

CASE 3604: Appli. of CONTINENTAL
for a waterflood project, Lea
County, New Mexico.

Case Number

3604

Application
Transcripts.

Small Exhibits

ETC.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

July 18, 1967

C
O
P
Y
Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Dear Mr. Kellahin:

Reference is made to Commission Order No. R-3269, recently entered in Case No. 3604, approving the Continental Langlie Jack Waterflood Project.

Y Injection is to be through the eight authorized water injection wells, each of which shall be equipped with a string of tubing and a packer, with said packer being set as near to the casing shoe as is practicable. The casing-tubing annulus shall be loaded with a corrosion inhibited fluid.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 714 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

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July 18, 1967

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

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allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/DSN/esr

cc: Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

United States Geological Survey
P. O. Box 1838
Hobbs, New Mexico

Mr. Frank Irby
State Engineer Office
Capitol Building
Santa Fe, New Mexico

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. 3604
Order No. R-3269

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 June 28, 1967,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 10th day of July, 1967, 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
permission to institute a waterflood project in its Langlie Jack
Unit Area, Langlie-Mattix Pool, by the injection of water into
the Seven Rivers-Queen formations through eight injection wells
in Sections 17, 20, 21, and 29, Township 24 South, Range 37 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.

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CASE No. 3604
Order No. R-3269

(5) 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 in its Langlie Jack Unit Area, Langlie-Mattix Pool, by the injection of water into the Seven Rivers-Queen formations through the following-described wells in Township 24 South, Range 37 East, NMPM, Lea County, New Mexico:

COMPANY	LEASE	WELL NO.	UNIT	SECTION
Cities Service	Thomas "F"	1	O	17
Gulf	Rilla	1	P	17
King, Warren & Dye	Harrison	1	F	20
King, Warren & Dye	Harrison	3	D	20
Continental	Jack A-20	1	I	20
Continental	Jack A-20	6	O	20
Pan American	Meyer "B"	4	E	21
Continental	Jack A-29	1	A	29

(2) That the subject waterflood project is hereby designated the Continental Langlie Jack Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

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

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

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

OFFICE 000
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67
BEFORE THE OIL CONSERVATION COMMISSION

OF THE

STATE OF NEW MEXICO

Case 3604

IN THE MATTER OF THE APPLICATION OF
CONTINENTAL OIL COMPANY FOR APPROVAL
OF THE LANGLEIE JACK UNIT AGREEMENT
EMBRACING 680 ACRES, MORE OR LESS,
LOCATED IN SECTIONS 17, 20, 21, AND 29,
TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM,
LEA COUNTY, NEW MEXICO, AND FOR PER-
MISSION TO INSTALL AND OPERATE A WATER-
FLOOD WITHIN THE BOUNDARIES OF SAID
UNIT AREA

A P P L I C A T I O N

Comes now Applicant, Continental Oil Company, and
respectfully requests approval of the Langlie Jack Unit Agree-
ment embracing 680.00 acres, more or less, described as:

S/2 SE/4 Section 17,
E/2, N/2 NW/4 and SE/4 NW/4, Section 20
SW/4 NW/4 and W/2 SW/4, Section 21,
NE/4 NE/4, Section 29
Township 24 South, Range 37 East,
Lea County, New Mexico

and for permission to install and operate a waterflood within
said unit, and in support thereof Applicant would show:

1. That the Langlie Jack Unit Agreement is
attached hereto and marked Exhibit 1.
2. That designation of Unit Area and preliminary
approval of the Unit Agreement by the U.S.
Geological Survey was given November 21, 1966.
3. That the attached lease plat marked Exhibit 2
shows the Langlie Jack Unit and surrounding
area.
4. That production in the Unit Area is at an
advanced stage of depletion and that recovery
by primary methods is at or near the economic
limit.

5. That engineering investigations indicate that waterflooding the Langlie Jack Unit Area will be physically and economically feasible.
6. That agreement between the Working Interest Owners has proceeded to the extent that a logical and systematic secondary recovery operation is assured.
7. That the formation to be unitized and waterflooded is the Seven Rivers and Queen formations which are specifically indicated on the radioactivity log of the Continental Oil Company Jack B-26 No. 2 well attached hereto and marked Exhibit 3.
8. That all proposed injection wells are or will be completed in such a manner that injected water will be confined to the unitized formation. The present status of all proposed injection wells is shown on the tabulation of injection well data attached hereto and marked Exhibit 4, and on the schematic diagrams attached hereto and marked Exhibits 4-1 through 4-8.
9. That applicant proposes to inject a total of approximately 4,800 barrels of water per day into the 8 proposed injection wells on a modified peripheral pattern. Said water will be obtained either from Jalmat oil wells in the area or from an outside supplier.
10. That the said waterflood will be installed and operated in conformance with Rule 701E.
11. That the proposed unitization and secondary recovery will result in the recovery of hydrocarbons which would not be recovered by primary methods and is therefore in the interest of conservation and prevention of waste.

Application to NMOCC
Page 3

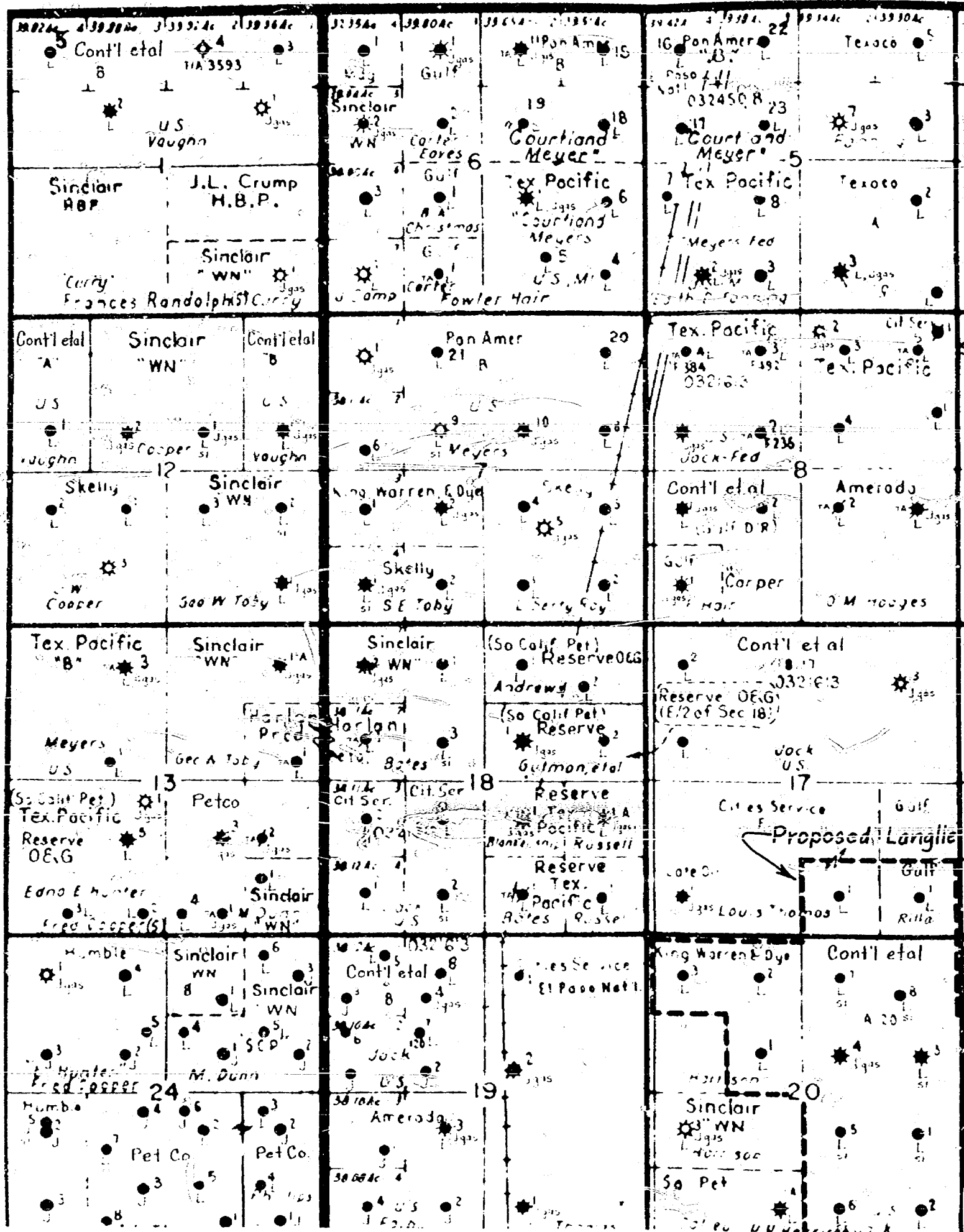
Wherefore, Applicant respectfully requests that this matter be set for hearing before the Commission's duly qualified Examiner and that upon hearing an order be entered approving the Langlie Jack Unit Agreement, and granting permission to install and operate a waterflood within the Unit Area as described herein above.

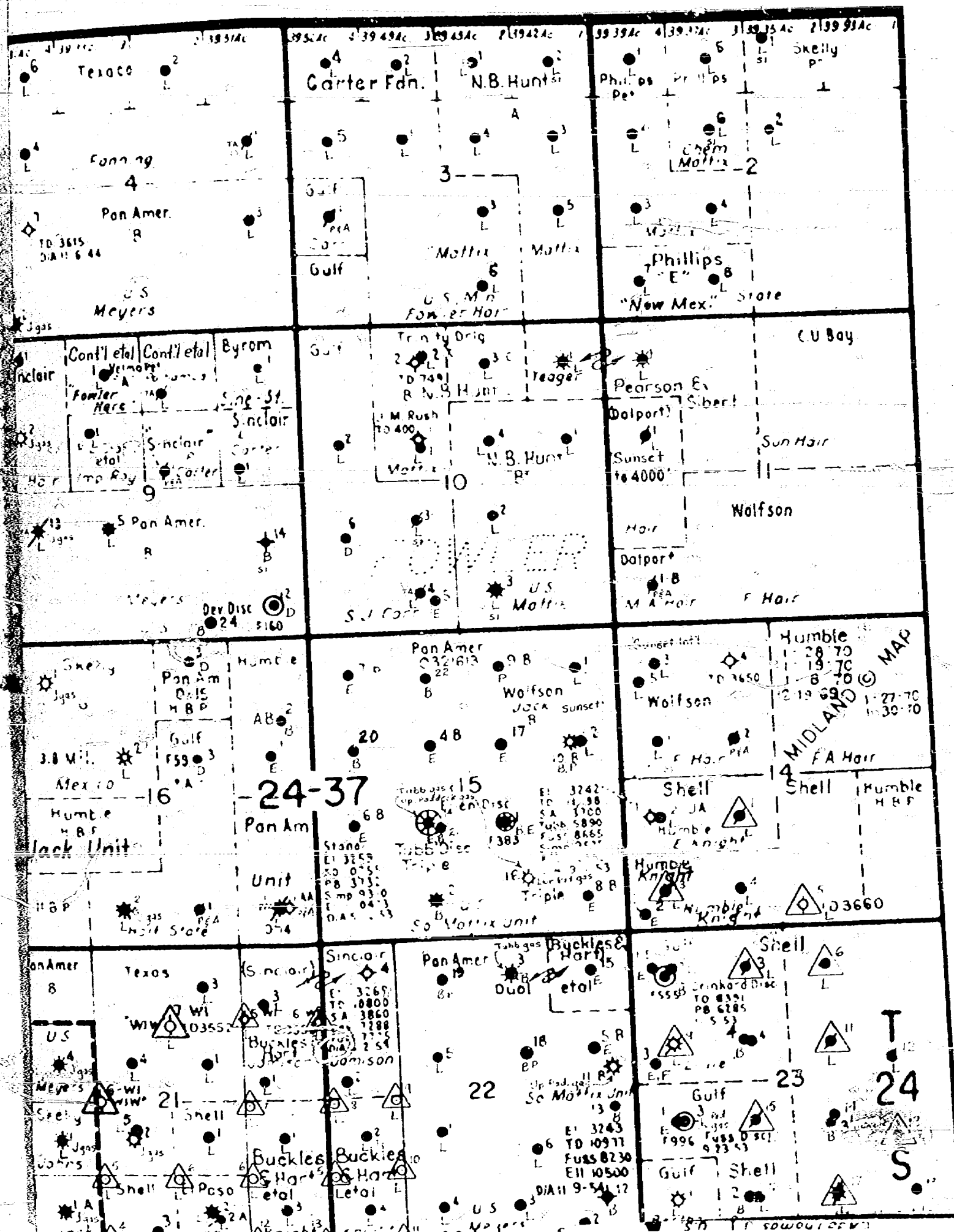
Respectfully submitted,

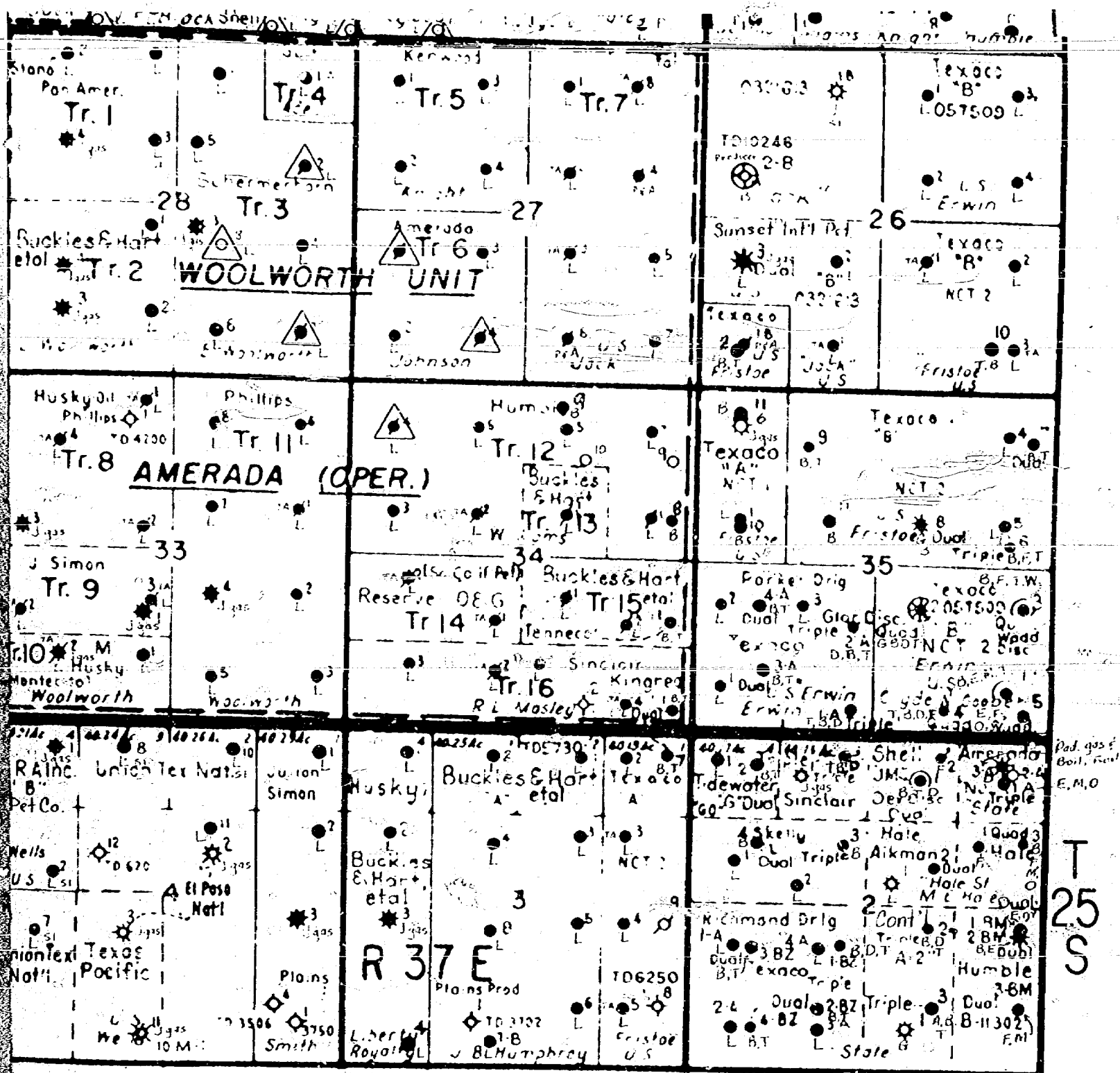


L. P. THOMPSON
District Manager
Hobbs District

LPT-JS







The graph displays two data series over a period from 2600 to 3300. The y-axis represents values from 0 to 100. The top series is a highly volatile line, while the bottom series is more stable.

Date	Top Series (Approx.)	Bottom Series (Approx.)
2600	25	15
2700	35	20
2800	45	25
2900	55	30
3000	65	35
3100	75	40
3200	85	45
3300	95	50

Continental Oil Company,
Operator

LANGFIE JACK UNIT - INJECTION WELL DATA

Company, Lease & Well No.	TD And/or PBD	Surface Casing			Intermediate Casing			Producing Casing			Producing Interval
		Size	Depth	Cement	Size	Depth	Cement	Size	Depth	Cement	
CITIES SERVICE OIL CO. Thomas "F" No. 1 660' FSL & 1980' FEL Section 17-24-37	3660/ 3605'	9 5/8"	1174'	625	None			7"	3249'	250	OH 3249-3605'
CONTINENTAL OIL COMPANY Jack A-20 No. 1 1980' FSL & 660 FEL Section 20-24-37	3585' 10 3/4"	220'	225	7 5/8"	1187'	425	5 1/2"	3210'	425	OH 3210-3585'	
Jack A-20 No. 6 660' FSL & 1980' FEL Section 20-24-37	3593' 10 3/4"	376'	175	None			7"	3330'	900	OH 3330-3593'	
Jack A-29 No. 1 330' FNL & 330" FEL Section 29-24-37	3605' 10 3/4"	231'	225	7 5/8"	1199'	425	5 1/2"	3238'	425	OH 3238-3605'	
GULF OIL CORPORATION Rilla No. 1 660' FSL & 660 FEL Section 17-24-37	3625' 13 3/4"	281'	225	None			6"	3350'	350	OH 3350-3625'	
KING, WARREN & DYE Harrison No. 1 1980' FNL & 1980' FNL Section 20-24-37	3582' 8 5/8"	371'	175	None			5 1/2"	3405'	425	OH 3405-3582'	
Harrison No. 3 660' FNL & 660' FNL Section 20-24-37	3611' 11 3/4"	357'	200	None			7"	3405'	450	OH 3405-3611'	
PAN AMERICAN PETROLEUM CORP. Meyer "B" No. 4 1980' FNL & 660' FNL Section 21-24-37	3682' 13 5/8"	281'	200	8 5/8"	1269'	400	5 1/2"	3295'	130	OH 3295-3682'	

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EXHIBIT NO. 4

Case 3604

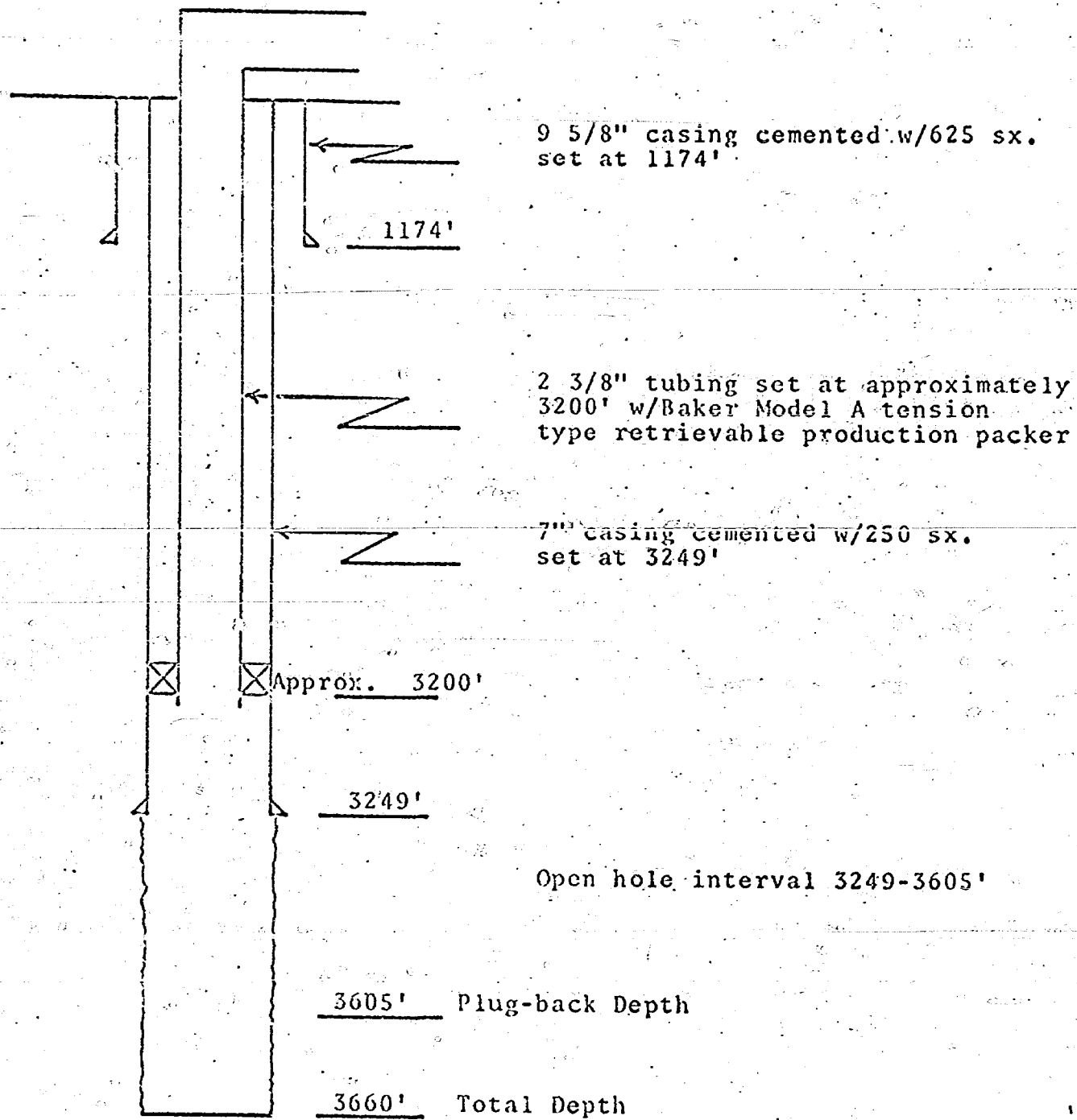
Water Injection Well Data

Cities Service Oil Company

Thomas "P" No. 1

660' FSL & 1980' FEL, Unit O, Sec. 17-24-37

Elev: 3257' GL



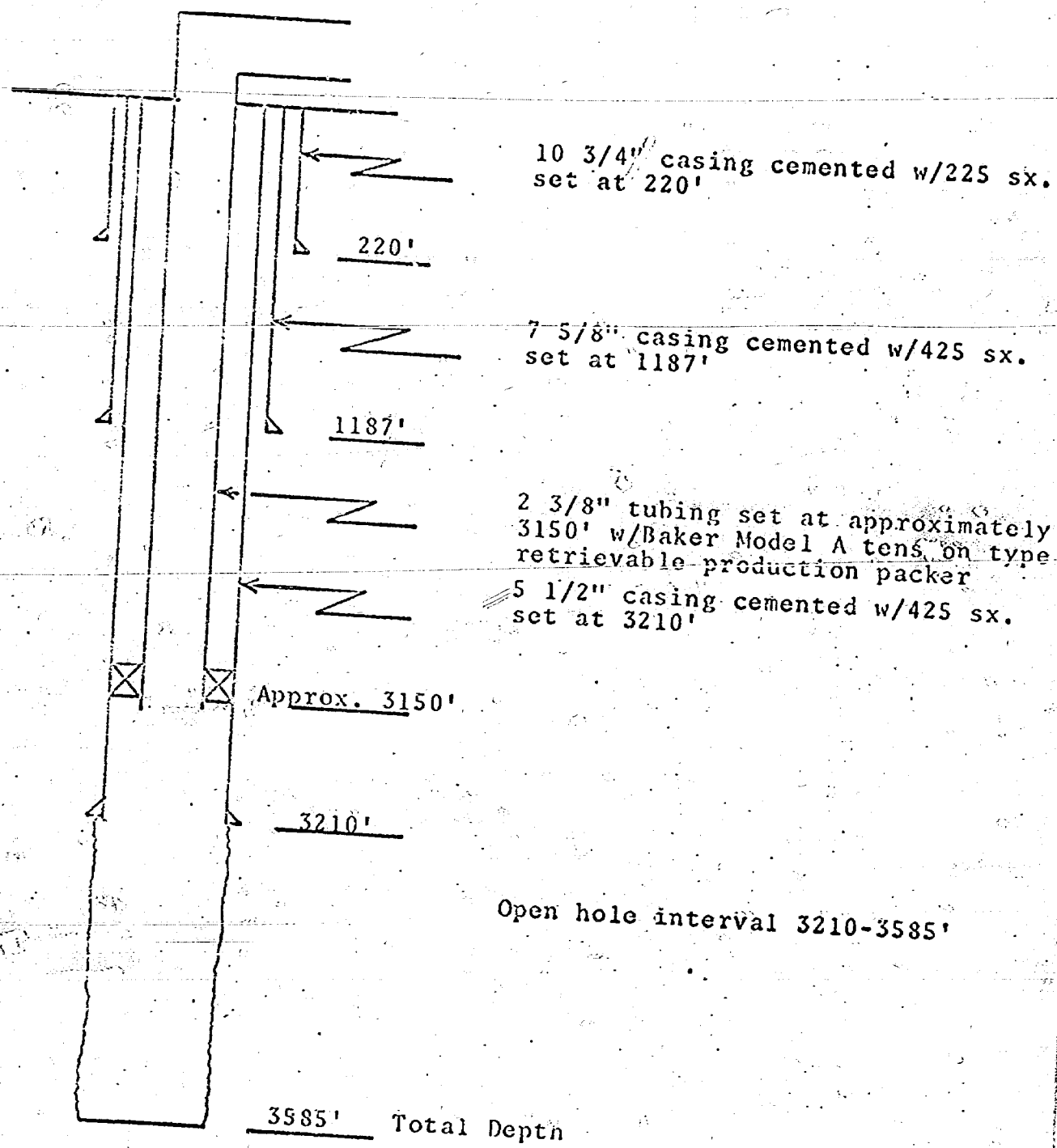
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to 3605'
3. Run Gamma Ray-Neutron & Caliper Logs
4. Run tubing and set at approximately 3200'

EXHIBIT NO. 4-1

Water Injection Well Data

Continental Oil Company
Jack A-20 No. 1
1980' FSL & 660' FEL, Unit I, Sec. 20-24-37
Elev: 3261' DF



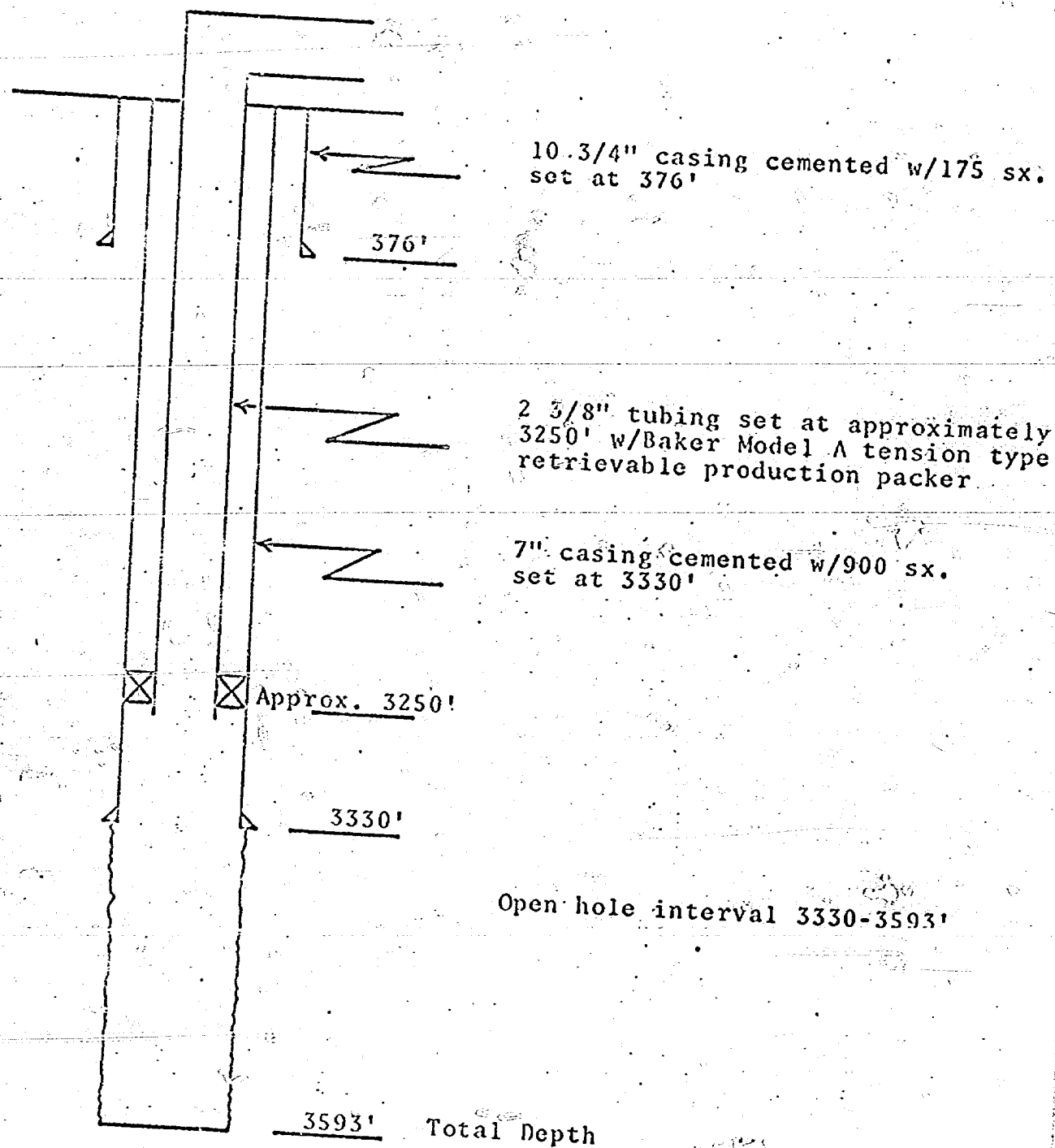
Proposed Procedure

1. Rig up DD Unit
2. Cleanout to TD
3. Run Gamma Ray-Neutron and Caliper Logs
4. Run tubing and set at approximately 3150'

EXHIBIT NO. 4-2

Water Injection Well Data

Continental Oil Company
Jack A-20 No. 6
660' FSL & 1980' FEL, Unit O, Sec. 20-24-37
Elev: 3267' GL



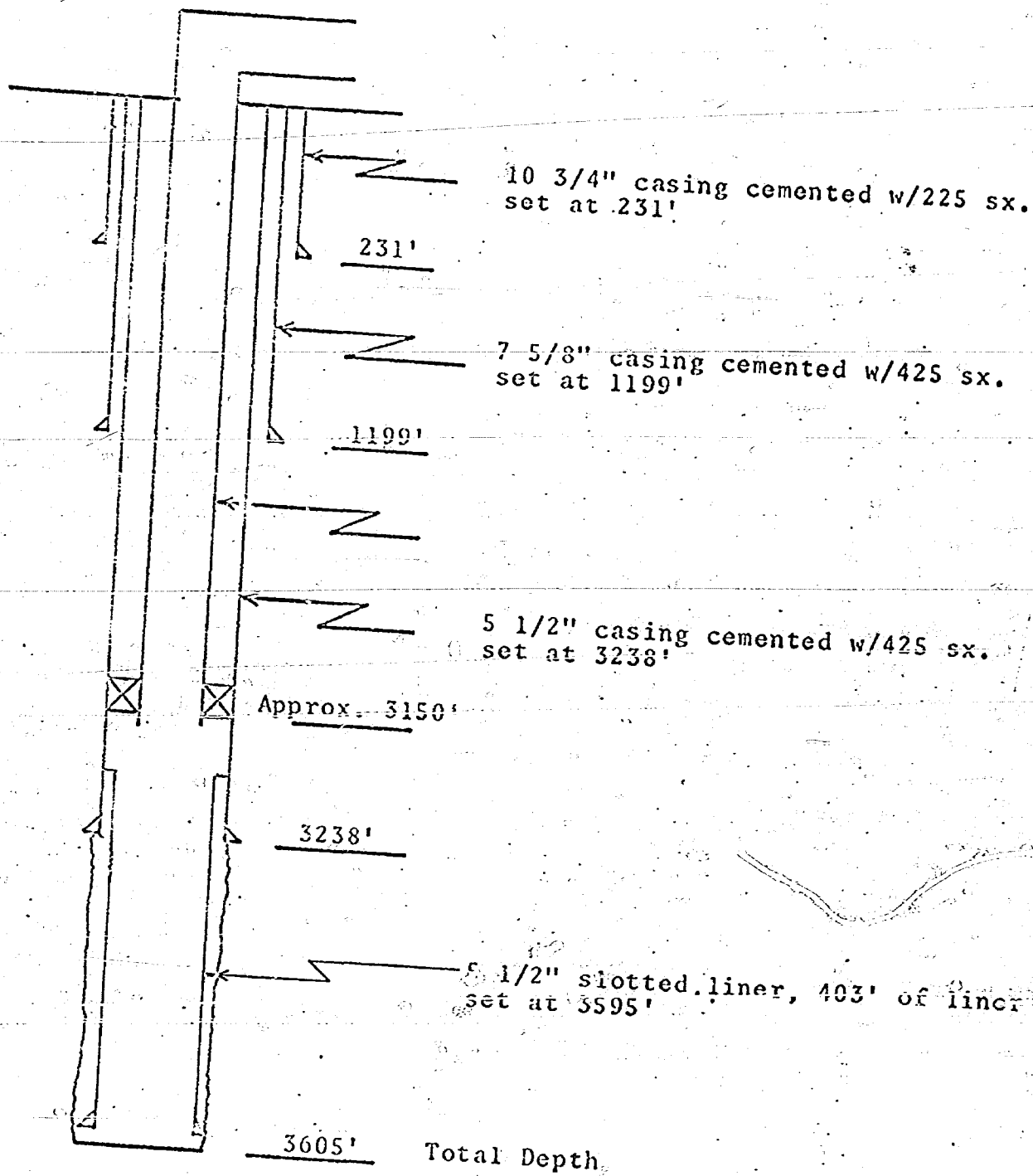
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Test casing for leaks
3. Squeeze leaks if found
4. Cleanout to TD
5. Run Caliper Log
6. Run tubing and set at approximately 3250'

EXHIBIT No. 4-3

Water Injection Well Data

Continental Oil Company
Jack A- 29 No. 1
330' ENL & 1980' FEL, Unit A, Sec. 29-24-37
Elev: 3247' DF



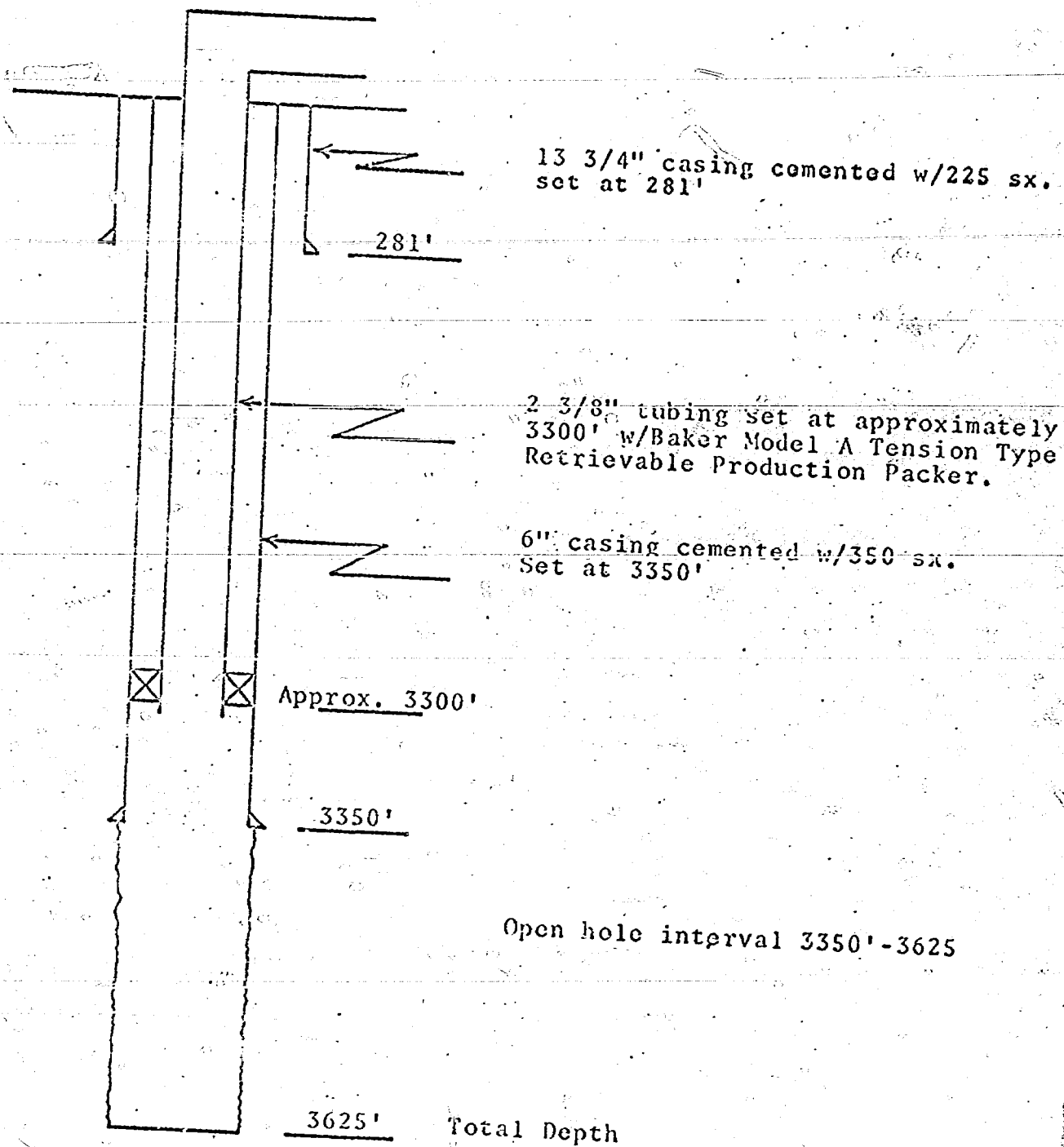
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron Log
4. Run tubing and set at approximately 3150'

EXHIBIT NO. 4-4

Water Injection Well Data

Gulf Oil Corporation
Rilla No. 1
660' FSL & 660' FEL, Unit P, Sec. 17-24-37
Elev: 3270' GL



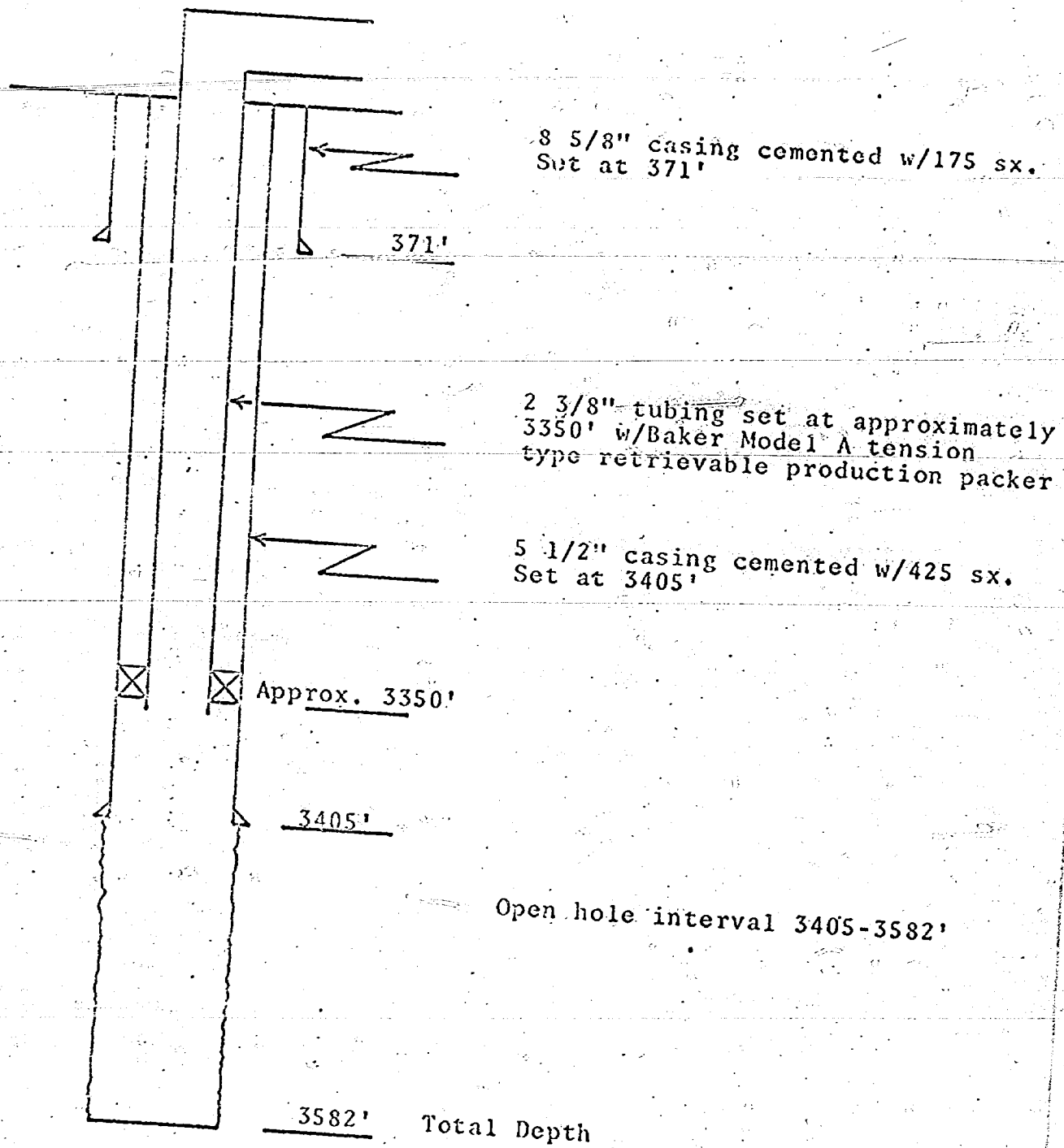
Proposed Procedure

1. Rig up DD unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron Log and Caliper
4. Run tubing and set at approximately 3300'

EXHIBIT NO. 4-5

Water Injection Well Data

King, Warren & Dye
Harrison No. 1
1980' FNL & 1980' FWL, Unit F, Sec. 20-24-37
Elev: 3287'



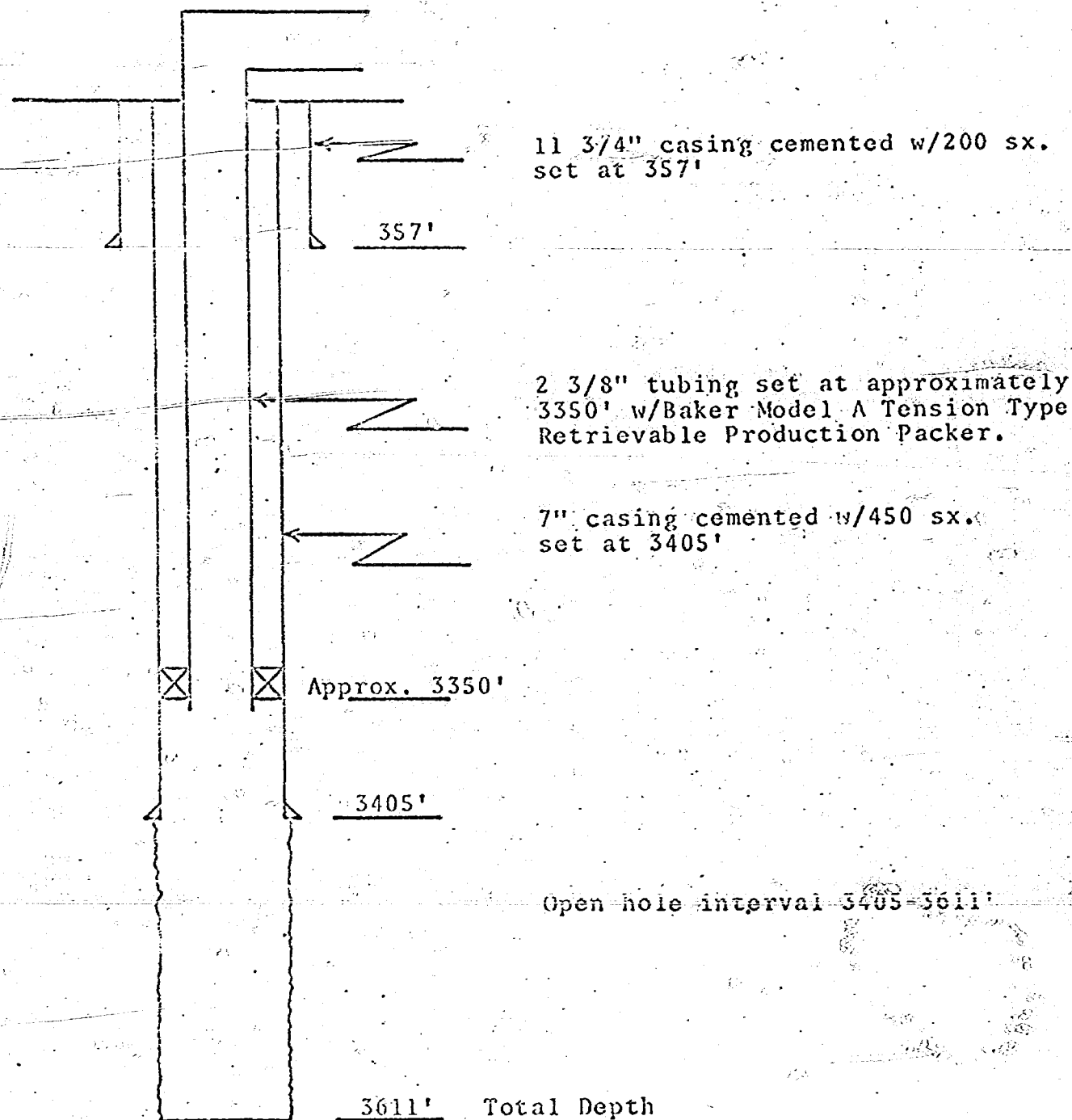
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron and Caliper Logs
4. Run tubing and set at approximately 3350'

EXHIBIT NO. 4-6

Water Injection Well Data

King, Warren & Dye
Harrison No. 3
660' FNL & 660' FWL, Unit D, Sec. 20-24-37
Elev: 3298'



Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron Log and Caliper
4. Run tubing and set at approximately 3350'

EXHIBIT NO. 4-7

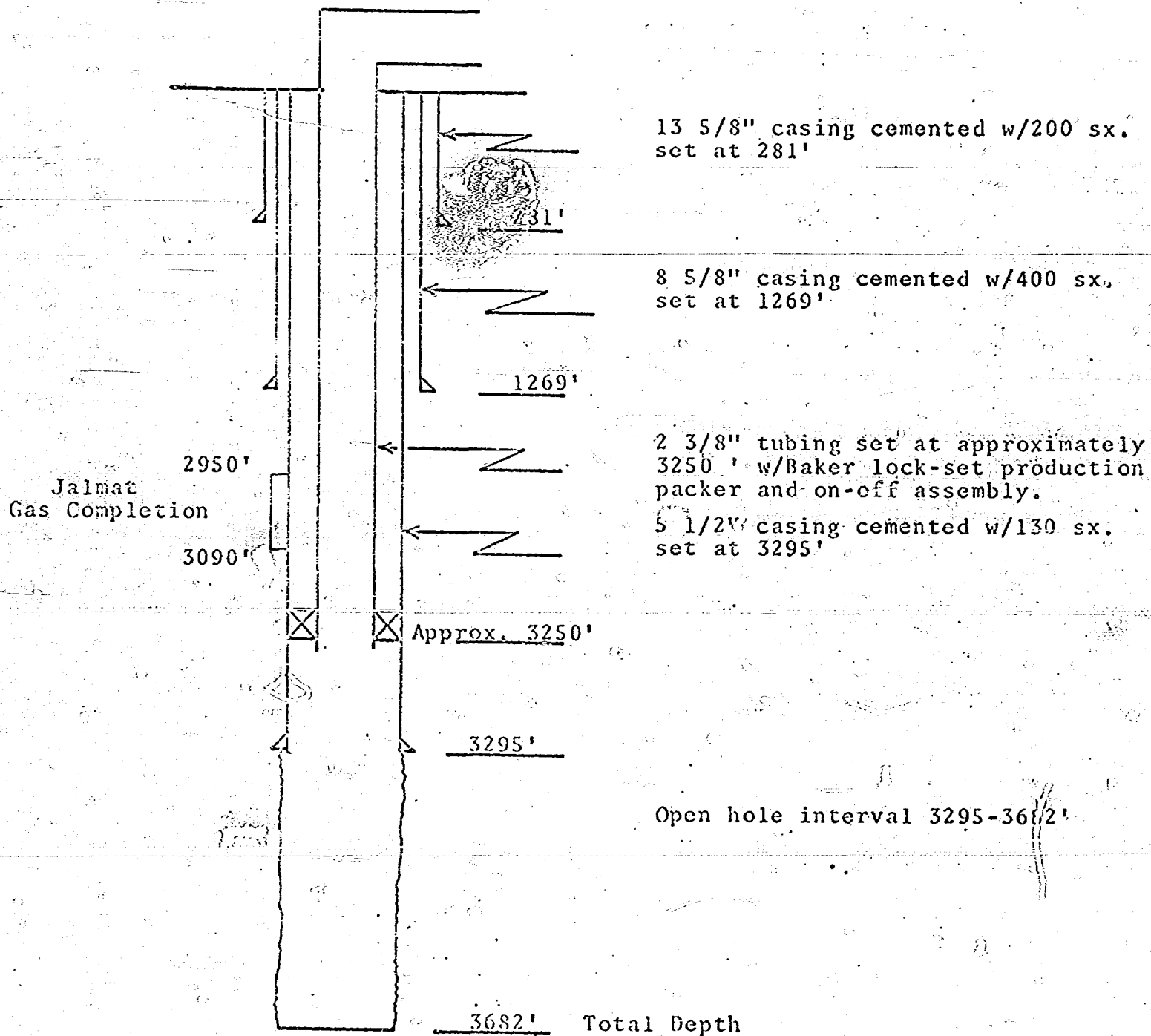
Water Injection Well Data

Pan American Petroleum Corp.

Meyer "B" No. 4

1980' FNL and 660' FWL, Unit E, Sec. 21-24-37

Elev: 3243'



Proposed Procedure (To be done by Pan American)

1. Rig up DD Unit and kill gas well
2. Pull tubing and install BOP
3. Drill and cleanout to TD
4. Run Caliper Log
5. Run tubing and set at approximately 3250'
6. Restore Jalmat gas production through annulus

EXHIBIT NO. 4-8

June 14, 1967

Continental Oil Company
Box 460
Hobbs, N. M. 88240

Attn. Mr. L. P. Thompson

Gentlemen:

Receipt of a copy of your application to the Oil Conservation Commission requesting authorization to install and operate a waterflood project in parts of Sections 17, 20, 21 and 29, T. 24 S., R. 37 E., (Langlie Jack Unit) is gratefully acknowledged.

FEI/ma
cc-Oil Conservation Comm.

Yours truly,

S. E. Reynolds
State Engineer

By:

Frank E. Irby
Chief
Water Rights Div.

MAIN 01

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MAIN OFFICE 000

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State of New Mexico
Oil Conservation Commission



July 10, 1967

Re: Case No. 3604
Order No. R-3269
Applicant:
CONTINENTAL OIL COMPANY

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

Other _____

Docket No. 19-67

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 28, 1967

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

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

- CASE 3598: Application of Dugan Production Corporation for the creation of a new gas pool, special pool rules and three unorthodox gas well locations, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the creation of the North Shiprock-Gallup Gas Pool in Section 14, Township 30 North, Range 18 West, San Juan County, New Mexico and the promulgation of special rules therefor including a provision to authorize exception to the pump-~~ing~~ method of cementing prescribed by Rule 107 (a). Applicant also seeks authority to meter production from all wells on its Shiprock lease in said pool through one meter and to allocate production from the individual wells on the basis of well tests. Applicant further seeks approval of the unorthodox gas well locations for its Shiprock Well No. 5 located 1650 feet from the North line and 1870 feet from the East line, its Shiprock Well No. 7 located 990 feet from the North line and 2310 feet from the West line, and its Shiprock Well No. 8 located 2310 feet from the South line and 660 feet from the East line, all in Section 14, Township 30 North, Range 18 West.
- CASE 3599: Application of Franklin, Aston and Fair, Inc. for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg-San Andres formations through two wells located in Unit E of Section 17 and Unit A of Section 18, Township 17 South, Range 31 East, Grayburg-Jackson Pool, Eddy County, New Mexico.
- CASE 3600: Application of Texaco Inc., for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Cotton Draw Unit Well No. 65, located in Unit G of Section 2, Township 25 South, Range 31 East, Eddy County, New Mexico, to produce gas from an undesignated Wolfcamp gas pool and gas from an undesignated Morrow gas pool through parallel strings of tubing.
- CASE 3601: Application of Walker Brothers Oil Company and Tesoro Petroleum Corporation for an exception to Rule 104 C I, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the well location requirements of Rule 104 C I to permit the drilling of more than one well on a 40-acre tract, said wells being located closer than 660 feet to each other and with each 40-acre tract being subject to a single 40-acre allowable. The above exceptions for the South Hospah Upper Sand Oil Pool and the South Hospah Lower Sand Oil Pool, McKinley County, New Mexico, would be applicable to Walker's Hansen Lease comprising the S/2 of Section 6, and Walker's Santa Fe Lease comprising the N/2 and

and SW/4 of Section 7, both in Township 17 North, Range 8 West and to Tesoro's Santa Fe Lease comprising the SE/4 of Section 1, Township 17 North, Range 9 West.

CASE 3602: Application of Amerada Petroleum Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its State WE "K" Well No. 1 located in Unit F of Section 15, Township 21 South, Range 35 East, Lea County, New Mexico, in such a manner as to permit the production of gas from an undesignated Wolfcamp gas pool and gas from an undesignated Morrow gas pool through parallel strings of tubing.

CASE 3603: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Langlie Jack Unit Area comprising 680 acres, more or less, of Federal and Fee lands in Township 24 South, Range 37 East, Lea County, New Mexico.

CASE 3604: 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 in its Langlie Jack Unit Area by the injection of water into the Seven Rivers-Queen formations through 8 injection wells in Sections 17, 20, 21, and 29, Township 24 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3605: Application of Walter Duncan for a casing-cementing exception, and for an unorthodox location, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to complete his North Hogback 1 Well No. 5 at an unorthodox Dakota oil well location 2466 feet from the North line and 2310 feet from the East line of Section 1, Township 29 North, Range 17 West, San Juan County, New Mexico. Applicant further seeks an exception to the provisions of Rule 107(a) concerning cementing of casing.

CASE 3606: Application of Bell Petroleum Company for salt water disposal and a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to complete its State "K" Well No. 1 located in Unit K of Section 21, Township 11 South, Range 33 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the North Bagley-Lower Pennsylvanian formation and the disposal of produced salt water through the intermediate casing-production casing annulus into the San Andres and other formations included in the open-hole interval from 3845 feet to 7800 feet.

June 28, 1967 Examiner Hearing.

Docket No. 19-67

CASE 3607: Application of Stoltz & Company for an amendment to Order No. R-3238, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment to Order No. R-3238, which order authorized the disposal of produced salt water into a playa lake in Sections 12 and 13, Township 10 South, Range 32 East, and Sections 6 and 7, Township 10 South, Range 33 East, Lea County, New Mexico. Applicant seeks to alter the location of the three observation wells required by said order. Alternate locations proposed by applicant are as follows: one well 300 feet from the South line and 1100 feet from the West line; one well 600 feet from the South line and 1400 feet from the East line; one well 2400 feet from the South line and 1100 feet from the East line, all in Section 7, Township 10 South, Range 33 East. Applicant further seeks the amendment to Order No. R-3238 to alter the location of two of the three permanent water level markers required by said order. Applicant proposes one marker on the North shore of the lake in lieu of the marker required in the SW/4 SE/4 of Section 6 and one marker on the East shore of the lake in lieu of the marker required in the SE/4 NW/4 of Section 7.

dearnley-meier reporting service, inc.

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

1120 SIMMS BLDG. • P. O. BOX 1092 • PHONE 243-6491 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
EXAMINER HEARING

June 28, 1967

IN THE MATTER OF:

Application of Continental Oil
Company for a unit agreement,
Lea County, New Mexico.

Case No. 3603

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

Case No. 3604

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

dearnley-meier reporting service, inc.

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

1120 SIMMS BLDG. • P.O. BOX 1092 • PHONE 243-1691 • ALBUQUERQUE, NEW MEXICO 87101
1400 FIRST NATIONAL BANK EAST • PHONE 256-1294 • ALBUQUERQUE, NEW MEXICO 87108

MR. UTZ: Case 3603. Are you going to ask for consolidation of the next two cases?

MR. KELLAHIN: Yes, Case 3603, 3604.

MR. HATCH: Case 3603: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Case 3604: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico.

MR. KELLAHIN: Jason Kellahin, Kellahin and Fox, Santa Fe, appearing for the Applicant. I have two witnesses I would like to have sworn, please.

(Whereupon, Applicant's Exhibit A 1-1 through 2-10 was marked for identification.)

(Witnesses sworn.)

VICTOR T. LYON

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A Victor T. Lyon, L-y-o-n.

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

A I am employed by Continental Oil Company as Supervising Engineer in the Hobbs District Office.

dearley-meier reporting service inc.

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

1120 SIMMS BLDG. • P.O. BOX 1092 • PHONE 243-6691 • ALBUQUERQUE, NEW MEXICO 87101
1400 FIRST NATIONAL BANK EAST • PHONE 256-1294 • ALBUQUERQUE, NEW MEXICO 87108

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

A Yes, I have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q Mr. Lyon, are you familiar with the application of Continental Oil Company in Case No. 3603 and 3604 presently before the Commission?

A Yes, sir.

MR. KELLAHIN: I assume that the record shows that these two cases are consolidated for purposes of testimony, is this correct?

MR. UTZ: Yes, sir, for purposes of testimony and separate orders will be written.

Q (By Mr. Kellahin) Briefly stated, what is proposed by Continental Oil Company in these applications?

A Continental Oil Company is asking for approval of the unit agreement for the Langlie-Jack Unit in Lea County, New Mexico, and for the installation of a waterflood project in that unit.

Q Now, your testimony, as I understand it, will be confined to that portion pertaining to the unit agreement,

is that correct?

A Yes, sir.

Q Referring to what has been marked as Exhibit No. 1, would you identify that exhibit, please?

A Exhibit No. 1 is a copy of the unit agreement which we are proposing for the Langlie-Jack Unit. It is more or less standard modified federal form. It has attached to it two exhibits, Exhibit A, which is a plat of the unit area, and immediately surrounding area, and Exhibit B, which is a schedule of the tracts and the ownership of them which are a part of the unit.

The unit area is shown on Exhibit A and is described in the unit agreement as consisting of in Section 17, the South Half of the Southeast Quarter; in Section 20, the East Half, the North Half of the Northwest Quarter, the Southeast Quarter of the Northwest Quarter; in Section 21, the West Half of the Southwest Quarter, the Southwest Quarter of the Northwest Quarter; and in Section 29, the Northeast Quarter of the Northeast Quarter, all in Township 24 South, Range 37 East and containing a total of approximately 680 acres.

Q Is this unit offset by other units in the area?

A Yes, sir. It is offset to the southeast by the Langlie Mattix Woolworth Unit. There are waterflood projects on non-unitized leases immediately to the east.

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Q And that's immediately offsetting the proposed unit, is that correct?

A Yes.

Q That is designated as the Buckles et al. Operation, is that right?

A Well, the Buckles Operation is a little farther east. Those immediately adjoining are the Texaco and Shell Black Lease waterfloods.

Q Those are two separate waterfloods, is that correct?

A Yes.

Q On Exhibit B, is there a tabulation of the data showing the lease ownership?

A Yes, sir.

Q What percentage of the unit area is federal, state and fee?

A There are three tracts, Tracts 1, 2 and 3, which are federal and contain 480 acres or 70.59 percent of the unit area. The remaining acreage, three tracts No. 4, 5 and 6 are fee and contain 200 acres or 29.41 percent of the unit area. There is no state land in the proposed unit.

Q Now, what is the unitized formation?

A The unitized formation is defined in Section 2, paragraph (f) as the Seven Rivers and Queen formations found between the subsurface depth of 2737 feet and 3503 feet as

shown on the Lane-Wells acoustic log run January 7, 1965 and the Continental Oil Company's Jack B-26 No. 2 well located 1980 feet from the north line and 660 feet from the west line, Section 26, Township 24 South, Range 36 East, N.M.P.M.

I might point out that this log was run in a well which is outside of the unit area and the reason for this is that no well inside the unit area completely penetrated the Queen formation and consequently, in order to give a footage definition of the entire unitized interval, we selected the nearest well which had penetrated the entire Queen.

Q Was this log filed with the Commission?

A Yes, sir.

Q It was attached to the application, was it not?

A Yes, it was.

Q What is the basis for tract participation under the unit agreement?

A The basis of tract participation is described in Section 13 and is based 25 percent on tract acreage plus 75 percent tract cumulative production. There is an exhibit designated Exhibit 1-1 which shows this data for each of the tracts in the unit area and reduces this to the over-all tract participation.

Q You stated in your previous testimony that this was a more or less standard form of unit agreement. Would you

discuss briefly the salient points covered by the agreement?

A Yes, sir. The agreement covers most of the, I suppose all of the standard provisions. Section 2 has the definitions, Section 4 describes the method for expanding, Section 6 designates the unit operator, Continental Oil Company, Sections 7 and 8 provide for the resignation or removal and the election of a successor operator. Section 13 describes the method of tract participation, Section 24 provides the effective date and term, the effective date being upon the accomplishment of three objectives, one is the commitment by the working interest owners of 85 percent of the unit area to the unit agreement, two, approval by the Oil Commission and the U.S.G.S., and three, the filing of a counterpart copy of the agreement in the Lea County records.

Q Now, has preliminary approval of this agreement been given by the U.S.G.S.?

A Yes, sir, the U.S.G.S. gave preliminary approval to this unit by letter dated November 21, 1966.

Q What percentage of the ownership have ratified or joined the unit?

A At the present time 47 percent of the working interest owners have ratified, 18 percent of the royalty owners have ratified other than the U.S.G.S., and 16 percent of the overriding royalty owners have ratified. This is really

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a pretty good response, I think, considering the fact that the agreements were mailed to the royalty owners and overriding royalty owners a week ago yesterday.

Q Do you have any commitment from the other working interest owners as to joining the unit?

A No, we have no firm commitment. We have had no objections to date.

Q Do you anticipate that you will get 100 percent of the working interest ownership signed up?

A Yes.

Q In the event that you don't, is there provision in the unit agreement for subsequent joinder?

A Yes, there is.

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

MR. UTZ: Without objection, Exhibit A will be entered into this case.

(Whereupon, Applicant's Exhibit A was offered and admitted in evidence.)

KELLAHIN: We would like also to offer into evidence Exhibit A-1-1, being the tabulation of parameters which is attached to the exhibit.

MR. UTZ: Exhibit A and Exhibit A-1-1 will be admitted.

(Whereupon, Exhibit A-1-1 was offered and admitted in evidence.)

MR. KELLAHIN: That's all I have on direct examination of this witness.

MR. UTZ: Your other witness will be the one who will take care of the waterflood?

MR. KELLAHIN: Yes, sir.

MR. UTZ: Any questions of Mr. Lyon? The witness may be excused.

(Witness excused.)

C. C. WOODWARD

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Clifton C. Woodward, Junior.

Q By whom are you employed and in what position?

A Senior Reservoir Engineer, Continental Oil Company, Hobbs District Office.

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

A No, sir.

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

A I have a Bachelor of Science Degree from

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Pennsylvania State College in Petroleum Engineering. I have been employed by Continental Oil Company for nineteen years in various engineering capacities in New Mexico and Texas. Presently employed in the Hobbs District Office as Senior Reservoir Engineer.

Q In connection with your work as Senior Reservoir Engineer, have you made a study of the Langlie-Mattix area?

A Yes, sir.

Q Which is under consideration in this application?

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. UTZ: Yes, they are.

Q (By Mr. Kellahin) You heard the testimony just given by Mr. Lyon in regard to the Langlie-Jack Unit Agreement. What is the purpose of this unit agreement?

A This is being formed for the purpose of conducting waterflood operations in the unit area.

Q Referring to what has been marked as Exhibit 2 attached to Exhibit A, would you identify that exhibit, please?

A Exhibit 2 is a plat of the Langlie-Jack Unit Area and an area two miles in each direction from the unit boundary. Lease ownership and location and identification of the wells

are shown in the usual manner. The pool from which each well is producing is shown by a letter and color symbol which is explained in the legend. The unit area is shown within the red outline which depicts the unit boundary. The boundary of the Langlie Mattix Woolworth Unit to the southeast, operated by Amerada Petroleum Corporation, is shown by a dashed line. The proposed unit is also offset to the east by a cooperative waterflood operated by individual lease owners. Shell Oil Company operates the Black Lease in Units J, N and O in Section 21. Texaco operates their Black Lease in Units B, F, G and K of Section 21.

Q According to Exhibit No. 2 there appear to be three injection wells along the east boundary of the Langlie-Jack Unit. Are those wells in operation?

A Two of the wells, Shell Oil Company Black Numbers 4 and 5 have been in operation since December, 1964. Cumulative water injection to April 1, 1967 was 110,752 barrels for Well No. 4 and 144,149 barrels for Well No. 5. The third well, Texaco's Black No. 6, has not been put in operation as of April 1st, 1967.

Q That would be the northernmost well?

A Yes.

Q Do you have a line agreement with the operators there or do you contemplate having one? Do you know that?

A I believe these wells were drilled for the purpose of injection into both units.

Q For the purpose of operating both units, is that correct?

A Well, there's a -- but not cooperative.

Q Would you turn to Exhibit No. 3 and describe the information shown on that exhibit?

A Exhibit No. 3 is a type log for the Langlie-Jack Unit. As shown on the log, the top of the Seven Rivers formation is at a depth of 2737 feet and the base of the Queen or the top of the Grayburg formation is found at a depth of 3503.

MR. UTZ: What are those two zones again that you marked on the exhibit?

A The top of the Seven Rivers at 2737 and the base of the Queen or top of the Grayburg at 3503.

Q (By Mr. Kellahin) This well is not in the unit area, is it?

A No, sir.

Q Do you have a typical well from within the unit area?

A Yes, sir. Exhibit No. 3-A is a copy of the radioactivity log run on Continental's Jack A-20 Well No. 5 located in the Northwest Quarter of the Southeast Quarter of Section 20, Township 24 South, Range 37 East.

Q Is that in the Southwest of the Southeast though?

A No, Northwest of the Southeast.

Q Would you continue, please?

A This exhibit is a type log of the productive interval from within the unit boundary. The log shows, by the horizontal red line, the top of the Seven Rivers formation at a depth of 3165 feet and in a similar manner the top of the Queen formation is shown at a depth of 3525 feet. The productive interval in the Langlie-Jack Unit Area consists roughly of the top 50 to 100 feet of the Queen formation and the lower 50 to 100 feet of the Seven Rivers formation. Because of lack of reservoir and completion data it is difficult to find the exact producing interval.

Q Would you give a brief history of the Langlie-Jack Unit Area?

A Initial production from the unit area was from the Continental Jack A-21 No. 1, completed December 1st, 1937. Development of the remaining area continued through 1938 and 1939 until 15 of the 17 wells in the unit area had been completed. The King, Warren & Dye - Harrison No. 3 was completed in 1947 and the Citgo Thomas "F" No. 1 was completed in 1952. All of the completions were made in open hole with casing seats ranging from 51 feet above sea level to 118 feet below sea level. All of the wells were shot with nitro-

glycerine, the treatment size ranging from 20 to 580 quarts at the initial completion or shortly thereafter. Five of the wells are currently producing, nine are shut in and three have been plugged back and completed in the Yates formation for Jalmat gas. One of the current producers has been dually completed for Langlie-Mattix oil production and Jalmat gas production.

Q What is the daily average production for the unit area?

A During the month of March the unit area averaged ten barrels of oil and two-tenths water per day with over-all gas-oil ratio of 14,250 feet per barrel.

Q Would you consider that this reservoir is at a stripper stage?

A It indicates that the reservoir is at a depleted stage.

Q And it is ready for secondary recovery operation?

A Yes.

Q What's the cumulative production for the unit area?

A As of April 1st, 1967 cumulative production for the unit area was 1,117,249 barrels of oil.

Q What was the reservoir drive mechanism during the primary recovery?

A The reservoir drive mechanism for the Langlie-Jack

area is a solution gas drive.

Q Referring to what has been marked as Exhibit No. 5, would you identify that exhibit?

A Exhibit No. 5 is a map showing the structural configuration on top of the Queen formation. The Langlie-Jack Unit is located on the western slope of a large regional north-south trending anticline. A small secondary high centered in the Southwest Quarter of Section 20 retards the westward dip of the formation over most of the unit area. This map illustrates that a permeability pinchout and not structure, controls the limits of production. The Queen completions were unsuccessful in the Late Oil Company - Thomas No. 1, Unit M of Section 17, and in the Sinclair - Harrison No. 3 in Unit L of Section 20. Below average completions were obtained in the Cities Service - Thomas "F" No. 1, Unit O of Section 17 and Southern Petroleum Exploration's Calley No. 1 in Unit N of Section 20.

Q Referring to what has been marked as Exhibit No. 6, would you identify that exhibit?

A Exhibit 6 is a tabulation of data in regard to the reservoir rock, fluid characteristics and the estimated waterflood performance.

Q Is there anything unusual or significant in there that should be called to the attention of the Examiner?

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A No, sir.

Q It's self-explanatory, is it?

A Yes.

Q In your opinion, is waterflooding feasible in the Langlie-Jack Unit?

A Yes, sir. After reviewing the available reservoir data and the oil recovery under primary operations and calculation of waterflood performance by accepted standards and the performance of the offsetting floods, my opinion is that the unit area can be flooded successfully and economically.

Q Other waterflood operations in the area have been successful, have they not?

A Yes, sir, as far as I know.

Q Will waterflooding in the unit area result in the recovery of oil that would not otherwise be recovered?

A Yes. It's estimated that approximately 846,000 barrels of oil will be recovered by waterflooding, which would not otherwise be recovered.

Q That would result in the prevention of waste, is that correct?

A Yes, sir.

Q Referring to what has been marked as Exhibit No. 7, would you explain what is shown on that exhibit?

A Exhibit No. 7 is a map of the unit area showing the

proposed waterflood pattern. Injection wells are shown by a triangular symbol. The injection pattern is a modified peripheral arrangement which utilizes maximum advantage from the three lease line injection wells. It also simplifies conversion of the offsetting 40-acre five spot pattern to a 40-acre well spacing development in the Langlie-Jack area. Conversion of wells inside the pattern to injection during the latter stages of the flood is anticipated to obtain maximum sweep efficiency.

Q Referring back to what was marked as Exhibit 4, would you describe the information shown on that exhibit?

A Exhibit 4 is a tabulation of the wells which are proposed to be converted for water injection. The size and setting depth of each casing string, the amount of cement used and the interval open to the formation are shown for each well. We have Exhibits 4-1 through 4-8 which are schematic diagrams for each well showing the same information as that tabulated in Exhibit 4. Exhibits 4-1 through 4-8 also show the proposed completion technique. Injection initially will be through tubing with a packer set a short distance above the casing shoe. This procedure will serve to protect the casing against corrosion and the high injection pressures. Subsequent injectivity profiles may make it advisable to lower the packer.

Q You refer to high injection pressures. Do you have

any idea what those pressures might be?

A I expect them to be in the range of 1500 to 2000 psi.

Q And the type of completion you are using in your injection wells, in your opinion will adequately protect against any migration of water to any other zone, is this correct?

A Yes.

Q Are all of your cementing programs shown on all of these wells?

A Yes, they are on a tabulation.

Q How much water do you anticipate will be injected in this waterflood project?

A Initially we expect to inject approximately 4800 barrels per day into the eight injection wells. The total water requirements for the Langlie-Jack waterflood will be approximately 15,000,000 barrels.

Q What source of water will you use?

A Currently three sources of water will be considered, a primary source and two alternates. Our primary source is produced water from Continental Oil Company's Wells B-1 No. 3 well located in Unit C of Section 1, Township 25 South, Range 36 East, approximately three miles southwest of the unit boundary. The Wells B-1 No. 3 is a producing oil well completed in the Seven Rivers formation of the Jalmat Pool.

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The first alternate source is the purchase of water from Skelly. Skelly has proposed a water line from their source water used in the Skelly Penrose "B" unit to the Dollarhide field, and this line will probably run within a mile of our unit boundary. The second alternate source is the development of Santa Rosa water. Produced water from the unit area will be reinjected.

Q Do you have a chemical analysis of the sources you have mentioned?

A Yes.

Q Other, of course, than the produce water?

A Yes. We have three exhibits, Exhibit No. 8 is an analysis of a representative sample of water produced from Continental's Wells B-1 No. 3 well and Exhibit No. 9 is an analysis of a representative sample of the water which will be supplied by Skelly Oil Company, and Exhibit No. 10 is an analysis of a representative sample of Santa Rosa water from the Langlie-Jack Unit Area.

Q Do you propose to use some water from the Langlie-Jack Unit Area?

A At present we expect to use a primary source from the Wells B-1 well which should serve as an adequate source.

Q Is it proposed compatible with the water formation, I mean?

A Yes, these waters are reported to be compatible. Skelly is currently injecting the water to be supplied by them in the Skelly "B" Unit in the Langlie-Mattix Pool and this water is from the same formation as the proposed water from Continental's Wells B-1 No. 3. Santa Rosa water is being injected into the Queen formation of the Langlie Mattix --

Q That's operated by Amerada?

A By Amerada.

Q Have these operators encountered any problems to your knowledge?

A No. We are not aware of any problems so far.

Q What waterflood allowable would you anticipate for this unit?

A There are 17 wells that will be in operation in this waterflood, each on a 40-acre tract, and based on the minimum waterflood allowable of 42 barrels per day as provided under Rule 701-E, a minimum waterflood unit allowable of 714 barrels per day would be anticipated. Under current regulations, a higher normal unit allowable would, of course, make the allowable proportionately higher. A normal unit allowable of 47 would provide a total allowable of 799 barrels of oil per day.

Q I take it, then, that you don't expect to use a pilot program in this waterflood project, do you?

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A No. The adjoining waterfloods have demonstrated the floodability of the Queen and Seven Rivers formation in the area. There appears to be no useful information which can be gained by installing a pilot.

Q In your opinion, will the granting of this application result in the protection of correlative rights and the prevention of waste?

A Yes. It is well recognized that unit operations protect correlative rights and that secondary recovery operations recover additional oil which otherwise would not be recovered.

Q Were Exhibits 2 through 10 prepared by you or under your supervision?

A Yes, Sir.

MR. KELLAHIN: At this time I would like to offer Exhibits 2 through 10 inclusive.

MR. UTZ: Without objection, Exhibit A's attachments 2 through 10 will be entered into the record of this case.

(Whereupon, Applicant's Exhibit A's attachments 2 through 10 were offered and admitted in evidence.)

Q (By Mr. Kellahin) Do you have any other comments for the Examiner, Mr. Woodward?

A Yes. As previously mentioned, it is anticipated that a few wells within the boundary of the proposed peripheral

injection pattern will be converted to injection at a later date. These conversions will be needed to assure maximum sweep of the unitized area. In view of this fact, it is requested that the order contain provisions which will permit administrative approval for converting additional wells to injection status and altering the proposed injection pattern. Such a procedure would permit modification without the necessity of additional hearings.

Q I would like to turn back for a moment, if we may, to your Exhibit No. 4 and the attached exhibits, showing the proposed completion of your injection wells, from the water analysis that has been offered it would indicate that some of the water, at least, that you will utilize will be corrosive, is that correct?

A No, I believe that the analyses show that the chlorides are relatively low and would not be too corrosive.

Q Then you don't anticipate any corrosion problem?

A No, sir. Well, we will treat the injection water but we don't plan to protect the two-inch string.

Q You don't see any necessity for using a line tube?

A No, sir.

Q Not at the present time?

A No.

Q Would you make any test to determine if corrosion is

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Q I would like to turn back for a moment, if we may, to your Exhibit No. 4 and the attached exhibits, showing the proposed completion of your injection wells, from the water analysis that has been offered it would indicate that some of the water, at least, that you will utilize will be corrosive, is that correct?

A No, I believe that the analyses show that the chlorides are relatively low and would not be too corrosive.

Q Then you don't anticipate any corrosion problem?

A No, sir. Well, we will treat the injection water but we don't plan to protect the two-inch string.

Q You don't see any necessity for using a lined tube?

A No, sir.

Q Not at the present time?

A No.

Q Would you make any test to determine if corrosion is

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occurring?

A Well, we will run regular periodic tests on the water for both corrosion and bacteria and all other treatment.

Q And all the water that you utilize will be treated before injection?

A Yes, sir.

MR. KELLAHIN: That's all I have on direct examination.

CROSS EXAMINATION

BY MR. UTZ:

Q Could you state whether or not, Mr. Woodward, you would reinject produced water?

A Yes, sir. As soon as the line becomes sufficient we will reinject all the produced water.

Q How will that water be as far as salinity and corrosive characteristics are concerned?

A We will already be treating and it may be necessary to alter out inhibition treatment of the commingled waters for reinjection; if we find that the problem does become more severe, then naturally we will take other measures.

Q As I understand it, all these injection wells will have tubing or will be injecting water under a packer?

A That is correct.

Q Do you intend to use any inert fluid in the annulus?

A We are not intending to do that unless we find it

becomes necessary from our analysis of our performance in water handling.

Q Do you have any objection to using inert fluid in the annulus?

A No, sir.

MR. UTZ: Other questions of the witness? I notice you have a letter in the file from the State Engineer saying that they received all your exhibits and gratefully acknowledge them. I presume that he has no objection since he's not here.

Are there any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Are there any statements in the case?
The case will be taken under advisement.

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I N D E X

WITNESS

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VICTOR T. LYON

Direct Examination by Mr. Kellahin

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C. C. WOODWARD

Direct Examination by Mr. Kellahin

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Cross Examination by Mr. Utz

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EXHIBITS

MARKED

OFFERED AND
ADMITTED

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A-1-1 through 10

2

A & A-1-1
2-10

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 3rd day of July, 1967.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 360 B. & 4 held by me on June 28, 1967.
[Signature] Examiner
New Mexico Oil Conservation Commission.

UNIT AGREEMENT

LANGLIE JACK UNIT

LEA COUNTY, NEW MEXICO

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Cont EXHIBIT NO. A
CASE NO. 3603-3604

1B parts.

3/29/67

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UNIT AGREEMENT

LANGLIE JACK UNIT

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UNIT AGREEMENT
FOR THE DEVELOPMENT AND OPERATION OF THE
LANGLIE JACK UNIT
LEA COUNTY, NEW MEXICO

NO. _____

THIS AGREEMENT, entered into as of the 18th day of April, 1967, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as "parties hereto";

WITNESSETH: That,

WHEREAS, the parties hereto are the owners of working royalty or other oil or gas interest in the Unit Area subject to this Agreement; and

WHEREAS, the Oil Conservation Commission of the State of New Mexico is authorized by law (Chap. 72, Laws of 1935, as amended by Chap. 193, Laws of 1937, Chap. 166, Laws of 1941, and Chap. 168, Laws of 1949, Chap. 65, Art. 3, Sec. 14, N.M.S., 1953 anno) to approve this Agreement, and the conservation provisions hereof; and

WHEREAS, the Mineral Leasing Act of February 25, 1920, 41 Stat. 437, as amended, 30 U.S.C. Sections 181 et seq., authorizes Federal lessees and their representatives to unite with each other, or jointly or separately with others, in collectively adopting and operating a cooperative or unit plan of development or operation of any oil or gas pool, field or like area, or any part thereof for the purpose of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest; and

WHEREAS, the parties hereto hold sufficient interests in the Langlie Jack Unit Area covering the land hereinafter described to give reasonably effective control of operation therein; and

WHEREAS, it is the purpose of the parties hereto to enable institution and consummation of secondary recovery operations, conserve natural resources, prevent waste and secure the other benefits obtainable through development and operation of the area subject to this Agreement under the terms, conditions, and limitations herein set forth;

NOW, THEREFORE, in consideration of the premises and the promises herein contained, the parties hereto commit to this Agreement their entire respective interests in the below-defined Unit Area, and agree severally among themselves as follows:

SECTION 1. ENABLING ACT AND REGULATIONS. The Mineral Leasing Act of February 25, 1920, as amended, supra, and all valid pertinent regulations, including operating and unit plan regulations, theretofore issued thereunder and valid pertinent and reasonable regulations hereafter issued thereunder are accepted and made a part of this Agreement as to Federal lands, provided such regulations are not inconsistent with the terms of this Agreement; and, as to Non-Federal lands, the oil and gas operating regulations in effect as of the effective date hereof governing drilling and producing operations, not inconsistent with the terms hereof or the laws of the State in which the Non-Federal land is located, are hereby accepted and made a part of this Agreement.

SECTION 2. UNIT AREA AND DEFINITIONS. The area described by tracts in Exhibit B and depicted on Exhibit A

attached hereto is hereby designated and recognized as constituting the Unit Area, containing 680 acres, more or less, in Lea County, New Mexico. Said land is described as follows:

T-24-S R-37-E

Section 17	S/2 SE/4	80.00 ac
Section 20	E/2, E/2 NW/4, NW/4 NW/4	440.00 ac
Section 21	SW/4 NW/4, W/2 SW/4	120.00 ac
Section 29	NE/4 NE/4	40.00 ac

For the purpose of this Agreement, the following terms and expressions as used herein shall mean:

(a) "Commission" is defined as the Oil Conservation Commission of the State of New Mexico.

(b) "Director" is defined as the Director of the United States Geological Survey.

(c) "Secretary" is defined as the Secretary of the Interior of the United States of America.

(d) "Department" is defined as the Department of the Interior of the United States of America.

(e) "Supervisor" is defined as the Oil and Gas Supervisor of the United States Geological Survey.

(f) "Unitized Formation" is defined as the Seven Rivers and Queen formations, found between the subsurface depths of 2,737 feet and 3,503 feet, as shown on the Lane Wells Acoustilog run January 7, 1965, in the Continental Oil Company Jack B-26 No. 2 well, located 1,980 feet from the North line and 660 feet from the West line of Section 26, Township 24 South, Range 37 East, N.M.P.M.

(g) "Unitized Substances" means all oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate and all associated and constituent liquid or liquefiable hydrocarbons within or produced from the Unitized Formation, save and except, any part of any of the enumerated substances which are committed to a presently existing gas proration unit, the well for which is located outside of the Unit Area.

(h) "Tract" is defined as each parcel of land described as such and given a Tract number in Exhibit B.

(i) "Tract Participation" is defined as that percentage of Unitized Substances produced from the Unitized Formation which is allocated to a Tract under this Agreement.

(j) "Unit Participation," of each Working Interest Owner, is defined as the sum of the percentages obtained by multiplying such Working Interest Owner's fractional Working Interest in each tract by the Tract Participation of such Tract.

(k) "Working Interest" is defined as the right to search for, produce and acquire Unitized Substances whether held as an incident of ownership of mineral fee simple title under an oil and gas lease, or otherwise held.

(l) "Working Interest Owner" is defined as and shall mean any party hereto owning a Working Interest, including a carried working interest owner, whether by virtue of a lease, operating agreement, fee title or otherwise, whose interest is chargeable with and obligated to pay or bear, either in cash or out of production, or otherwise, all or a portion of the cost of drilling, developing and producing the Unitized Substances from the Unitized Formation and operating therefor hereunder. Any interest in Unitized Substances which is a Working Interest as of the date the owner thereof executes or ratifies this Agreement shall thereafter be treated as a Working Interest for all purposes of this Agreement.

(m) "Royalty Interest" or "Royalty" is defined as any interest other than a Working Interest in or right to receive a portion of the Unitized Substances or the proceeds thereof and includes the royalty interest reserved by the lessor by an oil and gas lease and any overriding royalty interest, oil payment interest, or any other payment or burden which does not carry with it the right to search for and produce Unitized Substances. "Basic Royalty Interest" is defined as the royalty interest reserved by the lessor by an oil and gas lease.

(n) "Lessee of Record" is defined as the holder of record title under a United States Oil and Gas Lease.

(o) "Royalty Owner" is defined as and shall mean the owner of a Royalty Interest.

(p) "Unit Operating Agreement" is defined as and shall mean any agreement or agreements (whether one or more) entered into (separately or collectively) by and between the Unit Operator and the Working Interest Owners as provided in Section 9, infra, and shall be styled "Unit Operating Agreement, Langlie Jack Unit, Lea County, New Mexico."

(q) "Paying Quantities" is defined as production of Unitized Substances in quantities sufficient to pay for the cost of producing same from wells on the Unitized Land.

(r) "Tract Acreage" is defined as the acreage within the Unit Area contained within a given tract committed hereto as shown on Exhibits A and B.

(s) "Unit Acreage" is defined as the acreage within the Unit Area contained within all tracts committed hereto as shown on Exhibits A and B.

(t) "Tract Cumulative Production" is defined as the total production of oil, in barrels, from the Unitized Formation from a given tract committed hereto from inception of production until January 1, 1965, as reported in the statistical reports of the New Mexico Oil and Gas Engineering Committee.

(u) "Unit Cumulative Production" is defined as the production of oil, in barrels, from the Unitized Formation from all tracts committed hereto from inception of production until January 1, 1965, as reported in the statistical reports of the New Mexico Oil and Gas Engineering Committee.

SECTION 3. EXHIBITS. Exhibit A attached hereto is a map showing the Unit Area and, to the extent known to the Unit Operator, the boundaries and identity of Tracts and leases in said Unit Area. Exhibit B attached hereto is a schedule showing, to the extent known to the Unit Operator, the acreage comprising each Tract, percentage ownership of each Working Interest Owner in each Tract, the Lessee of Record in each Tract, and the percentage of participation each Tract has in the Unit Area, together with the Royalty Interests in each Tract and the ownership thereof. Nothing herein or in said schedule or map shall be construed as a representation by any party hereto as to the ownership of any interest other than such interest or interests as are shown in said map or schedule as owned by such party.

Exhibits A and B shall be revised by the Unit Operator whenever changes render such revision necessary or when requested by the Supervisor, and not less than six copies thereof shall be filed with the Supervisor.

SECTION 4. EXPANSION. The above-described Unit Area may when practicable be expanded to include therein any additional Tract or Tracts regarded as reasonably necessary or advisable for the purposes of this Agreement. Such expansion shall be effected in the following manner:

(a) The Working Interest Owner or Owners of a Tract or Tracts desiring to commit such Tract or Tracts hereto shall file an application therefor with Unit Operator requesting such admission.

(b) Unit Operator shall circulate a notice to each Working Interest Owner of the proposed expansion, setting out the basis for admission, the proposed participation to be assigned to each such Tract, and other pertinent data. After negotiation (at Working Interest Owners' meeting or otherwise), if 90 per cent of the Working Interest Owners (on the basis of unit participation) have agreed to such commitment of such Tract or Tracts, then Unit Operator shall, after preliminary concurrence by the Director:

- (1) Prepare a notice of proposed expansion describing the contemplated changes in the boundaries of the Unit Area, the reason therefor, the basis for admission of the additional Tract or Tracts, the Tract Participation to be assigned each such Tract and the effective date thereof, preferably 7:00 a.m. of the first day of the second month following final approval thereof as herein provided; and
- (2) Furnish copies of said notice to the Supervisor, each Working Interest Owner, lessee, and lessor whose interests are affected (mailing copy of such notice to the last known address of each such Working Interest Owner), advising such parties that thirty (30) days will be allowed for submission to the Unit Operator of any objection to such proposed expansion; and
- (3) File, upon the expiration of said thirty (30) day period, as set out in (2) immediately above, the following: (i) Evidence as to mailing said notice of expansion; (ii) An application for such expansion in sufficient numbers for appropriate approval and distribution; and (iii) An instrument containing the appropriate joinders in compliance with the participation requirements of Section 14 (Tracts Qualified for Unit Participation) and Section 33 (Non-Joinder and Subsequent Joinder), *infra*; and (iv) A copy of all objections received.

The expansion shall, after due consideration of all pertinent information and upon approval by the Director and the Commission, become effective as of the date prescribed in

the notice thereof. The revised Tract Participations of the respective Tracts included within the Unit Area prior to such enlargement shall remain in the same ratio one to another.

SECTION 5. UNITIZED LAND AND UNITIZED SUBSTANCES.

All oil and gas in and under the land committed to this Agreement within and producible from the Unitized Formation are herein called Unitized Substances. All land committed to this Agreement as to the Unitized Formation shall constitute land referred to herein as Unitized Land or "land subject to this Agreement."

SECTION 6. UNIT OPERATOR. Continental Oil Company, a Delaware corporation, is hereby designated as Unit Operator, and by signing this instrument as Unit Operator it agrees and consents to accept the duties and obligations of Unit Operator for the operation, development and production of Unitized Substances as herein provided. Whenever reference is made herein to Unit Operator, such reference means the Unit Operator acting in that capacity and not as an owner of interests in Unitized Substances; and the term "Working Interest Owner" when used herein shall include or refer to Unit Operator as the owner of a Working Interest when such an interest is owned by it.

SECTION 7. RESIGNATION OR REMOVAL OF UNIT OPERATOR.

Unit Operator shall have the right to resign at any time, but such resignation shall not become effective so as to release Unit Operator from the duties and obligations of Unit Operator and terminate Unit Operator's rights as such for a period of six (6) months after written notice of intention to resign has been given by Unit Operator to all Working Interest Owners

and the Supervisor and until all unit wells are placed in a satisfactory condition for suspension, abandonment, or operations, whichever is required by the Supervisor and the Commission, unless a new Unit Operator shall have taken over and assumed the duties and obligations of Unit Operator prior to the expiration of said period.

The Unit Operator may, upon default or failure in the performance of its duties or obligations hereunder, be subject to removal by 75 per cent of the committed Working Interest Owners (on the basis of Unit Participation) exclusive of the Working Interest Owner who is the Unit Operator. Such removal shall be effective upon notice thereof to the Supervisor.

In all such instances of effective resignation or removal, until a successor to Unit Operator is selected and approved as hereinafter provided, the Working Interest Owners shall be jointly responsible for the performance of the duties of the Unit Operator and shall, not later than thirty (30) days before such resignation or removal becomes effective, appoint a Unit Manager to represent them in any action to be taken hereunder.

The resignation or removal of Unit Operator under this Agreement shall not terminate its right, title or interest as the owner of a Working Interest or other interest in Unitized Substances; but, upon the resignation or removal of Unit Operator becoming effective, such Unit Operator shall deliver possession of all equipment, books, and records, materials, appurtenances and any other assets, used in conducting the Unit operations and owned by the Working Interest Owners (including any and all

data and information which it might have gained or assembled by reason of its operation of the Unitized Land) to the new duly qualified successor Unit Operator or to the Unit Manager if no such new Unit Operator has been elected, to be used for the purpose of conducting Unit operations hereunder. Nothing herein shall be construed as authorizing removal of any material, equipment and appurtenances needed for the preservation of any wells. Nothing herein contained shall be construed to relieve or discharge any Unit Operator who resigns or is removed hereunder for any liability or duties accruing or performable by it prior to the effective date of such resignation or removal.

SECTION 8. SUCCESSOR UNIT OPERATOR. Whenever the Unit Operator shall tender its resignation as Unit Operator or shall be removed as hereinabove provided, the Working Interest Owners shall select a successor Unit Operator by a majority vote of the Working Interest Owners (on the basis of Unit Participation), provided no Working Interest Owner who has been removed as Unit Operator may vote for self-succession. Such selection shall not become effective until (a) a Unit Operator so selected shall accept in writing the duties and responsibilities of Unit Operator; and (b) the selection shall have been filed with the Supervisor. If no successor Unit Operator is selected and qualified as herein provided, the Director, at his election, may declare this Agreement terminated.

SECTION 9. ACCOUNTING PROVISIONS AND UNIT OPERATING AGREEMENT. Costs and expenses incurred by Unit Operator in conducting Unit operations hereunder shall be paid, apportioned among, and borne by the Working Interest Owners in accordance with the Unit Operating Agreement; however, no such Unit Operating

Agreement shall be deemed either to modify any of the terms and conditions of this Unit Agreement or to relieve the Unit Operator of any right or obligation established under this Agreement, and in case of any inconsistency or conflict between this Agreement and the Unit Operating Agreement, this Agreement shall prevail. Required copies of any Unit Operating Agreement executed pursuant to this section shall be filed with the Supervisor prior to approval of this Agreement.

SECTION 10. RIGHTS AND OBLIGATIONS OF UNIT OPERATOR.

Except as otherwise specifically provided herein, the exclusive right, privilege and duty of exercising any and all rights of the parties hereto which are necessary or convenient for prospecting for, producing, storing, allocating and distributing the Unitized Substances are hereby delegated to and shall be exercised by the Unit Operator as herein provided. Upon request, acceptable evidence of title to said rights shall be deposited with said Unit Operator and, together with this Agreement, shall constitute and define the rights, privileges, and obligations of Unit Operator. Nothing herein, however, shall be construed to transfer title to any land or to any lease or operating agreement, it being understood that under this Agreement the Unit Operator, in its capacity as Unit Operator, shall exercise the rights of possession and use vested in the parties hereto only for the purposes herein specified.

SECTION 11. EASEMENTS OR USE OF SURFACE.

(a) The parties hereto, to the extent of their rights and interests, hereby grant to Working Interest Owners the right to use as much of the surface of the land within the Unit Area as may reasonably be necessary for Unit operations except

a site for a water, gas injection, processing or other plant, or camp site.

(b) Working Interest Owners shall have free use of brine or water or both from the Unit Area for Unit operations, except water from any well, lake, pond, or irrigation ditch of a Surface Owner.

(c) Working Interest Owners shall pay the owner for damages to growing crops, timber, fences, improvements, and structures on the Unit Area that result from Unit operations.

SECTION 12. PLAN OF OPERATIONS. It is recognized

and agreed by the parties hereto that all of the land subject to this Agreement is reasonably proved to be productive of Unitized Substances in paying quantities and that the object and purpose of this Agreement is to formulate and to put into effect a secondary recovery project in order to effect the greatest economic recovery of Unitized Substances, prevent waste and conserve natural resources, consistent with good engineering practices expected of a prudent operator. The parties hereto agree that the Unit Operator may, subject to the consent to a plan of operation by the Working Interest Owners and approval by the Supervisor, inject into the Unitized Formation, through any well or wells completed therein, brine, water, air, gas, oil and any one or more other substances whether produced from the Unitized Land or not, and that the location of input wells and the rates of injection therein shall be governed by standards of good engineering practices and conservation methods. After commencement of secondary operations, Unit Operator shall furnish the Supervisor monthly injection and production reports for each well in the Unit. The Working Interest Owners

and the Supervisor shall be furnished periodic reports on the progress of the plan of operation and any revisions or changes thereto; provided, however, that any major revisions of the plan of operation involving a basic deviation from the initial plan of operation shall be subject to the approval of the Working Interest Owners and the Supervisor.

The initial plan of operation shall be filed with the Supervisor concurrently with the filing of this Unit Agreement for final approval. Said plan of operation and all revisions thereof shall be as complete and adequate as the Supervisor may determine to be necessary for timely operation consistent herewith. Thereafter, from time to time before the expiration of any existing plan, the Unit Operator shall submit for like approval a plan for an additional specified period of operation. Reasonable diligence shall be exercised in complying with the obligations of the approved plan of operation.

Notwithstanding anything to the contrary herein contained, the Unit Operator shall commence operations for the secondary recovery of Unitized Substances from the Unit Area within six (6) months after the effective date of this Agreement, or any extension thereof approved by the Supervisor. After such operations are commenced, Unit Operator shall carry on such operations as would a reasonably prudent operator under the same or similar circumstances.

SECTION 13. TRACT PARTICIPATION.

In Exhibit B attached hereto there are listed and numbered the various Tracts within the Unit Area, and set forth opposite each Tract is the Tract Participation of each Tract in the Unit Area calculated on the basis of 100 per cent

commitment. The Tract Participation of each Tract was determined by the following formula:

Percentage of Tract Participation =

$$25\% \times \frac{\text{Tract Acreage}}{\text{Unit Acreage}}$$

+

$$75\% \times \frac{\text{Tract Cumulative Production}}{\text{Unit Cumulative Production}}$$

In the event less than all of the Tracts within the Unit Area are qualified for unit participation as of the effective date hereof, Unit Operator shall, as soon as practicable after said effective date, prepare a revised Exhibit B setting forth the qualified Tracts and showing the revised Tract Participation of each committed Tract, which Tract Participation shall be calculated and determined by using the factors and formulas set forth above, but applying the same only to the qualified Tracts. Unit Operator shall promptly file copies of such revised Exhibit B with the Supervisor and, unless such revised Exhibit B is disapproved by the Supervisor within thirty (30) days after such filing, the revised Exhibit B shall be effective as of the effective date of this Agreement, and shall thereafter govern the allocation of all Unitized Substances, subject, however, to any further revision or revisions of Exhibit B in accordance with the provisions hereof.

Any Tract within the Unit Area not committed on the effective date hereof may thereafter be committed hereto in the following manner: The owner or owners of the Working Interest in such Tract shall initiate a request directed to Unit Operator for the commitment thereof hereto and such owner or owners, committed Working Interest Owners, and Unit Operator

shall thereupon seek to determine the basis therefor, including a Tract Participation for such Tract and any appropriate adjustments of investments. When such matters have been agreed upon by the required vote of Working Interest Owners, as provided for in the Unit Operating Agreement, and upon compliance with the applicable provisions of Sections 14 (Tracts Qualified for Unit Participation) and 33 (Non-Joinder and Subsequent Joinder), then Unit Operator shall file with the Supervisor the required copies of the instruments of joinder and the revised Exhibit B, showing the revised Tract Participation; and, upon approval by the Director or the Supervisor, such commitment shall be effective at 7 a.m. on the first day of the month following filing in the Supervisor's office. In any such event, the revised Tract Participations of the respective Tracts entitled to participation prior to such subsequent commitment shall remain in the same ratio one to another.

SECTION 14. TRACTS QUALIFIED FOR UNIT PARTICIPATION.

As the objective of this Unit Agreement is to have lands in the Unit Area operated and entitled to participation under the terms hereof, it is agreed that, notwithstanding anything herein to the contrary, no joinder shall be considered a commitment to this Unit Agreement unless the Tract involved is qualified under this Section 14.

(1) On and after the effective date hereof the Tracts qualified for Unit Participation hereunder shall be the Tracts that qualify as follows:

(a) Each tract as to which Working Interest Owners owning 100% of the Working Interest have become committed

to this agreement and as to which (i) Royalty Owners under oil and gas leases on fee land owning seventy-five per cent (75%) or more of the Basic Royalty Interest; or (ii) Lessees of Record owning seventy-five per cent (75%) or more of the record title interest, whichever is applicable, have become parties to this Agreement.

(b) Each Tract as to which Working Interest Owners owning one hundred per cent (100%) of the Working Interest have become committed to this Agreement and as to which Royalty Owners under oil and gas leases on fee land owning less than seventy-five per cent (75%) of the Basic Royalty Interest or Lessees of Record owning less than seventy-five per cent (75%) of the record title interest have become parties to this Agreement and as to which (i) all Working Interest Owners in such Tract have joined in a request for the commitment of such Tract to the Unit Agreement, and as to which (ii) seventy-five per cent (75%) of the combined voting interests of Working Interest Owners in all Tracts that meet the requirements of Section 14(1)(a) have voted in favor of the commitment of such Tract.

For the purpose of this Section 14(1)(b), the voting interest of a Working Interest Owner shall be equal to the ratio that its Unit Participation attributable to Tracts that qualify under Section 14(1)(a) bears to the total Unit Participation of all Working Interest Owners attributable to all Tracts

that qualify under Section 14(1)(a).

(c) Each Tract as to which Working Interest Owners owning less than one hundred per cent (100%) of the Working Interest have become committed to this Agreement regardless of the percentage of Royalty Owner or Lessee of Record commitment hereto, and as to which (i) the Working Interest Owner who operates the Tract and all of the other Working Interest Owners in such Tract who have become committed to this Agreement have joined in a request for commitment of such Tract to the Unit Agreement, and have executed and delivered an indemnity agreement indemnifying and agreeing to hold harmless the other Working Interest Owners in the Unit Area, their successors and assigns, against all claims and demands that may be made by the owners of Working Interests in such Tract who are not parties to this Agreement, and which arise out of the commitment of the Tract to this Unit Agreement; and as to which (ii) seventy-five per cent (75%) of the combined voting interest of Working Interest Owners in all Tracts that meet the requirements of Section 14(1)(a) and 14(1)(b) have voted in favor of the commitment of such Tract and to accept the indemnity agreement.

For the purpose of this Section 14(1)(c), the voting interest of each Working Interest Owner shall be equal to the ratio that its Unit Participation attributable to Tracts that qualify under

Section 14(1) (a) and 14(1) (b) bears to the total Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Section 14(1) (a) and 14(1) (b). Upon the commitment of such a Tract to this Unit Agreement, the Unit Participation that would have been attributed to the non-subscribing owners of the Working Interest in such Tract, had they become parties to this Agreement and the Unit Operating Agreement, shall be attributed to the Working Interest Owners in such Tract who have become parties to such agreements, in proportion to their respective Working Interests in the Tract.

SECTION 15. ALLOCATION OF UNITIZED SUBSTANCES.

All Unitized Substances produced and saved (less, save and except any part of such Unitized Substances used in conformity with good operating practices on Unitized Land for drilling, operating, camp, and other production or development purposes and for pressure maintenance or unavoidable loss) shall be apportioned among and allocated to the committed Tracts within the Unit Area in accordance with the respective Tract Participation effective hereunder during the respective periods such Unitized Substances were produced, as set forth in the then effective schedule of participation in Exhibit B. The amount of Unitized Substances so allocated to each Tract (regardless of whether it be more or less than the amount of the actual production of Unitized Substances from the well or wells, if any, on such Tract) shall, for all intents, uses and purposes, be deemed to have been produced from such Tract.

The Unitized Substances allocated to each Tract shall be distributed among, or accounted for to, the parties executing, consenting to or ratifying this Agreement entitled to share in the production from such Tract in the same manner, in the same proportions, and upon the same conditions, as they would have participated and shared in the production from such Tracts, or in the proceeds thereof, had this Agreement not been entered into, and with the same legal force and effect.

No Tract committed to this Agreement and qualified for participation as above provided shall be subsequently excluded from participation hereunder on account of depletion of Unitized Substances; and nothing herein contained shall be construed as requiring any retroactive adjustment for production obtained prior to the effective date of the joinder of any Tract.

If the Working Interest and the Royalty Interest in any Tract are or become divided with respect to separate parcels or portions of such Tract and owned severally by different persons, the Tract Participation assigned to such Tract shall, in the absence of a recordable instrument executed by all owners and furnished to Unit Operator fixing the divisions of ownership, be divided among such parcels or portions in proportion to the number of surface acres in each.

The Unitized Substances allocated to each Tract shall be delivered in kind to the respective Working Interest Owners and parties entitled thereto by virtue of the ownership of oil and gas rights therein. Each Working Interest Owner and the parties entitled thereto shall have the continuing right to receive such production in kind at a common point within the

Unit Area and to sell or dispose of the same as it sees fit. Each such party shall have the right to construct, maintain and operate all necessary facilities for that purpose on Unitized Land, provided the same are so constructed, maintained and operated as not to interfere with operations carried on pursuant hereto. Subject to Section 16 (Royalty Settlement) hereof, any extra expenditure incurred by Unit Operator by reason of the delivery in kind of any portion of the Unitized Substances shall be borne by the party receiving the same in kind.

In the event any party hereto shall fail to take or otherwise adequately dispose of its proportionate share of the Unitized Substances as and when produced, then, so long as such conditions continue, Unit Operator, for the account and at the expense of such party and in order to avoid curtailing the operation of the Unit Area, may sell or otherwise dispose of such production to itself or others on a day-to-day basis at not less than the prevailing market price in the area for like production; and the account of such party shall be charged therewith as having received such production. The net proceeds, if any, of the Unitized Substances so disposed of by Unit Operator shall be paid to the party entitled thereto; provided, however, Unit Operator shall not make a sale into interstate commerce of any Working Interest Owner's share of gas production without first giving such Working Interest Owner sixty (60) days' notice of such intended sale.

The Working Interest Owners of each Tract shall be responsible for the payment of all Royalty on or affecting such Tract; and each such party shall hold each other party hereto

harmless against all claims, demands and causes of action for such Royalty.

If, after the effective date of this Agreement, there is any Tract or Tracts that are subsequently committed hereto, as provided in Section 4 (Expansion), Section 13 (Tract Participation), and Section 33 (Non-Joinder and Subsequent Joinder) hereof, or if any Tract is excluded from the Unit Area as provided for in Section 32 (Loss of Title), the schedule of participation as shown in the current Exhibit B shall be revised by the Unit Operator and distributed to the Working Interest Owners, the Supervisor, and the Director to show the new percentage participation of all the committed Tracts; and the revised schedule, upon approval by the Working Interest Owners, the Supervisor under Section 32 (Loss of Title), or the Director under Section 4 (Expansion) and Section 33 (Non-Joinder and Subsequent Joinder) shall govern all the allocation of Unitized Substances from and after the effective date thereof until the effective date of a new schedule so approved. The Tract Participations of all Tracts participating prior to any such revision shall remain in the same ratio one to the other.

SECTION 16. ROYALTY SETTLEMENT. The United States of America and all Royalty Owners who, under an existing contract, are entitled to take in kind a share of the Unitized Substances produced from any Tract unitized hereunder, shall continue to be entitled to such right to take in kind their share of the Unitized Substances allocated to such Tract, and Unit Operator shall make deliveries of such Royalty share taken in kind in conformity with the applicable contracts,

laws and regulations. Settlement for Royalty Interest not taken in kind shall be made by Working Interest Owners responsible therefor under existing contracts, laws and regulations, on or before the last day of each month for Unitized Substances produced during the preceding calendar month; provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any Royalty due under their leases, except that such Royalty shall be computed in accordance with the terms of this Unit Agreement.

If gas obtained from lands not subject to this Agreement is introduced into the Unitized Formation for use in repressuring, stimulation or production or increasing ultimate recovery in conformity with a plan approved pursuant to Section 12 (Plan of Operations), a like amount of gas, less appropriate deductions for loss from any cause, may be withdrawn from the Unitized Formation, Royalty free as to dry gas but not as to the products extracted therefrom; provided such withdrawal shall be pursuant to such conditions and formulas as may be prescribed or approved by the Supervisor, and provided further that such right of withdrawal shall terminate as of the effective date of termination of the Unit Agreement.

All Royalty due the United States of America and the other Royalty Owners hereunder shall be computed and paid on the basis of all Unitized Substances allocated to the respective Tract or Tracts committed hereto, in lieu of actual production from such Tract or Tracts.

Royalty due the United States shall be computed as provided in the operating regulations and paid in value or delivered in kind as to all Unitized Substances on the basis of the amounts thereof allocated to unitized Federal land as provided herein at the rates specified in the respective Federal leases, or at such lower rate or rates as may be authorized by law or regulation; provided that, for leases on which the Royalty Rate depends on the daily average production per well, said average production shall be determined in accordance with the operating regulations as though the Unitized Land were a single consolidated lease.

Each Royalty Owner (other than the United States of America) that executes this Agreement represents that it is the owner of a Royalty Interest in a Tract or Tracts within the Unit Area as its interest appears in Exhibit B attached hereto. If any Royalty Interest in a Tract or Tracts should be lost by title failure or otherwise, in whole or in part, during the term of this Agreement, then the Royalty Interest of the party representing himself to be the owner thereof shall be reduced proportionately and the interest of all parties in the affected Tract or Tracts shall be adjusted accordingly.

SECTION 17. RENTAL SETTLEMENT. Rentals or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefor under existing contracts, laws and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof due under their leases. Rental or minimum royalty for lands of the United

States of America subject to this Agreement shall be paid at the rate specified in the respective leases from the United States of America, unless rental or minimum royalty is waived, suspended, or reduced by law or by approval of the Secretary or his duly authorized representative.

SECTION 18. CONSERVATION. Operations hereunder and production of Unitized Substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by or pursuant to Federal and State laws and regulations.

SECTION 19. DRAINAGE. The Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from Unitized Land by wells on land not subject to this Agreement.

SECTION 20. LEASES AND CONTRACTS CONFORMED AND EXTENDED. The terms, conditions and provisions of all leases, subleases and other contracts relating to exploration, drilling, development or operation for oil or gas on lands committed to this Agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect; and the parties hereto hereby consent that the Secretary shall, and by his approval hereof, or by the approval hereof by his duly authorized representatives, does hereby establish, alter, change or revoke the drilling, producing, rental, minimum royalty and royalty requirements of Federal leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this Agreement.

Without limiting the generality of the foregoing, all leases, subleases and contracts are particularly modified

in accordance with the following:

(a) The development and operation of lands subject to this Agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned tract subject to this Agreement, regardless of whether there is any development of any particular part or Tract of the Unit Area, notwithstanding anything to the contrary in any lease, operating agreement or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.

(b) Drilling, producing or secondary recovery operations performed hereunder upon any Tract of Unitized Land shall be accepted and deemed to be performed upon and for the benefit of each and every Tract of Unitized Land, and no lease shall be deemed to expire by reason of failure to drill or produce wells situated on land therein embraced.

(c) Suspension of drilling or producing operations on all Unitized Land pursuant to direction or consent of the Supervisor or his duly authorized representatives shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every Tract of Unitized Land.

(d) Each lease, sublease, or contract relating to the exploration, drilling, development or operation for oil and gas which by its terms might expire prior to the termination of this Agreement is hereby extended beyond any such term so provided therein, so that it shall be continued in full force and effect for and during the term of this Agreement.

(e) Termination of this Agreement shall not affect any lease which, pursuant to the terms thereof or any applicable laws, shall continue in force and effect thereafter.

(f) The segregation of any Federal lease committed to this Agreement is governed by the following provision in the fourth paragraph of Sec. 17(j) of the Mineral Leasing Act, as amended by the Act of September 2, 1960 (74 Stat. 781-784);

"Any (Federal) lease heretofore or hereafter committed to any such (unit) plan embracing lands that are in part within and in part outside of the area covered by any such plan shall be segregated into separate leases as to the lands committed and the lands not committed as of the effective date of unitization: Provided, however, that any such lease as to the non-unitized portion shall continue in force and effect for the term thereof but for not less than two years from the date of such segregation and so long thereafter as oil or gas is produced in paying quantities."

SECTION 21. CORRECTION OF ERRORS. It is hereby agreed by all parties to this Agreement that Unit Operator is empowered to correct any mathematical or clerical errors

which may exist in the pertinent exhibits to this Agreement; provided, however, that correction of any error other than mathematical or clerical shall be made by Unit Operator only after first having obtained approval of Working Interest Owners and the Supervisor.

SECTION 22. COVENANT RUN WITH LAND. The covenants herein shall be construed to be covenants running with the land with respect to the interest of the parties hereto and their successors in interest until this Agreement terminates; and any grant, transfer or conveyance of interest in land or leases subject hereto shall be, and hereby is, conditioned upon the assumption of all privileges and obligations hereunder by the grantee, transferee or other successor in interest. No assignment or transfer of any Working Interest subject hereto shall be binding upon Unit Operator until the first day of the calendar month after Unit Operator is furnished with the original, or acceptable photostatic or certified copy, of the recorded instrument of transfer; and no assignment or transfer of any Royalty Interest subject hereto shall be binding upon the Working Interest Owner responsible therefor until the first day of the calendar month after said Working Interest Owner is furnished with the original, or acceptable photostatic or certified copy, of the recorded instrument of transfer.

SECTION 23. WAIVER OF RIGHT TO PARTITION. Each party hereto covenants that, during the existence of this Agreement, it will not resort to any action to partition the Unit Area as to the Unitized Formation or the Unit Equipment, and to that extent waives the benefits of all laws authorizing such partition.

SECTION 24. EFFECTIVE DATE AND TERM. This Agreement shall become binding upon each party who executed or ratified it as of the date of execution or ratification by such party and shall become effective as of 7 a.m. on the first day of the month next following:

(a) The execution or ratification of this Agreement and the Unit Operating Agreement by Working Interest Owners sufficiently to commit under Section 14 (Tracts Qualified for Unit Participation) hereof 85% (measured by surface area) of the lands comprising the Unit Area; and

(b) The approval of this Agreement by the Director and the Commission; and

(c) The filing of at least one counterpart of this Agreement for record in the office of the County Clerk of Lea County, New Mexico, by the Unit Operator; and provided, further, that if (a), (b) and (c) above are not accomplished on or before January 1, 1968, this Agreement shall ipso facto expire on said date (hereinafter called "expiration date") and thereafter be of no further force or effect, unless prior thereto Working Interest Owners owning a combined Unit Participation of at least 75% have become parties to this Agreement and have decided to extend the expiration date for a period not to exceed six (6) months. If the expiration date is so extended and requirements of Section 24(a) are not accomplished on or before the extended expiration date, this Agreement shall ipso facto expire on the extended expiration date and thereafter be of no further effect. For the purpose of this section, Unit Participation shall be as shown on the original Exhibit B attached to the Unit Agreement.

(d) Unit Operator shall, within thirty (30) days after the effective date of this Agreement, file for record in the county records where a counterpart of this Agreement is recorded a certificate to the effect that this Agreement has become effective according to its terms and stating further the effective date.

The term of this Agreement shall be for and during the time that Unitized Substances are or can be produced in paying quantities from the Unitized Land and as long thereafter as drilling, reworking or other operations (including secondary recovery operations) are prosecuted thereon without cessation of more than ninety (90) consecutive days, and so long thereafter as Unitized Substances can be produced as aforesaid.

Termination under the above paragraph shall be effective as of the first day of the month after the Unit Operator determines, on confirmatory data satisfactory to the Director, that the unit is no longer paying.

This Agreement may be terminated by Working Interest Owners owning 90% Unit Participation at any time for any other reason, with the approval of the Director. Notice of any such termination shall be given by Unit Operator to all parties hereto.

Upon termination of this Agreement, Unit operations shall cease, and thereafter the parties hereto shall be governed by the terms and provisions of the leases and contracts affecting the separate tracts.

If not otherwise covered by the leases unitized under this Agreement, Royalty Owners hereby grant Working Interest Owners a period of six (6) months after termination of this Agreement in which to salvage, sell, distribute or otherwise dispose of the personal property and facilities used in connection with Unit operations.

SECTION 25. RATE OF PROSPECTING, DEVELOPMENT AND PRODUCTION. All production and the disposal thereof shall be in conformity with allocations and quotas made or fixed by any duly authorized person or regulatory body under any federal or state statute. The Director is hereby vested with authority to alter or modify from time to time, in his discretion, the rate of prospecting and development and within the limits made or fixed by the Commission to alter or modify the quantity and rate of production under this Agreement, such authority being hereby limited to alteration or modification in the public interest, the purpose thereof, and the public

interest to be served thereby to be stated in the order of alteration or modification; provided, further, that no such alteration or modification shall be effective as to any privately owned lands subject to this Agreement as to the quantity and rate of production in the absence of specific written approval thereof by the Commission.

Powers in this Section vested in the Director shall only be exercised after notice to Unit Operator and opportunity for hearing to be held not less than fifteen (15) days from notice.

SECTION 26. NON-DISCRIMINATION. In connection with the performance of work under this Agreement, the Operator agrees to comply with all of the provisions of Section 202, (1) to (7) inclusive, of Executive Order 11246 (30 F.R. 12319), which are hereby incorporated by reference in this Agreement.

SECTION 27. APPEARANCES. Unit Operator shall, after notice to other parties affected, have the right to appear for or on behalf of any and all interests affected hereby before the Department, and the Commission, and to appeal from any order issued under the rules and regulations of the Department or the Commission, or to apply for relief from any of said rules and regulations or in any proceedings relative to operations before the Department or the Commission, or any other legally constituted authority; provided, however, that any other interested party shall also have the right at his or its own expense to be heard in any such proceeding.

SECTION 28. NOTICES. All critical notices, demands, objections or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given

if made in writing and personally delivered to the party or parties or sent by registered or certified mail, addressed to such party or parties at their respective addresses set forth in connection with the signatures hereto or to the ratification or consent hereof or to such other address as any such party or parties may have furnished in writing to the party sending the notice, demand or statement. All other matter shall be forwarded to the parties hereto by postpaid mail addressed in a like manner as hereinabove required.

SECTION 29. NO WAIVER OF CERTAIN RIGHTS. Nothing in this Agreement contained shall be construed as a waiver by any party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the State wherein said Unitized Land is located, or rules or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive.

SECTION 30. EQUIPMENT AND FACILITIES - FIXTURES ATTACHED TO REALTY. Each Working Interest Owner has heretofore placed and used on its Tract or Tracts committed to this Agreement various well and lease equipment and other property, equipment and facilities. It is also recognized that additional equipment and facilities may hereafter be placed and used upon the Unit Area as now or hereafter constituted. Therefore, for all purposes of this Agreement, any and all such equipment shall be considered to be personal property and not fixtures attached to realty. Accordingly, said well and lease equipment and personal property is hereby severed from the mineral estates

affected by this Agreement; and it is agreed that any and all such equipment and personal property shall be and remain personal property for all purposes.

SECTION 31. UNAVOIDABLE DELAY. All obligations under this Agreement requiring the Unit Operator to commence or continue secondary recovery operations or to operate on or produce Unitized Substances from any of the lands covered by this Agreement shall be suspended while, but only so long as, the Unit Operator, despite the exercise of due care and diligence, is prevented from complying with such obligations, in whole or in part, by strikes, acts of God, Federal, State or municipal law or agency, unavoidable accident, uncontrollable delays in transportation, inability to obtain necessary materials in open market, or other matters beyond the reasonable control of the Unit Operator whether similar to matters herein enumerated or not.

SECTION 32. LOSS OF TITLE. In the event title to the Working Interest in any Tract of Unitized Land shall fail so as to render the Tract inoperable under this Agreement and the true owner cannot be induced to join this Unit Agreement, such Tract shall be automatically regarded as not committed hereto effective as of 7 a.m. or the first day after such title failure is determined, and there shall be such re-adjustment of future costs and benefits as may be required on account of the loss of such title. In the event of a dispute as to title as to any Royalty, Working Interest or other interest subject thereto, payment or delivery on account thereof may be withheld without liability or interest until the dispute is finally settled; provided that, as to Federal

land or leases, no payments of funds due the United States of America shall be withheld, but such funds shall be deposited as directed by the Supervisor, to be held as unearned money pending final settlement of the title dispute, and then applied as earned or returned in accordance with such final settlement.

Unit Operator as such is relieved from any responsibility for any defect or failure of any title hereunder.

SECTION 33. NON-JOINDER AND SUBSEQUENT JOINDER.

Joinder by any Royalty Owner, at any time, must be accompanied by appropriate joinder of the corresponding Working Interest Owner in order for the interest of such Royalty Owner to be regarded as effectively committed. Joinder to the Unit Agreement by a Working Interest Owner, at any time, must be accompanied by appropriate joinder to the Unit Operating Agreement in order for such interest to be regarded as committed to this Unit Agreement.

Any oil or gas interest in the Unitized Formation underlying the Unit Area not committed hereto prior to submission of this Agreement to the Director for final approval may thereafter be committed hereto upon compliance with the applicable provisions of this Section and of Section 14. (Tracts Qualified for Unit Participation) hereof, at any time up to the effective date hereof on the same basis of participation as provided in said Section 14, by the owner or owners thereof subscribing, ratifying, or consenting in writing to this Agreement and, if the interest is a Working Interest, by the owner of such interest subscribing also to the Unit Operating Agreement.

It is understood and agreed, however, that from and after the effective date hereof the right of subsequent joinder by a Working Interest Owner, as provided in this Section, shall be governed by the provisions of Section 4 (Expansion) and of Section 13 (Tract Participation). Except as may be otherwise herein provided, subsequent joinder as to Tracts within the Unit Area shall be effective as of 7 a.m. of the first day of the month following the filing with the Supervisor of duly executed counterparts of any and all documents necessary to establish effective commitment of his interest to this Agreement.

SECTION 34. PRODUCTION AS OF THE EFFECTIVE DATE.

(a) Oil in Lease Tankage on Effective Date.

Unit Operator shall make a proper and timely gauge of all lease and other tanks on Unitized Land in order to ascertain the amount of merchantable oil above the pipe line connection in such tanks as of 7 a.m. on the effective date hereof. All such oil which has then been produced legally shall be and remain the property of the Working Interest Owner entitled thereto the same as if the Unit had not been formed; and such Working Interest Owner shall promptly remove said oil from the Unitized Land. Any such oil not so removed shall be sold by Unit Operator for the account of such Working Interest Owner, subject to the payment of all Royalty to Royalty Owners under the terms and provisions of the Unit Agreement and any applicable lease or leases and other contracts. The oil that is in excess of the prior allowable of the wells from which it was produced shall be regarded as Unitized Substances produced after the effective date hereof.

(b) Overproduction. If, as of the effective date hereof, any Tract within the Unit Area is overproduced

with respect to the allowable of the wells on such Tract and the amount of overproduction has been sold or otherwise disposed of, such overproduction shall be regarded as a part of the Unitized Substances produced after the effective date hereof and shall be charged to such Tract as having been delivered to the parties entitled to Unitized Substances allocated to such Tract.

SECTION 35. COUNTERPARTS. This Agreement may be executed in any number of counterparts, no one of which needs to be executed by all parties, and may be ratified or consented to by separate instrument in writing specifically referring hereto, and shall be binding upon all those parties who have executed such a counterpart, ratification or consent hereto with the same force and effect as if all parties had signed the same document, and regardless of whether or not it is executed by all other parties owning or claiming an interest in the lands within the above-described Unit Area.

SECTION 36. TAXES. Each party hereto shall, for its own account, render and pay its share of any taxes levied against or measured by the amount or value of the Unitized Substances produced from the Unitized Land; provided, however, that, if it is required or if it be determined that the Unit Operator or the several Working Interest Owners must pay or advance said taxes for the account of the parties hereto, it is hereby expressly agreed that the parties so paying or advancing said taxes shall be reimbursed therefor by the parties hereto, including Royalty Owners, who may be responsible for the taxes on their respective allocated share of said Unitized Substances. No such taxes shall be charged to the United States or to any lessor who has a contract with a lessee which requires

his lessee to pay such taxes.

SECTION 37. CONFLICT OF SUPERVISION. Neither the Unit Operator nor the Working Interest Owners, nor any of them, shall be subject to any forfeiture, termination or expiration of any rights hereunder or under any leases or contracts subject hereto, or to any penalty or liability on account of delay or failure in whole or in part to comply with any applicable provisions thereof to the extent that the said Unit Operator or the Working Interest Owners, or any of them, are hindered, delayed or prevented from complying therewith by reason of failure of the Unit Operator to obtain, in the exercise of due diligence, the concurrence of proper representatives of the United States and proper representatives of the State of New Mexico in and about any matters or things concerning which it is required herein that such concurrence be obtained. The parties hereto, including the Commission, agree that all powers and authority vested in the Commission in and by any provisions of this Agreement are vested in the Commission and shall be exercised by it pursuant to the provisions of the laws of the State of New Mexico and subject in any case to appeal or judicial review as may now or hereafter be provided by the laws of the State of New Mexico.

SECTION 38. NO PARTNERSHIP. It is expressly agreed that the relation of the parties hereto is that of independent contractors, and nothing in this Agreement contained, express or implied, or any operations conducted hereunder, shall create or be deemed to have created a partnership or association between the parties hereto or any of them.

SECTION 39. BORDER AGREEMENTS. Subject to the approval of the Supervisor, the Unit Operator, with concurrence of 75% of the voting interest of the Working Interest Owners, may enter into a border-protection agreement or agreements with the Working Interest Owners of adjacent lands along the exterior boundary of the Unitized Land with respect to the operations in the border area for the maximum ultimate recovery, conservation purposes and proper protection of the parties and interests.

SECTION 40. LIMITATION OF APPROVALS. Notwithstanding anything herein contained to the contrary, if no Federal lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Department, the Secretary, the Director, or the Supervisor, and it shall not be necessary to file any instrument hereunder with said officers or agencies unless and until Federal lands are so committed to this Agreement; likewise, if no fee lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Commission, and it shall not be necessary to file any instrument hereunder with said office unless and until fee lands are so committed to this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and have set opposite their respective names the date of execution.

ATTEST:

Secretary

Date: _____

CONTINENTAL OIL COMPANY

By _____

Its _____

UNIT OPERATOR AND WORKING
INTEREST OWNER

WORKING INTEREST OWNERS:

DATE _____

ATTEST:

Secretary

By _____

Its _____

DATE _____

ATTEST:

Secretary

By _____

Its _____

DATE _____

ATTEST:

Secretary

By _____

Its _____

DATE _____

ATTEST:

Secretary

By _____

Its _____

ROYALTY INTEREST OWNERS:

DATE _____

DATE _____

DATE _____

DATE _____

STATE OF _____
COUNTY OF _____

X
X
X

The foregoing instrument was acknowledged before me
this _____ day of _____, 1967, by _____,
_____ of CONTINENTAL OIL COMPANY, a Delaware
corporation, on behalf of said corporation.

Notary Public

My Commission Expires:

STATE OF _____
COUNTY OF _____

X
X
X

The foregoing instrument was acknowledged before me
this _____ day of _____, 1967, by _____,
_____ of _____, a
corporation, on behalf of said
corporation.

Notary Public

My Commission Expires:

STATE OF _____
COUNTY OF _____

X
X
X

The foregoing instrument was acknowledged before me
this _____ day of _____, 1967, by _____,
_____ of _____, a
corporation, on behalf of said
corporation.

Notary Public

My Commission Expires:

STATE OF _____ X
COUNTY OF _____ X

The foregoing instrument was acknowledged before me
this _____ day of _____, 1967, by _____,
_____ of _____, a
_____ corporation, on behalf of said
corporation.

Notary Public

My Commission Expires:

STATE OF _____ X
COUNTY OF _____ X

The foregoing instrument was acknowledged before me
this _____ day of _____, 1967, by _____,
_____ of _____, a
_____ corporation, on behalf of said
corporation.

Notary Public

My Commission Expires:

STATE OF _____ X
COUNTY OF _____ X

The foregoing instrument was acknowledged before me
this _____ day of _____, 1967, by _____,
_____ of _____, a
_____ corporation, on behalf of said
corporation.

Notary Public

My Commission Expires:

STATE OF _____

X
X
X

COUNTY OF _____

The foregoing instrument was acknowledged before
me this _____ day of _____, 1967, by
_____.

Notary Public

My Commission Expires:

STATE OF _____

X
X
X

COUNTY OF _____

The foregoing instrument was acknowledged before
me this _____ day of _____, 1967, by
_____.

Notary Public

My Commission Expires:

STATE OF _____

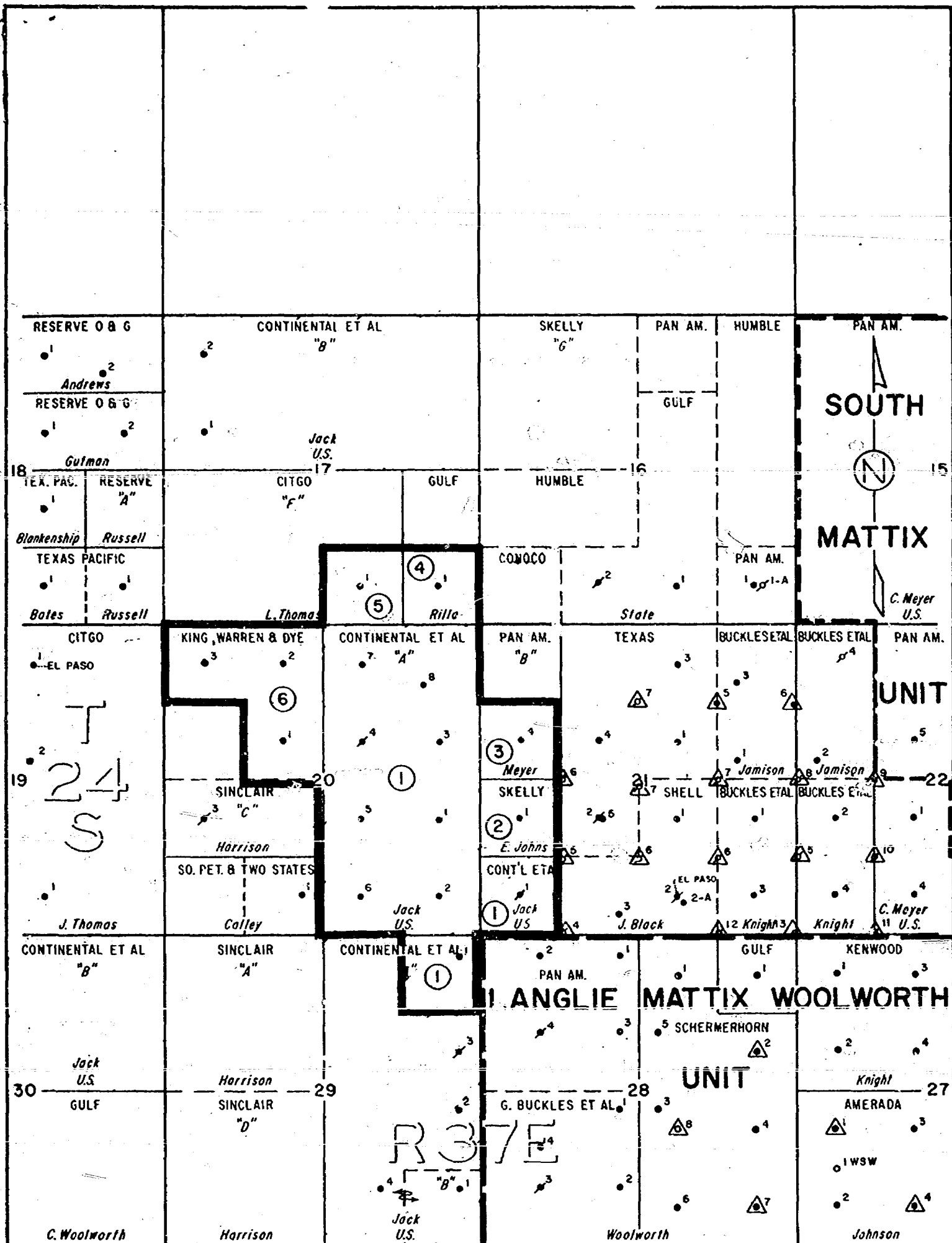
X
X
X

COUNTY OF _____

The foregoing instrument was acknowledged before
me this _____ day of _____, 1967, by
_____.

Notary Public

My Commission Expires:



LANGLIE MATTIX POOL WELLS

① TRACT NUMBERS

CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT—HOBBS DISTRICT

LANGLIE MATTIX JACK AREA

Lea County, New Mexico

PROPOSED LANGLEIE JACK UNIT

— PROPOSED UNIT BOUNDARY

SCALE



RDR 12/1/65

EXHIBIT A . BLJ

**EXHIBIT "B" TO UNIT AGREEMENT
LANGLIE-JACK UNIT, LEA COUNTY, NEW MEXICO**

<u>Tr. No.</u>	<u>Description of Land</u>	<u>No. of Acres</u>	<u>Serial No. & Exp. Date</u>	<u>Basic Royalty</u>	<u>Record Lessee</u>	<u>ORRI Owner & Percent</u>	<u>Working Int. Owner & Percentage</u>	<u>Tract Participation (Percent)</u>
	(T24S R37E)							
1	Sec. 20, E/2 Sec. 21, SW/4 Sec. 29, NE/4	400	LC 032326(a)	USA Sched. C	See Append. Note 1	See Append. Note 2	Atlantic Richfield Co. 25.0 Chevron Oil Company 25.0 Continental Oil Co. 25.0 Pan American Petro. 25.0	55.27647
2	Sec. 21 NW/4 SW/4	40	LC 033575 HBP	USA Sched. D	Skelly Oil Company	See Append. Note. 3	Skelly Oil Company 100.0	7.68134
3	Sec. 21, SW/4 NW/4	40	NM 037657	USA Sched. D	Firm Royalties & Anne Hughes Myers	None	Pan American Petro. 100.0	6.17763
Three Federal Tracts containing 480.00 acres or 70.59% of the Unit Area								
4	Sec. 17 SE/4 SE/4	40	HBP	See Appendix Note 4	Gulf Oil Corporation	None	Gulf Oil Corporation 100.0	5.59261
5	Sec. 17, SW/4 SE/4	40	HBP	See Appendix Note 5	Cities Service Oil Co.	None	Cities Service 69.7675 Gordon M. Cone & Kathleen Cone 30.2325	2.44250
6	Sec. 20, E/2 NW/4 & NW/4 NW/4	120	HBP	See Appendix Note 6	Tidal Oil Company	Tidewater Oil Company 10.9375	Carl B. King 50.0 F. W. Dye Estate 25.0 J. E. Warren Trusts 25.0	22.82945

LANGLIE JACK UNIT
APPENDIX TO EXHIBIT "B"

NOTE 1 - LESSEE OF RECORD UNDER TRACT 1

W. M. Beachamp, Anc. Guardian of the Estate of
William Howard Jack
Abner M. Jack
Guy Jack, Jr.
Florence Jack Mayo
Annie May Kavanaugh

NOTE 2 - OVERRIDING ROYALTY OWNERSHIP UNDER TRACT NO. 1

Column A provides for an overriding royalty of 7.5% during the period or periods when the average production per well per day is more than 15 bbls. on the entire leasehold or any part of the area thereof or any zone segregated for computation of royalties. Column B provides for an overriding royalty of 5% during the period when the average production per well per day is 15 bbls. or less on the entire leasehold or any part of the area or any zone segregated for computation of royalties.

<u>O.R.R.I. Owner</u>	<u>Col. A (%)</u>	<u>Col. B (%)</u>
Ray E. Hubbard	0.12500	0.08333
W. W. Lechner	0.12500	0.08333
Marshall & Winston, Inc.	0.75000	0.50000
Helen Hudson	1.00000	0.66667
Annie May Kavanaugh	0.59375	0.39584
Mack Easley	0.06250	0.04167
John Quinn	0.06250	0.04167
J. H. Daws	0.06250	0.04167
W. M. Beauchamp, Anc. Gdn. of Est. of		
Wm. Howard Jack	0.56250	0.37500
Ruth Rush Weaver	0.03125	0.02083
Boyce Rush Davis	0.03125	0.02083
Selma E. Andrews	0.53705	0.35803
Albuquerque National Bank, Testamentary Trustee		
of Frank Andrews, Dec'd	0.46295	0.30863
John M. Loffland, Jr.	0.75000	0.50000
Lula S. Rush	0.06250	0.04167
Lucille R. Jack	0.56250	0.37500
June D. Speight	1.00000	0.66667
Mrs. Charles S. Mitchell	0.03907	0.02604
Virginia Mitchell Lee	0.00781	0.00521
Charles S. Mitchell, Jr.	0.00781	0.00521
Dorothy Mitchell Latady	0.00781	0.00521
Raymond E. Hubbard, Raymond Ellsworth Hubbard, Jr.,		
& Morgan Richardson Hubbard, Executors under the		
Will of G. E. Hubbard, Dec'd.	0.12500	0.08333
The Catholic Church Extension Society of		
Chicago, Illinois	0.50000	0.33333
Howard Bradley Jack	0.03125	0.02083

NOTE 3 - OVERRIDING ROYALTY OWNERSHIP UNDER TRACT NO. 2

Column A provides for an overriding royalty of 7.5% during the period or periods when the average production per well per day is more than 15 bbls. on the entire leasehold or any part of the area thereof or any zone segregated for computation of royalties. Column B provides for an overriding royalty of 5% during the period when the average production per well per day is 15 bbls. or less on the entire leasehold or any part of the area or any zone segregated for computation of royalties.

<u>O. R. R. I. Owner</u>	<u>Col. A (%)</u>	<u>Col. B (%)</u>
J. B. Bockman	2.50000	1.66667
Ruth T. Johns Lisle	3.12500	2.08333
Martha Johns Densmore	0.93750	0.62500
Nancy Johns Kent	0.93750	0.62500

NOTE 4 - BASIC ROYALTY UNDER TRACT NO. 4

J. M. Armstrong
Fowler Hair
Marjorie Cone Kastman, Guardian of S. E. Cone
Mrs. E. A. Kelly
Kops Oil Company
Suda Willis Oles
W. A. Yeager

% Interest

1.56250
3.12500
3.12500
0.45310
2.21870
0.45320
1.56250

NOTE 5 - BASIC ROYALTY UNDER TRACT NO. 5

Cities Service Oil Company
Bank of the Southwest, Houston, Texas, Trustee
under the Will of Hubert E. Clift, Dec'd.
Bank of the Southwest, Houston, Texas, Trustee
under Trust No. 1608
San Angelo National Bank, Successor Trustee
under the Will of Ralph W. Leftwich
San Angelo National Bank, Executor of the Estate
of Lorraine B. Leftwich
Gordon M. Cone & Kathleen Cone
A. L. Cone

% Interest

7.81250
0.48828
0.48828
0.48828
0.48828
0.48828
2.86458
0.52083

NOTE 6 - BASIC ROYALTY UNDER TRACT NO. 6

Bank of the Southwest, Houston, Texas, N.A., Ind.
Executor of the Estate of Hubert E. Clift
E. S. Birdsong
Mrs. Ruth B. Conger
Hugh Corrigan, III
J. Pat Corrigan
Rose M. Cottingham, Ind, Exectrix of Estate of Virgil
E. Cottingham
The Fluor Corporation, Ltd.
D. E. Foley
W. H. Harrison & E. Harrison, Survivor for the life
of the Survivor
T. J. Horsley
Lasca, Inc.
John J. Reynolds
E. H. Stafford
S. Morse Willis
W. A. Yeager

% Interest

0.63476
2.34375
0.26044
0.31738
0.31738
0.39062
3.12499
0.26042
0.39062
0.39063
0.50000
2.62500
0.29296
0.39063
0.26042

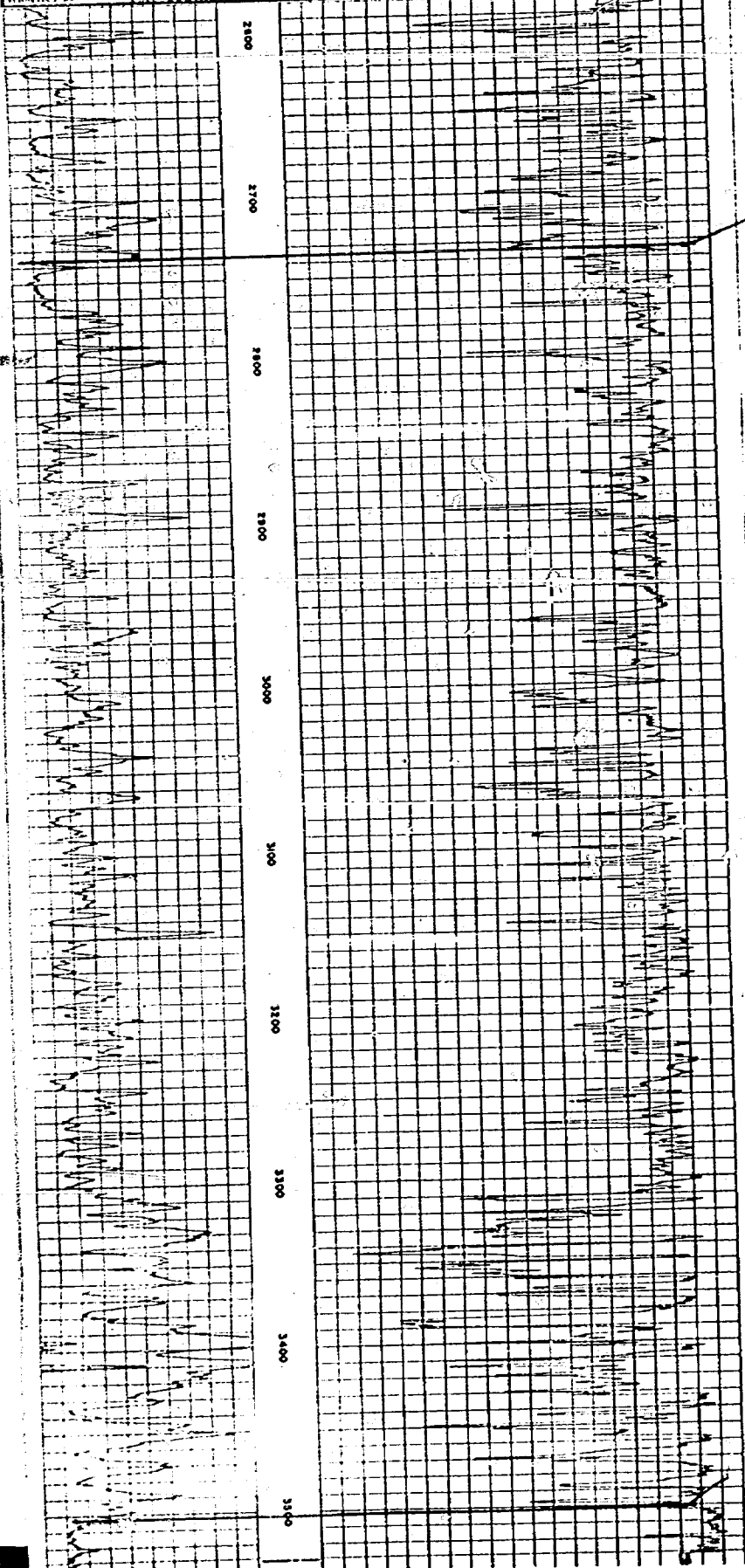
**SCHEDULE OF PARTICIPATION PARAMETERS
PROPOSED LANGLEY-JACK UNIT**

	<u>Acres</u> <u>No.</u>	<u>Survey</u>	<u>250</u> <u>Weight</u>	<u>Qm. Prod. 1-1-65</u> <u>No.</u>	<u>Survey</u>	<u>750</u> <u>Weight</u>	<u>Total</u> <u>Participation</u>
<u>Cities Service</u> <u>Wichita</u>	40	5.88235	1.47059	23078	1.29567	0.97191	2.44250
<u>Continental (MWD)</u> <u>Jack "A"</u>	400	58.82353	14.70588	545919	54.09412	40.57059	55.27647
<u>Gulf</u> <u>Fields</u>	40	5.88235	1.47059	55465	5.49603	4.12202	5.59261
<u>Mos. Warren & Dye</u> <u>Harrison</u>	120	17.64707	4.41176	247329	24.55693	18.41769	22.82943
<u>Part American</u> <u>Meyer "B"</u>	40	5.88235	1.47059	63338	6.27605	4.70704	6.17763
<u>Stoll</u> <u>Johns</u>	40	5.88235	1.47059	83572	8.28100	6.21075	7.68134
	600	100.00000	25.00000	1,009,202	100.00000	75.00000	100.00000

COMPANY CONTINENTAL OIL COMPANY
 WELL JACK B-26 NO. 2
 FIELD WILDCAT
 COUNTY LEA STATE NEW MEXICO
 LOCATION 1980' FNL & 660' FWL
 SEC. 26 TWP. 24-S RGE. 32-E

Current Datum BRADEN HEAD ELANGE Elev. 3155
 Measured from K. B. 11 ft. Above Permanent Datum
 1980' FNL & 660' FWL
 Other Services

1/7/65
 ONE
 3543
 3537
 3531
 50
 3/8-309
 309
 2 1/4"
 S.W. MUD
 WITH 5% OIL
 9.8 34
 5.5 30
 CIRCULATED
 15 @ 68
 12 @ 68
 17 @ 68
 MEAS. MEAS.
 11 @ 104
 104
 4596 HOBBS
 SHANKS
 MR. EDGINGTON & MR. OILM



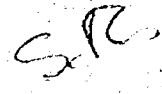
Sandstone

EXHIBIT NO. 3
 Type Log for
 LANGLIE JACK UNIT
 Continental Oil Company,
 Operator

Bozeman

17
SOL. SECTION
ROSWELL DIV.
S. W. REGION
-D

NW 1/4 Sec. 20



T. Queen

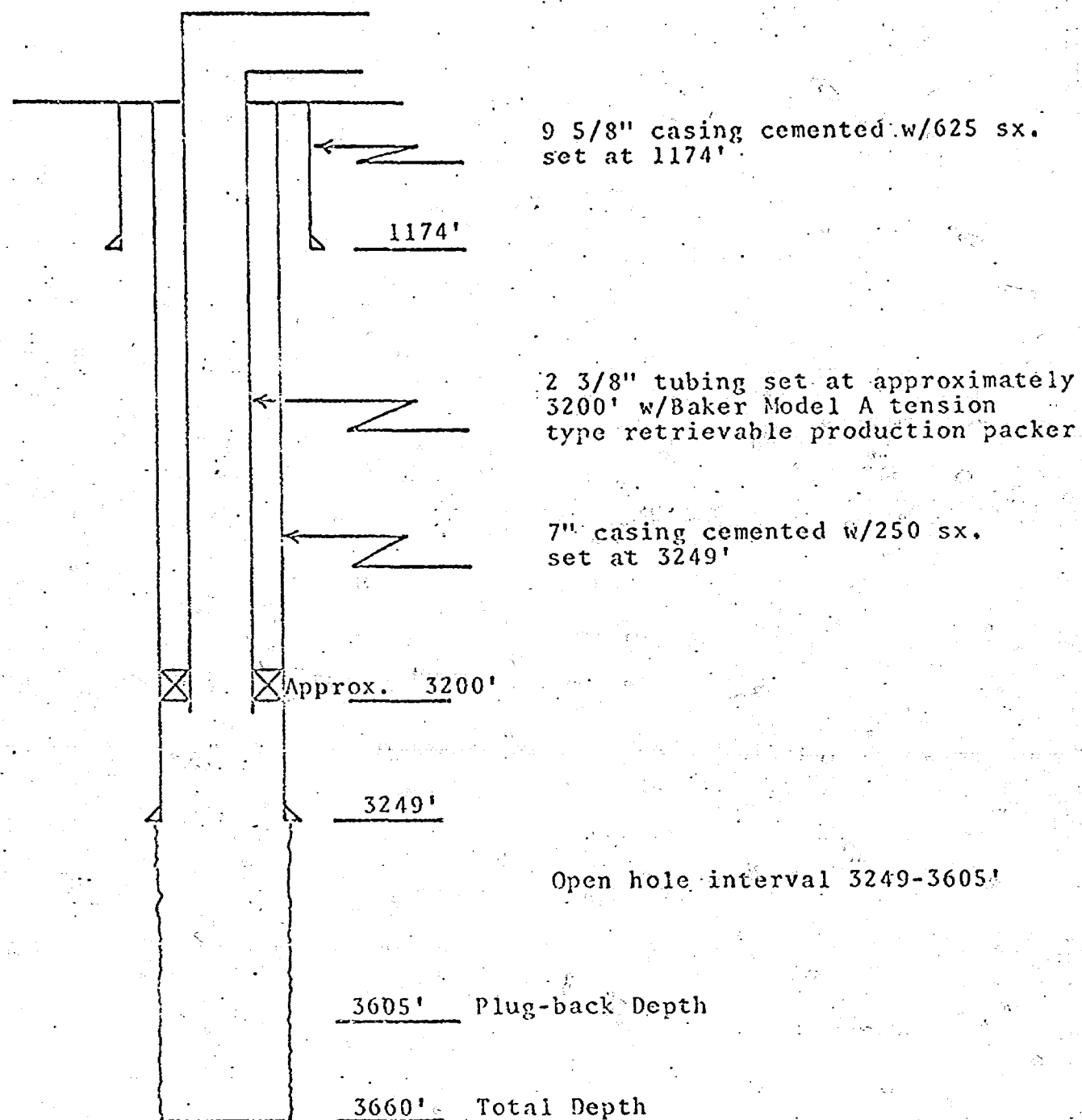
EXHIBIT NO. 3-A

LANGFIE JACK UNIT - INJECTION WELL DATA

Company, Lease & Well No.	TD And/or PBD	Surface Casing			Intermediate Casing			Producing Casing			Producing Interval
		Size	Depth	Cement	Size	Depth	Cement	Size	Depth	Cement	
CITIES SERVICE OIL CO. Thomas "F" No. 1 660' FSL & 1980' FEL Section 17-24-37	3660/ 3605'	9 5/8"	1174'	625	None			7"	3249'	250	OH 3249-3605'
CONTINENTAL OIL COMPANY Jack A-20 No. 1 1980' FSL & 660' FEL Section 20-24-37	3585' 10 3/4"	220'	225	7 5/8"	1187'	425	5 1/2"	3210'	425	OH 3210-3585'	
Jack A-20 No. 6 660' FSL & 1980' FEL Section 20-24-37	3593' 10 3/4"	376'	175	None			7"	3330'	900	OH 3330-3593'	
Jack A-29 No. 1 330' FNL & 330" FEL Section 29-24-37	3605' 10 3/4"	231'	225	7 5/8"	1199'	425	5 1/2"	3238'	425	OH 3238-3605'	
GULF OIL CORPORATION Rilla No. 1 660' FSL & 660' FEL Section 17-24-37	3625' 13 3/4"	281'	225	None			6"	3350'	350	OH 3350-3625'	
WING, WARREN & DYE Harrison No. 1 1980' FNL & 1980' FNL Section 20-24-37	3582' 8 5/8"	371'	175	None			5 1/2"	3405'	425	OH 3405-3582'	
Harrison No. 3 660' FNL & 660' FNL Section 20-24-37	3611' 11 3/4"	357'	200	None			7"	3405'	450	OH 3405-3611'	
PAN AMERICAN PETROLEUM CORP. Meyer "B" No. 4 1980' FNL & 660' FNL Section 21-24-37	3682' 13 5/8"	281'	200	8 5/8"	1269'	400	5 1/2"	3295'	130	OH 3295-3682'	

Water Injection Well Data

Cities Service Oil Company
Thomas "F" No. 1
660' FSL & 1980' FEL, Unit O, Sec. 17-24-37
Elev: 3257' GL



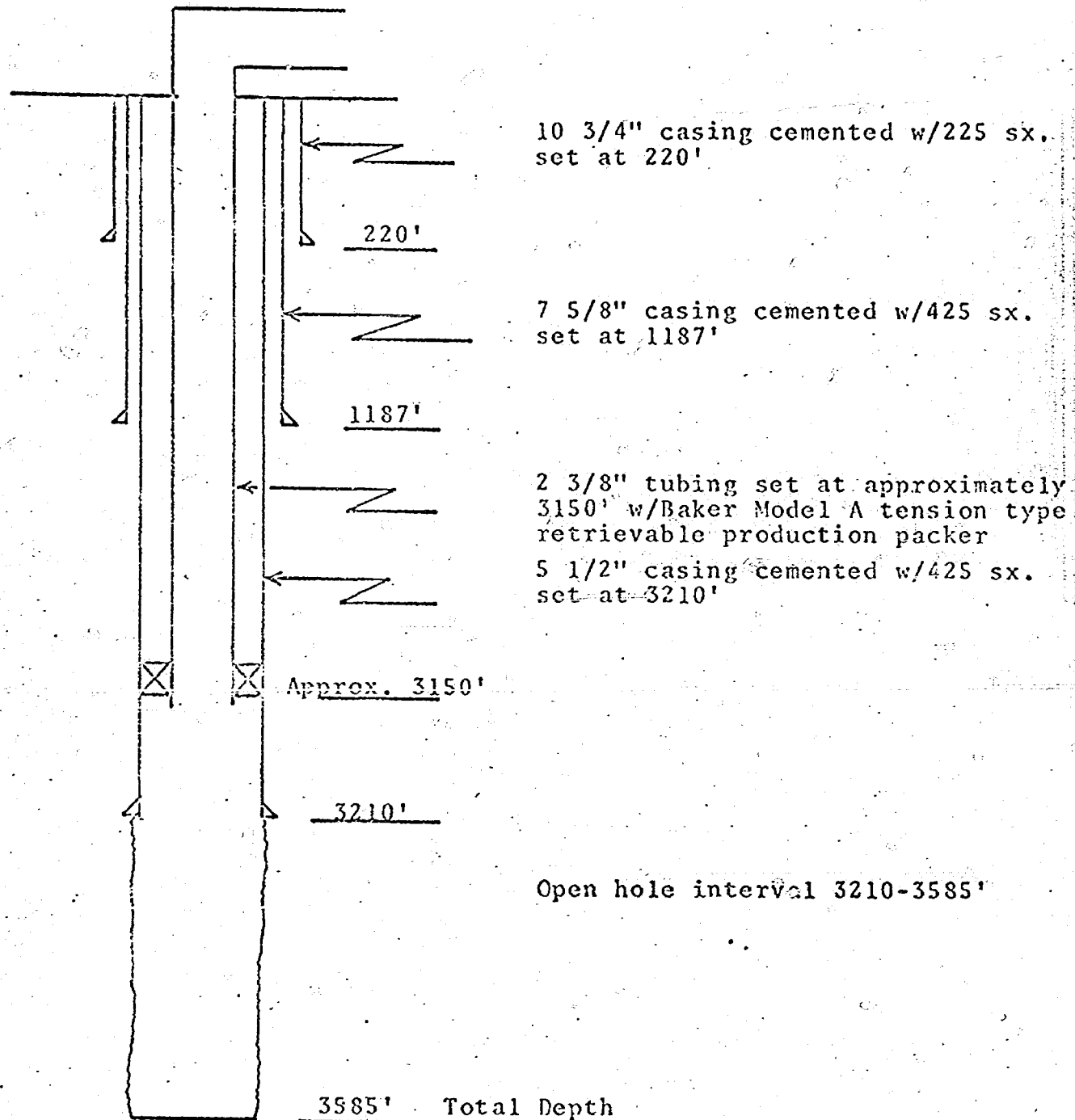
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to 3605'
3. Run Gamma Ray-Neutron & Caliper Logs
4. Run tubing and set at approximately 3200'

EXHIBIT NO. 4-1

Water Injection Well Data

Continental Oil Company
Jack A-20 No. 1
1980' FSL & 660' FEL, Unit I, Sec. 20-24-37
Elev: 3261' DF



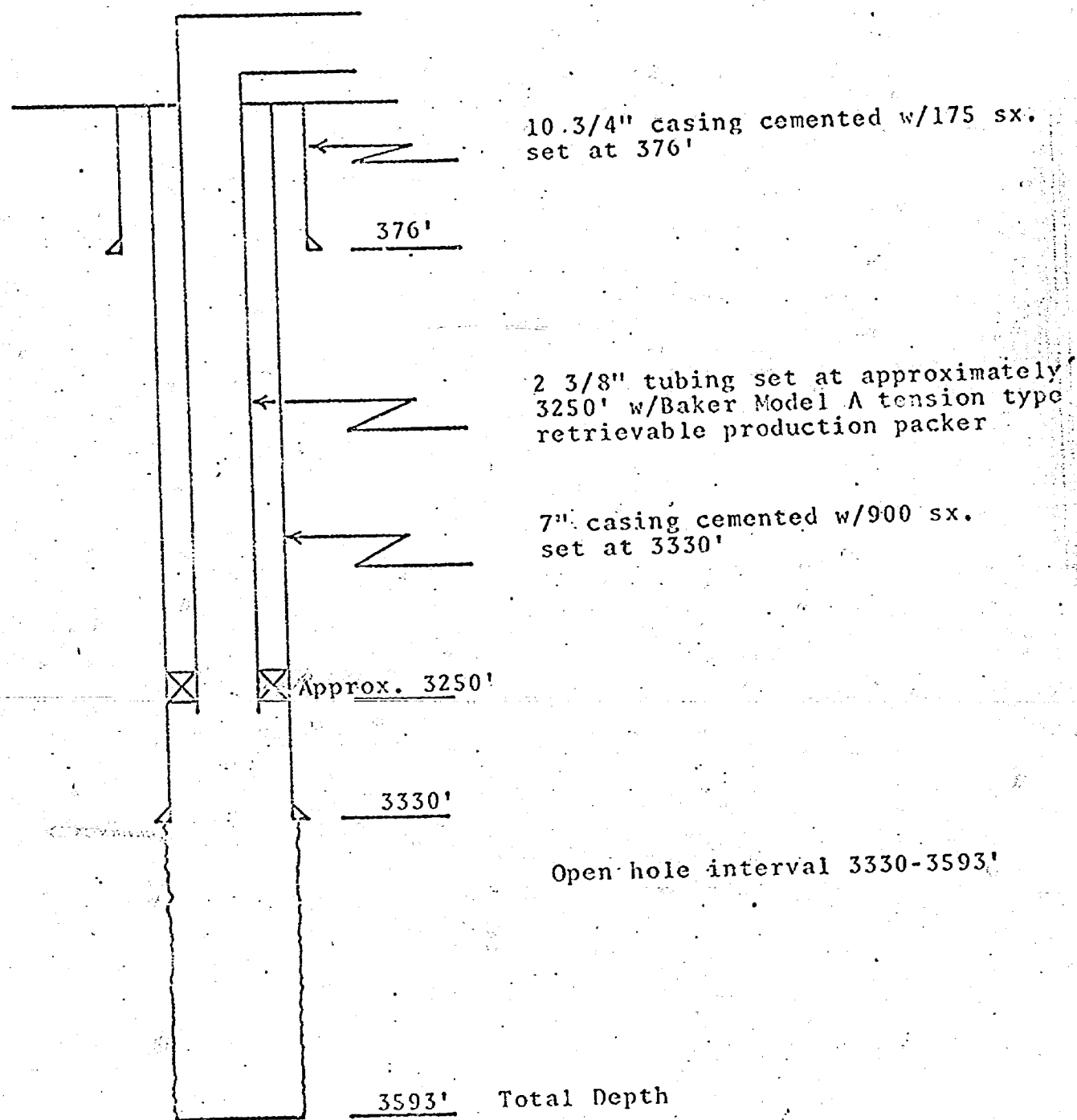
Proposed Procedure

1. Rig up DD Unit
2. Cleanout to TD
3. Run Gamma Ray-Neutron and Caliper Logs
4. Run tubing and set at approximately 3150'

EXHIBIT NO. 4-2

Water Injection Well Data

Continental Oil Company
Jack A-20 No. 6
660' FSL & 1980' FEL, Unit O, Sec. 20-24-37
Elev: 3267' GL



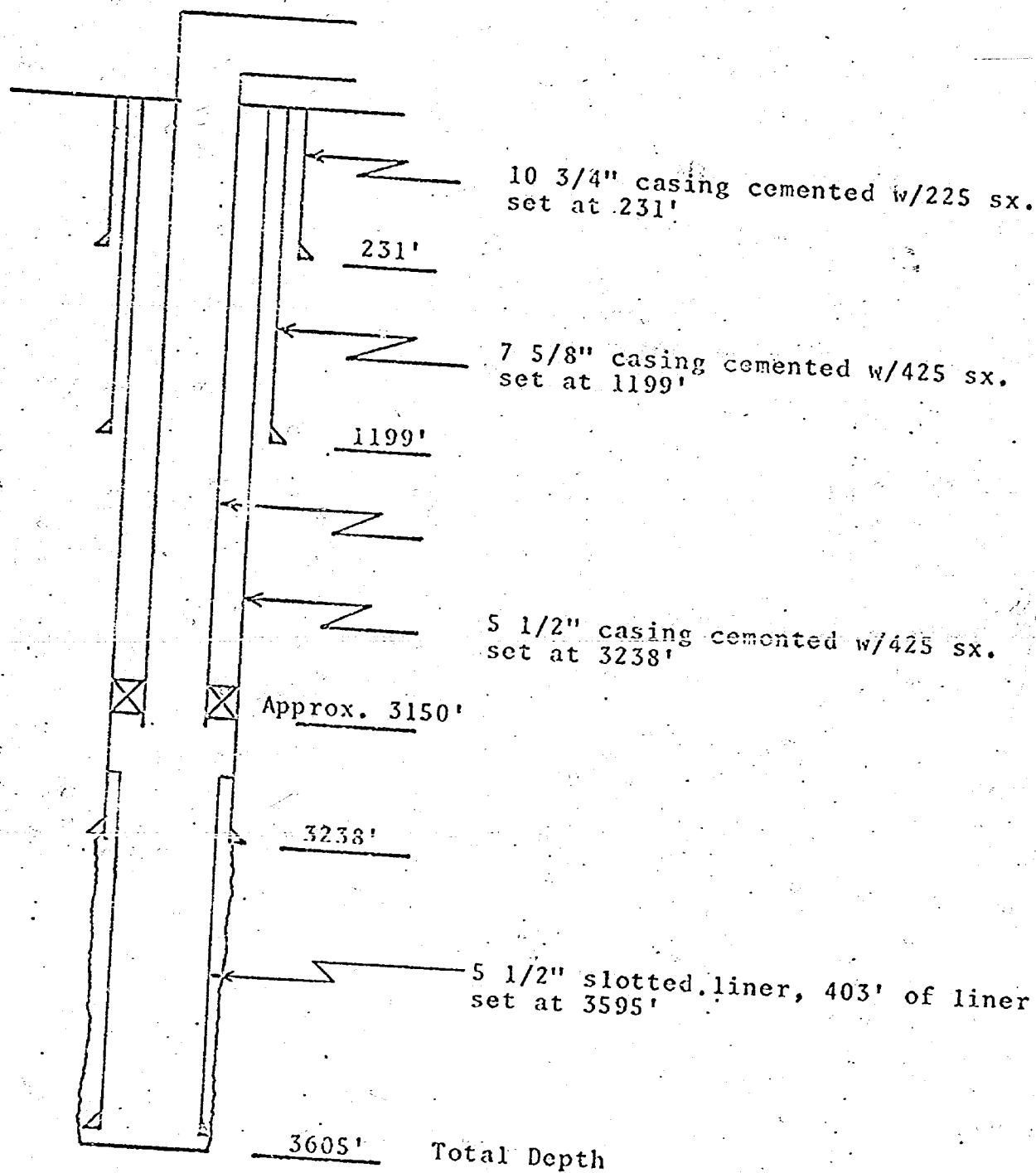
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Test casing for leaks
3. Squeeze leaks if found
4. Cleanout to TD
5. Run Caliper Log
6. Run tubing and set at approximately 3250'

EXHIBIT No. 4-3

Water Injection Well Data

Continental Oil Company
Jack A- 29 No. 1
330' FNL & 1980' FEL, Unit A, Sec. 29-24-37
Elev: 3247' DF



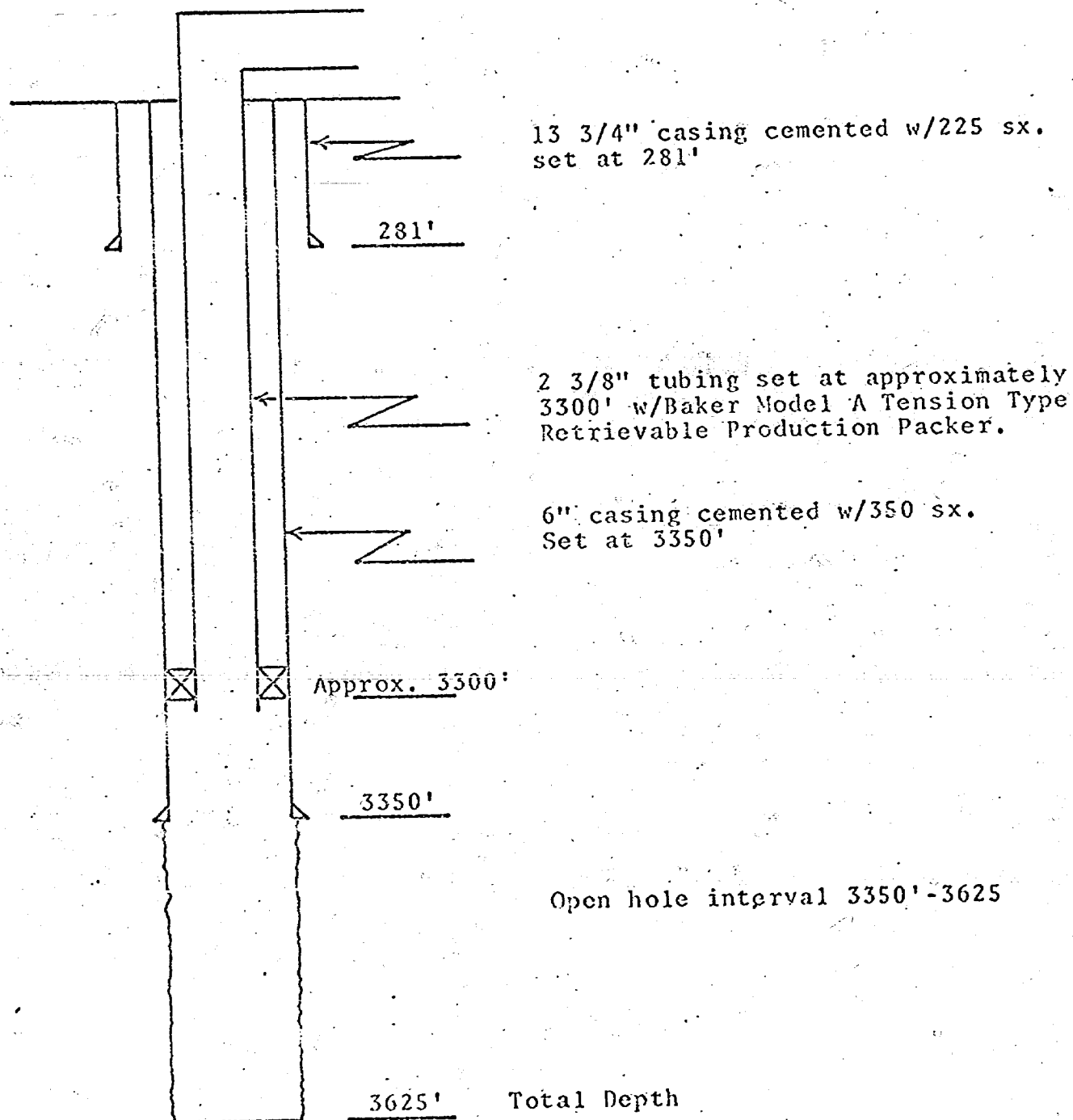
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron Log
4. Run tubing and set at approximately 3150'

EXHIBIT NO. 4-4

Water Injection Well Data

Gulf Oil Corporation
Rilla No. 1
660' FSL & 660' FEL, Unit P, Sec. 17-24-37
Elev: 3270' GL



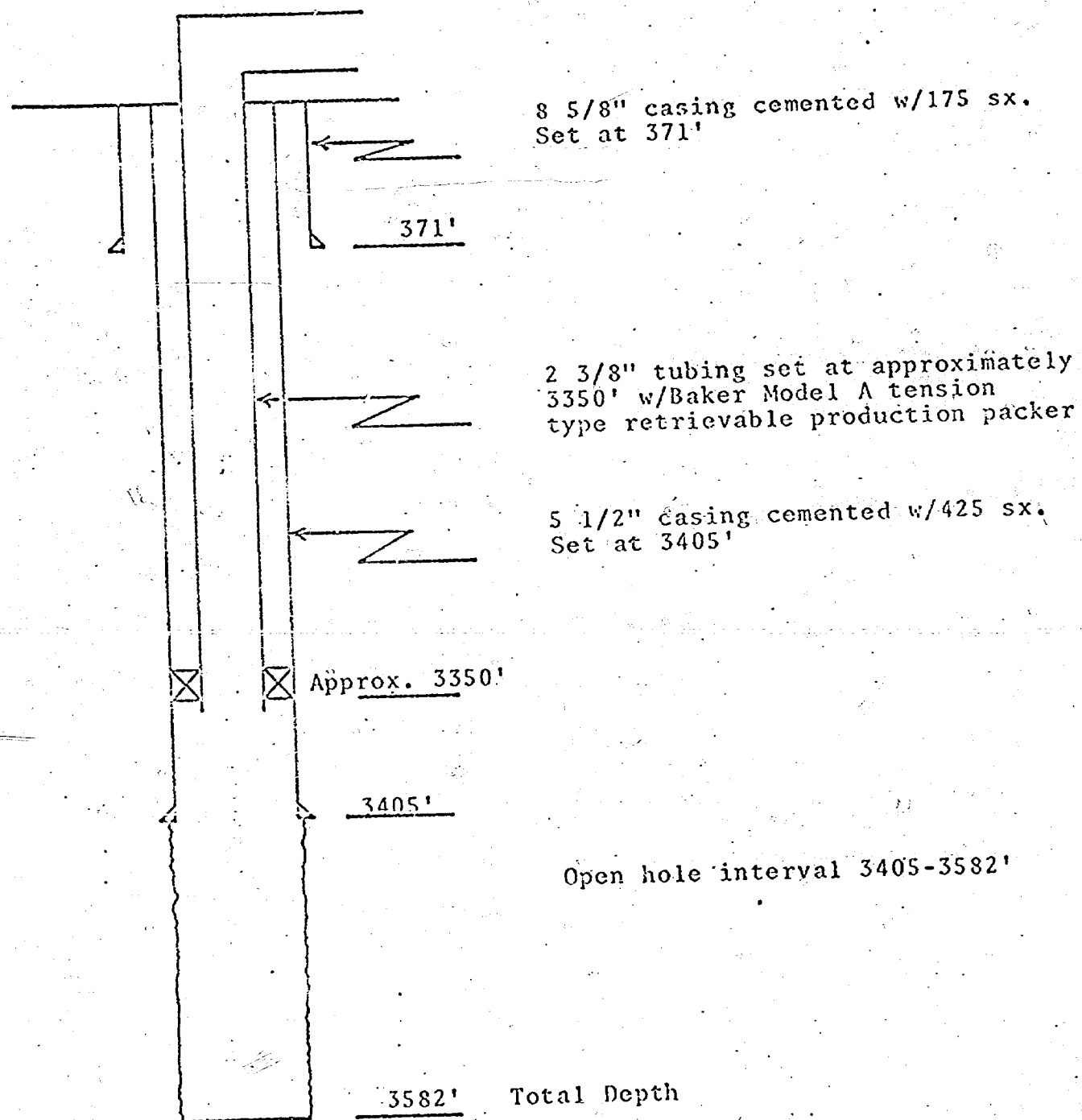
Proposed Procedure

1. Rig up DD unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron Log and Caliper
4. Run tubing and set at approximately 3300'

EXHIBIT NO. 4-5

Water Injection Well Data

King, Warren & Dye
Harrison No. 1
1980' FNL & 1980' FWL, Unit F, Sec. 20-24-37
Elev: 3287'



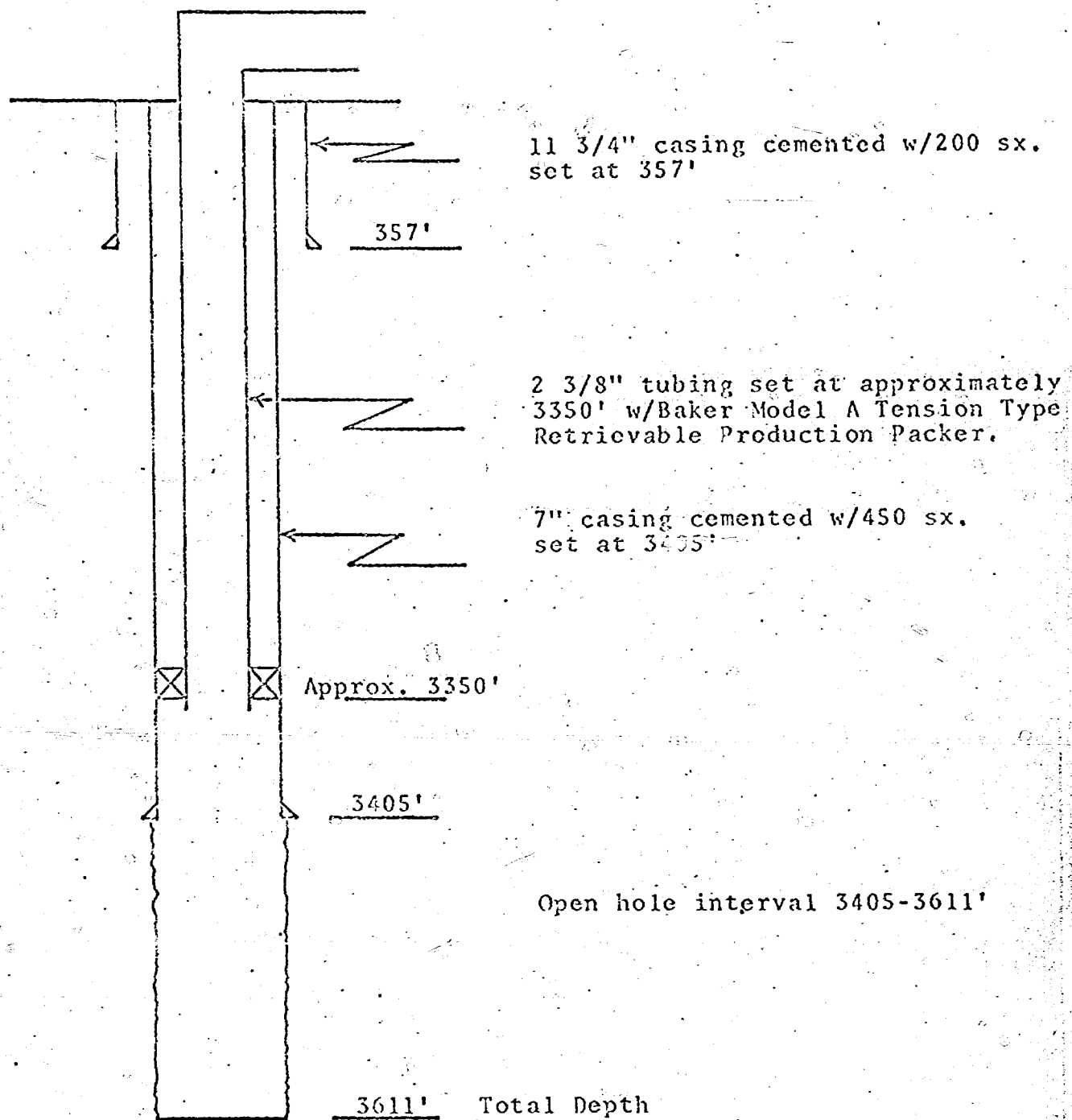
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron and Caliper Logs
4. Run tubing and set at approximately 3350'

EXHIBIT NO. 4-6

Water Injection Well Data

King, Warren & Dye
Harrison No. 3
660' FNL & 660' FWL, Unit D, Sec. 20-24-37
Elev: 3298'



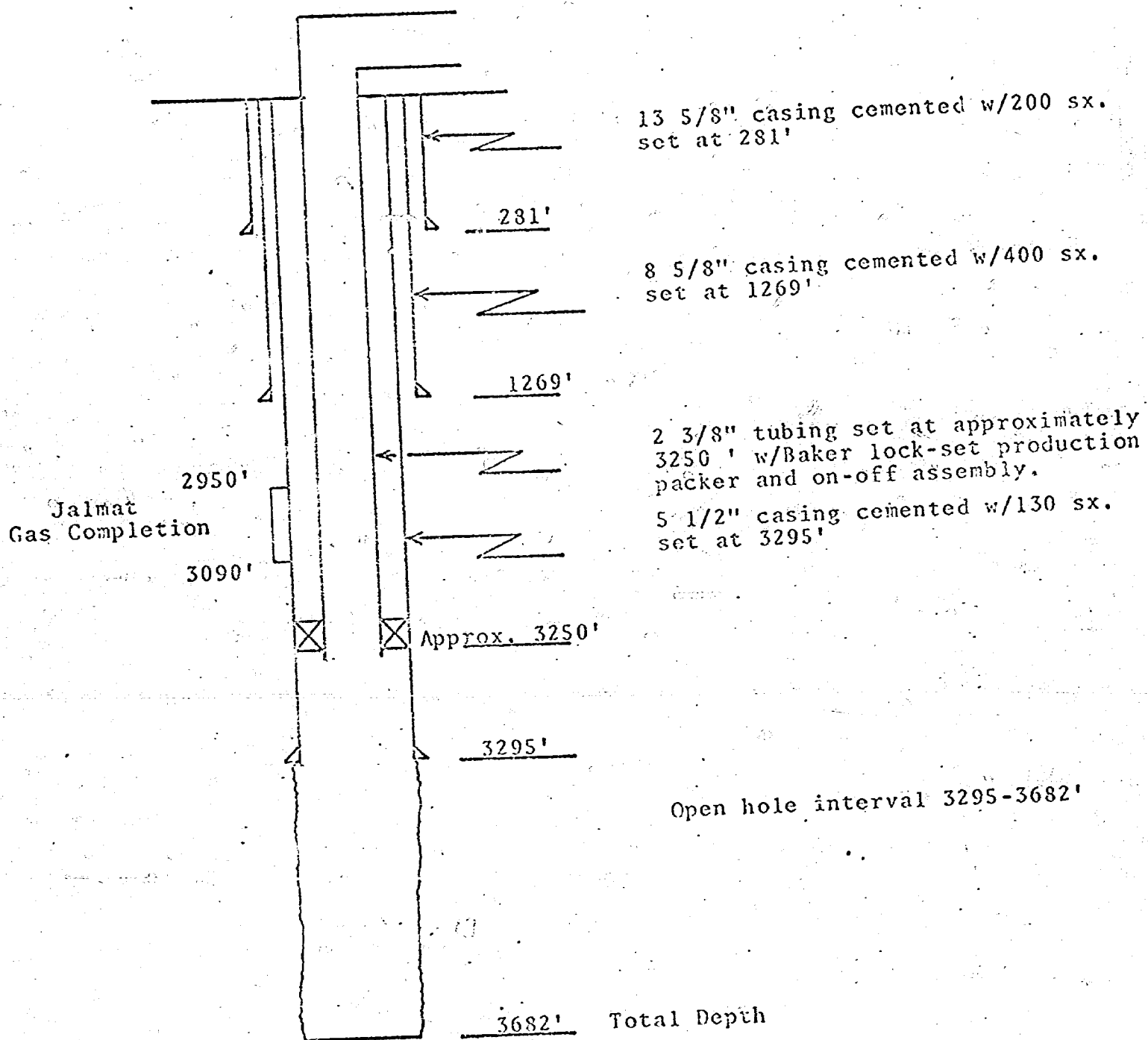
Proposed Procedure

1. Rig up DD Unit and pull tubing
2. Cleanout to TD
3. Run Gamma Ray-Neutron Log and Caliper
4. Run tubing and set at approximately 3350'

EXHIBIT NO. 4-7

Water Injection Well Data

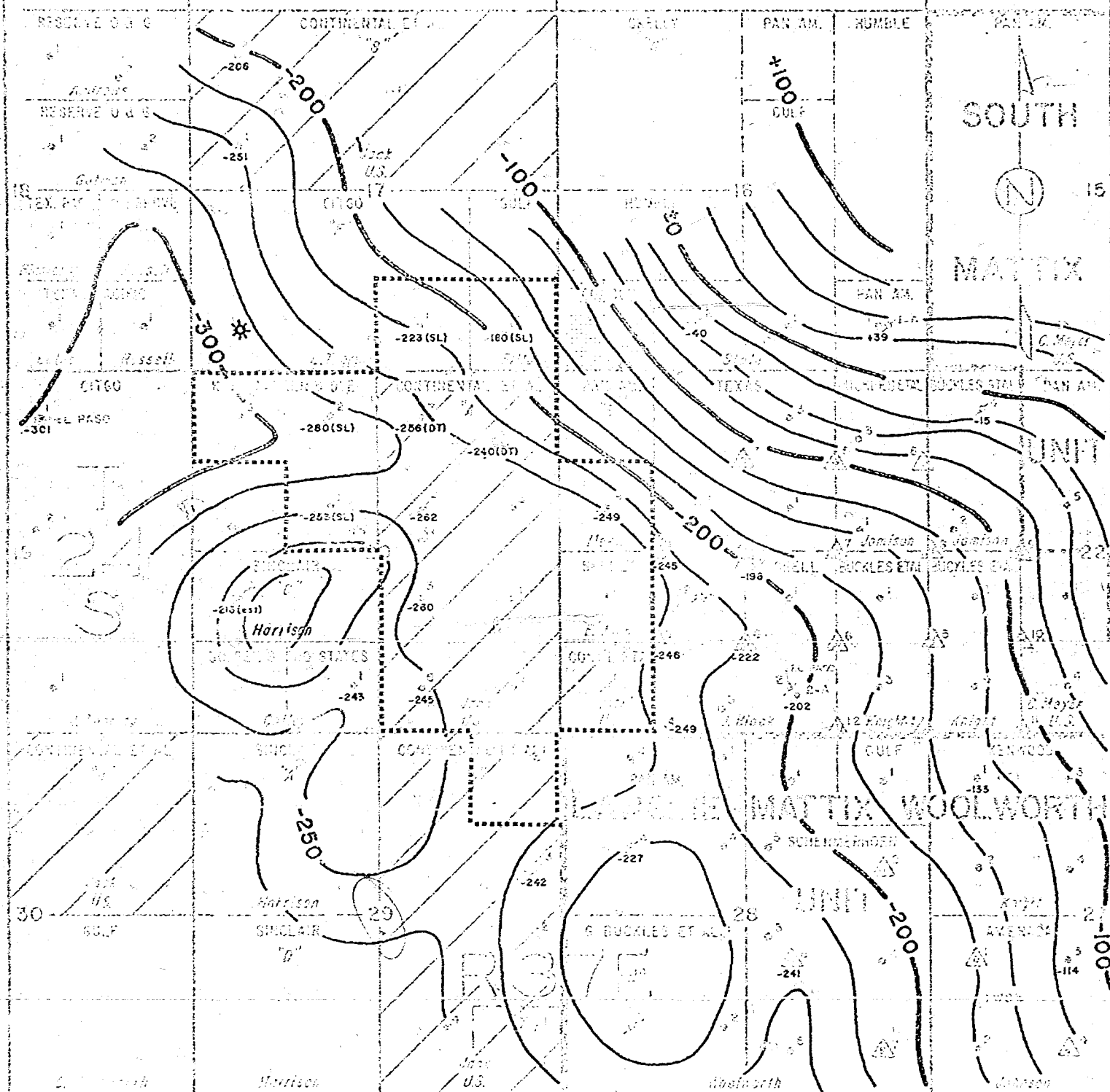
Pan American Petroleum Corp.
Meyer "B" No. 4
1980' FNL and 660' FWL, Unit E, Sec. 21-24-37
Elev: 3243'



Proposed Procedure (To be done by Pan American)

1. Rig up DD Unit and kill gas well
2. Pull tubing and install BOP
3. Drill and cleanout to TD
4. Run Caliper Log
5. Run tubing and set at approximately 3250'
6. Restore Jalmat gas production through annulus

EXHIBIT NO. 4-8



LEGEND

- PROPOSED UNIT BOUNDARY
- LANGLIE MATTIX POOL WELLS SHOWN

CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT--HOOBS DISTRICT

LANGLIE MATTIX JACK AREA

Lea County, New Mexico

CONTOURED ON TOP QUEEN

Contour Interval: 25'

EXHIBIT 5

SUMMARY DATA SHEET

LANGLIE JACK UNIT

General

1. Area, Acres	680
2. Number of Producing Oil Wells	5
3. Number of Plugged or Shut-in Wells	12
4. Cumulative Oil Production at 11-1-66 ⁴⁻¹⁻⁶⁷ , bbls.	1,017,249 1,015,843
5. Average Daily Oil Production Per Producing Well, October 1966 ^{March, 1967} , bbls.	2
6. Average Daily Water Production Per Producing Well, October 1966 ^{March, 1967} , bbls.	0.2 0.3
7. Average Gas-Oil Ratio, October, 1966 ^{March, 1967}	6,800 13,450

Geological Data

1. Producing Formation	Queen-Seven Rivers
2. Average Depth, Feet	3,500
3. Type Structure	Flank of Anticline
4. Primary Pore Volume, Acre-Feet	9,520
5. Secondary Pore Volume, Acre-Feet	7,270

Reservoir Properties

1. Estimated Original Reservoir Pressure, Est., psi	1,440
2. Estimated Reservoir Pressure at Waterflood, psi	200
3. Average Porosity	18
4. Reservoir Saturation	
Initial Water, %	30
Initial Reservoir Oil, %	70
Reservoir Oil at Waterflood, %	54
Residual Reservoir Oil After Sweep, %	33
5. Reservoir Oil Properties	
Initial Formation Volume Factor	1.23
Waterflood Formation Volume Factor	1.09
API Gravity	36

6. Estimated Original Oil in Place

Stock Tank Barrels

7,550,000

Stock Tank Barrels per Acre-Feet

794

Reserve Estimates

1. Primary Recovery, Percent of ST Oil In Place

13.4

2. Estimated Waterflood Recovery

Barrels ST Oil

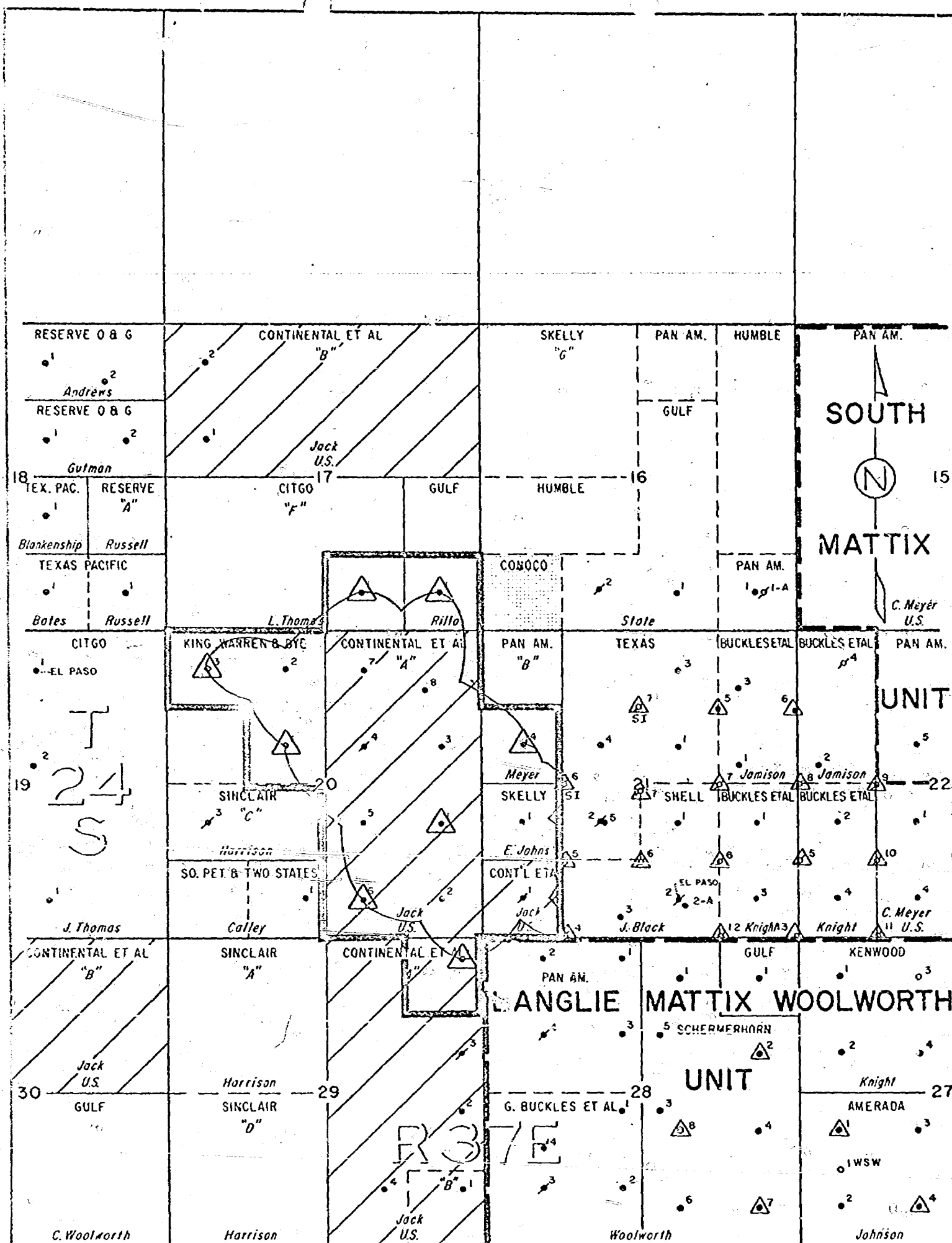
846,000

Barrels ST Oil Per Acre-Foot

89

Percent of Initial STO In Place

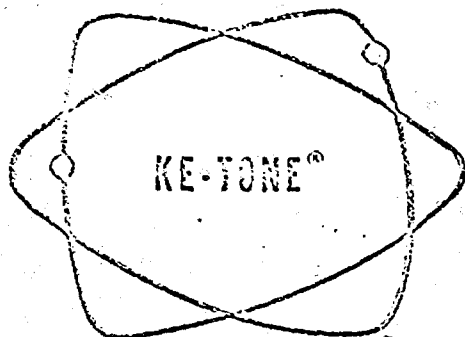
11.2



△ LANGLEIE MATTIX POOL WELLS
 △ PROPOSED INJECTION WELLS

CONTINENTAL OIL COMPANY	
PRODUCTION DEPARTMENT—HOBBS DISTRICT	
LANGLIE MATTIX JACK AREA	
Lea County, New Mexico	
PROPOSED LANGLEIE JACK UNIT	
— PROPOSED UNIT BOUNDARY	
SCALE	
RDR 12/1/65	EXHIBIT 7 BLJ

TELEPHONE: HOBB5 393-6215



UNITED CHEMICAL CORPORATION

OF NEW MEXICO

601 NORTH LEECH

P. O. BOX 1499

HOBB5, NEW MEXICO 88240

Company Continental Oil Company

Field Langlie-Mattix

Lease Wells Bl No. 3

Sampling Date 12-30-66

Type of Sample Wellhead

WATER ANALYSIS

IONIC FORM	me/l *	mg/l *
Calcium (Ca++)	25.95	520
Magnesium (Mg++)	14.72	179
Sodium (Na+) (Calculated)	44.04	1012
Bicarbonate (HCO ₃)	18.60	1135
Carbonate (CO ₃ -)	Not	Found
Hydroxide (OH-)	"	"
Sulphate (SO ₄ -)	1.25	60
Chloride (Cl-)	64.86	2300
7.5 pH c 68 °F		
Dissolved Solids on Evap. at 103° - 105° C		
Hardness as Ca CO ₃	40.67	2034
Carbonate Hardness, as CaCO ₃ (temporary)	18.60	930
Non-Carbonate Hardness as CaCO ₃ (permanent)	2207	1104
Alkalinity as CaCO ₃	18.60	930
Specific Gravity c 68° F	1.005	

* mg/l = milligrams per Liter

* me/l = milliequivalents per Liter

Make's Water Work

EXHIBIT NO. 8

L. C. CASE, P. E.

CONSULTANT, OIL FIELD WATER PROBLEMS

206 SUNSET DRIVE

TULSA 14, OKLAHOMA

LOUHER 3-3307

LOUHER 3-3007

WATER ANALYSIS- Seven Rivers brine. Skelly Oil Company, Coates Lease.
Sampled at supply tank, 7/29/66

	Milligrams/liter	E.P.L.% (R.V.%)
Sodium, Na	2,005	32.19
Calcium, Ca	520	9.61
Magnesium, Mg	266	8.10
Sulfate, SO ₄	540	4.15
Chloride, Cl	3,595	37.55
Bicarbonate, HCO ₃	1,366	8.30
Carbonate, CO ₃	nil	0.00
Total	8,292	100.00%

Other determinations:

Sp.Gr. at 60°F 1.009

pH value 6.8

Hydrogen sulfide, H₂S - 408* (At supply tank, 7/29/66)

Hypothetical Combinations, milligrams/liter:

* Milligrams/liter

Calcium bicarbonate, Ca(HCO ₃) ₂	1,816
Magnesium bicarbonate, Mg(HCO ₃) ₂	0.0
Sodium bicarbonate, NaHCO ₃	0.0
Calcium sulfate, CaSO ₄	241
Magnesium sulfate, MgSO ₄	462
Sodium sulfate, Na ₂ SO ₄	0.0
Calcium chloride, CaCl ₂	0.0
Magnesium chloride, MgCl ₂	675
Sodium chloride, NaCl	5,098
Total	8,292

Definition of water character:

Primary salinity	64.58
Secondary salinity	18.82
Primary alkalinity	0.00
Secondary Alkalinity	16.60
Total	100.00%

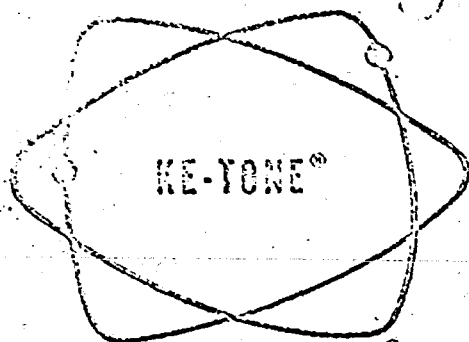
Remarks:

Considerable time was spent in an attempt to count the bacteria in a sample of this brine taken from the supply tank. The count was not accurate due to the very high H₂S, which darkened the agar. Final results were indicated to be as follows: Aerobic bacteria-- less than 500/ml in API agar. SO₄-reducers-- 0 colonies in 18 days.

This brine shows no tendency to deposit gypsum, calculated from gypsum solubility data. This brine is incompatible with waters having appreciable dissolved iron or oxygen.

EXHIBIT NO. 9

TELEPHONE: HOBBS 393.6215



UNITED CHEMICAL CORPORATION

OF NEW MEXICO
601 NORTH LEECH P. O. BOX 1499
HOBBS, NEW MEXICO 88240

Company Amorada Petroleum Corporation
Field LMWU
Lease Well #3 Sampling Date 9/28/66
Type of Sample Source Well

WATER ANALYSIS

IONIC FORM	me/l *	mg/l *
Calcium (Ca++)	1.60	32
Magnesium (Mg++)	1.81	22
Sodium (Na+) (calculated)	13.40	308
Iron		2
Bicarbonate (HCO ₃)	5.60	341
Carbonate (CO ₃ -)	Not Found	
Hydroxide (OH-)	Not Found	
Sulfate (SO ₄ -)	8.95	43.0
Chloride (Cl-)	2.25	80
Dissolved Oxygen		0.3
pH @ 68° F 7.7		
Dissolved Solids on Evap. at 103° - 105° C		
Hardness as CaCO ₃	3.41	171
Carbonate Hardness, as CaCO ₃ (temporary)	5.60	280
Non-Carb. Hardness as CaCO ₃ (permanent)	--	--
Alkalinity as CaCO ₃	5.60	280
Specific Gravity @ 68° F	----	

* mg/l = milligrams per Liter

* me/l = milliequivalents per Liter

Makes Water Work

EXHIBIT NO. 10