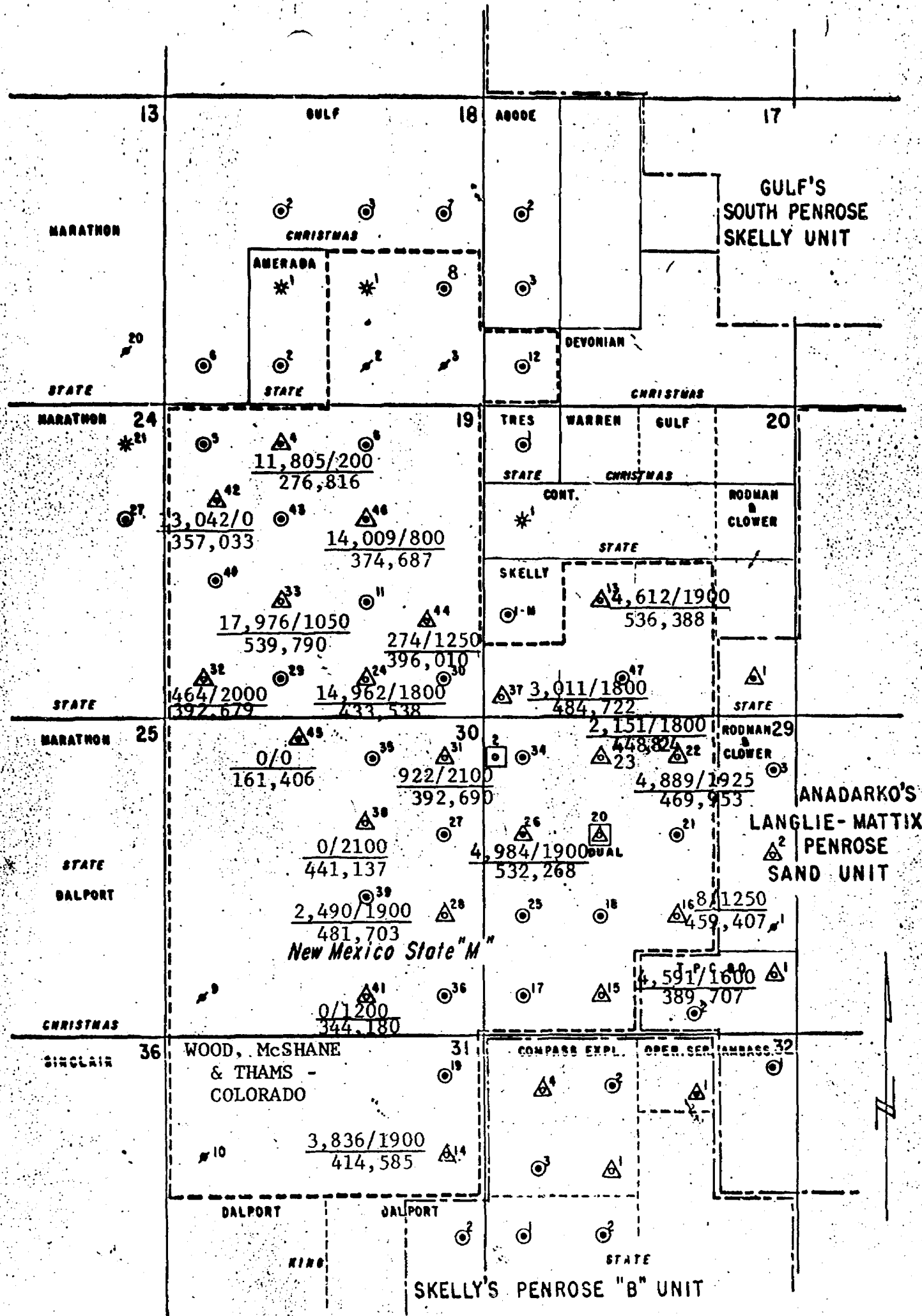
EXHIBIT NO. 2

WOOD, McSHANE & THAMS - COLORADO

New Mexico M State Lease
 Langlie Mattix Pool
 Lea County, New Mexico

OIL PRODUCTION DATA

Bbls. Oil/Bbls. Water
 Cumulative 12-1-69



- LEGEND -

- ⊙ Producing Wells
- △ Water Injection Wells
- Water Source Wells
- * Gas Wells
- ⚡ P. & A. Wells
- State "M" Lease
- Unit Lines

EXHIBIT NO. 3

WOOD, McSHANE & THAMS - COLORADO

New Mexico M State Lease
Langlie Mattix Pool
Lea County, New Mexico

WATER INJECTION DATA

Bbls. per Month/Pressure
Cumulative 11-1-69

WOOD, McSHANE & THAMS - COLORADO
 LANGLEIE MATTIX POOL
 NEW MEXICO "M" STATE LEASE
 PRODUCTION & INJECTION DATA

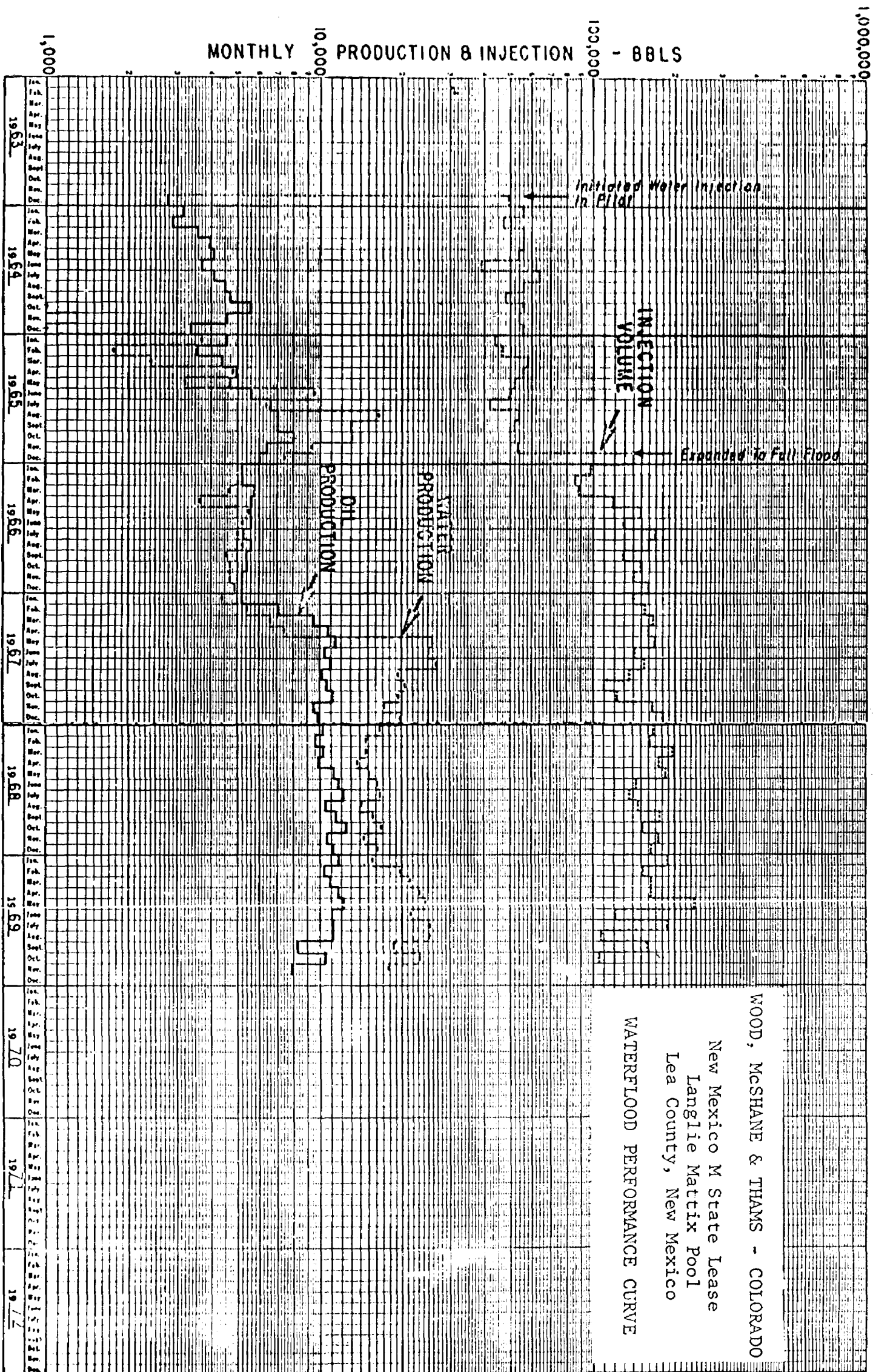
<u>DATE</u>	<u>OIL</u>	<u>WATER</u>	<u>GAS</u> <u>MCF</u>	<u>RATE</u>	<u>INJECTION</u> <u>PRESSURE</u>
<u>1963</u>					
November	912	103	6,530	1,797	-0-
December	2,794	613	21,269	49,172	270
Annual	3,706	716	27,799	50,969	
Cumulative	3,706	716	27,799	50,969	
<u>1964</u>					
January	3,178	886	20,303	55,705	720
February	2,942	685	20,068	46,771	860
March	3,639	902	21,469	56,618	1,040
April	4,049	556	20,998	56,167	1,140
May	4,143	502	22,150	53,975	1,160
June	3,699	378	19,197	39,490	1,180
July	4,059	514	18,036	63,004	1,260
August	4,491	549	18,599	56,812	1,330
September	4,661	784	16,143	48,362	1,330
October	5,659	1,018	15,991	56,835	1,410
November	4,588	1,275	13,537	54,098	1,450
December	3,392	935	11,632	55,891	1,470
Annual	48,500	8,984	218,123	643,728	
Cumulative	52,206	9,700	245,922	694,697	
<u>1965</u>					
January	4,636	3,710	14,553	43,574	1,380
February	3,562	1,800	10,689	46,694	1,450
March	4,414	2,412	10,644	57,404	1,510
April	5,065	4,799	11,704	55,073	1,580
May	4,658	3,218	8,555	51,079	1,500
June	5,680	9,302	10,509	50,439	1,620
July	6,549	6,489	12,674	41,843	1,570
August	6,946	15,544	32,065	53,114	1,580
September	6,995	13,108	21,383	51,311	1,720
October	8,065	13,059	20,818	50,881	1,470
November	6,335	9,203	16,225	54,102	430
December	5,944	7,398	19,197	143,517	190
Annual	68,849	90,042	189,016	699,031	
Cumulative	121,055	99,742	434,938	1,393,728	

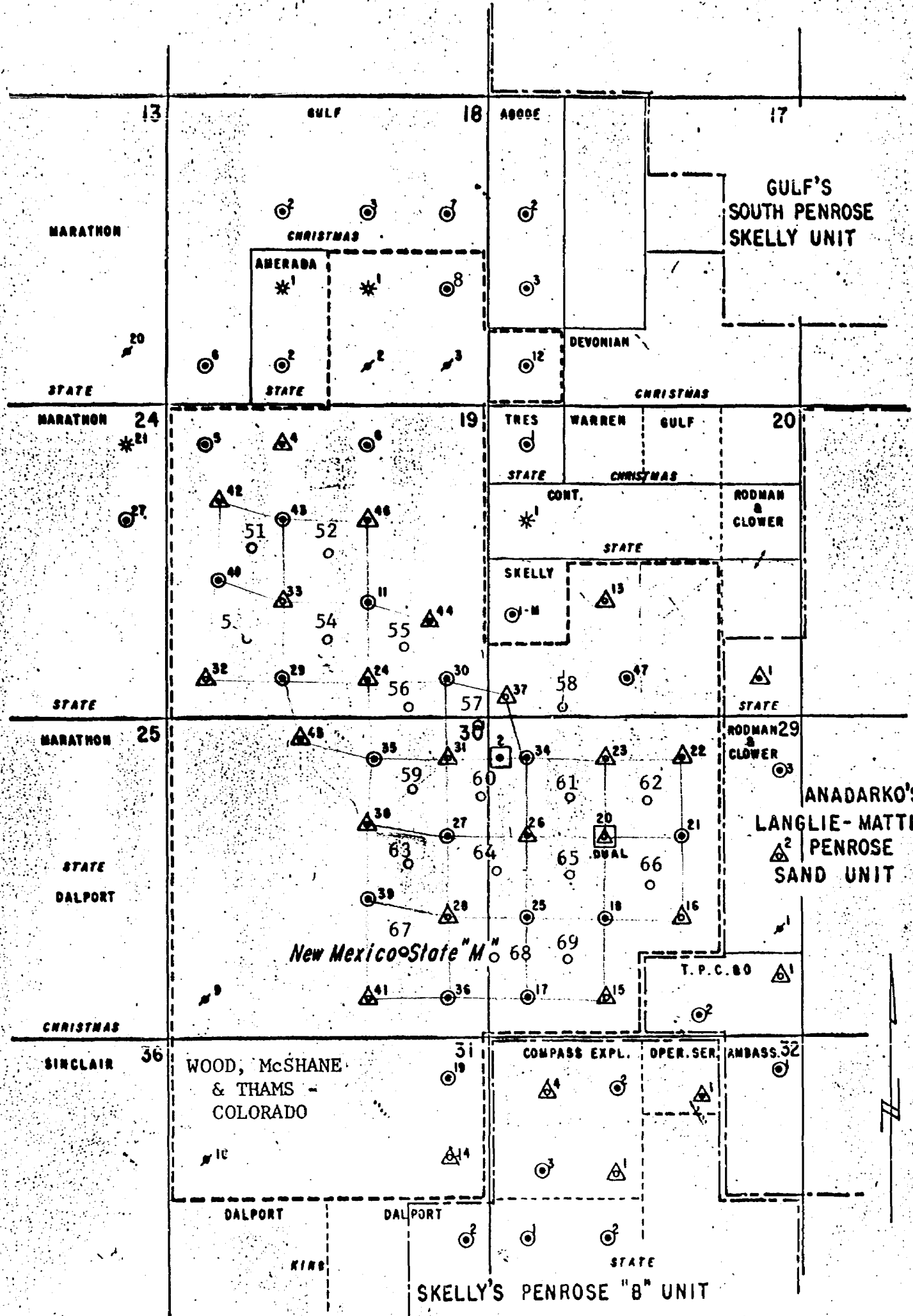
NEW MEXICO "M" STATE LEASE (CONT'D)

<u>DATE</u>	<u>OIL</u>	<u>WATER</u>	<u>GAS</u> <u>MCF</u>	<u>INJECTION</u> <u>RATE</u>	<u>PRESSURE</u>
<u>1966</u>					
January	5,168	5,075	11,856	98,040	520
February	5,207	5,140	10,826	85,055	650
March	5,796	4,556	9,974	87,363	810
April	5,608	3,712	9,671	117,678	770
May	5,564	5,594	12,863	151,820	830
June	5,626	5,126	11,960	125,867	920
July	5,146	5,039	13,195	166,360	950
August	5,683	5,143	14,067	163,853	890
September	5,478	4,556	12,823	134,513	920
October	5,440	4,701	12,906	149,144	1,000
November	5,177	4,669	11,799	135,471	1,030
December	5,238	5,022	10,934	160,532	1,080
Annual	65,131	58,333	142,874	1,575,696	
Cumulative	186,186	158,075	577,812	2,969,424	
<u>1967</u>					
January	5,275	4,479	9,476	138,707	1,010
February	7,020	5,500	8,980	155,592	1,160
March	9,428	6,659	13,311	167,554	1,160
April	10,691	7,533	14,479	160,746	1,220
May	11,280	26,353	13,208	169,244	1,230
June	10,252	25,511	13,653	143,846	1,220
July	10,815	26,828	16,507	152,875	1,240
August	10,097	19,463	15,390	130,908	1,250
September	10,571	20,403	14,952	111,401	1,200
October	11,117	19,883	15,138	125,091	1,240
November	9,634	17,243	13,754	167,555	1,250
December	9,953	19,661	13,279	184,144	1,340
Annual	116,133	199,516	162,127	1,807,663	
Cumulative	302,319	357,591	739,939	4,777,087	

NEW MEXICO "M" STATE LEASE (CONT'D)

<u>DATE</u>	<u>OIL</u>	<u>WATER</u>	<u>GAS</u> <u>MCF</u>	<u>RATE</u>	<u>INJECTION</u> <u>PRESSURE</u>
<u>1968</u>					
January	10,607	17,062	13,500	165,629	1,300
February	9,515	14,659	12,212	161,512	1,380
March	10,160	14,867	14,262	193,241	1,420
April	9,835	13,950	14,070	174,793	1,410
May	11,089	15,303	14,058	184,106	1,420
June	11,637	16,054	13,998	140,206	1,450
July	12,142	16,742	13,623	138,911	1,380
August	10,409	14,357	13,484	145,554	1,450
September	11,358	15,658	13,162	173,939	1,440
October	12,163	16,782	14,401	152,869	1,430
November	10,561	14,569	12,304	173,836	1,360
December	11,709	16,164	12,513	162,182	1,330
Annual	131,185	186,167	161,587	1,966,778	
Cumulative	433,504	543,758	901,526	6,743,865	
<u>1969</u>					
January	11,506	15,872	12,734	188,453	1,420
February	10,094	19,945	11,169	153,804	1,410
March	10,951	21,649	12,099	161,409	1,380
April	11,782	23,282	12,706	162,976	1,410
May	12,171	24,046	12,188	234,155	1,500
June	11,009	21,754	13,082	120,339	1,420
July	11,273	25,409	13,187	186,899	1,530
August	11,121	25,154	12,923	108,647	1,510
September	8,285	18,641	12,125	157,877	1,500
October	10,283	23,129	12,112	104,098	
November	7,933	17,851	10,591		
December					
Annual	116,408	236,732	134,916	1,578,657	
Cumulative	549,912	780,490	1,036,442	8,322,522	





T 22 S - R 37 E

- LEGEND -

- ⊙ Producing Wells
- △ Water Injection Wells
- Water Source Wells
- * Gas Wells
- ↗ P & A Wells

----- State "M" Lease
Unit Lines

EXHIBIT NO. 6

WOOD, McSHANE & THAMS - COLORADO

New Mexico M State Lease
Langlie Mattix Pool
Lea County, New Mexico

PROPOSED 40 ACRE
PATTERN

JASON W. KELLAHIN
ROBERT E. FOX

KELLAHIN AND FOX
ATTORNEYS AT LAW
54 1/2 EAST SAN FRANCISCO STREET
POST OFFICE BOX 1769
SANTA FE, NEW MEXICO 87501

TELEPHONE 982-4315
AREA CODE 505

December 2, 1969

DEC 3 1969

Case 4288

New Mexico Oil Conservation Commission
Post Office Box 2088
Santa Fe, New Mexico

Gentlemen:

Enclosed find application of Wood, McShane and Thams -
Colorado for approval of an unorthodox well location.
Please set hearing for the earliest possible date.

Yours very truly,

Jason W. Kellahin
Jason W. Kellahin

jwk;jh

Encl. Original and 2 copies.

DOCKET MAILED

Date 12-27-69

100-8100

BEFORE THE
OIL CONSERVATION COMMISSION OF NEW MEXICO

APPLICATION OF WOOD, McSHANE
AND THAMS-COLORADO FOR APPROVAL OF
AN UNORTHODOX WELL LOCATION,
LANGLIE MATTIX POOL, LEA COUNTY,
NEW MEXICO, CONVERSION OF
PRODUCING WELLS TO INJECTION,
AND ADMINISTRATION PROCEDURE
FOR FURTHER DEVELOPMENT.

Case 4288

A P P L I C A T I O N

Come now Wood, McShane and Thams-Colorado, a partnership composed of B. Oliver Wood, Joe B. McShane, Jr., William H. Thams, and Colorado Oil and Gas Corporation, and apply to the Oil Conservation Commission of New Mexico for approval of an unorthodox well location to be used for production purposes in the Humble Oil & Refining Company State "M" waterflood project, and in support thereof would show the Commission:

1. Applicants are the operator of the Humble Oil & Refining Company State "M" waterflood project, which was approved by Oil Conservation Commission Order No. R-2556, and extended by Order No. R-2891.

2. Applicants proposed to drill their well No. 63 at a location 2740 feet from the South line, and 1280 feet from the East line of Section 30, Township 22 South, Range 37 East, N.M.P.M., for production from the Queen formation of the Langlie Mattix Pool, in the State "M" waterflood project.

3. Applicants further propose to convert, at some future date, producing wells Nos. 27 and 39 for water injection providing a forty-acre five-spot injection pattern rather than the existing 80-acre five-spot pattern.

4. Applicants further apply to the Oil Conservation Commission for an order providing for administrative approval for the drilling of further wells at unorthodox locations within the Langlie Mattix State "M" waterflood project under such rules as to the Commission seems proper, with further provision for an administrative procedure for the conversion of producing wells to injection, or from injection to production, whether such wells have received a response from the waterflood project or not.

Attached to this application is a plat showing the present pattern of injection and producing wells, location of the proposed well No. 63, and location of producing wells Nos. 27 and 39, and other wells in the waterflood project.

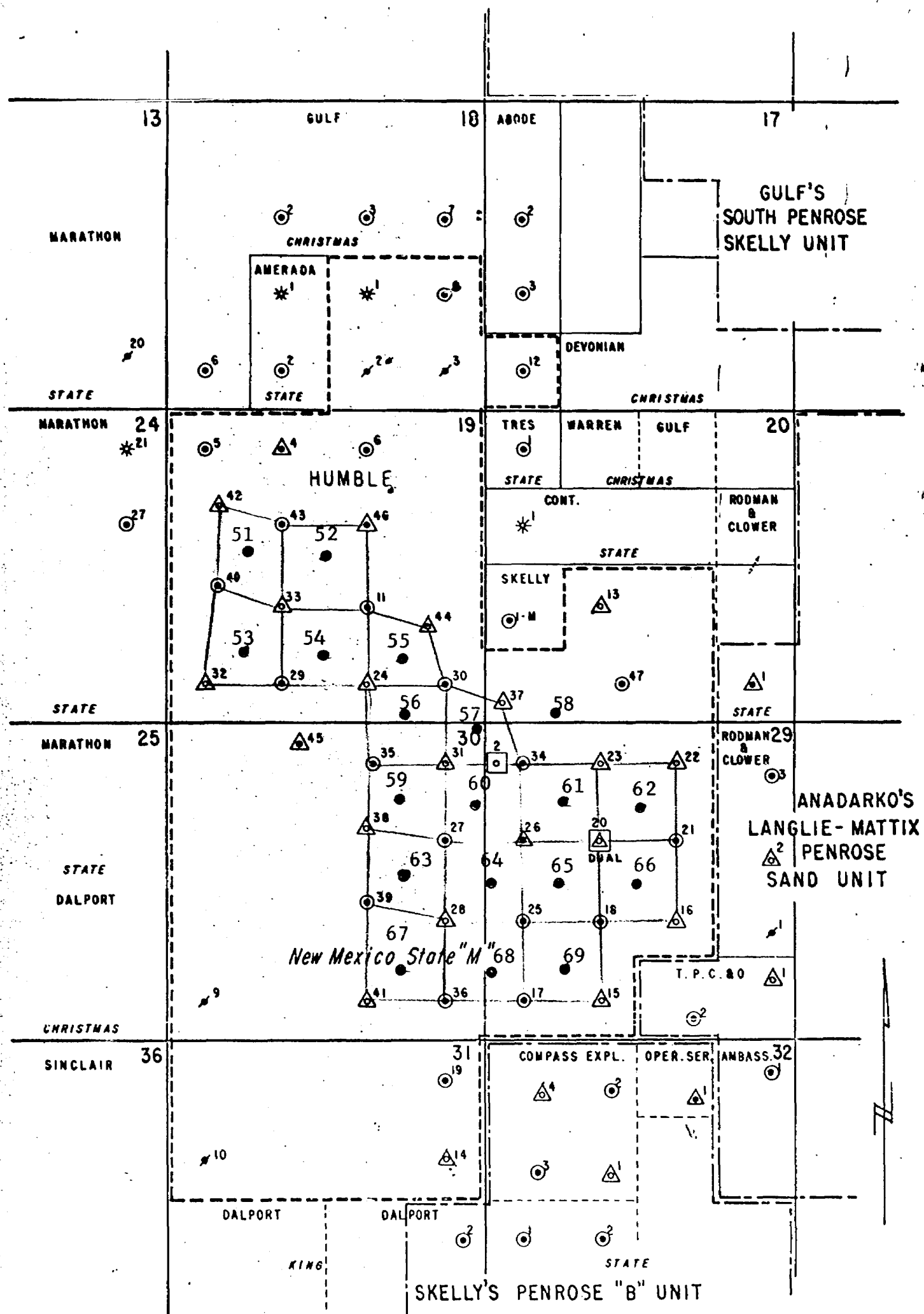
WHEREFORE applicant prays that this application be set for hearing before the Commission or the Commission's duly appointed examiner, and that after notice and hearing as required by law, the Commission enter its order granting the relief asked in this application.

Respectfully submitted,

WOOD, MCSHANE & THAMS - COLORADO

By Jason W. Kellahin
Kellahin & Fox
Post Office Box 1769
Santa Fe, New Mexico

ATTORNEYS FOR APPLICANT



- LEGEND -

- ⊙ Producing Wells
- △ Water Injection Wells
- Water Source Wells
- * Gas Wells
- ✕ P. & A. Wells

NEW WELLS ○

#60

#64

QUEEN SAND

FLOOD PATTERN

----- State "M" Lease
 ----- Unit Lines

PLAT SHOWING HUMBLE'S
 NEW MEXICO STATE "M" LEASE
 LANGLIE MATTIX POOL
 LEA COUNTY, NEW MEXICO

PLAT "B"
 PROPOSED INFIELD WELL LOCATIONS
 & NUMBERS

December 1, 1969

DRAFT

GMH/esr

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

GMH
IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

AKP
CASE No. 4288

Order No. R-3910

APPLICATION OF WOOD, McSHANE AND
THAMS-COLORADO FOR AN UNORTHODOX
OIL WELL LOCATION AND WATERFLOOD
EXPANSION, LEA COUNTY, NEW MEXICO.

WCC
ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 7, 19670,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this _____ day of January, 19670, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That the applicants, Wood, McShane and Thams-Colorado,
^{now} are the operators of the ~~Humble Oil & Refining Company~~ State "M"
Lease Waterflood Project, Langlie-Mattix Pool, Lea County, New
Mexico, ^{formerly operated by Humble Oil & Refining Company and} ~~which waterflood project was~~ approved by Commission Order
No. R-2556 and extended by Order No. R-2891.

(3) That the applicants seek authority to drill their Well
No. 63, a producing oil well, at an unorthodox location 2740 feet
from the South line and 1280 feet from the East line of Section 30,
Township 22 South, Range 37 East, NMPM, Lea County, New Mexico,
as an infill well in said ~~Humble Oil & Refining Company~~ State "M"
Lease Waterflood Project.

(4) That the proposed unorthodox location is necessary to provide an efficient oil producing pattern.

(5) That the applicants also seek the establishment of an administrative procedure whereby the Secretary-Director of the Commission may authorize additional producing wells and injection wells at orthodox and unorthodox ~~infill~~ locations within said ~~Humble Oil & Refining Company~~ State "M" Lease Waterflood Project area as may be necessary to complete an efficient production and injection pattern.

(6) That approval of the requested administrative procedure will afford the applicants the opportunity to produce their just and equitable share of the oil in the Langlie-Mattix Pool, provided said wells are drilled no closer than 330 feet to the outer boundary of the ~~Unit~~ ^{subject lease} nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary.

(7) That the subject waterflood project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations, provided however, that the showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicants, Wood, McShane and Thams-Colorado, are hereby authorized to drill their Well No. 63, a producing oil well, at an unorthodox location 2740 feet from the South line and 1280 feet from the East line of Section 30, Township 22 South, Range 37 East, NMPM, Langlie-Mattix Pool, Lea County, New Mexico, as an infill well in their ~~Humble Oil & Refining Company~~ State "M" Lease Waterflood Project.

continue to

(2) That the subject waterflood project shall be governed¹ by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations;

6-11-70

PROVIDED HOWEVER, that the Secretary-Director of the Commission may approve such additional producing wells and injection wells at orthodox and unorthodox ~~infill~~ locations within the ~~Humble Oil & Refining Company~~ State "M" Lease Waterflood Project area as may be necessary to complete an efficient production and injection pattern; provided said wells are drilled no closer than 330 feet to the outer boundary of the ~~unit~~ *subject lease* nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary, and provided that the application therefor has been filed in accordance with Rule 701 B of the Commission Rules and Regulations. The showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

continue to

(3) That the subject waterflood project shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations *insofar as said rules are not inconsistent with this order.*

(4) That monthly progress reports of the subject waterflood project shall *continue to* be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(5) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

CASE 4289: Application of GETTY
OIL COMPANY FOR DOWNHOLE COM-
MINGLING, LEA COUNTY, N. M.