

CASE 6132: CONTINENTAL OIL COMPANY
FOR A WATERFLOOD PROJECT, LEA COUNTY,
NEW MEXICO

CASE Number

6132

Application

Transcripts.

Small Exhibits

ETC.

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. 6132
Order No. R-5632

APPLICATION OF CONTINENTAL OIL COMPANY
FOR A WATERFLOOD PROJECT, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 18, 1978, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 24th day of January, 1978, 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 applicant, Continental Oil Company, seeks authority to institute a waterflood project on its Warren Unit Area, Warren-McKee Pool, by the injection of water into the McKee formation through 4 injection wells in Sections 20 and 29, Township 20 South, Range 38 East, NMPM, Lea County, New Mexico.
- (3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.
- (4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.
- (5) That the operator should take all steps necessary, including limiting injection pressure, to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.
- (6) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

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Case No. 6132
Order No. R-5632

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to institute a waterflood project on its Warren Unit Area, Warren-McKee Pool, by the injection of water into the McKee formation through the following-described wells in Township 20 South, Range 38 East, NMPM, Lea County, New Mexico:

<u>Warren Unit Well No.</u>	<u>Unit Letter</u>	<u>Section</u>
22	K	29
23	G	29
25	O	29
27	O	20

(2) That injection into each of said wells shall be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation; that the casing-tubing annulus of each injection well shall be tested for leaks, be loaded with an inert fluid and the annulus shall be allowed to remain open or be equipped with an approved pressure gauge or attention-attracting leak detection device, and that the injection wells or system shall be equipped in such a manner as to limit wellhead injection pressure to no more than 1800 psi.

(3) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of 1800 psi upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

(4) That the wells within the project area shall be equipped with risers or in another acceptable manner such as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

(5) That the operator shall immediately notify the supervisor of the Commission's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

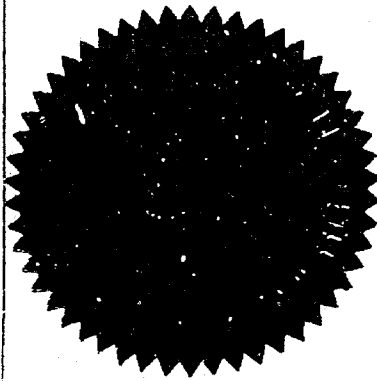
(6) That the subject waterflood project is hereby designated the Warren Unit Area Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(7) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1115 of the Commission Rules and Regulations.

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Case No. 6132
Order No. R-5632

(8) 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

Phil R. Lucero
PHIL R. LUCERO, Chairman

Emery C. Arnold
EMERY C. ARNOLD, Member

Joe D. Ramey
JOE D. RAMEY, Member & Secretary

S E A L

jr/

Dockets Nos. 4-78 and 5-78 are tentatively set for hearing on February 8 and 22, 1978. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: COMMISSION HEARING - WEDNESDAY - JANUARY 11, 1978

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

CASE 5958: (DE NOVO)

Application of Continental Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Gonzales-Mesaverde and Otero-Chacra production in the wellbores of its AXI Apache "J" Wells Nos. 18, 23, and 24 located in Units A, D, and P of Section 8; Nos. 19 and 22 in Units D and L of Section 6; Nos. 20 and 21, in Units C and I of Section 5; and No. 25 in Unit A of Section 7, all in Township 25 North, Range 5 West, Rio Arriba County, New Mexico.

Upon application of Continental Oil Company this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 6026: (DE NOVO)

Application of William G. Rabe and Alice P. Rabe for a non-standard gas proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 160-acre non-standard gas proration unit comprising the NE/4 of Section 25, Township 27 North, Range 8 West, Blanco-Mesaverde Pool, San Juan County, New Mexico.

Upon application of William G. Rabe and Alice P. Rabe this case will be heard De Novo pursuant to the provisions of Rule 1220.

CASE 6027: (DE NOVO)

Application of Great Lakes Chemical Corporation for a non-standard gas proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 160-acre non-standard gas proration unit comprising the SE/4 of Section 25, Township 27 North, Range 8 West, Blanco-Mesaverde Pool, San Juan County, New Mexico.

Upon application of Great Lakes Chemical Corporation this case will be heard De Novo pursuant to the provisions of Rule 1220.

DOCKET: EXAMINER HEARING - WEDNESDAY - JANUARY 18, 1978

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

The following cases will be heard before Richard L. Stamets, Examiner, or Daniel S. Nutter, Alternate Examiner:

- ALLOWABLE: (1) Consideration of the allowable production of gas for February, 1978, from fifteen prorated pools in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.
- (2) Consideration of the allowable production of gas for February, 1978, from four prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

CASE 6123: Application of Stevens Oil Company for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its O'Brien "F" Well No. 1 located 1650 feet from the South line and 330 feet from the East line of Section 35, Township 8 South, Range 28 East, Twin Lakes-San Andres Associated Pool, Chaves County, New Mexico, the SE/4 of said Section 35 to be dedicated to the well.

CASE 6124: Application of HNG Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for its Shoetar Ranch Unit Area comprising 961 acres, more or less, of State lands in Townships 16 and 17 South, Range 35 East, Lea County, New Mexico.

- CASE 6125: Application of Shell Oil Company for an exception to Rule 202(B), San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Commission Rule No. 202(B), San Juan County, New Mexico, to permit the temporary abandonment of certain wells on its Carson Unit Area in Township 25 North, Ranges 11 and 12 West, Alti-Jewel Gallup Oil Pool, San Juan County, New Mexico. Applicant further seeks that any further extensions be administratively approved.
- CASE 6126: Application of Yates Petroleum Corporation for compulsory pooling and an unorthodox location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp and Pennsylvanian formations underlying the W/2 of Section 21, Township 17 South, Range 26 East, Eddy County, New Mexico, to be dedicated to its Siegenthaler IS Well No. 2 to be drilled at an unorthodox location 1460 feet from the South line and 1980 feet from the West line of said Section 21. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.
- CASE 6127: Application of Southland Royalty Company for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Aztec Palmillo State Com Well No. 1 located in Unit G of Section 32, Township 18 South, Range 29 East, to produce oil from the Wolfcamp and gas from the Morrow formations.
- CASE 6128: Application of Champlin Petroleum Company for an unorthodox location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its State "36" Well No. 1 located 1980 feet from the South line and 660 feet from the West line of Section 36, Township 21 South, Range 27 East, East Carlsbad Gas Field, Eddy County, New Mexico, the S/2 of said Section 36 to be dedicated to the well.
- CASE 6129: Application of King Resources Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for its Gardner Draw Unit Area comprising 19,840 acres, more or less, of Federal, State, and fee lands in Townships 19 and 20 South, Ranges 20 and 21 East, Eddy County, New Mexico.
- CASE 6130: Application of Continental Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Wantz Abo and Wantz Granite Wash production in the wellbore of its Lockhart B-35 Well No. 5 located in Unit H of Section 35, Township 21 South, Range 37 East, Lea County, New Mexico.
- CASE 6131: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project on its Southeast Monument Unit Area, Warren McKee Pool, Lea County, New Mexico, by the injection of water into the McKee formation through 8 wells. Applicant further seeks the establishment of an administrative procedure for adding or substituting injection wells.
- CASE 6132: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project on its Warren Unit Area, Warren McKee Pool, Lea County, New Mexico, by the injection of water into the McKee formation through 4 wells. Applicant further seeks the establishment of an administrative procedure for adding and substituting injection wells.
- CASE 6133: Application of Doyle Hartman for compulsory pooling and a non-standard proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the SE/4 of Section 8, Township 19 South, Range 37 East, Eumont Gas Pool, Lea County, New Mexico, to form a non-standard unit to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.
- CASE 6134: Application of Burleson & Huff for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Queen formation underlying the SE/4 NW/4 of Section 22, Township 25 South, Range 37 East, Langlie Mattix Pool, Lea County, New Mexico, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6119: (Continued from January 4, 1978, Examiner Hearing)

Application of Caulkins Oil Company for a dual completion and downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Pictured Cliffs, Chacra and Mesaverde production in the wellbore of its Breech Well No. 228, to be located in Unit A of Section 18, Township 26 North, Range 6 West, Rio Arriba County, New Mexico, and to dually complete the commingled formations and the Dakota formation in said well.

CASE 6120: (Continued from January 4, 1978, Examiner Hearing)

Application of Caulkins Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Chacra and Mesaverde production in the wellbores of its Breech E Wells Nos. 109 in Unit M of Section 3 and 104 in Unit P of Section 5 and its Breech A Wells Nos. 627 in Unit B of Section 8, 677 and 679 in Units L and J, respectively, of Section 9, and 207 in Unit A of Section 10, all in Township 26 North, Range 6 West, Rio Arriba County, New Mexico.

CASE 6121: (Continued from January 4, 1978, Examiner Hearing)

Application of Caulkins Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Pictured Cliffs and Chacra production in Sections 3, 4, 5, 7 thru 11, 13 thru 18, 21, 22, 24, and 25 in Township 26 North, Range 6 West, and Sections 13, 14, 23, and 24, Township 26 North, Range 7 West, Rio Arriba County, New Mexico.

CASE 6122: (Continued from January 4, 1978, Examiner Hearing)

Application of Caulkins Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Mesaverde and Dakota production in the wellbores of its Breech E Wells Nos. 64 and 58 located in Unit A of Section 1 and Section 3, its State A Well No. 62 in Unit A of Section 2, and its Breech D Well No. 341 located in Unit B of Section 21, all in Township 26 North, Range 6 West; and its Breech F Wells Nos. 4 and 45 located in Unit A of Section 33, Unit M of Section 35, both in Township 27 North, Range 6 West, Rio Arriba County, New Mexico.

CASE 6096: Continued from January 4, 1978, Examiner Hearing

Application of Texas Oil & Gas Corporation for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp and Pennsylvanian formations underlying the S/2 of Section 14, Township 21 South, Range 34 East, Lea County, New Mexico, to be dedicated to applicant's South Wilson State Well No. 1 to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6135: In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the extension of the Wagon Mound Dakota-Morrison Gas Pool in Township 21 North, Range 21 East, Mora County, New Mexico.

CASE 6136: In the matter of the application of the Oil Conservation Commission of New Mexico upon its own motion for an order for the creation and extension of certain pools in Lea, Chaves, and Roosevelt Counties, New Mexico.

(a) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for San Andres production and designated as the Caprock-San Andres Pool. The discovery well is the Elk Oil Company State D.J. Well No. 1 located in Unit H of Section 2, Township 12 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 12 SOUTH, RANGE 32 EAST, NMPM
Section 2: NE/4

(b) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for Yates production and designated as the West Scarborough-Yates Pool. The discovery well is the Gifford, Mitchell and Wisenbaker Horse Back Well No. 2 located in Unit G of Section 33, Township 26 South, Range 36 East, NMPM. Said pool would comprise:

TOWNSHIP 26 SOUTH, RANGE 36 EAST, NMPM
Section 33: NE/4

(c) CREATE a new pool in Lea County, New Mexico, classified as a gas pool for Morrow production and designated as the Sombra-Morrow Gas Pool. The discovery well is the Phillips Petroleum Company Michel Well No. 1 located in Unit C of Section 13, Township 16 South, Range 33 East, NMPM. Said pool would comprise:

TOWNSHIP 16 SOUTH, RANGE 33 EAST, NMPM
Section 13: NW/4

(d) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Morrow production and designated as the East Vest Ranch-Morrow Gas Pool. The discovery well is the Cockrell Corporation Occidental Federal Well No. 1 located in Unit A of Section 22, Township 14 South, Range 30 East, NMPM. Said pool would comprise:

TOWNSHIP 14 SOUTH, RANGE 30 EAST, NMPM
Section 22: N/2

(e) EXTEND the Blinebry Oil and Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
Section 23: SW/4
Section 26: NW/4

(f) EXTEND the Bluit-Wolfcamp Gas Pool in Roosevelt County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 37 EAST, NMPM
Section 10: NE/4
Section 11: NW/4

(g) EXTEND the Brinninstool-Morrow Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 33 EAST, NMPM
Section 21: W/2

(h) EXTEND the South Brunson-Granite Wash Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 38 EAST, NMPM
Section 31: SW/4

(i) EXTEND the West Kemnitz-Lower Wolfcamp Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 16 SOUTH, RANGE 33 EAST, NMPM
Section 29: S/2
Section 30: SE/4

(j) EXTEND the Querecho Plains-Queen Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 27: NW/4

(k) EXTEND the Tom Tom-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 7 SOUTH, RANGE 31 EAST, NMPM
Section 23: SW/4
Section 26: W/2
Section 33: SE/4

(l) EXTEND the Townsend-Wolfcamp Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 35 EAST, NMPM
Section 27: SE/4

(m) EXTEND the North Vacuum-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 15: NW/4

(n) EXTEND the Warren-Tubb Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
Section 23: SW/4
Section 26: NW/4

(o) EXTEND the West Warren-Blinebry Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 38 EAST, NMPM
Section 20: SW/4
Section 29: NW/4

CASE 6119: (Continued from January 4, 1978, Examiner Hearing)

Application of Caulkins Oil Company for a dual completion and downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Pictured Cliffs, Chacra and Mesaverde production in the wellbore of its Breech Well No. 228, to be located in Unit A of Section 18, Township 26 North, Range 6 West, Rio Arriba County, New Mexico, and to dually complete the commingled formations and the Dakota formation in said well.

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Application of Caulkins Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Pictured Cliffs and Chacra production in Sections 3, 4, 5, 7 thru 11, 13 thru 18, 21, 22, 24, and 25 in Township 26 North, Range 6 West, and Sections 13, 14, 23, and 24, Township 26 North, Range 7 West, Rio Arriba County, New Mexico.

CASE 6122: (Continued from January 4, 1978, Examiner Hearing)

Application of Caulkins Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Mesaverde and Dakota production in the wellbores of its Breech E Wells Nos. 64 and 58 located in Unit A of Section 1 and Section 3, its State A Well No. 62 in Unit A of Section 2, and its Breech D Well No. 341 located in Unit B of Section 21, all in Township 26 North, Range 6 West; and its Breech F Wells Nos. 4 and 45 located in Unit A of Section 33, Unit M of Section 35, both in Township 27 North, Range 6 West, Rio Arriba County, New Mexico.

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TOWNSHIP 12 SOUTH, RANGE 32 EAST, NMPM
Section 2: NE/4

(b) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for Yates production and designated as the West Scarborough-Yates Pool. The discovery well is the Gifford, Mitchell and Wisenbaker Horse Back Well No. 2 located in Unit G of Section 33, Township 26 South, Range 36 East, NMPM. Said pool would comprise:

TOWNSHIP 26 SOUTH, RANGE 36 EAST, NMPM
Section 33: NE/4

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 18, 1978

EXAMINER HEARING

IN THE MATTER OF:

Application of Continental Oil Company for
a waterflood project, Lea County, New Mexico

CASE
6131

and

Application of Continental Oil Company for
a waterflood project, Lea County, New Mexico

CASE
6132

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil
Conservation Commission:

Lynn Teschendorf, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant:

Jason W. Kellahin, Esq.
KELLAHIN & FOX
Attorneys at Law
500 Don Gaspar
Santa Fe, New Mexico

sid morrish reporting service
General Court Reporting Service
825 Calle Meja, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

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 General Court Reporting Service
 825 Calle Mejia, No. 112, Santa Fe, New Mexico 87501
 Phone (505) 982-9212

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sid morriss reporting service
General Court Reporting Service
825 Calle Mojia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

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825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

1 MR. STAMETS: We will call next Case 6131.
2 MS. TESCHENDORF: Case 6131, application of
3 Continental Oil Company for a waterflood project, Lea County,
4 New Mexico.

5 MR. KELLAHIN: If the Examiner please, Jason
6 Kellahin, Kellahin and Fox, Santa Fe, appearing for the
7 applicant and we have three witnesses to be sworn.

8 MR. STAMETS: I would like to have all witnesses
9 stand and be sworn at this time.

10 MR. KELLAHIN: The record may show that Mr. Lyon
11 has been sworn.

12 (THEREUPON, the witnesses were duly sworn.)

13 MR. KELLAHIN: If the Examiner please, we would like
14 to consolidate for purposes of the record this case with
15 Case Number 6132. They involve similar matters and we will
16 use the same exhibits and the same witnesses.

17 MR. STAMETS: Please call Case 6132.

18 MS. TESCHENDORF: Case 6132, application of
19 Continental Oil Company for a waterflood project, Lea County,
20 New Mexico.

21 MR. STAMETS: These cases will be consolidated.

22
23 VICTOR T. LYON
24 called as a witness, having been first duly sworn, was
25 examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Victor T. Lyon.

Q Are you the same Mr. Lyon who testified in the previous case and was qualified?

A Yes, sir.

Q Mr. Lyon, what does the applicant, Continental Oil Company, propose in Cases 6131 and 6132?

A Cases 6131 and 6132 are the application of Continental Oil Company for approval of waterflood projects on a cooperative basis in the Warren McKee Pool in the Southeast Monument Unit and the Warren Unit, both operated by Continental Oil Company and located in Lea County, New Mexico.

Q Now referring to what has been marked as Applicant's Exhibit Number One in the consolidated cases, would you identify that exhibit, please?

A Yes, sir, Exhibit Number One is a location and ownership plat showing the proposed injection project and the area in a two mile radius surrounding this project. The Warren Unit is shown by the small dashed area consisting of all or parts of Sections 20, 21, 22, 27, 28, 29, 33 and 34. The alternating long dash and short dash area to the west of that is the area of the Southeast Monument Unit. To the north

sid morrison reporting service
General Court Reporting Service
825 Calle Meja, No. 122, Santa Fe, New Mexico 87501
Phone (505) 982-9212

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1 with the intermediate dashed boundary, is the Amerada Warren
2 McKee Unit and just to the west of that is the Texaco Skaggs
3 Grayburg Unit. In the southwest portion of the exhibit
4 Continental's Eumont Hardy Unit is shown. The solid triangles
5 in the various areas represent existing injection wells. The
6 red boundary in the center of the exhibit shows the partici-
7 pating area for the McKee formation in the two units. That
8 portion lying in the Southeast Monument Unit, of course, is
9 the McKee participating area for that unit and that portion
10 lying within the Warren unit is the McKee participating area
11 for that unit. The wells marked with a red triangle and also
12 a dashed triangle are the proposed injection wells in this
13 unit. The wells with the green circles are the producing wells
14 inside our project area and those green circles outside of
15 the project are the wells which are open in the McKee to the
16 best of our knowledge and belief.

17 The wells on the exhibit throughout are identified
18 to the best of our knowledge as to the formations which are
19 producing or which have been produced in each of the wells.

20 Q Now as to the ownership within the Warren McKee
21 Unit, is that common throughout?

22 A Yes, sir.

23 Q Now how about as to the Southeast Monument portion?

24 A That ownership is common throughout too. It is
25 not identical other than working interest, you know, one

1 participating area to the other participating area but within
2 each participating area all ownership is common and the
3 working interest ownership is common throughout this project,
4 including the area covering both units.

5 Q But because of the two separate units is the reason
6 for having the two separate waterflood projects, is that
7 correct?

8 A Yes, sir. They are two separate properties
9 actually.

10 Q Well, will they be operated then in the nature of
11 a cooperative flood on the two different units?

12 A Yes, sir, and each will have its own producing
13 facilities and the oil will be accounted for separately.

14 Q You expect separate tank batteries for them?

15 A Yes.

16 Q Now has this waterflood project been under con-
17 sideration for some length of time?

18 A Yes, sir, it has been under consideration for at
19 least fifteen years to my certain knowledge and at that time,
20 fifteen years ago when I first became involved with it, we
21 had under consideration a reservoir-wide unit. We had
22 problems putting that unit together and so the attempt to
23 unitize was dropped and Amerada proceeded to unitize the
24 north half of the pool and attempted to waterflood without
25 success and there have been many problems which have beset

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1 this project and which has delayed its coming into being. This
2 is a very deep waterflood project, about nine thousand feet
3 and there have been a number of McKee waterfloods attempted
4 and none have been successful. One of the problems that all
5 of these McKee reservoirs have had is a matter of sand control.
6 The McKee formation is very loosely consolidated and sand
7 flow in the well has been a problem and it has caused a great
8 deal of artificial lift problems. Another problem has been
9 injectivity which we believe, after considerable research,
10 has been caused by water incompatibility and there has been
11 demonstrated in a number of tests that we have run a decided
12 water incompatibility with produced water and the McKee
13 water such that it just made it unsuitable for injection
14 in this formation.

15 The pool has been a very prolific producer of oil
16 and still has very substantial primary oil reserves. In years
17 past it was considered too risky to jeopardize the remaining
18 reserves to attempt a waterflood project that may not be
19 successful and we have two witnesses who will follow me who
20 are more familiar with the details as to the various aspects
21 of this project but I would like to point out that we have
22 taken unusually great pains to secure a water supply which
23 we believe will be compatible and which can help this
24 project to be successful. We have tried to anticipate and be
25 able to react to other foreseen problems and possible problems

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1 which could occur here.

2 We believe that the magnitude of possible secondary
3 recoverable reserves justifies this effort and expense.

4 I would like to point out one other factor. This
5 project is not far from an area where there have been con-
6 siderable water flows and it has been our belief from the
7 beginning of those problems that these flows have resulted
8 through channels created by improperly cemented wells or im-
9 properly plugged wells and I would like to point out that
10 the McKee formation is the bottom formation, it is the
11 bottom-most formation that produces in this area and, there-
12 fore, the penetrations to the McKee are absolutely minimal.
13 So we feel that if we can confine the water in our injection
14 wells to the McKee formation that we present little if any
15 danger at all to any other producing zones or fresh water
16 resources. We also have the advantage here because of the
17 great depth of having a large hydrostatic head so that as we
18 foresee the operation it should not be necessary to use
19 excessive surface pressures so we feel that this project
20 really represents no danger to any other producing or oil
21 producing or water producing formations.

22 Q In your opinion will the wells take the water on
23 a vacuum then to that depth?

24 A Initially they will, now, of course, we will have
25 to wait and see how it operates but we don't see any surface

1 pressures except just enough to get the water into the
2 wellhead.

3 Q You referred to this as being quite deep but I
4 don't believe you said how deep.

5 A Nine thousand feet.

6 Q Now on your Exhibit Number One you show a proposed
7 injection pattern. Is that the final pattern that you would
8 want approved?

9 A Well, this is what we are looking at at the present
10 time but it is tentative and I might point out one reason
11 that there may be some changes in the near future. Well
12 No. 58 which is the SEMU Well No. 58 which is in Unit C of
13 Section 29, was recently plugged back and recompleted for
14 testing in the Blinebry. The Blinebry completion in that
15 well appears to be commercial and in the very near future we
16 are going to have to make a decision as to whether to drill
17 a twin well either to the Blinebry or to the McKee. If the
18 twin well is drilled to the McKee then we would need to change
19 the injection wells at that location.

20 Also in the southeast portion of the project area
21 we have some indications that this area may not have been
22 drained as efficiently as the rest of the project area and
23 we have plans to drill one well, perhaps two, in this area
24 and an evaluation of those wells upon completion may indicate
25 that some change in pattern may be desirable, so for this

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1 reason we would like administrative procedures to be established
2 in the order where we could add or substitute injection wells.

3 Q You have the Amerada waterflood project to the
4 north?

5 A Yes.

6 Q From your Exhibit Number One it would appear that
7 only four wells have ever been used as injectors and they
8 are in the extreme north portion of that unit, is that
9 correct?

10 A Yes, sir, that is correct.

11 Q Do you have any cooperative agreement with Amerada
12 with regard to this proposed waterflood?

13 A We have been in contact with Amerada and hope in
14 the very near future to work out with them a cooperative
15 effort with them where they would place Well No. 114 on
16 injection.

17 Q Was Exhibit One prepared by you or under your
18 supervision?

19 A Yes, it was.

20 MR. YELLAHIN: At this time I would like to offer
21 into evidence Exhibit Number One.

22 MR. STAMETS: Exhibit Number One will be admitted.

23 (THEREUPON, Applicant's Exhibit Number One
24 was admitted into evidence.)

25 MR. KELLAHIN: That's all I have of this witness,

1 Mr. Stamets.

2 CROSS EXAMINATION

3 BY MR. STAMETS:

4 Q Mr. Lyon, this administrative procedure that you
5 have requested, I'm not certain as to the necessity of that.
6 Under our Rule 701(E)-4 we do have an administrative procedure
7 for approval of additional injection wells in waterflood
8 projects.

9 A Is this before any response or must you have a
10 response in order to expand?

11 Q I don't believe any response is required these days.

12 A Well, I really hadn't checked that but I wanted to
13 make sure that we did have the authority to make substitutions
14 or additions administratively rather than have to come to a
15 hearing.

16 Q I believe the only requirement now is that the
17 Secretary-Director determine that the additional well is on
18 a waterflood injection pattern which will result in a
19 thorough and efficient sweep of oil in the project and that
20 is all, so unless you are requesting, say, an unorthodox
21 locations for injection wells it appears that a general rule
22 is already applied.

23 A That will be fine. We don't anticipate any un-
24 orthodox locations.

25 Q You indicated that--

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1 A Unless for some reason we might want to convert
2 Well No. 24. Well No. 24 is at an unorthodox location. It
3 was drilled to the McKee but was never completed in that
4 formation and although we do not foresee at the present
5 time that that well would be used it still remains a
6 possibility.

7 Q It is an existing well?

8 A Yes, sir.

9 Q And that unorthodox location has already been
10 approved?

11 A No, it has never been used for any purpose except
12 to dispose of water. Incidentally, the legend on Exhibit One
13 is for the identification of the producing formations as
14 shown on the right side. That well was drilled off of the
15 location that was proposed in there due to a surveying error
16 and when we got to the McKee we just backed off from it
17 and never produced the well.

18 MR. STAMETS: Any further questions of this witness?

19 MR. KELLAHIN: That's all we have.

20 MR. STAMETS: He may be excused.

21 (THEREUPON, the witness was excused.)

22 MR. KELLAHIN: I would like to call Mr. Hoover.

23 JERRY W. HOOVER

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Jerry W. Hoover.

Q By whom are you employed and in what position,
Mr. Hoover?

A I'm employed by Continental Oil Company as an
Associate Engineer.

Q Where are you located?

A In Hobbs, New Mexico.

Q How long have you been an Associate Engineer with
Continental Oil Company?

A Since May of 1977.

Q Have you ever testified before the Oil Conservation
Commission or one of its examiners?

A No, sir.

Q For the benefit of the Examiner would you briefly
outline your education and experience as an engineer?

A I was graduated from Texas Tech University in 1963
with a Bachelor of Music degree and from Southwestern
Theological Seminary in '66 with a Masters in Music and again
from Texas Tech University in 1977 with a Bachelor of Science
in Petroleum Engineering.

MR. KELLAHIN: Are the witness' qualifications
acceptable?

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1 MR. STAMETS: They would certainly appear to be.

2 Q (Mr. Kellahin continuing.) Mr. Hoover, are you
3 familiar with the application, the two applications, before
4 the Commission at this time?

5 A Yes, I am.

6 Q Now referring to what has been marked as the
7 Applicant's Exhibit Number Two, would you identify that
8 exhibit, please?

9 A Exhibit Number Two is a location and ownership plat
10 of the Warren McKee Pool. Continental's Warren Unit McKee
11 No. 3 in Section 29, Unit J, drilled in December of 1948 was
12 the discovery well of the Warren McKee Pool. Development
13 continued in this pool on eighty acre spacing until 1956. The
14 northern half of the pool was originally developed as a
15 separate pool.

16 Q Now you said it developed on eighty acre spacing,
17 is that correct?

18 A Originally.

19 Q It originally was eighty acre spacing?

20 A Yes, that is correct.

21 Q Thank you.

22 A But in 1956 with the drilling of Southeast Monument
23 Unit McKee No. 50 in Section 20, Unit L, the continuity of
24 these previously supposed separate reservoirs was established.
25 Development then continued until forty acre spacing was

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1 achieved throughout the extent of the pool. The Continental
2 operated wells within this pool are within our Southeast
3 Monument Unit, there are some fourteen wells and our
4 Warren Unit, nine wells.

5 The proposed injection wells for this waterflood
6 project are identified by the broken triangular symbols and
7 as was previously noted in testimony we are negotiating for
8 injection in Amerada's Warren McKee Unit No. 114, Section 29,
9 Unit A, on a cooperative basis.

10 Q Now referring to what has been marked as Exhibit
11 Number Three, would you identify that exhibit?

12 A Exhibit Three is a structure map of the Warren
13 McKee Pool. This pool is one of a series of McKee sand
14 reservoirs located along the western edge of the central
15 basin platform. The McKee sandstone is the basal member of
16 the Tulip Creek formation of the Simpson group and is of
17 middle-Ordovician age. The McKee sands are uniformly deposited
18 and are continuous throughout the pool which is located on
19 a northwest-southeast trending anticlinal fold and is
20 separated into two well defined highs by a narrow saddle.
21 This structure map is contoured on the top of the McKee pay
22 section which consists of an upper sand and a main sand. The
23 McKee section was formed by the deposition of alternate
24 layers of argillaceous sand and relatively clean sand inter-
25 bedded with shale layers. The sand layers are generally

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1 several feet thick and the shale layers less than one foot
2 thick. Much of the sand, especially these argillaceous
3 portions, is very loosely consolidated. The clays present
4 in the formation were identified as predominately kaolinite
5 with some montmorillonite. The montmorillonite is water
6 sensitive.

7 The average depth of the top of the McKee pay
8 section is nine thousand feet. Only the upper and the main
9 McKee sands are considered productive and injection is plan-
10 ned only for these two zones. The main sand is the principal
11 producing interval and has an average pay interval of seventy
12 feet. The upper sand has an average pay thickness of eight
13 feet and is of poorer quality. Production is limited to
14 the east by a fault or by a series of faults and elsewhere
15 by a water-oil contact at a minus fifty-six fifty feet. The
16 crude was undersaturated at the initial bottom-hole pressure
17 of thirty-four forty psi so the reservoir did not have a
18 gas cap.

19 Q Now referring to what has been marked as Exhibit
20 Number Four would you identify that exhibit?

21 A Exhibit Four is a tabular record of the production
22 history and the current well status. The Warren Unit McKee
23 wells have recovered four million, seven hundred and forty-
24 four thousand and sixty-six barrels of oil as of October 31,
25 1977 and are currently averaging eight barrels of oil, two

1 barrels of water and four MCF of gas per day, per well. The
2 Southeast Monument Unit McKee wells have recovered four
3 million, one hundred and sixty-three, four hundred and forty-
4 five barrels of oil as of October 31, 1977 and are currently
5 averaging four barrels of oil, two barrels of water and two
6 MCF of gas per day, per well.

7 Q On the basis of this information would you say that
8 the productivity from these two units has reached the stripper
9 stage or practically so?

10 A Yes, sir.

11 Q The primary reserves are substantially depleted?

12 A That is correct.

13 Q It is ready then for secondary recovery efforts?

14 A Yes, it is.

15 Q Now referring to Exhibits Five and Six, would you
16 discuss those two exhibits, please?

17 A Exhibit Numbers Five and Six are production curves
18 for the Warren McKee and Southeast Monument Unit McKee wells
19 respectively. Remaining primary reserves were determined
20 from analysis of these curves.

21 Q Now referring to what has been marked as Exhibit
22 Number Seven, what does that show?

23 A Exhibit Number Seven is a table showing basic
24 reservoir parameters and I would like to read into the
25 record this table.

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1 (Reading.) The producing mechanism was solution
2 gas. The average porosity was fourteen point five percent.
3 The average air permeability, Upper Sand, was sixteen point
4 eight millidarcies and the Main Sand eighty-nine point three
5 millidarcies. The Connate water is estimated to be thirty
6 percent. Original reservoir data consists of a bottom hole
7 pressure of thirty-four forty psi. Oil viscosity of point
8 five four nine centipoise. Solution GOR is six seventy-one.
9 Formation volume factor, one point three five nine reservoir
10 barrels per standard tank barrel, and an oil-water contact
11 of a minus five thousand six hundred and fifty feet. In
12 addition the bubble point pressure was twenty-one hundred
13 and fifty-six psi. The reservoir temperature is one hundred
14 and twenty-three degrees. Reservoir volumes, the Upper
15 Sand is estimated to include eight thousand one hundred and
16 ninety-two acre feet and the Main Sand eighty thousand three
17 hundred and eighty acre feet. The original oil-in-place is
18 calculated to be fifty-one million two hundred and eighty-
19 three thousand barrels. The primary recovery as of October
20 31st, 1977 has been eight million nine hundred and seven
21 thousand five hundred and eleven barrels. The primary
22 reserves are estimated to be a hundred and sixty-eight
23 thousand eight hundred and eighteen barrels and ultimate
24 primary recovery, which would be about seventeen point seventy-
25 five percent of the original oil in place was estimated to be

1 nine million seventy-six thousand three hundred and twenty-
2 nine barrels. (End of reading.)

3 Q Have you made some waterflood performance calcula-
4 tions based on your information?

5 A Yes, sir, we have. Waterflood performance calcula-
6 tions were made for this reservoir and theoretical recoveries
7 ranged from one to one point two five times the primary
8 recovery, however, because of the known sand production
9 problems from the McKee formation, secondary recovery will
10 be limited by the operating economics and probably will range
11 from point five to one times the primary recovery. Initially
12 it is anticipated that each injector will inject two thousand
13 barrels of water per day and that the reservoir fillup will
14 occur in approximately two years. Initial injection rates
15 were designed to achieve reservoir fillup as soon as feasible,
16 however, because of limitations on the fluid volumes that can
17 be lifted from the eleven producers in this waterflood,
18 injection rates will be substantially reduced after reservoir
19 fillup is achieved.

20 We anticipate low surface injection pressures
21 during the life of the waterflood. It is difficult to
22 estimate exactly what that maximum pressure may be because of
23 the potential injectivity problems inherent in the McKee
24 formation. Maintenance of relatively low surface injection
25 pressures will depend to the degree of success achieved in

1 our designed water quality control programs and sand con-
2 solidation programs.

3 A pilot five-spot pattern, with Southeast Monument
4 Unit McKee No. 50 as the producer, will be conducted for
5 three to six months in order to evaluate injectivity, water
6 compatibility and sand consolidation treatments before
7 expansion to full scale operations. A peak oil producing rate
8 of approximately two hundred and eighty-one barrels of oil
9 per day per well is anticipated and the life of the waterflood
10 is expected to be fourteen years.

11 Q Now your source of water and the proposed treatment
12 of the water will be discussed by another witness?

13 A That is correct, the witness to follow.

14 Q Now referring to what has been marked as Exhibit
15 Number Eight, would you identify that exhibit, please?

16 A Exhibit Number Eight is a gamma ray neutron log of the
17 Warren McKee No. 22 extending from the surface to sixty feet
18 below the main McKee sand. Formation tops from the salt
19 section through the McKee are marked on the log.

20 Q Now referring to the group of exhibits marked
21 Nine-A through Nine-L, would you identify those exhibits,
22 please?

23 A Exhibits Nine-A through Nine-L are log sections of
24 the McKee formation in each of the proposed injection wells.

25 Q Now, Mr. Hoover, were Exhibits Two through Nine-L

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1 prepared by you or under your supervision?

2 A Yes, sir, they were.

3 MR. KELLAHIN: At this time I would like to offer
4 into evidence Exhibits Two through Nine-L.

5 MR. STAMETS: These exhibits will be admitted.

6 (THEREUPON, Exhibits Two through Nine-L were
7 admitted into evidence.)

8 MR. KELLAHIN: That's all I have of this witness.

9 CROSS EXAMINATION

10 BY MR. STAMETS:

11 Q Mr. Hoover, both you and Mr. Lyon discussed the
12 pressures and indicated that they probably would be quite
13 low. Would the Commission's current two tenths of a pound
14 per foot of depth at the surface be considered a reasonable
15 limit to at least the end of this project?

16 A I don't see how in this project this would be any
17 problem to the project.

18 MR. STAMETS: Okay. Any other questions of the
19 witness? He may be excused.

20 (THEREUPON, the witness was excused.)

21 MR. KELLAHIN: I would like to call the next
22 witness, Mr. Rooney.

23 MICHAEL S. ROONEY

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

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DIRECT EXAMINATION

2 BY MR. KELLAHIN:

3 Q Would you state your name, please?

4 A Michael S. Rooney.

5 Q By whom are you employed and in what position,
6 Mr. Rooney?

7 A I'm employed as an Engineer by Continental Oil
8 Company.

9 Q Where are you located?

10 A Hobbs, New Mexico.

11 Q How long have you been working as an Engineer at
12 the Hobbs Division?

13 A For almost three years.

14 Q Have you ever testified before the Oil Conservation
15 Commission or one of its examiners?

16 A No, sir.

17 Q For the benefit of the Examiner would you briefly
18 outline your educational background and your experience?

19 A Yes, sir, I graduated in March of 1975 from the
20 Montana State University with a Bachelor of Science in
21 Mechanical Engineering Technology, at which time I was employed
22 by Continental Oil Company.

23 Q And have you been working for Continental ever
24 since?

25 A Yes, sir.

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1 Q And that is in the Hobbs Division?

2 A Yes, sir.

3 Q And that relates to the area involved here?

4 A Yes, sir.

5 Q Have you been involved in the proposed waterflood
6 projects for some period of time?

7 A For two years now I have been working on the
8 design and the construction.

9 MR. KELLAHIN: Are the witness' qualifications
10 acceptable?

11 MR. KELLAHIN: They are.

12 Q (Mr. Kellahin continuing.) Mr. Rooney, referring
13 to a series of exhibits which are marked as Exhibit Numbers
14 Ten-A through Ten-E, would you identify and discuss those
15 exhibits, please?

16 A Exhibits Ten-A through Ten-E are the diagrammatic
17 sketches of the plugged and abandoned wells within the one
18 half mile radius as described by NMOCC Memo 3-77. The
19 schematics show the size and location of all plugs and the
20 casing left in the hole and the date of abandonment. These
21 wells are the Lea "BU" State drilled by Antwell and formerly
22 operated by Elk Oil.

23 Ten-B is State "A" No. 1 drilled by Shell and
24 operated by Elk Oil.

25 Exhibit Ten-C is State No. 1 drilled by E. W. Mudge, Jr.

1 and now held by Exxon.

2 Exhibit Number Ten-D, Warren Unit McKee No. 5
3 drilled and held by Conoco. This well has never been acidized
4 or perforated. During plugging operations a seventy sack
5 cement plug was set over the McKee from ninety eighty-five to
6 ninety-one eighty-five, a two hundred sack cement plug over
7 the Devonian from seventy-seven sixteen to eighty-one ten
8 feet, and a fifty sack cement plug over the Drinkard from
9 sixty-seven fifty to sixty-six fifty.

10 Attempts to shoot off the nine and five-eighths
11 casing were made at two thousand fifty feet, nineteen hundred
12 feet, seventeen hundred feet, fifteen hundred feet, twelve
13 hundred feet, eleven hundred feet, one thousand feet, eight
14 hundred and forty feet, seven hundred feet, six hundred feet
15 and five hundred and forty feet. The nine and five-eighths
16 inch was finally successfully shot off and salvaged from
17 four hundred and seventy feet at which point a seventy-seven
18 sack cement plug was placed from four ten feet to five ten
19 feet.

20 Exhibit Ten-E, the SEMU-McKee No. 12 drilled by
21 Conoco and held by Conoco. During plugging operations a
22 thirty-five sack cement plug was set from TD to ninety-six
23 hundred feet, a forty-five sack cement plug was placed over
24 the McKee from ninety-two ten feet to ninety-one ten feet,
25 a twenty-five sack cement plug was placed from eighty-two

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1 ninety feet to eighty-one ninety feet to isolate the Fusselman
2 and Montoya.

3 MR. STAMETS: If I may interrupt, I think probably
4 these exhibits are pretty well self-explanatory and you would
5 only need to go into specific plugging if it looks like there
6 were problems.

7 A Okay, sir.

8 Q (Mr. Kellahin continuing.) Mr. Rooney, based on
9 the exhibits and your information about these wells, will a
10 waterflood project in any way cause any problems with
11 communication through these particular wellbores?

12 A No, sir.

13 Q Now referring to what has been marked as Exhibit
14 Eleven, would you identify that exhibit, please?

15 A Exhibit Number Eleven is a diagrammatic sketch
16 showing the plugged back San Andres salt water disposal well
17 Warren Unit McKee No. 24 which has been periodically used
18 for disposing of excess produced water from the Eumont Hardy
19 Waterflood, the Skaggs Pool Waterflood and the SEMU Penn Salt
20 Water Disposal Well.

21 Q And that exhibit likewise shows the cement program
22 on that particular well?

23 A Yes, sir.

24 Q Do you anticipate using that well for an injector
25 or any other purpose?

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1 A At the present time we haven't really discussed it,
2 it is just a possibility.

3 Q Now referring to what has been marked as Exhibit
4 Number Twelve, would you identify that exhibit, please?
5 Twelve-A through Twelve-L?

6 A Exhibits Twelve-A through Twelve-L are the twelve
7 diagrammatic sketches of the proposed injection wells showing
8 the proposed injection intervals, the casing patterns and
9 the manner in which the wells will be completed as injectors.

10 Q And that covers all of the proposed injectors shown
11 on the exhibits that have been offered up to date?

12 A Yes, sir.

13 Q Now referring to what has been marked as Exhibit
14 Number Thirteen, would you identify that exhibit, please?

15 A Exhibit Thirteen is the tabulation of all of the
16 wells within the one-half mile radius of any one proposed
17 injection wells that have penetrated the intended injection
18 zone showing all of the casing strings, the setting depths,
19 the sacks of cement used, the cement tops, the total depth,
20 well identification, the McKee production interval and their
21 locations.

22 Q Now on the basis of that information do you antici-
23 pate any problem with water communication through those
24 particular wells?

25 A No, sir.

1 Q Now referring to what has been marked as Exhibit
2 Number Fourteen, would you identify that exhibit, please?

3 A Exhibit Number Fourteen is a water analysis com-
4 leted on some of the McKee produced water.

5 Q And Exhibit Number Fifteen, what does that exhibit
6 show?

7 A Exhibit Number Fifteen is a water analysis completed
8 on our source water. It is a City of Hobbs secondary treated
9 effluent.

10 Q Have you made a contract with the City of Hobbs
11 to utilize this water?

12 A Yes, sir.

13 Q What kind of a treatment will you have to give the
14 water to make it compatible with the McKee formation water?

15 A We will have to drill a salt brine generation well.
16 We have a tentative location picked for it. What we are
17 going to have to do is produce the salt brine of about twenty-
18 five thousand parts per million to be compatible with forma-
19 tion water. When serious plans for this waterflood project
20 began some four years ago compatibility tests were run on the
21 McKee water and various produced waters which were available.
22 When the McKee water is mixed with any of the produced waters
23 available in the area there is an instantaneous reaction to
24 the water, iron sulfide is formed. The reaction was caused
25 by the iron ions mixing with sulfide ions in any of the

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1 produced water in the nearby area.

2 It became necessary, therefore, to find a sulfide-
3 free water for injection. Fresh water sources are not readily
4 available in that area but we found that the sewage effluent
5 from the secondary treatment plant of the City of Hobbs
6 Sewage Treatment facilities was available in the quantities
7 we needed and it had an absence of the sulfide ions.

8 The next problem was to find a satisfactory method
9 of treating the sewage water for the removal of solids and
10 other contaminants which might plug the formation. After
11 three years of working with our production research group in
12 Ponca City and with various commercial laboratories and
13 manufacturers of equipment we have found methods and the
14 equipment to treat the water to our specifications.

15 The water analysis of the McKee produced water and
16 the City of Hobbs secondary treatment plant effluent have
17 been obtained periodically from early 1976. Almost all of
18 these samples have shown the scaling index to be nearly
19 negative or less than point five. Even after mixing the
20 waters at various ratios the scaling indices still indicate
21 less than point six. For example, a fifty-fifty mixture of
22 sewage water and McKee produced water has a scaling index of
23 point zero five at one hundred and twenty-two degrees
24 Fahrenheit.

25 Although these tests indicate the probability that

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1 scaling will not occur, a scale inhibition program will be
2 developed to prohibit any possibility of calcium sulfate or
3 magnesium sulfate formation in the flow lines or in the
4 reservoir. Poly phosphonate compounds will be the method of
5 protection and will be added to the fresh water inlet at the
6 brine mixing tank near the water supply transfer point
7 located in the southwest quarter of the northwest quarter of
8 Section 2, Township 20 South, Range 38 East. This location
9 is where we would be taking the water from the City also. The
10 amount of chemical will be very low considering the very low
11 scaling index.

12 Further piping system protection and ultimate
13 reservoir protection will be provided by the addition of an
14 oxygen stripping chemical compatible with the reservoir
15 characteristics and any chemical injected upstream of the
16 injection station. The injection station will be located in
17 the southwest quarter of the southwest quarter of Section 20,
18 Township 20 South, Range 38 East. The positive pressure pro-
19 tection provided by gas blankets will be utilized in the surge
20 and pump suction tanks at the injection station to further
21 prevent oxygen absorption in the injection waters.

22 The City of Hobbs sewage effluent water supply will
23 not be injected in the McKee reservoir as fresh water. A
24 well is proposed for the Salado salt that will be used as a
25 brine generation facility. A saturated salt brine will be

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1 produced by circulating approximately one-eighth to one-fifth
2 of the daily total flood injection volume through the Salado
3 well known as our Warren McKee Brine Lease, Well No. 1. It
4 is tentatively located in the southwest quarter of the south-
5 west quarter of Section 2, Township 20 South, Range 38 East.
6 This brine will then be mixed with the remaining supply water
7 and pumped across country to the injection station. The
8 brine well is tentatively located eighteen hundred feet south
9 of our brine mixing point.

10 The resulting injection quality brine will be main-
11 tained at no less than twenty-five thousand parts per million
12 chloride ions by means of control valves operating on signals
13 sent by a continuous operating salinity monitor. The resolu-
14 tion of the instrument is approximately one thousand parts per
15 million and should provide us with a reservoir quality brine.

16 Suspended solids will be removed down to 5-10 microns
17 by a bank of automatically backwashable filters. These filters
18 are in a parallel configuration and are therefore backwashed
19 on a cyclic basis based on a preset pressure differential.
20 Coagulation or flocculation of any particulate matter will not
21 be used. Any additional chemical or physical flocculation aids
22 will not be necessary due to the inherent qualities of the
23 brine water.

24 Q What are you planning to do about sand control, has
25 that been a problem?

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1 A Sand control has been a problem, it has caused some
2 pretty serious problems in our production facilities. Each
3 one of the producing wells will undergo sand consolidation
4 treatment. It's not felt that we need a high bottom-hole
5 pressure before we consolidate since there are tools available
6 to circulate. We are going to use a mechanical sand consoli-
7 dation treatment consisting of screens and gravel packing.
8 We will possibly consider it in our injectors also if condi-
9 tions merit backwashing.

10 Q Now what are your plans of operation of these two
11 waterflood units?

12 A The injection rates for each well will be continuously
13 monitored by computer interlock and the gathered data will
14 be used to detect any decrease or increase in our planned
15 two thousand barrel per day rate per well. Wellhead tubing
16 and annular pressures will be checked by field personnel on
17 a daily basis during the proposed period of pilot operation.
18 Annular spaces will be protected to the surface with a con-
19 ventional pre-mixed packer fluid consisting of a biocide,
20 a corrosion inhibitor, an oxygen scavenger, a pH adjustment
21 chemical and a non-reactive Kcl water.

22 All buried lines will be plastic lined and externally
23 wrapped as well as cathodically protected. All tubing will be
24 plastic lined. All other lines not protected in that manner
25 will be glass reinforced plastic or fiberglass lined. The

1 wetted surfaces of all valves, pumps, or non-coated piping
2 system components will be manufactured from corrosion resist-
3 ant materials such as three sixteen stainless steels, aluminum
4 bronzes or ceramics and all of our tanks will be cathodically
5 protected also.

6 Initial injection water will be preceded by an acid
7 and scale inhibition treatment to further prevent the formation
8 of carbonate or sulfate compounds in the reservoir.

9 Q Will you have any necessity for artificial lift in
10 connection with the flooding?

11 A For our artificial lift that presently we are using
12 gas pressure from Warren Unit McKee No. 35. Some of our wells
13 are temporarily shut in so it has provided us with a reason-
14 ably good source of gas pressure for our gas lift system.
15 Once we get on line and have response to our waterflood we are
16 going to revamp or redesign a gas lift compressor system out
17 there into a closed lift system.

18 Q That will be depending upon your success in consoli-
19 dating the sand formations, will it not, to some extent?

20 A Well, we are going to have to use this to produce
21 it. Dependent upon sand consolidation will be other forms
22 of artificial lift, such as beam pumping.

23 Q Were Exhibits Ten-A through Fifteen prepared by
24 you or under your supervision?

25 A Yes, sir.

1 MR. KELLAHIN: At this time I would like to offer
2 into evidence Applicant's Exhibits Ten-A through Fifteen.

3 MR. STAMETS: These exhibits will be admitted.

4 (THEREUPON, Applicant's Exhibits Ten-A
5 through Fifteen were admitted into evidence.)

6 CROSS EXAMINATION

7 BY MR. STAMETS:

8 Q Mr. Rooney, referring to Exhibit Ten-C, now in this
9 particular well a cement plug of fifty sacks was set from
10 ninety-three fifty-five to ninety-one fifty and then there is
11 no additional plug in that hole until you get up to forty-one
12 fifty. Does that fifty sacks cover the McKee zone that will
13 be flooded?

14 A Yes, sir, if you will note there is a tabulation to
15 the right of the wellbore there and it says the top of the
16 McKee is ninety-two thirty-seven in that particular wellbore.

17 Q So you've got slightly more than a hundred feet of
18 coverage in there?

19 A Yes, sir.

20 Q Do you think that will be adequate to keep the
21 water in the McKee in this well?

22 A There is also a weighted brine or a weighted mud
23 fluid that we have put in between these plugs in the con-
24 ventional plugging operation.

25 Q This well is right at the limit of the half mile

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Phone (505) 982-9212

1 from your closest injector, at least at the present time?

2 A That's right.

3 Q Okay. Now back to Exhibit Number Thirteen. I'm on
4 the first page of that exhibit, the last well there, the
5 Warren Unit No. 4.

6 A Correct.

7 Q That indicates that it was drilled to the McKee but
8 not completed in the McKee? I guess that indicates that it
9 was not completed in the McKee, is that correct?

10 A It was not perforated per se or completed for a
11 producer in the McKee.

12 Q Is there casing through the McKee in that well?

13 A Well, we have indicated here to seventy-three
14 hundred feet and I don't have the records of the well with
15 me.

16 Q The only problem I have is on the two hundred and
17 eighty-six feet of casing. I think there must be something
18 haywire on the exhibit.

19 A Well, that might be an error that I hadn't checked
20 out.

21 Q It is your understanding that the casing is set
22 through the McKee and that casing is cemented back to seventy-
23 three hundred feet?

24 A I would have to go back through this, sir.

25 Q Okay, if you will advise us on that.

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1 A I would have to go back through the records, sir.

2 Q Exhibit Number One does show that as a McKee
 3 producer. I would assume that it is a McKee producer.

4 MR. LYON: Did you say No. 4 or 24?

5 MR. STAMETS: No. 4.

6 MR. KELLAHIN: You will supply Mr. Stamets with
 7 the information on that, won't you?

8 A Yes, sir.

9 Q (Mr. Stamets continuing.) Then on the last page of
 10 that exhibit you show the "CU" McKee No. 2 as plugged and
 11 abandoned? Is that one shown on the schematics?

12 A Yes, sir.

13 Q Okay.

14 A I believe No. 12 is.

15 Q Ten-E?

16 A Ten-E.

17 Q Very good. Will the water that you will be inject-
 18 ing be treated for bacteria?

19 A Yes, sir.

20 MR. STAMETS: Okay. Any other questions of the
 21 witness? He may be excused.

22 (THEREUPON, the witness was excused.)

23 MR. KELLAHIN: That completes our case, Mr. Stamets.

24 Thank you.


25 MR. STAMETS: If there is nothing further we will

1 take this case under advisement and we will recess the
2 hearing until one fifteen.
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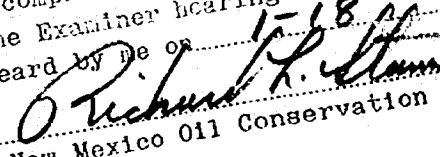
REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter,
do hereby certify that the foregoing and attached Transcript
of Hearing before the New Mexico Oil Conservation Commission
was reported by me, and the same is a true and correct record
of the said proceedings to the best of my knowledge, skill and
ability.


Sidney F. Morrish, C.S.R.

sid morrish reporting service

General Court Reporting Service
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Phone (505) 982-9212

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 6131-6132
heard by me on 1-18-31, 1928

Richard H. Stamm, Examiner
New Mexico Oil Conservation Commission

PRODUCTION HISTORY AND WELL STATUS

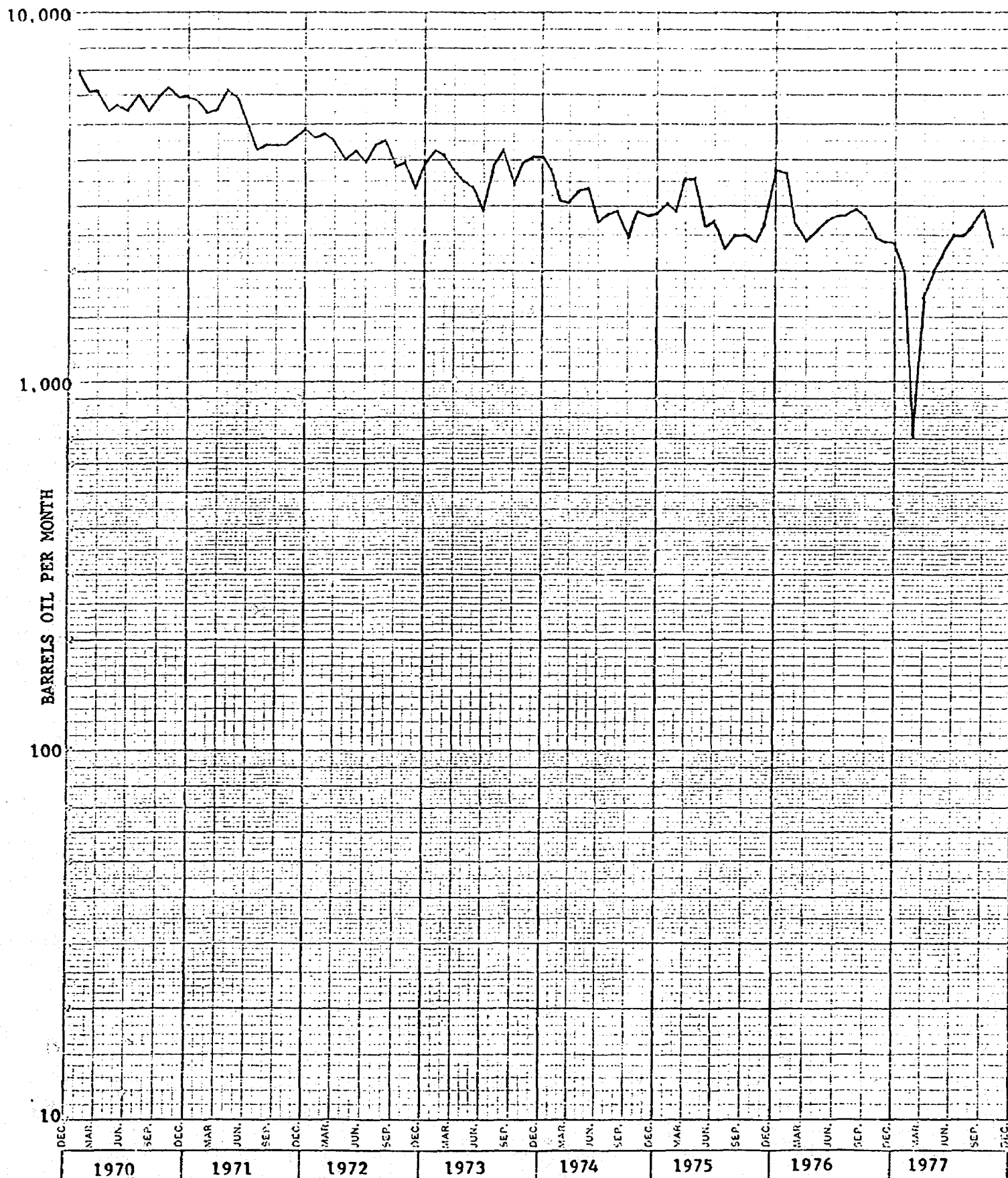
<u>LEASE AND WELL NO.</u>	<u>STATUS</u>	<u>OCT. '77 PROD. RATE BOPD</u>	<u>PROJECTED PRODUCER OR INJECTOR</u>	<u>CUMULATIVE PRIMARY PROD. AS OF 10-31-77</u>
Warren Unit McKee No. 3	Prod. - GL*	2	P	972,113
Warren Unit McKee No. 4	S.I. - 6/73	0	P	561,628
Warren Unit McKee No. 6	Prod. - GL	9	P	659,451
Warren Unit McKee No. 7	Prod. - GL	12	P	833,251
Warren Unit McKee No. 22	Prod. - GL	27	I	320,315
Warren Unit McKee No. 23	Prod. - GL	4	I	439,797
Warren Unit McKee No. 25	Prod. - GL	13	I	483,724
Warren Unit McKee No. 27	Prod. - GL	4	I	295,048
Warren Unit McKee No. 28	Prod. - GL	<u>3</u>	P	<u>178,739</u>
		72		4,744,066
SEM U McKee No. 10	Rec. to Dev.	0	P	671,878
SEM U McKee No. 11	S.I. - 6/73	0	P	510,442
SEM U McKee No. 13	Rec. to Drinkard S.I. - 6/73	0	P	463,554
SEM U McKee No. 50	Prod. - GL	2	P	314,466
SEM U McKee No. 51	S.I. - 6/73	0	P	191,513
SEM U McKee No. 53	Prod. - GL	14	I	255,952
SEM U McKee No. 57	S.I. - 6/73	0	I	157,981
SEM U McKee No. 58	Rec. to Tubb & Blinbry	0	I	160,662
SEM U McKee No. 59	S.I. - 6/73	0	I	197,903
SEM U McKee No. 60	S.I. - 6/73	0	I	206,844
SEM U McKee No. 62	Prod. - GL	5	I	216,539
SEM U McKee No. 63	Prod. - GL	2	I	111,044
SEM U McKee No. 71	Prod. - GL	14	I	477,661
SEM U McKee No. 72	Prod. - GL	<u>8</u>	P	<u>227,006</u>
		45		4,163,445
TOTALS		117 BOPD		8,907,511 Barrels

*Gas Lift

BEFORE EXAMINER STAMETS
 OIL CONSERVATION COMMISSION
 EXHIBIT NO. 4
 CASE NO. 6131-6132
 Submitted by Conoco
 Hearing Date Jan. 18, 1978

EXHIBIT 4

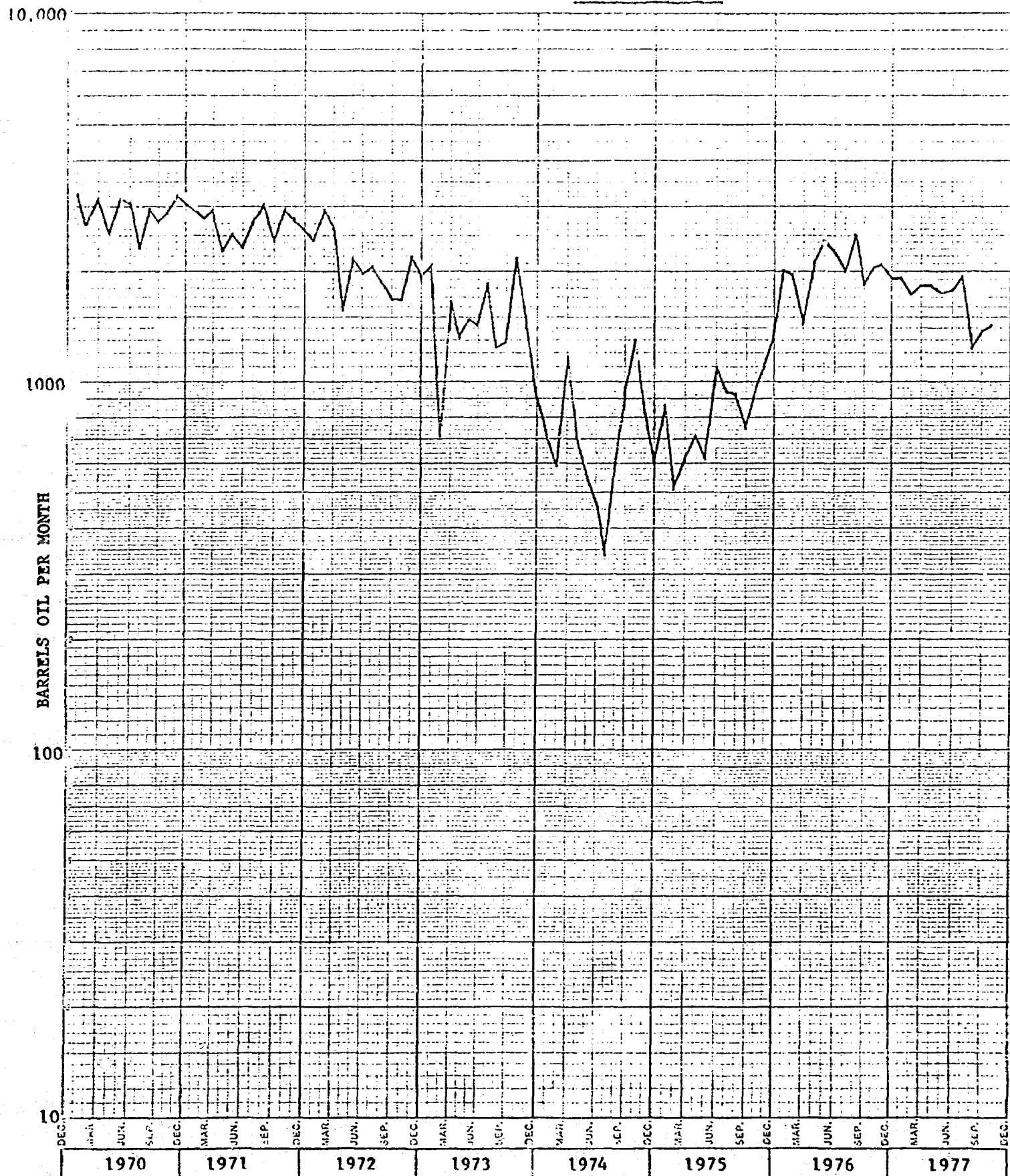
WARREN MCKEE



BEFORE EXAMINER STAMETS
 OIL CONSERVATION COMMISSION
 EXHIBIT NO. 5
 CASE NO. 6131-6132
 Submitted by Conoco
 Hearing Date Jan. 18, 1978

EXHIBIT 5

S E M U McKEE



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 6

CASE NO. 6131-6132

Submitted by Conoco

Hearing Date Jan. 18, 1978

EXHIBIT 6

RESERVOIR PARAMETERS

Producing Mechanism	Solution Gas
Average Porosity	14.5%
Average Air Permeability:	
Upper Sand	16.8 md.
Main Sand	89.3 md.
Connate Water	30%
Original Reservoir Data:	
Bottom Hole Pressure	3440 psi
Oil Viscosity	0.549 cp
Sol. GOR	671
FVF	1.359 R-bbl/STB
Oil-Water Contact	-5650 feet
Bubble Point Pressure	2156 psi
Reservoir Temperature	123°
Reservoir Volumes:	
Upper Sand	8,192 acre-feet
Main Sand	80,380 acre-feet
Original Oil-in-Place	51,283,000 barrels
Primary Recovery (10-31-77)	8,907,511 barrels
Primary Reserves	168,818 barrels
Ultimate Primary Recovery (17.75% OOIP)	9,076,329 barrels

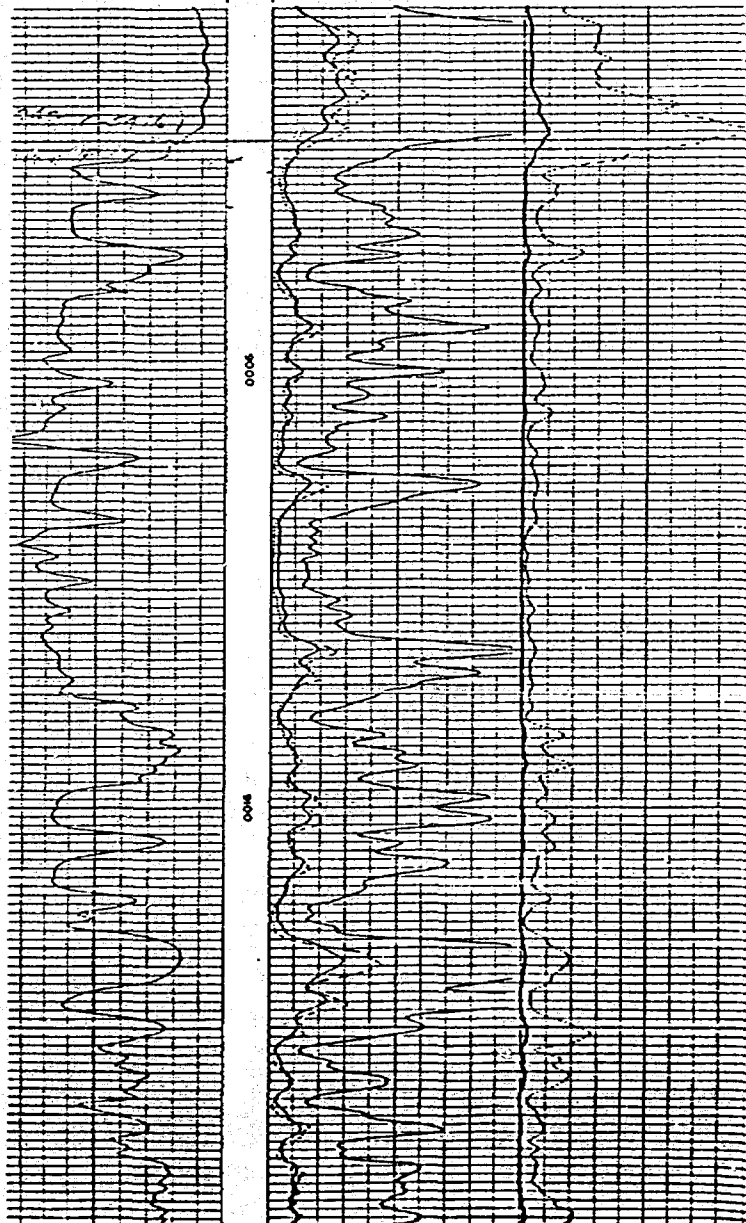
BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 6131-6132
Submitted by Canoco
Hearing Date Jan. 18, 1978

SCHLUMBERGER WELL SURVEYING CORPORATION

Schlumberger

COUNTY <u>Lea</u> FIELD or LOCATION <u>Warren Mc Kee</u> WELL <u>Warren Unit Mc Kee</u> COMPANY <u>Continental Oil</u>	COMPANY <u>CONTINENTAL OIL</u> COMPANY <u>GEOL</u> WELL <u>WARREN UNIT</u> <u>MC. KEE # 22</u> FIELD <u>WARREN MC KEE</u> LOCATION <u>SEC. 29-20S-38E.</u> COUNTY <u>LEA</u> STATE <u>NEW MEXICO</u>	Other Surveys ML Location of Well <u>2090' 1 54 1/2 L</u> Elevation D.F. <u>3532</u> K.B. or G.I. FILING No.
---	---	---

SPONTANEOUS-POTENTIAL millivolts	SH/20	RESISTIVITY ohms. m ² /m	RESISTIVITY ohms. m ² /m
- 20 -	0	AMP. Normal 40	0 19" Lateral 100
	0	10" Normal 200	0 1000
	0	2000	0 10000
	0	22" LS Lateral 250	



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

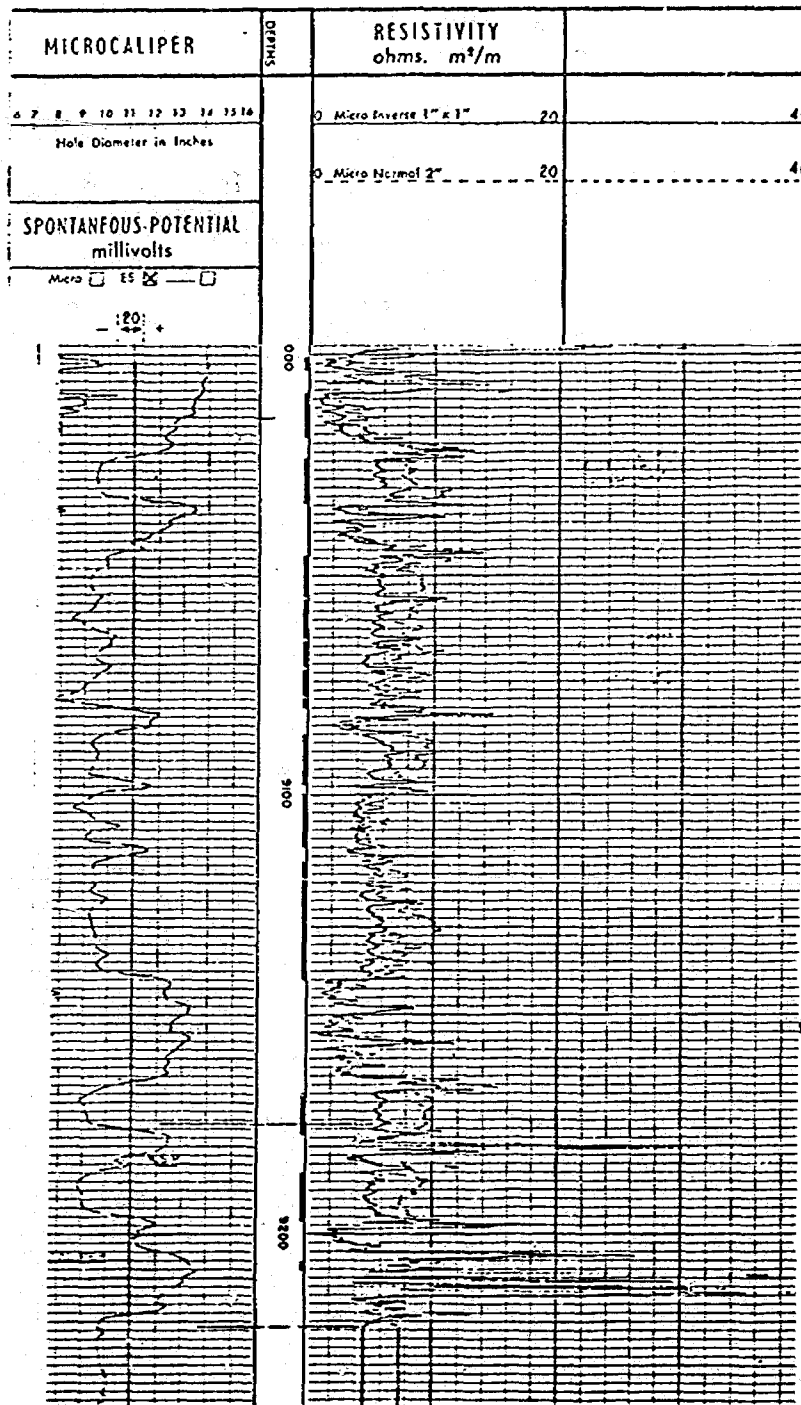
EXHIBIT NO. 9A

CASE NO. 6131-6132


Submitted by Conoco

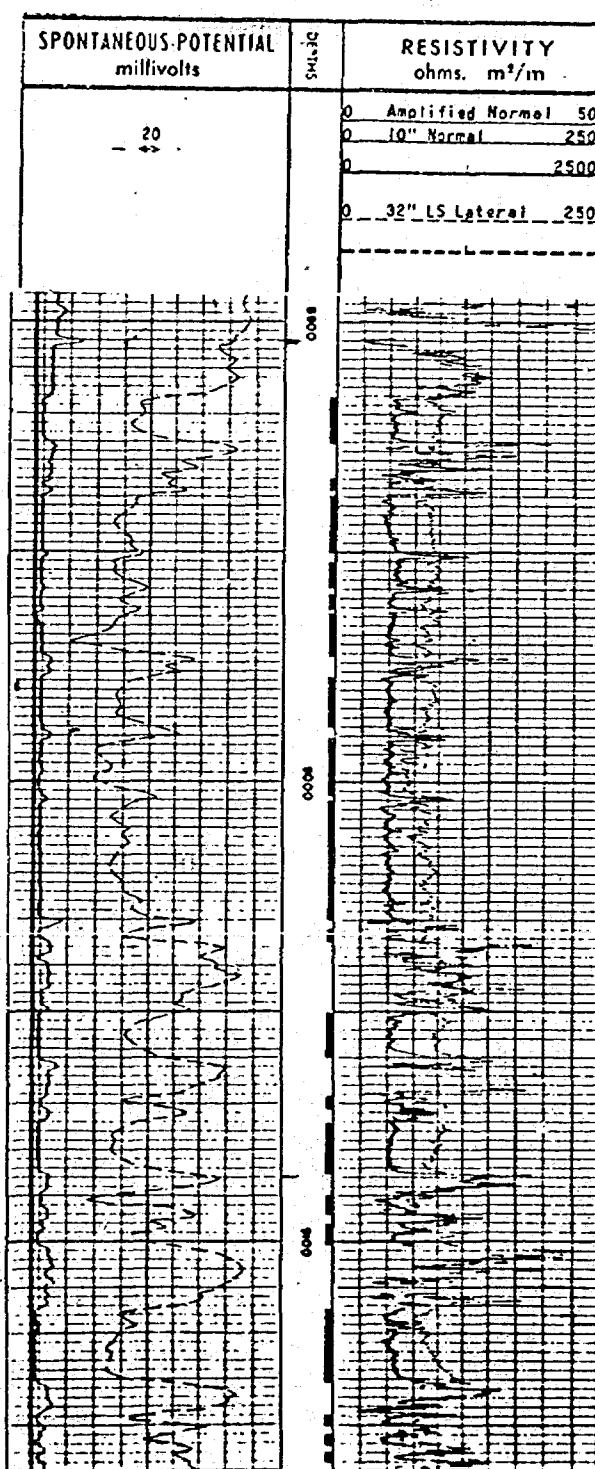
Hearing Date Jan. 18, 1978

SCHLUMBERGER WELL SURVEYING CORPORATION	
MicroLogging®	
COUNTY - <u>LEA</u>	COMPANY - <u>CONTINENTAL OIL</u>
FIELD - <u>WARREN MCKEE</u>	COMPANY - <u>ES</u>
LOCATION - <u>WARREN MCKEE #25</u>	Location of Well
WELL - <u>WARREN MCKEE #25</u>	890' f S/L
FIELD - <u>WARREN MCKEE</u>	2310' f E/L
LOCATION - <u>SEC 29-20S-38E</u>	
COUNTY - <u>LEA</u>	Elevation: D.F. 3525
STATE - <u>NEW MEXICO</u>	K.B. 3526
	or G.L. 36145



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 9B
CASE NO. 6131-6132
Submitted by Corraco
Hearing Date Jan. 18, 1978

SCHLUMBERGER WELL SURVEYING CORPORATION  Electrical Log		
COUNTY <u>Lee</u> FIELD <u>Warren McKee</u> LOCATION <u>Warren Unit McKee</u> WELL <u>#23</u> COMPANY <u>Continental Oil Co</u>	COMPANY <u>CONTINENTAL OIL</u> COMPANY	Other Surveys <u>ML</u>
	WELL <u>WARREN MCKEE</u>	Location of Well <u>1980' f N5E/L</u>
	UNIT <u>23</u>	
	FIELD <u>WARREN MCKEE</u>	Elevation: D.F. <u>3548</u> K.S. <u> </u> or G.L. <u> </u>
	LOCATION <u>SEC. 29-20S-38E</u>	FILING No. <u> </u>
	COUNTY <u>LEA</u>	
	STATE <u>NEW MEXICO</u>	



BEFORE EXAMINER STAMETS
 OIL CONSERVATION COMMISSION
 EXHIBIT NO. 9C
 CASE NO. 6131-6132
 Submitted by Conoco
 Hearing Date Jan. 18, 1978

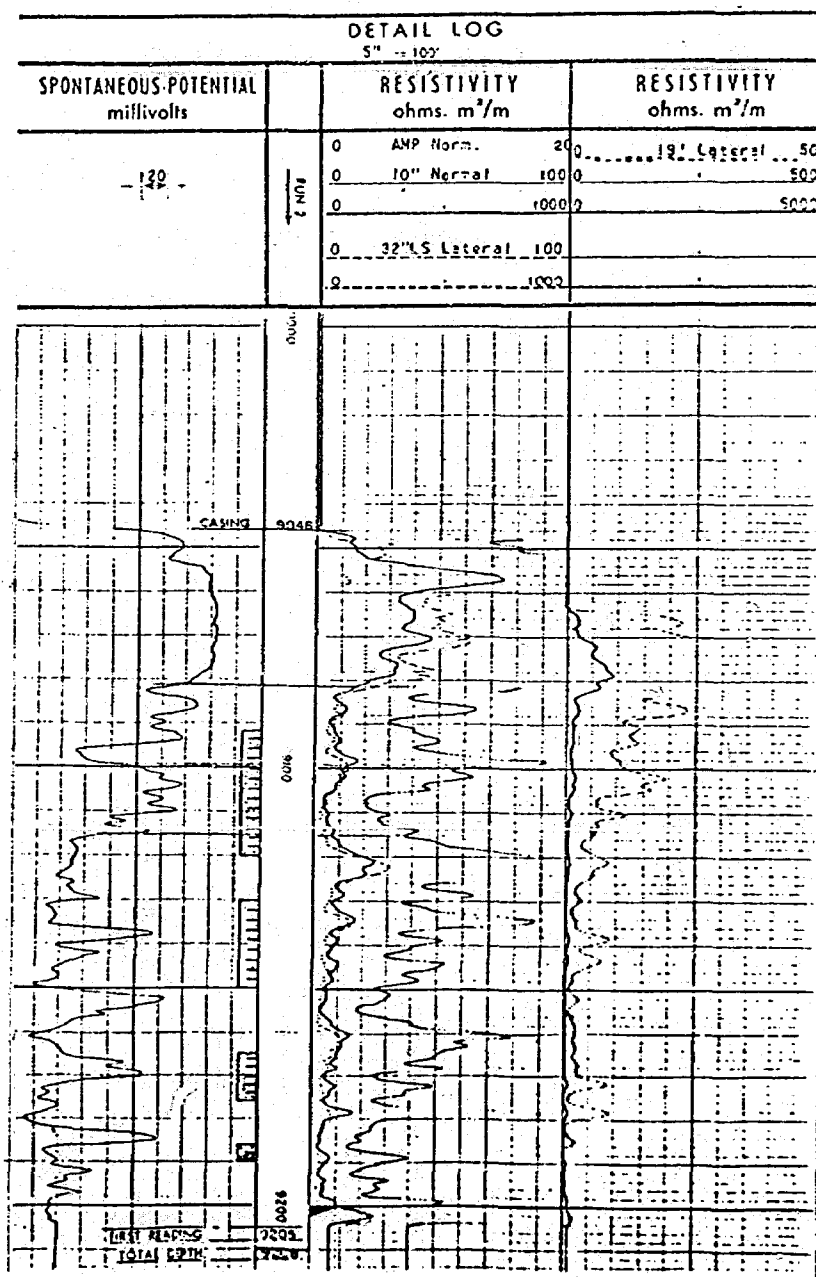
GAMMA RAY		DEPTH	NEUTRON	
RADIATION INTENSITY INCREASES			RADIATION INTENSITY INCREASES	
← 0RU → 29U/CD → 40RU →			← 600EU → 150EU/CD → 3600EU →	
R.D. 9099 T.O. 9111		512	R.D. 9110	
CONTINENTAL OIL CO.				

**BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION**

EXHIBIT NO. 90

CASE NO. 6131-6132

Submitted by CanoocoHearing Date Jan. 18, 1978



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 9E

CASE NO. 6131-6132

Submitted by Conoco

Hearing Date Jan. 18, 1978

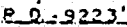


EXHIBIT NO. 9F

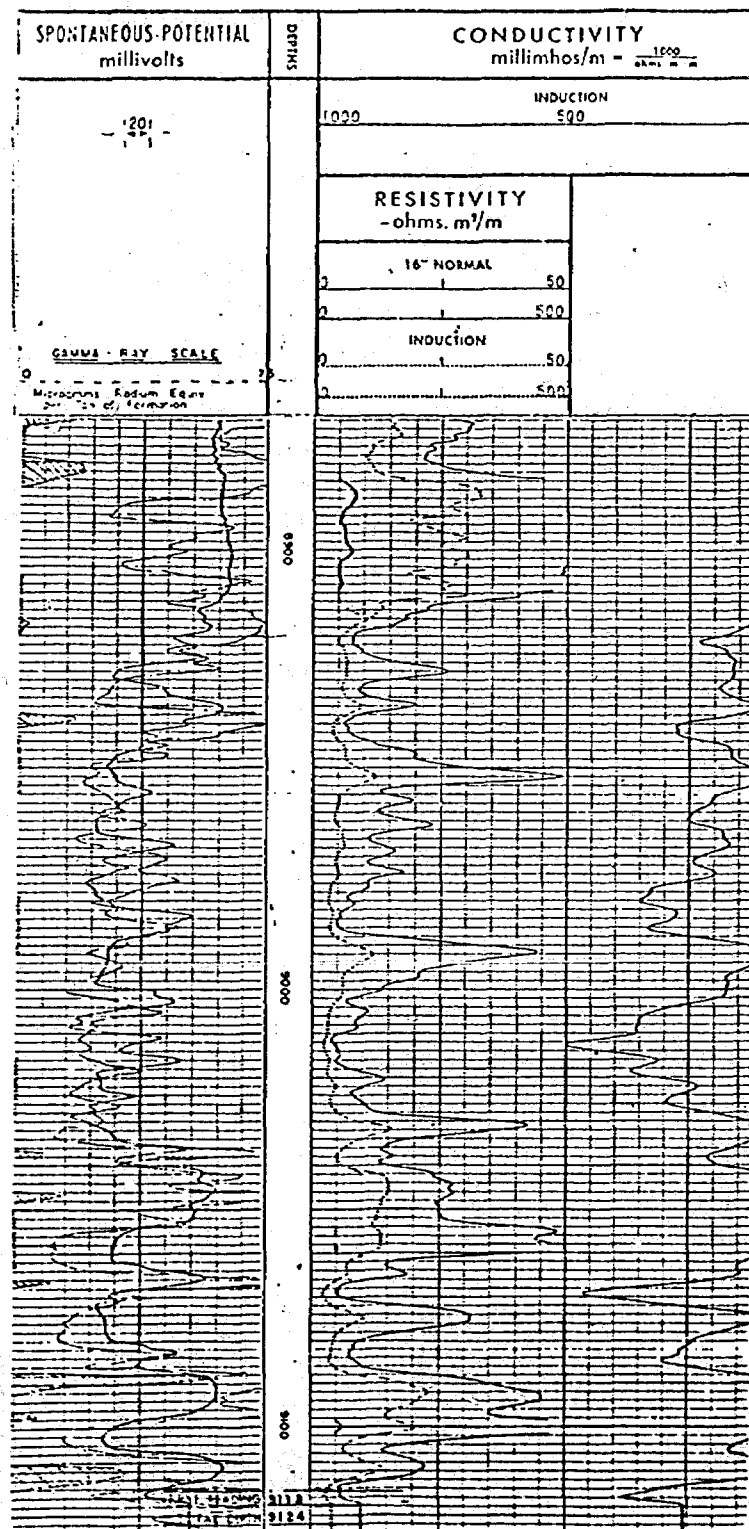
Submitted by Canace

Hearing Date Jan. 18, 1978

SCHLUMBERGER WELL SURVIVING CORPORATION
ESTABLISHED 1919

Schlumberger Well Surviving Corporation

COUNTY Leas FIELD Warren McKee LOCATION Warren McKee WELL S.E. 1/4, Sec. 25 COMPANY Continental Oil Co.	COMPANY CONTINENTAL OIL	Other Surveys HL GR
	COMPANY SEMU BURGER 8 #58	Location of Well
	WELL S.E. 1/4, Sec. 25	660' f N/L 1980' f V/L
	FIELD WARREN McKEE	Elevations: DF 3547 X 3518 or GL 3537
	LOCATION SEC. 25-20S-38E	FILING No.
COUNTY LEA	STATE NEW MEXICO	



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 9G

CASE NO. 6131-6132

Submitted by Canoca

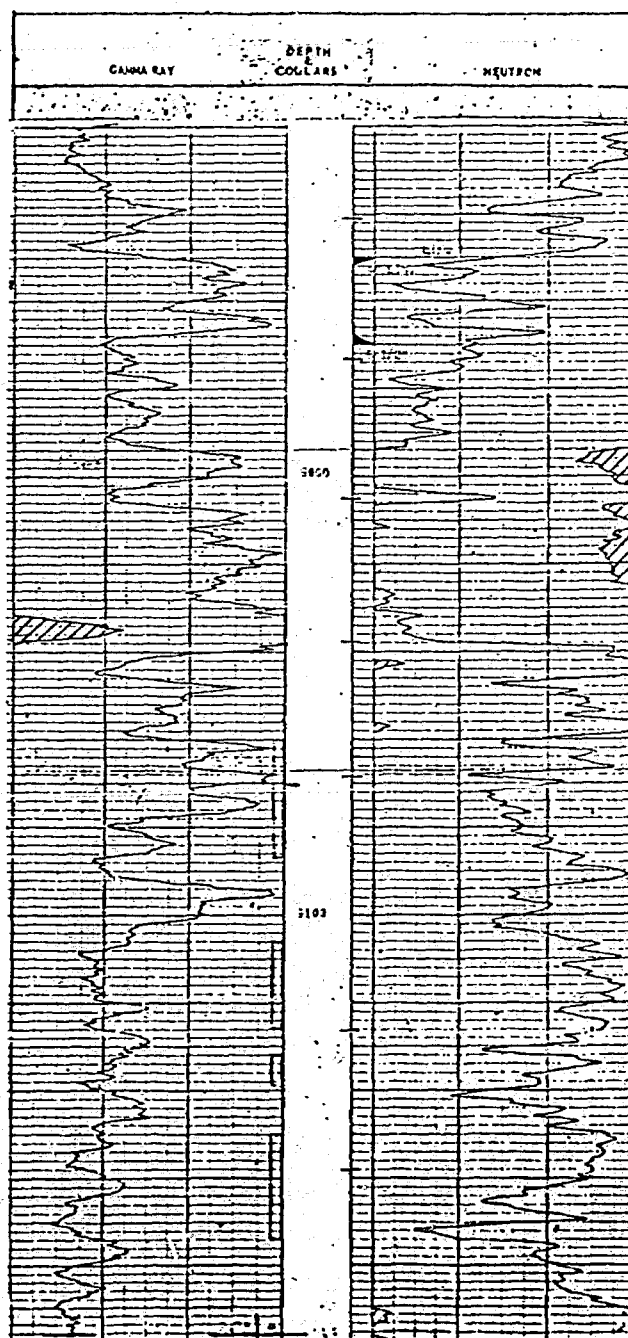
Hearing Date Jan. 18, 1978

PERFORMING GEOSATLAS CORPORATION

Simultaneous

Radiation Log

LOG NO. 1554	COMPANY CONTINENTAL OIL COMPANY																																				
STATION 4225	WELL SEMI MC KEE # 59																																				
TRUCK NO. 42-2A	FIELD WADSWORTH KEE																																				
CONTINENTAL OIL COMPANY SEMI MC KEE # 59 WADSWORTH KEE LEA, NEW MEXICO	COUNTY STATE LEA, NEW MEXICO																																				
	LOCATION SEC. 20 TAP. 70 E. 37. 33 E																																				
	LOG HEAD FROM 801 ABOVE GULL. ELEV. 3549																																				
	CRUC. HEAD FROM SAME ELEV. 3549																																				
	PERMANENT DATUM GULL. ELEV. 3539																																				
<table border="1"> <thead> <tr> <th colspan="3">CASING RECORD</th> <th colspan="3">BORE HOLE RECORD</th> </tr> <tr> <th>SIZE</th> <th>WT.</th> <th>FROM</th> <th>TO</th> <th>SIZE</th> <th>WT.</th> </tr> </thead> <tbody> <tr> <td>10 3/4</td> <td>30.6</td> <td>0</td> <td>259</td> <td></td> <td></td> </tr> <tr> <td>7 7/8</td> <td>27.0</td> <td>259</td> <td>270</td> <td></td> <td></td> </tr> <tr> <td>5 1/2</td> <td>27.0</td> <td>270</td> <td>270</td> <td></td> <td></td> </tr> <tr> <td>4" L.I.N.</td> <td>27.0</td> <td>270</td> <td>270</td> <td></td> <td></td> </tr> </tbody> </table>		CASING RECORD			BORE HOLE RECORD			SIZE	WT.	FROM	TO	SIZE	WT.	10 3/4	30.6	0	259			7 7/8	27.0	259	270			5 1/2	27.0	270	270			4" L.I.N.	27.0	270	270		
CASING RECORD			BORE HOLE RECORD																																		
SIZE	WT.	FROM	TO	SIZE	WT.																																
10 3/4	30.6	0	259																																		
7 7/8	27.0	259	270																																		
5 1/2	27.0	270	270																																		
4" L.I.N.	27.0	270	270																																		
COMPANY	WELL	FIELD	COUNTY	STATE																																	



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 9H

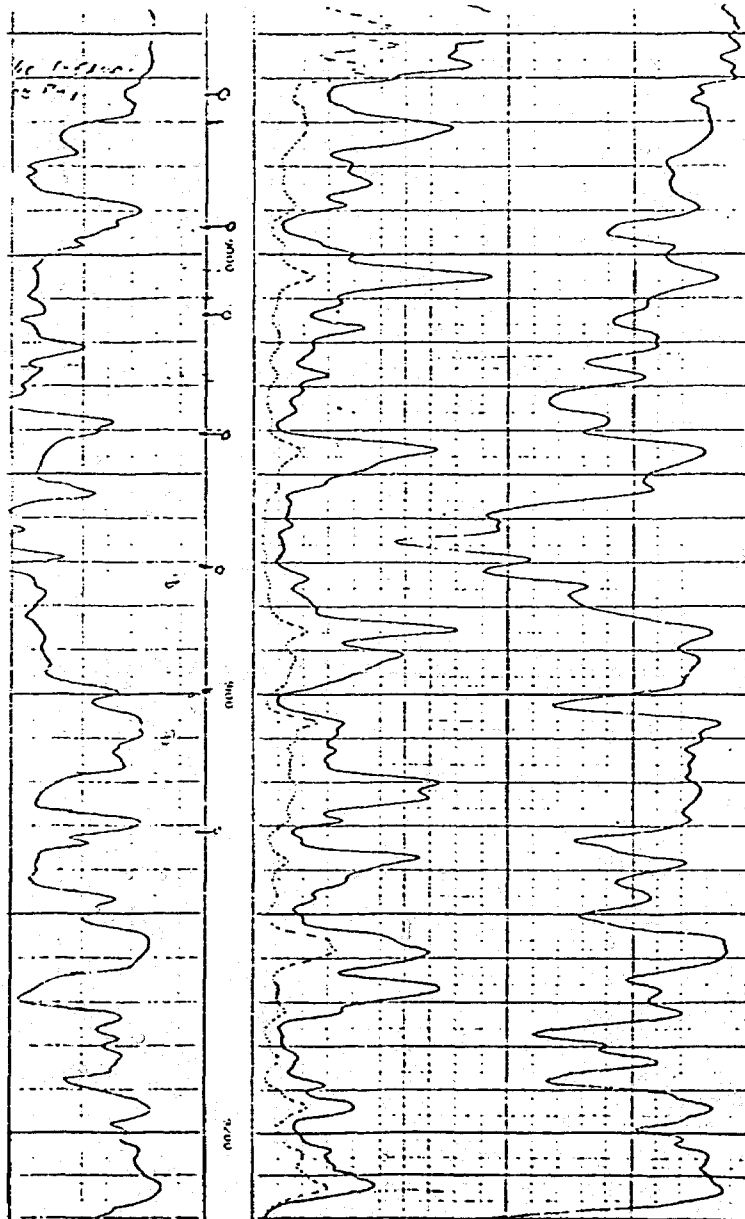
CASE NO. 8131-6132

Submitted by Conoco

Hearing Date January 18, 1978

COUNTY LEA FIELD BY LOCATION WELL COMPANY CONTINENTAL OIL		COMPANY CONTINENTAL OIL COMPANY WELL SEMU MCKEE #30 FIELD WARREN MCKEL LOCATION SEC. 29-205-38E COUNTY LEA STATE NEW MEXICO	OTHER SURVEY NL LOCATION OF WELL 1930' 1 1/2" L 0' 1 1/2" L E-5 Elevation OF 3540 RB 3541 or G1 3528 FILING NO
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SPONTANEOUS POTENTIAL millivolts	DEPTH	CONDUCTIVITY millimhos/m = $\frac{1000}{\text{ohms} \cdot \text{cm}}$	
		INDUCTION	
		1000	500
		RESISTIVITY -ohms. m ² /m	
		16 NORMAL	
		0	50
		0	500
		INDUCTION	
		0	50
0	500		




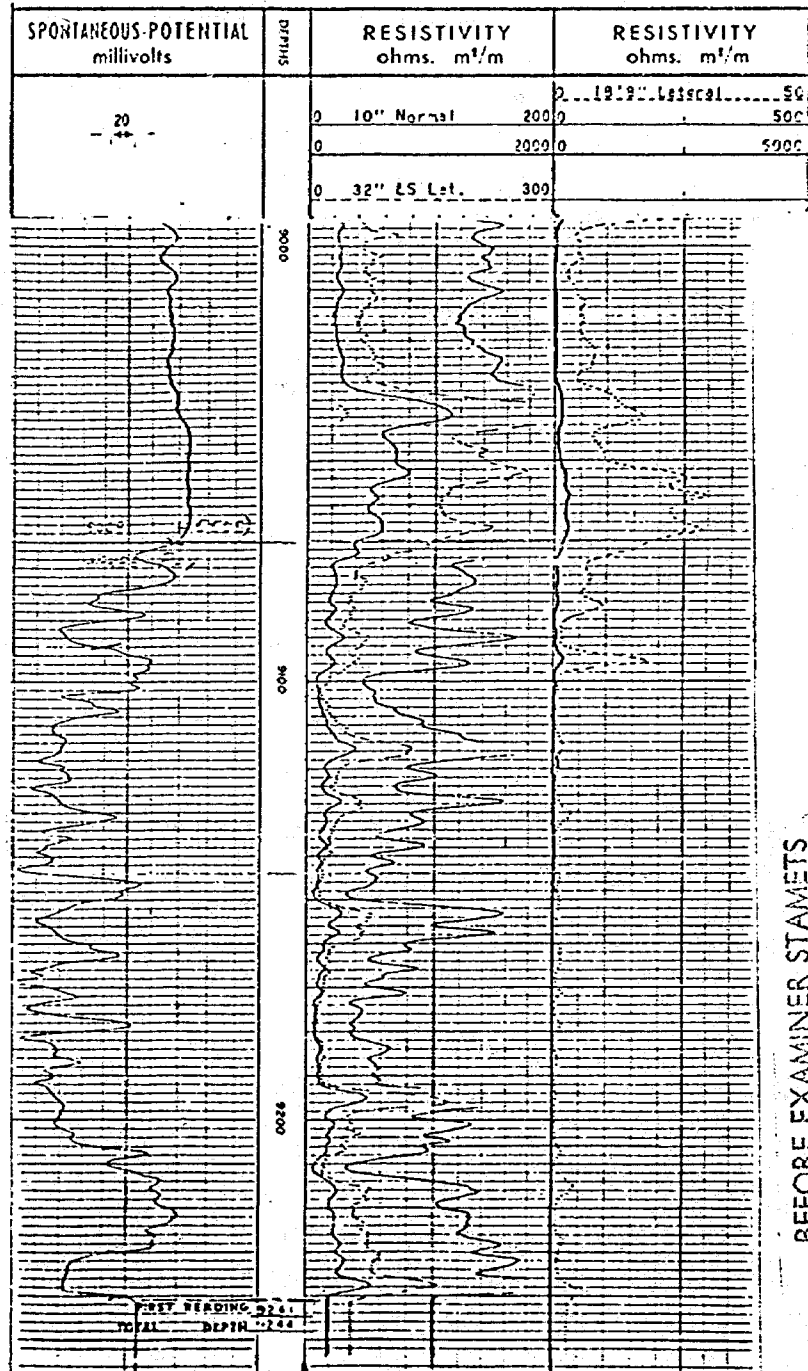
BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 91

CASE NO. 6131-6132

Submitted by CamocoHearing Date Jan. 18, 1978

SCHLIMBERGER WELL SURVEYING CORPORATION		
		
COUNTY: Lea FIELD or LOCATION: Warren McKee WELL: SEMU McKee #62 COMPANY: Continental Oil	COMPANY: CONTINENTAL OIL	Other surveys
	COMPANY:	HL
	WELL: SEMU McKee #62	Location of Well
	FIELD: WARREN McKee	1980' f S&W/L
	LOCATION: SEC. 20-20S-38E	
	COUNTY: Lea	Elevation: D.F. 3562 K.B. 35635 or G.L.
	STATE: NEW MEXICO	FILE No.



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 9J
 CASE NO. 6131-6132
 Submitted by Conoco
 Hearing Date Jan. 18, 1978

SCHLUMBERGER WELL SURVEYING CORPORATION

Electrical Log

COUNTY LEA FIELD WARREN MCKEE LOCATION SEMUR MCKEE #63 COMPANY CONTINENTAL OIL

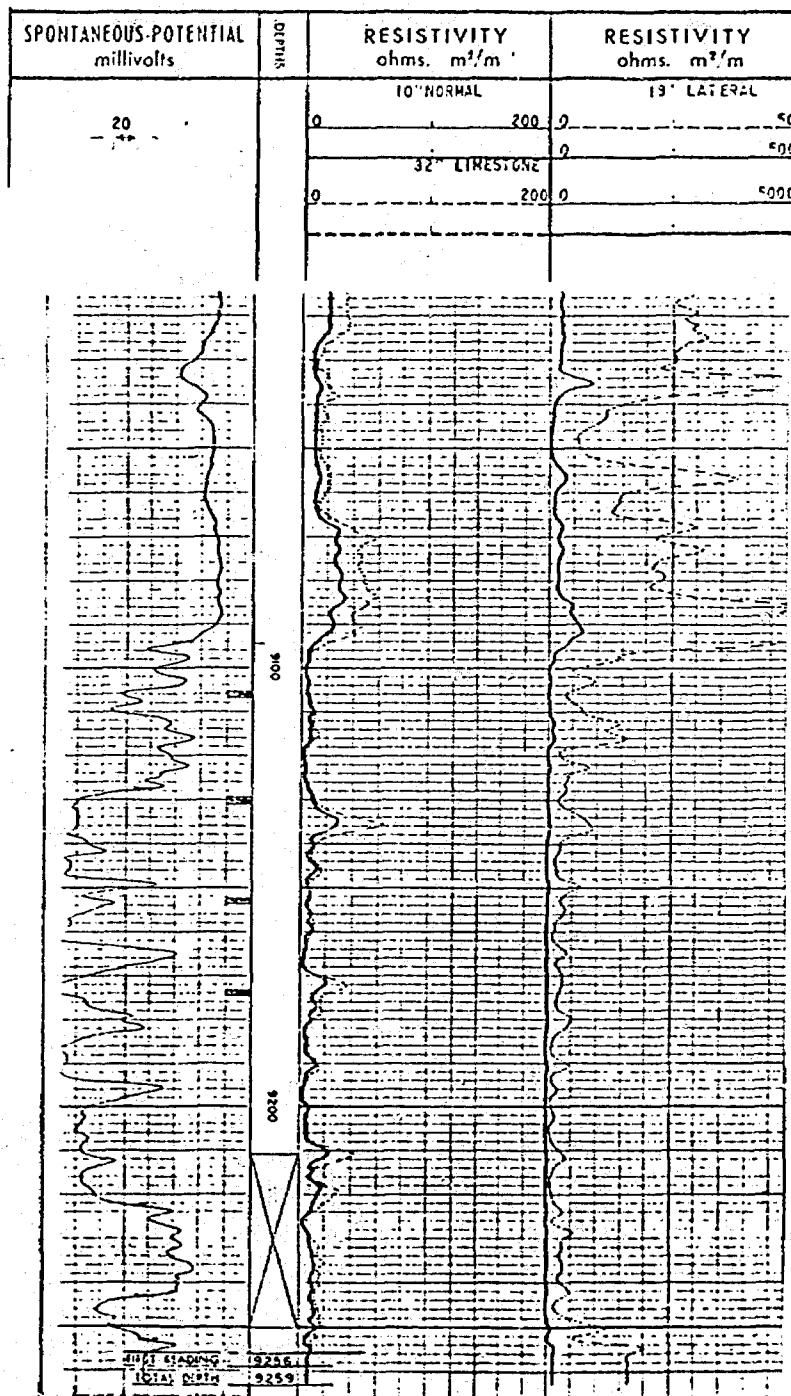
COMPANY CONTINENTAL OIL COMPANY CONTINENTAL OIL WELL SEMUR MCKEE #63 FIELD WARREN MCKEE LOCATION SEC. 19-205-38E

COUNTY LEA STATE NEW MEXICO

Location of Well
1650' ± N/L
1650' ± E/L

Elevation: D.F. 3556
K.B. 3546
or G.L. 3546

FILING No.



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 9K

CASE NO. 6131-6132

Submitted by Conoco

Hearing Date Jan. 18, 1978

SCHLUMBERGER WELL SURVEYING CORPORATION

Electric Log

COUNTY - LEA
FIELD or LOCATION - N. HARRIS MCKEE
WELL - # 71
COMPANY - CONTINENTAL OIL

COMPANY - CONTINENTAL OIL
WELL - # 71
FIELD - N. HARRIS MCKEE
LOCATION - SEC. 18-20S-38E

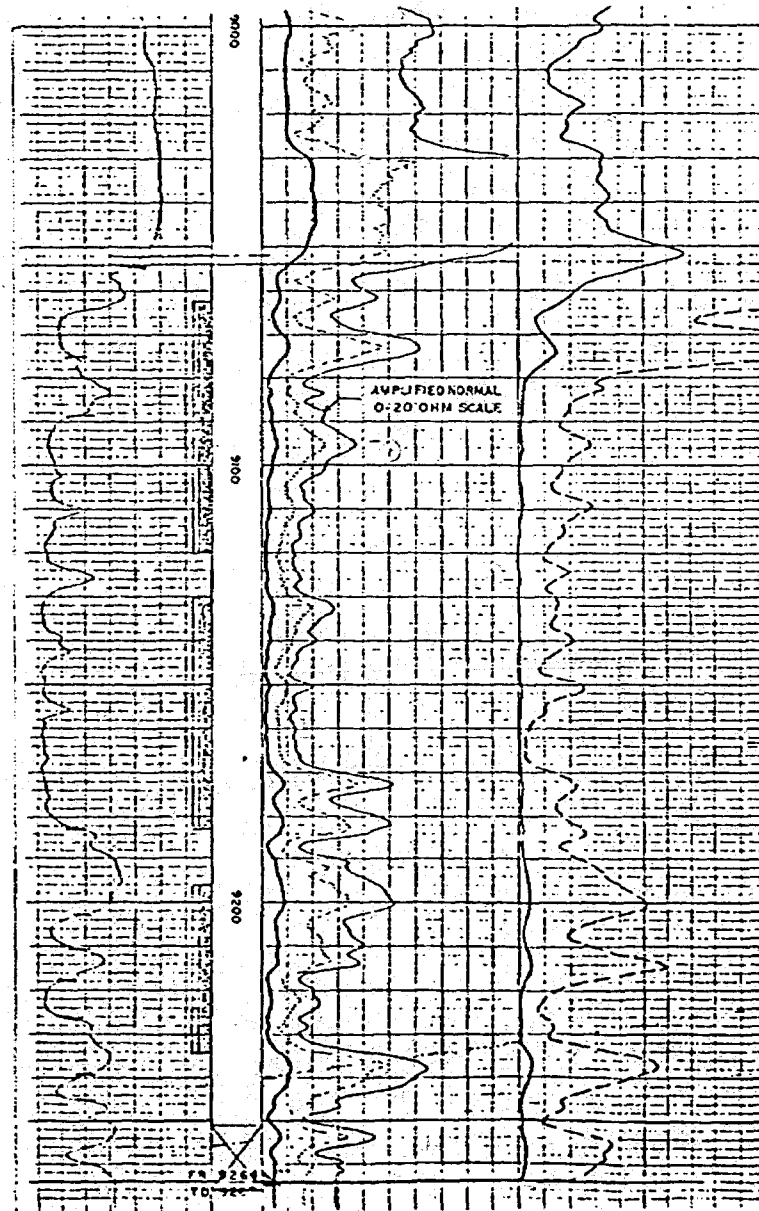
Location of Well
1930' T. 2S
660' R. 3E
Sec. 18-20S-38E

Elevation: D.F. 3563
K.B.
or G.L.

COUNTY - LEA
STATE - NEW MEXICO

FILING No.

SPONTANEOUS POTENTIAL millivolts	SHALLOWS	RESISTIVITY -ohms. m ³ /m	RESISTIVITY -ohms. m ³ /m
-115 +115		0 10" Normal 100	0 12" Lateral 20
		0 1000	0 2000
		0 12" LS Lateral 50	



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 9L

CASE NO. 6/31-6/32

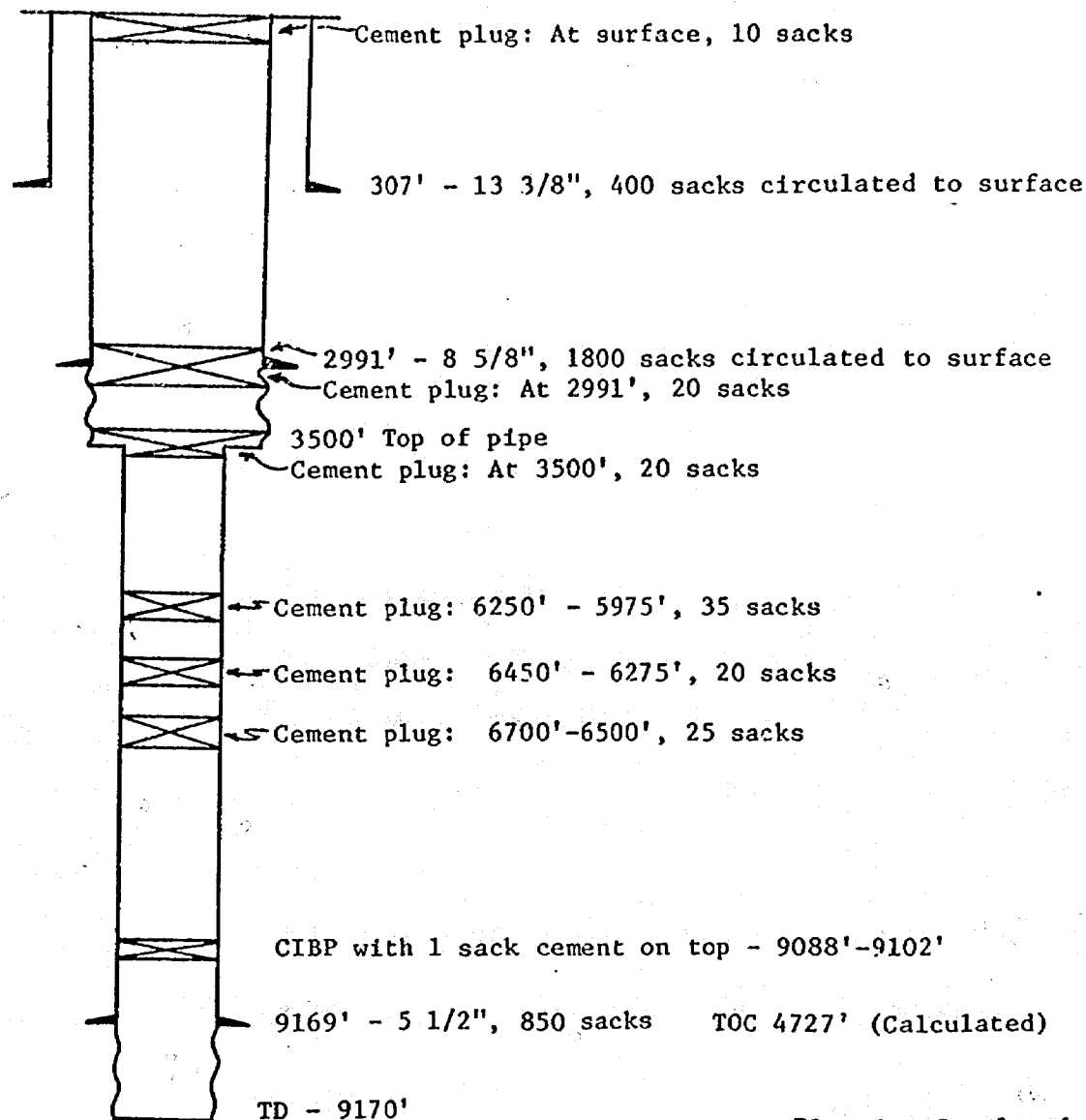
Submitted by Conoco

Hearing Date Jan. 18, 1978

Lea "BU" State
Elev: 3513' "0"-10' AGL

Elk 011
(drilled by Antweil)

330' FNL & 2307' FWL
Sec. 32, T20S, R38E



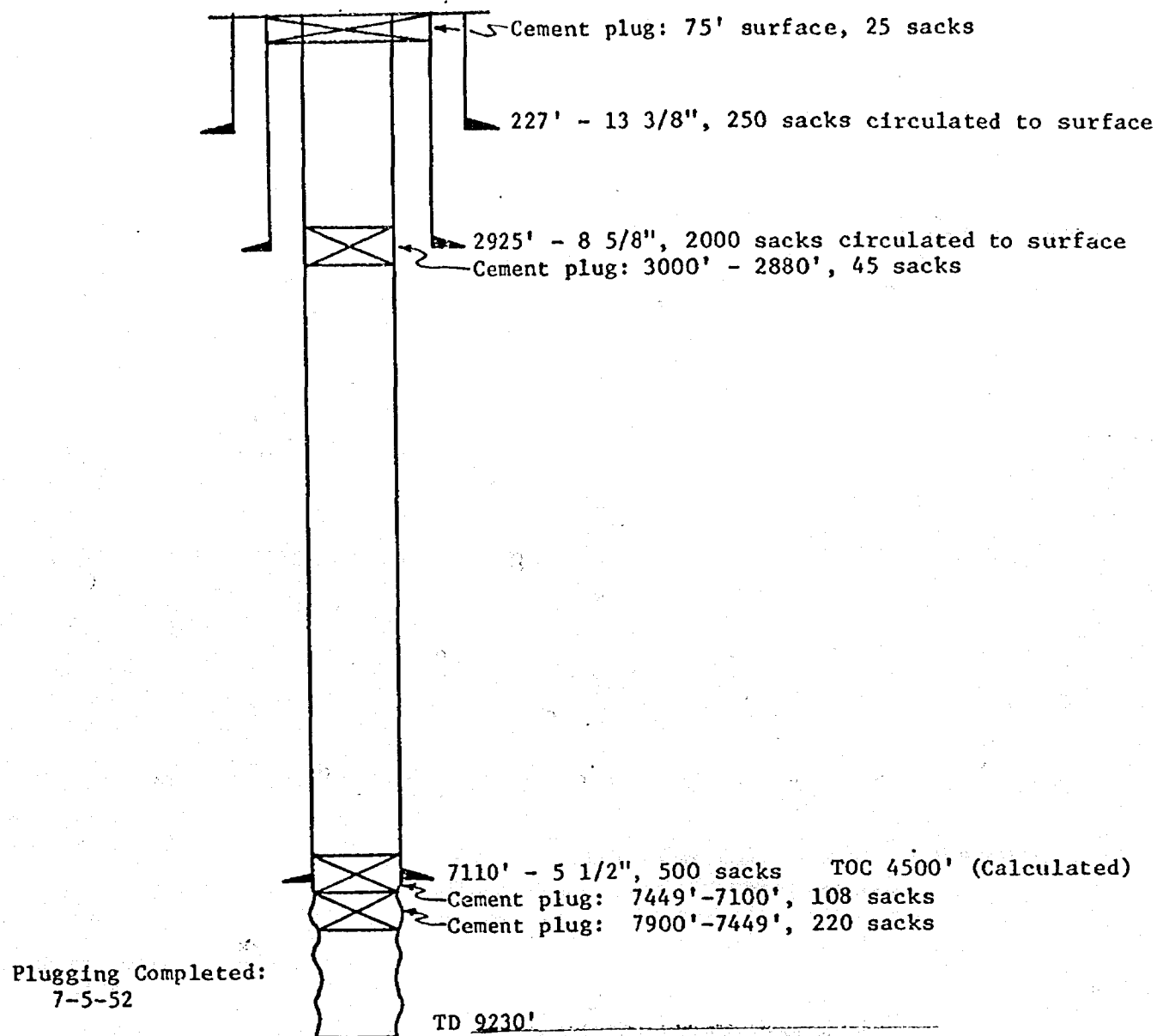
Plugging Completed:
4-4-68

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 10 A
CASE NO. 6131 - 6132
Submitted by Conoco
Hearing Date 18 Jan '78

EXHIBIT 10A

State "A" #1
330' FNL & 660' FWL, Sec 32, T20S, R38E
Elev: 3510' - "0" - 11' AGL

Elk Oil
(drilled by Shell)



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 10 B

CASE NO. 6131 - 6132

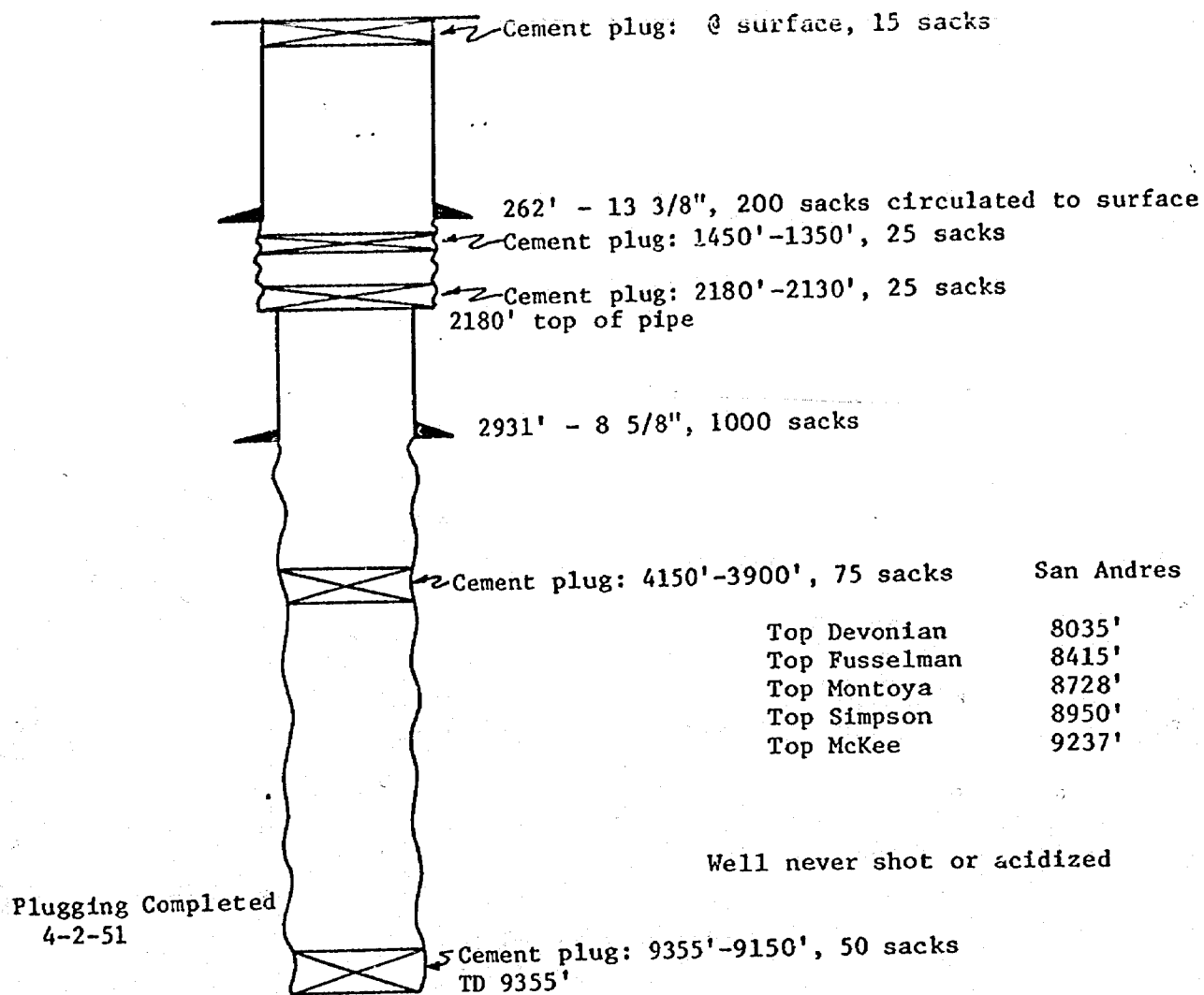
Submitted by Conoco

Hearing Date 16 Jan 78

EXHIBIT 10B

State No. 1
660' FNL & 660' FEL, Sec 32, T20S, R38E
Elev: 3510' "0" - 12' AGL

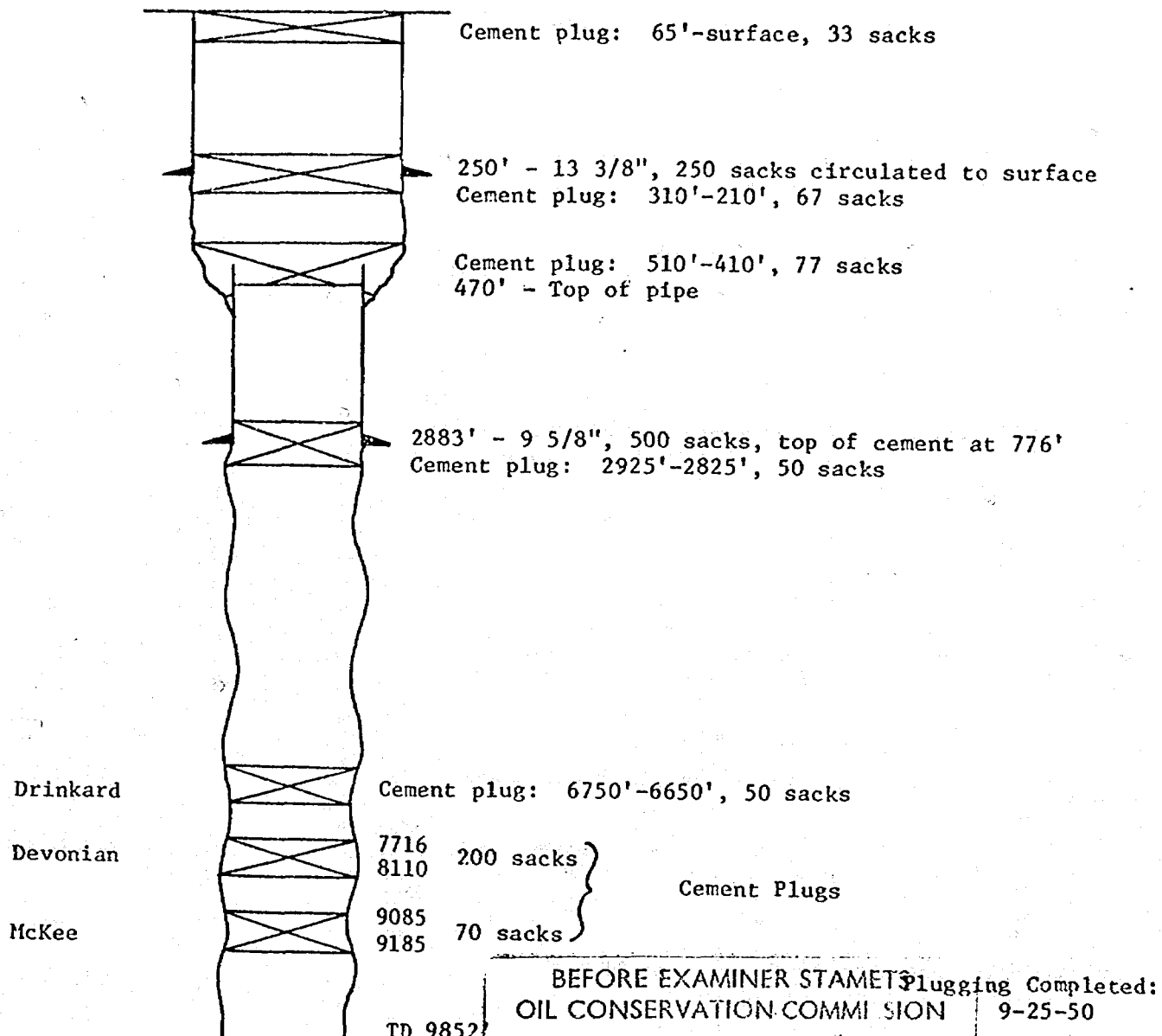
Exxon
(drilled by Tidewater)



BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 10C
CASE NO. 6131-6132
Submitted by Conoco
Hearing Date 18 Jan 78

EXHIBIT 10C

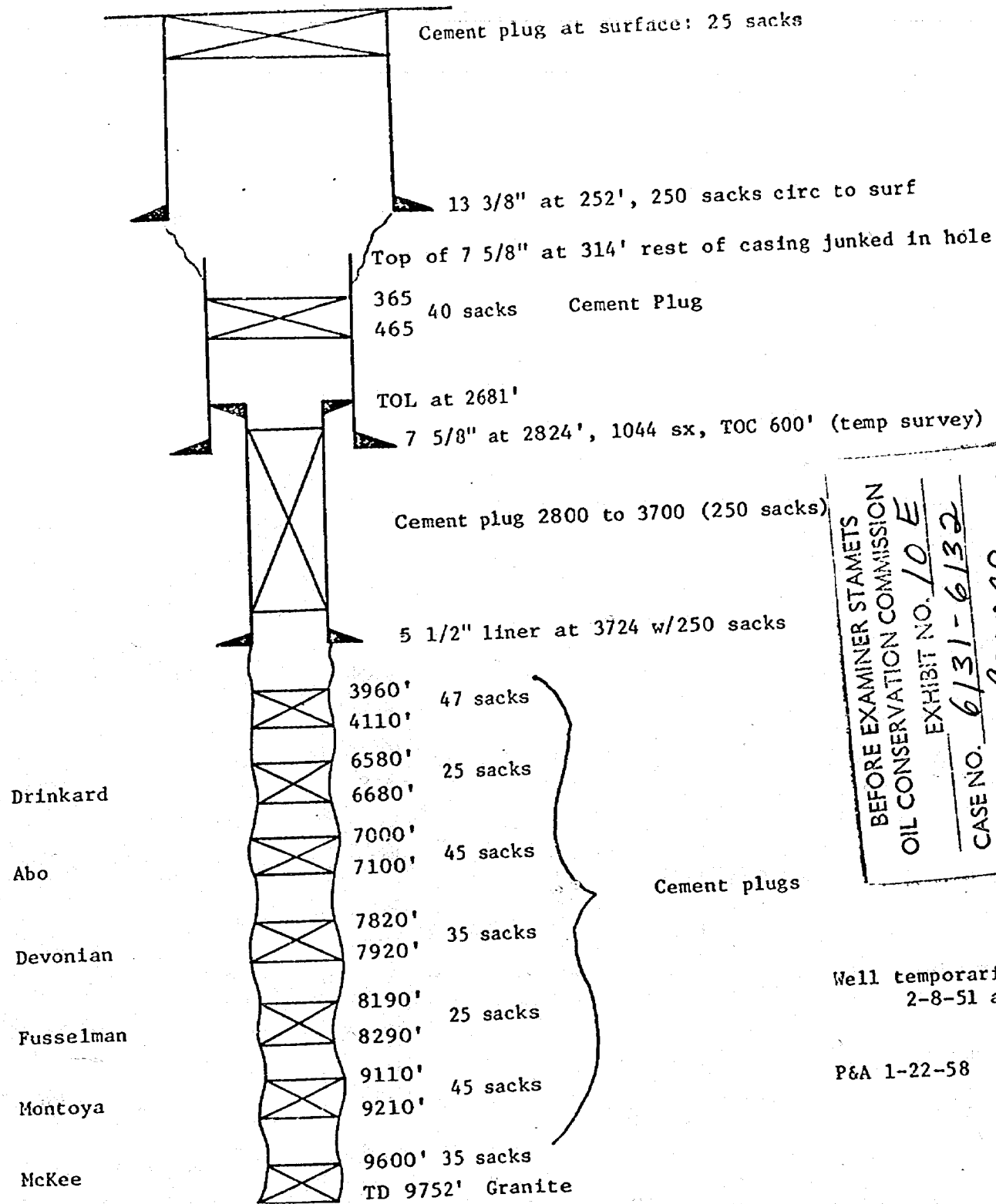
Warren Unit McKee #5
 1980' FNL & 660' FEL, Sec 29, T-20S, R-38E
 Elev: 3548' "0" - 11' AGL



BEFORE EXAMINER STAMET
 OIL CONSERVATION COMMISSION
 Plugging Completed: 9-25-50
 EXHIBIT NO. 10D
 CASE NO. 6131 - 6132
 Submitted by Conoco
 Hearing Date 18 Jan 78

EXHIBIT 10D

SEMU McKee Well No. 12
 1980' FNL & 660' FEL, Sec 30, T-20S, R-38E
 Elev: 3539, "0" - 10' AGL



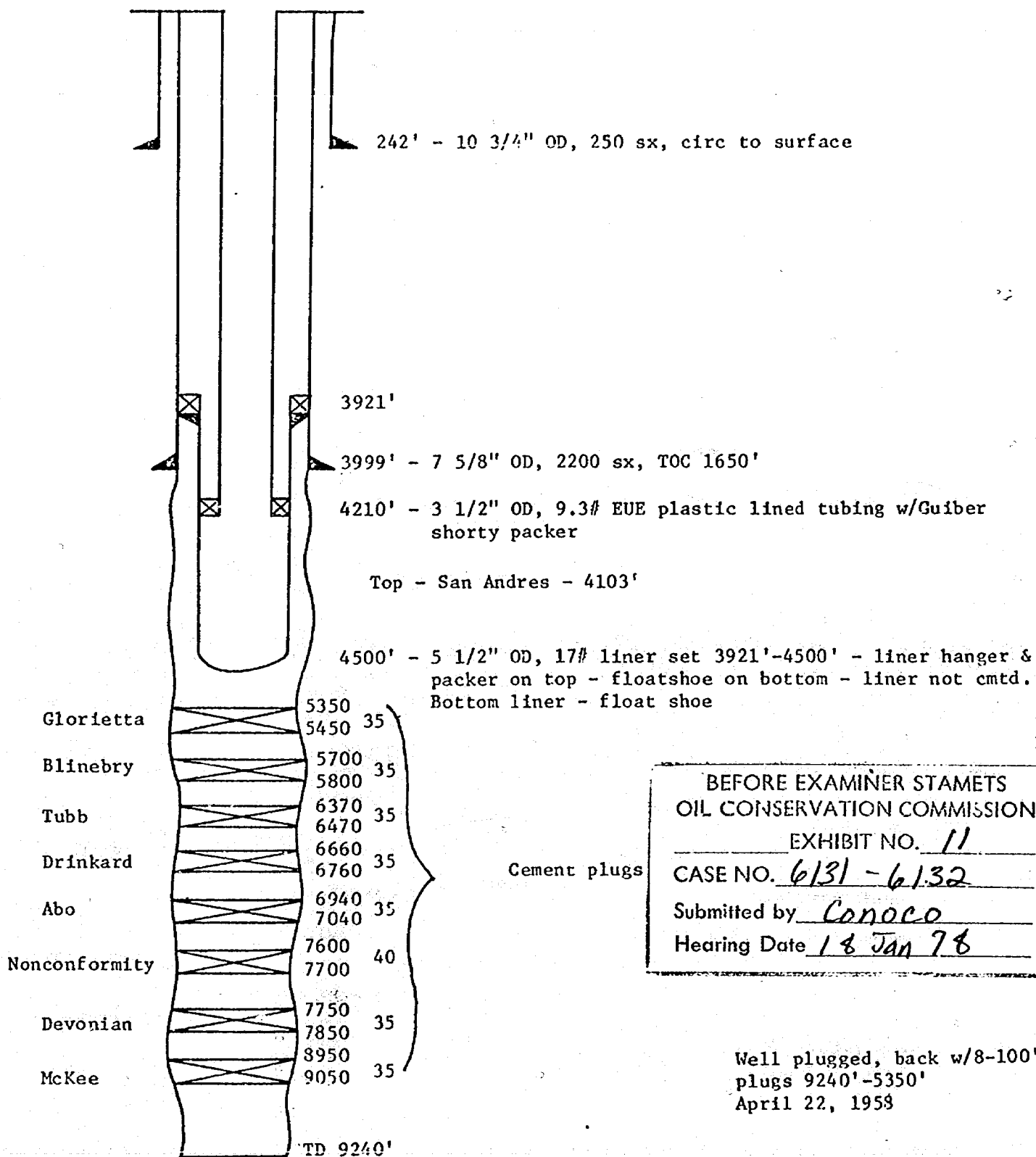
BEFORE EXAMINER STAMETS
 OIL CONSERVATION COMMISSION
 EXHIBIT NO. 10 E
 CASE NO. 6131-6132
 Submitted by Conoco
 Hearing Date 18 Jan 78

Well temporarily abandoned
 2-8-51 as dry hole

P&A 1-22-58

EXHIBIT 10E

Warren Unit McKee No. 24
 San Andres SWD Well
 247' FSL & 3129' FWL, Sec 29, T20S, R38E
 "0"-13' above BHF



BEFORE EXAMINER STAMETS
 OIL CONSERVATION COMMISSION

EXHIBIT NO. 11

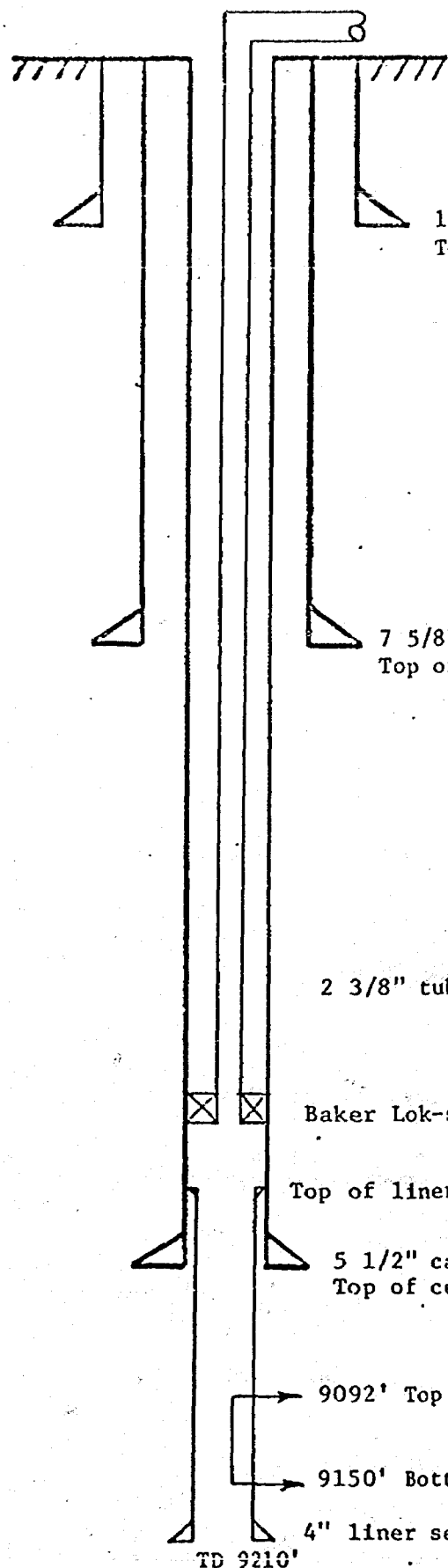
CASE NO. 6131 - 6132

Submitted by Conoco

Hearing Date 18 Jan 78

Well plugged, back w/8-100'
 plugs 9240'-5350'
 April 22, 1958

EXHIBIT 11



10 3/4" casing set at 273' w/250 sx of common cement.
Top of cement is at the surface.

7 5/8" casing set at 3998' w/1875 sx of mixed cement.
Top of cement is at 1575'.

2 3/8" tubing set at 8970'

Baker Lok-set Packer set at 8970'

Top of liner 8983'

5 1/2" casing set at 9043' w/225 sx of common cement.
Top of cement is at 7850'

9092' Top of perfs

9150' Bottom of perfs

4" liner set at 9200' w/25 sacks cement

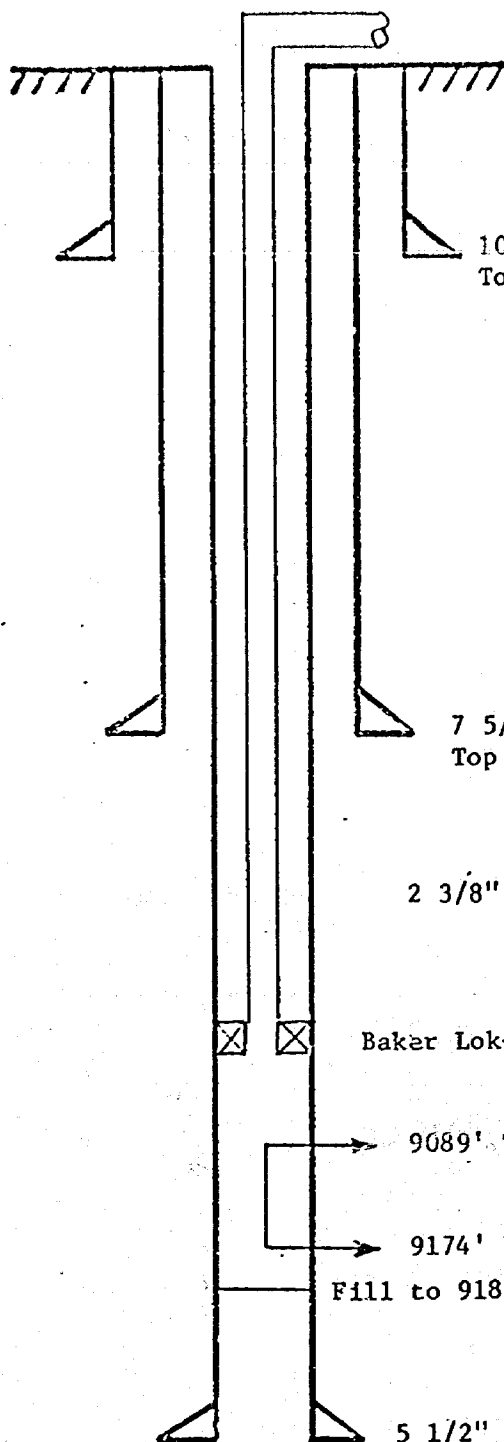
TD 9210'

Perfs
9092'-9120', 9130'-50', 9165'-76',
9186'-90' w/4 SPF

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
EXHIBIT NO. 12A
CASE NO. 6131-6132
Submitted by Conoco
Hearing Date 18 Jan 78

SENU McKee No. 53
Warren McKee Simpson Pool
Unit E, Sec. 20, T20S, R38E
Elev: 3549 O/W 9149
10-3-77 MCR

EXHIBIT 12A



10 3/4" casing set at 260' w/250 sx of common cement.
Top of cement is at surface.

7 5/8" casing set at 4000' w/1630 sx of mixed cement.
Top of cement is at 1550'.

2 3/8" tubing set at 8980'

Baker Lok-set Packer set at 8980'

9089' Top of perfs

9174' Bottom of perfs

Fill to 9180'

Perfs
9089'-96', 9112'-27', 9135'-44',
9152'-58', 9166'-74' w/4 SPF

5 1/2" casing set at 9223' w/530 sx of mixed cement.
Top of cement is at 5385'. Total depth 9224'.

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12B

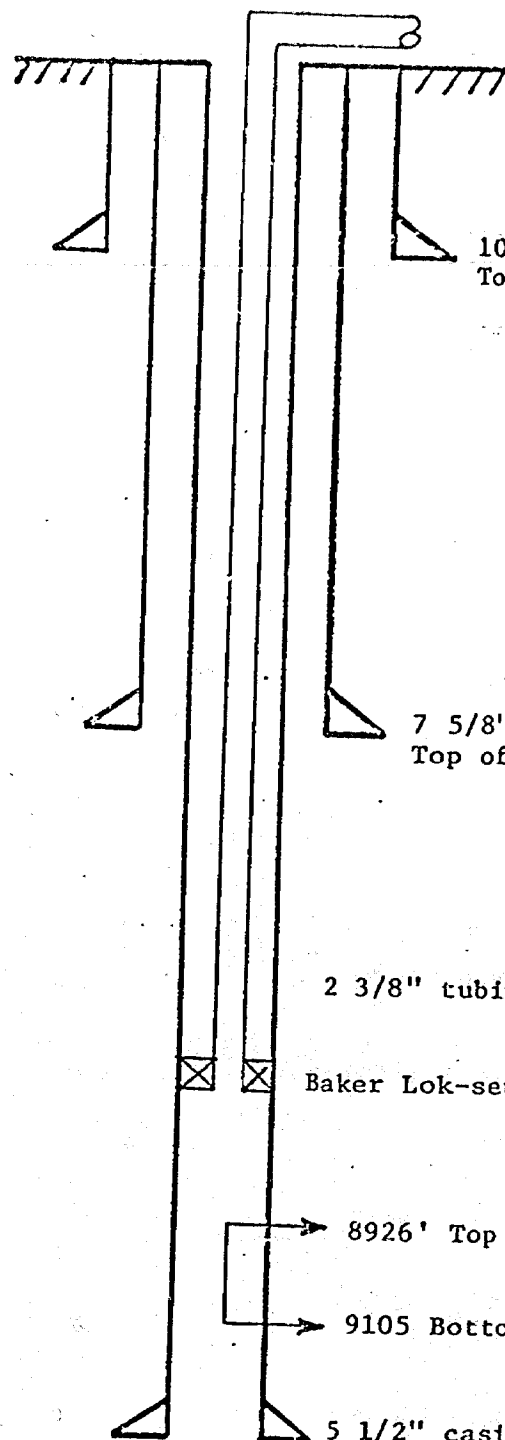
CASE NO. 6131-6132

Submitted by Conoco

Hearing Date 18 Jan 78

SENU McKee No. 57
Warren McKee Simpson Pool
Unit I, Sec. 19, T20S, R38E
Elev: 3540 O/W 9140
10-3-77 MSR

EXHIBIT 12B



10 3/4" casing set at 255' w/250 sx cement.
Top of cement is at surface.

7 5/8" casing set at 4004' w/1800 sx cement.
Top of cement is at 1700'.

2 3/8" tubing set at 8820'

Baker Lok-set Packer set at 8820'

8926' Top of perfs

9105 Bottom of perfs

5 1/2" casing set at 9119' w/525 sacks of cement.
Top of cement 4650'. Total depth 9120'.

Perfs
8926'-31', 8947'-54', 8958'-65',
8970'-80', 8990'-98', 9005'-09',
9019'-33', 9055'-62', 9072'-79',
9099'-9105' w/4 SPF

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12C

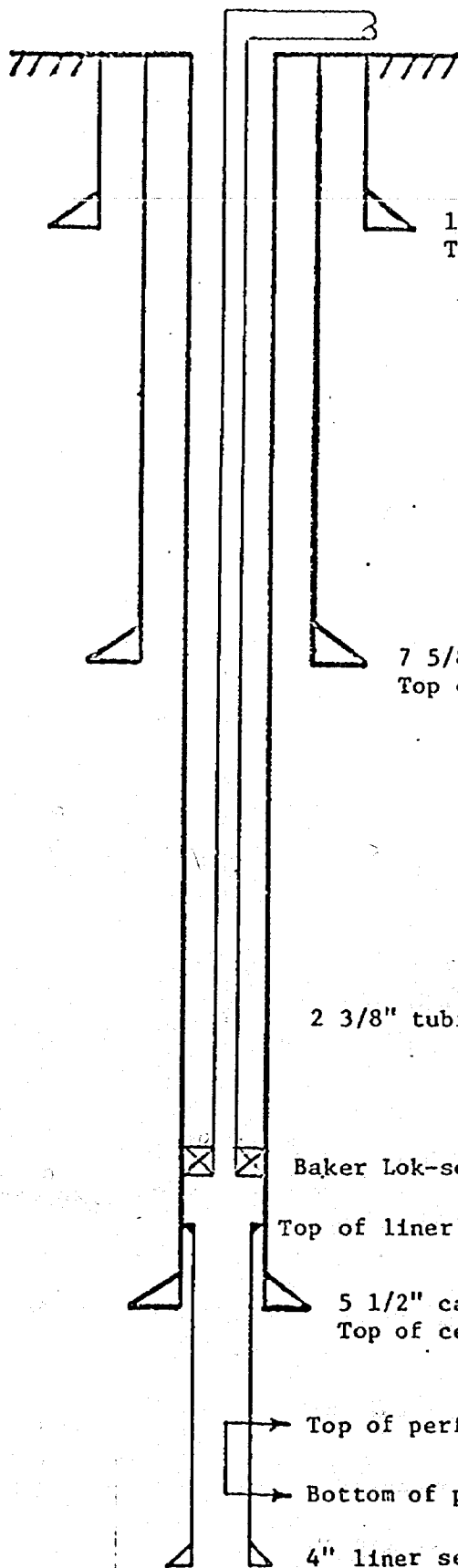
CASE NO. 6131 - 6132

Submitted by Conoco

Hearing Date 16 Jan 78

SEMU McKee No. 58
Warren McKee Simpson Pool
Unit C, Sec. 29, T20S, R38E
Elev: 3537 O/W 9137
10-3-77 MSR

EXHIBIT 12C



10 3/4" casing set at 229' w/250 sx of common cement.
Top of cement is at the surface.

7 5/8" casing set at 3998' w/2000 sx of mixed cement.
Top of cement is at 1400'.

2 3/8" tubing set at 8900'

Baker Lok-set Packer set at 8900'

Top of liner 8960'

5 1/2" casing set at 9022' w/500 sacks of mixed cement.
Top of cement 5950'. Total depth 9210'.

Top of perfs 9060'

Bottom of perfs 9174'

4" liner set at 9210' w/15 sx

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12D

CASE NO. 6131-6132

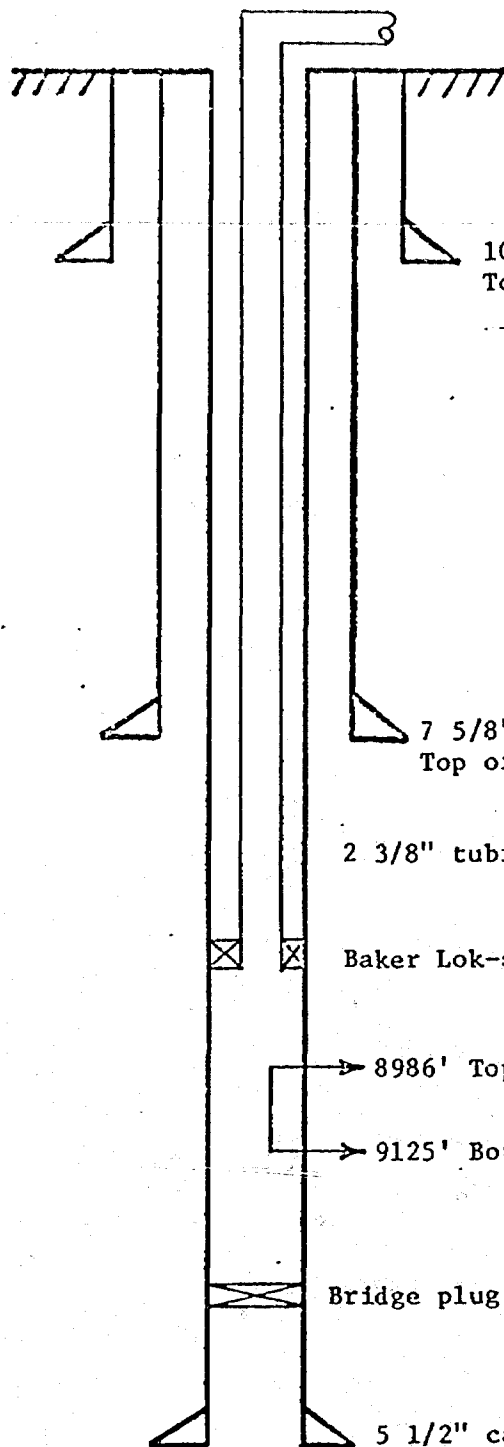
Submitted by Conoco

Hearing Date 18 Jan 76

Perfs
9060'-87', 9106'-26',
9132'-39' & 9150'-74' w/4 SPF

SEMU McKee No. 59
Warren McKee Simpson Pool
Unit M, Sec. 20, T20S, R38E
Elev: 3539 O/W 9139
10-3-77 MSR

EXHIBIT 12D



10 3/4" casing set at 263' w/250 sx of common cement.
Top of cement at surface.

7 5/8" casing set at 3999' w/2150 sx of mix cement.
Top of cement 800'.

2 3/8" tubing set at 8880'

Baker Lok-set Packer at 8880'

8986' Top of perfs

9125' Bottom of perfs

Bridge plug at 9151'

5 1/2" casing set at 9398' w/250 sx of mix cement.
Top of cement at 6300'. Total depth 9400'.

SEMU McKee No. 60
Warren McKee Simpson Pool
Unit E, Sec. 29, T20S, R38E
Elev: 3528 O/W 9128
10-3-77 MSR

BEFORE EXAMINER STAMPS
OIL CONSERVATION COMMISSION

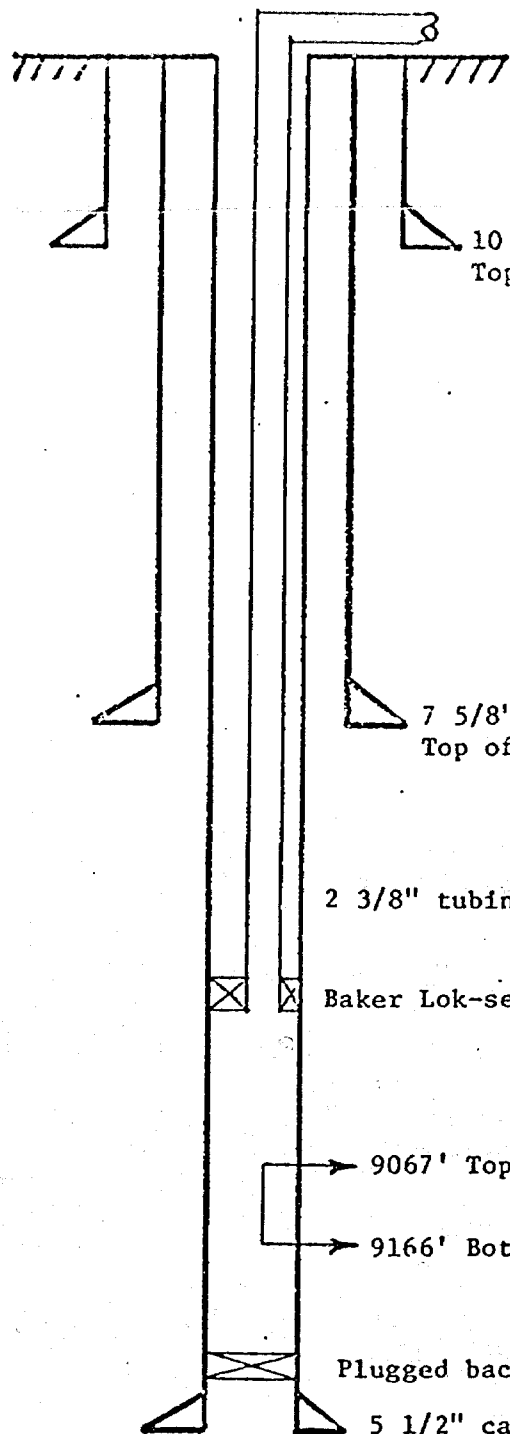
EXHIBIT NO. 12E

CASE NO. 6131-6132

Submitted by CONOCO

Hearing Date 16 Jan 78

EXHIBIT 12E



10 3/4" casing set at 255' w/250 sx of common cement.
Top of cement is at the surface.

7 5/8" casing set at 3999' w/1000 sx of Diacel "D" Cement.
Top of cement at 1500'.

2 3/8" tubing set at 8960'

Baker Lok-set Packer set at 8960'

9067' Top of perfs

9166' Bottom of perfs

Plugged back depth 9186'

5 1/2" casing set at 9236' w/310 sx of Diacel "D" Cement.
Top of cement at 6160'. Total depth 9250'.

Perfs
9067'-70', 9076'-80', 9085'-91',
9103'-12, 9122'-23', 9132'-42',
9148'-56', & 9165'-66' w/4 SPF

BEFORE EXAMINER STAMPS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12F

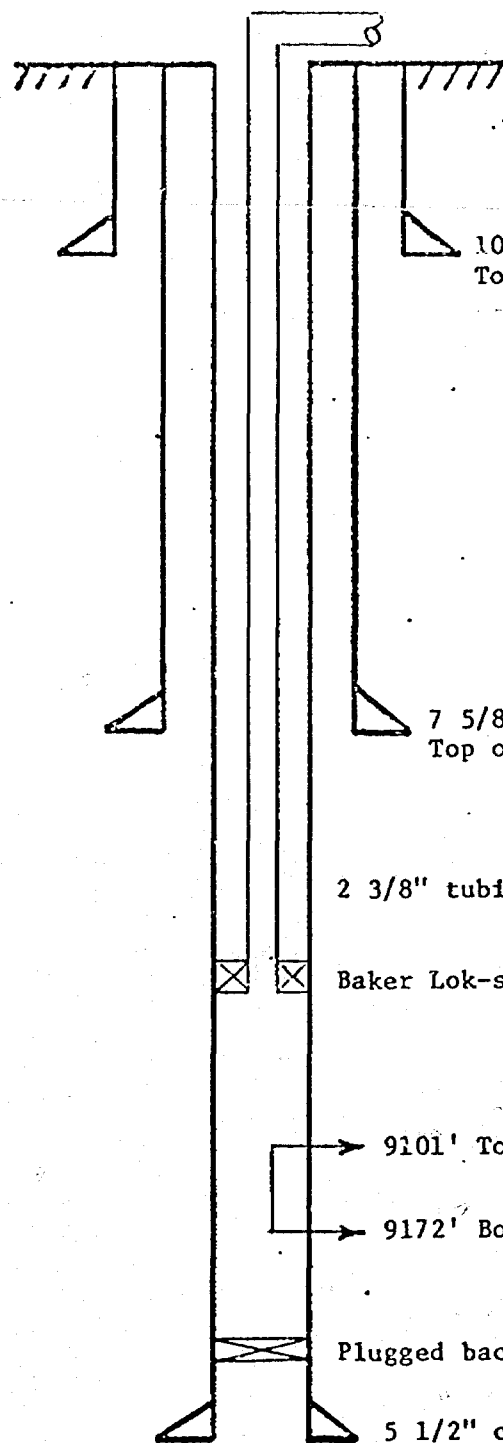
CASE NO. 6131-6132

Submitted by CONOCO

Hearing Date 18 Jan 78

SEMU McKee No. 62
Warren McKee Simpson Pool
Unit K, Sec. 20, T20S, R38E
Elev: 3552 O/W 9152
10-3-77 MSR

EXHIBIT 12F



10 3/4" casing set at 259 w/285 sx common cement.
Top of cement at surface.

7 5/8" casing set at 3995' w/3200 sx of Pozmix Cement.
Top of cement at 1300'.

2 3/8" tubing set at 9000'

Baker Lok-set Packer set at 9000'

9101' Top of perfs

Perfs
9106', 9130', 9153', 9172' w/6 SPF

9172' Bottom of perfs

Plugged back total depth 9211'

5 1/2" casing set at 9250' w/600 sx Pozmix Cement.
Top of cement is at 5100'. Total depth is 9250'

SEMU McKee No. 63
Warren McKee Simpson Pool
Unit G, Sec. 19, T20S, R38E
Elev: 3546 O/W 9146
10-3-77 MSR

BEFORE EXAMINER STAMLEY
OIL CONSERVATION COMMISSION

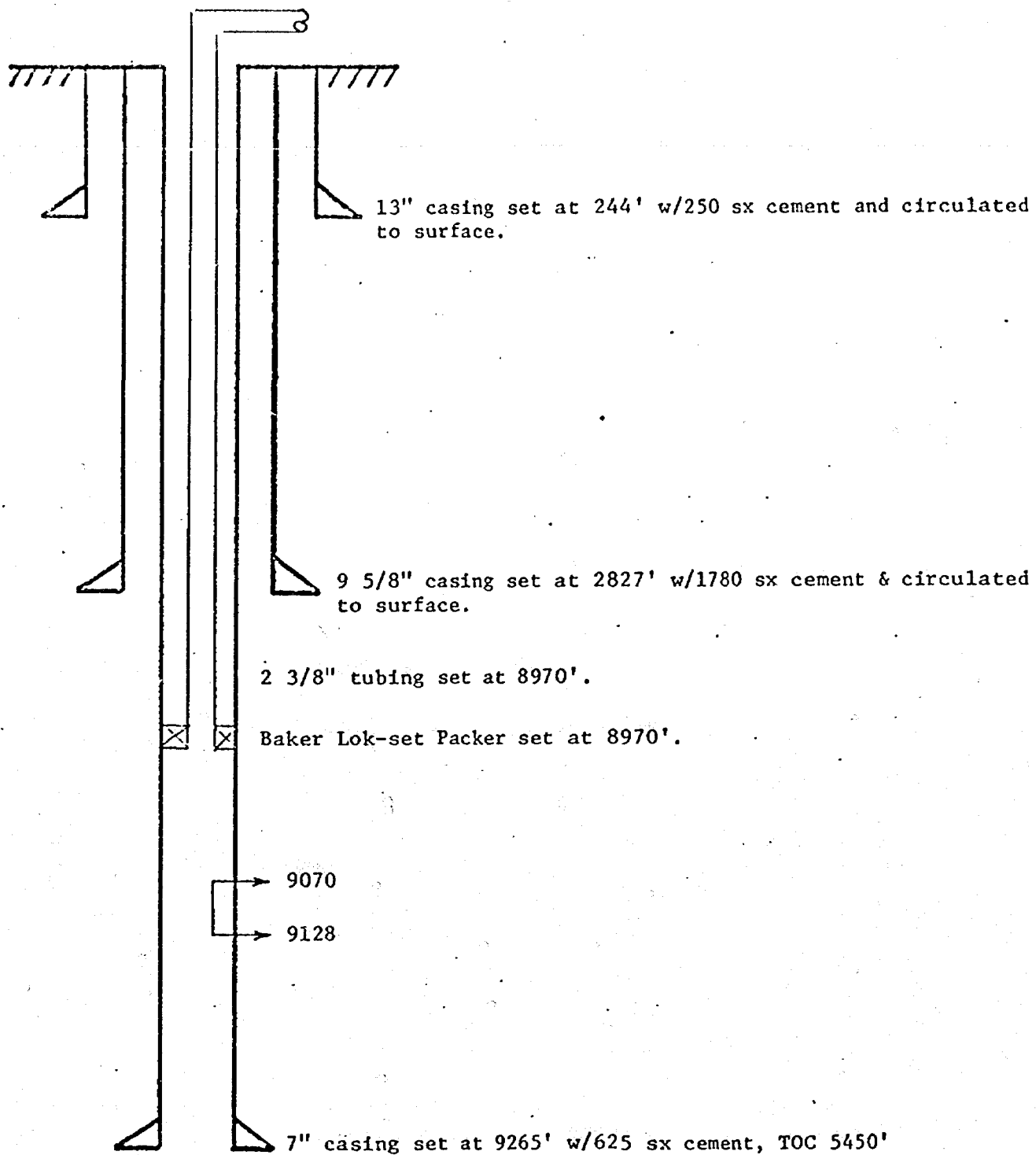
EXHIBIT NO. 12 G

CASE NO. 6131-6132

Submitted by Conoco

Hearing Date 18 Jan 78

EXHIBIT 12G



SEMU McKee No. 71
 Warren McKee Simpson Pool
 Unit 0, Sec. 18, T20S, R38E
 Elev: 3552 O/W 9152
 10-3-77 MSR

BEFORE EXAMINER STAMPS
 OIL CONSERVATION COMMISSION

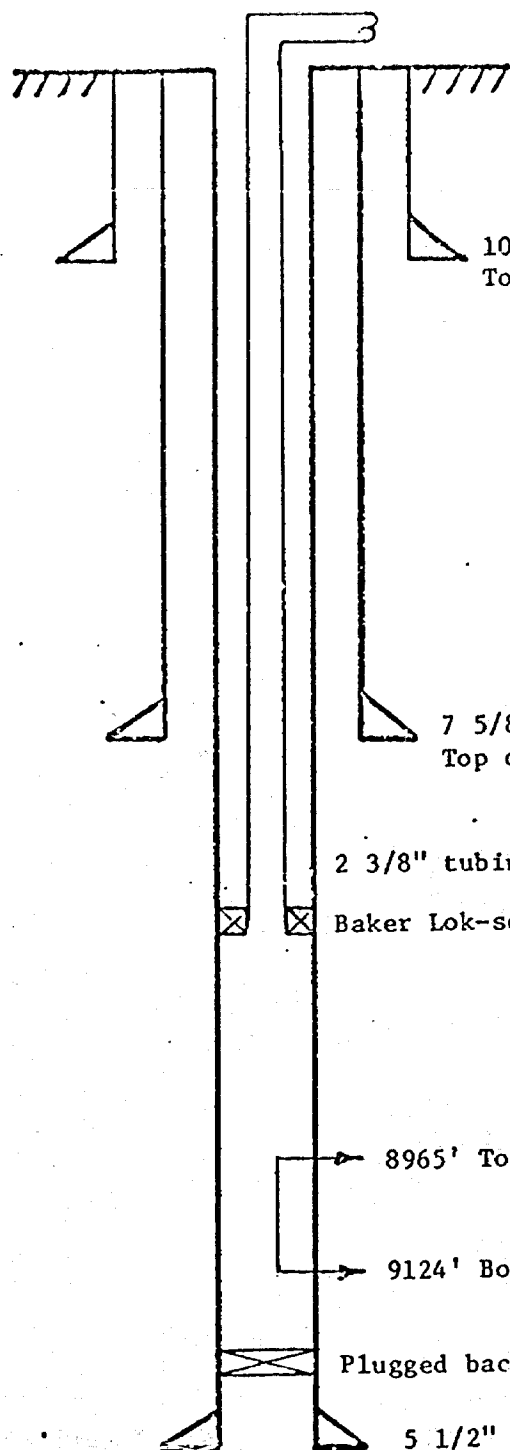
EXHIBIT NO. 124

CASE NO. 6131-6132

Submitted by CONOCO

Hearing Date 18 Jan 78

EXHIBIT 12H



10 3/4" casing set at 256' w/250 sx of common cement.
Top of cement at surface.

7 5/8" casing set 3998' w/700 sacks of Diacel "D" cement.
Top of cement 1375'.

2 3/8" tubing set at 8860'

⊗ ⊗ Baker Lok-set Packer set at 8860'

→ 8965' Top of perfs

→ 9124' Bottom of perfs

⊗ ⊗ Plugged back total depth 9161'

5 1/2" casing set at 9195' w/230 sx Diacel "D" cement.
Top of cement 5450'. Total depth 9200'.

Original Perforations

8965', 8978', 8998', 9025', 9035',
9049', 9071', 9108' & 9123'
6-59 Sand fraced w/47,300 gals.
& 3700 lbs.
4-62 Cleaned out to 9161'.

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12 I

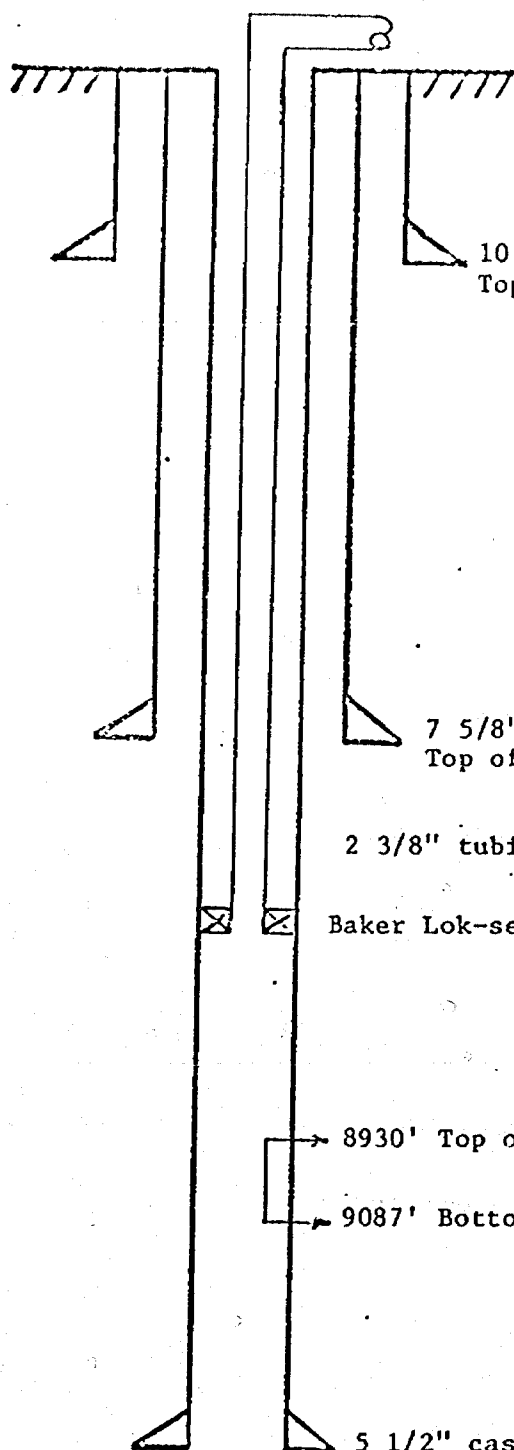
CASE NO. 6131 - 6132

Submitted by Conoco

Hearing Date 16 Jan 78

WARREN UNIT No. 22
WARREN McKEE SIMPSON POOL
Unit K, Sec. 29 T20S R38E
Elev. 3532' O/W 9132'
10-3-77 MSR

EXHIBIT 12I



10 3/4" casing set at 279' w/250 sx common cement.
Top of cement is at surface.

7 5/8" casing set at 3999' w/2660 sx Diamix Cement.
Top of cement is at 1540'.

2 3/8" tubing set at 8830'

⊗ ⊗ Baker Lok-set Packer set at 8830'

→ 8930' Top of perfs

→ 9087' Bottom of perfs

Original Perfs
8930', 8955', 8978', 8994', 9027',
9065', 9087', w/8 shots

5 1/2" casing set at 9198' w/260 sx Diacel "D" Cement.
Top of cement is at 4675'.

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12 J

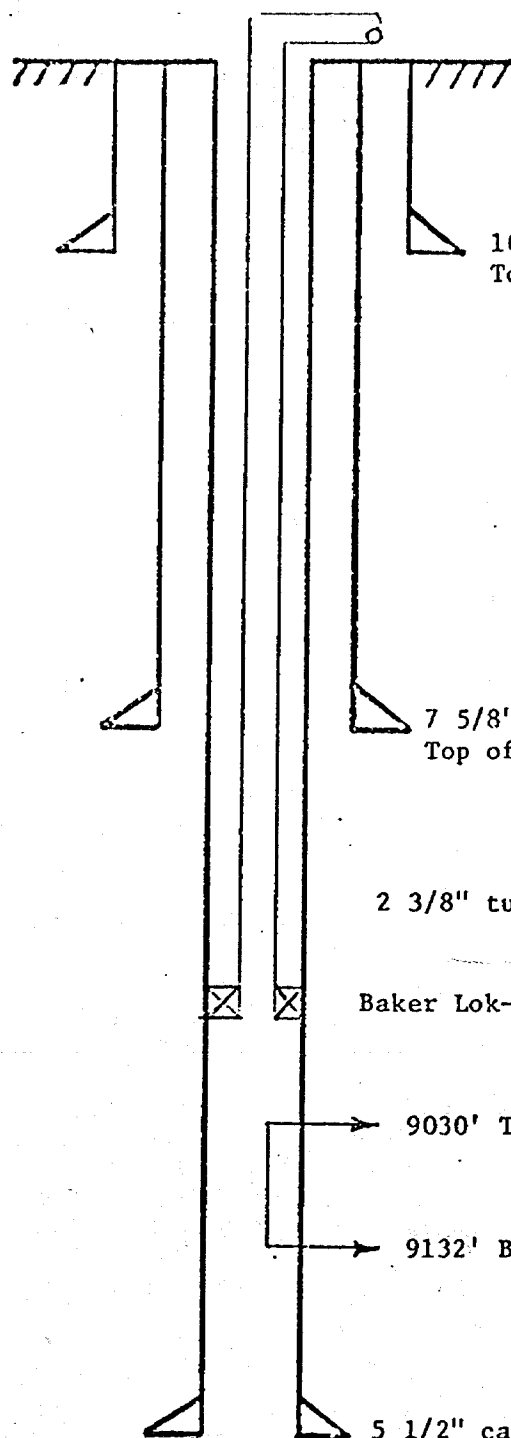
CASE NO. 6131 - 6132

Submitted by CONOCO

Hearing Date 18 Jan 78

Warren Unit No. 23
Warren McKee Simpson Pool
Unit G, Sec. 29, T20S, R38E
Elev 3535' O/W 9135'
10-3-77 MSR

EXHIBIT 12J



10 3/4" casing set at 263' w/250 sx of common cement.
Top of cement is at surface.

7 5/8" casing set at 4000' w/3350 sx of cement.
Top of cement is at 1575'

2 3/8" tubing set at 8930'

Baker Lok-set Packer set at 8930'

9030' Top of perfs

9132' Bottom of perfs

Original Perfs
9030'-32', 9053'-55', 9070'-72',
9092'-94', 9104'-06', 9188'-20',
9130'-32'

5 1/2" casing set at 9215' w/675 sx pozmix cement.
Top of cement at 5700'. Total depth 9218'.

BEFORE EXAMINER STAFF
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12K

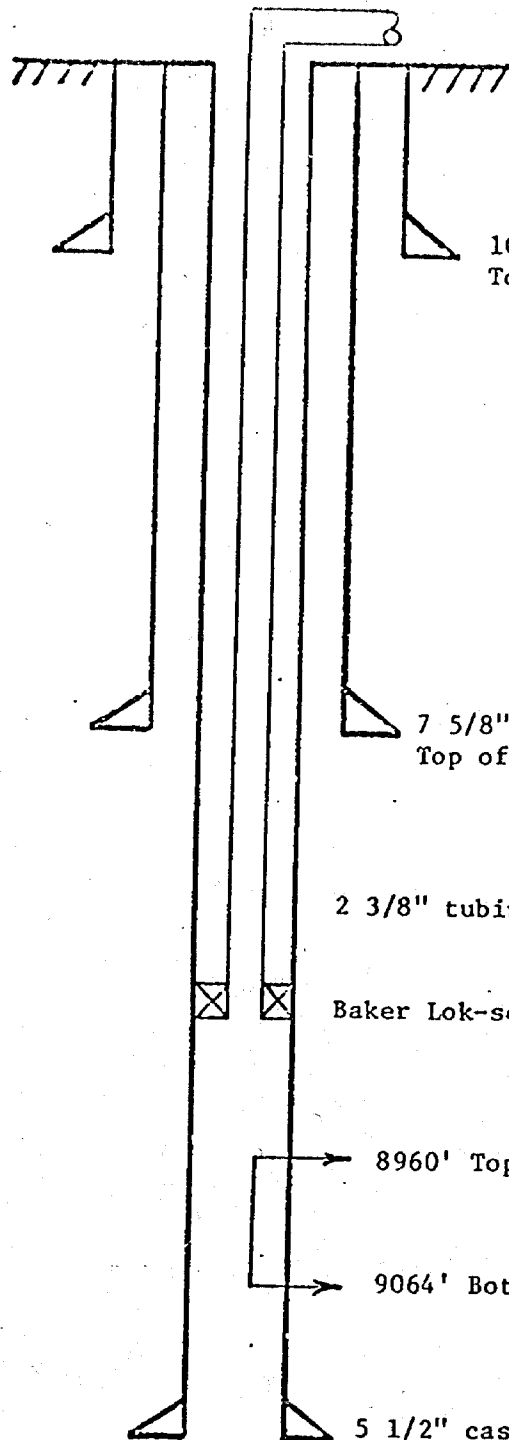
CASE NO. 6131-6132

Submitted by CONOCO

Hearing Date 16 Jan 74

Warren Unit No. 25
Warren McKee Simpson Pool
Unit 0, Sec. 29, T20S, R38E
Elev 3515' O/W 9115
10-3-77 MSR

EXHIBIT 12K



10 3/4" casing set at 260 w/300 sx common cement.
Top of cement is at surface.

7 5/8" casing set at 3999' w/1550 sx pozmix cement.
Top of cement is at 1010'

2 3/8" tubing set at 8860'

Baker Lok-set Packer set at 8860'

8960' Top of perfs

9064' Bottom of perfs

Perfs
8960'-66', 8982'-90', 8998'-9002',
9012'-22', 9034'-48', 9058'-64'

5 1/2" casing set at 9108' w/475 sx mixed cement.
Top of cement is at 3885'. Total depth is 9133'.

BEFORE EXAMINER STAFF
OIL CONSERVATION COMMISSION

EXHIBIT NO. 12L

CASE NO. 6131-6132

Submitted by Conoco

Hearing Date 19 Jan 78

Warren Unit No. 27
Warren McKee Simpson Pool
Unit 0, Sec. 20, T20S, R38E
Elev: 3545' O/W 9145
10-3-77 MSR

EXHIBIT 12L

Operator	Well (McKee Production Interval)	Location	T.D.	Casing		Cement	
				Size	Depth	Sacks	Top
Conoco	Warren Unit No. 3 (open hole)	1980' FSL & 1980' FEL Sec. 29, T-20S, R-38E	9070'	13 3/8" 9 5/8" 7"	262' 2989' 8947'	250 625 900	Surface 1600' 4330'
	Warren Unit No. 6 (9016'-9093')	660' FSL & 1980' FWL Sec. 29, T-20S, R-38E	9160'	10 3/4" 7 5/8" 5 1/2"	243' 2893' 9159'	200 1145 220	Surface 800' 4650'
	Warren Unit No. 7 (8926'-9094')	660' FNL & 1980' FEL Sec. 29, T-20S, R-38E	9145'	10 3/4" 7 5/8" 5 1/2"	286' 2859' 9144'	225 940 207	270' 850' 5975'
	Warren Unit No. 22 Injector for Warren McKee Waterflood	2090' FSL & 2090' FWL Sec. 29, T-20S, R-38E	9200'	10 3/4" 7 5/8" 5 1/2"	256' 3998' 9195'	250 700 230	Surface 1375' 5450'
	Warren Unit No. 24 (McKee plugged & not perfo- rated)	24' FSL & 2145' FEL Sec. 29, T-20S, R-38E SWD	9240' PB-5350'	10 3/4" 7 5/8" 5 1/2"	242' 3999' 4500'	250 2300 70	Surface 1650' 1650'
	Warren Unit No. 28 (9020'-9138')	1980' FSL & 2310' FEL Sec. 20, T-20S, R-38E	9218' PB-9110'	13 3/8" 9 5/8" 7"	250' 3000' 9217'	300 1550 550	Surface 1100' 5950'
	SEMU Burger No. 21 (McKee plugged & not perfo- rated)	660' FSL & 1980' FEL Sec. 19, T-20S, R-38E	9731' PB-7250'	13 3/8" 9 5/8" 7"	250' 3697' 8000'	250 340 730	Surface 1125' 3728'
	SEMU Warren No. 10 (8979'-9150')	1980' FNL & 1980' FWL Sec. 29, T-20S, R-38E	9391' PB-9150'	13 3/8" 9 5/8" 7"	226' 2906' 9145'	250 500 900	Surface 1989' 4665'
	Warren Unit No. 4 (9046'-9144')	1980' FSL & 660' FWL Sec. 29, T-20S, R-38E	9230' PB-9220'	13 3/8" 9 5/8" 7"	254' 2024' 286'	250 1915 286	Surface 400' 7300'

BEFORE EXAMINER STANDS
OIL CONSERVATION COMMISSION

EXHIBIT NO. 13

CASE NO. 6131-6132

Submitted by Conoco

Hearing Date 14 Jan 78

EXHIBIT 13

Operator	Well (McKee Production Interval)	Location	T.D.	Casing		Cement	
				Size	Depth	Sacks	Top
Amerada	Warren McKee Unit No. 110 (9054'-9160')	1980' FNL & 1880' FEL Sec. 18, T-20S, R-38E	9230'	13 3/8" 8 5/8" 5 1/2"	295' 3708' 9230'	200 1500 600	Surface 1164' 6270'
	Warren McKee Unit No. 111 (9040'-9130')	1980' FSL & 660' FEL Sec. 18, T-20S, R-38E	9228' PB-9215	13 3/8" 8 5/8" 5 1/2"	297' 3702' 9228'	150 1500 600	Surface 1180' 5893'
	Warren McKee Unit No. 112 (9095'-9165' & 9236'-9256' squeezed)	1980' FNL & 2317' FWL Sec. 18, T-20S, R-38E	9300' PB-9220	13 3/8" 8 5/8" 5 1/2"	296' 3705' 9300'	300 1500 600	Surface 840' 5575'
	Warren McKee Unit No. 113 (9045'-9135')	660' FSL & 660' FEL Sec. 18, T-20S, R-38E	9200' DOD-9196	13 3/8" 8 5/8" 5 1/2"	299' 3703' 9198'	225 1500 600	Surface 1224' 6295'
	Warren McKee Unit No. 114 (9040'-9135')	660' FNL & 660' FEL Sec. 19, T-20S, R-38E	9325'	13 3/8" 8 5/8" 5 1/2"	256' 3702' 9323'	250 1500 600	Surface 1980' 6450'
	Warren McKee Unit No. 117 (9068'-9158')	1980' FNL & 660' FEL Sec. 18, T-20S, R-38E	9475' DOD-9312	13 3/8" 8 5/8" 5 1/2"	258' 3703' 9368'	200 1700 600	Surface 1192' 4422'
	Warren McKee Unit No. 119 (9080'-9160')	1980' FSL & 1880' FEL Sec. 18, T-20S, R-38E	9240' DOD-9235 PB-9143	13 3/8" 8 5/8" 5 1/2"	285' 3702' 9240'	200 1700 600	Surface 1285' 5826'
	Warren McKee Unit No. 132 (9040'-9131')	560' FNL & 560' FWL Sec. 20, T-20S, R-38E	9206'	13 3/8" 8 5/8" 5 1/2"	258' 3703' 9204'	275 1500 600	Surface 2026' 4725'
	Warren McKee Unit No. 141 (9012'-9048')	660' FSL & 660' FWL Sec. 17, T-20S, R-38E	9429'	13 3/8" 8 5/8" 5 1/2"	258' 3830' 9300'	275 1500 500	Surface 1200' 5081'

BEFORE EXAMINER STAMPS
OIL CONSERVATION COMMISSION

EXHIBIT NO. _____

CASE NO. _____

Submitted by _____

Hearing Date _____

EXHIBIT 13 Contd.

Operator	Well (McKee Production Interval)	Location	T.D.	Casing		Cement	
				Size	Depth	Sacks	Top
Conoco	SEMU McKee No. 12* (9160' - 9228')	1980' FNL & 660' FEL Sec 30, T-20S, R-38E	9752'	13 3/8"	252'	250	Surface
				7 5/8"	2824'	1044	600'
				5 1/2" Liner	3724'	250	

*Plugged and Abandoned

BEFORE EXAMINER SIGNATURE
OIL CONSERVATION COMMISSION

EXHIBIT NO. 1

CASE NO.

Submitted by

Hearing Date

Operator	Well (McKee Production Interval)	Location	T.D.	Casing		Cement	
				Size	Depth	Sacks	Top
Amerada	Warren McKee Unit No. 142 (8996'-9085')	1980' FSL & 660' FWL Sec. 17, T-20S, R-38E	9270'	13 3/8"	296'	250	Surface
				8 5/8"	3710'	1500	1050'
				5 1/2"	9270'	1000	3727'
Elk Oil	Lea B. U. State No. 1* (Shown on Schematic)	330' FNL & 2307' FWL Sec. 32, T-20S, R-38E	9170'	13 3/8"	307'	400	Surface
				8 5/8"	2991'	1800	Surface
				5 1/2"	9159'	850	2669'
	State "A" No. 1* (Shown on Schematic)	330' FNL & 660' FWL Sec. 32, T-20S, R-38E	9230'	13 3/8"	227'	250	Surface
				8 5/8"	2925'	2000	Surface
				5 1/2"	7110'	500	3302'
Exxon	State No. 1* (Shown on Schematic)	660' FNL & 660' FEL Sec. 32, T-20S, R-38E	9355'	13 3/4"	262'	200	Surface
				8 5/8"	2931'	100	400'
Conoco	Warren McKee Unit No. 5* (Shown on Schematic)	1980' FNL & 660' FEL Sec. 29, T-20S, R-38E	9852'	13 3/8"	250'	250	Surface
				9 5/8"	2883'	500	776'
BEFORE EXAMINER STAMPS OIL CONSERVATION COMMISSION EXHIBIT NO. _____	SEMU McKee No. 11 (9110'-9148')	660' FNL & 660' FWL Sec. 29, T-20S, R-38E	9235' PB-9150'	13 3/8"	252'	250	Surface
	SEMU Burger No. 13 (8992'-9142') Bridge plug at 7000'	660' FSL & 1980' FWL Sec. 20, T-20S, R-38E	9197' PB-9042'	10 3/4"	264'	250	Surface
	SEMU McKee No. 50 (9072'-9179')	1980' FSL & 660' FWL Sec. 20, T-20S, R-38E	9232'	7 5/8"	2849'	1420	635'
	SEMU McKee No. 51 (9022'-9110')	1650' FNL & 330' FEL Sec. 19, T-20S, R-38E	9220' PB-9218'	5 1/2"	9197'	260	5100'
	SEMU McKee No. 50 (9072'-9179')	1980' FSL & 660' FWL Sec. 20, T-20S, R-38E	9232'	10 3/4"	272'	250	Surface
	SEMU McKee No. 51 (9022'-9110')	1650' FNL & 330' FEL Sec. 19, T-20S, R-38E	9220' PB-9218'	7 5/8"	4039'	2100	1567'
CASE NO. _____ Submitted by _____ Hearing Date _____ EXHIBIT 13 cont.	SEMU McKee No. 50 (9072'-9179')	1980' FSL & 660' FWL Sec. 20, T-20S, R-38E	9232'	5 1/2"	9232'	770	5150'
	SEMU McKee No. 51 (9022'-9110')	1650' FNL & 330' FEL Sec. 19, T-20S, R-38E	9220' PB-9218'	10 3/4"	258'	250	Surface
	SEMU McKee No. 51 (9022'-9110')	1650' FNL & 330' FEL Sec. 19, T-20S, R-38E	9220' PB-9218'	7 5/8"	3998'	2500	1555'
	SEMU McKee No. 72 (9093'-9144')	330' FNL & 1650' FEL Sec. 19, T-20S, R-38E	9250' PB-9155'	5 1/2"	9218'	440	5600'
				10 3/4"	250'	250	Surface
				7 5/8"	3009'	887	1525'
				5 1/2"	9249'	370	5185'

*Plugged and abandoned, see attached wellbore schematics

CONOCO

HOBBS PRODUCTION DIVISION
WATER ANALYSIS REPORT FORM

LABORATORY United Chemical Corporation
 FIELD Warren McKee LEASE Prod. Treater Water Dump WELL NO. _____
 DATE SAMPLED 9-16-76 DATE ANALYZED 9-22-76

CATIONS

CALCIUM (Ca++)
 MAGNESIUM (Mg++)
 SODIUM (Na+)

R⁺ - 0.06 @ 76°F

meq/L	mg/L
770.00	15,400
342.00	4,104
1,856.51	42,681
Fe -	63
.70	43
6.81	327
2,961.00	105,000
	167,555

ANIONS

BICARBONATE (HCO₃⁻)
 SULFATE (SO₄⁼)
 CHLORIDE (Cl⁻)

TOTAL DISSOLVED SOLIDS

OTHERS

pH 5.6
 TEMP 30 °C

SP GR 1.115

SUSP SOLIDS _____

SCALING INDEX

CALCIUM CARBONATE
 cc: CALCIUM SULFATE
 Paul Adams ✓
 Dave Edmonds
 Jim Sealy
 Pacho Jara
 Cy Foster

U-143-12

(CIRCLE ONE)

POSITIVE

~~NEGATIVE~~ (-1.02)

POSITIVE

~~NEGATIVE~~ (-1.95)

Elizabeth Wesley
 SIGNATURE ANALYST

EXHIBIT 14

BEFORE EXAMINER STAMETS
 OIL CONSERVATION COMMISSION

EXHIBIT NO. 14CASE NO. 6131-6132Submitted by ConocoHearing Date 18 Jan 78

CONOCO

HOBBS PRODUCTION DIVISION
WATER ANALYSIS REPORT FORMLABORATORY United Chemical Corporation

FIELD

LEASE City of Hobbs water WELL NO. _____Taken from filtersDATE SAMPLED 12-2-76DATE ANALYZED 12-3-76

CATIONS

CALCIUM (Ca++)

MAGNESIUM (Mg++)

SODIUM (Na+)

Iron

meq/L	mg/L
3.40	68
3.00	36
7.05	162
	0.38
6.60	403
3.41	164
3.44	122
	955

ANIONS

BICARBONATE (HCO₃⁻)SULFATE (SO₄⁼)CHLORIDE (Cl⁻)

TOTAL DISSOLVED SOLIDS

OTHERS

pH 7.7TEMP 30 °CSP GR 1.000

SUSP SOLIDS _____

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSIONEXHIBIT NO. 15CASE NO. 6131-6132Submitted by ConocoHearing Date 18 Jan 76

SCALING INDEX

CALCIUM CARBONATE

CALCIUM SULFATE

cc

B. Branch

Paul Adams

Dave Edmonds

Pacho Jara

(CIRCLE ONE)

POSITIVE 0.80

POSITIVE

NEGATIVE

NEGATIVELuella Little

SIGNATURE ANALYST

EXHIBIT 15

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF
CONTINENTAL OIL COMPANY FOR AUTHORITY
TO INSTALL A WATERFLOOD PROJECT IN THE
WARREN MC KEE POOL IN SECTIONS 20 AND
29, TOWNSHIP 20 SOUTH, RANGE 38 EAST,
LEA COUNTY, NEW MEXICO, BY CONVERTING
TO INJECTION FOUR (4) WELLS IN THE
WARREN UNIT, AND FOR ESTABLISHMENT OF
ADMINISTRATIVE PROCEDURES FOR ADDING
OR SUBSTITUTING INJECTION WELLS.

APPLICATION

Applicant, CONTINENTAL OIL COMPANY, hereby requests approval to install a waterflood project in the Warren McKee Pool in Sections 20 and 29 of T-20-S, R-38-E, Lea County, New Mexico, by converting to water injection four (4) wells in the Warren Unit, and for establishment of administrative procedures for adding or substituting wells in said project, and in support thereof would show:

1. Applicant is operator and co-owner of the Warren Unit which includes lands in Sections 20 and 29, as well as other lands in T-20-S, R-38-E, Lea County, New Mexico.

2. Applicant has heretofore drilled and completed in the Warren McKee Pool nine (9) wells on the Warren Unit.

3. Said wells have reached an advanced stage of depletion and operator now desires to institute a waterflood project by converting the following wells to injection:

Warren Unit Well No. 22, Unit K, Section 29

Warren Unit Well No. 23, Unit G, Section 29

Warren Unit Well No. 25, Unit O, Section 29

Warren Unit Well No. 27, Unit O, Section 20

4. The attached plat shows the location and ownership of the properties and wells in the waterflood project and in an area within a radius of two miles from said wells.

5. The waterflood project is anticipated to result in the recovery of oil which otherwise would not be recovered and, therefore, is in the interest of the prevention of waste and the protection of correlative rights.

6. Unforeseen conditions requiring changes in injection wells may arise; and therefore, to avoid the necessity of further hearings, administrative procedures should be established to permit such changes.

-2-

WHEREFORE, applicant respectfully requests that this matter be set for hearing before the Commission's duly appointed examiner and upon hearing an order be entered authorizing the waterflood project described above.

Respectfully submitted.

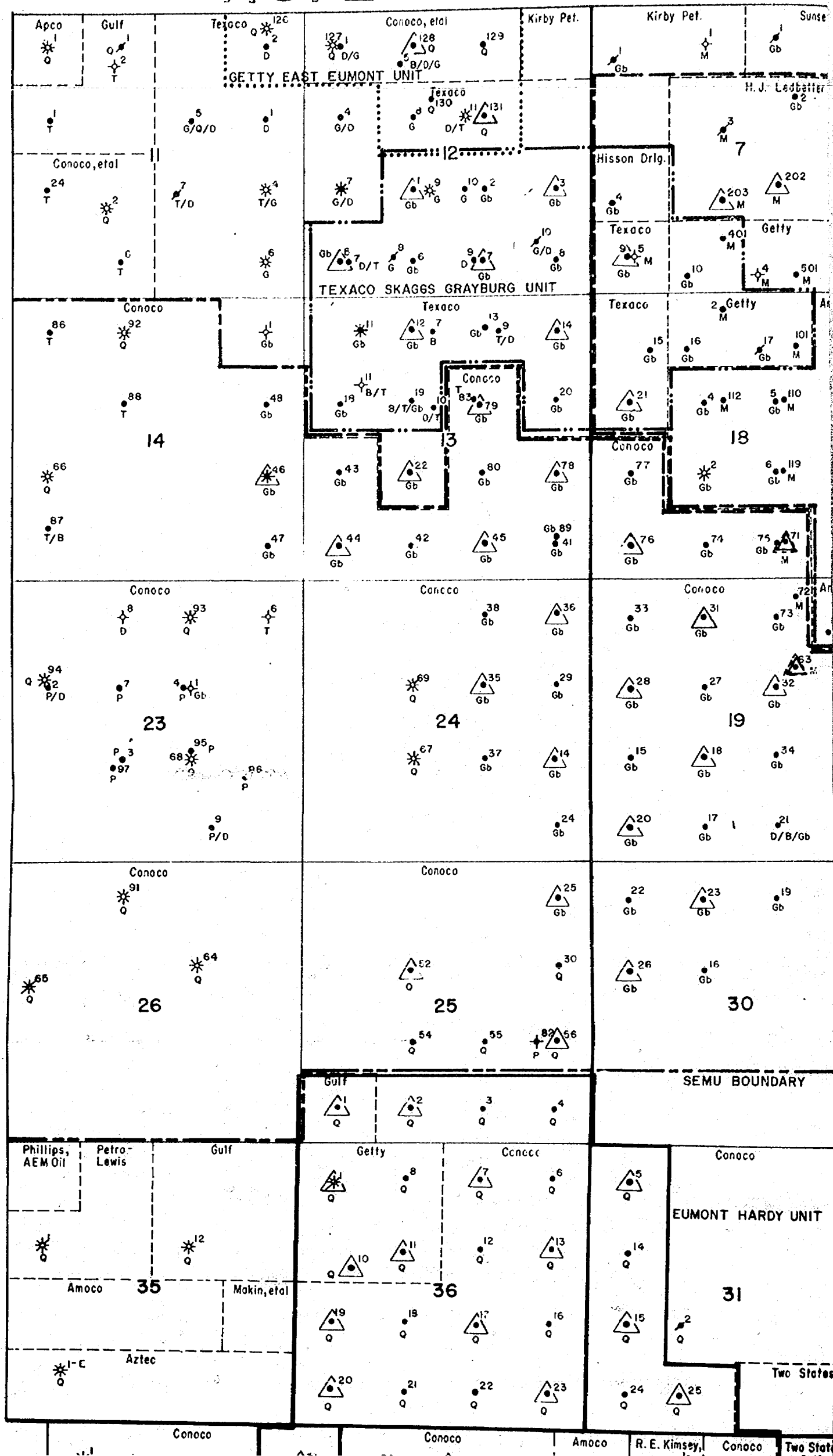
CONTINENTAL OIL COMPANY

BY E. L. Oshlo
E. L. OSHLO, Assistant Division Manager
of Production

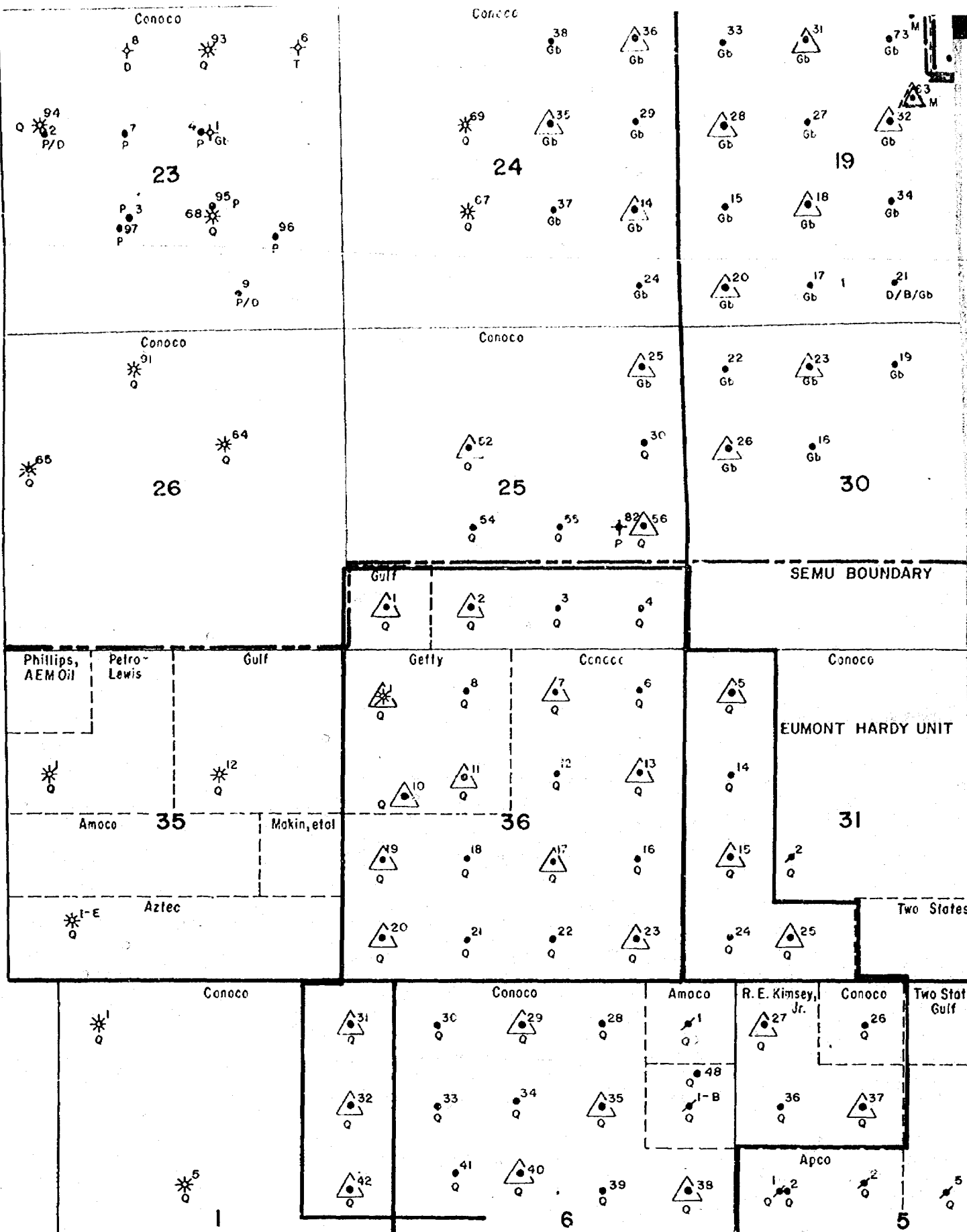
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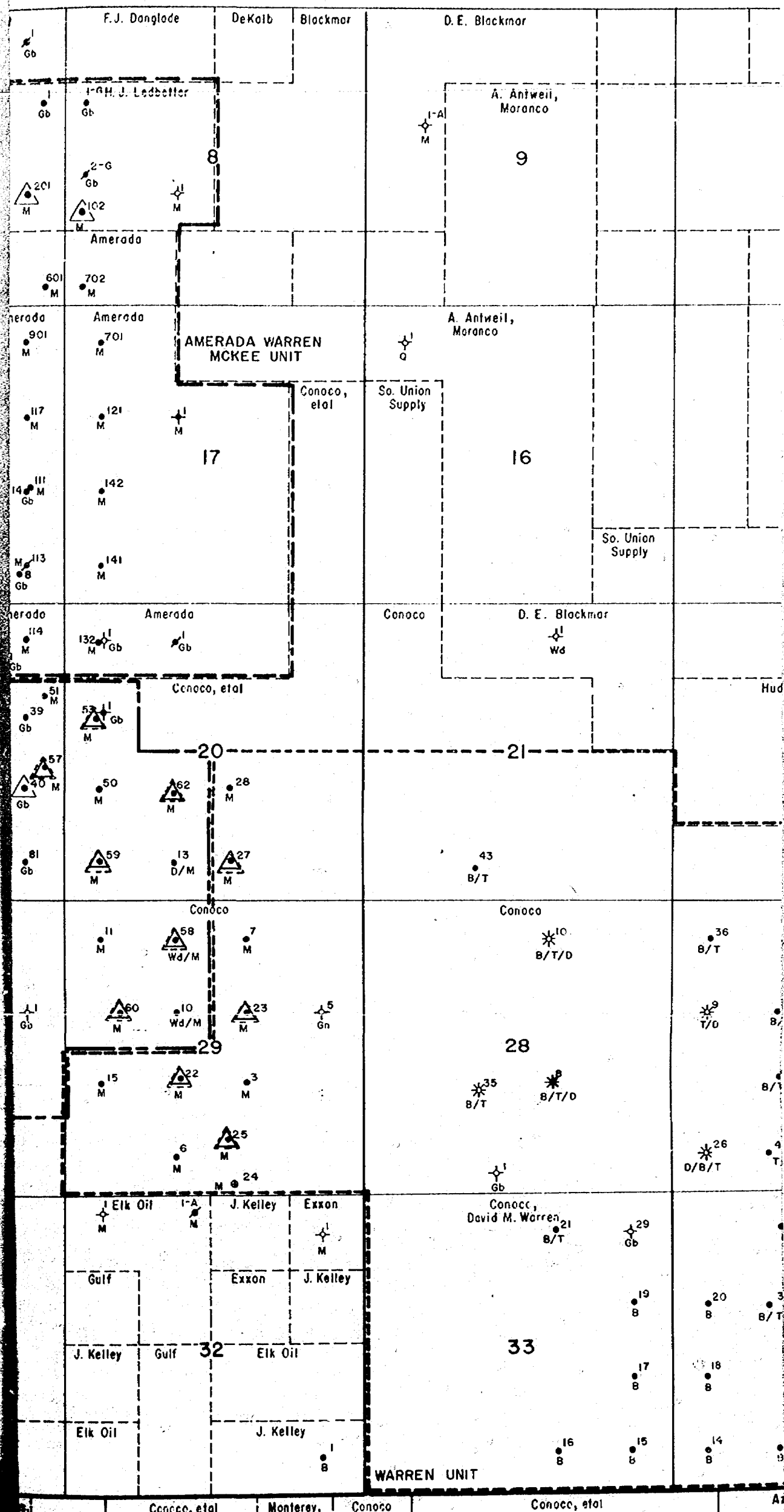


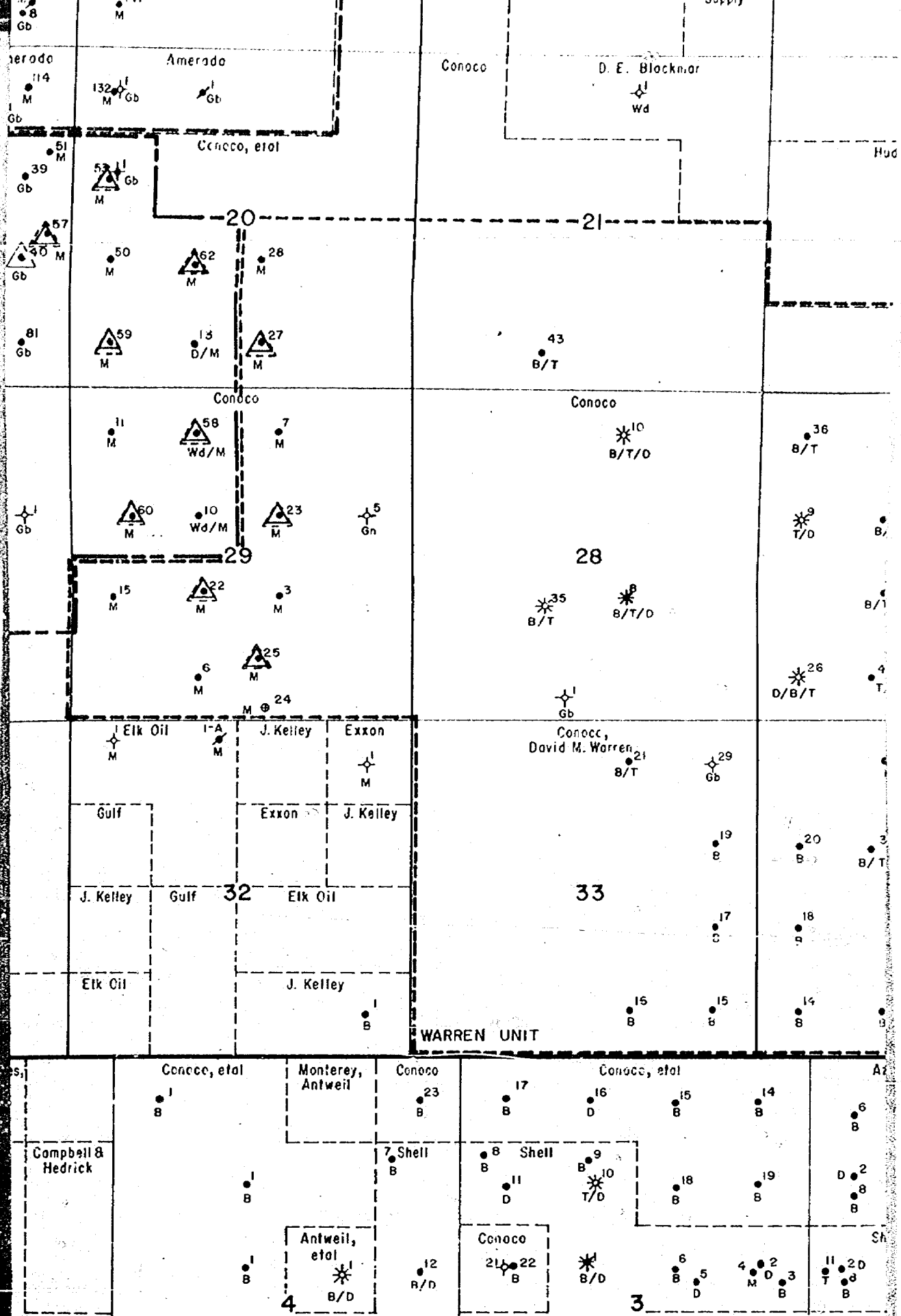
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20
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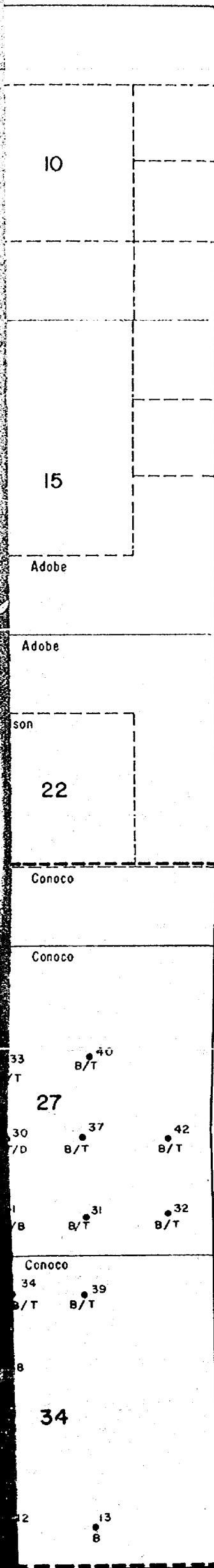
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R37E



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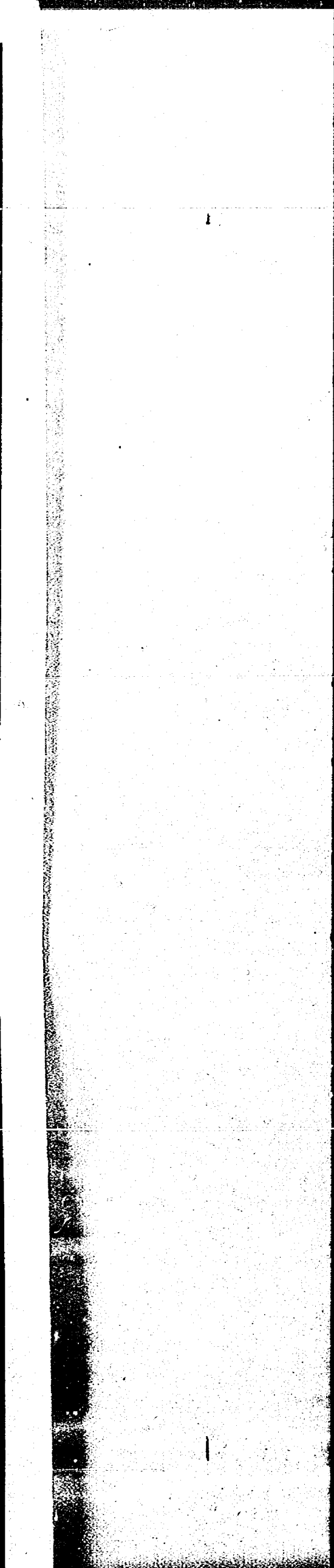
LEGEND:

- D Drinkard
- T Tubb
- P Penn
- Go Grayburg
- M McKee
- Q Queen
- G Glorietta
- B Blinbry
- Wd Devonian
- Gn Granite

Formations



Injection Well



Adobe

Ison

22

Conoco

Conoco

33

T

27

30

T/D

1

B

Conoco

34

B/T

8

34

12

tec

7

8

9

5

B/D

ell

15

16

T

B

2

N

LEGEND:

D Drinkard
T Tubb
P Penn
Go Grayburg
M McKee
Q Queen
G Glorietta
B Blinberry
Wd Devonian
Gn Granite

Formations



Injection Well



Proposed Injection Well

CONOCO

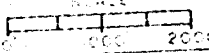
PRODUCTION DEPARTMENT

HOBBS DIVISION

WARREN MCKEE WATERFLOOD
LEA COUNTY, NEW MEXICO

OWNERSHIP & COMPLETION MAP

10-77



11m

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. 6132

Order No. R-5632

APPLICATION OF CONTINENTAL OIL COMPANY

FOR A WATERFLOOD PROJECT, LEA

COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 18,
19 78, at Santa Fe, New Mexico, before Examiner, Richard L. Stamets.

NOW, on this day of January, 19 78, 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 applicant, Continental Oil Company,
seeks authority to institute a waterflood project on its
Warren Unit Area ~~Lease~~, Warren-McKee
Pool, by the injection of water into the McKee
formation through 4 injection wells in Sections 20 and 29,
Township 20 South, Range 38 East, NMPM, Lea
County, New Mexico.

(3) That the wells in the project area are in an advanced
state of depletion and should properly be classified as
"stripper" wells.

(4) That the proposed waterflood project should result
in the recovery of otherwise unrecoverable oil, thereby preventing
waste.

Case NO. _____

Order No. R- _____

including limiting injection pressure,

(5) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

(6) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to institute a waterflood project on its Warren Unit Area ~~Lease~~, Warren-McKee Pool,

by the injection of water into the McKee formation through the following-described wells in Township 20 South, Range 38 East, NMPM, Lea County,

New Mexico:

<u>Warren Unit Well No.</u>	<u>Unit Letter</u>	<u>Section</u>
22 ✓	22 (K) ✓	29 -
23 -	G -	29 -
25 -	O -	29 -
27 ✓	O -	20 -

shall be allowed to remain open or be equipped

(2) That injection into each of said wells shall be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation; that the casing-tubing annulus of each injection well shall be tested for leaks, be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device, and that the injection wells or system shall be equipped in such a manner as to limit wellhead injection pressure to no more than ~~1140~~ ¹⁸⁰⁰ psi.

(3) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of ~~1140~~ ¹⁸⁰⁰ psi upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

See under

(4) That the wells within the project area shall be equipped with risers or in another acceptable manner such as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

failure of the tubing or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

Case No. _____
Order No. R _____

(6) That the subject waterflood project is hereby designated the Warren Unit Area Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(7) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and ~~1120~~¹¹¹⁵ of the Commission Rules and Regulations.

(8) 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.