Case No.

556 file #1

Application, Transcript,
Small Exhibits, Etc.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 556
Order No. R-350

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR PERMISSION TO EFFECT A DUAL COMPLETION OF ITS FORT NO. 1 WELL, LOCATED IN THE NE/4 NE/4 SECTION 34, TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY, NEW MEXICO (IN THE DENTON FIELD), IN SUCH A MANNER AS TO PERMIT PRODUCTION OF OIL FROM THE DEVONIAN FORMATION THROUGH EXISTING CASING PERFORATIONS, 12,564 TO 12,710 FEET, AND OIL FROM THE WOLFCAMP FORMATION AFTER PERFORATING FROM 9680 TO 9360 FEET.

PETITION FOR REHEARING

Comes now Phillips Petroleum Company and respectfully petitions the Oil Conservation Commission of New Mexico for a rehearing in the above captioned matter, and in support thereof would show:

1. That Petitioner was the applicant in Case No. 556 before the Oil Conservation Commission of New Mexico, and is adversely affected by Order No. R-350 entered therein.

2. That while said order bears the date August 28, 1953, Petitioner was not notified that such order had been entered, or that any order had been entered, within the time allowed for applying for rehearing, and in that respect has been denied its rights as provided by law. (Sec. 69-223, New Mexico Statutes, 1941 Annotated, 1949 Supp.)

3. That the Commission erred in entering its order in this case, the same being Order No. R-350, and that said order is unlawful in that it is unreasonable, arbitrary and capricious and would deprive Petitioner of a valuable property right without due process of law, in the following respects:

(a) The order is not supported by the evidence offered in this case, and there is no substantial evidence in the record to support said order.

(b) That the findings of the Commission are vague and indefinite, subject to ambiguity and doubt, and are insufficient to support the order of the Commission.

(c) That the findings of fact are not supported by substantial evidence, and are contrary to the evidence presented.

(d) That the testimony offered and exhibits introduced clearly show that the dual completion of the Fort No. 1 well in the NE/4 NE/4 Section 34, Twp. 14 S., R. 37 E., NMPM will not subject such well to operational hazards, that no serious danger of interzone communication exists and that reservoir conditions are highly favorable to the dual completion as proposed, and the equipment proposed to be used will afford adequate and ample protection to all producing horizons, all as is clearly shown by the testimony and exhibits offered at said hearing, and that such dual completion will result in the prevention of waste and protection of correlative rights.

(e) That the Commission order was not entered in accordance with law.

(f) That the order will require the drilling of an excessive number of wells, with attendant risks and economic loss.

WHEREFORE PETITIONER PRAYS:

1. That this petition for rehearing be considered timely filed.

2. That a rehearing of Case No. 556 be granted by the Commission.

3. That the Commission rescind its Order No. R-350, dated August 28, 1953, and enter in lieu thereof its order approving the dual completion of Petitioner's Fort No. 1 well, in the NE/4 NE/4 Section 34, T. 14 S., R. 37 E., NMPM, Lea County, New Mexico, for the production of oil from the Denton-Wolfcamp formation, and oil from the Denton-Devonian formation, all as proposed and prayed in the original petition herein.

Respectfully submitted.

Phillips Petroleum Company

By Jason W. Kellahin
Jason W. Kellahin
Attorney for Petitioner
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 COM-
MISSION OF NEW MEXICO FOR THE PURPOSE
OF CONSIDERING:

CASE NO. 556
ORDER NO. R-350-A

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR PERMISSION TO EFFECT A DUAL COMPLETION OF ITS FORT NO. 1 WELL, NE/4 NE/4 SECTION 34, TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY, NEW MEXICO, IN THE DENTON POOL, IN SUCH MANNER AS TO PERMIT PRODUCTION OF OIL FROM THE DEVONIAN FORMATION THROUGH EXISTING CASING PERFORATIONS (12,564 - 12,710') AND OIL FROM THE WOLFCAMP FORMATION AFTER PERFORATING FROM 9680 to 9360 FEET.

ORDER OF THE COMMISSION FOR RE-HEARING

BY THE COMMISSION:

This cause came on for hearing upon the petition of Phillips Petroleum Company for a re-hearing on Order No. R-350 heretofore entered as of August 28, 1953.

NOW, on this 28th day of September, 1953, the Commission, a quorum being present, having fully considered said motion and application,

IT IS HEREBY ORDERED:

That the above-entitled matter be re-opened and a re-hearing in said cause be held on October 15, 1953, at 9 o'clock a.m. on said day at Santa Fe, New Mexico, or at such time as the Commission may designate after due notice, at which time and place all interested parties may appear.

IT IS FURTHER ORDERED: That the effective date for the operation of Commission Order No. R-350 be, and the same hereby is suspended pending further order of the Commission in the premises.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Edwin L. Mechem, Chairman

E. S. Walker, Member

R. R. Spurrier, Member and Secretary

S E A L

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 556
ORDER NO. R-350-B

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR PERMISSION TO EFFECT A DUAL COMPLETION OF ITS FORT NO. 1 WELL, LOCATED IN THE NE/4 NE/4 SECTION 34, TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY, NEW MEXICO (IN THE DENTON FIELD), IN SUCH A MANNER AS TO PERMIT PRODUCTION OF OIL FROM THE DEVONIAN FORMATION THROUGH EXISTING CASING PERFORATIONS, 12,564 to 12,710 FEET, AND OIL FROM THE WOLFCAMP FORMATION AFTER PERFORATING FROM 9,680 TO 9,360 FEET.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This case came on for hearing upon the petition of Phillips Petroleum Company on July 16, 1953 at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission" and for re-hearing on October 15, 1953.

NOW, on this 10th day of December, 1953, the Commission, a quorum being present, having fully considered the record and the testimony adduced and the exhibits received at said hearing and re-hearing, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given in accordance with law, the Commission has jurisdiction of this cause, the persons and subject matter thereof.

(2) That after due public notice and hearing on July 16, 1953, the Commission entered its Order No. R-350, denying petitioner's application for dual completion (oil-oil) of its Fort No. 1 Well, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, NMPM., Lea County, New Mexico in the Denton field.

(3) That upon motion duly filed, the Commission granted a re-hearing by its Order No. R-350-A for the purpose of taking additional testimony and hearing oral arguments, and that such re-hearing was held on October 15, 1953.

(4) That no evidence was presented at such re-hearing sufficient to justify an order granting petitioner's application.

IT IS THEREFORE ORDERED:

That Phillips Petroleum Company's application for permission to dually complete its Fort No. 1 Well located in the NE/4 NE/4 Section 34, Township 14 South, Range 37 East, NMPM., Lea County, New Mexico, for production of oil from the Denton-Wolfcamp Pool, and oil from the Denton-Devonian Pool, be and the same hereby is denied and the Commission's Order No. R-350 be and the same hereby is affirmed.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

R. R. SPURRIER, Member and Secretary

S E A L

PHILLIPS PETROLEUM COMPANY
LENZO NO. 1
NW-NW SEC 35 - 14S - 37E
LEA COUNT, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION

EXHIBIT B

UPPER ZONE

WOLFCAMP

TOP 9256'

PERFORATE

4TH	9260'	9360'
3RD	9400'	9440'
2ND	9450'	9520'
1ST	9550'	9562'

NOTE IT IS PROPOSED TO PERFORATE WOLFCAMP IN ORDER SHOWN. IF WATER IS ENCOUNTERED IN A ZONE THAT ZONE TO BE SQUEEZED OFF.

PRODUCTION PACKER SET AT APPROXIMATELY 9150'

THIS ZONE TO BE PRODUCED THRU TUBING

PRODUCTION PACKER SET AT APPROXIMATELY 12215'

LOWER ZONE

DEVONIAN

TOP 12345'

PERFORATE

12455' - 12550'

12580' - 12650'

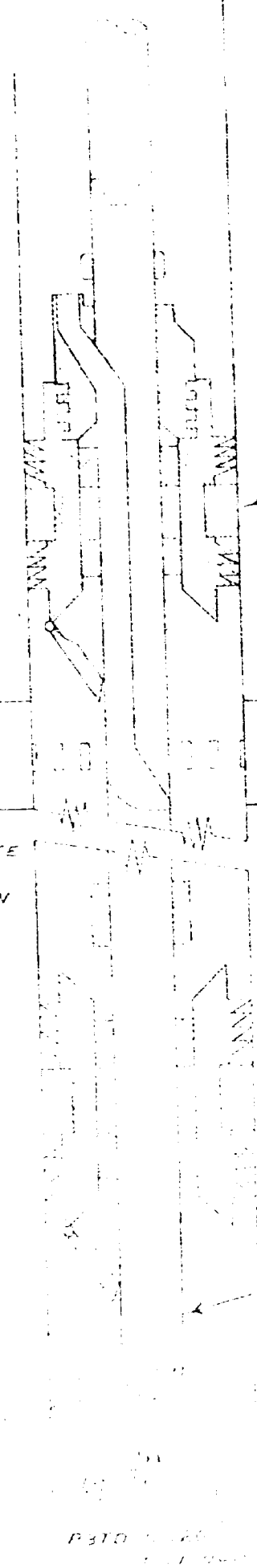
5 1/2" CSG. SET AT 12733'

THIS ZONE TO BE PRODUCED THRU CASING

P.B.T.D. 12687'

T.D. 12743'

PHILLIPS PETROLEUM COMPANY
CENTURY NO. 12
SW. NW, SEC. 11-15S-37E
LEA COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION



PRODUCTION PACKER
SET AT APPROXIMATELY
9120'

UPPER ZONE

WOLFCAMP

TOP 9220'

PERFORATE

4TH	9230' -	9320'
3RD	9350' -	9460'
2ND	9480' -	9500'
1ST	9546' -	9556'

THIS ZONE TO BE PRODUCED
THRU TUBING

NOTE IT IS PROPOSED TO PERFORATE WOLFCAMP IN ORDER SHOWN. IF WATER IS ENCOUNTERED IN A ZONE THAT ZONE TO BE SQUEEZED OFF.

PRODUCTION PACKER
SET AT APPROXIMATELY
11950'

LOWER ZONE

DEVONIAN

2" TUBING LANDED AT 12102'

TOP 12[illegible]'

PERFORATE

12[illegible]' - [illegible]'
12[illegible]' - 12[illegible]'

THIS ZONE TO BE PRODUCED
THRU CASING

[illegible] SET AT 12[illegible]'

PBTD [illegible]'

PHILLIPS PETROLEUM COMPANY
GRAY "A" NO. 13
NW/4 NW/4 SECTION 11-15S-37E
LEA COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION.

PRODUCTION PACKER
SET AT APPROXIMATELY
9043'

UPPER ZONE
WOLFCAMP

TOP 9143'

	PERFORATE
4TH	9150' - 9260'
3RD	9290' - 9430'
2ND	9460' - 9500'
1ST	9530 - 9590'

THIS ZONE TO BE PRODUCED
THRU TUBING

NOTE: IT IS PROPOSED TO PERFORATE WOLFCAMP IN ORDER SHOWN. IF WATER IS ENCOUNTERED IN A ZONE THAT ZONE TO BE SQUEEZED OFF.

PRODUCTION PACKER
SET AT APPROXIMATELY
[illegible]

LOWER ZONE
DEVONIAN

TOP [illegible]
PERFORATE
12580' - [illegible]
12760' - 12780'

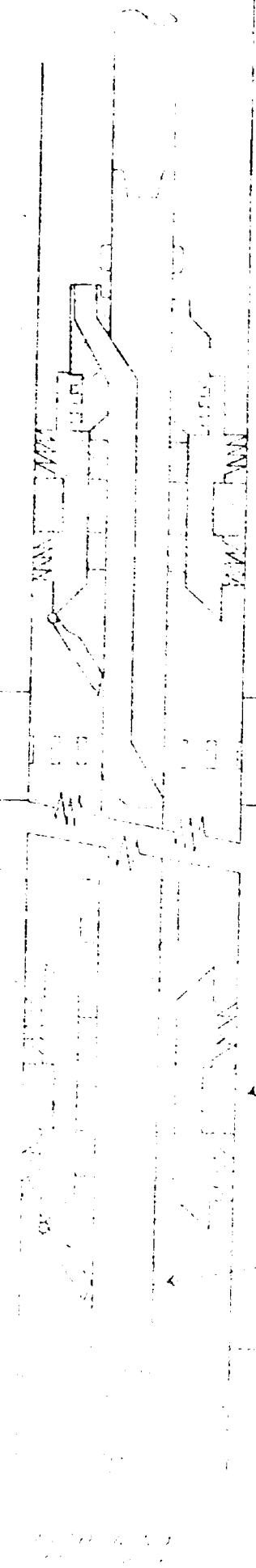
[illegible] CSG SET AT [illegible]

[illegible] SET AT 12[illegible]

THIS ZONE TO BE PRODUCED
[illegible]

Case 556
Exh. #4

PHILLIPS PETROLEUM COMPANY
FORT NO. 1
NE. NE SEC 34 - 14S - 37E
LEA COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION



PRODUCTION PACKER
SET AT APPROXIMATELY
9250'

THIS ZONE TO BE PRODUCED
THRU TUBING

PRODUCTION PACKER
SET AT APPROXIMATELY
12453'

2" TUBING LANDED AT 12648'

THIS ZONE TO BE PRODUCED
THRU CASING

UPPER ZONE

WOLFCAMP

TOP AT 9350'

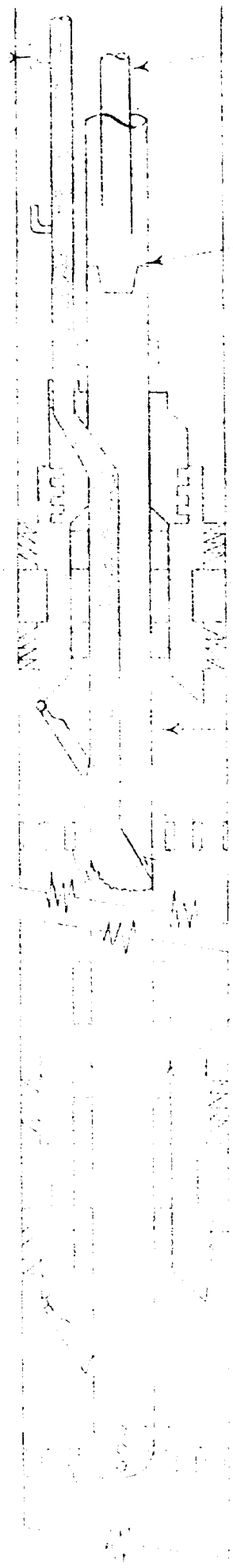
PERFORATE
4TH - 9380' - 9460'
3RD - 9500' - 9550'
2ND - 9580' - 9610'
1ST - 9615' - 9680'

NOTE: IT IS PROPOSED TO PERFORATE THE WOLFCAMP IN THE ZONES SHOWN. IF WATER IS ENCOUNTERED ZONE TO BE SQUEEZED OFF.

10

10

ARRANGEMENT FOR HYDRAULIC PUMPING ONE ZONE AND GAS LIFTING OR FLOWING OTHER ZONE OF DUAL-COMPLETED WELL



OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

December 10, 1953

COPY

Mr. E. H. Foster
Legal Department
Phillips Petroleum Company
Amarillo, Texas

Dear Judge Foster:

We enclose copies of Order R-350-B in Case 556, and Order R-351-B in Case 557, these having been signed today in a meeting of the Commission.

You will notice that they have been signed by Mr. Spurrier and Land Commissioner Walker, who were present at the meeting. Rather than delay your receiving the orders, we are sending them on to you signed by the quorum only, as the third member of the Commission, Governor Mechem, is out of the state for a few days.

Very truly yours,

W. B. Macey,
Chief Engineer

WBM:nr

Encl.

SINCLAIR OIL & GAS COMPANY

SINCLAIR BUILDING

TULSA, OKLAHOMA

H. B. SMITH
PRESIDENT

July 6, 1953

Mr. R. R. Spurrier, Secretary
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Spurrier:

Reference is made to the application of Phillips Petroleum Company s et for hearing July 16th for permission to effect oil-oil dual completions between the Devonian and Wolfcamp formations in wells in the Denton Field, Lea County, New Mexico.

Sinclair Oil & Gas Company, being the owner of developed and undeveloped leases in the Denton Field, concurs in the application of Phillips Petroleum Company and would appreciate the New Mexico Oil Conservation Commission issuing an order permitting oil-oil dual completions in Devonian and Wolfcamp formations in the Denton Field.

Yours very truly,

H. B. Smith

LJF/as

cc-Phillips Petroleum Company
Attn. - Mr. L. E. Fitzjarrald
Bartlesville, Oklahoma.

PHILLIPS PETROLEUM COMPANY

AMARILLO, TEXAS

LEGAL DEPARTMENT
RAYBURN L. FOSTER
VICE PRESIDENT
AND GENERAL COUNSEL
HARRY O. TURNER
GENERAL ATTORNEY

AMARILLO DIVISION
E. H. FOSTER
CHIEF ATTORNEY
R. S. SUTTON
CLIFFORD J. ROBERTS
C. REX BOYD
JACK RITCHIE
THOMAS M. BLUME
JOE V. PEACOCK
WILLIAM M. COTTON
STAFF ATTORNEYS

November 5, 1953

Mr. W. B. Macey
Chief Engineer, Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Bill:

It may be of interest to you to know that, on November 3, 1953, the Texas Railroad Commission ordered semiannual packer leakage tests to be made on all wells completed dually in the Toler Fields, Fisher County, Texas, in the Swastika Sand and the Canyon Sand. The order gave blanket approval to dual completions between the two zones, after filing with the Commission a diagram of the proposed method of completion and electric, gamma ray, or other log showing the zones and perforations and a packer setting affidavit. The semiannual tests are to be made in May and November.

I am just passing this information along to you for what it may be worth.

Sincerely yours,

E. H. Foster

EHF:fe
cc: Mr. R. M. Spurrier

DENTON POOL
LEA CO. N. MEX.
SCALE 1" = 2000'

WOLFCAMP-
DEVONIAN -

T 14 S
T 15 S
R 37 E

27 26 25
34 35 36
3 2 1
10 11 12
14 13

Shell 7-24-55
Shell 10-15-57
Magnolia
32403 3-8-56
Redfern, Shell Blackman 5-5-53 11-5-57
Stanolind 6-16-55
"Shell-Shelton" "Lee Wolfman"
Magnolia 3-3-56
"Maxwell" "Pope"
32403 "Fort" 32403 "Fenn"
Atlantic "A"
Lowe & Cab. Corp. "D"
Sinc. Shell, Hard Redfern 5-3-53 11-25-63
Sinc. Cab Corp. 5-3-56
"Dickinson" "Pope"
Atlantic "Jones" "Jones" "Dickinson" "Pope"
"Pope" "Mann"
Skelly 10,123'
Shell
Skelly "Mexico"
McAlister "State"
"Fort" "H. Priest"
Atlantic
Shell "A" "State"
45636 12-8-56
Gulf 2-8-55
Gulf "D"
"Simpson" "State" "Co State"
"B.C. Dickenson"
Magnolia 4-16-57
Warren, Shell 9-20-57 11-9-53
Shell 11-26-58
41592
Atlantic "B"
Atlantic
"Denton"
Ohio
Warren, Shell 11-5-57
"Pacific Royalty"
"Denton"
"B.C. Dickenson"
Gen. Amer. 13,055'
Gulf "D"
Gibson "State" "McClure"
Atlantic "A"
"Chamberlain"
"B.C. Dickenson"
Atlantic 3-8-55

DOMESTIC SERVICE

Check the class of service desired; otherwise this message will be sent as a full rate telegram

FULL RATE TELEGRAM	
DAY LETTER	
NIGHT LETTER	

$
S
E

WESTERN UNION

W. P. MARSHALL, PRESIDENT

1206 10-51

INTERNATIONAL SERVICE

Check the class of service desired; otherwise the message will be sent at the full rate

FULL RATE	
LETTER TELEGRAM	
SHIP RADIOGRAM	

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
	PD		OIL CONSERVATION COMMISSION	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Santa Fe, New Mexico
July 31, 1953

O. P. NICOLA
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

APPLICATION FOR OIL-OIL DUALS CASES 556 THROUGH 559 DENIED BY COMMISSION.

W. B. MACEY
OIL CONSERVATION COMMISSION

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

September 8, 1953

COPY

Mr. E. H. Foster
Chief Attorney
Phillips Petroleum Company
AMARILLO, TEXAS

Dear Judge Foster:

We enclose two signed copies each of orders issued in Cases 556, 557, 558 and 559 in which your company presented testimony at the July 16 hearing.

Inasmuch as these orders are dated August 28, 1953 and you are not receiving them until this time, you may have until September 18 to file any request for rehearing which you may contemplate.

Sincerely,

W. B. Macey
Chief Engineer

WBM:nr

VIA AIR MAIL

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 556
ORDER No. R-350

THE MATTER OF THE APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR PERMISSION TO EFFECT A DUAL COMPLETION OF ITS FORT NO. 1 WELL, LOCATED IN THE NE/4 NE/4 SECTION 34, TOWNSHIP 14 SOUTH, RANGE 37 EAST, NMPM, LEA COUNTY, NEW MEXICO (IN THE DENTON FIELD), IN SUCH A MANNER AS TO PERMIT PRODUCTION OF OIL FROM THE DEVONIAN FORMATION THROUGH EXISTING CASING PERFORATIONS, 12,564 TO 12,710 FEET, AND OIL FROM THE WOLF-CAMP FORMATION AFTER PERFORATING FROM 9680 TO 9360 FEET.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 16, 1953, at Santa Fe, New Mexico, before the Oil Conservation Commission, hereinafter referred to as the "Commission".

NOW, on this 28th day of August, 1953, the Commission, a quorum being present, having considered the application and the testimony adduced at said hearing, 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.

(2) That dual completion of the Fort No. 1 well in NE/4 NE/4 Section 34, Township 14 S, Range 37 E, NMPM, Lea County, New Mexico (in the Denton Field) for production of oil from the Denton-Wolfcamp formation and oil from the Denton-Devonian formation would be subject to the operational hazards incident to great depths.

(3) That there exists between the two reservoirs a considerable pressure differential, and, should interzone communication occur from any reason, the deeper Devonian Reservoir with the higher pressure would be injured.

(4) That testimony shows that packer, and other mechanical failures in oil-oil completions at various depths have caused injurious interzone communication in reservoirs in other areas under conditions similar to those existing in the Denton Field.

(5) That applicant's testimony as to the economic effectiveness of the Wolfcamp pay section under the subject well appears to be unduly conservative.

(6) That application for oil-oil dual completion of the Fort No. 1 well should be denied.

IT IS THEREFORE ORDERED:

That the application of Phillips Petroleum Company for permission to dually complete its Fort No. 1 Well, located in the NE/4 NE/4, Section 34, Township 14 South, Range 37 East, NMPM, for production of oil from the Denton-Wolfcamp formation, and oil from the Denton-Devonian formation, be, and the same hereby is denied.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

E. S. WALKER, Member

R. R. SPURRIER, Secretary

SEAL

GOVERNOR EDWIN L. MECHEM
CHAIRMAN
LAND COMMISSIONER E.S.WALKER
MEMBER
STATE GEOLOGIST R.R.SPURRIER
SECRETARY AND DIRECTOR

New Mexico
OIL CONSERVATION COMMISSION

P. O. BOX 871
SANTA FE, NEW MEXICO

RECEIVED
[illegible] 1953
[illegible] LAW DEPT.

September 8, 1953

Mr. E. H. Foster
Chief Attorney
Phillips Petroleum Company
AMARILLO, TEXAS

Dear Judge Foster:

We enclose two signed copies each of orders issued in Cases 556, 557, 558 and 559 in which your company presented testimony at the July 16 hearing.

Inasmuch as these orders are dated August 28, 1953 and you are not receiving them until this time, you may have until September 18 to file any request for rehearing which you may contemplate.

Sincerely,

W B. Macey
W. B. Macey
Chief Engineer

WBM:nr

VIA AIR MAIL

SKELLY OIL COMPANY
Mexico "F" Lease
Wolfcamp Formation

LEASE DEVELOPMENT:

First well started	-	February	- 1952
Last well completed	-	April	- 1953
Number wells drilled	-	6	

INVESTMENT:

Total investment as of 6-30-53	-	$884,854.00
Payout status as of 6-30-53	-	200,951.00
Operating expense including production tax		-$56,858.00
Production - gross barrels	-	285,808.00
Lifting cost per gross barrel	-	$.20
Payout rate - per month	-	$70,000.00
Estimated date of payout	-	Oct. 1, 1953

Average per well investment (Includes tank battery)	$147,476.00
Payout time per well	12.7 Months

Tubular requirements - average per well

Surface pipe	-	13-3/8	-	303 feet
Intermediate string	-	9-5/8 or 8-5/8	-	4753 "
Oil string	-	5-1/2	-	9204 "
Tubing	-	2	-	9142 "

Average per well tubular tonnage - 189 tons

MISCELLANEOUS:

Average elapsed time - spudding to release	- 62 days
Cement - total all casing	- 3040 sx.
Acid	- 1925 gal.
Perforations	- 140
Tank battery	- 5-H1000
Average depth drilled	- 9217

SKELLY OIL COMPANY
Mexico "F" Lease
Wolfcamp Formation

LEASE DEVELOPMENT:

First well started	-	February	- 1952
Last well completed	-	April	- 1953
Number wells drilled	-	6	

INVESTMENT:

Total investment as of 6-30-53	-	$884,854.00
Payout status as of 6-30-53	-	200,951.00
Operating expense including production tax		-$56,858.00
Production - gross barrels	-	285,808.00
Lifting cost per gross barrel	-	$.20
Payout rate - per month	-	$70,000.00
Estimated date of payout	-	Oct. 1, 1953

Average per well investment (Includes tank battery)	$147,476.00
Payout time per well	12.7 Months

Tubular requirements - average per well

Surface pipe	-	13-3/8	-	303 feet
Intermediate string	-	9-5/8 or 8-5/8	-	4753 "
Oil string	-	5-1/2	-	9204 "
Tubing	-	2	-	9142 "

Average per well tubular tonnage - 189 tons

MISCELLANEOUS:

Average elapsed time - spudding to release	- 62 days
Cement - total all casing	- 3040 sx.
Acid	- 1925 gal.
Perforations	- 140
Tank battery	- 5-H1000
Average depth drilled	- 9217

EXHIBIT 2

[illegible] OF [illegible] COMPANY
[illegible] NO. 1
NW NW SEC. 35-14S-31E
CHAVES COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION

UPPER ZONE

WOLFCAMP

TOP 9250'
PERFORATE
4TH - 9260' - 9310'
3RD - 9400' - 9410'
2ND - 9490' - 9520'
1ST - 9550' - 9592'

NOTE IT IS PROPOSED TO PERFORATE WOLFCAMP IN ORDER SHOWN. IF WATER IS ENCOUNTERED IN A ZONE THAT ZONE TO BE SQUEEZED OFF.

PRODUCTION PACKER SET AT APPROXIMATELY 9150'

THIS ZONE TO BE PRODUCED THRU TUBING

PRODUCTION PACKER SET AT APPROXIMATELY 12215'

2" [illegible] LANDED AT 12552'

LOWER ZONE

DEVONIAN

TOP 12315'

PERFORATE
12425' - 12550'
12580' - 12640'

THIS ZONE TO BE PRODUCED THRU CASING

5½" CSG. SET AT 12732'

PBTD 12687'
TD 12740'

PHILLIPS PETROLEUM COMPANY
[illegible]
SW/4 NW/4 SEC. 11-15S-37E
LEA COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION

EXHIBIT 3

UPPER ZONE

WOLFCAMP

TOP 9220'

PERFORATE

4TH	9230' -	9320'
3RD	9350' -	9460'
2ND	9480' -	9500'
1ST	9520' -	9550'

NOTE IT IS PROPOSED TO PERFORATE WOLFCAMP IN ORDER SHOWN. IF WATER IS ENCOUNTERED IN A ZONE THAT ZONE TO BE SQUEEZED OFF.

PRODUCTION PACKER SET AT APPROXIMATELY 9120'

THIS ZONE TO BE PRODUCED THRU TUBING

PRODUCTION PACKER SET AT APPROXIMATELY 11980'

2" TUBING LANDED AT 12702'

LOWER ZONE

DEVONIAN

TOP 12260'

PERFORATE

12320' - 12350'
12550' - 12570'

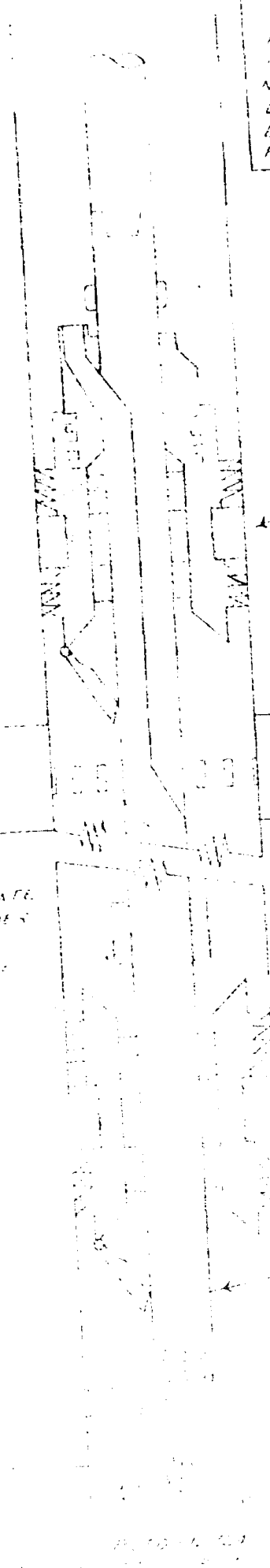
THIS ZONE TO BE PRODUCED THRU CASING

5 1/2" CSG SET AT 12773'

PBTD 12730'

EXHIBIT 4

PHILLIPS PETROLEUM COMPANY
FERT NO. 1
NE. NE SEC 34 14S-37E
LEA COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION



PRODUCTION PACKER
SET AT APPROXIMATELY
9250'

THIS ZONE TO BE PRODUCED
THRU TUBING

UPPER ZONE

WOLFCAMP

TOP AT 9350'

PERFORATE

4TH - 9360' - 9460'
3RD - 9500' - 9550'
2ND - 9580' - 9610'
1ST - 9615' - 9680'

NOTE. IT IS PROPOSED TO PERFORATE THE WOLFCAMP IN THE DRILLERS SHOWN. IF WATER IS ENCOUNTERED ZONE [illegible] SQUEEZED OFF.

PRODUCTION PACKER
SET AT APPROXIMATELY
12453'

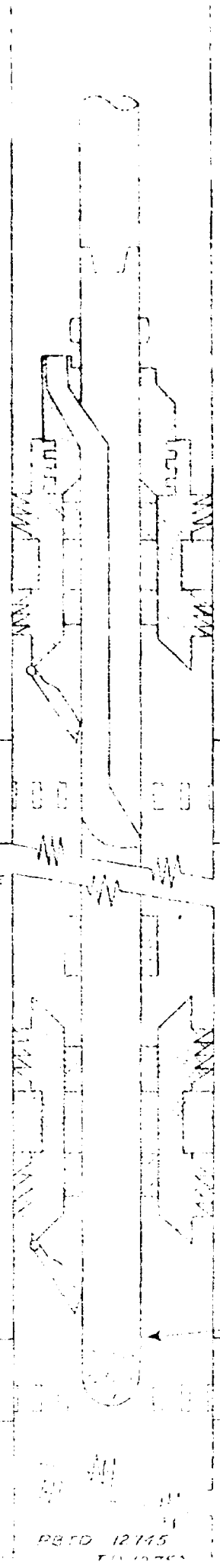
LOWER ZONE

TUBING LANDED AT 12648'

THIS ZONE TO BE PRODUCED
THRU TUBING

EXHIBIT 5

PHILLIPS PETROLEUM COMPANY
DENTON NO. 13
NW. NW, SECTION 11-15S-37E
LEA COUNTY, NEW MEXICO
DIAGRAMMATIC SKETCH SHOWING
PROPOSED DUAL COMPLETION.



PRODUCTION PACKER
SET AT APPROXIMATELY
9043'

UPPER ZONE
WOLFCAMP

TOP 9143'

PERFORATE

4TH	9150' - 9260'
3RD	9290' - 9430'
2ND	9450' - 9500'
1ST	9530' - 9580'

THIS ZONE TO BE PRODUCED
THRU TUBING

NOTE IT IS PROPOSED TO PERFORATE WOLFCAMP IN ORDER SHOWN. IF WATER IS ENCOUNTERED IN A ZONE THAT ZONE TO BE SQUEEZED OFF.

PRODUCTION PACKER
SET AT APPROXIMATELY
11692'

LOWER ZONE
DEVONIAN

TOP 11762'

PERFORATE
12580' - 12670'
12700' - 12730'

2" TUBING LANDED AT 12716'

THIS ZONE TO BE PRODUCED
THRU CASING

5½" CSG SET AT 12745'

PBTD 12745

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

August 11, 1953

COPY

Mr. Vincent M. Vesely
Box 190
SILVER CITY, NEW MEXICO

Dear Sir:

The Oil Conservation Commission has not yet issued orders in the dual completion cases you mention in your letter of August 4. These cases were heard on July 16, and orders probably will be issued in the near future. I will make a note to send you copies of these orders as soon as they are released, or write and advise you of the decision as announced.

Sincerely,

nr

George A. Graham

THOMAS P. FOY
SILVER CITY
BAYARD

VINCENT M. VESELY
BOX 190
SILVER CITY

FOY AND VESELY
ATTORNEYS-AT-LAW
SILVER CITY, NEW MEXICO

August 4, 1953

Mr. George A. Graham
Oil Conservation Commission
Santa Fe, New Mexico

Re: Phillips Fort and Fonzo Wells
34-14-37

Dear George:

Last month you advised me that the Phillips Petroleum Company had requested permission with the Oil Conservation Commission to secure dual production from a single well on the Fort and Fonzo leases in Lea County, New Mexico, and that you expected it would be some weeks before they Commission reached a decision in this matter. Inasmuch as Mrs. Vesely owns a Royalty Interest under these leases, it would be appreciated if you would kindly advise us as soon as possible of your decision.

Yours very truly,

VINCENT M. VESELY

VMV/vb

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

1201

W. P. MARSHALL, PRESIDENT

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
VLT=Int'l Victory Ltr.

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

LA69 KB317

1953 MAY 20 PM 4 44

K.BRA231 NL PD=BARTESVILLE OKLA 20=

=NEW MEXICO OIL CONSERVATION COMMISSION=

=SANTA FE NMEX=

=APPLICATIONS FOR HEARING BEFORE COMMISSION TO DUALLY COMPLETE OUR FORT WELL NO 1 AND DENTON WELLS 12 & 13 IN DENTON FIELD LEA COUNTY BEING FORWARDED YOUR OFFICE. WE PROPOSE DUALLY COMPLETING IN THE DEVONIAN AND WOLFCAMP PAYS BOTH OIL PRODUCING FORMATIONS. URGENT THAT THESE APPLICATIONS BE SCHEDULED FOR JUNE DOCKET=.

PHILLIPS PETROLEUM CO L E FITZJARRALD=(

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Cases 556 & (and 557, 558, 559)

PHILLIPS PETROLEUM COMPANY

LEGAL DEPARTMENT
RAYBURN L. FOSTER
VICE PRESIDENT
AND GENERAL COUNSEL
HARRY D. TURNER
GENERAL ATTORNEY

AMARILLO, TEXAS

AMARILLO DIVISION
E. H. FOSTER
CHIEF ATTORNEY
R. S. SUTTON
CLIFFORD J. ROBERTS
REX BOYD
JACK RITCHIE
THOMAS M. BLUME
JOE V. PEACOCK
STAFF ATTORNEYS

June 11, 1953

AIR MAIL

re: Application of Phillips Petroleum Company to Effect Oil-Oil Dual Completions between the Devonian and Wolfcamp Formations in its Fort Well No. 1, Fonzo Well No. 1, and Denton Wells Nos. 12 and 13, Denton Field, Lea County, New Mexico

Mr. W. B. Macey
Chief Engineer, Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Mr. Macey:

Phillips Petroleum Company desires to oil-oil dually complete between the Devonian and Wolfcamp formations the following wells:

Case 556

1. Fort Well No. 1, located in the NE/4 NE/4, Section 34-14S-37E, Lea County, New Mexico. This well was completed on September 1, 1951, in Devonian pay at a plugged back total depth of 12,774 feet. 12,789 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,544 feet to 12,630 feet; and from 12,660 feet to 12,710 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9445'-9550' test for water. If water squeeze
and perforate 9580'-9610' test for water. If water squeeze
and perforate 9620'-9650' test for water. If water squeeze
and perforate 9740'-9760' combine with previous perforations
that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company Atlantic Building, Dallas, Texas

Magnolia Petroleum Company — Magnolia Building, Dallas, Texas
Shell Oil Company — Petroleum Building, Midland, Texas
Ralph Lowe & Cabot Carbon Co. — Ward Tower, Midland, Texas

Case 557

2. Fonzo Well No. 1, located in the NW/4 NW/4, Section 35-14S-37E, Lea County, New Mexico. This well was completed on July 17, 1952, in Devonian pay at a plugged back total depth of 12,687 feet. 12,710.83 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,580 feet to 12,680 feet; and from 12,456 feet to 12,550 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9550'-9590' test for water. If water squeeze
and Perforate 9480'-9520' test for water. If water squeeze
and Perforate 9400'-9440' test for water. If water squeeze
and Perforate 9260'-9360' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company — Atlantic Building, Dallas, Texas
Magnolia Petroleum Company — Magnolia Building, Dallas, Texas
Ralph Lowe & Cabot Carbon Co. — Ward Tower, Midland, Texas

Case 558

3. Denton Well No. 12, located in the SW/4 NW/4, Section 11-15S-37E, Lea County, New Mexico. This well was completed on June 24, 1952 in Devonian pay at a plugged back total depth of 12,772 feet. 12,752 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,650 feet to 12,700 feet; and 12,600 feet to 12,650 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9540'-9590' test for water. If water squeeze
and Perforate 9480'-9530' test for water. If water squeeze
and Perforate 9350'-9430' test for water. If water squeeze
and Perforate 9280'-9320' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company — Atlantic Building, Dallas, Texas
Shell Oil Company — Petroleum Building, Midland, Texas
Gulf Oil Corporation — Gulf Building, Pittsburgh 30, Pennsylvania
Ohio Oil Company — Petroleum Building, 532 W. Main St., Midland, Texas

Case 559

4. Denton Well No. 12, located in the NW/4 NW/4, Section 11-15S-37E, Lea County, New Mexico. This well was completed on October 19, 1952, in the Devonian pay at a plugged back total depth of 12,745 feet. 12,736 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,700 feet to 12,730 feet; and from 12,580 feet to 12,670 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9530'-9580' test for water. If water squeeze
and Perforate 9460'-9500' test for water. If water squeeze
and Perforate 9290'-9430' test for water. If water squeeze
and Perforate 9150'-9260' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company	Atlantic Building, Dallas, Texas
Shell Oil Company	Petroleum Building, Midland, Texas
Gulf Oil Corporation	Gulf Building, Pittsburgh 30, Pennsylvania
Ohio Oil Company	Donnell Building, 539 S. Main St. Findlay, Ohio

Baker & Otis equipment will be used in these completions, together with some additional equipment subcontracted from Garrett Oil Tools, Inc., for gas lift installations, if necessary. Baker Oil Tools representatives will present cutaway models of the equipment to be used, together with diagrammatic sketches of proposed installations, and will demonstrate and explain this equipment and the installations to the Commission.

I am attaching appropriate plats showing lease and well locations.

Very truly yours,

E. H. Foster

Encls. Plats 2
Extra Copy of this Letter

cc: Oil Conservation Commission
Hobbs, New Mexico

DENTON POOL
LEA CO. N. MEX.
SCALE 1" = 2000'

WOLFCAMP -
DEVONIAN -

T 14 S
T 15 S
R 37 E

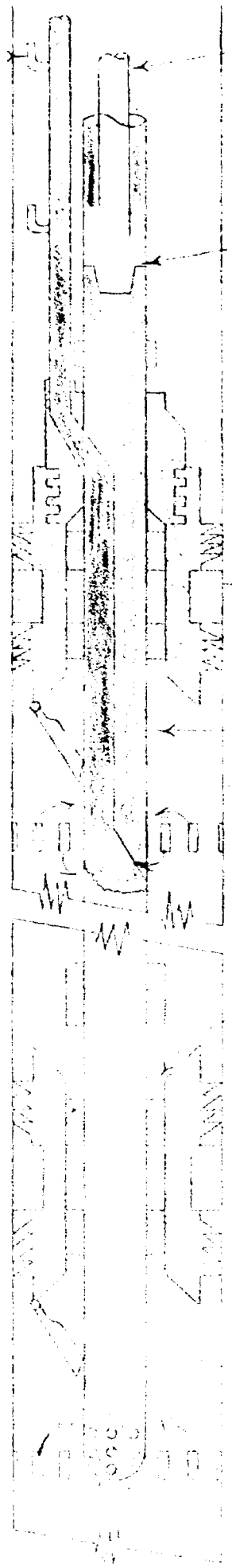
27 26 25
34 35 36
3 2 1
10 11 12
15 14 13

Shell 7-24-55
Shell
Magnolia
32403 2-8-59 3-9-58
Redfern, Shell Blackman 5-8-63 11-5-57
Stanolind 6-16-58
"Shell Shelton" "Wyman"
"Maxwell" "Pope"
32403 9780' "Fort" "Forge"
Magnolia 3-13-56
Sinc. Shell, Hard Redfern 5-8-53 11-21-63
Sinc, Cab Carb 5-8-53 3-13-66
Atlantic "A"
Lowe & Cab. Carb. "D"
"Dickinson"
"Jones" "Jones" "Dickinson" "Cole"
"Pope" "Mann"
Skelly 10,123'
Shell
Skelly
"Mexico"
McAlister "D"
"Fort" "State" "H. Priest"
Atlantic "A"
45656 12-8-56
Gulf 2-8-55
Gulf
Shell "A"
"State"
Gulf "D"
"Simpson"
"State" "Lea State"
"B.C. Dickenson"
Magnolia 4-14-57
Warren, Shell 9-20-57 11-9-53
Shell 11-26-58
41592
"Denton"
Ohio
Warren, Shell 11-6-57
"Pacific Royalty"
Atlantic "B" 2-3-55
Gen. American 12,015
Gulf "D"
McAlister "D"
Goldston
McAlister
"McClure"
"Chamberlain"
Goldston 3-2-56

EXHIBIT 6

GAS VALVE

ARRANGEMENT FOR HYDRAULIC PUMPING ONE ZONE AND GAS LIFTING OR FLOWING OTHER ZONE OF DUAL-COMPLETED WELL



POWER OIL FOR TUBE

CONVENTIONAL KOBE PUMP

PRODUCTION PACKER

CHANGE-OVER FLOW TUBE

TUBING SEAL NIPPLE

PRODUCTION PACKER

NO

CASE 556: Phillips' dual completion of Fort No. 1, NE NE 34-14S-37E (oil from Devonian and oil from Wolfcamp)

DUALLY COMPLETED OIL WELLS
PHILLIPS OPERATED
as of July 1, 1953

Pool	Lease	Well No.	Lower Zone Name	Lower Zone Depth Perf.	Upper Zone Name	Upper Zone Depth Perf.	Date of Dual Comp.
Andector	McEntire	3	Waddell	7835-7910'	McKee	7825-7725'	Apr. '53
Goldsmith	Nysewander	5	Clearfork	6170-6200'	Goldsmith 5600'	5450-5560'	Nov. '52
Goldsmith	Nysewander	6	Clearfork	6190-6275'	Goldsmith 5600'	5421-5582'	Oct. '52
Goldsmith	Schar	10	Clearfork	6119-6260'	Goldsmith 5600'	5347-5477'	Nov. '52
Goldsmith	Schar	11	Clearfork	6192-6280'	Goldsmith 5600'	5421-5578'	Oct. '52
Goldsmith	Schar	12	Clearfork	6165-6260'	Goldsmith 5600'	5430-5600'	Oct. '52
Goldsmith	Schar "A"	11	Clearfork	6190-6275'	Goldsmith 5600'	5420-5605'	Oct. '52
T. Andrews	Tex.Univ."CC"	2	Ellenburger	13825-T.D.	Devonian	13353-13560'	Nov. '45
Embar	Univ. Andrews	44	Ellenburger	7690-7900'	Ordian	6241-6259'	Feb. '50
Embar	Univ. Andrews	58	Ellenburger	7800-7840'	Permian	6200-6250'	Nov. '44
TXL	Alma	5	Ellenburger	9640-9680'	Silurian	8282-8320'	Feb. '52
Wheeler	Cushing	1	Ellenburger	10530-10560'	Devonian	8465-8612'	June '50
Wenwell	Millard "B"	1	Ellenburger	8600-8677'	Waddell	8387-8475'	Oct. '52
Wenwell	Millard "C"	1	Ellenburger	8655-T.D.	Fusselman	7150-7250'	Sept. '53
TXL	Slat	1	Ellenburger	9610-9700'	Silurian	8341-8423'	Nov. '52
TXL	Slat	2	Ellenburger	9665-9695'	Silurian	8354-8420'	Dec. '52
TXL	TXL "A"	1	Ellenburger	9670-9720'	Silurian	8426-8530'	Dec. '52
TXL	TXL "A"	2	Ellenburger	9690-9720'	Silurian	8362-8418'	Oct. '52
Wheeler	TXL "G"	1	Ellenburger	10575-10600	Devonian	8450-8520'	Sept. '46
Wheeler	TXL "N"	1	Ellenburger	10572-10622'	Devonian	8407-8502'	Sept. '47
E.White Point	Call	2	1st Sinton	5785-5815'	E.White Point	5597-5610'	Mar. '53
E.White Point	Call	3	1st Sinton	5822-5826'	E.White Point	5593-5600'	May '53
W. Ringwood	Grimsley	2	5th Conglomerate	5846-5852	2nd Conglomerate	5658-5672'	May '53
Frankirk	Stonewall	3	Ellenburger	6011-	Canyon	4525-4549'	Apr. '52
Hackoy	Watson "A"	1	5100' Strawn	5072-5100'	4400' Strawn	4471-4478'	June '53
N.Lindsay Deese	Alice	1	5th Deese	8400-8440'	Hart	8175-8220'	Dec. '51
Golden Trend	Arnesen	1	Springer	9676-9758'	Hart	9693-9735'	Mar. '53
Golden Trend	Audy "A"	1	Springer	9612-9688'	Hart	7038-7150'	Oct. '52
Golden Trend	Audy "B"	1	Springer	9636-9775'	Hart	8673-8738'	Dec. '52
Golden Trend	Barb	1	Springer	9363-9429'	Hart	8592-8624'	May '52
Golden Trend	Basal	1	Hart	7749-7845'	Gibson	7317-7395'	Dec. '49
Golden Trend	Basal	2	Hart	7636-7689'	Gibson	7435-7495'	Dec. '49
Golden Trend	Basal	3	Hart	7621-7632'	Gibson	7432-7475'	Mar. '50
Golden Trend	Baxter	1	Hart	6959-6952'	Gibson	5776-5868'	Dec. '52
Golden Trend	Burnham	1	Hart	7512-7520'	Gibson	7262-7302'	Jan. '53
Golden Trend	Cecelia	1	Hart	7750-7814'	Gibson	7597-7659'	Nov. '52

Pool	Lease	Well No.	Lower Zone Name	Lower Zone Depth Perf.	Upper Zone Name	Upper Zone Depth Perf.	Date of Dual Comp.
Golden Trend	Chem-Larnie	1	Hart	7927-7954'	Gibson	7706-7725'	Jan. '52
N.W.Lindsay	Cicero	1	1st & 2nd Bromide	10620-10854'	Chimney Hill	9718-9761'	Oct. '52
Golden Trend	Clark "A"	1	Hart	6908-6878'	Gibson	6742-6762'	Dec. '52
West Doyle	Craven	1	Hefner	6202-6250'	Culberson - Gas	5412-5429'	Oct. '43
West Doyle	Culberson	3	Doyle	6122-6156'	Culberson - Gas	5442-5545'	July '45
Golden Trend	Curtis	3	Hart	6895-6916'	Gibson	6724-6[illegible]'	Aug. '50
Golden Trend	Denson	1	Springer	9437-9557'	Hart	8586-8632'	Jan. '52
Golden Trend	Denson	2	Springer	9512-958[illegible]'	Hart	8632-8658'	Jan. '53
Golden Trend	Denson	3	Springer	9319-9370'	Hart	8643-8654'	Mar. '53
Golden Trend	Emma	1	Hart	6980-7003'	Gibson	6818-6903'	May '52
Golden Trend	Forkner	1	Hart	7596-7708'	Gibson	7453-7467'	Aug. '51
Golden Trend	Grant	1	Hart	7053-7070'	Gibson	6[illegible]8-6916'	July '52
Golden Trend	Harr	1	Hart	7428-7497'	Gibson	7278-7341'	Mar. '51
Golden Trend	Hinkle	1	Hart	7564-7604'	Gibson	7386-7458'	Dec. '52
Golden Trend	Manda	1	Hart	7110-7127'	Gibson	6968-7011'	Mar. '52
Golden Trend	Manda	2	Hart	7195-7203'	Gibson	7044-7061'	Nov. '52
N.W.Lindsay	McDaniel	1	Bromide	10765-10866'	Chimney Hill	9760-9825'	Oct. '51
Golden Trend	Norma	1	Hart	8536-8593'	Gibson	9232-9093'	Aug. '52
Golden Trend	Potts "A"	1	Hart	7166-7193'	Gibson	6999-7053'	July '52
Golden Trend	Russell	1	Hart	7182-7216'	Gibson	7096-7113'	May '51
Golden Trend	Sam	1	Hart	7527-7570'	Gibson	7422-7436'	Sept. '52
Golden Trend	Saylors	1	Hart	7514-7538'	Gibson	7365-7403'	Feb. '52
Golden Trend	Tecumseh	1	Hart	7447-7481'	Gibson	7353-7323'	July '51
Golden Trend	Thompson "A"	1	Hart	7136-7163'	Gibson	7045-7099'	July '51
Golden Trend	Tibsen	1	Hart	7853-7913'	Gibson	7663-7673'	Feb. '49
Golden Trend	Vena	1	Hart	7622-7656'	Gibson	7428-7505'	June '52
Golden Trend	Walden	1	Hart	7485-7560'	Gibson	7346-7403'	May '51
Golden Trend	Walden	2	Hart	7488-7562'	Gibson	7344-7369'	Aug. '51
Golden Trend	Wilber	1	Hart	7314-7336'	Gibson	7187-7255'	Mar. '51
S. White Point	Sand	3	1st Sinton	5785-5815'	S. White Point	5605-5610'	July '53
Chocolate Bayou	Banfield	2	U.Houston Farms	11432-11475'	L.Houston Farms	11012-11022'	Aug. '53
Chocolate Bayou	Schenck	4	U.Houston Farms	9838-9882'	Upper Frio	9821-9826'	Aug. '53
Tenwell	Millard "A"	1	Ellenburger	8610-8677'	Wichita Albany	6556-6610'	Aug. '53
N.E.Andrews	Tex. Univ. "VV"	1	Ellenburger	13813-13849'	Devonian	12530-12570'	Aug. '53

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

CASE 556: In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fort Well No. 1, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,536 to 12,710 feet, and oil from the Wolfcamp formation after perforating from 9680 to 9360 feet.

CASE 557: In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fenzo Well No. 1, NW/4 NW/4 Section 35, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,456 to 12,600 feet, and from the Wolfcamp formation after perforating from 9590 feet to 9360 feet.

(contd next page)

TRANSCRIPT OF HEARING

Date

BEFORE: Honorable Ed. L. Mechem, Governor
Honorable E. S. Walker, Land Commissioner
Honorable R. R. Spurrier, Director, OCC

STATE OF NEW MEXICO)
ss
COUNTY OF BERNALILLO)

I HEREBY CERTIFY That the within transcript of proceedings before the Oil Conservation Commission is a true record of the same to the best of my knowledge, skill, and ability.

DONE at Albuquerque, N. M., this _____day of _____195____.

E. E. Greeson

My Comm. Ex.:
August 4, 1956

E. E. Greeson
Notary - Reporter

CASE 558:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Denton Well No. 12, SW/4 NW/4 Section 11, Township 15 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,600 to 12,700 feet, and oil from the Wolfcamp formation after perforating 9590 to 9230 feet.

CASE 559:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Denton Well No. 13, NW/4 NW/4 Section 11, Township 15 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,580 to 12,730 feet, and oil from the Wolfcamp formation after perforating 9580 to 9150 feet.

o

MR. SPURRIER: We will move on to the next case on the docket.

I believe we can consolidate Cases 556 through 559. Without objection, we will try to do that.

(Mr. Graham reads the advertisement of the cases.)

(Off the record.)

o

E. N. WASHBURN,

having been first duly sworn testified as follows:

DIRECT EXAMINATION

BY MR. PEACOCK:

Q Please state your name.

A E. N. Washburn.

Q And your address?

A Bartlesville, Oklahoma.

Q By whom are you employed?

A Phillips Petroleum Company.

Q For how long?

A I am working my twentieth year.

Q In what capacity?

A Engineer; petroleum engineer.

Q Have you testified before this Commission before?

A I have.

MR. PEACOCK: Is the Commission satisfied with Mr. Washburn's qualifications?

MR. SPURRIER: It is.

Q Mr. Washburn, for the record, we will be discussing the four wells concerned in the four cases Nos. 556 through 559. These wells will be generally denominated as the Fort No. 1, the Fonzo No. 1, the Denton No. 12 and the Denton No. 13. Are you familiar with these wells?

A Yes, sir, I am.

Q Are these producing oil wells at this time?

A Yes, sir.

Q From what formation do they produce?

A All four are presently Devonian wells.

Q At what depth is the Devonian formation?

A At approximately 12,500 feet.

Q How thick, measuring vertically, is the Devonian?

A In these wells in question: The Fort has approximately 147 feet of Devonian; the Fonzo has approximately 365 feet; and the Denton 13 has 948 feet; and the Denton No. 12 has about 620 feet. That is productive footage. It is approximately 200 feet more than that in the actual Devonian formation.

Q Are these presently flowing wells?

A They are.

Q Does the Wolfcamp formation lie above the Devonian formation in each of these wells?

A Yes, sir.

Q At what depth does the Wolfcamp lie?

A Approximately 9250 average.

Q How thick is the estimated Wolfcamp pay in the Fort No. 1?

A The productive footage is approximately 22 feet.

Q Do you have micro-log which reveals that information?

A We do.

MR. PEACOCK: I offer this micro-log in evidence

as Applicant's Exhibit 1.

Q Will you examine this micro-log section on the Fort No. 1 and, for the record, point out approximately the pay sands revealed by this micro-log in the Wolfcamp?

A The zone that we propose to perforate would be considerably more footage than the micro-log shows is actual porosity. We do that mainly so that we will get it all. The first zone is between 9645 and 9680, in which - it possibly goes below water-oil contact, and we have approximately five feet of porosity.

The second zone is 9580 to 9610, which contains approximately thirteen feet of porosity.

The third zone is 9500 to 9550, which contains approximately fifteen feet of porosity.

And the upper zone is 9360 to 9460, 100 feet of perforation for five feet of porosity. The porosity totals to about 38 feet.

But, based on examination of other cores from the Wolfcamp, we estimate about 22 feet, about two-thirds of that will be productive.

Q How thick is the Wolfcamp pay sand in the Fonzo and the Denton Nos. 12 and 13 wells?

A I don't have a micro-log of those wells. We estimate the footage in the Fonzo is about 35 feet of productive porosity, and that the two Denton wells will have probably

fifty feet of productive porosity.

Q Other than what you have told us about the conclusions of the Wolfcamp formation, is there any additional information that you have concerning the quality of the Wolfcamp formation in this area?

A You refer to its recovery?

Q Is it lime or --

A It is a lime, embedded with shale streaks.

Q Is it considered a tight formation in this area we are concerned with?

A Yes, it is considered tight.

Q What is the estimated total recovery from the Wolfcamp sand in the Fort No. 1?

A It is generally, from information that we have, we estimate recovery will be approximately 77 barrels per acre foot.

In the Fort well it would have a recovery of approximately 1700 barrels per acres.

Q And the Fort is on a 40-acre unit?

A 40-acre unit, which would give it a recovery of approximately about 68,000 barrels.

Q What would be the estimated total recovery from the Fonzo No. 1 well?

A I would estimate the Fonzo would have approximately 3000 barrels per acre, or about 120,000 barrels on a

40-acre unit.

Q Would the Denton No. 12 -- Do you have figures on the Denton No. 12 and 13?

A They would probably have a recovery of about 4500 barrels per acre, or about 180,000 barrels for the 40-acre unit.

Q What would a 12,000 foot well such as the four wells under consideration cost to drill?

A The Devonian wells are priced about $320,000 each.

Q Does that include storage, taxes and lease cost?

A No, it doesn't.

Q What would it cost to complete a well to the Wolfcamp formation on these four units under discussion?

A Based on the price of six Wolfcamp wells we have drilled in the Denton field, about $200,000.

Q Does that include storage, taxes and lease cost?

A No.

Q What would it cost to dually complete these four wells? That is, the Fort No. 1, the Fonzo and the Dentons 12 and 13, so that they could be produced both from the Devonian and the Wolfcamp formations?

A That price will vary. Probably thirty to forty thousand dollars.

Q Could it run slightly more or slightly less?

A It could run slightly more and with good success, it could be a little less.

Q The estimated total recovery from the Wolfcamp formation in the Fort No. 1 unit is - which you gave us a while ago - is that sufficient to pay back the drilling cost of another well completed to the Wolfcamp formation on that unit?

A No, sir, it isn't.

Q What can you say about the Fonzo No. 1 with relation to the estimated total recovery balanced against the drilling cost of a single well there?

A Considering lifting cost, royalties, production tax, income tax, and taking credit for depletion allowance, there possibly would be a break-even deal, not discounting your money that would be tied up for that period.

6b Q How long is the estimated economic life of the Devonian pay sand in this area?

A The Devonian is estimated to have a thirty to fifty year life. It may exceed that.

Q Now, these four wells which are now producing from the Devonian, are they flowing wells at this time?

A Yes, sir.

Q Is it your opinion they will continue to be flowing wells for as long as they are produced from the Devonian?

A No; they eventually would have to be artificially lifted.

Q Have you an opinion concerning the time at which artificial lifting methods must be applied to this Devonian sand?

A No, sir. I would say that it would be reasonable to expect the flowing life of the Devonian, most of the Devonian, will be flowing by the time the Wolfcamp is abandoned.

Q What is your opinion as to the economic life of the Wolfcamp in this area?

A The Wolfcamp in various studies has been estimated to be approximately ten years.

Q Is the Wolfcamp presently produced by flowing?

A Yes, sir.

Q Will it be able to be produced in that manner during the economic life of that Wolfcamp formation, or must artificial lifting means be applied there at some future date?

A Artificial lift will be required at a later date.

Q Therefore, is it your conclusion that the Wolfcamp will be depleted; that is, it will be at the end of its economic life before it is necessary to artificially lift the oil from the Devonian?

A That is a reasonable assumption; yes, sir, that's right.

Q Upon what do you base that?

A On various studies that we have made.

Q What is the difference in the bottomhole pressure between the Devonian and the Wolfcamp in the wells in this area?

A The Wolfcamp has approximately 3200 pounds and the Devonian has approximately 4500 pounds.

Q Will that pressure decrease as the fields are produced?

A The Wolfcamp pressure is declining at a faster rate than the Devonian.

Q Is the Wolfcamp and the Devonian oil corrosive?

A No; they are considered both sweet oil.

Q Is it considered that they will materially affect the seals which are placed outside the casing and at other places in dual completions?

A We wouldn't expect it to.

Q Has the Wolfcamp formation been sealed off from the Devonian in these four wells outside the casing?

A The wells have been cemented by two-stage cement jobs, using approximately six to eight barrels - I mean six to eight hundred bags - of cement.

In three casing temperature surveys, which were made after the second stage cement job, the cement was found between 2000 and 5000 feet.

In the Fort well 150 sacks were cemented and cir-

culated outside of the casing.

Q Is there any communication between the Devonian and the Wolfcamp in these wells?

A I can't answer that. We don't think there is.

Q Would an additional test for communication be made prior to the installation of any dual completion on these wells?

A That would be the standard procedure in dual completing a well, to run a retrievable packer to test communication outside the pipe before setting the permanent packer.

Q Will you explain what you mean by dual completion?

A The process of separating two zones by a form of packer and having a cross-over flow nozzle where you can arbitrarily produce either zone through either the annulus or the tubing.

Q What size casing is in each of these four wells?

A All have $5\frac{1}{2}$-inch casing.

Q What type of equipment is it proposed that would be used in dually completing these wells? That is, the equipment of what companies?

A We propose to use the Baker production packer and the Otis cross-over nipples.

Q Now, have you prepared exhibits which represent a true schematic cutaway view of the proposed dual completion

using Baker-Otis equipment?

A Yes, sir.

MR. PEACOCK: I would like to offer in evidence these schematic drawings as Applicant's Exhibits 2, 3, 4 and 5. Those are - There is one drawing for each of the wells under consideration.

MR. SPURRIER: Without objection, they will be admitted.

(Off the record.)

Q Will the methods shown allow oil to be flowed from both the Devonian and Wolfcamp formations in these wells without commingling?

A Yes, sir.

Q Is it proposed to measure the oil produced from each formation separately?

A It is.

Q Will you describe briefly the method proposed to perforate the casing to produce from the Wolfcamp?

A I previously covered that. Our geological department has picked four zones in each of the wells they would like to perforate and in order that we may get all the productive porosity in the well. Those four zones are shown on the left of each of the exhibits. It should be understood if any zone shows water, that that zone would be squeezed off. We may have one of the four zones squeezed

off. The first zone is possibly the water zone. It is the lowest zone.

Q Have you prepared an exhibit which represents a schematic cross section view of your dual completion equipment which would allow pumping from the top zone and gas lifting or flowing from the bottom zone of such a well?

A Yes, sir.

MR. PEACOCK: We would like to offer in evidence this Applicant's Exhibit 6.

Q Now, do all of these schematic drawings represent cutaway views of the proposed Baker-Otis dual completion equipment which we intend to use in dually completing these wells?

A The Baker-Otis equipment is the same. This combination on this last exhibit would not necessarily have to be used. There is all reason to believe that only one zone at a time would have to be artificially lifted in each of these four wells.

Q Is your reason for such belief that it is your opinion that the Wolfcamp will be depleted prior to the time that it will be necessary to pump the Devonian?

A That's right.

Q This Exhibit 6 represents a Kobe hydraulic pump. Is that the only type pump which may be used in a dual completion?

A No, sir. There is several combinations you could use if you had to artificially lift both zones at the same time. This is one.

Q Then you do not present this as the only possible means for artificially lifting oil from either or both zones?

A No, sir, although this arrangement is being used successfully in other wells, not by Phillips.

Q Can remedial work be done on a dual completion well such as squeezing and acidizing and other types of remedial work along those lines?

A Yes, sir.

Q How many dual completion wells does Phillips Petroleum Company have now?

A 122 dually completed wells.

Q How many of these dual completion wells are oil-oil?

A 51 at last count.

Q Does a dual completion represent a saving in steel?

A Yes, sir.

Q Over the drilling of two wells?

A In this case about 80 to 100 times.

MR. PEACOCK: That is all I have from Mr. Washburn.

MR. SPURRIER: Do you have another witness?

MR. PEACOCK: Yes, sir; I have two other witnesses.

MR. SPURRIER: Would you like to put them on now, or take the cross examination first?

MR. PEACOCK: Well, these other two will explain briefly the Baker-Otis equipment.

(Off the record.)

_____o_____

CROSS EXAMINATION

BY MR. SELINGER:

Q Mr. Washburn -- For the record, my name is George Selinger, and I represent the Skelly Oil Company. -- Mr. Washburn, I didn't -- In your original testimony I didn't get quite the 50 some odd dual completions you have. Is that Phillips Petroleum Company, your operation?

A 51 oil-oil dual completions in all their operations.

Q Where do they lie mostly, just generally?

A There is about 25 of them in the Oklahoma area around the Ardmore area.

There are 37 of them in the West Texas area, and the remaining are in Louisiana and the Gulf Coast.

Q How many of your dual completions in Oklahoma are as deep as 12,000 feet?

A There is none of them I know of that deep.

Q Are there any 9000 feet, 9400 feet, in Oklahoma?

A No, sir.

Q Now, how many of your dual completions in West Texas are at 12,000 feet?

A I don't know the exact number. There is some.

Q Do you know of any that are at 9400 feet?

A Yes, sir.

Q Now, how many in Louisiana or the Gulf Coast of Texas are at 12,000 feet?

A The Gulf Coast is mostly around five and six thousand feet.

Q Do you have any dual completions at 12,000 feet in the Gulf Coast?

A I don't have any and I don't intend to have; no, sir, we don't.

Q You don't have any. Now, with respect to the Denton pool, you estimate you had 50 feet of effective pay inthe Wolfcamp in your Nos. 12 and 13 Denton; is that correct?

A Yes, sir.

Q Approximately. Now, to the east of - to the east on your twin wells drilled to the Wolfcamp, how many effective feet of pay do you have in those wells?

A I don't have that information here.

Q Is it more or less the same?

A The average for the field is about 53.

Q The average for the field is about 53, and these are 50.

A Yes, sir; approximately fifty feet. That is generous.

Q Well, then, insofar as Nos. 13 and -- 12 and 13 -- are concerned on the Denton lease, they are not below the average of pay thicknesses of the Wolfcamp producers.

A No, sir; they may be a little.

Q Now, you estimate you will recover 180,000 barrels of oil from each, approximately?

A Yes, sir.

Q You are saying those two wells will be uneconomic wells?

A No, sir; I am not.

Q Let's take the Fonzo well; you estimate you have 35 feet of effective pay in the Wolfcamp.

A Yes, sir.

Q Are there any offset wells to this well producing from the Wolfcamp?

A I believe there is one to the north. I don't have a map in front of me.

Q One to the north.

A My recollection is there is.

Q Do you know how much effective pay that well has in

the Wolfcamp?

A Not for sure; no, sir.

Q Is it more or less than what you estimate for your wells?

A I would estimate it approximately the same.

Q Is it a dual completion or a twin drilled well to the Wolfcamp?

A It is a twin well.

Q Who operates that?

A Magnolia.

Q I presume it is admitted there are no dually completed wells in the Denton pool; is that correct?

A That's right.

Q And this is the first attempt to secure dual completions for oil-oil in this field?

A The first to my knowledge.

7b Q Do you know how many Wolfcamp wells have been drilled in this field? If the latest records of the Commission indicate 96, is that approximately correct?

A I think it is.

Q In the neighborhood of 100 wells.

A I was thinking 93.

Q Do you know how many Devonian wells have been drilled?

A No, sir.

Q If the Commission records indicate 142, that is just about right?

A I have that information here. I can't find my information. I assume you're right.

Q That is all right. We can pass on and furnish that later. Now, all of the Wolfcamp wells that have been drilled have been drilled as twin wells to the Devonian, have they not?

A Yes, sir.

Q Now, with respect to the Fonzo No. 1. What is your opinion as to whether or not that is an economic well or an uneconomic well for the Wolfcamp?

A I would estimate the Fonzo was probably a break-even deal.

Q It isn't an uneconomic well in the sense of the term it will not pay back its drilling costs and operation?

A I don't think it would pay back its money if it was discounted.

Q You mean for profit and lease overhead. But I am talking about actual drilling cost and the cost of operations, physical field operations, and you are not saying to this Commission it will not pay that money back.

A It would probably be a break-even deal. It would probably pay the $200,000 back.

Q Are you figuring that 120,000 barrels at the latest price increase your company instituted?

A Yes, sir.

Q Now, Mr. Washburn, with respect to the actual mechanical means of dual completion, I believe you said all four of these wells are completed with $5\frac{1}{2}$-inch OD casing; is that right?

A That's right.

Q And you estimate the flowing life of the Wolfcamp to be comparatively short, particularly as compared to the Devonian?

A Yes, sir.

Q Now, can you tell this Commission which of the horizons are producing water, if any?

A There is a little water being produced in each zone. The water in the Wolfcamp is more to the southeast.

Q Would you say that the Wolfcamp zone will eventually have more water productive each day as time goes on, rather than the Devonian?

A I would say the Devonian would probably produce more water.

Q To a larger extent than the Wolfcamp?

A Yes, sir.

Q Now, with respect to your $5\frac{1}{2}$-inch casing, insofar as both zones produce, you will use the normal packer setting

and normal production of the deeper pay in the tubing, and the shallow pay between the annulus of the tubing and the casing?

A No, sir; I would flow the weak formation, the Wolfcamp, through the tubing, because I feel it will be the first to have to be pumped and we would be set for it.

Q And you would immediately have to set over a cross-over packer; is that correct?

A Yes, sir.

Q Would the likelihood of flowing be within the space of a year or two years, or three years, so far as the Wolfcamp is concerned?

A That will vary with the well. With the little section we have in the Fort, I would expect artificial lift to be required in one or two years. That is purely a guess.

Q When artificial lift is required, then you would use your diagramatic sketch, which is colored in yellow and red --

A I would continue to let the lower zone flow through the casing and with the conventional pump, pump the tubing.

Q How do you do that, pump one zone and flow the other, or is it necessary -- what is it necessary to do to the well mechanically?

A I don't know, other than setting artificial lift equipment.

Q Within your 5½-inch casing, what equipment would you have to put into the well - one string of tubing, two strings, or a macaroni?

A You will have several pieces. In the case shown, it would probably be a macaroni, Kobe conventional pump; or go to rods and put a conventional pump in, or go to the damper type pump, which is a hydraulic pump with a conventional engine.

Q When you go to rods, would you attempt to pump the oil from the 9400 foot or 12,000 foot --

A We are doing it every day.

Q In New Mexico?

A Just a little east of it, in West Texas.

Q Now, with respect to your gas lifting at 9000 and at 12,000 feet, have you made any estimates of the cost of gas injection for such gas lift?

A No, sir.

Q Can you tell this Commission whether or not such a means of operation is economic at those great depths?

A It would all depend on the allowable.

Q Well, suppose the present allowable.

A I mean on the -- Present production would be economical if that was the way you had to go.

Q What is the present allowable?

A In the Devonian?

Q No; the Wolfcamp.

A 170 barrels in the Wolfcamp.

Q Do you believe that any of those four wells will be top allowable wells?

A I can't answer that. All the Wolfcamp wells we have drilled so far have been. Possibly the two of them would be. The two Denton wells; and it is possible the other two might come in potential 170.

Q Have you figured -- Suppose that 170 barrels of oil allowable, have you estimated the volume of gas necessary to gas lift at a depth of 9000 and 12,000?

A When you have the artificial lifting of both zones, I believe - is that right?

Q Pick either one. If you want to use the first zone that ceases to flow, you can. Go ahead and do that if you desire.

A I haven't made calculations on the cost of gas lift.

Q At such depths with such pressures, would it take a comparably large or small volumeof gas?

A It would take approximately 2000 cubic feet per barrel, as a guess.

Q Total gas, or over and above formation gas?

A Over and above formation gas.

Q What is the total volume of gas necessary to lift a barrel of oil now in the field from the Wolfcamp?

A Well, that was in it, if that is what you are getting at. Total solution gas?

Q No. What is the average gas-oil ratio now?

A Around 300, I believe, for the -- Well, I have it here. The gas-oil ratio in the Wolfcamp is running about fourteen, sixteen hundred. And the Devonian is running about 700.

Q Now that you have given the information with respect to the Wolfcamp, let's assume you have to artificially lift both the Devonian and the Wolfcamp. How much gas would it take to produce the top allowable for both horizons, as your first premise, if you can answer that?

A I don't have those figures. It is feasible to gas lift at those depths because it is being done. But I am not limited to gas lift. I can go to rods or hydraulic pumps also.

Q Let's assume gas lift. Would you be able to recover 170 barrels from one horizon and the larger allowable from the other horizon on gas lift?

A No, sir, but it is doubtful when artificial lifting comes you would have that full allowable.

Q Now, your 5½-inch casing, what size strings would you use within the well bore?

A It would depend on what is the situation. You want to lift both zones, now?

Q Yes.

A I would probably run 2-inch tubing and -- Well, if I was going to use rod pumps, I would run 2½-inch tubing; an Otis dual pump, run 2½-inch tubing. If going to have hydraulic, I would put a conventional hydraulic pump in, a conventional Kobe, and run 3-inch tubing with three-quarter macaroni string. And if I had gas lift on the outside, I would run 1-inch on the outside of that.

Q With that equipment in the hole, would there be any restriction mechanically as to the amount of oil that could be produced?

A In the Kobe you have a capacity of 150 to 175 barrels. This depends on what the lift is. You have got it at the extreme, which is what you want, I assume. No bottomhole pressure existing. Probably 150 or 170 barrels through Kobe equipment. And on the gas lift side, have an area equipped through 4-inch tubing. In your annulus, if you want to throw your macaroni, you could gas lift 70 to 80 barrels a day.

Q Where would the point of greatest restriction be in an installation like that? In the first place, would

there be any points of restriction in the production of oil? I believe you answered yes.

A The lowest capacity would be your Kobe equipment.

Q Where would the points of greatest restriction be in that installation on a Kobe pump?

A I don't know what that word "restriction" means.

Q You said that the equipment would restrict the volume of oil that could be produced.

A Yes, sir; it would be in the conventional Kobe equipment.

Q Now, having the most favorable equipment in your well, could you tell this Commission, if dually completing these wells to the Devonian and Wolfcamp from now until the end of time insofar as productionwise is concerned, you would recover more or less oil if you twinned a well to each of the two formations? What is your considered opinion?

A Well, recovery --

Q Where would you recover the most oil? We are talking about the recovery of oil only.

A Recovery of oil, it wouldn't make any difference. I could do justas much -- the way I think the field will perform -- I could do just as good in a dual well as a twin well, just about.

Q Even though in the dual completion well you have

in your 5½-inch casing in one instance, I believe you said, an inch and a half and an inch and a quarter, and in another instance two inches and one and a half inches?

A I will have that at the time when the volumes being handled will be considerably less than they are now, at least in one zone.

Q So, in your opinion, the total recovery would not be any different between the dual completions and the twins drilled in these two horizons in this field? Is that your answer?

A Yes, sir; if the field performs like I think it will.

Q If you want to rework a singly completed well as compared to a dually completed well, what differences are there in such reworking, if any?

A There is a little more. It is more expensive in the dual well.

Q Would you lose any appreciable amount of oil every time you reworked a dually completed well, whether from one horizon to the other horizon?

A I don't see why you would.

Q You wouldn't be required to shut down production from the Devonian, for example, --

A Yes, I see what you are getting at. You would lose your allowable at that time.

8b

Q You would be shut down to the extent it takes to rework the Wolfcamp?

A Yes, sir.

Q If these are uneconomic wells as you say they are, and every time you shut down for the Wolfcamp production the other production is lost, or if you shut down for the Devonian to rework the Devonian well, whatever production is secured from the Wolfcamp is lost insofar as that deep production is concerned, if it isn't a top allowable well - is that correct?

A Yes, sir.

Q Do you anticipate any reworking of dually completed wells if the Commission permits you to dually complete these wells?

A There may be one reworking in the Devonian coming up, because we are completed low. As water encroaches, we will have to go back and complete in the top of the zone.

Q In your original testimony, you testified as to the bottomhole pressure of the Wolfcamp and the bottomhole pressure of the Devonian. What was that difference in bottomhole pressure?

A I believe about fifteen or seventeen hundred pounds.

Q Difference?

A Yes, sir.

Q And I believe you said the bottomhole pressure on

the Wolfcamp was declining more rapidly than the Devonian; is that correct?

A Yes, sir.

Q And therefore the 1700 pounds pressure differential will be markedly increased as time goes on; is that correct?

A I won't say markedly. It will be increased.

Q It will be increased from the difference of 1700 pounds, it will be more than 1700 pounds?

A Yes, sir.

Q In your installation picture you have given to the Commission, do you believe there is any danger about having so much pressure across your packers?

A No, sir, I don't. That testimony will come in later, on how much differential you can handle on a packer.

Q I am asking you as an engineer. You don't believe there is any danger of 2200 pounds pressure differential across the packer?

A We are using this packer in the Fort Stockton area with 9000 pounds across it.

Q Have you ever had any trouble with such packers with such pressures across?

A No, sir. That is one case I know of without trouble.

Q Have you ever had any packer leaking or failing?

A Yes, sir, but they can be detected.

Q How can they be detected here in this case?

A There is packer tests which should be run periodically, or can be run periodically, by shutting in and pressuring up both zones.

Q How often should those periodic tests take place?

A At any time you suspect a leak.

Q I will ask you one final question, Mr. Washburn. Would you, as a cautious operator, as I know Phillips is, in any way jeopardize the better formation, the Devonian, by any attempted dual completions, would you ever have any doubts as to protection of the Devonian formation from the Wolfcamp?

A Rephrase that. I don't catch it.

Q I will rephrase it. Do you think there is any doubt of no harm being done to the better formation, the Devonian, by your dual completion installation with the Wolfcamp?

A If we were afraid of damaging, we wouldn't have asked for this hearing at all.

MR. SELINGER: That's all.

(Off the record.)

MR. SPURRIER: We will recess until 1:30.

(Noon recess.)

MR. SELINGER: Mr. Spurrier, may I add, for the record, insofar as the number of wells completed in the Devonian, there are 66 completed in the Devonian and 48 completed in the Wolfcamp. I wanted the record to be correct to that extent.

I wanted to ask Mr. Washburn one more question.

Q I asked with respect to the north offset to the Fonzo and you said Magnolia had a twin Wolfcamp well as a north offset to the Fonzo. Isn't that true of the Fort No. 1, that Magnolia has a twin Wolfcamp north of that well also?

A That's right, sir.

CROSS EXAMINATION BY MR. MADOLE:

MR. MADOLE: Ross Madole, on behalf of Magnolia Petroleum Company.

Q Mr. Washburn, before we start on these particular facts, is the basis of Phillips' contention in these cases that the economics don't justify the drilling of twin wells?

A In this particular instance, yes, sir.

Q Is that the basis of your applications?

A Pertaining especially to Fort No. 1.

Q What is the basis with reference to the others?

A That we can recover as much oil by dual completing as we could by twinning and save money and critical material

doing it.

Q You have no fear of damage to the reservoir?

A No, sir.

Q Has that been Phillips' position in previous hearings before the Commission?

A No, sir; it hasn't.

Q What has been Phillips' position before the Commission at the other hearings?

A You mean before this New Mexico --

Q Yes, sir.

A I am not familiar. When I said no, sir, I was referring to Texas.

Q Isn't it true in previous hearings before the Commission Phillips has been opposed to dual completions generally unless the economics of the pool as distinguished from the well didn't justify the drilling of an additional well?

A I have never run into that testimony, as far as the State of New Mexico is concerned. I can't answer that.

Q I would like to refer to the record in Cases No. 92, 93 and 94 in relation to the Hobbs Pool, Lea County, New Mexico, and the application of Gulf Oil Corporation, for dual completions of oil-oil formations. Judge Foster, on behalf of Phillips, made this statement:

"We are not opposed to dual completions generally but we do think each one should stand on its own merits. I have a statement to present to the Commission.

"Under ordinary competitive peacetime operations, we believe the production of two oil reservoirs by means of a dual completion is in general unwise and should be definitely discouraged in almost all future instances. There

is little doubt in the vast majority of cases such practice will lend to smaller ultimate recovery of oil from at least one of the reservoirs involved. In addition, we feel added operating problems are numerous and dangerous, and far outweigh any savings that might be realized in the initial development cost.

"It is likewise perfectly obvious to us that producing oil through the annulus is inefficient and will certainly result in shortening the flowing life of the wells.

"We further believe with proper well spacing it is entirely possible to economically develop each producing oil reservoir in a field on an individual well basis, thus mostly eliminating the need for dual completions.

"There are some instances where extremely thin sand sections or rim reservoirs cannot be spaced in a manner to permit individual well development of each oil reservoir. Under such circumstances, if for this class of production, it is considered necessary dual completions might likely be the solution of the problem.

"When development is being carried on with conjunction of a plan of controlled pressure maintenance, there are undoubtedly certain other instances where dual completions might be amply justified.

"Dual oil-gas and dual gas-gas completions are not so susceptible to the many problems consistently found in dual completions of oil-oil wells.

"We therefore feel that the range of application is considerably broader and should be looked upon with greater general favor. However, it is suggested that even in this type of dual completion, each case should stand on its own merits.

"In conclusion, we would like to urge the Commission to adopt the policy of holding hearings and carefully checking each well application

for all types of dual completion and permits be issued only after suitable evidence has been received."

Now, there is no pressure maintenance in the Denton field, is there?

A No, sir.

Q Then, if your policy at that time is the same as now, then the only factor would be the factor of economics? Are you still in accord with that general statement?

A That is no longer Phillips' policy. I believe they believe in oil-oil dual completions. Would you tell me what date that bears?

Q I would be glad to, sir. The meeting was on the fifteenth of April, 1947, in the Coronado Room of the La Fonda Hotel, Santa Fe, New Mexico.

A There has been a considerable improvement in the technique of both manufacturers and the operators since that day.

Q You have no fear of reservoir damage by dual completions?

A No, sir.

Q Now, on your dual completions you testified Phillips Petroleum Company had 51 dual completions.

A They operate 51.

Q Are any of those in the West Texas fields?

A Yes, sir.

Q Where are they located?

A Most of them are in the TXL Field.

Q Is that a carbonated crude?

A Sir?

Q Is that a carbonated reservoir?

A Carbonated?

Q Yes, sir.

A I don't know what you mean by that.

Q A little sour.

A Yes, sir.

Q Have you had any experience which would indicate to you that dual completion is not effective in those fields that have a sour crude?

A We have none of those oil-oil wells there being dual pumped. We have several wells in one zone. The lower zone mostly, the Embar-Ellenberger. And we have no well trouble - no more trouble with those than ordinary single completions.

Q But you are having packer trouble?

A No, sir.

Q You have had no packer failures in those wells?

A We have had no packer failures once we get one set right.

Q When is your definition "when you get it set"?

A When we move the rig away.

Q When you move the rig away. Have you ever set a packer at 12,000 feet in those wells?

A No, sir.

Q Can you tell me that in a crooked hole, which necessarily you will have a floating hole, that you can set a packer at 12,000 feet without any danger of packer failure?

A I can't say it positively, but it is being done by you and by us.

Q I think we will put on testimony to refute the effectiveness of the packer. But I want to know your experience now. Have you had any field packer failures there? You said about single completions. Do you set packers in your single completions?

A Not this type of packer; no, sir.

Q You don't have any more because you don't have any in the single completions?

A Don't have --

Q -- any packer problems because you don't have any packers there, do you?

A No, sir.

Q Now, in these dual completions you say you don't have any more? Let's see how much -- how much packer failures you have experienced in your fields in West Texas?

A By packer failure you mean initial failure, or before the well is put on production?

Q I mean after production, while you are producing it, while you have a packer leak.

9b A We have no record in the Bartlesville office of such a failure - such a packer leak - after the well has been put on production.

Q How long have they been on production?

A The oldest one I can remember is probably three or four years.

Q Don't you know the average life of a packer at its best in corrosive crude of that nature is two and a half to three years? Is usually the maximum life of a packer.

A I certainly don't know that.

Q You don't?

A No, sir.

MR. PEACOCK: Mr. Spurrier, we testified here this oil from the Wolfcamp and from the Devonian isn't corrosive. Mr. Washburn has testified that the oil in the Wolfcamp and the Devonian isn't corrosive.

MR. MADOLE: That is his statement. We will prove otherwise.

Q Since you have gotten to that point, I will ask you how many grains of hydrogen sulfide is found in the

Devonian in the Denton field?

A In the gas? It is classified as sweet.

Q I didn't ask that. I asked how many grains you have got in it?

A If it is sweet, it is less than ten.

Q How about the Wolfcamp?

A I would say it is ten or less.

Q Have you ever run any tests for the hydrogen sulfide content of that pool?

A I have seen reports. I have seen refinery production reports on the evaluation of the Denton Devonian and the Denton Wolfcamp.

Q But you have made no actual test of the pool itself?

A No, sir.

Q Have you ever smelled any of it?

A I have on the batteries; yes, sir.

Q Did you smell any sulphur in it?

A No, sir.

Q Smelled as sweet as the growing flowers, did it?

A Yes, sir.

Q Do you have a paraffin in the production?

A Yes, sir; you have paraffin, especially in the Devonian.

Q High?

A It is classed as a paraffin intermediate base crude.

Q That will affect your dual completions, won't it?

A Paraffin is just like packer troubles. They are magnified considerably. If you recognize you haveparaffin, it can be handled. There are ways of handling it.

Q Then you recognize packer troubles?

A I was using it for your example.

Q Well, we certainly recognize it. Are you familiar with the Dollarhide Field in West Texas?

A No, sir.

Q You have never made any studies of that production?

A No, sir.

Q Or those dual completions?

A Nothing elaborate.

Q With reference to the Devonian, I think you have testified there is an effective water drive; is that correct?

A Appears to be one.

Q Now, in figuring these figures you gave as to the ultimate recovery, what was your efficiency rate that you used in the Devonian?

A I didn't give figures on recovery of the Devonian, I don't believe.

Q Well, have you made any calculation of the recovery in the Devonian?

A I could get them.

Q Well, you testified that these wells were going to last twenty or thirty years. You ought to have some - I don't want any details - but isn't it true that the efficiency rate used in the Devonian by the engineering committee is approximately 60%?

A I believe that's right.

Q Now, you did give some figures in the Wolfcamp?

A Yes.

Q As to recovery?

A Yes.

Q What efficiency rate did you use there?

A I used it only in a solution gas drive of about 25%.

Q Now, don't you find some evidence of a water drive exists in the Wolfcamp?

A There is indications of one being to the southeast part of the field.

Q You made a statement that there was some water found down there. Are you familiar with the C-115 reports to the effect that those wells in the southeast run from 29% to 75% water?

A Yes, sir.

Q That is some water, isn't it?

A Yes, sir.

Q Then, wouldn't that indicate to you that there was somewater drive to the southeast?

A I testified there probably was some water drive.

Q Then would that revise your estimate of the ultimate recovery - would that revise your estimate of the ultimate recovery in the Wolfcamp if a water drive developed rather than a solution gas drive?

A Yes, sir.

Q Then to the extent that the water drive developed and approached the water drive of the Devonian, then your figure of efficiency rate of recovery would be revised upward to a maximum of 60%, wouldn't it, assuming that the water drive developed?

A I don't think the water drive is effective and the fact is pretty apparent.

Q I didn't ask you - You can make your statement as to what you think. Assuming it did develop, then your figure used for ultimate recovery would have to be revised upward toward the 60%, wouldn't it, because that is the efficiency rate used on a water drive field? Is that right?

A It would be increased upward; yes, sir.

Q The effectiveness of water drive is yet to be determined. I will concede that. But now let's go into this recovery that you estimated. In the Wolfcamp Fort No. 1

you estimated a 22-foot effective pay area for recovery; is that right?

A Yes, sir.

Q Now, how did you just figure a 22-foot taken off of the 38 feet that by your own logs would indicate that there are at least 38 feet of all this dolomite you are going to perforate is effective pay sand? Area instead of sand. Excuse me. How did you arrive at 22 feet?

A We had to base that upon cores that had been made in other wells.

Q On a core analysis of these particular wells?

A No; these wells were never cored.

Q Which wells did you use?

A We used the engineering report, Atlantic Dickinson No. 12, I believe it is.

Q Where is that located, Mr. Washburn?

(Off the record.)

A It is Dickinson A-1, No. 1.

Q Where is it located?

A It is one of the early wells that was cored.

(Off the record.)

Q This well is in the northwest of the southwest quarter of Section 1, Township 15 South?

A Yes, sir.

Q When was that well originally brought in?

A I don't have that information.

Q Do you know the accumulative recovery from that well to date?

A No, sir.

Q If I told you according to the engineering report there has been 94,000 barrels produced from that well, would you quarrel with that statement?

A No, sir, I wouldn't.

Q Then the ultimate recovery is going to, if your well performs in the same manner as that well, it will greatly exceed 68,000 barrels, wouldn't it?

A I don't know what its recovery is per acre foot.

Q Well, I thought you used the same recovery data that was shown in their core analysis.

A No, sir. I say we took approximately - based on that well - we took approximately - we assumed two-thirds of the porosity had enough permeability to be productive.

Q Well, what porosity are you figuring on in that two-thirds?

A Approximately 6%.

Q Have you eliminated --

A I am using the micro-log. I beg your pardon. Where the micro-log shows porosity, using approximately two-thirds of that footage.

Q After using that two-thirds, what porosity factor are you cranking into your figures?

A Six percent.

Q Six percent. Then, if you pick the best porosity, the average of the entire area, figuring by the engineering committee as 6%, then if you pick just the best to base your figures on, you ought to increase your porosity, shouldn't you?

A No, sir.

Q Some of the wells have better than 10% porosity, don't they?

A Not to my knowledge.

Q Well, let's see. You know the location of the Magnolia Pope No. 1, or 6? No. 1 in the southwest southeast of Section 35. And No. 6 is in the northwest of the southeast of 26. One to the northeast and one to the southwest of this Fort and Fonzo. If the core date of the Wolfcamp pay of the Magnolia Pope No. 1 and No. 6 indicated an average porosity of 10.3%, would you quarrel with that figure?

A No. 6? Not if your data shows that; no, sir.

Q Well, it looks to me, Mr. Washburn -- I mean if you eliminate all your poor areas and take your best to figure your estimated ultimate recovery, that you ought to revise upward your porosity factor, wouldn't you?

A Not necessarily. That is the way I did it.

Q I know that, but we don't agree with your way of figuring.

A If we could assume that full 38 feet of porosity had sufficient permeability to be productive, we would still have a well less than a marginal well. We would never get our money back.

Q We are going to get to that, too. But let's figure with this 25%, your porosity factor of 6%, and figure it on 38 feet. What would be your recovery?

A Will you repeat that, please?

Q Let's assume our factor of - that your accepted factor of 25% efficiency rate of recovery, let's revize the effective pay zone from 22 to 38 feet and apply the factor you applied to the 22 feet, apply them to 38 feet. What would be the resulting figure of ultimate recovery?

A Approximately 136,000.

Q Sir?

A About 136,000.

Q Now, with reference to the economics of dually completing the Fort No. 1 and the Fonzo, is it the position of Phillips that the other operators go ahead and twin their wells, and then on their edge wells that they should be allowed to dually complete those because their edge wells might not pay them as much profit as they would

like to obtain? In other words, here in recent months Magnolia has twinned the north location from the Fonzo. Do you think that -- You think Magnolia is a fairly prudent operator, don't you?

A Yes, sir.

Q You think they came out with any such figures as those and then proceeded to twin that well?

A We never considered any of that. We merely asked for permission to dual ours. If you want to twin yours, that is your privilege.

Q Do you think we would have drilled a well if our figures indicated we wouldn't get back the cost of drilling it?

A No, sir, I don't.

Q No. Now, let's go to this $200,000 cost of these wells. I would like a little breakdown on that, more than what you have stated, that it is just a flat $200,000. On what is that based?

A On six Wolfcamps we have drilled.

Q With Atlantic?

A On our Denton lease.

Q With Atlantic?

A Yes, sir.

Q Is that the figure you and Atlantic settled on?

A That is the cost charge we have on it.

Q Is that the charge you made to Atlantic?

A That is the cost estimate that was approved by Atlantic; yes, sir. I believe that's right.

Q Now, this estimate - we want to know when the dollar changing started, when Atlantic started paying the bill. On what basis did you settle on those six wells?

A I don't know what you are getting at. I don't think I could answer --

Q Yes, I think you do. You divided up and figured up your cost and sent Atlantic a bill for their proportionate share of the cost, didn't you?

A I never looked at the bill we sent Atlantic. I looked at the bill in our office.

10b

Q Will you look at the bill you gave Atlantic and furnish us that information as to the actual bill presented Atlantic on those six wells, because your $200,000 figure is in excess of fifty to sixty thousand over the average cost of these wells. I don't know what difficulties you experienced.

A The Denton No. 11 cost $195,000; the Denton No. 14 cost $212,000. Those are the last two we drilled. Rounded out, as I said, approximately $200,000.

Q We are doing a lot of rounding. Let's get down to -- You say you based your $200,000 on these six wells.

Now you say you did it on two wells.

A Well, if the Commission requires them, we have the price of the six wells. I used them, and the other ones are a year or so old. I used thelast figures, the 11 Denton and the Denton 14.

Q Used the figures on all six or the last two?

A The last two.

Q On the last two. Did you have any mechanical difficulty in completing those two wells?

A None that I know of.

Q Would you be willing to furnish the Commission with the cost on which you and Atlantic settled for these six wells for the Wolfcamp?

A If the Commission so desires, we certainly would.

Q Well, if we desire, would you so furnish it?

A Well, now, you are getting into -- I can't answer that. I don't know what the policy is on letting figures out.

Q Well, you present some figures here to let yourself into dual completion. You ought to let some more figures out to show the basis on which you are asking for it.

A I don't know what this is getting us at, quite frankly.

Q You know what I am getting at. You know $200,000 is high for those wells.

A We think a Wolfcamp well drilled today would cost $200,000. That is my statement.

Q If our figures on Pope No. 8 are far below that figure, then how do you account for the great difference between the cost of your wells -- Just how do you figure the cost of your wells, figure overhead and profit?

A It is cost of equipment, tangible and intangible values, and it does have some lease foremen and salaries in there for a month or two. But it is a minor item.

Q Actual cost of drilling equipment and completing the well?

A Yes, sir.

Q In your statement with reference to the Wolfcamp, you made the statement it was a tight formation. What is your definition of "tight"?

A Permeability of 10 milledarceys or less.

Q Did you take into consideration the vertical fractures in that formation?

A No, sir.

Q They have vertical fractures in the Wolfcamp in the Denton field do they not?

A Yes, sir.

Q That figure can't be calculated, but it would in-

crease the permeability over-all, wouldn't it?

A Yes, sir, to some extent. I still believe you would class it as a tight formation.

Q Now, with reference to that, do you classify the Devonian as a tight formation in the Denton field?

A No, it is intermediate. We can't say it is -- No, I don't know that.

Q Now, on this -- Your experience in packer failures, I think you said -- I don't want to misquote you -- You did refer to dual completions at ten or twelve thousand feet in the Gulf Coast area?

A I never said that; no, sir.

Q Would you estimate that? You made some reference to the Gulf Coast area. What reference did you make?

A To the fact that we had dual oil-oil, dual completions in the Gulf Coast area is about all I said. But they weren't deep.

Q But you wouldn't be apprehensive of dual completions at ten or twelve thousand feet in the Gulf Coast area?

A I am not familiar with the Gulf Coast area. I know it is different from this hard rock country. I can't answer that.

Q Where are you familiar - with what area - the West Texas area?

A Primarily West Texas.

Q The Dollarhide - is it a sweet crude in the Devonian-Silurian over there?

A I don't have that at my fingertips; I don't know.

Q Now, with reference to your testimony that when you go to artificial lift, what bottomhole pressure in the Wolfcamp did you estimate - did you estimate at what point that you will have to go to artificial lift?

A I can't answer that. We know that artificial lift is coming up, maybe in two years, maybe three years, maybe sooner. I understand there are some on the pump now.

Q There are eleven of them, aren't there? The figure of eleven given you as the number of wells on the artificial pump at this date, that would be pretty well in line with your information?

A Yes, sir.

Q Isn't it true that your pressures in the Wolfcamp indicate that most of the wells will go to artificial lift of some kind in not quite a year or two, but in a matter of months?

A I don't think so.

Q What pressure do you calculate they will go to artificial lift? What pressure? What bottomhole pressure?

A 1000 pounds, in the vicinity of 1000 pounds. I had better say I don't know. I don't know.

Q That would be refuted by the fact that they are on pump and the average pressure is about 3200 pounds?

A Yes, sir; that's right. There is eleven on the pump. There is some others flowing at 3200 pounds. So I don't know when the others will go.

11

Q Will the oil capacity of artificial lift be decreased if water is produced in the formation?

A The rates I gave were approximate capacities at near depletion pressure.

Q With no water?

A With no water. Fluid capacities in other words.

Q There will be some water?

A There is a possibility of that; yes.

Q Then that water will reduce the capacity, won't it, the oil capacity there?

A Naturally.

Q Have you made any analysis of water found in the Devonian or Wolfcamp in the Denton field?

A No, sir, I don't -- We make a very small amount of water, but it has never been analyzed.

Q There is some gyp or lime deposits there, aren't there?

A There are other fields with gyp. That can be

handled like paraffin; if you recognize you have got gyp, you can take care of it.

Q How can you?

A By down hole treatment or by proper selection of equipment that you are using, the artificial lift you use.

Q All of them have got to have some metal, haven't they?

A Yes.

Q And it is going to have a reaction on that metal, isn't it?

A Well, I wouldn't avoid pumping a well because it had a little gyp.

Q No, Idon't advocate your pumping it, but I advocate pumping it in two different holes so that you won't make any communication in different formations in the event you have packer failure. I am not opposing your pumping your wells any way you want to, but I do oppose your pumping them out of the same well bore.

A With Kobe equipment, or hydraulic equipment, I could service that pump much easier than you could do it with rods, or just as easy as a single well.

Q Are you making that statement to this Commission, that you can do a work over job in a dual completion as easy as any single completion?

A I can pull rods on pumps out of the zone that is

being pumped as easy as I could --

Q How about the pressure down in your Devonian? You have got to keep that pressure down, haven't you, to hold that in the formation?

A Well, you are going to choke that off.

Q Choke it off. Okay. I have no further questions.

MR. MADOLE: I would like to reserve the opportunity to cross examine if, as to these packer tools, that I understand they are going to testify about it, if the manufacturers are proposing to testify and don't know what the actual operations of those tools in the field are, because we would like to go into that. But it is premature until such time as the evidence with reference to the tools to be used in the completion of these dual completions.

MR. SPURRIER: Are there any other questions of the witness?

CROSS EXAMINATION BY MR. NESTOR:

MR. NESTOR: My name is E. W. Nestor of Shell Oil Company.

Q There is one point I would like to figure out from your testimony on workovers. If I understood you, you expected to have only one workover possibly during the life of your Wolfcamp wells; is that right?

A I don't believe I made that statement concerning the Wolfcamp. I was talking of the Devonian.

Q There was some statement made -- That is what I mean, the Devonian.

A Yes, sir.

Q Now, when you are going to work over the Devonian, how do you propose to do that?

A Well, the way we would do it today wouldbe to mud it off and squeeze the lower zone and perforate.

Q You would have to pull the dual completion equipment out of the hole and put mud over both formations and proceed. Now, in doing that work, don't you figure that an additonal risk of damage to the Wolfcamp formation, which you have already specified as tight? Now, you are going introduce mud into that formation. What effect do you suppose that will have on your ultimate recovery?

A It all depends on how clean you get it.

Q Now, you just testified it is tight, and I believe you would normally figure, once you have acidized such a tight formation, one of the things you don't want to do is get any fluids back in there again.

A Yes, sir.

Q So, even though the Wolfcamp formation itself didn't require any work at the time, if it is necessary --

which it probably is -- to work over the Devonian formation, then you are going to have to kill the Wolfcamp, and then have to bring it back in, with some possibilities that your Wolfcamp zone won't be as good as it was originally.

A That is a possibility.

Q Are you acquainted with the flowing bottomhole pressure on the west side of the pool, currently? In round figures? Or would you estimate the flowing bottomhole pressure?

A What zone?

Q Wolfcamp.

A About 3200 pounds.

Q On the west side?

A Well, frankly, I can't answer that.

Q That figure is possibly fairly accurate for the east side. But in the west side, in the area where you are proposing to do this work, I am satisfied you will find it averages well under, possibly 2900 pounds or even less. That is all based on the cooperative survey which the Oil & Gas Committee ran in April. They have actually run some pressures since then.

llb

There is another question along that line. Of course, you said you didn't believe you could answer at what bottomhole pressure it would require artificial lift

on the west side. Would you agree, if the wells on the west side are having difficulty and requiring swabbing operations currently at pressures of 24 and 25, would you assume they are getting pretty close to the point where lift would be required?

A Yes, sir.

Q That actually is the case on some of those west side leases. But I think there is a danger that probably the flowing bottomhole pressure of about 2300 pounds will be as low as will sustain the flow on that side.

There is one thing that concerns me too in your comment on the Devonian. I think you mentioned you expected the Devonian would probably flow for at least ten years. Now, did you - or would you state to the Commission you believe your Fort No. 1 will flow for ten years, from the Devonian, that is?

A I think that it will. I will tell them that.

Q Actually, the bottomhole pressures there are about 4400 pounds and you don't know what the critical pressure is there yet. But pressures are dropping and -- How much pay does that well have?

A The Fort in the Devonian?

Q Yes.

A Approximately 150 feet; 147 is what I used.

Q That is good. Roughly, what would the average

thickness for the Devonian be in the Denton?

A Around 900 feet or 1000 feet or 1000 feet.

Q No, that is -- Just the average for all the wells, including the rim wells, probably be somewhere around 600 pounds maybe. As the water comes in, do you not envision that your Fort 1 well there will make water?

A As it comes in, yes.

Q There is a strong possibility you will have to install artificial lift in that well quite a bit before some of your better wells.

A Yes, sir.

Q Such as theDenton 12 and 13. Just roughly, what do you figure is your average operating net income from a barrel of Wolfcamp oil?

A Approximately, after all costs?

Q All costs.

A Between a dollar twenty-five and a dollar and a half.

Q I wonder -- Do you suppose you could outline that for us?

A I don't have that data here. I base that on experiences of payout of other wells in that area.

Q That seems considerably lower than some of the figures we have on that. I wonder if that isn't a bit pessimistic in view in particular of your January price

hike. You still believe it would be roughly that figure?

A That has been my experience in other studies of this nature.

Q Do you suppose you could show the Commission how that figure is arrived at, fairly quickly?

A I don't have the information - the data I need to work with here. My tables, my discount tables, - Let's start out with oil at a dollar fifty-eight plus twenty-five. We take 7/8 of that. That is working interest.

Q Two dollars and fifty-eight cents plus a quarter.

A Yes. Multiply by 7/8, you get a working interest, and we would have about 7½% production tax, or 7.3, I believe it is, to deduct. And then we would have lifting cost, which we would estimate at about $3000 per year per well. Now, then, we have to --we can charge off our intangibles on this first year and we can take depletion allowance and we can take -- we wouldn't have any equipment -- we could depreciate the wellhead equipment.

Q The tangible.

A The tangible part. And after that we would have to figure how our income tax would be at about 52%. Find out what taxable income after that. Then deducting our taxable income from our -- We would multiply by 52% to get our tax, and deduct it from our income, after lifting costs.

Q In other words, you have taken the tax provision

in that? That includes that?

A Yes, sir.

Q Now, there is one other question which concerns me on the west side there where the Wolfcamp pressures are dropping. I believe you testified that the present differential in bottomhole pressures between the Wolfcamp and the Devonian zones is 1700 pounds.

A Approximately.

Q Is that the figure? Actually, the figures on one of the west side leases, and which were taken again from this April survey, from the cooperative survey, showed within just a few pounds of 2000 pounds on two west side wells. One of them is a mile from the Fort and another is less than a mile from the Denton 13, about a half mile.

A Yes.

Q And more or less in a similar stratigraphic position, west flank wells, more or less similar to the flank position of your wells. I thought I would make that point. It does run some higher than 1700 and something, which you would know. Recent pressures indicate it is now over 2100. Since April another 100 pounds of differential has entered the scene. It is quite alarming the differential that is established between the two zones.

A That is bottomhole pressure. It isn't necessarily the differential across the packer.

Q That's right. You could figure roughly 900 pounds as would be a logical figure to assume for the difference in datum.

A Yes.

MR. NESTOR: I believe that is all, Mr. Spurrier.

MR. SPURRIER: Anyone else have a question of Mr. Washburn?

MR. WHITE: I would like to ask one question. I don't believe it has been brought out here very particularly.

How many packer failures have you had on the 51 dual completions after they went on production?

A We had one packer failure in the Embar-Ellenberger field, which was put in - one of the earliest packers we put in - but it was later identified and we corrected it immediately.

MR. WHITE: But that is the only one you know of?

A That is the only one I am aware of, in West Texas, now.

MR. WHITE: That's all.

MR. SELINGER: What depth was the packer?

A Between the Tubbs and the Embar.

MR. NESTOR: There is one further discussion

there on the oil-oil duals in the TXL Field. That is one of the places where you have them in West Texas which you might consider as comparable here. There is one bit of information which might cast, leave, an erroneous impression in someone's mind there. You were questioned as to the length of time the packers had been installed in some of those wells, and I think you stated around three or four years.

A Yes.

MR. NESTOR: Now, I would like for you to clear up for the Commission that that isn't necessarily true for many of those wells in the TXL, is it?

A Our Zeta No. 1 is one of the oldest, approximately three years.

Q Which zone is that?

A It is -- I have got it here in my books somewhere. It is the Embar-Ellenberger and the Silurian, I believe.

Q Ellenberger?

A I beg your pardon. Ellenberger is the zone being pumped.

Q And you think the other is the Silurian?

A Yes, sir.

Q And how long has that well been completed as a dual?

A Approximately three years to the best of my knowl-

edge.

Q What part of the structure is that well, do you know offhand?

A No, sir.

Q I believe prior to the very late 1951 that there weren't any Ellenberger-Fusselman duals in any part of the south zone of the TXL structure. Maybe three. Phillips didn't have any. I may be in error. That is one of the points that concerned me I wanted to get cleared up. There were three wells dualed in the south zone but I believe none were Phillips operated. I thought you made most of them there in 1952. '52, I believe you will find most of the dualing was done.

MR. PEACOCK: Is it still your opinion that was three years?

A I can't be positive. I am recalling from memory.

MR. NESTOR: It sounds like most of the dualing occurred there in late '51 or early '52, which would be about a year old. The specific well you mentioned, I am not sure of either.

MR. SPURRIER: Do you want to have your testimony sworn to, Mr. Nestor?

(Laughter.)

MR. NESTOR: I was just asking. He threw out something I thought was erroneous. I may be wrong.

MR. SPURRIER: Does anyone else have a question of Mr. Washburn? If not, the witness may be excused. We will take a ten minute recess.

(Witness excused.)

(Recess.)

———o———

MR. PEACOCK: I want to call Mr. C. C. Taylor to the stand, please.

C. C. TAYLOR,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. PEACOCK:

Q Will you state your name, please, sir?

A C. C. Taylor.

Q Your address?

A 1610 Bedford Drive, Midland, Texas.

Q By whom are you employed, Mr. Taylor?

A Baker Oil Tools, Incorporated.

Q How long have you worked for them?

A Thirteen years.

Q In what capacity are you working for them at this time?

A I am district manager of West Texas and New Mexico.

MR. PEACOCK: I should like to qualify this witness to testify concerning Baker dual completion equipment. Is the Commission satisfied with his qualifications to so testify?

MR. SPURRIER: I would judge he is qualified.

Q Does Baker Oil Tools, Incorporated, make equipment used in dual completion of wells, that is, oil-oil completions?

A Yes, sir; we do.

Q What is the equipment that your company makes?

A We manufacture a retainer production packer with accessory equipment for production purposes.

Q What is the purpose, briefly, of this equipment?

A The purpose of this equipment is to provide a means of isolating a single zone or multiple zones within the bore of the casing, or the liner.

Q I see, Mr. Taylor, you have brought along a scale model of your equipment, and I propose now to have you explain and demonstrate to the Commission, briefly, what your equipment is and how it works. Will you do so?

A Yes, sir, I will.

Briefly, this is a Baker retainer production packer, Model 415-D-4.

12b This packer, with its accessory equipment, is to segregate or isolate any zones that may be desirable. The

packer itself consists of a setting sleeve. This is the setting sleeve. It consists of an upper slips, a cone, expanding rings; a lead seal, a synthetic packing element, and your lower slips and a junk pusher and a flapper valve installed.

This packer is made of drillable cast iron material. We can set this packer as the operator desires, either on the electric wire line through the medium of a power setting tool. We can set the packer on tubing, or on a drill pipe; as I say, whichever may be desirable.

When we set the packer, if we set it on tubing or drill pipe through the medium of auxiliary equipment, if on tubing or drill pipe, you pull at approximately thirty to thirty-five thousand pounds pull. To properly set your upper slips and to back off your packing element and expand the expanding gas rings out against the walls of the casing. The lower slips are then set and the upper slips set and your packing element and everything squeezed together in this manner to isolate the zone.

When we set it on the wire line, which is an electric line, the same line you perforate with, we place a powder charge in a pressure chamber, which, as I say, is a medium for collapsing the tool and back off the packing element. In this particular tool the powder

charge burns and discharges its gas and from there on the operation is a hydraulic operation, of course, which we call a pressure E-3 setting assembly.

We have set this packer and we are ready to go back into the casing. And then we use the auxiliary equipment. We have this packer set with your clean bore through it. Your flapper valve is closed in that position to keep pressure from below in the event of pressure from below.

We make this equipment up on the tubing, which consists of the auxiliary packing equipment, what we call tubing seal nipples. They have chevron seals working downward to hold pressure from below. And chevron seals working upward to hold pressure from above.

We have in this particular case a Baker cross-over flow tube, which is this - from here down is the Baker cross-over flow tube, with an inner tube and the outer tube. We have a locater sub that mates with a corresponding set in the top of this packer.

If we go back in the hole with the tubing, to assure you these seals are positioned in the bore of the packer, we can set as much weight down on this packer as is practicable to put down on the tubing. If you want to put 50,000 pounds of weight, it's all right. But if you are in large casing, such as 7-inch, with 2-inch

tubing, you might kink or bend the tubing with that much weight down.

This auxiliary equipment is the combination of Baker Oil Tools, Incorporated, and Otis Equipment Company. You can back in with the tubing, your flapper valve opens, your seals are then positioned in the bore of the packer, and you confirm that you are in the bore of the packer by setting a weight of your tubing down.

I believe from there that Otis will explain their --

MR. PEACOCK: I now propose to have the Otis equipment man testify and then I think cross examination could well be directed to the two of them, because the questions will probably relate to both their equipment.

MR. SPURRIER: Very well.

(Witness excused.)

---o---

DON TAYLOR,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. PEACOCK:

Q State your name, please.

A Don F. Taylor.

Q Your address?

A Dallas, Texas.

Q By whom are you employed?

A Otis Pressure Control, Incorporated.

Q For how long have you worked with them?

A Some thirteen years.

Q In what capacity do you now work for them?

A I am the manager of the Special Services Division for Otis Pressure Control.

MR. PEACOCK: Is the Commission satisfied Mr. Taylor is qualified to speak concerning Otis equipment used in dual completions?

MR. SPURRIER: It is.

Q What is the name of the equipment your company makes for dual completions?

13 A We make several tools for dually completing oil wells. The one in question here is the Otis Type H selective cross-over nipple assembly.

Q What is the purpose of this tool?

A The purpose of this tool is to be used in conjunction with an oil well packer placed above the upper formation for separating and controlling the flow of two zones, and utilizing the tubing casing annulus from that point to produce one zone and the internal bore of the tubing to produce the second zone.

Q Now, you have brought along examples of some of your equipment, have you not?

A Yes, sir.

Q Would you demonstrate those to the Commission at this time?

A I would be glad to do that.

This selective cross-over nipple assembly we have here sets on top of the Baker packer and tubular equipment, and it is run on the tubing string at the time the tubing is run into the hole, not before that. As you see, this item here, this nipple, has no control in it. Normally, in your completing practices your two zones will be commingling while you are running your tubing. There is no way to prevent that unless conditions exist which will overcome this flapper valve area here.

At the time this is landed, I think most of you are familiar with the fact that there must be another packer placed between your formations so that your isolation of your lower zone formation from your upper zone will be complete, and a seal between the casing and the tubing effected so that the lower zone production is directed through the bore of the tubing. At that time, and when the tubing is landed, this condition occurs.

The lower zone is then in the tubing and the upper zone is trying to enter the tubing from between

the two packers. And at that time, if you will glance down here, I think I have some prints here if you would like to show them that --

Q Well, are these the reproductions of what we have there?

A I believe those are faithful reproductions with the extent that they don't show some of the detail of the packer arrangements; but essentially they do.

MR. PEACOCK: We would like to introduce these, then, as Applicant's Exhibit 7.

MR. SPURRIER: Without objection, they will be received.

A Gentlemen, if you will glance at the drawing there - and I think you can look at this exhibit or item on display here and correlate the two - you will see down here at the bottom of the page a set of ports beneath the Baker packer, where the upper zone - which allow the upper zone to come in through an annular space between the flow tube and the tubing seal nipples. I want to bring that out at this time so that you will fully understand the path of the two fluids up to this point right here where my hands are, which is the lower portion of the Otis cross-over nipple assembly.

The upper zone fluid, then, comes up underneath the seal nipples and on the outside of the inner flow

tube, and up this channel right here.

Beneath the outer case of the nipple assembly, and on up above, are some horizontal ports that will come out in a diagonal direction from the tubing bore. The upper zone can enter the tubing at this point some four to six inches above the horizontal ports coming out from the tubing into the tubing casing annulus.

That condition exists at the time the casing is landed. From this time on, with your normal well completion practice on the surface, the tubing hanger and casing hanger will correspond to raise and control the device at the surface. We can then, either under pressure or no pressure, install by means of a wire line - what we call a wire line operation - the subsurface control, which will then separate the two zones and direct either zone you desire into the tubing casing annulus.

By means of this you will then produce simultaneously both zones: one through the casing and one through the tubing. Production from the casing wing and the production from the tubing out the normal Christmas tree head.

This tool I have in my hand, and shown in the sketch distributed to you, is known as the cross-over choke. The word "choke" is used colloquially in our

business as a sub-surface control which backs off and seals and directs the flow.

This tool operates in this manner: It has a locking device on it, and is dropped into the tubing, at which point it seals in a locking - locking itself - so that in the upper movement of that tool, that tool is locked into place.

13b I am going to ask your indulgence. The packing on this has been intentionally chipped so that we won't have to get up with a hammer and drive it in and out. But if you will visualize that tool is in that position during the productive life of the well, and is then what we called crossed over - the crossed over position then allows the lower zone, coming up the internal bore of the tubing, to impinge on this bottom of this control by means of the bore of the choke being sealed up, and the upper rings sealing the internal bore of the tubing, and the flow of the lower zone. Directed out through these ports.

I think, if you look on your diagram there, you can see the ports. And from that time on, the lower zone in this particular installation is directed up the tubing casing annulus and out the casing wing valve.

The upper part has a somewhat different path; comes up the little annular crevice in the carcass of

the nipple assembly until it hits these ports here. And they are not external. Covered by a steel sheet. The upper zone fluids hit this mandrill. The nozzles go up or down by means of the packing and plug in the choke, and are then directed into the choke bore; and from there on come right up to the surface through the tubing.

If at any time in the productive life of the well you desire for any reason to change that flow, the wonderful advantage this tool performs is the fact that you can then extract this choke and replace it with another, which has the hollow bore through it all the way down, and it changes the set of the packing to a point below these ports. And the lower zone then is forced through the bore of the packing right on up the tubing. And the upper zone fluid is then forced into here. It can no longer go into the bore of the choke. It is then forced out this point here into your tubing casing annulus.

And with this installation now in place here, you have what we call a regular flow condition for a dual completion. In other words, you normally carry the upper zone up the tubing casing and the lower zone through the tubing.

I think that about covers it. The advantages to this tool are that you can work over each zone as you wish, while producing the other, by the simple means of

a wire line operation.

Q I have a couple of more questions I would like to ask both Mr. Charles Taylor and Mr. Don Taylor.

Mr. Charles Taylor, the equipment you have demonstrated and explained to the Commission, could that be used in a 5½-inch casing for an oil-oil dual completion with the producing zones at approximately 9200 feet and 12,000 feet?

A Yes, sir; it can be.

Q Could either of the zones or both zones be pumped with your equipment installed in the casing?

A You can only, with that installation, pump one zone.

Q With this installation?

A You can pump either zone through your tubing, either the upper or lower zone.

Q Yes.

A But to my knowledge, with that particular installation you cannot pump both zones.

Q Do you have equipment, types of installations, with which both zones can be pumped?

A We do not have that equipment. That equipment is available, I understand.

Q What differential and pressure between the upper and lower zones will these packers sustain without

leaking?

A We have tested this particular packer to 9500 pounds per square inch at 350 degrees Fahrenheit temperature.

MR. WHITE: Did it stand the test?

A Sir?

MR. WHITE: Did it stand the test?

A Yes, sir; it stood the test.

Q Now, Mr. Don Taylor, is the equipment which you have demonstrated to us here today the nature and type which could be used in a $5\frac{1}{2}$-inch casing, a dual oil-oil completion with pay zones at 9200 feet and 12,000 feet?

A Yes, sir.

Q Is the type of choke which you have demonstrated the kind which would be used when both zones are flowing?

A Yes, sir.

Q Do you have equipment with which one or both zones could be pumped?

A The present equipment could be adapted to pump one zone through the tubing by means of an appropriate setting nipple and exchanging the appropriate sub-surface choke to throw the desired zone into the tubing, and allow the other zone to be flowed out the casing. By that

means you can pump one zone and flow the other.

Q Does your company have equipment which could be used in an installation where both zones are pumped?

A Yes, sir.

Q And is it used today for that purpose?

A Yes, sir.

Q In oil-oil dual completions?

A Yes, sir.

Q Mr. Charles Taylor, would you repeat, if you have not already -- I mean if you have already said so -- would you repeat whether or not you would recommend the installation of the packers in a well such as the type I asked you about, approximately - you don't have to say within so many feet -- What I want to know is will one packer be placed between the two zones and another packer in the upper pay zone?

14 A Yes, sir. One packer will be beneath the two zones and one above.

Q You mean between the two zones and one above?

A One between the two zones and one above.

Q Does the equipment which you have demonstrated here prevent commingling of the oil produced from two different pay zones when properly installed?

A Yes, sir; it does.

Q What are these?

A Those are the seal nipples. These are the chevron seals.

Q Is that the usual number of seals you would recommend for installation in the type of well of which I spoke to you a while ago?

A We suggest a flow tube that has twice this many seal rings. In other words, we have both to offer for sale; one with double seals, or this particular one with single seals.

Q With a pressure differential of 1700 or 2000 pounds between the two pay zones, what would you recommend on the number of seals there?

A I would recommend two sets of seals. They cross over the flow tube with two sets of seals with a hanger type flow tube.

Q Do your service men assist and advise the operators in the installation of your equipment?

A Yes, sir; our service men assist and advise in the installation.

Q Do they actually do the installation?

A They only assist and advise in the installation.

Q Do your service men, Mr. Don Taylor, assist and advise?

A We do.

Q What do you actually do in the installation?

A If the operator wishes us to, we will assist and advise in the installation.

MR. PEACOCK: No further questions.

MR. SPURRIER: Does anyone have a question of either of the Mr. Taylors?

MR. SELINGER: Yes.

MR. SPURRIER: Mr. Selinger.

BY MR. SELINGER:

Q Mr. Taylor with Baker: How many installations do you have of Baker retainer packers in $5\frac{1}{2}$-inch casing? That is, your whole assembly installed in $5\frac{1}{2}$-inch casing wells. Do you have any?

A We have made in the -- Do you mean this particular hookup?

Q Yes.

A This identical arrangement?

Q Yes.

A The best of my recollection, we have made approximately 45 installations in the past year and a half.

Q Where were they mostly?

A They were in the Goldsmith Field of Ector County; in the Wheeler Field. I believe that is in Winkler County. I'm not sure. Maybe borders on Winkler in Ector. In the Pegasus Field. In the Benadum Field. In Upton County. In

the Pinwell Field in Ector County.

Q That is all 5½-inch casing?

A Well, we have made a number of 5½ --

Q Let's start over. I am asking just about installations in 5½-inch wells, not 7-inch.

A I can't answer the exact number. I don't know the exact number.

Q What I want from you is whether or not you have any installations in 5½-inch casing.

A Yes, sir; we have.

Q Do you know where they are?

A Yes, sir.

A Yes, sir.

Q Just roughly.

A I know a number are in the Pegasus Field.

Q That is 5½-inch casing?

A That is 5½-inch casing; in the Pegasus Field. And in the Wheeler Field they have 5½-inch casing. In the Benadum Field of Upton County they have 5½-inch installations.

Q Do any of those installations of yours go as deep as 12,500?

A Yes, sir.

Q Which one?

A In the Pegasus field, I believe it is; to the best of my knowledge; 12,500.

Q Now, are you talking about a Baker retainer pro-

duction packer with a special change-over head - is that what you are talking about?

A Yes, sir.

Q And that has been designed to replace the by-pass collar of your regular change-over flow tube? Is that what you are talking about?

A Yes, sir; that's correct.

Q And you say it has been manufactured and used and tested in 5½-inch OD casing wells?

A Yes, sir.

Q Who is R. D. McBrine with your company?

A R. D. McBrine was district manager of West Texas and New Mexico.

Q Would he know whether or not in West Texas the Baker retainer production packer for 5½-inch casing was tested and used in the wells in the West Texas district? Would he know that?

A Yes, sir.

Q Now, your installation you're talking about - with respect to flowing wells, is that correct?

A We install the packers --

Q I am saying you are talking about installations of packers in flowing wells?

A Well, I am talking about the installation of packers.

Q Regardless whether flowing or artificial lift or pumping?

A Yes, sir.

Q And so far as packers are concerned, it makes no difference which type of production, by what means you secure your production, the packer has nothing todo whether it is flowing or artificial lift or pumping; is that correct?

A No, sir.

Q Well, then, what is this installation you are talking about? Which method of production?

A Well, this particular one in question here is the isolation of two zones. And we are talking about the exact installation here, which is flowing.

Q Now, with respect to your 5½-inch size well, the installation you are talking in West Texas was with respect to flowing?

A To the best of my knowledge, they were flowing.

Q As a matter of fact, all the installations you are talking about in West Texas are confined to flowing conditions, are they not?

(No response.)

Q If you don't know, we will go on. But I am asking whether or not you know if they are confined to flowing conditions.

A I believe at the initial installation they were confined to flowing.

Q Now, if artificial means is to be employed after the initial flowing stage, is there any change in the set-up of those wells for production purposes? From the change over of natural flow to artificial lift.

A We do not make pumping equipment or artificial lift equipment.

Q Then your testimony is confined to the equipment you have with respect to flowing wells; is that correct?

A Yes, sir.

Q Now, Mr. Taylor, I will get to you, with the Otis. Do you want to say something, Mr. Peacock?

MR. PEACOCK: That wasn't the impression I got from the gentleman's testimony.

14b MR. SELINGER: Well, the witness can take care of himself. That's what he said. If he has something else to say, I will be glad to hear it.

A I will be glad to renew it. I am not familiar with it.

MR. PEACOCK: You did testify you don't know what type production methods are used in all those wells, didn't you.

MR. SELINGER: I asked him if he didn't know, to

say so and we would go on. And he said so far as he knew, it was confined to flowing wells.

A Our equipment is confined to flowing wells. This equipment here is confined to flowing wells. The auxiliary equipment would be of someone else's manufacture.

MR. SELINGER: Thank you, Mr. Taylor. That is all -- That's what I understood you to say.

Q Now, Mr. Taylor with the Otis.

Your equipment is used with respect to what type of production, whether flowing or artificial lift or pumping?

A This equipment can be used in any type of production you mentioned.

Q Is it used for $5\frac{1}{2}$-inch casing?

A Yes, sir.

Q To what extent have you tested your equipment in $5\frac{1}{2}$-inch casing with respect to depth?

A Oh, we have made so many installations it is hard to recall just exactly how many.

Q I didn't ask how many. I just asked as to the depth.

A We test -- Let me answer the question this way: We test the cross-over nipple assembly, each one of them, at the time we assemble them in our plant in Dallas, with

a hydrostatic head.

Q I believe you misunderstood my question. I am referring with respect to depth only. To what extent has your equipment been used, to what depth?

A It goes to any depth that there is an oil well that has a dual completion in it.

Q Then answer the question correctly, Mr. Taylor. Point out the specific well to the furthest depth you have had your equipment installed.

A I believe Pegasus is a good example of that. I don't recall just how deep it is. I doknow we have several dual completions. I don't know whether oil and oil in the Pegasus Field --

Q Let's take that. Is there anything deeper than Pegasus in Texas you know of?

A Yes, sir; there are deeper wells in Texas than Pegasus.

Q That your equipment has been used in in 5½-inch?

A Yes, sir.

Q In which fields? I won't put the wells. Which fields?

A Well, there again I don't believe I am qualified to say which wells in which fields.

Q All right. We will go on. Now, that installation you have there is for flowing, did you say?

A No, sir; I said it was adapted and could be adapted to any kind of production that would carry the flow through that nipple assembly.

Q Now, what, in addition to that equipment, can you tell this Commission is necessary for artificial lift from one or two zones?

A Well, in the Otis equipment there is nothing that we furnish in this setup that is required additionally. There are manufacturers, other manufacturers' equipment, that can be placed in your tubing string and other types of artificial lift that can be placed on the tubing and on the surface to produce an oil well.

Q In addition to the Baker people and the Otis people, it is necessary for other equipment people to come in and give the Commission the complete picture?

A No, sir; it is the standard pumping equipment, standard lifting equipment. If you prefer to define gas lift as artificial lift --

Q That instrument is prepared for gas lifting purposes?

A It can be adapted to it.

Q Is it right now adapted to it?

A No, sir.

Q What else do you have to use with it?

A You have to use additional equipment with it.

This machine, as you call it, right here, directs the flow of the fluids of each zone.

Q What other equipment do you have to put in that?

A You must put on there, if going to gas lift, put on the appropriate gas lift equipment.

Q Who manufactures that equipment?

A There are several manufacturers of that. Kamco manufactures some of it.

Q Let's stop at Kamco. Do you know whether or not the Kamco people recommend the use of their equipment for $5\frac{1}{2}$-inch casing at a depth of 12,000 feet?

A I am not prepared to say.

Q You don't know?

A No.

Q Those people are located in Houston, are they not?

A Their field offices are all over.

Q Their main office is in Houston?

A I don't know, frankly.

Q In addition to the Kamco people, who else?

A Oh, I will refer you to the composite catalog.

(Laughter.)

Q If you don't know there are other people.

(Laughter.)

A I don't recall anyone in particular that comes

in mind.

Q Here is a chance to give other people some free advertising.

MR. SPURRIER: Strike that.

Q Now, with respect to pumping, what other devices are necessary for pumping a well with the adaptability of your equipment there?

A Oh, if you would envision pumping that well from the specified depth, you would simply add a setting nipple at the time the pump was on the - with certain specifications it would be full opening so that we could get our wire line tools to this nipple assembly.

Q You have to run through the macaroni string inside the casing and tubing?

A You can but it isn't necessary.

Q You can pump these wells through this instrument you have there?

A With a rod string you can pump that tubing with no additional tubing equipment except with a setting nipple and the rod string and the pump and the surface equipment.

Q For both zones?

A No.

Q What do you have to do for both zones?

A For both zones we manufacture a two-zone pump.

Q Yes.

A You must pull out all this equipment.

Q Yes.

15 A You must take out the top packer, or you may adapt the setting nipple for the two-zone pump to set at some point above this upper packer and take production from both zones as you will from whatever elevation you desire.

Q Now, Mr. Taylor, from what depth have you utilized the Otis two-zone pump?

A I believe we have an installation now at an average depth of about 8000 feet. I say an average depth. The lower zone is somewhat lower and the upper zone is somewhat - pumped from somewhat higher. If you got the depths and ran them both together, it would come our right close to 8000 feet.

Q Is your instrument restricted as to the maximum ability of fluid ?

A The two-zone pump?

Q Yes.

A It is restricted only by the mechanical lifting devices attached at the surface.

Q And naturally within the 5½-inch casing there is more restriction than within a 7-inch casing; is that

correct?

A Let's put it this way. If the intake of the pumps can be placed opposite or near the perforations in the casing, then we can take as much oil as one - either of the zones will give up - or your surface equipment will allow you to pump - move the plunger of our pumps.

Q Will you go over that explanation again?

(Laughter.)

Q I don't see how it can be right, but I may be a little dense.

A You may have equipment which will exceed the capacity of the well to produce oil, or oil and water, or oil and gas.

Q Yes.

A In that case you would definitely pump off. Your pumps would be operating inefficiently through no fault of their own.

Q Yes.

A Simply moving a greater length or capacity than the zones have a capacity to give up.

Q You mean if the Wolfcamp and the Denton field was capable of producing 1000 barrels and the Devonian capable of producing 1000 barrels, you could produce one thousand barrels from each horizon?

A If you had the proper rod string and surface equip-

ment to do it with.

Q Could you do it in 5½-inch casing?

A Not 1000 barrels.

Q How much could you produce, total fluid? You know the mathematical calculations as to the maximum volume of the equipment.

A Yes.

Q Now, with this installation, your 5½-inch casing, maximum, and 2½ or 1½ and 1¼, now, what would be the maximum fluid that could be produced?

A Well, that is a question that is eliminated even when you calculate it. It isn't a question of how much we can produce so much as it is a question of satisfying the producer of an allowable, and the ability of the oil zone to give it up. In other words, we have pumps in the ground now that are not producing the proper amount of fluid in that the surface equipment has not been redesigned or reinstalled, of whatever it is, to increase the length of the stroke necessary to give the oil to satisfy the deeper allowable. In other words, the operator is taking what he can get with his surface equipment at the time the pumps are put in. If you have a long enough stroke and you can get that stroke and the oil zone has the capacity to follow that plunger up to the full length of its stroke -- Do you follow me?

Q Yes, I follow you. Go ahead.

A Then you can take that amount of production with a certain pump efficiently.

Q Suppose, as has been testified by Mr. Washburn of Phillips, the Wolfcamp in the particular well is a very uneconom ic well, very small capacity well, do you think your instrument there could successfully operate in an instance where the Wolfcamp is a low producing capacity and the Devonian was a top allowable well?

A I think that we could bring the equipment to bear that would satisfy the operation.

Q Now, I want to ask you, Mr. Taylor, with respect to the total recovery of oil. Presumably a well has all the installations. Now, you can take it in three classifications, flowing, gas lifting and pumping of both horizons. Now, your well on 5½-inch casing, having the equipment of both Baker and Otis and others in the matter of flowing, would you recover more oil by a single completion rather than a dual completion under flowing conditions?

MR. PEACOCK: Objection. I don't believe the gentleman has qualified himself to answer that.

MR. SPURRIER: Does the witness wish to answer?

A I don't believe I am qualified to answer that. We manufacture the equipment.

Q Are you an engineer, Mr. Taylor?

A May I finish?

Q Yes.

A And we have it for sale for those who want to use it. We will work with those that desire to use that. And if in our estimation it isn't a feasible application, we will so recommend. The mechanics of your depletions, we have never gone into.

15b Q Mr. Taylor, are you an engineer by profession?

A Yes, sir.

Q Have you made any study of oil recoveries brought about by installation of your equipment?

A No, sir. That is up to the oil companies and I don't believe we have ever asked them for that information.

Q I believe you, in answer to a question from Mr. Peacock, said a number of instances the producer-operator goes to you for advice as to the installation of packer equipment suited to his particular purpose.

A Yes, sir; he goes to us with the idea he has in mind how much money he wants to spend.

Q Suppose I am Operator A and I come to you for equipment for a well in the Denton Pool on 5½-inch casing. Would you recommend I utilize such an installation under dual completion practices under 9500 and 12,000 feet, or recommend I drill a single well for such a production?

A We make no recommendations of that kind. We recom-

mend only as to the equipment we have available.

Q As an engineer, what would your recommendation be?

MR. PEACOCK: Mr. Taylor isn't qualified to answer that. I object.

A I don't want to answer that. I'm not qualified on that.

MR. SELINGER: He said he didn't want to answer it. It is all rightwith me.

MR. SPURRIER: Let's take a ten minute recess.

(Recess.)

MR. SPURRIER: Mr. Selinger.

MR. SELINGER: I want to ask Mr. Taylor of Baker --

Q In this proposed installation of packers at 9500 and 12,500 feet, where would you set the two packers? About what approximate depth?

A That would be entirely up to the operator.

Q Do you have any recommendation where that should be?

A No, sir.

Q Have you looked at the Phillips exhibit as to the depth they state where they are going to put it?

A Well, as far as we would be concerned, that would be entirely up to --

Q What is the depth indicated on that exhibit?

A 9150 on the upper packer and 9250 on the lower packer -- No; wait a minute. 12,215 on the lower packer and 9,150 on the upper packer.

Q Now, if the lower zone fails to produce, how would that oil get up that 3000-foot string?

A If the lower zone failed to produce?

Q Yes, sir.

A I suppose they would artificially lift the zone if the lower zone failed to produce.

Q I mean if the lower zone quit flowing. I will put it that way. If the lower zone quit flowing, how would that oil get up the 3000-foot separation between the upper packer and the lower packer?

A You could confine the lower zone to your tubing or your annulus, either way you desired to.

Q Suppose you have to pump it?

A I don't know about pumping it.

MR. SELINGER: That's all.

MR. MADOLE: I want to ask one question or two here.

Q Mr. Charley Taylor, does your jurisdiction of your district extend over into the Dollarhide Field of West Texas?

A Yes, sir, it does.

Q Have you assisted and advised in any other dual completions of Magnolia wells in that area?

A Yes, sir; we have run our packers in the Dollarhide.

Q Are you familiar with how many wells you have dually completed for Magnolia in that field?

A No, sir; I'm not familiar with the number.

Q Isn't it approximately twelve wells?

A I couldn't say; I couldn't say.

Q Are you familiar with the packer failures on those dually completed wells?

A No, sir.

Q You haven't been called out for repair work or advice on the repair?

A I don't know those particular wells and I am not familiar enough to say if we were called out on those wells or not.

Q But they have had packer failures in those wells, haven't they?

A I couldn't say they were packer failures. I don't know if they were packer failures or communication behind the pipe or between -- by the cement job-- or tubing failures.

Q But you did have communication, didn't you?

A Yes, sir; I believe that's correct.

Q Now, with reference to these packers, what do you state is the average life of one of these packers in a hole, assuming comparable conditions we are talking about as represented by the Denton Field?

A I don't know the average life. I don't know whe-

ther packers -- I have been back in West Texas -- I know of packers that have been in wells since 1947, I believe. I do not know exactly what the life of the packer will be.

Q Those are your good jobs. Let's talk about some of the bad jobs. What is the estimated life in some of those?

A Actually, I believe the life of the packer will be as long as the life of the well equipment, your tubing equipment, for instance.

Q Do you all have any written guarantee of that?

A No, sir; I sure wouldn't have. No, sir.

Q I would like to present you a few bills if you do.

Do you, Mr. Don Taylor? Are you familiar with the failures in the Dollarhide Field of dual completions?

A No, sir.

Q Have you supervised, or advised - whatever you do - with reference to those completions?

A No, sir.

Q You have never had any experience in the Dollarhide Field?

A No, sir, I haven't.

Q You are aware some of your equipment is installed there?

A I am aware of the fact that there is some of our equipment in the field.

Q Does your company have a written guarantee?

A No, sir. We guarantee against defects in workmanship and material on the surface. We do everything to assist you once it goes into the ground.

Q Once it goes into the ground, do you help pay for the cost of it where it won't work?

A No, sir.

Q Have you had any experience in the Shafter Lake area?

A A little.

16 Q Are you acquainted with any equipment failures or packer failures due to dual completion wells in that field?

A Yes, I am acquainted to this extent: where we have used our equipment to dually pump in the Shafter Lake.

Q Is this by pump or by artificial lift?

A By pump.

MR. MADOLE: That's all.

MR. SPURRIER: Does anyone else have a question of either of the Mr. Taylors?

MR. PEACOCK: There is one other question I think Mr. Charles Taylor might have had an opportunity - or did not fully explain as to his equipment on these pumping operations. And I would like to ask you this. Is this the type of equipment that you have demonstrated to us here, the type that would be used in a pumping operation?

A Yes, sir.

Q If the well were pumped?

A Yes, sir.

Q Either one or both zones.

MR. SELINGER: I would like to object to the question because on interrogation of Mr. Taylor for Baker, he said he knew nothing about the pumping part of it. I dropped any cross examination about pumping. If you are taking it up, I will interrogate further.

MR. PEACOCK: I asked if this was the type of equipment that would be used. Is there any change in this equipment necessary - if the well ceased flowing of its own accord, would they have to come to you and buy something else when they install the pump?

A No, sir, they wouldn't.

MR. SELINGER: Mr. Taylor, with respect to that, if both zones had to be produced by pump, would there be any additional equipment necessary in the well? I asked you a while ago, and if you are going to answer Mr. Peacock that way, I will ask about two zones --

MR. PEACOCK: I asked if they would have to come to him and buy any more equipment and he said no.

MR. SELINGER: That is the point. This gentleman doesn't handle that equipment. He told me he had nothing to do with the pumping part of it.

A That's right.

MR. SELINGER: Can you answer the question, Mr. Taylor, if both zones have to be pumped what additional equipment is necessary in addition to the packers you have?

A I don't know what additional equipment is necessary.

Q How do you know additional equipment is necessary?

A There isn't any of our equipment required additional.

Q You mean insofar as the packers furnished by Baker are concerned, it requires - it makes no difference whether pumper or flowing or artificial lift?

A No, sir.

MR. PEACOCK: That is all we were trying to show, I think.

MR. SELINGER: I will take it one step further.

Q Is it possible to pump both zones without the use of any of the Baker equipment?

A I am sure it is.

MR. MACEY: You mean any more packer equipment?

MR. SELINGER: No; any Baker equipment. The witness just said yes, he felt sure it was.

MR. SPURRIER: Anyone else? Do you have any further witnesses?

MR. PEACOCK: That is all we have.

MR. HADDLE: We have one witness, if the Commission please.

MR. SPURRIER: If there is no further questions of the Taylors, we will excuse them.

(Witnesses excused.)

———o———

EARL G. THURMAN,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MADOLE:

Q State your name, please.

A Earl G. Thurman.

Q Are you a graduate engineer?

A Yes, sir.

Q What school did you attend?

A Oklahoma University.

Q What degree do you hold?

A B.S. in Petroleum Engineering.

Q When were you graduated?

A January 1950.

Q Since that time by whom have you been employed?

A Magnolia Petroleum Company.

Q At what location have you been stationed?

A At Kermit, Texas.

Q In your capacity as petroleum engineer with Magnolia, have you had experience in the Dollarhide Field?

A Yes, sir.

MR. MADOLE: I didn't ask the Commission. Will you accept his qualifications?

MR. SPURRIER: We will.

Q Where is the Dollarhide Field located?

A In the southwestern part of Andrews County, Texas.

Q Magnolia has dually completed wells in that field?

A Yes, sir.

Q Also, we might add, for the record, it is in New Mexico also. We have never been fortunate enough to produce oil therefrom.

From what formations are the wells completed?

A Magnolia dual well completions are completed in the Devonian and Silurian formations.

Q What is the approximate depth of the two formations?

A TheDevonian is an average depth of about 7500 feet and the Silurian 8300 feet.

Q What type drive is present in the field?

A The Devonian formation is a depletion type drive and the Silurian is a moderately strong water drive.

Q Are you familiar with the hydrogen sulfide content of these two formations?

A There have been numerous tests run in those two formations. The approximate hydrogen sulfide content of

the Devonian gas is about 600 grains per hundred cubic feet, and the Silurian is about 1000 to 1200 grains per hundred cubic feet.

Q How many dual completions does Magnolia have in the field?

A Twelve.

Q What type of equipment is utilized in that operation?

A Baker and Otis.

Q Could you -- In your last three years of experience -- Could you outline to the Commission the existence of any cases of communication between zones as a result of packer failure or otherwise, in the field?

A Yes. Dual completions were first started in the latter part of 1947, and really began in earnest in 1948. And Magnolia has completed twelve.

Since that time, we have experienced twelve packer leaks. I won't say packer leaks, communications, on seven wells. Five of the original twelve wells have never had communication. Of the twelve communications, it is my opinion nine of them have been the result of packer element failures and two side-door choke failures and one hole in the tubing.

Q Has that, in your opinion, caused damage to the reservoir?

16b A Well, we have made a thorough investigation to determine whether that has occurred. And we believe in two

instances we can attribute communication between the Devonian and the Silurian being a direct result of damage to the Silurian reservoir.

Q Are you through?

A I was going to add a little more and explain how it was determined.

We had two top allowable wells dually completed and flowing when communication occurred. And unfortunately it isn't always possible to detect communication at the instant it occurs. Maybe a month or several months. But before communication was detected, the wells began to pump water. We worked over and corrected communication. And after the workover, the water percentage increased to about as high as 86% on the two wells, and our production decreased almost half. And we had to install lifting equipment.

It is my opinion the communication resulting in the Silurian formation, which is the strong water drive, charging the depletion Devonian reservoir to such an extent that water was coned into the Silurian formation prematurely, which, in my opinion, has shortened the life of two of those wells.

Q Do you agree with Mr. Washburn's statement it is easy to detect failures or other instances of communication between two formations?

A No; not entirely. I have run a number of packer

leakage tests and on occasion it is very easy to detect a leak. On other occasions it has been very difficult. We have resorted to the bottomhole pressure bomb on some occasions, and have not been able to detect communication, yet we knew we had communication by the gas-oil ratio and the bottomhole pressure performance.

In one case the Silurian charged the Devonion zone reservoir pressure about 500 pounds. That was indication enough we had communication between the Devonian zone and the Silurian, for the Devonian zone was charged to such an extent you could determine from surface equipment or the bottomhole pressure bomb test.

Q Are workovers of this nature difficult?

A We have found workovers at Dollarhide to be difficult and costly and hazardous too. It is necessary, since the Silurian zone is the higher pressure zone, - that wasn't brought out, but it is quite a bit higher pressure than the Devonian - it is necessary to mud up and use water to kill it. Whenever you do this, the upper pressure zone acts as such zone and takes mud and water. And when you put the well back on production, it has been our experience two or three months swabbing and fooling around is required to get back in production.

Q I haven't brought out from you the pressures, the pressure differential. Will you outline for us that informa-

tion?

A On November 1st, 1952, the latest pressure figures I have, the Devonian reservoir had a pressure of 1970 pounds. The Silurian reservoir at that same date had a pressure of 3151 pounds, approximately. That is an absolute pressure differential of about 1181 pounds bottomhole pressure.

So acting is an oil column of about the third gradient of about 940 pounds across the packer.

Q Substantially less than in the - than is the differential in the Denton Field?

A Yes, sir.

Q Does Magnolia have any dual wells artificially lifting in the Dollarhide Field?

A Yes; we have five dual gas lift installations.

Q Has there been any problems with that artificial lifting equipment?

A Unfortunately there is a problem. And we have had some specific problems. We have used gas lift entirely to lift both zones of the dual wells. Since theSilurian zone in the wells in which we have dual gas lift equipment produces water, we have had a particularly harrassing problem of scale formation forming in our tubing and gas lift valve. And this has not only reduced the amount of production we have been able to lift because of the decrease in the effective tubing area size, but has also resulted in

having to pull the well on several occasions, increasing workover costs. We have not been able to handle the volume of oil from our dual gas lift installations we had hoped to do initially.

MR. MADOLE: I have no further questions.

———o———

CROSS EXAMINATION

BY MR. PEACOCK:

Q Mr. Thurman, is the type of packer installed in the wells in the Dollarhide Field the same type as has been demonstrated here?

A Yes, sir.

Q Were you present at the installation of these packers?

A Some of them.

Q At what time have these wells been dually completed,-- You mentioned '47 and '48 -- all twelve completed then?

A They were completed over the interval from late 1947 to late 1951.

Q Did you say there were twelve of these?

A Yes, sir.

MR. MADOLE: Twelve failures in seven wells. Not all twelve wells.

Q Oh. Well, you did, then, have packer failures in

not all twelve?

A Yes, sir.

Q But you did in seven of the wells?

A Yes, sir; that's right.

Q When did the first of these failures occur?

A About the middle of 1948.

Q Why did Magnolia continue installing them?

A We had -- That was really before my time. I don't believe I could answer that question.

Q Have they installed any since your time?

A No; I don't believe they have.

Q Then, you are not actually --

A I mean drilled the wells. I mean actually drilled the wells since my time. That is what I mean by that.

Q Has your experience been limited to this one field?

A Not entirely. I have had some experience in the Pegasus Field.

Q About how much?

A About three months.

Q Is Magnolia presently dually completing any wells in the Pegasus?

A Yes, sir.

Q In the light of their experience in the Dollarhide Field, with all these packer failures, why do you think they continue to install and dually complete these wells?

A It wasn't the recommendation of the engineering department, and that is all I could say.

(Laughter.)

Q You say it was or it wasn't?

A It wasn't.

17 Q Are you familiar with any of the Magnolia operations at places other than the Dollarhide and Pegasus?

A Not personally.

Q Does your company to your knowledge have any policy against oil-oil dual completions?

A No; to my knowledge they don't.

Q Does it have any oil-oil dual completions?

A Yes.

Q Do you know where?

A Dollarhide, Pegasus; the only ones I am acquainted with. I understand we have some in South Texas.

Q Do you have communication between the two zones in the Dollarhide, the one in particular you spoke of you had the great difficulty in locating? Could that have been communication around the outside of the casing?

A No, sir.

Q Have you had any experience with communication on the outside of the casing?

A No, sir; not to my knowledge.

Q Is that well still leaking?

A No, sir.

Q Did you get it fixed?

A Yes, sir.

Q It wasn't impossible, was it, then?

A No, sir.

Q Mr. Thurman, are you aware of Magnolia's having obtained a special order from the Railroad Commission of Texas on February 26th, 1951, granting them permission to dually complete the Lux No. 6 well in the East Abell-Waddell and Abell-Silurian-Montoya Fields in Pecos County, Texas?

A No, sir.

Q Are you aware of the fact that your company, Magnolia, on March the 12th, 1951, obtained a special order from the Railroad Commission of Texas, granting it permission to dually complete its Russel No. 7 well in the Falfurrias Field in Jim Wells County, Texas?

A No, sir.

Q Are you aware your company, Magnolia Petroleum Company, on November 13th, 1951; August 4th, 1952; February 25th, 1952; August 2nd, 1951; October 13th, 1952 --

MR. MADOLE: Are these all oil-oil completions?

MR. PEACOCK: No, sir; all dual completions.

MR. MADOLE: That is what I thought.

Q October 8th, 1951; March 23rd, 1953; and August 4th, 1952, obtained special orders from the Railroad Com-

mission of the State of Texas, authorizing it to dually complete wells?

A No, sir.

MR. PEACOCK: That is all we have, Mr. Spurrier.

———o———

REDIRECT EXAMINATION

BY MR. MADOLE:

Q Just one question. Did I understand those are oil-oil completions?

MR. PEACOCK: Not all of them. You want to know which ones are?

MR. WHITE: There has been no evidence introduced there have been any so far.

MR. MADOLE: The man said he didn't know anything about them. I think they are gas-oil completions. I think we will skip it and go on with the witness.

MR. PEACOCK: If you want the information, we have it here.

MR. MADOLE: I don't care.

MR. SPURRIER: I don't care.

Q Mr. Thurman, there was reference to dual completions in the Pegasus Field. We have only one dual completion there; is that correct?

A To the best of my knowledge that is correct; yes, sir.

Q Are you familiar with the fact that the direct offset to that dual completed well is a dually completed well?

A No, sir.

Q You are not familiar with the fact that we protested that application?

MR. PEACOCK: Objection.

A I am familiar with the fact that we protested it; yes, sir.

Q Are you familiar with the fact that we protested the application for dual completion as a diagonal offset to that well prior to the time we drilled it?

A I don't know on that.

Q This is the third well drilled in the Pegasus Field on dual completion, isn't it?

MR. PEACOCK: Mr. Spurrier --

A I believe that's correct.

(Off the record.)

MR. MADOLE: I have no further questions.

MR. SPURRIER: Does anyone have a further question of Mr. Thurman? If not, the witness may be excused.

(Witness excused.)

MR. SPURRIER: Is there any further comment in this case?

MR. SELINGER: I would like to make astatement,

if statements are in order, as to our position for Skelly Oil Company.

We don't have a fixed policy of opposing dual completions as such. However, we don't look with much favor on such completions. We originally opposed Gulf's application in Cases 92, 93 and 94, as some of the members of the Commission may well know. We did it on the grounds that all the equipment had to be under the most ideal conditions in order for it to function 100%.

Now, in my attempted cross examination I attempted to show the Commission in a 5½-inch casing well you had to put in all this equipment. Now, the applicant brought the Otis and Baker people, and we found out there was additional equipment that had to be put in, depending upon the stage of the development. You have not only this equipment, but have two macaroni strings that had to be in there. And it became evident with all that equipment in a 5½-inch hole you just weren't going to recover that oil through that well as compared with a single completion from the Wolfcamp.

As to the Otis and Baker people, we believe their equipment is good and will continue to buy it, and we think they have good equipment. But we question the accuracy of their equipment at depths of 12,500 feet. That is not saying five years from now we won't accept it, or

two years hence. We will accept the equipment just like the oil industry generally will accept all progressive equipment.

And I think in this case in the Denton Field that when you take into consideration a well can be drilled to the Wolfcamp and a well can be drilled to the Devonian, and from Phillips' own testimony they failed to show economically they cannot drill separate wells to each of the formations. And for that reason and that reason alone we think they should be denied their application for dual completions in the Denton Pool.

MR. MADOLE: I think Magnolia's position in this case is clear. The only observation I would like to make, without getting into a further argument, is the economics as testified to by Mr. Washburn as to the cost of these wells. On the testimony of Mr. Selinger and as assessed by Mr. Washburn, it was brought out that the taxes on this recovered oil, the income tax, is deducted. Well, if that is true, then as you all know, anybody drilling oil wells to save dollars, you apply the saving rather to the $200,000,

17b you won't have but a $98,000 cost in your well. If you put it on one side, you ought to take it off the other.

For that reason, I don't think the economics of this dual completion have been justified.

MR. SPURRIER: Anyone else before Mr. Peacock sums

this up.

MR. NESTOR: I have a statement for the Shell Oil Company in Cases 556 to 559, inclusive, and I will have a copy for the court reporter.

The Oil Conservation Commission of the State of New Mexico has previously stated that it has yet to be convinced of the soundness of oil-oil dual or multiple completions as a general practice in New Mexico and has denied all previous requests for such completions. Most recent examples were Order Number R-78 in Case Number 274, Order Number R-79 in Case Number 275 and Order Number R-233 in Case Number 426. It is Shell's understanding that the principles heretofore controlling the Commission's action with reference to oil-oil dual or multiple completions have been (1) that such completions do not assist it in the performance of its duty of conservation of oil and gas and the protection of correlative rights except in the instance where one of the affected pools will not justify development on its own merit, and (2) that such completions are more apt to result in waste and violation of correlative rights than ordinary completions in the following respects:

1. Oil-oil dual completion often results in the abandonment of one or both zones at a time when there is a reserve therein that would be produced under normal single zone completions. This is because workovers of dual comple-

tions are more expensive than workovers of ordinary completions and will on the average occur at least twice as often, and risk of damage to each reservoir occurs whenever a workover occurs though the occasion therefor may have involved only one of them.

2. Artificial lift in dual completions where production from both horizons must be lifted simultaneously is not as efficient or as practical as in ordinary completions. It seems probably that both the Devonian and Wolfcamp zones at Denton will require artificial lift at the same time. Recent data indicate that eleven Denton Wolfcamp wells are now on artificial lift and that artificial lift installations are pending in at least eight additional wells. This total figure of nineteen wells represents 37 per cent of the 51 field wells.

3. Annular flow is less efficient than flow through tubing and consequently waste of reservoir energy occurs when an oil zone is flowed through the annulus.

4. The danger of communication of reservoir fluids from one zone to another which exists in any well is greatly increased in a dually completed well. This is true because in a dual completion both reservoirs are opened into a single well bore and separated only by a packer which is subject to deterioration with age and exposure to the reservoir fluids.

5. The Oil Conservation Commission of the State of

New Mexico is without sufficient engineers and technical employees to act as a policing group in the checking of packer tests and in the preventing of damage resulting from careless dual completion operations.

It is Shell's opinion that such principles are sound and should continue to be the basis for action by this Commission with reference to requests for oil-oil dual completions. Shell Oil Company therefore respectfully requests that the Commission deny the applications of the Phillips Petroleum Company in Case Numbers 556, 557, 558 and 559, and this even though Shell Oil Company is a part owner with Phillips Petroleum Company in the Fort 1 and Fonzo 1 wells involved in Cases Numbered 556 and 557.

MR. SPURRIER: Anyone else?

MR. JOHNSON: J. P. Johnson with the Atlantic Refining Company.

The Atlantic Refining Company concurs with the Phillips Petroleum Company in their application to effect four dual oil-oil completions in the Denton Field. Atlantic has 50% interest in two of the wells in this application; namely, Phillips' Denton 12 and 13 wells now completed in the Devonian reservoir. In addition to interest in these two wells, Atlantic is owner and operator of 22 wells in the field, and has an interest in 32 wells operated by other companies.

Dual oil-oil completions between the Devonian and Wolfcamp pools are recommended from the standpoint of mechanical feasibility. Atlantic has had experience with numerous dual completion operations and found them to be mechanically and economically feasible.

Atlantic is of the opinion that the paramount consideration here is whether the production can be separated effectively, and the evidence presented on behalf of Phillips Petroleum Company and our past experience indicates it can be done. It is believed proper maintenance and separation of production can be insured by the Commission by appropriate rules and regulations calling for periodic checks to be performed by the operator.

MR. SPURRIER: Anyone else?

MR. CHRISTIE: R. S. Christie of Amerada.

I just wanted to note our position which we have stated before.

While we have no direct interest in these cases, we are still opposed to oil-oil dual completions as a general principle.

MR. SPURRIER: Anyone else?

MR. SPELLMAN: B. K. Spellman for the Ohio Oil Company.

The Ohio is opposed to the granting of Phillips' application for dual oil-oil completions in the Denton Field,

We do not believe the reservoirs are the type which would justify dual completions, and therefore it would be better conservation practice to continue single completions in each reservoir.

MR. SPURRIER: Anyone else? Mr. Peacock.

MR. PEACOCK: To add to what the gentleman from Atlantic so well stated, I would like to say this: First of all, Shell's interest in these two wells he mentioned is one plus percent. It is less than 2%.

(Laughter.)

MR. PEACOCK: We believe that we have presented testimony in evidence to this Commission which proves that dual completion of wells in the Fonzo, Fort and Denton 12 and 13 wells is feasible and practicable. Every company here that has opposed us has dually completed wells. And although they are not here in New Mexico in oil-oil, most of them have oil-oil completions outside of the State of New Mexico.

The equipment which we demonstrated to the Commission is of the type that the Commission has approved for use in dual completions in gas-oil production in this state. And it is our position that this type of equipment will be as effective in preventing commingling and communication in an oil-oil dual completion as it is in a gas-oil dual completion.

Now,we have this further argument applying to the

Fort and Fonzo wells, which I admit doesn't apply to the Denton No. 12 and 13. We could drill twin wells there and pay them out, but could not do so in the Fort and Fonzo No. 1. The Fort will not pay back drilling costs - the Fonzo will not pay back drilling costs. The Fort, we will break even. That is according to the estimates of our engineers. That is the way we determine whether we will or will not drill wells. The same as every company determines the matter.

The Fonzo and Fort won't be drilled and it will result in this, that the oil will lie there in the Wolfcamp formation and it won't be produced under these two 40-acre units. The royalty owners will losetheir royalty. I don't believe any of them could maintain an action against us successfully for failure to drill wells to the Wolfcamp formation in either the Fonzo or Fort 40-acre tracts. They would have to prove that a reasonably prudent operator would drill such a well, and no court in this state will hold a reasonably prudent operator will drill a well where he will lose money or where he will just exactly make back what he spends.

Only one other item here I would like to bring to the attention of the Commission. There are no oil-oil dual completions in this state. TheCommission has had, under its powers, has had the opportunity to study these oil-oil

dual completions, and it has not determined they are not feasible. And it has continued to permit completions, dual completions for gas-oil production. Now, if there were an oil-oil dual completion available for study to this Commission, it could, as a result of its study and as a result of the information which would be available to it, which is not available to it at this time, - those oil-oil completions lie outside this jurisdiction - it would be in a better position to regulate the production of oil from two zones out of the same hole.

Now, I think that all the proponents and opponents of these applications have agreed in the past few years there have been very - at least some improvement - in the equipment for dual completions. Now, Mr. Selinger said his company might in two years change its mind on this dual completion --

MR. SELINGER: Or in five years.

MR. PEACOCK: Or in five years. That is a recognition of the fact that this type of equipment is being improved.

MR. WHITE: But this exhibit is dated 1951; 5-24-51.

MR. SPURRIER: That is the Otis equipment.

MR. PEACOCK: Well, Phillips is in that position now. We are willing to try and see, and we urge the Commission to grant these applications.

MR. SPURRIER: Does anyone else have a comment in this case? If not, we will take the case under advisement and move on to the nomenclature cases.

_____o_____

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

CASE 556: (Re-hearing) Notice is hereby given by the State of New Mexico, through its Oil Conservation Commission, that Phillips Petroleum Company, upon proper petition, has requested a re-hearing in Case 556; that in said petition, petitioner asks recision of Order No. R-350, which order refused petitioner's application for permission to effect dual completion of its Fort No.1 Well, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico, in such manner as to permit production of oil from both the Devonian and Wolfcamp formations; that the Commission, by its Order No. R-350-A, has granted said re-hearing and set it for 9 a.m. on October 15, 1953, at Mabry Hall, Santa Fe, New Mexico, at which time and place petitioner and other interested parties will be heard.

CASE 557: (Re-hearing) Notice is hereby given by the State of New Mexico, through its Oil Conservation Commission, that Phillips Petroleum Company, upon proper petition, has requested a re-hearing in Case 557; that in said petition, petitioner asks recision of Order No. R-351, which order refused petitioner's application for permission to effect dual completion of its Fonzo No.1 Well, NW/4NW/4 Section 35, Township 14 South, Range 37 East, Lea County, New Mexico, in such manner as to permit production of oil from both the Devonian and Wolfcamp formations; that the Commission, by its Order No. R-351-A, has granted said re-hearing and set it for 9 a.m. on October 15, 1953, at Mabry Hall, Santa Fe, New Mexico, at which time and place petitioner and other interested parties will be heard.

TRANSCRIPT OF HEARING
October 15th, 1953

BEFORE: Honorable Ed. L. Mechem, Governor
Honorable E. S. Walker, Land Commissioner
Honorable R. R. Spurrier, Director, OCC

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss

I HEREBY CERTIFY that the within transcript of proceedings before the Oil Conservation Commission is a true record of the same to the best of my knowledge, skill, and ability.

DONE at Santa Fe, N.M., this 17th day of October, 1953.

Maryanne L. Allen
Reporter

SWORN TO before me this 17th day of October, 1953.

M. O. Omsen
Notary Public

My Commission Expires:

CASE 556: Re-hearing — In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fort Well No. 1, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,536 to 12,710 feet, and oil from the Wolfcamp formation after perforating from 9,680 feet to 9,360 feet.

CASE 557: Re-hearing — In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fonzo Well No. 1, NW/4 NW/4 Section 35, Township 15 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,456 to 12,680 feet, and oil from the Wolfcamp formation after perforating from 9590 feet to 9260 feet.

****

COM. SPURRIER: We will now take up Cases 556 and 557.

(Mr. Graham reads the advertisement of the case.)

JUDGE FOSTER: If it please the Commission, I have Mr. Jacob L. Williams here as a witness. He has not previously testified before the Commission, and therefore I will qualify him.

****

JACOB L. WILLIAMS

having been first July sworn testified as follows:

DIRECT EXAMINATION

BY JUDGE FOSTER:

Q Will you please state your name to the Commission?

A Jacob L. Williams.

Q Where do you reside?

A Midland, Texas.

Q By whom are you employed?

A Phillips Petroleum Company.

Q In what capacity?

A Geologist

Q From what school are you a graduate?

A Iowa State College.

Q What year did you graduate?

A 1943

Q With what degree?

A Bachelor of Science.

Q And how long have you practiced your profession as geologist?

A Eight years.

Q All of that time with the Phillips Petroleum Company?

A Yes.

Q What are your duties and where are you located ?

A Midland, Texas.

Q You are familiar with West Texas, New Mexico area of oil and gas production, are you?

A Yes.

Q And you have made a study of the Denton Pool in which Phillips has some wells?

A Yes.

Q And you have made a study of the area that is at issue here in respect to the application of Phillips Petroleum Company to dually complete some oil wells?

A Yes.

Q What area is that?

A Denton Pool

Q And have you prepared some Exhibits and cross-sections with respect to testimony you wish to present?

A Yes.

JUDGE FOSTER: We submit the witness has been qualified, Mr. Commissioner.

COM. SPURRIER: He is qualified.

Q (By Judge Foster): Mr. Williams, will you turn here to the board and just designate the first instrument on the board there as Phillips Petroleum Exhibit No. 1. ?

(Phillips Petroleum Exhibit No. 1 is identified by Mr. Williams.)

Q Now, will you please tell just what that exhibit represents?

A Exhibit No. 1 is a map of the top of the Wolfcamp formation. This particular map I should explain to be on a scale of one inch equals two thousand feet and, some copies I have made here are on a scale that one inch equals four thousand feet.

Q That is a map that reflects the Phillips Petroleum Company's Fort No. 1 and its Fonzo No. 1 wells in the Denton Pool?

A Yes.

Q Will you tell the Commission what that map shows in respect to those two wells?

A This is a map on top of the Wolfcamp formation. It shows which wells are situated higher on the structure and which are located on the fringe, in this position here.

Q What do you mean by "in this position here"?

A Sections 11, 15, 37 and Sections 2, 15, 37 are located on the crest of the Wolfcamp structure. The Phillips' Fonzo Well No. 1 and Fort No. 1 are located off of the crest on the northwest fringe of this structure.

Q On what quarter section are those located?

A The No. 1 Fort is located on the NE/4 of the NE/4 of Section 34, Township 14 South, Range 37 East, NMPM.

Q And the other one?

A The Fonzo Well No. 1 is located on the NW/4 of the NW/4 of Section 35, Township 14 South, Range 37 East, NMPM.

Q In respect to the structural position, what do they show?

A That the No. 1 Fort and No. 1 Fonzo are located on the northwest flank of the down structure.

Q I see you have some legend on the map. Will you explain it?

A The blue encircling the different wells designates that that well is producing from the Wolfcamp and the red pertains to the Wolfcamp formation.

Q There is some other color there, is there not?

A Yes. Yellow shows the leases in which Phillips has an interest.

Judge Foster: We offer in evidence Phillips Exhibit No. 1.

COM. SPURRIER: Without objection, it will be admitted.

(Phillips Exhibit No. 1 received in evidence.)

Q Will you please take that Exhibit down and put up Phillips Exhibit No. 2, identifying it please?

(Phillips Exhibit No. 2 identified.)

Q Now, will you just tell the Commission, without explaining anything that is on the map, just what that map is? What is that?

A That is a cross section drawn North-South through the Phillips No. 1 Fort and showing the relation of the Wolfcamp to the lower formations.

Q What is the source of the information reflected on that map?

A Electro-logs.

Q And was that prepared by you or under your supervision?

A Yes.

Q And that correctly reflects the condition there as you have pictured it on the Exhibit in respect to wells shown on there?

A Yes.

Q Will you please explain that to the Commission and tell them what facts are on there and draw any conclusions from that?

A I will show the cross sections which are on the map, Exhibit No. 1.

Judge Foster: I have had some folders made up that contain all of these maps and you might want to look at them and follow them along with the testimony.

(Whereupon, the folders are distributed.)

A It sets forth the two locations of Phillips - No.1 Fort starting at Magnolia going into Magnolia and Phillips No. 1 Fo[illegible]no and south to Atlantic 8-34 and Atlantic through Jones.

Q You say it extends north to the locations. What is the distance of the locations in that area?

A 1300 feet.

Q You are speaking about well location?

A Yes.

Q And that is on the 40 acres proration units in that area?

A Yes, sir. This map is pretty much of Wolfcamp, so it does not show much structure on this particular cross section, but it does show the relationship of the Wolfcamp to the underlying formations. For instance, the distance from the top of Wolfcamp on No. 1 Fort at this base and west on top here is 750 feet, and the distance from here to here,

Q Where is from here to here?

A From the top of Wolfcamp then to the top of Devonian is about 3100 feet. Another thing it shows is the drill tests in the upper Wolfcamp. You will notice tests in the upper Wolfcamp recover oil in many cases, but the lower Wolfcamp offered nothing.

Q You are pointing to those drill stem wells. What have you got on the map?

A Magnolia -- Monument. This shows above the Wolfcamp that tests have gotten nothing but mud and at the top of the Wolfcamp, 7245 feet, of oil.

Q That is oil in the pipe or hole?

A In the pipe.

Q And beyond that, by a drill stem test, it recovered mud?

A Yes.

Q You speak about a drill stem test. Where was that?

A That was on Phillips' No. 1 Fort.

Q What did it show?

A On these two tests in the upper part of the Wolfcamp, we got 11.3 barrels of oil on the first and 32 barrels of oil on the second. There were three tests there below that and they recovered mud.

Q Compare Phillips' Petroleum Company's No. 1 Fort with No. 1 Magnolia Monument with drill stem tests. How does that compare? How do those wells compare?

A Magnolia recovered 7,245 barrels of oil and this one recovered 11.3 barrels of oil on the first test and 32 barrels of oil on the second test.

Q What well do you mean when you say "this one"?

A The Phillips' Fort No. 1.

Q And that is one of the wells involved in this case?

A Yes.

Q And so the Magnolia well appears to be a substantially better well than Phillips No. 1 Fort?

A Yes.

Q Would you say it is a substantially better well than Phillips'

No. 1 Fort on drill stem basis?

A Yes.

Q If you were to select the best one, which one would that be?

A Magnolia No. 1 Maxwell. We do not have any information on the Atlantic well.

Q How far from the Phillips Fort No. 1 was the Atlantic's No. 1. Dickson?

A About 2600 feet.

Q Would that be about one-half mile?

A Yes.

Q And, on the basis of drill stem test comparison, how does the Phillips' Fort No. 1 compare with Atlantic No. 2 Dickson 834?

A Fort No. 1 recovered 1200 feet of oil and Atlantic No. 2 Dickson 834 recovered about 1990 feet of oil.

Q Would you say that Atlantic No. 2 Dickson was substantially a better well than Phillips No. 1 Fort on the basis of the drill stem tests?

A It is somewhat better.

Q You are looking at the map - which one would you take as the best well?

A Atlantic No. 2 Dickson 834.

Q What is the next well shown?

A Atlantic No. 2 Jones. They took one drill stem test on top of Wolfcamp and recovered 3109 feet of oil and on another test

recovered fifteen feet of mud.

Q Comparing Atlantic No. 2 Jones with Phillips Fort No. 1 on drill stem tests, how did they compare?

A I would say this one had a much better test.

Q You would take Atlantic No. 2 Jones against Phillips' No. 1 Fort, would you?

A Yes.

Q What other information have you collected on that map?

A Another thing of interest is that the oil recovered is from the very top of the Wolfcamp.

Q In what well?

A In all of them.

Q And the tests below the top did not get any?

A No.

Q How do you account for that?

A Through lack of permeability.

Q When you say "lack of permeability", that does not mean anything to me. What are you talking about? Put that in the record.

A Permeability is the ability of the formation to allow fluid to pass through it.

Q To turn it loose and get it into the well hole?

A Yes.

Q How does the permeability of Phillips Fort No. 1 compare with the other wells shown here on the cross section?

A It is much lower.

Q Does that mean better or worse?

A It is worse.

Q Does that mean that you are less likely to recover substantial amounts of oil from Phillips Fort No. 1 than from the other wells?

A Yes.

Q It is just a poor well?

A Yes.

Q That is what these facts represent?

A Yes.

Q Is that what the map is for?

A Partially, and also to show the relationship between the Wolfcamp and the underlying formations.

Q Just show us , if you will, what the relationship is between the Wolfcamp and the underlying formations, well by well.

A It is pretty much the same for all of them. It shows the Wolfcamp is about 1750 feet thick.

Q The Wolfcamp formation from the top to the base?

A Yes.

Q That does not mean you have 1750 feet of pay section, does it?

A No. Underlying that we encounter the Upper Mississippi lime which, in this particular cross-section is about 600 feet thick. Below that is the Lower Mississippi lime which is 750 feet thick. Below that is Woodford 110 feet thick shale and then Devonian.

Q In what formation can you get production in that area, from those wells shown in the cross section?

A In the very upper part of the Wolfcamp and in the Devonian.

Q These other formations, the Upper Mississippi and the Lower Mississippi and other formations, are not productive of oil and gas?

A Not in this cross section.

Q They do not produce?

A There was one well that produced for awhile, but it is in the Upper Mississippi.

Q Those formations are not productive formations in this pool?

A No.

Q What other information is reflected on that map?

A That is about all.

Q Will you take that down and go to the next one. Just before you take that down, let me ask you what is the distance from Phillips' Fort No. 1 to Atlantic No. 1 Jones?

A About three-quarters of a mile.

Q That is about three locations away?

A Yes.

Q Over there, get to the very end of the map, what is that well?

A That is the Magnolia No. 3 Maxwell.

Q Do you have a drill stem test on that one?

A No, I do not. There is a twin to this well, but this Devonian well is not tested.

Q Just the Devonian is reflected in this cross section?

A Yes.

Judge Foster: It is please the Commission, we would like to offer in evidence Phillips' Petroleum Exhibit No. 2.

COM. SPURRIER: Without objection, it will be admitted.

(Phillips Petroleum Co. Exhibit No. 2 admitted in evidence.)

Q (By Judge Foster) Will you mark that Exhibit on the board as Phillips' Exhibit No. 3 please?

(Phillips Petroleum Co. Exhibit No.3 identified.)

Q Without stating what Exhibit No. 3 reflects, just state what it is.

A This is a North-South cross section through Point B shown on the map.

Q What map?

A On the Wolfcamp map of Denton Pool. It shows essentially the same thing as Exhibit No. 2 except it goes through Phillips No. 1 Fort. It is one location East up depth from Exhibit No. 2, which is cross section.

Q You mean Fonzo No. 1 instead of Fort, do you not?

A Yes.

Q The other cross section went through Fort No. 1?

A Yes.

Q Also, at the extreme left hand side of the map you have the the Magnolia No. 16 Pope reflected in the Wolfcamp formation?

A Yes, this is the top of the Wolfcamp formation, and the well

is in the process of being completed now.

Q Is there anything that you want to add in effect to that cross section that you did not talk about on the other one?

A No.

Q On Phillips Fonzo Well No. 1, what did the drill stem tests show?

A There were two tests in the upper part , which is the most prospective. The two tests taken recovered no formation fluid.

Q You got nothing on that?

A No.

Q That makes it still a poor well as well as the other Phillips well?

A I do not think so, because the upper part was not tested. Some of these other drill stem tests are of interest. Magnolia No.16 Pope tested the upper, most prospective part, and recovered 1630 feet of oil and ninety feet oil and gas test mud.

Q Is that a good or bad well?

A To me it would indicate there is not much there. It is a pretty poor well.

Q How far is that from Phillips No. 1 Fonzo?

A Thirteen hundred feet.

Q One location West?

A Two locations North.

Q That would be about 2600 feet?

A Yes.

Q Have you any other drill stem tests that may be of interest?

A The Magnolia No. 4 Pope well flowed 27 barrels of oil in one hour and, when they tested it the second time, they got no fluid.

Q What does that mean?

A It indicates it might make a well in the upper Wolfcamp.

Q Referring to Phillips Fonza No. 1, how does it compare?

A It is hard tosay because it was not tested in the same zone.

Q Why did you not test it?

A I do not know.

Q There is nothing unusual about it?

A No; It could probably be tested.

Q But you do not know why it was not tested?

A No, I do not.

Q Have you some other drill stem tests?

A Between 3 D, Deck A was tested in the upper part and recovered 580 feet of oil and 270 feet of oil and salt water.

Q What does that indicate?

A It indicates to me there is not as much oil was there was here on the Pope and that the water is connate water.

Q Now, in the No. 2 Deck you had a drill stem test?

A Yes, the test recovered 6,450 feet of oil.

Q That indicates a pretty fair well?

A Yes.

The Atlantic No. 1 Jones tested 390 feet of oil and gas mud and 150 feet or slightly over of gas mud.

Q In the upper Wolfcamp?

A Yes.

Q When you say "the upper Wolfcamp", what do you mean?

A I am meaning the upper 100 to 150 feet that has the best permeability.

Q Does that indicate the Atlantic No. 1 Jones is a pretty good well?

A Not to me.

Q Any other statements you want to make?

A No.

JUDGE FOSTER: We would like to offer in evidence Phillips Petroleum Company Exhibit No. 3.

COM. SPURRIER: Without objection, it will be admitted.

(Phillips Petroleum Company's Exhibit No. 3 admitted in evidence.)

Q (By Judge Foster) Will you please identify the Exhibit on the board as Phillips Exhibit No. 4?

(Phillips Petroleum Company's Exhibit No. 4 marked for identification.)

COM. SPURRIER: We will take a recess until 1:30.

(Thereupon, at 12:05 p.m. the meeting recessed until 1:30 p.m. of the same day.)

AFTERNOON SESSION

1:30 p.m.

COM. SPURRIER: The meeting will come to order please. Judge Foster, will you continue please?

JUDGE FOSTER: I want to get a correction in the record, in the testimony of Mr. Williams about the feet of oil on the drill stem test in our Fort No. 1 Well.

Q I believe you said you had 1200 feet of oil in the hole?

A Yes.

Q That should have been what?

A Approximately three thousand. The number of barrels was correct.

Q You miscalculated the number of feet of oil in the drill stem ?

A Yes.

Q What size is that drill stem?

A Three and one-half inches I believe.

Q Now, as we adjourned, you had just identified Exhibit No. 4 up there and, without stating what Exhibit 4 reflects, will you tell what it is?

A Exhibit 4 is a cross section, East-West, through the Phillips No. 2 Fort, No. 1 Fort and No. 1 Fonzo and Magnolia #13 Pope starting from a point above the Wolfcamp through the Devonian.

Q For what purpose did you prepare that cross section?

A To show the relationship between the formations below the Wolfcamp, East and West; the T.D in the area.

Q What is "T.D."?

A Total depth.

Q Going over to Phillips No. 2 Fort - what is reflected on Exhibit 4 in respect to that well?

A It shows the top of the Wolfcamp and total depth of 9780' at which it was broken.

Q That is Phillips No. 2 Fort?

A Yes.

Q Are you saying that was a dry hole?

A Yes.

Q How close was that dry hole to Phillips No. 1 Fort?

A About thirteen hundred feet.

Q What direction from Fort No. 1?

A West.

Q How far West?

A Thirteen hundred feet.

Q You mean approximately thirteen hundred feet?

A Yes.

Q You got a dry hole in Wolfcamp?

A Yes.

Q You did not drill on to the Devonian?

A No.

Q Why?

A Because we thought it would be low on the structure - below the water.

Q What does the Exhibit reflect with respect to Phillips No.1

Fort, one of the wells at issue here?

A. It shows Phillips No. 1 Fort is up on the Devonian structure, up from the No. 2 Fort.

Q But it is still down structurally?

A Yes, from the other wells located on the cross section.

Q On Phillips No. 1 Fort, do you have any drill stem tests there?

A I do not know them on this cross section, but I did on the other ones.

Q You show Phillips No. 1 Fonzo. Where is it located with respect to Phillips No. 1 Fort as shown on the Exhibit?

A It is one location East.

Q And what will this Exhibit reflect with respect to No. 1 Fonzo and No. 1 Fort? What wells?

A It shows that Phillips No. 1 Fonzo is structurally about the same as Phillips No. 1 Fort.

Q But still on the down structure?

A Yes.

Q What do you mean by saying they are "down structure"?

A That they are closer to water.

Q They are not as well located as other wells?

A Yes.

Q Do you mean they are, or are not?

A They are not as well located on the structure.

Q And what effect is that likely to have in respect to

getting a good or bad well?

A If it is low on the structure, there would not be as much prospective as above water.

Q As there would likely be up on the structure?

A Yes. It is better developed on the upper structure than on the lower structure.

Q Then, you would expect from the structural position of Phillips Fort No. 1 and Fonzo No. 1 wells that they would not be as good wells as those would be further up structure?

A In general.

Q You would expect they would produce less oil than other wells?

A Other things being equal, yes.

Q In respect to this Exhibit, the other two cross sections that we have been talking about, Exhibits 2 and 3, I notice you have the logs on there. How did you get them on there?

A Just glued them on.

Q Did you just photograph them?

A Those are the electro-logs which have been photostated. Then I had the photographer shoot them down to one-half size.

Q But they are the actual reproductions of the actual logs of the well? Is that correct?

A Yes.

Q And the Atlantic No. 5 Dickson would be up structure from Phillips No. 1 Fonzo? Is that right?

A Yes.

Q Is there any special information shown in respect to that well that you have not testified about?

A No.

Q Just that it is higher than Magnolia No. 13 Pope, is that true also?

A It is shown to be down on the flank of the Wolfcamp as you go West.

JUDGE FOSTER: If it please the Commission, we would like to offer Phillips Petroleum Company Exhibit No. 4 in evidence.

COM. SPURRIER: I accept it. It will be admitted.

(Whereupon, Phillips Petroleum Company Exhibit No. 4 was admitted in evidence.)

JUDGE FOSTER: We will go now to the next Exhibit, No. 5.

Q Will you please mark that cross section as Phillips Petroleum Company's Exhibit No. 5?

(Phillips Petroleum Company's Exhibit No. 5 marked for identification.)

Q Mr. Williams, before I interrogate you about Exhibit 5, I want to return to our discussion about these comparative drill stem tests. I want this record to be clear and do not want anybody to be confused about the matter and I want you to state for the record here what the value of a drill stem test is.

A I would say that that test is an indication of what a well might produce in general.

Q In the industry, as a rule of thumb in the early stages

of drilling, you do rely on these drill stem tests to give you some indication of what kind of a well you might get, do you not?

A Yes, as an indication.

Q Now, it is true, of course, that in comparing drill stem tests, that one drill stem test there has gotten less in the hole than another drill stem test would show in another well, but that does not necessarily indicate that the well that has got the least oil in the hole is the poorest well, does it?

A Not necessarily.

Q By taking the law of averages and not by using it as a rule of thumb, it does indicate that the lower drill stem test is most likely to produce the poorest paying well, is that no so?

A In general.

Q There are some exceptions?

A Yes.

Q But I mean on the over all picture generally, the lower the drill stem test in the well the less productive well you might expect to get?

A I would say the poorer the drill stem test, the worse it would look in general.

Q Tell us what is represented here on Exhibit No. 5.

A Exhibit No. 5 is another cross section covering just a part of the Wolfcamp. It is constructed of micro-logs of Wolfcamp pay sections and covers the same wells that were shown on Exhibit 4.

Q I want to be sure that this record shows what a micro-log

is.

A It is an electro-log in much greater detail, designed to show the porosity of a pay zone.

Q They kind of act as a looking glass for the industry so they can look down in the ground and tell what is down there?

A It shows the porosity but does not indicate the permeability.

Q Is it the most accurate way you know of to determine the porosity?

A In the abosence of cores, I would say yes.

Q It is the only recognized way of doing it?

A Yes.

Q These micro-logs are generally relied on by the industry as being accurate in respect to information that they reflect?

A Yes.

Q I mean in a practical way. I am not talking theoretically. That is what the industry puts its money on?

A It is what we complete wells from.

Q This cross section here, Exhibit 5, reflects the micro-logs of what wells?

A Phillips No. 2 Fort west and going east, Phillips No. 1 Fort, Phillips No. 1 Fonza and Atlantic's Dickson and below that are Magnolia's No. 22 Pope and Magnolia's 33 Pope. These two wells are not on scale.

Q For what purpose did you prepare that Exhibit?

A I prepared it to show the structure, which is similar to

the other cross sections showing that you are coming down going West and also to show the characteristics of the Wolfcamp pay interval is from the top of Wolfcamp to water.

Q What is the characteristic of Wolfcamp pay zone there, as reflected by that Exhibit?

A This Exhibit shows it to be lenslike. The black represents porosity. It does not represent pay. And, in between, is the impervious zone. It shows the zones of porosity regardless of fluid. The sands in that area are limestone but linticular formation .

Q What do you mean by "linticular"?

A It is just like your fingers spread out.

Q It just comes to nothing?

A Yes.

Q If a zone of sand on which you might expect you pay, what would you say about a linticular sand?

A You cannot depend upon a given porosity being present in an offsetting well. It might peter out.

Q Starting from the top of Wolfcamp sand, where you have it illustrated on the Exhibit, at what depth would you encounter the top of that sand?

A This line represents the top of the structure, and the top on the West is 9350 feet.

Q And where do you get the bottom of it?

A We have a water level that is very poorly established at 5800 feet. The reason it is poorly established is that the pay is

so linticular that you do not get water because of lack of porosity.

Q You have a pay zone of what thickness?

A On an oil bearing zone, from the top to the bottom.

Q What thickness? From where you first hit it to where you can get it?

A There is some porosity almost to the top of Wolfcamp and maybe 20 feet to 30 feet in depending on wells, but from the top of Wolfcamp to minus 5800, which is approximately water, the interval bears to 245 feet to about 471 feet over here and higher over there on the crest of the Wolfcamp structure. (Illustrating on map).

Q On Phillips No. 1 Fort , what is the area?

A The Phillips No. 1 Fort has about 208 feet from the top of the Wolfcamp to minus 5800, but not all of this is pay.

Q You do not mean that you have 280 feet of sand there that will produce oil?

A That is the interval in which it would be found. Beyond this depth, you would not expect it.

Q Now, that is about 280 feet?

A Yes.

Q In the Phillips No. 1 Fort?

A Yes.

Q What is it in the Phillips No. 1 Fonza?

A It is close to 400 feet - about 370 feet.

Q That is from where you first strike the top of the Wolfcamp horizontally until you run out of it?

A Yes.

Q Going back to Phillips No. 1 Fort, how much effective pay sand do you have in that well?

A I think according to the micro-logs, there is twenty-nine feet indicated porosity, but I do not feel that all of that is pay because in the drill stem actually , that is five feet on top of Wolfcamp from which we got our oil on the drill stem test.

Q Did you say out of the 280 feet distance from the top of the Wolfcamp sand down to the bottom of the Wolfcamp sand in Phillips No. 1 Fort, you have only five feet on which you can expect oil?

A That five feet looks the best and below twenty-two feet of this we could not depend upon. It may yield a little oil but not much.

Q You would not expect much production?

A No.

Q So the effective pay sand does not exceed five feet, is that right?

A Yes.

Q How does that compare with the effective pay zone in the Magnolia No. 22 Pope?

A Magnolia No. 22 Pope has about eleven feet and that is the best part of Wolfcamp and sixteen feet developed by micro-log .

Q Now, in Magnolia No. 13 Pope what would you say?

A About the same.

Q How does that compare with Atlantic's No. 5 Dickson on the map?

A It has more - in the neighborhood of 14 feet.

Q Comparatively speaking then, the micro-logs show Phillips No. 1 Fort,as compared to the Atlantic's No. 5 Dickson and the two Magnolia wells, No. 13 and #22 Pope, is relatively poor?

A Yes.

Q And you would not expect to get anything from the recovery of oil from Phillips No. 1 Fort like the two Magnolias?

A No.

Q What would you say in reference to Fonza No. 1?

A It has about 28 feet developed throughout the best part. Where we were talking about, No. 1 Fort was possibly seven feet.

Q Does that indicate to you that as you go up structure your effective pay zone increases?

A Not necessarily. In general it is true, but there are wells that are high that have not effective pay zones.

Q But you do not have a record of them here?

A One of those is down toward the south. There is about 42 feet effective pay zone.

Q Comparing Phillips No. 1 Fonza with Atlantic's No. 2 Dickson, Magnolia's 22 Pope and Magnolia's 33 Pope, relatively

speaking, would you say that Phillips No. 1 Fonzo is a poor well?

A I would say according to the micro-logs it would indicate it was not a good well.

Q You say according to micro-logs - do you have anything else to go by?

A We do not have a drill stem test.

Q But you do have your micro-logs?

A Yes.

Q And it shows it a relatively poor well?

A As compared with other wells I mentioned, yes.

Q It shows it to be a little better well than Phillips Fort No. 1?

A Yes.

Q And you would expect some more oil out of No. 1 Fonzo than you would out of No. 1 Fort. Is that right?

A Yes.

Q Now, let me ask you this question. Are there any other factors reflected on this cross section that you want to call to the Commission's attention?

A I do not know whether we have gone over it in detail or not. I think the drill stem tests are interesting. With very few weels, we do not get very much formation fluid above this upper porosity - 50 to 100 feet below Wolfcamp. That porosity in the micro-logs has not yielded anything on drill stem test.

Q You mean in the lower porosity zones?

A Yes.

Q You mean when you are talking about lower porosity zones, you are talking about sands?

A Yes, I am not talking about pay sands. There are dolemites and limes, etc. As I already said, we tested No. 1 Fort through these zones.

Q That does not mean anything. You will have to tell me what zones are.

A Zones show porosity.

Q Where are they located?

A Between depths of 9518 feet and 9600 feet.

Q The drill stem tests on those zones shows what?

A Just mud. They did not give up any formation fluid. The Phillips No. 2 hold, one location West, tested the lower porosity zones from a depth of 9620 feet to 9730 feet, part of which, having minus 5800 figure for water, and recovered mud on three tests and water on the 4th test.

Q Indicating there is nothing there?

A Yes and we perforated these porosity zones and the first one was from 9677 to 9690 for twelve hours and we recovered sixteen barrels of salt water.

Q What well had that?

A Phillips No. 2 Fort. Then we perforated the porosity from 9608 to 9630, allowed four barrels of mud in five hours and swabbed

dry and attempted five gallons of acid and it was impervious. After that we perforated 9550 to 9578, swabbed dry, attempted acid, and it did not take. It does not show much on the micrologs, however. After that we perforated from 9460 - it happens to be in the upper Wolfcamp-and swabbed dry and got seven barrels of mud in eight hours.

Q Are you still talking about Phillips Fort No. 2?

A Yes. These drill stem tests and perforations on Phillips No 2 Fort here, two of them were these lower porosity zones that were encountered on No. 1 Fort.

Q What did you do on drill stem tests and further tests on Phillips No. 1 Fort?

A We just took drill stem tests and tested it down to the bone.

Q How about the Fonzo No. 1 respecting the drill stem test?

A We took two drill stem tests.

Q At what levels?

A The first was from 9350 to 9550, for a term of two hours, and the recovery was seven feet of slightly gas cut mud. We took the second drill stem test at 9605 to 9705 and were over one hour and twenty-five minutes and recovered 100 feet of mud and this one happens to be mostly below what we would call water.

Q Still in Wolfcamp?

A Yes. We did not test the upper, most prospective zone of Wolfcamp.

Q Now, let me ask you something: There is some oil that is to be recovered from Phillips No. 1 Fort and Phillips No. 1 Fonzo? There is some oil there to be recovered, is there not?

A Yes

Q Unless we twin this No. 1 Fort and No. 1 Fonzo, or the Commission here permits us to complete those two weeks, what is going to happen to that oil - that is, in the effective pay zones of those two wells?

A A good share of it would just stay there.

Q Where will the rest of it go?

A Some of it will be produced by other wells.

Q What surrounding wells are there?

A The Magnolia Maxwell No. 2.

Q Where is it located with respect to Fort No. 1?

A The Magnolia Maxwell is one location north.

Q The next location north from Fort No. 1?

A Yes.

Q What other wells around there might get some of that oil?

A Magnolia's No. 4 Pope is diagonally northeast offset and direct north offset to the Fonzo.

Q Do you expect that well to get some of that oil from the effective pay zone?

A Yes.

Q What other wells?

A Just from the Fort No. 1?

Q Yes.

A I believe that Atlantic is drilling immediately south os us.

Q That might get some of it when it gets going?

A Yes.

Q In respect to Phillips No. 1 Fonzo, there is some oil there to be recovered?

A I believe so.

Q And, if you are going to get the oil out of there, you are going to twin that or dually complete it?

A Yes.

Q Suppose we do not complete it, where is that oil going to go?

A Some of it would stay there and some of it would be produced by surrounding wells.

Q What wells surround it?

A The Magnolia No. 4 Pope to the north.

Q Just one location north?

A Yes.

Q Is that not No. 8?

A Yes, that is No. 8 Pope. And to the East is the Low 90 Dickenson.

Q One location away?

A Yes, east. And to the south I believe there is Atlantic. No, I do not believe it is Atlantic, but Low 11 B Dickenson, which is

producing from Devonian.

Q That would get some of it?

A Yes.

Q Assuming - but I do not suppose you know about well pay out and things of that sort?

A No, I do not.

Q But, assuming for the purpose of this question that this No. 1 Fort and No. 1 Fonso would not be what we would call a paying well, and that Phillips Petroleum Company, in discharging their duty to royalty owners would not be obliged to drill that well if it was not a paying well, the only way to get the oil out is to complete the well?

A Yes.

Q You have to get it out of a hole somewhere. You have to get it out of the hole or drill one, is that not true?

A Yes.

Q So, the net result is some of that oil in those two wells we are talking about will never be produced, is that not true?

A If it is not twined or dualed, it will not be produced.

Q It will just stay there and nobody get the benefit of it?

A Yes.

Q Mr. Williams, let me ask you this question: I may have overlooked something that may be of important to the Commission in settling this matter and, if I have, will you please tell us what it is,if I have failed to ask you something that I should have asked

you as to what is reflected here by this Exhibit No. 5, that you would like to explain?

A I think we have covered most of it. The only thing that is of more interest to me than anything else is that it seems in this part of the field, and possibly throughout the field, the best prospective porosity is found in the upper part of the Wolfcamp and not further down.

Q What is the upper part of the Wolfcamp?

A I would say the upper one hundred to one hundred and fifty feet and sometimes closer to the top than that. It may be within thirty feet of the top, but within an interval of from one hundred to one-hundred and fifty feet of the upper Wolfcamp would be found the most effective pay. That is indicated by the drill stem tests and comparative methods that have been attempted in lower zones below one hundred to one hundred and fifty feet I am speaking of. The micro-logs would indicate the prospective in the upper zone is just as good - down in here.

Q Where is "down in here"?

A Well, starting about one hundred and fifty feet on down. From a point one hundred and fifty feet below the top on down.

Q The micro-logs indicate what?

A The porosity indicates it may be just as good but drill stem tests do not substantiate that. It did not give up anything from the formation.

Q If anything was there, would you expect to get it on drill

stem test?

A Generally, not always. Wells are completed at 100 to 150 feet. These lower zones, below the depth of 150 feet, samples indicate the porosity is a pinpoint and not as permeable.

Q Do you know of any productive wells in Wolfcamp in what you describe as a lower zone?

A There are some completed in both zones, but the upper zone would be contributing most of the oil and although some of them are completed in the lower zones, they would be in the minority. I think the cross section would indicate porosity in the lower part, but most of the pay will come from the upper part, 100 to 150 feet.

Q I want to call your attention to something. If you cannot answer it, just say so. It is already in this record by Mr. Washburn that in the Fort No. 1, you have 22 feet of six percent porosity. What does that mean to you?

A He is counting 22 feet porosity from the micro-logs and core information on other wells. I count about 29 feet from the micro-logs alone and the fact they had six percent porosity does not mean you would have effective permeability in all of it.

Q We have the same testimony with respect to Fonzo, that you got 35 feet six percent porosity effective pay zone. What does that mean to you ?

A Just the same. Not all of these thirty-five feet would be effective pay. It may not be permeable. I do not think it is from the drill stem tests.

Q The drill stem test indicated it would not be?

A A lot of this includes this down here which we did not get anything on.

Q That is being liberal on it?

A Yes, I would say so.

Q Not that there is anything wrong in being liberal, but I just wanted to make it clear. I believe that is all.

COM. SPURRIER: Does anyone have any question?

CROSS EXAMINATION

BY MR. MADOLE:

Q Judge Foster, I would like to ask your witness a question: Mr. Williams, in the micro-logs that you have made a cross section East and West, did you look at micro-logs North and South to make a comparison there?

A No, I have not made a cross section of it.

Q Why not?

A Because I did not have time.

Q Would it paint a better picture?

A Going south, some of the wells are better. The Atlantic No. 4 Ted Jones which is situated in the SE/4 of the SE/4 of Section 34, Township 14, Range 37, the micro-log indicates about 42 feet.

Q How about the North - on Maxwell No. 2?

A To the North, on Maxwell No. 2, I found it to be twelve feet.

Q How about Pope No. 8 on the north of Fonzo No. 1?

A I count 28 feet throughout the log that had been run but six feet at the top, but I had figured in the more prospective pay zone.

Q The comparison is almost identical to Fonzo No. 1?

A Yes.

Q How about to the South of Fonzo #1?

A Five feet on the low 3 V Dickenson. The twin is -

JUDGE FOSTER: While he is looking for this, I will submit Phillips Petroleum Exhibit No. 5 in evidence.

COM. SPURRIER: So long as there is no objection, it will be admitted.

(Whereupon, Phillips Petroleum Company's Exhibit No. 5 is received in evidence.)

Q (By Mr. Madole) In other words, the wells to the north and south, the Fort and Fonzo No. 1, according to the micro-logs, they are almost identical to the logs you found on Fort No. 1 and Fonzo No. 1.

A Immediately north and south of us.

Q Are you familiar with the accumulative recovery of those wells?

A No, I am not.

MR. MADOLE: If the Commission please, we have asked Mr. Macey to take off the figures from the Commission's report on the accumulative recovery of all the wells on the Wolfcamp in the Denton field. He has not had an opportunity to check his figures. We

would like to request permission that they be placed in the record.

COM. SPURRIER: The accumulative figures on the production of the various wells in the Wolfcamp formation in the Denton field is requested from the records of the Commission. Is there any objection?

(No objection voiced.)

Q (By Mr. Madole) : I ask first on this five feet of pay that you find in Fort No. 1, what is your estimated recovery in barrels of oil?

A I do not have that.

Q Have you any opinion as to how much is recovered?

A No. Mr. Washburn would have to answer that.

Q Your opinion as to the footage of pay, etc. is based on micro-logs and comparison of drill stem tests - is that correct?

A Yes.

Q You have not taken into consideration the actual production in offset wells?

A I have taken into account the fact the surrounding wells, most of them, are producing only from their upper zone.

Q Would that be an indication of the amount of oil that could be produced from Fort No. 1 and Fonzo No. 1?

A I do not know how it could when you do not know how much they are going to produce.

Q You have the figures on actual production by months from

the time they have been in?

A We did know we did produce that much, but how would we know how long that would produce that?

Q It is as good an indication as drill stem tests, is it not?

A Yes.

Q Is it not a fact that drill stem tests at best are indications of mud conditions in the hole and everything else will affect that test?

A It is an indication.

Q But the mud indication of the well will affect recovery on the drill stem tests?

A Yes.

Q Then what that well will give up is best determined by the actual oil that comes out of the hole?

A Yes.

JUDGE FOSTER: I object - the question is argumentive!

MR. MADOLE: It behooves Foster to raise an objection - and he has been arguing with his own witness all through this case.

JUDGE FOSTER: I want to show it is argumentive.

Q (By Mr. Madole): If Maxwell No. 2,in six months' period, has produced 27,537 barrels of oil, would that not be a pretty good indication that Fort No. 1 , which is directly off of that, will produce oil?

A Yes.

Q And in approximately the same amounts?

A I would not say that.

Q You found the micro-log had pay footage accrual?

A Just about.

Q What factors are you going to subtract from recovery in No. 1?

A By the same line of reasoning, you cannot use a drill stem test to tell what a well can produce, I do not see how you can use production from one well to say that that the offset well will produce the same.

Q It is a pretty good indication, is it not?

A Yes.

Q In general or specific detail?

A In general.

Q Now you said on these micro-logs, on cross sections, that all of the wells indicate that production is from the first 150 feet?

A I said in general.

Q What do you mean by "in general"

A Because there are some wells completed in both the upper pay zone and some have perforated in the lower part.

Q I am talking about this Exhibit. Is there any in the lower zone?

A There may be one or two.

Q Which ones?

A I believe Atlantic's #3 Ted Jones is run on cross section B-B Prime which would be Exhibit 3, is completed in both zones.

Q I am talking about those pictured on Exhibit No. 5. That is the one I am talking about.

A Four of those are Devonian wells and this one and this one (illustrating on map) are Wolfcamp ones which are completed in the upper zone.

Q Then, in your Fort No. 1 and Fonzo No. 1 you had 150 feet of Wolfcamp formation.

A You mean above water?

Q Yes

A We had more than that.

Q Then your Fort No. 1 and Fonzo No. 1 have in them the same pay formation that is being produced toward the East, is that not so?

A Yes.

Q Now, if the Commission decides not to complete and if you decide to twin these wells, where can you locate Fonzo No. 1 Twin on Fonzo No. 1?

A We would not twin them.

Q Is it not true that if you move the Fort No. 1 to 330 feet from the East line and 330 feet from the North line on the contour map that you used as Exhibit 1, would not that well be structurally almost on the same structural level as Magnolia's Maxwell No. 2?

A You say 330 feet from the North and East?

Q Yes.

A Yes, it would.

Q Then, under the rules of the Commission at this time you are permitted to so locate such a well, are you not?

A I believe that is right.

JUDGE FOSTER: I do not know whether it is or not.

Q (By Mr. Madole) Will you mark on Exhibit with an "X" where that would be on your contour line?

A Yes.

(Whereupon he marks Exhibit #5 with an "X")

Q Let us go on the Fonzo - On that same contour map, and go 330 feet to the North and East line of Fonzo, which you have marked with an "X", and tell me whether or not it would be on a structure comparable to Magnolia's Pope No.8?

A It would be just a little higher.

Q Now in the twinning of a well, your location of that twin well would not be identical with the Devonian location?

A No.

Q Then if these formations are linticular, there is a strong possibility of your hitting more porosity in that different location than in your Devonian location?

A More or less porosity.

Q But, as you move to the north and east, by your own testimony, you are getting more on structure, are you not?

A But I said in general the porosity -

Q In general?

JUDGE FOSTER: He has answered the question.

A It is hard to get specific because porosity does not change that much in relation to structure. This Atlantic well in the southeast of Section 34 is low on structure but it has high porosity, indicating it is quite eratic.

Q Did I understand your testimony correctly that, in general, as you move up structure you found more porosity?

A That is why I said "generally". There are exceptions to this.

Q What you are telling this Commission is, until you drill a hole that you do not find in Fort No. 1 or Fonzo No. 1, is that right?

A I did not say that. You can tell something by Devonian wells that have already been drilled.

Q You get general when it is necessary and you get specific when it is not necessary. I want you to stay on one side of the fence or the other. If, in general, going up structure you are going to get more permeability?

A I was speaking of the pool as a whole.

Q What is the purpose of this Exhibit 5?

A I was not speaking in respect to twin wells. On the crest of the Denton Pool the porosity is better - even that in general - but I think, in respect to twins, we could tell something about what

the porosity would be since the porosity on the immediate offsets are similar, which we already discussed.

Q Then if those wells would pay out, your wells should pay out?

A Yes, I think they would.

Q That is all.

REDIRECT EXAMINATION

By Mr. Foster:

Q Did I ask you the extent of the pay zone was that you found in Fonzo No. 1?

A Seven feet.

Q That is all.

MR. L. C. WHITE: Mr. Williams, how conclusive is a drill stem test?

A I think you can say if you get a flowing test, it is a good indication. It does not mean anything about what that well will produce. It is just an indication of the production of the fluid in the drill stem test interval. I do not think it can be taken as any kind of a measurement.

MR. SELINGER: I am with the Shell Oil Company and I would like to ask Mr. Williams some questions.

CROSS EXAMINATION

BY MR. SELINGER:

Q Mr. Williams, referring back to Exhibit 5, micro-log cross section. This Exhibit ends at the so-called crest. If you

had this Exhibit protrude out to the right, it would show the crest dipping down as you go over to the right, would it not?

A My map indicates no completed wells over there unless the completion is very recent and, east of 13, there is the 21. Is that completed? My map does not show it completed. East of that well is Sinclair, which is still being drilled.

Q Looking on the structure indicated by Exhibit I, other wells have been producing on the other side of the crest, in the southeast or easterly direction. Is that not true?

A Yes.

Q Mr. Williams, I believe your testimony was with respect to Exhibit 3, and which Judge Foster this afternoon had you correct your original testimony of this morning, in respect to drill stem test calculations you made on your well?

JUDGE FOSTER: I did not have him correct it! He called my attention to it and wished to have that corrected himself.

Q Well, in which you attempted to correct your testimony this morning , there being an error in your calculations as indicated on your Exhibit No. 3. It is your testimony now that your estimate there would be a 3,000 fill up on drill stem test?

A Approximately.

Q And your testimony still remains in respect to Atlantic's well - 1990 fill up on a drill stem test - that still remains?

A Yes.

Q Faced with a drill stem test of 1990 on Atlantic's well

and 3000 or more on the Phillips well, could you answer Judge Foster as to which is the better well?

A I would say the one at 3000.

Q You wouldprefer your well to the Atlantic well?

A Yes.

Q And, in that respect, you are correcting Judget Foster's question in which you gave an answer just opposite to this morning's answer?

A Judge Foster did not have the correct information.

Q And now you wish your testimony to be changed, that you prefer the Phillips well?

A Yes.

COM. SPURRIER: Does anyone else have a question of this witness? If not, the witness may be excused.

(Witness excused.)

COM. SPURRIER: We will take a short recess.

(Whereupon, at 3:10 p.m. a ten minute recess was taken.)

COM. SPURRIER: We will continue now. Judge Foster, did you have another witness?

JUDGE FOSTER: Mr. Washburn, will you be sworn please?

E. N. WASHBURN

having been first duly sworn testified as follows:

DIRECT EXAMINATION

BY JUDGE FOSTER :

Q Will you please state your name?

A E. N. Washburn.

Q You are the same Mr. Washburn who testified before in this case, are you not?

A Yes.

Q Mr. Washburn, how many barrels of oil at present prices will it take to pay out a Wolfcamp well?

MR. SELINGER: We wish to object to this question on the ground that the matter has been gone into in the original hearing on July 16th here.

JUDGE FOSTER: I understand it would take 116,000 barrels to pay out. I wish to get the correct understanding about it. I think it is a fair question.

COM. SPURRIER: Let us get some new testimony.

JUDGE FOSTER: May I, for the purpose of the record, state what the answer would be? It is very important if there should ever be a Court contest. They try it on the record and you can rule on the advisability or in inadvisability of the evidence, but I think it is important this witness be permitted to answer.

COM. SPURRIER: If it is new testimony we will hear it, but, if it is the same as the last hearing, I can see no reason to go over it again.

MR. SELINGER: My objection still stands that we went over this whole thing - the cost of the well by the amount of recoverable oil; The amount of oil necessary for each forty acres to pay out, and I see no reason to rehash it all over again.

JUDGE FOSTER: It is not my intention to do so.

COM. SPURRIER: If it is not in the record, put it in. What is your answer?

A 116,000 barrels of gross oil.

Q What do you mean by gross oil?

A Total oil.

Q Have you made any computation of the number of dual oil completed wells that Phillips Petroleum Company has operating today?

MR. SELINGER: I also wish to renew my objection, because he went into this at the last hearing.

COM. SPURRIER: Have you answered that before?

A I have similar data that is of a later date.

JUDGE FOSTER: It is a little different testimony.

MR. WHITE: I might state this to the Commission, that under this petition for rehearing, in my mind, I question the materiality of all the evidence introduced this morning and afternoon in this hearing. The grounds for rehearing are: 1. That Order 351 entered here was for further evidence. 2. As to the date of the Order. 3. That the Commission, in issuing said Order, acted unreasonably, arbitrarily and capriciously. I think the evidence should be set forth on the grounds set forth in the petition and not go over the whole case!

MR. SELINGER: That is why I objected. He is retrying it without the introduction of new testimony and this went through all of this morning and now this afternoon it is still testimony

of the last hearing!

JUDGE FOSTER: That while he testified as to the number of these wells, there is nothing in this record to show that Phillips has had ten years' experience in dually completing oil wells, and there is nothing in this record now to show that the depth, the range of the depth to which these dually completed wells have been completed by Phillips Petroleum Company and, if we are permitted to do so, we will show that we started in 1943 and, up to the present time, that we have dually completed seventy oil wells and that insofar as these seventy oil wells are concerned that no mechanical failure of the packers in those wells have ever resulted in any injury to the reservoir in which we have completed these wells. I think that is important in this case. There has been much said here and much objection about packer failures. We do not say that packers do not fail. Any mechanical device will fail at times as far as that is concerned, but I think it has very much probative value to show over ten years' experience by Phillips Petroleum Company that we have dually completed these seventy oil wells in widely varying areas from depths less than involved here to depths greater than involved here and that there has been very few failures in those wells and the few failures that have occurred, have not resulted in any injury to these reservoirs.

MR. WHITE: If that is your contention, what is it that you have to support your petition for rehearing on - your statement that the Order was unreasonable, arbitrary and capricious. What

testimony do you have to show that the Order was unreasonable, arbitrary and capricious?

JUDGE FOSTER: I call your attention to Paragraph F under No. 3 of the Petition which reads that the Order will require the drilling of several wells. That will mean a terrific loss and that is the purpose of this testimony, to show that those excess number of wells would be required under the Order.

MR. WHITE: That is your ground for claiming that the Order is unreasonable, arbitrary and capricious?

JUDGE FOSTER: That is correct.

MR. WHITE: The Order would have to be based on what was introduced at the last hearing.

JUDGE FOSTER: We asked for a rehearing and it seemed to me we should have one.

MR. WHITE: The whole testimony is out of the scope of the petition.

MR. MADOLE: All of the testimony outlined by Judge Foster was available at the previous hearing - all of this testimony given this morning and so far this afternoon, was available. There was no Motion for continuance to present additional testimony. The Motion as I understand it , and it was apparently created to show they have newly discovered evidence that had developed since the last hearing. This here is simply a rehash and simply an accumulation of testimony that could have been put forth at the previous hearing. If they had prepared themselves to adequately prepare their

Petition at the first hearing and I do not understand that a Motion is granted for rehearing for them to bolster their own inadequacies. If they have some new evidence developed since the previous hearing, certainly the Commission is within its jurisdiction to permit that evidence to come in, but not simply to retry the evidence of the previous hearing. I do not think that is the function of this Motion for rehearing.

JASON KELLAHIN: I would call your attention to Paragraph D of the petition which alleges that the equipment proposed to be used will provide adequate protection to the horizon which is clearly shown, and also will protect all correlative rights, and I do think we can present such testimony at this time.

MR. MADOLE: They presented their Otis pressure group and we had a demonstration of the effectiveness of packers and crossover nippels, etc., but Paragraph D wholly refers to prior testimony.

COM. SPURRIER: If you have new testimony, let us hear it.

JUDGE FOSTER: Do you consider this testimony new?

COM. SPURRIER: If it is not in the previous record, it is new.

JUDGE FOSTER: I think what I am offering here is new testimony.

COM. SPURRIER: Proceed, and we will see.

Q (By Judge Foster) I have here a tabulation showing dually completed oil wells that Phillips Petroleum Company has as of July 1st, 1953 giving the pool, lease, well number - in the lower zone its name and depth perforated and, in the upper zone, its name, the depth of perforation, and the date it was dually completed. Will you hand that to the reporter please so that she can mark it Phillips Petroleum Company's Exhibit No.6.

(Phillips Petroleum Company Exhibit No. 6 marked for identification.)

MR. MADOLE: We object to that!

MR. SELINGER: They were here on July 16th and all this testimony was available.

A (By Mr. Washburn) It is dated July 1st in the field but it is not received in Bartlesville office until September.

Q (MR. MADOLE:) You could have accumulated it at the time of the last hearing, could you not?

A Yes.

COM. SPURRIER: Proceed.

MR. MADOLE: May we have a ruling as to where we stand on this record?

COM. SPURRIER: Your objection is overruled. Proceed, Judge, but confine your testimony to new testimony.

JUDGE FOSTER: I will try to do that. You will have to decide whether it is new or not. Somebody is going to have to decide that question.

Q (By Judge Foster) Mr. Washburn, directing your attention to Exhibit 6, between what depth ranges were those seventy dually

completed oil wells?

A For the upper ones about 4400 down to a depth of 12,500.

Q Now, between what dates were those wells completed?

A From April of 1943 to August of 1953.

Q Now, to whatever extent you may have had any power failure in those wells, do you know of any power failure resulting in any damage to the reservoir?

A No, sir.

JUDGE FOSTER: That is all.

CROSS EXAMINATION

BY MR. SELINGER:

Q Mr. Chairman, we objected to this witness' testimony entirely and also to the introduction of this Exhibit. However, we wish to ask Mr. Washburn, in this Denton field, what is the difference in depth between the Devonian production and the Wolfcamp production? How much of an interval?

A I would guess about three thousand feet.

Q Can you show this Commission where in your wells of dual completion there is an interval of three thousand feet in dually completed oil wells?

A I cannot.

Q What is the maximum interval of dual oil completion on your Exhibit?

A About eighteen hundred feet I believe

Q Now, in respect to packer failures, have you had any production

packer failures - the type of packer you run on your turbine?

A Yes.

Q Do you recall at the July 16th hearing I asked whether there had been any production packer failures and whether there had been any dual oil well packer failures?

A I do not know about the question of production packer failures, but I do remember your asking if we had a dual-dual packer failure.

Q How do you know a packer failure in a dual-dual oil completion?

A There are several ways you might identify it. You might catch it from a change in flowing of the two zones or change in capacity in stock tank return or in the gas oil ratio.

Q It is a matter of policing which is the realm of the operator, is that not correct?

A It is.

CROSS EXAMINATION

BY MR. MADOLE:

Q Mr. Washburn, you say in these seventy wells, you have never had a packer failure?

A No, I did not say that.

Q What did you say? What was the significance of your Exhibit?

A This is a list of Phillips dually completed wells.

Q You have had packer failures in these wells?

A I know of no instance in this bunch.

Q Have you investigated your records and checked on these wells in particular to see if they have had some packer failures or are you just relying on your general knowledge?

A I have not individually investigated them.

Q You do not know there have not been packer leaks?

A They have not been reported.

Q This information was not available at Bartlesville at the time of your previous testimony, is that right?

A Yes, sir.

Q Then the record of packer failures is not available to you at Bartlesville, is it?

A During my time in Bartlesville I have never known of any letter or correspondence or Report 903, in which a packer had failed.

Q But, to find out if there have been packer failures on these seventy wells, you would have to go to the district in which one was located?

A Yes.

Q And you have not done that, have you?

A No.

MR. MADOLE: That is all.

FURTHER CROSS EXAMINATION

BY MR. SELINGER:

Q On this list of dually completed oil wells that Phillips operates, how many have five and one-half inch casing?

A I can only answer that for the part that covers West Texas. I have never worked in the Oklahoma Area . On all of the Ellenburger wells we use five and one-half inch casing. Goldsmith's are five inch to the best of my knowledge, but those shown in West Texas are five and one-half inch casings.

REDIRECT EXAMINATION

BY JUDGE FOSTER:

Q If you had a packer failure, would a report be made up?

A Yes.

Q Where does that report go?

A Through all channels and Bartlesville.

Q And that would have been available to you, would it not?

A Yes.

Q And, in compiling your records, you did not find any reports of a packer failure?

A No, sir.

RECROSS EXAMINATION

BY MR. MADOLE:

Q Let us go back now. You stated at the previous hearing that you did not have available this information. Now, is that report made on dually completed wells to Bartlesville?

A Yes, on individual wells it comes to Bartlesville.

Q And that is on packer failures?

A Yes, because that would come under reconditioning.

Q But it was not at Bartlesville at the time of the last hearing?

A I gave the date before in the previous hearing - that it was made January 1st. We get a report semi-annually. This is the July report which got into Bartlesville after the last hearing.

Q Are you telling this Commission that every packer failure is reported and would be there at Bartlesville?

A Yes.

Q Then your testimony a minute ago - to find out about packer failures you would have to go to a District - is not correct?

A I was in error. They do come to Bartlesville.

Q To avoid a rehash, we would like to state to the Commission - he threw in this figure of 116,000 barrels, his previous testimony in the record - and we do not agree with that figure. There is testimony as to the payout on these wells in detail in the previous hearing, but we do not want, in any way, to be bound by this 116,000 figure, especially in view of the fact that it does not coincide at all with his testimony at the previous hearing. Are you going to accept that over our objection? If you are, then we want to break down that 116,000 figure.

COM. SPURRIER: We would like to have you break that down. Do you have a calculation on that 116,000 figure?

Q (MR. MADOLE:) How did you arrive at it? Can you outline it?

A I used oil at $2.83. I took 7/8ths of that to deduct royalties, giving me a value of $2.476. I took 6.44% sales tax and various State taxes out.

Q (Mr. SELINGER): You mean gross production tax? Is that cents or percent?

A That makes $2.476 oil worth $2.316. I assume a sixty cents per barrel lifting cost, which ends up with an oil, before income tax of $1.716 per gross barrel .

Q (Mr. Madole): What after income tax?

A These wells will not pay out. There is not any income tax on depletion allowance.

Q You have $1.71 per barrel. What figure do you use for recovery?

A I valued the Wolfcamp well at $200,000 and divided $200,000 by $1.716 and I got 116,000 barrels by slide rule. In my previous testimony I had considered income tax in that, which was why the value of my oil was less.

Q Then you say your Fonzo would not pay out?

A Yes, sir.

Q Are you changing your testimony as to ultimate recovery from Fonzo?

A I estimate Fonzo will produce 107,800 barrels.

Q You used 120,000 before and the price of oil at $1.25.

A I was in error but, again, I would have to pay income tax.

Q How does income tax affect barrels to be recovered? You testified that 120,000 barrels of oil was going to be produced from your Fonzo?

A I cannot check that figure. I cannot check it with the data given.

Q I am asking about -

JUDGE FOSTER: He is not denying what he has said . He is saying that he will get 107,800 barrels from Fonzo.

Q (MR. MADOLE:) Let me read from Page 5 of the transcript of the previous hearing: "Q What would the estimated total recovery from the Fonzo No. 1 well? " "A I would estimate the Fonzo would have approximately 3000 barrels per acre, or about 120,000 barrels on a 40-acre unit." Now you say 116,000 barrels will be your pay out. If you took 116,000 or 120,000, then Fonzo #1 will pay out?

A On those figures it would pay out - yes, sir.

MR. MADOLE: That is all I have to ask.

MR. WASHBURN: I cannot get but thirty-five feet of porosity.

MR. MADOLE: Let me read again from the transcript: "How thick is the Wolfcamp pay sand in the Fonzo and the Denton Nos. 12 and 13 wells?" "A I don't have a micro-log of those wells. We estimate the footage in the Fonzo is about 35 feet of productive porosity, and that the two Denton wells will have probably fifty feet of productive porosity." That is what you testified previously.

Mr. WASHBURN: I probably had an error in my calculation . You take 35% and then take 6% in all our wells and multiply that and you will come out with 107,800 barrels I believe.

JUDGE FOSTER: Don't argue! Calculate it out!

MR. MADOLE: There has been a lot of arithmetic, but it is on a sliding basis!

Q (By Mr. Madole) Will you give us a breakdown of this $200,000 cost of your well?

A I base that on cost of wells we have drilled.

Q Let us just get figures. How many tangibles and how many intangibles and how much did you charge to each?

A I did not break it down that way. I went to the Accounting Department and got the actual cost of drilling six Wolfcamp wells.

Q What was the footage cost?

A I do not have that. I used the over all gross cost of drilling the well - the price it cost us. I have those cost estimates here.

Mr. MADOLE: We got in that circle last time - estimates of actual cost.

MR. WASHBURN: I have actual costs.

MR. MADOLE: Let us have the actual costs.

MR. WASHBURN: Denton 4 - this was the first well drilled. I will give them in order here. Denton 4 cost $190,373.55. Denton 5 cost $168,644.33; Denton 8 cost $185,860.43; Denton 10 cost $176,359.95; Denton 11 cost $196,325.57; Denton 14 cost $210,616.24. The average was $188,030.01. The last two wells is what I used for my basis, because the location of Fonzo is not as good as these wells and we anticipate more trouble of completing the well.

Q (By Mr. Madole) You said you used the six wells to calculate the $200,000?

A The question was what it would cost to drill Fonzo. I think we got into this argument before.

Q This $200,000 is your estimate and it is not the average of the six wells.

A It is approximately the average of the last two wells drilled.

Q Do you have the breakdown of the last two as to how much additional work was required in those wells in the way of mechanical difficulty?

A It was mostly perforating and swabbing at this west edge and it takes more time to get a well in.

Q Your tangibles remain constant?

A Yes.

Q Your intangibles?

A At least 90% of increase is due to intangibles.

Q What do you estimate of the $200,000 is intangibles?

A About $160,000.00

Q You would get credit on your income tax for that approximately if your income was in the 50% bracket, you would get credit for $80,000.00.

A If you want to drill a well that would not return your money you would. However, that is not a good way to operate.

Q That is the $64.00 question in this. We do not agree with your figures, but, if you suffered this catastrophe, you would get about $80,000 credit on your income tax.

A You would get to charge off all your intangibles the first year.

COM. SPURRIER: If no further question, the witness may be excused.

JUDGE FOSTER: I have not quite closed the case yet. Mr. Selinger had a witness he wanted to put on. I want to take up one other matter here to which I would like to call the Commission's attention. In Order R 351 A, which is the Order of the Commission granting this rehearing and not the Order R 350 A, which is the Order granting the rehearing on another well. In each one of those Orders I called the Commission's attention to the fact that it says that Order R 350 was heretofore entered as of August 28th, 1953 and, in Order R 351 it says it was heretofore entered on August 28th, 1953. Now, it would indicate on the face of the Order that our application for rehearing was filed too late. That being purely a jurisdictional matter, I would like to get the matter straight and, for the purposes of this record, I want to say that on July 31st, 1953, Mr. Macey sent a telegram to Mr. Colley at Bartlesville saying our application to dually complete all four wells involved in the original hearing had been denied by the Commission and then, on September 8th, Mr. Macey wrote me a letter which I received on September 10th saying: "We enclose two signed copies each of orders issued in Cases 556, 557, 558 and 559 in which your company presented testimony at the July 16 hearing. Inasmuch as these orders are dated August 28, 1953 and you are not receiving them until this time, you may have until September 18 to file any request for rehearing which you may contemplate." Now, I would like to have that letter in the record as well as the telegram

I mentioned that is in the file here in this case, sent by Mr. Macey. I am not criticizing anybody. I appreciate the notice given in the matter. I would also like to put into the record the duplicate signed originally by the Commission of Order R 350 and R 351, if I may do so. Now, the rest of the matter on the question which I have presented here will be handled by Mr. Kellahin, if the Commission please.

MR. WHITE:I might state that it is well for him to state on the record what he did, in view of the fact it recides in Order R 351 as to the date of the request being placed. In view of the fact that that date does not coincide with the filing of the order in the Commission's records, which was on or about the eighth of September, let the record show the order R 350 and 351 were entered of record on September 8th.

JUDGE FOSTER: I assume that is what happened and regardless of the date it is signed or allowed, it is effective as of the entry which is appearing as of September 8th. On the face of the order it shows the filing date, but that brings him well within twenty days. The date it was filed in Supreme Court was September 10th. If that stands as a fact, that is all right.

MR. WHITE: That will not truly reflect on the order itself.

JUDGE FOSTER: We had twenty days from which the order was entered on which to file our notice of rehearing. In view of Mr. White's statement, it is the statement by the Commission as to

the time the record reflects that the order was in and, if that is true, we have no further testimony to offer, if the Commission please.

COM. SPURRIER: The record is available, Judge, and Mr. White got his date from the record.

JUDGE FOSTER: If that is the record, that is it. I am satisfied. Mr. Kellahin was going to give testimony on it, but Mr. White has given that information.

MR. SELINGER: We now wish to renew our objection to the testimony given by the applicant as being all a part of the previous record of July 16th and we would like to have a ruling now on it - as to whether the Commission considers this new testimony or not.

COM. SPURRIER: Proceed with your witness, Mr. Selinger.

MR. WHITE: We are withholding our decision.

MR. SELINGER: Mr. Cooper, will you please take the stand?

J. D. COOPER

having been first duly sworn testified as follows:

DIRECT EXAMINATION

By Mr. Selinger:

Q Will you please state your name?

A J. D. Cooper

Q With what Company are you associated?

A Skelly Oil Company.

Q In what capacity?

A Petroleum Engineer.

Q Mr. Cooper, you were here on July 16th covering this same application?

A Yes.

Q Does Skelly Oil Company have any Wolfcamp wells in the Denton field?

A We have six.

Q Have they all been drilled and completed?

A Yes.

Q And all producing?

A Yes.

Mr. SELINGER: Will you please mark this as Skelly Exhibit No. 1 please?

(Skelly Exhibit No. 1 marked for identification.)

Q I hand you what has been identified as Skelly Exhibit No. 1. Does that reflect the extent of Skelly Oil Company's operations in Denton field in a sort of report?

A Yes, as far as Wolfcamp is concerned, yes.

Q When was the first oil well started?

A February of 1952.

Q And the last well completed?

A April of 1953. There was a total of six wells.

Q How much was the average per well investment or cost of drilling a Wolfcamp well by the Skelly Oil Company?

A The average cost was $147,476.

Q What was the payout time per well?

A Per well was about 12.7 months.

Q I will ask you whether or not at this time Skelly Oil Company wells in the Wolfcamp in the Denton Field are paid out.

A I cannot answer that directly, but based on a projection on the rate they would pay out as of June 30th, they should have paid out by October 1st.

Q And the reason you cannot get definite information is the fact that all the bills are not all in and debited yet?

A The bills, runs, and everything has not hit the books.

Q But, from February, 1952 to April of 1953 and down to July 1st, you have had the benefit of six wells' production?

A They were completed at various times and we have had their benefit. All six wells have not been producing for that period of time, however.

Q Mr. Cooper, would you say the cost of drilling a Wolfcamp well, as far as the Skelly Oil Company is concerned, is an average of $147,000 plus?

A Yes.

Mr. Selinger: That is all.

[illegible]: Any further questions of the witness?

(No further questions indicated)

[illegible]: If not, the witness may be excused.

[illegible]: We understand the original record is part

of the case and also there will be included in the record as Magnolia's Exhibit No. 1, the accumulative runs from each of the wells in the Wolfcamp in the Denton field. Is that correct, sir?

COM. SPURRIER: Mr. Selinger's objection was overruled. You are asking if this evidence that is presented is accepted as new?

MR. MADOLE: I am just asking if the original record in the July hearing will be considered with this testimony and that we will be allowed to supply the accumulative production on the Wolfcamp wells as reflected from the records of this Commission which Mr. Macey is going to check and supply as our Exhibit No. 1.

COM. SPURRIER: Do you have anything else, Judge?

JUDGE FOSTER: I have a few remarks. I want to point out one or two things. Sooner or later it seems to me that this Commission must reach the point where it is willing to grant applications for dual completion of oil wells. I do not know whether you have got to that point in your thinking or not but, in any event, it is just the march of time. Everybody else is doing it. It is being done fairly successfully according to this record. Now I know that you will find packer failures. You will find them in oil wells that are dually completed - oil and gas wells. You find failures in anything that is mechanical but that is no reason for not permitting us to complete these wells. Now, airplanes fall out of the sky due to mechanical defects. Railroad signals fail causing

wrecks and the wrecks causing deaths. There are mechanical defects on automobiles, but, because of these mechanical failures, nobody would argue that you should stop flying, going on railroads or automobiles and it is just as logical to say that because there may be a mechanical failure in one of these packers, that you should not grant a dual completion of an oil well. It is in the record, if the Commission please, of the Phillips Petroleum Company's experience and that is all the experience we have had over ten years of dually completed wells - oil wells - not oil and gas, but dually completed oil wells, that we have not had any report of packer failures in those well and we do not know of any reported packer failure in any wells that have caused any damage to the reservoir due to contamination in the two zones. It is all right to say that can happen but I am sure if there had been such instances that the opposition here, as strong as it is, would have dug it up and presented it to this Commission. They did not. They are simply content to argue that it could happen.

On the economic side of this picture, I do not know what kind of an operator Skelly is, but I know what a poor operator we are according to his figures, but it is in the record that any good, hard-headed business man who would go into this, would dual these wells. I think this Commission would be amply justified in finding that it would not be feasible to go out there and twin these wells. If that is the situation, then here is what you have got before you to consider. If you want to get that oil out of the ground, out of the Wolfcamp

formation, if it is not feasible, then it is only to get it out of the hole we have already got - the hole in the Devonian. If the Commission does not do that, then this record is clear and not denied that the productive oil that is in the Wolfcamp zone in these two wells will be produced by these offset operators - a large portion of it will. Some of it will not. That will be a loss for the people of the State of New Mexico. It will just stay there. We just ought to be practical and hardheaded about this thing. It would seem to me to protect the interest of our royalty owners, you should permit us to dually complete these wells and produce this oil that we can produce through a dually completed well and pay that royalty to the royalty owners and I believe that we have a legal obligation to the royalty owners, and, if it is not legal, it is certainly moral. We are trying to protect everybody's interest. What have the opposition here to lose? Just briefly, how can Skelly get hurt if this Commission grants this dual completion? What has Magnolia to lose? What has Sehll to lose? What has Amerada to lose? It is no skin off their nose and why they are here fighting it is something I do not understand. Now the fact that they have twinned wells in the same formation of the same characteristics, etc. does not prove that every well should be twinned. Now, why is it that Magnolia objects to this? The reservoir is not being injured. They will get as many barrels of oil as they would ever get if you permitted us totwin these wells but, they will get a lot more, if you don't.

These things get pretty plain to me just what the issue is and you just deny us the right to dual these wells and get that productive oil under our land there and deny us the right to dual and that productive oil will go to these other operators in this field and that is not something you can just laugh off. I think we have shown this Commission, in good faith, the way we see it, that we cannot twin these wells and pay them out. There is a serious question about it. Sooner or later in New Mexico you are going to be dually completing these oil wells. I know there is some objection to dually completing wells, and I do not say you should establish a policy of dually completing wells, but it is only after you have found the facts and I think when the Commission sits down conscientiously and digests these facts, you would be amply justified to let us complete these two wells. We have done all we can to remove any question of doubt you have in your minds. If anybody has failed, perhaps it is me. There may be some argument about these figures, as to what it takes to pay out a well. Mr. Washburn told us when he used thirty-five feet and six percent that he was wrong and you will get 116,000 barrels of oil and that, multiplied out, gives you so many thousand dollars.

I respectfully ask this Commission to give serious consideration to our request and grant our application to dually complete these two wells.

MR. MADOLE: I am Ross Madole appearing on behalf of

Magnolia. I am not planning to make any lengthy statement, but Judge Foster is implying here that we are coming here with an evil intent to steal his oil. We are here to oppose the dual completion on the ground that it embodies risk to the reservoir. He says there is no direct evidence in this record of packer failure. Either he is not reading his mail right or I am not because -

JUDGE FOSTER: I did not mean to say there is no record of packer failure.

MR. MADOLE: We brought our engineer from Texas and proved to our satisfaction that we had suffered twelve packer failures over there in a field - a total of twelve failures, of which he attributed nine to packer failure. He further testified that he found evidence of injury to the reservoir. That is not conjecture. Now, Mr. Foster refers to planes and railroads and automobiles. You have rules and regulations of running those automobiles. If you are a safe driver you stay on the right side of the road. All we suggest is that they stay on the right side of the road and put another hole down in that field and they will experience no difficulty or injury to the Reservoir. He says we suffer no injury. If there is injury to the Reservoir, and we are directly offsetting those wells, we would be affected and if there was contamination in the Fort or Fonzo, it would adversely affect our wells. Now, he refers to the evil intent of Magnolia to come up and oppose his application so that we can steal his

oil. That is not true. We suspect that Judge Foster is using this Commission to wash a little dirty linen of his own - his royalty owners demands for drilling. If we are going to get into personalities and what is behind this, I think a full disclosure would reveal that they have had a demand for drilling these two Wolfcamp wells and that is the purpose of this hearing to avoid and try to tie down a possible lawsuit action in the Courts of New Mexico.

COM.SPURRIER: Do you wish to speak?

J. H. VICKERY: My name is J. H. Vickery and I represent the Atlantic Refining Company. Atlantic Refining Company has approximately twenty percent of Denton field and we have no objection to the application of Phillips Petroleum Company to dully complete their Fort No. 1 and Fonzo No. 1. Atlantic has found that dual oil completions have been feasible in other areas where the Company operates and I would like to go on record to favor dual oil completions in the State of New Mexico.

GEORGE W. SELINGER: If the Commission please, Skelly Oil Company wishes to renew its objection to Phillips Petroleum Company's application. The record of the previous hearing has been made part of this rehearing, but the reason we are objecting is not because we are going to get Phillips' oil, but we feel there is that danger of contamination, particularly in areas where you have possible water production and it has been brought out throughout the entire hearing there is both water in Wolfcamp

and Devonian. I also want to point out that the matter of policing is a difficult one. It rests entirely with the operator, and we think that is a very important consideration of this Commission - this policing. Outside of bottom hole tests and gas returns, there is no way that the State or offset operator can be advised of such contamination if it exists and that is our sole interest in opposing Phillips - the danger of contamination. If they wish to contaminate their property, that is their business, but, when it comes to a common reservoir, where we might get injured, that is our objection. We wish to particularly call this Commission's attention to it here. We have also indicated that their equipment was unproven at great depths where there is also a mixing interval in respect to five and one-half inch casing. I think all those things should be thought of by the Commission in regard to the State as a whole and particularly to the Denton pool.

D. W. NESTOR: My name is D. W. Nestor and I represent Shell Oil Company. As explained before, even though we are part owners with the Phillips Petroleum Company in the Fonzo and Fort wells, we refer again to our previous statement and ask that their request for dually completing these wells be denied.

JUDGE FOSTER: Before we close, I would like the record to show that Mr. White is the attorney for the Commission. May that be shown?

COL. SPURRIER: Yes. If there is nothing further, we will take the case under advisement.

TABLE OF CONTENTS

VOLUME I

VOLUME II

I, William B. Macey ~~Richard R. Spurrier~~, Member and Secretary of the Oil Conservation Commission of the State of New Mexico, certify that the two accompanying volumes, composed as follows:

Volume I - Application; Notice of Hearing; Order Number R-351; Petition for Re-hearing; Order Number R-351-A; Notice of Re-hearing; Order Number R-351-B; Oral Testimony of Hearing on July 16, 1953; and Oral Testimony of Re-hearing of October 15, 1953

Volume II - Exhibits Numbers 1 to 7, inclusive, of Phillips Petroleum Company, hearing of July 16, 1953; Exhibits Numbers 1 to 6, inclusive, of Phillips Petroleum Company, re-hearing of October 15, 1953; Skelly Oil Company Exhibit Number 1; and Magnolia Petroleum Company Exhibit Number 1

contain a true and complete record of all of the petitions, applications, notices, orders, and evidence in Case Number 557 before the Oil Conservation Commission of the State of New Mexico, and the said two volumes are certified as the official record in said Case Number 557.

In witness whereof, I have affixed my hand and the seal of the Oil Conservation Commission of the State of New Mexico on this 23rd day of July 1954.

William B. Macey
Richard R. Spurrier, Member and
Secretary, Oil Conservation
Commission of the State of New Mexico

PHILLIPS PETROLEUM COMPANY)
)
VS.)
) NO. 11422
OIL CONSERVATION COMMISSION)
OF THE STATE OF NEW MEXICO)

IN THE DISTRICT COURT
IN AND FOR LEA COUNTY,
NEW MEXICO, FIFTH
JUDICIAL DISTRICT

S T I P U L A T I O N

It is stipulated and agreed by and between the Phillips Petroleum Company and the Oil Conservation Commission of the State of New Mexico, each acting by its duly authorized attorneys, that the two accompanying volumes, as certified by the Secretary of the Oil Conservation Commission of the State of New Mexico, contain a complete record of Case Number 557 before said Commission, and it is agreed that all or any part of the matter contained in said volumes may be introduced in evidence in this Case Number 11422 by any party, subject to objections as to competency, relevancy and materiality.

PHILLIPS PETROLEUM COMPANY

BY _____ Attorney

OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

BY _____ Attorney.

C
O
P
Y

June 11, 1953

AIR MAIL

Re: Application of Phillips Petroleum Company to Effect Oil-Oil Dual Completions between the Devonian and Wolfcamp Formations in its Fort Well No. 1, Fonzo Well No. 1, and Denton Wells Nos. 12 and 13, Denton Field, Lea County, New Mexico

Mr. W. B. Macey
Chief Engineer, Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Mr. Macey:

Phillips Petroleum Company desires to oil-oil dually complete between the Devonian and Wolfcamp formations the following wells:

1. Fort Well No. 1, located in the NE/4 NE/4 Section 34-14S-37E, Lea County, New Mexico. This well was completed on September 1, 1951, in Devonian pay at a plugged back total depth of 12,724 feet. 12,789 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,564 feet to 12,630 feet; and from 12,660 feet to 12,710 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9645'-9680' test for water. If water squeeze
and Perforate 9580'-9610' test for water. If water squeeze
and Perforate 9500'-9550' test for water. If water squeeze
and Perforate 9360'-9460' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company Atlantic Building, Dallas, Texas

Magnolia Petroleum Company	Magnolia Building, Dallas, Texas
Shell Oil Company	Petroleum Building, Midland, Texas
Ralph Lowe & Cabot Carbon Co.	V & J Tower, Midland, Texas

2. Fonzo Well No. 1, located in the NW/4 NW/4, Section 35-14S-37E, Lea County, New Mexico. This well was completed on July 17, 1952, in Devonian pay at a plugged back total depth of 12,687 feet. 12,710.83 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,580 feet to 12,680 feet; and from 12,456 feet to 12,550 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9550'-9590' test for water. If water squeeze
and Perforate 9480'-9520' test for water. If water squeeze
and Perforate 9400'-9440' test for water. If water squeeze
and Perforate 9260'-9360' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company	Atlantic Building, Dallas, Texas
Magnolia Petroleum Company	Magnolia Building, Dallas, Texas
Ralph Lowe & Cabot Carbon Co.	V & J Tower, Midland, Texas

3. Denton Well No. 12, located in the SW/4 NW/4, Section 11-15S-37E, Lea County, New Mexico. This well was completed on June 24, 1952 in Devonian pay at a plugged back total depth of 12,772 feet. 12,752 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,650 feet to 12,700 feet; and 12,600 feet to 12,650 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9540'-9590' test for water. If water squeeze
and Perforate 9480'-9500' test for water. If water squeeze
and Perforate 9350'-9460' test for water. If water squeeze
and Perforate 9230'-9310' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company	Atlantic Building, Dallas, Texas
Shell Oil Company	Petroleum Building, Midland, Texas
Gulf Oil Corporation	Gulf Building, Pittsburgh 30, Pennsylvania
Ohio Oil Company	Donnell Building, 539 S. Main St., Findlay, Ohio

4. Denton Well No. 13, located in the NW/4 NW/4, Section 11-15S-37E, Lea County, New Mexico. This well was completed on October 19, 1952, in the Devonian pay at a plugged back total depth of 12,745 feet. 12,736 feet of 5½-inch casing was set and perforated opposite the Devonian formation from 12,700 feet to 12,730 feet; and from 12,580 feet to 12,670 feet.

It is proposed to perforate the Wolfcamp in this well as follows:

Perforate 9530'-9580' test for water. If water squeeze
and Perforate 9460'-9500' test for water. If water squeeze
and Perforate 9290'-9430' test for water. If water squeeze
and Perforate 9150'-9260' combine with previous formations that were water free.

Offset operators to this lease with their addresses are as follows:

Atlantic Refining Company	Atlantic Building, Dallas, Texas
Shell Oil Company	Petroleum Building, Midland, Texas
Gulf Oil Corporation	Gulf Building, Pittsburgh 30, Pennsylvania
Ohio Oil Company	Donnell Building, 539 S. Main St. Findlay, Ohio

Baker & Otis equipment will be used in these completions, together with some additional equipment subcontracted from Garrett Oil Tools, Inc., for gas lift installations, if necessary. Baker Oil Tools representatives will present cutaway models of the equipment to be used, together with diagrammatic sketches of proposed installations, and will demonstrate and explain this equipment and the installations to the Commission.

I am attaching appropriate plats showing lease and well locations.

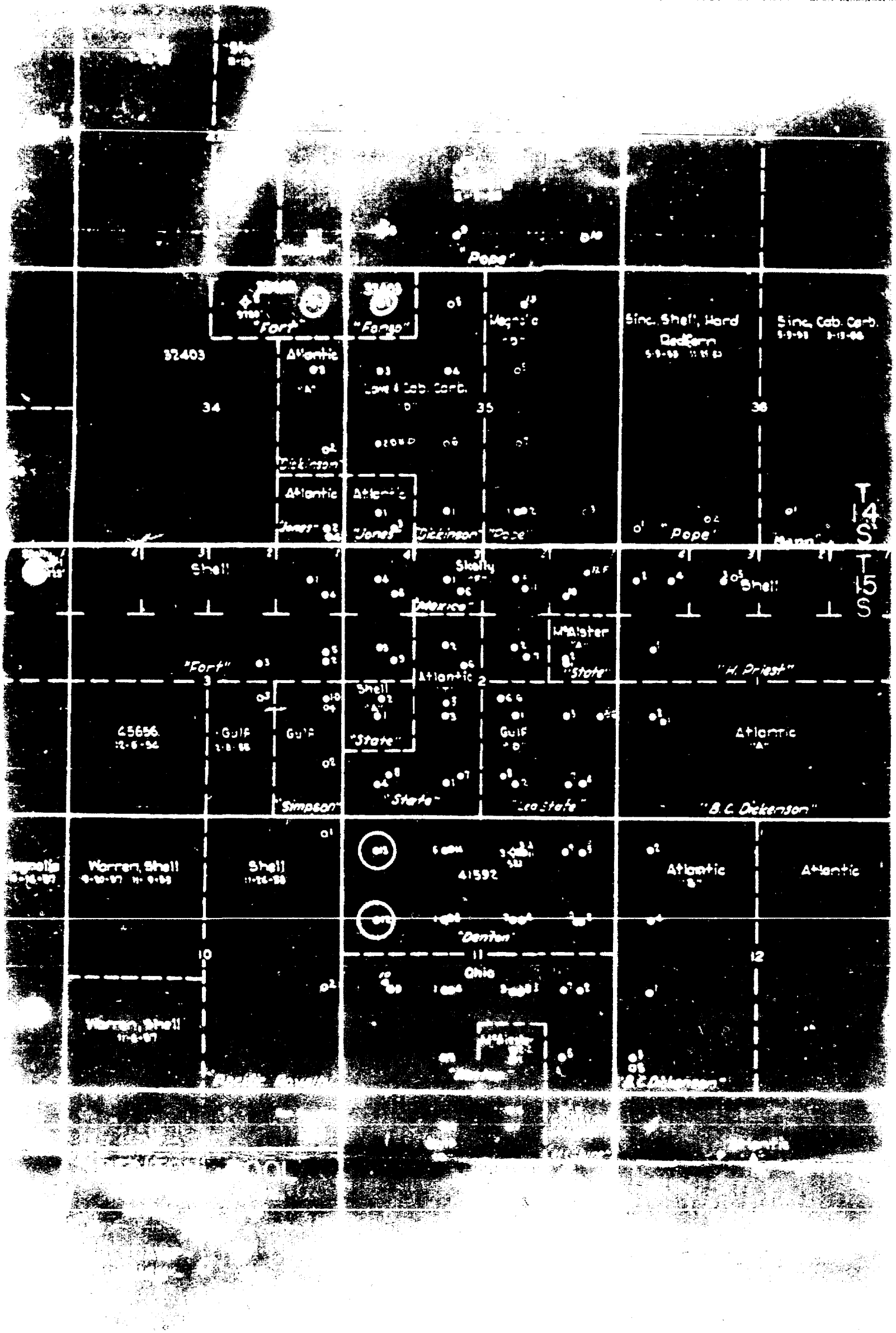
Very truly yours,

/s/ E. H. Foster

E. H. Foster

EHF:fe
Encls. Plats 2
Extra Copy This Letter

cc: Messrs: Harry D. Turner
J. E. Fitzjarrald


"Pope"
"Fort"
"Fargo"
Magnolia
Sinc. Shell, Hard Rock Corn
Sinc. Cab. Corb.
32403
Atlantic
Lone & Cab. Corb.
34
35
36
Dickinson
Atlantic
"Jones"
"Dickinson"
"Pope"
T 14 S
T 15 S
Shell
Skelly
"Fort"
McAlister "A"
"State"
"H. Priest"
Atlantic
45656
Gulf
"Simpson"
"State"
"B. C. Dickenson"
Warren, Shell
Shell
41592
"Denton"
Ohio
Atlantic
10
11
12

NOTICE AS PUBLISHED IN THE NEW MEXICAN AT SANTA FE, NEW MEXICO AND IN THE HOBBS DAILY NEWS SUN AT HOBBS, NEW MEXICO, ON JUNE 29, 1953

LEGAL ADVERTISING

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

The State of New Mexico by its Oil Conservation Commission hereby gives notice pursuant to law and the rules and regulations of said Commission promulgated thereunder of the following public hearings to be held at 9 o'clock a.m. on July 16, 1953, at Mabry Hall, State Capitol, in the City of Santa Fe, New Mexico.

STATE OF NEW MEXICO TO:
All named parties and persons having any right, title, interest or claim in the following cases, and notice to the public.

CASE 552: (Readvertisement)

In the matter of the revised application of the Oil Conservation Commission of New Mexico upon its own motion for an order authorizing the revision, modification and amendment of variously numbered rules in Sections 'G', 'A', and 'M' of the Rules and Regulations of the Commission (Revised Jan. 1, 1953), with particular reference to Rule 502, relating to Rate of Producing Wells and Daily and Monthly tolerances, etc.; and Rule 503 relating to Production Authorization and including therein the matter of so-called 'Back Allowable'; the insertion of a working definition of the term 'Back Allowable' within Section 'A' of said Rules; the addition to Section 'M' relating to forms, of said Rules and Regulations, of such other and additional required forms as may appear necessary or convenient as a result of any revision, modification or amendment of any of the rules aforesaid; the amendment of, deletion from or addition to any conflicting section, definition, phrase or clause in Order R-86-A or any other order previously issued by the Commission bearing on the foregoing matters.

CASE 555:

In the matter of the application of Lowry et al Operating Account for the approval of a pilot pressure maintenance program by water injection in one or both of two wells, said injection wells located in SW¼ SW¼ Section 3 and NE¼ NW¼ Section 10, Township 26 North, Range 6 West, NMPM, in the South Blanco-Tocito Pool, Rio Arriba County, New Mexico.

CASE 556:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fort Well No. 1, NE¼ NE¼ Section 34, Township 14 South, Range 37 East NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,564 to 12,710 feet, and oil from the Wolfcamp formation after perforating from 9,680 to 9,360 feet.

CASE 557:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fonzo Well No. 1, NW¼ NW¼ Section 35, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico, (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,456 to 12,680 feet, and oil from the Wolfcamp formation after perforating from 9590 to 9260 feet.

CASE 558:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Denton Well No. 12, SW¼ NW¼ Section 11, Township 15 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,600 to 12,700 feet, and oil from the Wolfcamp formation after perforating 9350 to 9230 feet.

CASE 559:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Denton Well No. 13, NW¼ NW¼ Section 11, Township 15 South, Range 37 East, NMPM, Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,580 to 12,730 feet, and oil from the Wolfcamp formation after perforating 9580 to 9150 feet.

CASE 560:

In the matter of the application of the Oil Conservation Commission of New Mexico upon its own motion for an order calling for the creation of new pools and extension of existing pools in San Juan and Rio Arriba Counties, New Mexico, and giving notice to all persons and parties interested in the subject matter thereof to appear and show cause why such extensions and creations should not be made.

(a) Create a new pool in San Juan County, New Mexico, classified as a gas pool for Dakota production, designated as the Huerfano-Dakota Pool, and described as:

Twp. 26N, Rge. 10W, NMPM
Section 13: S½;
Section 14: SE¼;
Section 23: E½;
Section 24: All

(b) Create a new pool in Rio Arriba County, New Mexico, classified as a gas pool for Dakota production, designated as the Compañero-Dakota Pool, and described as:

Twp. 27 N. Rge. 5W NMPM
Section 3: W½;
Section 4: all;
Section 9: N½;
Section 10: NW¼

(c) Create a new pool in San Juan County, New Mexico, classified as a gas pool for Dakota production, designated as the Blanco-Dakota Pool, and described as:

Twp. 31N, Rge. 10W, NMPM
Section 27: all;
Section 28: E½;
Section 33: NE¼;
Section 34: N½

(d) Create a new pool in San Juan County, New Mexico, classified as a gas pool for Dakota production, designated as the West Kutz-Dakota Pool, and described as:

Twp. 28N, Rge. 12W, NMPM
Section 21: E½;
Section 22: all;
Section 27: N½;
Section 28: NE¼

(e) Create a new pool in Rio Arriba County, New Mexico, classified as a gas pool for Dakota production, designated as the South Blanco-Dakota Pool, and described as:

Twp. 25N, Rge. 5W, NMPM
Section 9: S½;
Section 10: SW¼;
Section 15: W½;
Section 16: all

(f) Extend the Fulcher-Kutz--Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

Twp. 27N, Rge. 8W, NMPM
Section 18: W½

(g) Extend the West Kutz-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

Twp. 27N, Rge. 10W, NMPM
Section 32: E½

(h) Extend the Angels Peak Pool in San Juan County, New Mexico, to include therein:

Twp. 27N, Rge. 10W, NMPM
Section 9: E½;
Section 10: NW¼, S½;
Section 15: all;
Section 16: E½;
Section 22: all;
Section 23: W½;
Section 26: NW¼;
Section 27: N½

CASE 561:

In the matter of the application of the Oil Conservation Commission of New Mexico upon its own motion for an order for the extension of existing pools in Lea and Eddy Counties, New Mexico, and giving notice to all persons and parties interested in the subject matter thereof to appear and show cause why such extensions should not be made.

(a) Extend the East Caprock-Devonian Pool boundary in Lea County, New Mexico, to include therein:

Twp. 12S, Rge. 32E, NMPM
Section 2: N/2

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(b) Extend the Crossroads-Pennsylvanian Pool boundary in Lea County, New Mexico, to include therein:

Twp. 9S, Rge. 36E, NMPM
Section 19: E½

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(c) Extend the Dollarhide-Drinkard Pool boundary in Lea County, New Mexico, to include therein:

Twp 25S, Rge. 38E, NMPM
That portion of the N½ of Section 4 that lies within the State of New Mexico; and N½ Section 5

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(d) Extending the Dollarhide-Queen Pool boundary in Lea County, New Mexico, to include therein:

Twp 24S, Rge. 38E, NMPM
Section 30: S½

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(e) Extend the Eidson-Pennsylvanian Pool boundary in Lea County, New Mexico, to include therein:

Twp. 16S, Rge. 35E, NMPM
Section 7: SE¼;
Section 8: SW¼;
Section 17: NW¼

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(f) Extend the East Hobbs-San Andres Pool boundary in Lea County, New Mexico, to include therein:

Twp. 18S, Rge. 39E, NMPM
Section 30: all

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(g) Extend the Monument-Blinebry Pool boundary in Lea County, New Mexico, to include therein:

Twp. 20 South, Rge. 37E, NMPM
Section 7: NE¼;
Section 8: NW¼

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(h) Extend the Empire Pool boundary in Eddy County, New Mexico, to include therein:

Twp. 17S, Rge. 28E, NMPM
Section 19: SE¼;
Section 30: E½

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

GIVEN under the seal of the Oil Conservation Commission at Santa Fe, New Mexico, this 25th day of June, 1953.

(Seal)

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
R. R. SPURRIER, Secretary

(Pub. June 29, 1953).

C
O
P
Y

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. 557
Order No. R-351

THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY FOR
PERMISSION TO EFFECT DUAL COMPLETION
OF ITS FONZO NO. 1 WELL, LOCATED IN
NW/4 NW/4, SECTION 35, TOWNSHIP 14
SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY,
NEW MEXICO (IN THE DENTON FIELD) IN SUCH
A MANNER AS TO PERMIT PRODUCTION OF OIL
FROM THE DEVONIAN FORMATION, THROUGH
EXISTING CASING PERFORATIONS, 12,580 TO
12,680 FEET, AND FROM 12,456 TO 12,550 FEET,
AND OIL FROM THE WOLFCAMP FORMATION,
AFTER PERFORATING 9590 TO 9260 FEET.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 16, 1953, at Santa Fe, New Mexico, before the Oil Conservation Commission, hereinafter referred to as the "Commission."

NOW, on this 28th day of August, 1953, the Commission, a quorum being present, having considered the application and the testimony adduced at said hearing, 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.

(2) That dual completion of the Fonzo No. 1 Well, in the NW/4 NW/4 Section 35, Township 14 South, Range 37 East, N.M.P.M., in the Denton Field, Lea County, New Mexico, for production of oil from the Denton-Wolfcamp formation and oil from the Denton-Devonian formation would be subject to the operational hazards incident to great depths.

(3) That there exists between the two reservoirs a considerable pressure differential, and, should interzone communications occur from any reason, the deeper Devonian Reservoir with the higher pressure would be injured.

(4) That testimony shows that packer, and other mechanical failures in oil-oil completions at various depths have caused injurious interzone communication in reservoirs in other areas under conditions similar to those existing in the Denton Field.

(5) That applicant's testimony as to the economic effectiveness of the Wolfcamp pay section under the subject well appears to be unduly conservative.

(6) That application for oil-oil dual completion of the Fonzo No. 1 well should be denied.

IT IS THEREFORE ORDERED:

That the application of Phillips Petroleum Company for permission to dually complete its Fonzo No. 1 Well, located in the NW/4 NW/4, Section 35, Township 14 South, Range 37 East, NMPM, for oil from the Denton-Wolfcamp formation and oil from the Denton-Devonian formation be, and the same hereby is denied.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
/s/ E. L. Mechem

EDWIN L. MECHEM, CHAIRMAN

/s/ E. S. Walker

E. S. Walker, Member

/s/ R. R. Spurrier

R. R. Spurrier, Secretary

S E A L

C
O
I
Y

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION COM-
MISSION OF NEW MEXICO FOR THE PURPOSE
OF CONSIDERING:

CASE NO. 557
ORDER NO. R-351-A

THE MATTER OF THE APPLICATION OF PHILLIPS
PETROLEUM COMPANY FOR PERMISSION TO EFFECT
DUAL COMPLETION OF ITS FORZO NO. 1 WELL,
NW/4 NW/4 SECTION 35, TOWNSHIP 14 SOUTH,
RANGE 37 EAST, NMPM, LEA COUNTY, NEW MEXICO,
IN THE DENTON POOL, IN SUCH MANNER AS TO PERMIT
PRODUCTION OF OIL FROM THE DEVONIAN FORMATION
THROUGH EXISTING CASING PERFORATIONS (12,580-
12,680' AND 12,456 - 12,550) AND OIL FROM THE
WOLFCAMP FORMATION AFTER PERFORATING 9590 - 9260'.

ORDER OF THE COMMISSION FOR RE-HEARING

BY THE COMMISSION

This cause came on for hearing upon the petition of Phillips Petroleum Company for a re-hearing on Order No. R-351 heretofore entered on August 28, 1953.

NOW, on this 28th day of September, 1953, the Commission, a quorum being present, having fully considered said motion and application,

IT IS HEREBY ORDERED:

That the above-entitled matter be re-opened and a re-hearing in said cause be held on October 15, 1953, at 9 o'clock a.m. on said day at Santa Fe, New Mexico, or at such time as the Commission may designate after due notice, at which time and place all interested parties may appear.

IT IS FURTHER ORDERED: That the effective date for the operation of Commission Order No. R-351 be, and the same hereby is suspended pending further order of the Commission in the premises.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

/s/
Edwin L. Mechem, Chairman

/s/
E. S. Walker, Member

/s/
R. R. Spurrier, Member and Secretary

SEAL

C
O
I
Y

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 557
Order No. R-351

THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY FOR
PERMISSION TO EFFECT DUAL COMPLETION
OF ITS PORZO NO. 1 WELL, LOCATED IN
NW/4 NW/4, SECTION 35, TOWNSHIP 14
SOUTH, RANGE 37 EAST, N.M.P.M., LEA COUNTY,
NEW MEXICO (IN THE DENTON FIELD) IN SUCH
A MANNER AS TO PERMIT PRODUCTION OF OIL
FROM THE DEVONIAN FORMATION, THROUGH
EXISTING CASING PERFORATIONS, 12,580 TO
12,680 FEET, AND FROM 12,456 TO 12,550 FEET,
AND OIL FROM THE WOLFCAMP FORMATION, AFTER
PERFORATING 9590 TO 9260 FEET.

PETITION FOR REHEARING

Comes now Phillips Petroleum Company and respectfully petitions the Oil Conservation Commission of New Mexico for a rehearing in the above captioned matter, and in support thereof would show:

1. That Petitioner was the applicant in Case No. 557 before the Oil Conservation Commission of New Mexico, and is adversely affected by Order No. R-351 entered therein.

2. That while said order bears the date August 28, 1953, Petitioner was not notified that such order had been entered, or that any order had been entered, within the time allowed for applying for rehearing, and in that respect has been denied its rights as provided by law. (Sec. 69-223, New Mexico Statutes, 1941 Annotated, 1949 Supp.)

3. That the Commission erred in entering its order in this case, the same being Order No. R-351, and that said order is unlawful in that it is unreasonable, arbitrary and capricious and would deprive Petitioner of a valuable property right without due process of law, in the following respects:

(a) The order is not supported by the evidence

offered in this case, and there is no substantial evidence in the record to support said order.

(b) That the findings of the Commission are vague and indefinite, subject to ambiguity and doubt, and are insufficient to support the order of the Commission.

(c) That the findings of fact are not supported by substantial evidence, and are contrary to the evidence presented.

(d) That the testimony offered and exhibits introduced clearly show that the dual completion of the Fonzo No. 1 well in the NW/4 NW/4 Section 35, Twp. 14 S., R. 37 E., NMPM will not subject such well to operational hazards, that no serious danger of interzone communication exists and that reservoir conditions are highly favorable to the dual completion as proposed, and the equipment proposed to be used will afford adequate and ample protection to all producing horizons, all as is clearly shown by the testimony and exhibits offered at said hearing, and that such dual completion will result in the prevention of waste and protection of correlative rights.

(e) That the Commission order was not entered in accordance with law.

(f) That the order will require the drilling of an excessive number of wells, with attendant risks and economic loss.

WHEREFORE PETITIONER PRAYS:

1. That this petition for rehearing be considered timely filed.

2. That a rehearing of Case No. 557 be granted by the Commission.

3. That the Commission rescind its Order No. R-351, dated August 28, 1953, and enter in lieu thereof its order approving the dual completion of Petitioner's Fonzo No. 1 well, in the NW/4 NW/4 Section 35, T. 14 S., R. 37 E., NMPM, Lea County, New Mexico, for the production of oil from the Denton-Wolfcamp formation, and oil from the Denton-Devonian formation, all as proposed and prayed in the original petition herein.

Respectfully submitted.

Phillips Petroleum Company

By /s/ Jason Kellahin
Jason W. Kellahin
Attorney for Petitioner
Santa Fe, New Mexico

NOTICE AS PUBLISHED IN THE NEW MEXICAN AT SANTA FE, NEW MEXICO ON OCTOBER 1, 1953, AND IN THE HOBBS DAILY NEWS SUN AT HOBBS, NEW MEXICO ON OCTOBER 2, 1953

NOTICE OF PUBLICATION
STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
SANTA FE - NEW MEXICO

The State of New Mexico by its Oil Conservation Commission hereby gives notice pursuant to law and the Rules and Regulations of said Commission promulgated thereunder of the following public hearings to be held at 9 o'clock a.m. on October 15, 1953, at Mabry Hall, State Capitol, Santa Fe, New Mexico.

STATE OF NEW MEXICO TO:

All named parties and persons having any right, title, interest or claim in the following cases, and notice to the public.

(Note: All land descriptions herein refer to the New Mexico Principal Meridian, whether or not so stated.)

CASE 556: (Re-hearing)

Notice is hereby given by the State of New Mexico, through its Oil Conservation Commission, that Phillips Petroleum Company, upon proper petition, has requested a re-hearing in Case 556; that in said petition, petitioner asks recision of Order No. R-350, which order refused petitioner's application for permission to effect dual completion of its Fort No. 1 Well, NE4 NE4 Section 34, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico, in such manner as to permit production of oil from both the Devonian and Wolfcamp formations; that the Commission, by its Order No. R-350-A, has granted said re-hearing and set it for 9 a.m. on October 15, 1953, at Mabry Hall, Santa Fe, New Mexico, at which time and place petitioner and other interested parties will be heard.

CASE 557: (Re-hearing)

Notice is hereby given by the State of New Mexico, through its Oil Conservation Commission, that Phillips Petroleum Company, upon proper petition, has requested a re-hearing in Case 557; that in said petition, petitioner asks recision of Order No. R-351, which order refused petitioner's application for permission to effect dual completion of its Fonzo No. 1 Well, NW4 NW4 Section 35, Township 14 South, Range 37 East, Lea County, New Mexico, in such manner as to permit production of oil from both the Devonian and Wolfcamp formations; that the Commission, by its Order No. R-351-A, has granted said re-hearing and set it for 9 a.m. on October 15, 1953, at Mabry Hall, Santa Fe, New Mexico, at which time and place petitioner and other interested parties will be heard.

CASE 593:

In the matter of the application of Stanolind Oil & Gas Company for permission to dually complete its State 'E', Tract 17, Well No. 1, SW4 SE4 Section 1, Township 17 South, Range 36 East, Lea County, New Mexico, in such manner as to permit production of oil from the Paddock zone of the Lovington-Paddock Oil Pool through the tubing and gas from the Queen formation through the casing-tubing annulus.

CASE 594:

In the matter of the application of Atlantic Pipe Line Company for permission to operate a temporary portable treating plant on its Leach Tank Farm, Hobbs, New Mexico, for the processing, treating and reclaiming of approximately 25,000 barrels of basic sediment and water which has accumulated in the tanks on said tank farm, in accordance with the provisions of Rule 312 of the Rules and Regulations.

In the matter of the application of El Paso Natural Gas Company for compulsory unitization of the E2 of Section 32, Township 31 North, Range 10 West, San Juan County, New Mexico; or, in the alternative, for approval of an unorthodox drilling unit of 240 acres, more or less, in the E2 of said Section 32, Township 31 North, Range 10 West.

CASE 596:

In the matter of the application of El Paso Natural Gas Company for compulsory unitization of the E2 of Section 32, Township 30 North, Range 8 West, San Juan County, New Mexico; or, in the alternative, for approval of an unorthodox drilling unit of 280 acres, more or less, in the E2 of said Section 32, Township 30 North, Range 8 West.

CASE 597:

In the matter of the application of El Paso Natural Gas Company or permission to drill a well in NE4 NE4 Section 16, Township 15 North, Range 17 West, McKinley County, New Mexico, for the storage of liquefied petroleum gas after washing out a storage cavity in the Chinle formation at an approximate depth of 800 feet.

CASE 598:

In the matter of the application of the Oil Conservation Commission upon its own motion for a revision of Rule 104 (b) pertaining in part to well spacing in San Juan, Rio Arriba, Sandoval and McKinley Counties, New Mexico, and for a revision of Orders R-59, R-46 and R-110 pertaining to spacing of gas wells to be drilled to the Pictured Cliffs formation and to the Mesaverde formation.

CASE 599:

In the matter of the application of the Oil Conservation Commission upon its own motion for the creation of new pools and extension of existing pools in Lea County, New Mexico, and giving notice to all persons and parties interested in the subject matter thereof to appear and show cause why such extensions and creations should not be made.

(a) Create a new pool in Lea County, New Mexico, classified as an oil pool for Seven Rivers production designated as the East Hobbs-Seven Rivers Pool, and described as:

Township 18 S, Range 38 E
All of Section 25

and such other contiguous lands as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(b) Extend the Crossroads Pool boundary in Lea County, New Mexico, to include therein:

Township 9 S, Range 36 E
S2 Section 22

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(c) Extend the Denton-Wolfcamp Pool boundary in Lea County, New Mexico, to include therein:

Township 14 S, Range 37 E
N2 Section 26; all Section 36
Township 15 S, Range 37 E
E2 Section 10

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(d) Extend the Lovington-Paddock Pool boundary in Lea County, New Mexico, to include therein:

Township 16 S, Range 36 E
S2 Section 25

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

(e) Extend the Lynch Pool boundary in Lea County, New Mexico, to include therein:

Township 20 S, Range 34 E
E2 Section 35

and such other lands contiguous to said pool as may properly be included therein as supported by proper testimony and recommendations adduced at said hearing.

CASE 600:

In the matter of the application of the Oil Conservation Commission upon its own motion for the extension of existing pools in San Juan and Rio Arriba Counties, New Mexico, and giving notice to all persons and parties interested in the subject matter thereof to appear and show cause why such extensions should not be made.

(a) Extend the Blanco-Mesaverde Pool boundary in San Juan and Rio Arriba Counties, New Mexico, to include:

Township 29 N, Range 6 W
Sections 19 - 36, incl., all
Township 30 N, Range 6 W
Sections 23 and 24, all
Township 28N, Range 6 W
Partial sections 7 thru 12, incl., all;

Sections 13 thru 18, incl., all
Township 29 North, Range 7 W
Sections 20 thru 29, incl., all;
Sections 32 thru 36, incl., all

(b) Extend the Aztec-Pictured Cliffs Pool boundary in San Juan County, New Mexico, to include:

Township 29 N, Range 10 W
Section 3, all

(c) Extend the West Kutz-Pictured Cliffs Pool boundary in San Juan County, New Mexico, to include:

Township 28 N, Range 13 W
N2 Section 24

GIVEN under the seal of the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, this 28th day of September, 1953.

State of New Mexico
Oil Conservation Commission
R. R. SPURRIER, Secretary.

(SEAL)

(Pub. Oct. 1, 1953)

C
O
P
Y

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 557
ORDER NO. R-351-B

THE MATTER OF THE APPLICATION
OF PHILLIPS PETROLEUM COMPANY
FOR PERMISSION TO EFFECT A DUAL
COMPLETION OF ITS FONZO NO. 1
WELL, LOCATED IN THE NW/4 NW/4
SECTION 35, TOWNSHIP 14 SOUTH,
RANGE 37 EAST, N.M.P.M., LEA COUNTY,
NEW MEXICO (IN THE DENTON FIELD),
IN SUCH A MANNER AS TO PERMIT
PRODUCTION OF OIL FROM THE DEVON-
IAN FORMATION THROUGH EXISTING CASING
PERFORATIONS, 12,580 TO 12,680 FEET,
AND OIL FROM THE WOLFCAMP FORMATION
AFTER PERFORATING FROM 9,590 TO 9,260
FEET.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This case came on for hearing upon the petition of Phillips Petroleum Company on July 16, 1953 at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission" and for re-hearing on October 15, 1953.

NOW, on this 10th day of December, 1953, the Commission, a quorum being present, having fully considered the record and the testimony adduced and the exhibits received at said hearing and re-hearing, and being fully advised in the premises.

FINDS:

(1) That due public notice having been given, in accordance with law, the Commission has jurisdiction of this cause, the persons and subject matter thereof.

(2) That after due public notice and hearing on July 16, 1953, the Commission entered its Order No. R-351, denying petitioner's application for dual completion (oil-oil) of its Fonzo No. 1 Well, NW/4 NW/4 Section 35, Township 14 South, Range 37 East, NMPM., Lea County, New Mexico in the Denton Field.

(3) That upon motion duly filed, the Commission granted a re-hearing by its Order No. R-351-A for the purpose of taking additional testimony and hearing oral arguments, and that such re-hearing was held on October 15, 1953.

(4) That no evidence was presented at such re-hearing sufficient to justify an order granting petitioner's application.

IT IS THEREFORE ORDERED:

That Phillips Petroleum Company's application for permission to dually complete its Fonzo No. 1 Well located in the NW/4 NW/4 Section 35, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico for production of oil from the Denton-Wolfcamp Pool, and oil from the Denton-Devonian Pool be and the same hereby is denied and the Commission's Order No. R-351 be and the same hereby is affirmed.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

/s/
EDWIN L. MECHEM, Chairman

/s/
E. S. WALKER, Member

/s/
R. R. SPURRIER, Member and Secretary

S E A L

Oral Testimony
Hearing - 7/16/53

C
C
I
Y

RECEIVED
Sept 22, 1953
Amarillo Legal Dept.

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

CASE 556: In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fort Well No. 1, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, N.M.P.M., Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,536 to 12,710 feet, and oil from the Wolfcamp formation after perforating from 9680 to 9360 feet.

CASE 557: In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Fonzo Well No. 1, NW/4 NW/4 Section 35, Township 14 South, Range 37 East, N.M.P.M., Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,456 to 12,680 feet, and oil from the Wolfcamp formation after perforating from 9590 feet to 9260 feet.

(contd next page)

TRANSCRIPT OF HEARING

July 16, 1953
Date

BEFORE: Honorable Ed. L. Mechem, Governor
Honorable E. S. Walker, Land Commissioner
Honorable R. R. Spurrier, Director, OCC

STATE OF NEW MEXICO)
ss
COUNTY OF BERNALILLO)

I HEREBY CERTIFY That the within transcript of proceedings before the Oil Conservation Commission is a true record of the same to the best of my knowledge, skill, and ability.

DONE at Albuquerque, N. M., this 30th day of July 1953.

/s/ E. E. Greeson
E. E. Greeson
Notary - Reporter

My Comm. Ex.:
August 4, 1956

(Seal)

CASE 558:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Denton Well No. 12, SW/4 NW/4 Section 11, Township 15 South, Range 37 East, N.M.P., Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,600 to 12,700 feet, and oil from the Wolfcamp formation after perforating 9590 to 9230 feet.

CASE 559:

In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of its Denton Well No. 13, NW/4 NW/4 Section 11, Township 15 South, Range 37 East, N.M.P., Lea County, New Mexico (In the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,580 to 12,730 feet, and oil from the Wolfcamp formation after perforating 9580 to 9150 feet.

MR. SPURRIER: We will move on to the next case on the docket.

I believe we can consolidate Cases 556 through 559. Without objection, we will try to do that.

(Mr. Graham reads the advertisement of the cases.)

(Off the record.)

E. L. MASHBURN,

having been first duly sworn testified as follows:

DIRECT EXAMINATION

BY MR. PEACOCK:

Q Please state your name.

A E. N. Washburn.

Q And your address?

A Bartlesville, Oklahoma.

Q By whom are you employed?

A Phillips Petroleum Company.

Q For how long?

A I am working my twentieth year.

Q In what capacity?

A Engineer; petroleum engineer.

Q Have you testified before this Commission before?

A I have.

MR. PEACOCK: Is the Commission satisfied with Mr. Washburn's qualifications?

MR. SPURRIER: It is.

Q Mr. Washburn, for the record, we will be discussing the four wells concerned in the four cases Nos. 556 through 559. These wells will be generally denominated as the Fort No. 1, the Fonzo No. 1, the Denton No. 12 and the Denton No. 13. Are you familiar with these wells?

A Yes, sir, I am.

Q Are these producing oil wells at this time?

A Yes, sir.

- -

Q From what formation do they produce?

A All four are presently Devonian wells.

Q At what depth is the Devonian formation?

A At approximately 12,500 feet.

Q How thick, measuring vertically, is the Devonian?

A In these wells in question: The Fort has approximately 147 feet of Devonian; the Fonzo has approximately 365 feet; and the Denton 13 has 948 feet; and the Denton No. 12 has about 620 feet. That is productive footage. It is approximately 200 feet more than that in the actual Devonian formation.

Q Are these presently flowing wells?

A They are.

Q Does the Wolfcamp formation lie above the Devonian formation in each of these wells?

A Yes, sir.

Q At what depth does the Wolfcamp lie?

A Approximately 9250 average.

Q How thick is the estimated Wolfcamp pay in the Fort No. 1?

A The productive footage is approximately 22 feet.

Q Do you have micro-log which reveals that information?

A We do.

MR. HADDOCK: I offer this micro-log in evidence

as Applicant's Exhibit 1.

Q Will you examine this Micro-log section on the Fort No. 1 and, for the record, point out approximately the pay sands revealed by this Micro-log in the Wolfcamp?

A The zone that we propose to perforate would be considerably more footage than the Micro-log shows is actual porosity. We do that mainly so that we will get it all. The first zone is between 9645 and 9680, in which - it possibly goes below water-oil contact, and we have approximately five feet of porosity.

The second zone is 9580 to 9610, which contains approximately thirteen feet of porosity.

The third zone is 9500 to 9550, which contains approximately fifteen feet of porosity.

And the upper zone is 9360 to 9460, 100 feet of perforation for five feet of porosity. The porosity totals to about 33 feet.

But, based on examination of other cores from the Wolfcamp, we estimate about 22 feet, about two-thirds of that will be productive.

Q How thick is the Wolfcamp pay sand in the Fonzo and the Denton Nos. 12 and 13 wells?

A I don't have a Micro-log of those wells. We estimate the footage in the Fonzo is about 35 feet of productive porosity, and that the two Denton wells will have probably

fifty feet of productive porosity.

Q Other than what you have told us about the conclusions of the Wolfcamp formation, is there any additional information that you have concerning the quality of the Wolfcamp formation in this area?

A You refer to its recovery?

Q Is it lime or --

A It is a lime, embedded with shale streaks.

Q Is it considered a tight formation in this area we are concerned with?

A Yes, it is considered tight.

Q What is the estimated total recovery from the Wolfcamp sand in the Fort No. 1?

A It is generally, from information that we have, we estimate recovery will be approximately 77 barrels per acre foot.

In the Fort well it would have a recovery of approximately 1700 barrels per acres.

Q And the Fort is on a 40-acre unit?

A 40-acre unit, which would give it a recovery of approximately about 68,000 barrels.

Q What would be the estimated total recovery from the Fonzo No. 1 well?

A I would estimate the Fonzo would have approximately 3000 barrels per acre, or about 120,000 barrels on a

40-acre unit.

Q Would the Denton No. 12 — Do you have figures on the Denton No. 12 and 13?

A They would probably have a recovery of about 4500 barrels per acre, or about 180,000 barrels for the 40-acre unit.

Q What would a 12,000 foot well such as the four wells under consideration cost to drill?

A The Devonian wells are priced about $320,000 each.

Q Does that include storage, taxes and lease cost?

A No, it doesn't.

Q What would it cost to complete a well to the Wolfcamp formation on these four units under discussion?

A Based on the price of six Wolfcamp wells we have drilled in the Denton field, about $200,000.

Q Does that include storage, taxes and lease cost?

A No.

Q What would it cost to dually complete these four wells? That is, the Fort No. 1, the Fonzo and the Dentons 12 and 13, so that they could be produced both from the Devonian and Wolfcamp formations?

A That price will vary. Probably thirty to forty thousand dollars.

Q Could it run slightly more or slightly less?

A It could run slightly more and with good success, it could be a little less.

Q The estimated total recovery from the Wolfcamp formation in the Fort No. 1 unit is - which you gave us a while ago - is that sufficient to pay back the drilling cost of another well completed to the Wolfcamp formation on that unit?

A No, sir, it isn't.

Q What can you say about the Fonzo No. 1 with relation to the estimated total recovery balanced against the drilling cost of a single well there?

A Considering lifting cost, royalties, production tax, income tax, and taking credit for depletion allowance, there possibly would be a break-even deal, not discounting your money that would be tied up for that period.

Q How long is the estimated economic life of the Devonian pay sand in this area?

A The Devonian is estimated to have a thirty to fifty year life. It may exceed that.

Q Now, these four wells which are now producing from the Devonian, are they flowing wells at this time?

A Yes, sir.

Q Is it your opinion they will continue to be flowing wells for as long as they are produced from the Devonian?

A No; they eventually would have to be artificially lifted.

Q Have you an opinion concerning the time at which artificial lifting methods must be applied to this Devonian sand?

A No, sir. I would say that it would be reasonable to expect the flowing life of the Devonian, most of the Devonian, will be flowing by the time the Wolfcamp is abandoned.

Q What is your opinion as to the economic life of the Wolfcamp in this area?

A The Wolfcamp in various studies has been estimated to be approximately ten years.

Q Is the Wolfcamp presently produced by flowing?

A Yes, sir.

Q Will it be able to be produced in that manner during the economic life of that Wolfcamp formation, or must artificial lifting means be applied there at some future date?

A Artificial lift will be required at a later date.

Q Therefore, is it your conclusion that the Wolfcamp will be depleted; that is, it will be at the end of its economic life before it is necessary to artificially lift the oil from the Devonian?

A That is a reasonable assumption; yes, sir, that's right.

Q Upon what do you base that?

A On various studies that we have made.

Q What is the difference in the bottomhole pressure between the Devonian and the Wolfcamp in the wells in this area?

A The Wolfcamp has approximately 3200 pounds and the Devonian has approximately 4500 pounds.

Q Will that pressure decrease as the fields are produced?

A The Wolfcamp pressure is declining at a faster rate than the Devonian.

Q Is the Wolfcamp and the Devonian oil corrosive?

A No; they are considered both sweet oil.

Q Is it considered that they will materially affect the seals which are placed outside the casing and at other places in dual completions?

A We wouldn't expect it to.

Q Has the Wolfcamp formation been sealed off from the Devonian in these four wells outside the casing?

A The wells have been cemented by two-stage cement jobs, using approximately six to eight barrels - I mean six to eight hundred bags - of cement.

In three casing temperature surveys, which were made after the second stage cement job, the cement was found between 2000 and 5000 feet.

In the Fort well 150 sacks were cemented and cir-

culated outside of the casing.

Q Is there any communication between the Devonian and the Wolfcamp in these wells?

A I can't answer that. We don't think there is.

Q Would an additional test for communication be made prior to the installation of any dual completion on these wells?

A That would be the standard procedure in dual completing a well, to run a retrievable packer to test communication outside the pipe before setting the permanent packer.

Q Will you explain what you mean by dual completion?

A The process of separating two zones by a form of packer and having a cross-over flow nozzle where you can arbitrarily produce either zone through either the annulus or the tubing.

Q What size casing is in each of these four wells?

A All have 5½-inch casing.

Q What type of equipment is it proposed that would be used in dually completing these wells? That is, the equipment of what companies?

A We propose to use the Baker production packer and the Otis cross-over nipples.

Q Now, have you prepared exhibits which represent a true schematic cutaway view of the proposed dual completion

using Baker-Otis equipment?

A Yes, sir.

MR. PEACOCK: I would like to offer in evidence these schematic drawingsas Applicant's Exhibits 2, 3, 4 and 5. Those are - There is one drawing for each of the wells under consideration.

MR. SPURRIER: Without objection, they will be admitted.

(Off the record.)

Q Will the methods shown allow oil to be flowed from both the Devonian and Wolfcamp formations in these wells without commingling?

A Yes, sir.

Q Is it proposed to measure the oil produced from each formation separately?

A It is.

Q Will you describe briefly the method proposed to perforate the casing to produce from the Wolfcamp?

A I previously covered that. Our geological department has picked four zones in each of the wells they would like to perforate and in order that we may get all the productive porosity in the well. Those four zones are shown on the left of each of the exhibits. It should be understood if any zone shows water, that that zone would be squeezed off. We may have one of the four zones squeezed

off. The first zone is possibly the water zone. It is the lowest zone.

Q Have you prepared an exhibit which represents a schematic cross section view of your dual completion equipment which would allow pumping from the top zone and gas lifting or flowing from the bottom zone of such a well?

A Yes, sir.

MR. HEACOCK: We would like to offer in evidence this Applicant's Exhibit 6.

Q Now, do all of these schematic drawings represent cutaway views of the proposed Baker-Otis dual completion equipment which we intend to use in dually completing these wells?

A The Baker-Otis equipment is the same. This combination on this last exhibit would not necessarily have to be used. There is all reason to believe that only one zone at a time would have to be artificially lifted in each of these four wells.

Q Is your reason for such belief that it is your opinion that the Wolfcamp will be depleted prior to the time that it will be necessary to pump the Devonian?

A That's right.

Q This Exhibit 6 represents a Kobe hydraulic pump. Is that the only type pump which may be used in a dual completion?

A No, sir. There is several combinations you could use if you had to artificially lift both zones at the same time. This is one.

Q Then you do not present this as the only possible means for artificially lifting oil from either or both zones?

A No, sir, although this arrangement is being used successfully in other wells, not by Phillips.

Q Can remedial work be done on a dual completion well such as squeezing and acidizing and other types of remedial work along these lines?

A Yes, sir.

Q How many dual completion wells does Phillips Petroleum Company have now?

A 122 dually completed wells.

Q How many of these dual completion wells are oil-oil?

A 51 at last count.

Q Does a dual completion represent a saving in steel?

A Yes, sir.

Q Over the drilling of two wells?

A In this case about 80 to 100 tons.

MR. BABCOCK: That is all I have from Mr. Washburn

MR. MORRIS: Do you have another witness?

MR. PEACOCK: Yes, sir; I have two other witnesses.

MR. SPURRIER: Would you like to put them on now, or take the cross examination first?

MR. PEACOCK: Well, these other two will explain briefly the Baker-Otis equipment.

(Off the record.)

CROSS EXAMINATION

BY MR. SELINGER:

Q Mr. Washburn — For the record, my name is George Selinger, and I represent the Skelly Oil Company. — Mr. Washburn, I didn't -- In your original testimony I didn't get quite the 50 some odd dual completions you have. Is that Phillips Petroleum Company, your operation?

A 51 oil-oil dual completions in all their operations.

Q Where do they lie mostly, just generally?

A There is about 25 of them in the Oklahoma area around the Ardmore area.

There are 27 of them in the West Texas area, and the remaining are in Louisiana and the Gulf Coast.

Q How many of your dual completions in Oklahoma are as deep as 12,000 feet?

A There is none of that I know of that deep.

Q Are there any 9000 feet, 9400 feet, in Oklahoma?

A No, sir.

Q Now, how many of your dual completions in West Texas are at 12,000 feet?

A I don't know the exact number. There is some.

Q Do you know of any that are at 9400 feet?

A Yes, sir.

Q Now, how many in Louisiana or the Gulf Coast of Texas are at 12,000 feet?

A The Gulf Coast is mostly around five and six thousand feet.

Q Do you have any dual completions at 12,000 feet in the Gulf Coast?

A I don't have any and I don't intend to have; no, sir, we don't.

Q You don't have any. Now, with respect to the Denton pool, you estimate you had 50 feet of effective pay in the Wolfcamp in your Nos. 12 and 13 Denton; is that correct?

A Yes, sir.

Q Approximately. Now, to the east of - to the east on your twin wells drilled to the Wolfcamp, how many effective feet of pay do you have in those wells?

A I don't have that information here.

Q Is it more or less the same?

A The average for the field is about 53.

Q The average for the field is about 53, and these are 50.

A Yes, sir; approximately fifty feet. That is generous.

Q Well, then, insofar as Nos. 13 and -- 12 and 13 -- are concerned on the Denton lease, they are not below the average of pay thicknesses of the Wolfcamp producers.

A No, sir; they may be a little.

Q Now, you estimate you will recover 180,000 barrels of oil from each, approximately?

A Yes, sir.

Q You are saying those two wells will be uneconomic wells?

A No, sir; I am not.

Q Let's take the Fonzo well; you estimate you have 35 feet of effective pay in the Wolfcamp.

A Yes, sir.

Q Are there any offset wells to this well producing from the Wolfcamp?

A I believe there is one to the north. I don't have a map in front of me.

Q One to the north.

A My recollection is there is.

Q Do you know how much effective pay that well has in

the Wolfcamp?

A Not for sure; no, sir.

Q Is it more or less than what you estimate for your wells?

A I would estimate it approximately the same.

Q Is it a dual completion or a twin drilled well to the Wolfcamp?

A It is a twin well.

Q Who operates that?

A Magnolia.

Q I presume it is admitted there are no dually completed wells in the Denton pool; is that correct?

A That's right.

Q And this is the first attempt to secure dual completions for oil-oil in this field?

A The first to my knowledge.

7b Q Do you know how many Wolfcamp wells have been drilled in this field? If the latest records of the Commission indicate 96, is that approximately correct?

A I think it is.

Q In the neighborhood of 100 wells.

A I was thinking 93.

Q Do you know how many Devonian wells have been drilled?

A No, sir.

Q If the Commission records indicate 142, that is just about right?

A I have that information here. I can't find my information. I assume you're right.

Q That is all right. We can pass on and furnish that later. Now, all of the Wolfcamp wells that have been drilled have been drilled as twin wells to the Devonian, have they not?

A Yes, sir.

Q Now, with respect to the Fonzo No. 1. What is your opinion as to whether or not that is an economic well or an uneconomic well for the Wolfcamp?

A I would estimate the Fonzo was probably a break-even deal.

Q It isn't an uneconomic well in the sense of the term it will not pay back its drilling costs and operation?

A I don't think it would pay back its money if it was discounted.

Q You mean for profit and lease overhead. But I am talking about actual drilling cost and the cost of operations, physical field operations, and you are not saying to this Commission it will not pay that money back.

A It would probably be a break-even deal. It would probably pay the $200,000 back.

Q Are you figuring that 120,000 barrels at the latest price increase your company instituted?

A Yes, sir.

Q Now, Mr. Washburn, with respect to the actual mechanical means of dual completion, I believe you said all four of these wells are completed with 5½-inch OD casing; is that right?

A That's right.

Q And you estimate the flowing life of the Wolfcamp to be comparatively short, particularly as compared to the Devonian?

A Yes, sir.

Q Now, can you tell this Commission which of the horizons are producing water, if any?

A There is a little water being produced in each zone. The water in the Wolfcamp is more to the southeast.

Q Would you say that the Wolfcamp zone will eventually have more water productive each day as time goes on, rather than the Devonian?

A I would say the Devonian would probably produce more water.

Q To a larger extent than the Wolfcamp?

A Yes, sir.

Q Now, with respect to your 5½-inch casing, insofar as both zones produce, you will use the normal packer setting

and normal production of the deeper pay in the tubing, and the shallow pay between the annulus of the tubing and the casing?

A No, sir; I would flow the weak formation, the Wolfcamp, through the tubing, because I feel it will be the first to have to be pumped and we would be set for it.

Q And you would immediately have to set over a cross-over packer; is that correct?

A Yes, sir.

Q Would the likelihood of flowing be within the space of a year or two years, or three years, so far as the Wolfcamp is concerned?

A That will vary with the well. With the little section we have in the Fort, I would expect artificial lift to be required in one or two years. That is purely a guess.

Q When artificial lift is required, then you would use your diagramatic sketch, which is colored in yellow and red --

A I would continue to let the lower zone flow through the casing and with the conventional pump, pump the tubing.

Q How do you do that, pump one zone and flow the other, or is it necessary -- what is it necessary to do to the well mechanically?

A I don't know, other than setting artificial lift equipment.

Q Within your 5½-inch casing, what equipment would you have to put into the well - one string of tubing, two strings, or a macaroni?

A You will have several pieces. In the case shown, it would probably be a macaroni, Kobe conventional pump; or go to rods and put a conventional pump in, or go to the damper type pump, which is a hydraulic pump with a conventional engine.

Q When you go to rods, would you attempt to pump the oil from the 9400 foot or 12,000 foot --

A We are doing it every day.

Q In New Mexico?

A Just a little east of it, in West Texas.

Q Now, with respect to your gas lifting at 9000 and at 12,000 feet, have you made any estimates of the cost of gas injection for such gas lift?

A No, sir.

Q Can you tell this Commission whether or not such a means of operation is economic at those great depths?

A It would all depend on the allowable.

Q Well, suppose the present allowable.

A I mean on the -- present production would be economical if that was the way you had to go.

Q What is the present allowable?

A In the Devonian?

Q No; the Wolfcamp.

A 170 barrels in the Wolfcamp.

Q Do you believe that any of those four wells will be top allowable wells?

A I can't answer that. All the Wolfcamp wells we have drilled so far have been. Possibly the two of them would be. The two Denton wells; and it is possible the other two might come in potential 170.

Q Have you figured — Suppose that 170 barrels of oil allowable, have you estimated the volume of gas necessary to gas lift at a depth of 9000 and 12,000?

A When you have the artificial lifting of both zones, I believe - is that right?

Q Pick either one. If you want to use the first zone that ceases to flow, you can. Go ahead and do that if you desire.

A I haven't made calculations on the cost of gas lift.

Q At such depths with such pressures, would it take a comparably large or small volume of gas?

A It would take approximately 2000 cubic feet per barrel, as a guess.

Q Total gas, or over and above formation gas?

A Over and above formation gas.

Q What is the total volume of gas necessary to lift a barrel of oil now in the field from the Wolfcamp?

A Well, that was in it, if that is what you are getting at. Total solution gas?

Q No. What is the average gas-oil ratio now?

A Around 300, I believe, for the -- Well, I have it here. The gas-oil ratio in the Wolfcamp is running about fourteen, sixteen hundred. And the Devnoian is running about 700.

Q Now that you have given the information with respect to the Wolfcamp, let's assume you have to artificially lift both the Devonian and the Wolfcamp. How much gas would it take to produce the top allowable for both horizons, as your first premise, if you can answer that?

A I don't have those figures. It is feasible to gas lift at those depths because it is being done. But I am not limited to gas lift. I can go to rods or hydraulic pumps also.

Q Let's assume gas lift. Would you be able to recover 770 barrels from one horizon and the larger allowable from the other horizon on gas lift?

A No, sir, but it is doubtful when artificial lifting comes you would have that full allowable.

Q Now, your 5½-inch casing, what size strings would you use within the well bore?

A It would depend on what is the situation. You want to lift both zones, now?

Q Yes.

A I would probably run 2-inch tubing and -- Well, if I was going to use rod pumps, I would run 2½-inch tubing; an Otis dual pump, run 2½-inch tubing. If going to have hydraulic, I would put a conventional hydraulic pump in, a conventional Kobe, and run 3-inch tubing with three-quarter macaroni string. And if I had gas lift on the outside, I would run 1-inch on the outside of that.

Q With that equipment in the hole, would there be any restriction mechanically as to the amount of oil that could be produced?

A In the Kobe you have a capacity of 150 to 175 barrels. This depends on what the lift is. You have got it at the extreme, which is what you want, I assume. No bottom-hole pressure existing. Probably 150 or 170 barrels through Kobe equipment. And on the gas lift side, have an area equipped through 4-inch tubing. In your annulus, if you want to throw your macaroni, you could gas lift 70 to 80 barrels a day.

Q Where would the point of greatest restriction be in an installation like that? In the first place, would

there be any points of restriction in the production of oil? I believe you answered yes.

A The lowest capacity would be your Kobe equipment.

Q Where would the points of greatest restriction be in that installation on a Kobe pump?

A I don't know what that word "restriction" means.

Q You said that the equipment would restrict the volume of oil that could be produced.

A Yes, sir; it would be in the conventional Kobe equipment.

Q Now, having the most favorable equipment in your well, could you tell this Commission, if dually completing these wells to the Devonian and Wolfcamp from now until the end of time insofar as productionwise is concerned, you would recover more or less oil if you twinned a well to each of the two formations? What is your considered opinion?

A Well, recovery --

Q Where would you recover the most oil? We are talking about the recovery of oil only.

A Recovery of oil, it wouldn't make any difference. I could do just as much -- the way I think the field will perform -- I could do just as good in a dual well as a twin well, just about.

Q Even though in the dual completion well you have

in your 5½-inch casing in one instance, I believe you said, an inch and a half and an inch and a quarter, and in another instance two inches and one and a half inches?

A I will have that at the time when the volumes being handled will be considerably less than they are now, at least in one zone.

Q So, in your opinion, the total recovery would not be any different between the dual completions and the twins drilled in these two horizons in this field? Is that your answer?

A Yes, sir; if the field performs like I think it will.

Q If you want to rework a singly completed well as compared to a dually completed well, what differences are there in such reworking, if any?

A There is a little more. It is more expensive in the dual well.

Q Would you lose any appreciable amount of oil every time you reworked a dually completed well, whether from one horizon to the other horizon?

A I don't see why you would.

Q You wouldn't be required to shut down production from the Devonian, for example, --

A Yes, I see what you are getting at. You would lose your allowable at that time.

Q You would be shut down to the extent it takes to rework the Wolfcamp?

A Yes, sir.

Q If these are uneconomic wells as you say they are, and every time you shut down for the Wolfcamp production the other production is lost, or if you shut down for the Devonian to rework the Devonian well, whatever production is secured from the Wolfcamp is lost insofar as that deep production is concerned, if it isn't a top allowable well- is that correct?

A Yes, sir.

Q Do you anticipate any reworking of dually completed wells if the Commission permits you to dually complete these wells?

A There may be one reworking in the Devonian coming up, because we are completed low. As water encroaches, we will have to go back and complete in the top of the zone.

Q In your original testimony, you testified as to the bottomhole pressure of the Wolfcamp and the bottomhole pressure of the Devonian. What was that difference in bottomhole pressure?

A I believe about fifteen or seventeen hundred pounds.

Q Difference?

A Yes, sir.

Q And I believe you said the bottomhole pressure on

the Wolfcamp was declining more rapidly than the Devonian; is that correct?

A Yes, sir.

Q And therefore the 1700 pounds pressure differential will be markedly increased as time goes on; is that correct?

A I won't say markedly. It will be increased.

Q It will be increased from the difference of 1700 pounds, it will be more than 1700 pounds?

A Yes, sir.

Q In your installation picture you have given to the Commission, do you believe there is any danger about having so much pressure across your packers?

A No, sir, I don't. That testimony will come in later, on how much differential you can handle on a packer.

Q I am asking you as an engineer. You don't believe there is any danger of 2200 pounds pressure differential across the packer?

A We are using this packer in the Fort Stockton area with 9000 pounds across it.

Q Have you ever had any trouble with such packers with such pressures across?

A No, sir. That is one case I know of without trouble.

Q Have you ever had any packer leaking or failing?

A Yes, sir, but they can be detected.

Q How can they be detected here in this case?

A There is packer tests which should be run periodically, or can be run periodically, by shutting in and pressuring up both zones.

Q How often should those periodic tests take place?

A At any time you suspect a leak.

Q I will ask you one final question, Mr. Washburn. Would you, as a cautious operator, as I know Phillips is, in any way jeopardize the better formation, the Devonian, by any attempted dual completions, would you ever have any doubts as to protection of the Devonian formation from the Wolfcamp?

A Rephrase that. I don't catch it.

Q I will rephrase it. Do you think there is any doubt of no harm being done to the better formation, the Devonian, by your dual completion installation with the Wolfcamp?

A If we were afraid of damaging, we wouldn't have asked for this hearing at all.

MR. SHALLENBERGER: That's all.

(Off the record.)

MR. SHALLENBERGER: We will recess until 1:30.

(Noon recess.)

MR. SELINGER: Mr. Sparrier, may I add, for the record, insofar as the number of wells completed in the Devonian, there are 66 completed in the Devonian and 48 completed in the Wolfcamp. I wanted the record to be correct to that extent.

I wanted to ask Mr. Washburn one more question.

Q I asked with respect to the north offset to the Fonzo and you said Magnolia had a twin Wolfcamp well as a north offset to the Fonzo. Isn't that true of the Fort No. 1, that Magnolia has a twin Wolfcamp north of that well also?

A That's right, sir.

CROSS EXAMINATION BY MR. MADOLE:

MR. MADOLE: Ross Madole, on behalf of Magnolia Petroleum Company.

Q Mr. Washburn, before we start on these particular facts, is the basis of Phillips' contention in these cases that the economics don't justify the drilling of twin wells?

A In this particular instance, yes, sir.

Q Is that the basis of your applications?

A Pertaining especially to Fort No. 1.

Q What is the basis with reference to the others?

A That we can recover as much oil by dual completing as we could by twinning and save money and critical material

doing it.

Q You have no fear of damage to the reservoir?

A No, sir.

Q Has that been Phillips' position in previous hearings before the Commission?

A No, sir; it hasn't.

Q What has been Phillips' position before the Commission at the other hearings?

A You mean before this New Mexico --

Q Yes, sir.

A I am not familiar. When I said no, sir, I was referring to Texas.

Q Isn't it true in previous hearings before the Commission Phillips has been opposed to dual completions generally unless the economics of the pool as distinguished from the well didn't justify the drilling of an additional well?

A I have never run into that testimony, as far as the State of New Mexico is concerned. I can't answer that.

Q I would like to refer to the record in Cases No. 92, 93 and 94 in relation to the Hobbs Pool, Lea County, New Mexico, and the application of Gulf Oil Corporation, for dual completions of oil-oil formations. Judge Foster, on behalf of Phillips, made this statement:

"We are not opposed to dual completions generally but we do think each one should stand on its own merits. I have a statement to present to the Commission.

"Under ordinary competitive peacetime operations, we believe the production of two oil reservoirs by means of a dual completion is in general unwise and should be definitely discouraged in almost all future instances. There

9

is little doubt in the vast majority of cases such practice will lend to smaller ultimate recovery of oil from at least one of the reservoirs involved. In addition, we feel added operating problems are numerous and dangerous, and far outweigh any savings that might be realized in the initial development cost.

"It is likewise perfectly obvious to us that producing oil through the annulus is inefficient and will certainly result in shortening the flowing life of the wells.

"We further believe with proper well spacing it is entirely possible to economically develop each producing oil reservoir in a field on an individual well basis, thus mostly eliminating the need for dual completions.

"There are some instances where extremely thin sand sections or rim reservoirs cannot be spaced in a manner to permit individual well development of each oil reservoir. Under such circumstances, if for this class of production, it is considered necessary dual completions might likely be the solution of the problem.

"When development is being carried on with conjunction of a plan of controlled pressure maintenance, there are undoubtedly certain other instances where dual completions might be amply justified.

"Dual oil-gas and dual gas-gas completions are not so susceptible to the many problems consistently found in dual completions of oil-oil wells.

"We therefore feel that the range of application is considerably broader and should be looked upon with greater general favor. However, it is suggested that even in this type of dual completion, each case should stand on its own merits.

"In conclusion, we would like to urge the Commission to adopt the policy of holding hearings and carefully checking each well application

for all types of dual completion and permits be issued only after suitable evidence has been received."

Now, there is no pressure maintenance in the Denton field, is there?

A No, sir.

Q Then, if your policy at that time is the same as now, then the only factor would be the factor of economics? Are you still in accord with that general statement?

A That is no longer Phillips' policy. I believe they believe in oil-oil dual completions. Would you tell me what date that bears?

Q I would be glad to, sir. The meeting was on the fifteenth of April, 1947, in the Coronado Room of the La Fonda Hotel, Santa Fe, New Mexico.

A There has been a considerable improvement in the technique of both manufacturers and the operators since that day.

Q You have no fear of reservoir damage by dual completions?

A No, sir.

Q Now, on your dual completions you testified Phillips Petroleum Company had 51 dual completions.

A They operate 51.

Q Are any of those in the West Texas fields?

A Yes, sir.

Q Where are they located?

A Most of them are in the TXL Field.

Q Is that a carbonated crude?

A Sir?

Q Is that a carbonated reservoir?

A Carbonated?

Q Yes, sir.

A I don't know what you mean by that.

Q A little sour.

A Yes, sir.

Q Have you had any experience which would indicate to you that dual completion is not effective in those fields that have a sour crude?

A We have none of those oil-oil wells there being dual pumped. We have several wells in one zone. The lower zone mostly, the Embar-Ellenberger. And we have no well trouble - no more trouble with those than ordinary single completions.

Q But you are having packer trouble?

A No, sir.

Q You have had no packer failures in those wells?

A We have had no packer failures once we get one set right.

Q When is your definition "When you get it set"?

A When we move the rig away.

Q When you move the rig away. Have you ever set a packer at 12,000 feet in those wells?

A No, sir.

Q Can you tell me that in a crooked hole, which necessarily you will have a floating hole, that you can set a packer at 12,000 feet without any danger of packer failure?

A I can't say it positively, but it is being done by you and by us.

Q I think we will put on testimony to refute the effectiveness of the packer. But I want to know your experience now. Have you had any field packer failures there? You said about single completions. Do you set packers in your single completions?

A Not this type of packer; no, sir.

Q You don't have any more because you don't have any in the single completions?

A Don't have --

Q -- any packer problems because you don't have any packers there, do you?

A No, sir.

Q Now, in these dual completions you say you don't have any more? Let's see how much -- how much packer failures you have experienced in your fields in West Texas?

A By packer failure you mean initial failure, or before the well is put on production?

Q I mean after production, while you are producing it, while you have a packer leak.

9b A We have no record in the Bartlesville office of such a failure - such a packer leak - after the well has been put on production.

Q How long have they been on production?

A The oldest one I can remember is probably three or four years.

Q Don't you know the average life of a packer at its best in corrosive crude of that nature is two and a half to three years? Is usually the maximum life of a packer.

A I certainly don't know that.

Q You don't?

A No, sir.

MR. PEACOCK: Mr. Spurrier, we testified here this oil from the Wolfcamp and from the Devonian isn't corrosive. Mr. Washburn has testified that the oil in the Wolfcamp and the Devonian isn't corrosive.

MR. MAHOLM: That is his statement. We will prove otherwise.

Q Since you have gotten to that point, I will ask you how many grains of hydrogen sulfide is found in the

Devonian in the Denton field?

A In the gas? It is classified as sweet.

Q I didn't ask that. I asked how many grains you have got in it?

A If it is sweet, it is less than ten.

Q How about the Wolfcamp?

A I would say it is ten or less.

Q Have you ever run any tests for the hydrogen sulfide content of that pool?

A I have seen reports. I have seen refinery production reports on the evaluation of the Denton Devonian and the Denton Wolfcamp.

Q But you have made no actual test of the pool itself?

A No, sir.

Q Have you ever smelled any of it?

A I have on the batteries; yes, sir.

Q Did you smell any sulphur in it?

A No, sir.

Q Smelled as sweet as the growing flowers, did it?

A Yes, sir.

Q Do you have a paraffin in the production?

A Yes, sir; you have paraffin, especially in the Devonian.

Q High?

A It is classed as a paraffin intermediate base crude.

Q That will affect your dual completions, won't it?

A Paraffin is just like packer troubles. They are magnified considerably. If you recognize you have paraffin, it can be handled. There are ways of handling it.

Q Then you recognize packer troubles?

A I was using it for your example.

Q Well, we certainly recognize it. Are you familiar with the Dollarhide Field in West Texas?

A No, sir.

Q You have never made any studies of that production?

A No, sir.

Q Or those dual completions?

A Nothing elaborate.

Q With reference to the Devonian, I think you have testified there is an effective water drive; is that correct?

A Appears to be one.

Q Now, in figuring these figures you gave as to the ultimate recovery, what was your efficiency rate that you used in the Devonian?

A I didn't give figures on recovery of the Devonian, I don't believe.

Q Well, have you made any calculation of the recovery in the Devonian?

A I could get them.

Q Well, you testified that these wells were going to last twenty or thirty years. You ought to have some - I don't want any details - but isn't it true that the efficiency rate used in the Devonian by the engineering committee is approximately 60%?

A I believe that's right.

Q Now, you did give some figures in the Wolfcamp?

A Yes.

Q As to recovery?

A Yes.

Q What efficiency rate did you use there?

A I used it only in a solution gas drive of about 25%.

Q Now, don't you find some evidence of a water drive exists in the Wolfcamp?

A There is indications of one being to the southeast part of the field.

Q You made a statement that there was some water found down there. Are you familiar with the C-115 reports to the effect that those wells in the southeast run from 29% to 75% water?

A Yes, sir.

Q That is some water, isn't it?

A Yes, sir.

Q Then, wouldn't that indicate to you that there was some water drive to the southeast?

A I testified there probably was some water drive.

Q Then would that revise your estimate of the ultimate recovery - would that revise your estimate of the ultimate recovery in the Wolfcamp if a water drive developed rather than a solution gas drive?

A Yes, sir.

Q Then to the extent that the water drive developed and approached the water drive of the Devonian, then your figure of efficiency rate of recovery would be revised upward to a maximum of 60%, wouldn't it, assuming that the water drive developed?

A I don't think the water drive is effective and the fact is pretty apparent.

Q I didn't ask you - You can make your statement as to what you think. Assuming it did develop, then your figure used for ultimate recovery would have to be revised upward toward the 60%, wouldn't it, because that is the efficiency rate used on a water drive field? Is that right?

A It would be increased upward; yes, sir.

Q The effectiveness of water drive is yet to be determined. I will concede that. But now let's go into this recovery that you estimated. In the Wolfcamp Port No. 1

you estimated a 22-foot effective pay area for recovery; is that right?

A Yes, sir.

Q Now, how did you just figure a 22-foot taken off of the 38 feet that by your own logs would indicate that there are at least 38 feet of all this dolomite you are going to perforate is effective pay sand? Area instead of sand. Excuse me. How did you arrive at 22 feet?

A We had to base that upon cores that had been made in other wells.

Q On a core analysis of these particular wells?

A No; these wells were never cored.

Q Which wells did you use?

A We used the engineering report, Atlantic Dickinson No. 12, I believe it is.

Q Where is that located, Mr. Washburn?

(Off the record.)

A It is Dickinson A-1, No. 1.

Q Where is it located?

A It is one of the early wells that was cored.

(Off the record.)

Q This well is in the northwest of the southwest quarter of Section 1, Township 15 South?

A Yes, sir.

Q When was that well originally brought in?

A I don't have that information.

Q Do you know the accumulative recovery from that well to date?

A No, sir.

Q If I told you according to the engineering report there has been 94,000 barrels produced from that well, would you quarrel with that statement?

A No, sir, I wouldn't.

Q Then the ultimate recovery is going to, if your well performs in the same manner as that well, it will greatly exceed 68,000 barrels, wouldn't it?

A I don't know what its recovery is per acre foot.

Q Well, I thought you used the same recovery data that was shown in their core analysis.

A No, sir. I say we took approximately - based on that well - we took approximately - we assumed two-thirds of the porosity had enough permeability to be productive.

Q Well, what porosity are you figuring on in that two-thirds?

A Approximately 6%.

Q Have you eliminated --

A I am using the micro-log. I beg your pardon. Where the micro-log shows porosity, using approximately two-thirds of that footage.

Q After using that two-thirds, what porosity factor are you cranking into your figures?

A Six percent.

Q Six percent. Then, if you pick the best porosity, the average of the entire area, figuring by the engineering committee as 6%, then if you pick just the best to base your figures on, you ought to increase your porosity, shouldn't you?

A No, sir.

Q Some of the wells have better than 10% porosity, don't they?

A Not to my knowledge.

Q Well, let's see. You know the location of the Magnolia Pope No. 1, or 6? No. 1 in the southwest southeast of Section 35. And No. 6 is in the northwest of the southeast of 26. One to the northeast and one to the southwest of this Fort and Fonzo. If the core date of the Wolfcamp pay of the Magnolia Pope No. 1 and No. 6 indicated an average porosity of 10.3%, would you quarrel with that figure?

A No. 6? Not if your data shows that; no, sir.

Q Well, it looks to me, Mr. Washburn -- I mean if you eliminate all your poor areas and take your best to figure your estimated ultimate recovery, that you ought to revise upward your porosity factor, wouldn't you?

A Not necessarily. That is the way I did it.

Q I know that, but we don't agree with your way of figuring.

A If we could assume that full 38 feet of porosity had sufficient permeability to be productive, we would still have a well less than a marginal well. We would never get our money back.

Q We are going to get to that, too. But let's figure with this 25%, your porosity factor of 6%, and figure it on 38 feet. What would be your recovery?

A Will you repeat that, please?

Q Let's assume our factor of - that your accepted factor of 25% efficiency rate of recovery, let's revize the effective pay zone from 22 to 38 feet and apply the factor you applied to the 22 feet, apply them to 38 feet. What would be the resulting figure of ultimate recovery?

A Approximately 136,000.

Q Sir?

A About 136,000.

Q Now, with reference to the economics of dually completing the Fort No. 1 and the Fonzo, is it the position of Phillips that the other operators go ahead and twin their wells, and then on their edge wells that they should be allowed to dually complete those because their edge wells might not pay them as much profit as they would

like to obtain? In other words, here in recent months Magnolia has twinned the north location from the Fonzo. Do you think that -- You think Magnolia is a fairly prudent operator, don't you?

A Yes, sir.

Q You think they came out with any such figures as those and then proceeded to twin that well?

A We never considered any of that. We merely asked for permission to dual ours. If you want to twin yours, that is your privilege.

Q Do you think we would have drilled a well if our figures indicated we wouldn't get back the cost of drilling it?

A No, sir, I don't.

Q No. Now, let's go to this $200,000 cost of these wells. I would like a little breakdown on that, more than what you have stated, that it is just a flat $200,000. On what is that based?

A On six Wolfcamps we have drilled.

Q With Atlantic?

A On our Denton lease.

Q With Atlantic?

A Yes, sir.

Q Is that the figure you and Atlantic settled on?

A That is the cost charge we have on it.

Q Is that the charge you made to Atlantic?

A That is the cost estimate that was approved by Atlantic; yes, sir. I believe that's right.

Q Now, this estimate - we want to know when the dollar changing started, when Atlantic started paying the bill. On what basis did you settle on those six wells?

A I don't know what you are getting at. I don't think I could answer --

Q Yes, I think you do. You divided up and figured up your cost and sent Atlantic a bill for their proportionate share of the cost, didn't you?

A I never looked at the bill we sent Atlantic. I looked at the bill in our office.

10b Q Will you look at the bill you gave Atlantic and furnish us that information as to the actual bill presented Atlantic on those six wells, because your $200,000 figure is in excess of fifty to sixty thousand over the average cost of these wells. I don't know what difficulties you experienced.

A The Denton No. 11 cost $195,000; the Denton No. 14 cost $212,000. Those are the last two we drilled. Rounded out, as I said, approximately $200,000.

Q We are doing a lot of rounding. Let's get down to -- You say you based your $200,000 on these six wells.

Now you say you did it on two wells.

A Well, if the Commission requires them, we have the price of the six wells. I used them, and the other ones are a year or so old. I used the last figures, the 11 Denton and the Denton 14.

Q Used the figures on all six or the last two?

A The last two.

Q On the last two. Did you have any mechanical difficulty in completing those two wells?

A None that I know of.

Q Would you be willing to furnish the Commission with the cost on which you and Atlantic settled for these six wells for the Wolfcamp?

A If the Commission so desires, we certainly would.

Q Well, if we desire, would you so furnish it?

A Well, now, you are getting into -- I can't answer that. I don't know what the policy is on letting figures out.

Q Well, you present some figures here to let yourself into dual completion. You ought to let some more figures out to show the basis on which you are asking for it.

A I don't know what this is getting us at, quite frankly.

Q You know what I am getting at. You know $200,000 is high for those wells.

A We think a Wolfcamp well drilled today would cost $200,000. That is my statement.

Q If our figures on Pope No. 8 are far below that figure, then how do you account for the great difference between the cost of your wells — Just how do you figure the cost of your wells, figure overhead and profit?

A It is cost of equipment, tangible and intangible values, and it does have some lease foremen and salaries in there for a month or two. But it is a minor item.

Q Actual cost of drilling equipment and completing the well?

A Yes, sir.

Q In your statement with reference to the Wolfcamp, you made the statement it was a tight formation. What is your definition of "tight"?

A Permeability of 10 millidarcys or less.

Q Did you take into consideration the vertical fractures in that formation?

A No, sir.

Q They have vertical fractures in the Wolfcamp in the Denton field do they not?

A Yes, sir.

Q That figure can't be calculated, but it would in-

crease the permeability over-all, wouldn't it?

A Yes, sir, to some extent. I still believe you would class it as a tight formation.

Q Now, with reference to that, do you classify the Devonian as a tight formation in the Denton field?

A No, it is intermediate. We can't say it is -- No, I don't know that.

Q Now, on this -- Your experience in packer failures, I think you said -- I don't want to misquote you -- You did refer to dual completions at ten or twelve thousand feet in the Gulf Coast area?

A I never said that; no, sir.

Q Would you estimate that? You made some reference to the Gulf Coast area. What reference did you make?

A To the fact that we had dual oil-oil, dual completions in the Gulf Coast area is about all I said. But they weren't deep.

Q But you wouldn't be apprehensive of dual completions at ten or twelve thousand feet in the Gulf Coast area?

A I am not familiar with the Gulf Coast area. I know it is different from this hard rock country. I can't answer that.

Q Where are you familiar - with what area - the West Texas area?

A Primarily West Texas.

Q The Dollarhide - is it a sweet crude in the Devonian-Silurian over there?

A I don't have that at my fingertips; I don't know.

Q Now, with reference to your testimony that when you go to artificial lift, what bottomhole pressure in the Wolfcamp did you estimate - did you estimate at what point that you will have to go to artificial lift?

A I can't answer that. We know that artificial lift is coming up, maybe in two years, maybe three years, maybe sooner. I understand there are some on the pump now.

Q There are eleven of them, aren't there? The figure of eleven given you as the number of wells on the artificial pump at this date, that would be pretty well in line with your information?

A Yes, sir.

Q Isn't it true that your pressures in the Wolfcamp indicate that most of the wells will go to artificial lift of some kind in not quite a year or two, but in a matter of months?

A I don't think so.

Q What pressure do you calculate they will go to artificial lift? What pressure? What bottomhole pressure?

A 1000 pounds, in the vicinity of 1000 pounds. I had better say I don't know. I don't know.

Q That would be refuted by the fact that they are on pump and the average pressure is about 3200 pounds?

A Yes, sir; that's right. There is eleven on the pump. There is some others flowing at 3200 pounds. So I don't know when the others will go.

Q Will the oil capacity of artificial lift be decreased if water is produced in the formation?

A The rates I gave were approximate capacities at near depletion pressure.

Q With no water?

A With no water. Fluid capacities in other words.

Q There will be some water?

A There is a possibility of that; yes.

Q Then that water will reduce the capacity, won't it, the oil capacity there?

A Naturally.

Q Have you made any analysis of water found in the Devonian or Wolfcamp in the Denton field?

A No, sir, I don't -- We make a very small amount of water, but it has never been analyzed.

Q There is some gyp or lime deposits there, aren't there?

A There are other fields with gyp. That can be

handled like paraffin; if you recognize you have got gyp, you can take care of it.

Q How can you?

A By down hole treatment or by proper selection of equipment that you are using, the artificial lift you use.

Q All of them have got to have some metal, haven't they?

A Yes.

Q And it is going to have a reaction on that metal, isn't it?

A Well, I wouldn't avoid pumping a well because it had a little gyp.

Q No, I don't advocate your pumping it, but I advocate pumping it in two different holes so that you won't make any communication in different formations in the event you have packer failure. I am not opposing your pumping your wells any way you want to, but I do oppose your pumping them out of the same well bore.

A With Kobe equipment, or hydraulic equipment, I could service that pump much easier than you could do it with rods, or just as easy as a single well.

Q Are you making that statement to this Commission, that you can do a work over job in a dual completion as easy as any single completion?

A I can pull rods on pumps out of the zone that is

being pumped as easy as I could --

Q How about the pressure down in your Devonian? You have got to keep that pressure down, haven't you, to hold that in the formation?

A Well, you are going to choke that off.

Q Choke it off. Okay. I have no further questions.

MR. HADOLE: I would like to reserve the opportunity to cross examine if, as to these packer tools, that I understand they are going to testify about it, if the manufacturers are proposing to testify and don't know what the actual operations of those tools in the field are, because we would like to go into that. But it is premature until such time as the evidence with reference to the tools to be used in the completion of these dual completions.

MR. SPURRIER: Are there any other questions of the witness?

CROSS EXAMINATION BY MR. NESTOR:

MR. NESTOR: My name is E. W. Nestor of Shell Oil Company.

Q There is one point I would like to figure out from your testimony on workovers. If I understood you, you expected to have only one workover possibly during the life of your Wolfcamp wells; is that right?

A I don't believe I made that statement concerning the Wolfcamp. I was talking of the Devonian.

Q There was some statement made -- That is what I mean, the Devonian.

A Yes, sir.

Q Now, when you are going to work over the Devonian, how do you propose to do that?

A Well, the way we would do it today would be to mud it off and squeeze the lower zone and perforate.

Q You would have to pull the dual completion equipment out of the hole and put mud over both formations and proceed. Now, in doing that work, don't you figure that an additional risk of damage to the Wolfcamp formation, which you have already specified as tight? Now, you are going introduce mud into that formation. What effect do you suppose that will have on your ultimate recovery?

A It all depends on how clean you get it.

Q Now, you just testified it is tight, and I believe you would normally figure, once you have acidized such a tight formation, one of the things you don't want to do is get any fluids back in there again.

A Yes, sir.

Q So, even though the Wolfcamp formation itself didn't require any work at the time, if it is necessary --

which it probably is -- to work over the Devonian formation, then you are going to have to kill the Wolfcamp, and then have to bring it back in, with some possibilities that your Wolfcamp zone won't be as good as it was originally.

A That is a possibility.

Q Are you acquainted with the flowing bottomhole pressure on the west side of the pool, currently? In round figures? Or would you estimate the flowing bottomhole pressure?

A What zone?

Q Wolfcamp.

A About 3200 pounds.

Q On the west side?

A Well, frankly, I can't answer that.

Q That figure is possibly fairly accurate for the east side. But in the west side, in the area where you are proposing to do this work, I am satisfied you will find it averages well under, possibly 2900 pounds or even less. That is all based on the cooperative survey which the Oil & Gas Committee ran in April. They have actually run some pressures since then.

11b

There is another question along that line. Of course, you said you didn't believe you could answer at what bottomhole pressure it would require artificial lift

on the west side. Would you agree, if the wells on the west side are having difficulty and requiring swabbing operations currently at pressures of 24 and 25, would you assume they are getting pretty close to the point where lift would be required?

A Yes, sir.

Q That actually is the case on some of those west side leases. But I think there is a danger that probably the flowing bottomhole pressure of about 2300 pounds will be as low as will sustain the flow on that side.

There is one thing that concerns me too in your comment on the Devonian. I think you mentioned you expected the Devonian would probably flow for at least ten years. Now, did you - or would you state to the Commission you believe your Fort No. 1 will flow for ten years, from the Devonian, that is?

A I think that it will. I will tell them that.

Q Actually, the bottomhole pressures there are about 4400 pounds and you don't know what the critical pressure is there yet. But pressures are dropping and -- How much pay does that well have?

A The Fort in the Devonian?

Q Yes.

A Approximately 150 feet; 147 is what I used.

Q That is good. Roughly, what would the average

thickness for the Devonian be in the Denton?

A Around 900 feet or 1000 feet or 1000 feet.

Q No, that is -- Just the average for all the wells, including the rim wells, probably be somewhere around 600 pounds maybe. As the water comes in, do you not envision that your Fort 1 well there will make water?

A As it comes in, yes.

Q There is a strong possibility you will have to install artificial lift in that well quite a bit before some of your better wells.

A Yes, sir.

Q Such as the Denton 12 and 13. Just roughly, what do you figure is your average operating net income from a barrel of Wolfcamp oil?

A Approximately, after all costs?

Q All costs.

A Between a dollar twenty-five and a dollar and a half.

Q I wonder -- Do you suppose you could outline that for us?

A I don't have that data here. I base that on experiences of payout of other wells in that area.

Q That seems considerably lower than some of the figures we have on that. I wonder if that isn't a bit pessimistic in view in particular of your January price

hike. You still believe it would be roughly that figure?

A That has been my experience in other studies of this nature.

Q Do you suppose you could show the Commission how that figure is arrived at, fairly quickly?

A I don't have the information - the data I need to work with here. My tables, my discount tables, - Let's start out with oil at a dollar fifty-eight plus twenty-five. We take 7/8 of that. That is working interest.

Q Two dollars and fifty-eight cents plus a quarter.

A Yes. Multiply by 7/8, you get a working interest, and we would have about 7½% production tax, or 7.3, I believe it is, to deduct. And then we would have lifting cost, which we would estimate at about $3000 per year per well. Now, then, we have to --we can charge off our intangibles on this first year and we can take depletion allowance and we can take -- we wouldn't have any equipment -- we could depreciate the wellhead equipment.

Q The tangible.

A The tangible part. And after that we would have to figure how our income tax would be at about 52%. Find out what taxable income after that. Then deducting our taxable income from our -- We would multiply by 52% to get our tax, and deduct it from our income, after lifting costs.

Q In other words, you have taken the tax provision

in that? That includes that?

A Yes, sir.

Q Now, there is one other question which concerns me on the west side there where the Wolfcamp pressures are dropping. I believe youtestified that the present differential in bottomhole pressures between the Wolfcamp and the Devonian zones is 1700 pounds.

A Approximately.

Q Is that the figure? Actually, the figures on one of the west side leases, and which were taken again from this April survey, from the cooperative survey, showed within just a few pounds of 2000 pounds on two west side wells. One of them is a mile from the Fort and another is less than a mile from the Denton 13, about a half mile.

A Yes.

Q And more or less in a similar stratigraphic position, west flank wells, more or less similar to the frank position of your wells. I thought I would make that point. It does run some higher than 1700 and something, which you would know. Recent pressures indicate it is now over 2100. Since April another 100 pounds of differential has entered the scene. It is quite alarming the differential that is established between the two zones.

A That is bottomhole pressure. It isn't necessarily the differential across the packer.

Q That's right. You could figure roughly 900 pounds as would be a logical figure to assume for the difference in datum.

A Yes.

MR. NESTOR: I believe that is all, Mr. Spurrier.

MR. SPURRIER: Anyone else have a question of Mr. Washburn?

MR. WHITE: I would like to ask one question. I don't believe it has been brought out here very particularly.

How many packer failures have you had on the 51 dual completions after they went on production?

A We had one packer failure in the Embar-Ellenberger field, which was put in - one of the earliest packers we put in - but it was later identified and we corrected it immediately.

MR. WHITE: But that is the only one you know of?

A That is the only one I am aware of, in West Texas, now.

MR. WHITE: That's all.

MR. SPURRIER: What depth was the packer?

A Between the Tubbs and the Embar.

MR. HUTCH: There is one further discussion

there on the oil-oil duals in the TXL Field. That is one of the places where you have them in West Texas which you might consider as comparable here. There is one bit of information which might cast, leave, an erroneous impression in someone's mind there. You were questioned as to the length of time the packers had been installed in some of those wells, and I think you stated around three or four years.

A Yes.

MR. NESTOR: Now, I would like for you to clear up for the Commission that that isn't necessarily true for many of those wells in the TXL, is it?

A Our Zeta No. 1 is one of the oldest, approximately three years.

Q Which zone is that?

A It is -- I have got it here in my books somewhere. It is the Ebar-Ellenberger and the Silurian, I believe.

Q Ellenberger?

A I beg your pardon. Ellenberger is the zone being pumped.

Q And you think the other is the Silurian?

A Yes, sir.

Q And how long has that well been completed as a dual?

A Approximately three years to the best of my knowl-

edge.

Q What part of the structure is that well, do you know offhand?

A No, sir.

Q I believe prior to the very late 1951 that there weren't any Ellenberger-Fusselman duals in any part of the south zone of the TXL structure. Maybe three. Phillips didn't have any. I may be in error. That is one of the points that concerned me I wanted to get cleared up. There were three wells dualed in the south zone but I believe none were Phillips operated. I thought you made most of them there in 1952. '52, I believe you will find most of the dualing was done.

MR. PEACOCK: Is it still your opinion that was three years?

A I can't be positive. I am recalling from memory.

MR. NESTOR: It sounds like most of the dualing occurred there in late '51 or early '52, which would be about a year old. The specific well you mentioned, I am not sure of either.

MR. SPURLOCK: Do you want to have your testimony sworn to, Mr. Nestor?

(Laughter.)

MR. NESTOR: I was just asking. He threw out something I thought was erroneous. I may be wrong.

MR. SPURRIER: Does anyone else have a question of Mr. Washburn? If not, the witness may be excused. We will take a ten minute recess.

(Witness excused.)

(Recess.)

———o———

MR. PEACOCK: I want to call Mr. C. C. Taylor to the stand, please.

C. C. TAYLOR,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. PEACOCK:

Q Will you state your name, please, sir?

A C. C. Taylor.

Q Your address?

A 1610 Bedford Drive, Midland, Texas.

Q By whom are you employed, Mr. Taylor?

A Baker Oil Tools, Incorporated.

Q How long have you worked for them?

A Thirteen years.

Q In what capacity are you working for them at this time?

A I am district manager of West Texas and New Mexico.

MR. PEACOCK: I should like to qualify this witness to testify concerning Baker dual completion equipment. Is the Commission satisfied with his qualifications to so testify?

MR. SPURRIER: I would judge he is qualified.

Q Does Baker Oil Tools, Incorporated, make equipment used in dual completion of wells, that is, oil-oil completions?

A Yes, sir; we do.

Q What is the equipment that your company makes?

A We manufacture a retainer production packer with accessory equipment for production purposes.

Q What is the purpose, briefly, of this equipment?

A The purpose of this equipment is to provide a means of isolating a single zone or multiple zones within the bore of the casing, or the liner.

Q I see, Mr. Taylor, you have brought along a scale model of your equipment, and I propose now to have you explain and demonstrate to the Commission, briefly, what your equipment is and how it works. Will you do so?

A Yes, sir, I will.

Briefly, this is a Baker retainer production packer, Model 415-D-4.

12b This packer, with its accessory equipment, is to segregate or isolate any zones that may be desirable. The

packer itself consists of a setting sleeve. This is the setting sleeve. It consists of an upper slips, a cone, expanding rings; a lead seal, a sythetic packing element, and your lower slips and a junk pusher and a flapper valve installed.

This packer is made of drillable cast iron material. We can set this packer as the operator desires, either on the electric wire line through the medium of a power setting tool. We can set the packer on tubing, or on a drill pipe; as I say, whichever may be desirable.

When we set the packer, if we set it on tubing or drill pipe through the medium of auxiliary equipment, if on tubing or drill pipe, you pull at approximately thirty to thirty-five thousand pounds pull. To properly set your upper slips and to back off your packing element and expand the expanding gas rings out against the walls of the casing. The lower slips are then set and the upper slips set and your packing element and everything squeezed together in this manner to isolate the zone.

When we set it on the wire line, which is an electric line, the same line you perforate with, we place a powder charge in a pressure cylinder, which, as I say, is a medium for collapsing the tool and back off the packing element. In this particular tool the powder

charge burns and discharges its gas and from there on the operation is a hydraulic operation, of course, which we call a pressure E-3 setting assembly.

We have set this packer and we are ready to go back into the casing. And then we use the auxiliary equipment. We have this packer set with your clean bore through it. Your flapper valve is closed in that position to keep pressure from below in the event of pressure from below.

We make this equipment up on the tubing, which consists of the auxiliary packing equipment, what we call tubing seal nipples. They have chevron seals working downward to hold pressure from below. And chevron seals working upward to hold pressure from above.

We have in this particular case a Baker cross-over flow tube, which is this - from here down is the Baker cross-over flow tube, with an inner tube and the outer tube. We have a locater sub that mates with a corresponding set in the top of this packer.

If we go back in the hole with the tubing, to assure you these seals are positioned in the bore of the packer, we can set as much weight down on this packer as is practicable to put down on the tubing. If you want to put 50,000 pounds of weight, it's all right. But if you are in large casing, such as 7-inch, with 2-inch

tubing, you might kink or bend the tubing with that much weight down.

This auxiliary equipment is the combination of Baker Oil Tools, Incorporated, and Otis Equipment Company. You can back in with the tubing, your flapper valve opens, your seals are then positioned in the bore of the packer, and you confirm that you are in the bore of the packer by setting a weight of your tubing down.

I believe from there that Otis will explain their --

MR. PEACOCK: I now propose to have the Otis equipment man testify and then I think cross examination could well be directed to the two of them, because the questions will probably relate to both their equipment.

MR. SPURRIER: Very well.

(Witness excused.)

D. N. TAYLOR,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. PEACOCK:

Q Please your name, please.

A Don N. Taylor.

Q Your address?

A Dallas, Texas.

Q By whom are you employed?

A Otis Pressure Control, Incorporated.

Q For how long have you worked with them?

A Some thirteen years.

Q In what capacity do you now work for them?

A I am the manager of the Special Services Division for Otis Pressure Control.

MR. PEACOCK: Is the Commission satisfied Mr. Taylor is qualified to speak concerning Otis equipment used in dual completions?

MR. SPURRIER: It is.

Q What is the name of the equipment your company makes for dual completions?

13 A We make several tools for dually completing oil wells. The one in question here is the Otis Type H selective cross-over nipple assembly.

Q What is the purpose of this tool?

A The purpose of this tool is to be used in conjunction with an oil well packer placed above the upper formation for separating and controlling the flow of two zones, and utilizing the tubing string inside from that point to produce one zone and the internal bore of the tubing to produce the second zone.

Q Now, you have brought along examples of some of your equipment, have you not?

A Yes, sir.

Q Would you demonstrate those to the Commission at this time?

A I would be glad to do that.

This selective cross-over nipple assembly we have here sets on top of the Baker packer and tubular equipment, and it is run on the tubing string at the time the tubing is run into the hole, not before that. As you see, this item here, this nipple, has no control in it. Normally, in your completing practices your two zones will be commingling while you are running your tubing. There is no way to prevent that unless conditions exist which will overcome this flapper valve area here.

At the time this is landed, I think most of you are familiar with the fact that there must be another packer placed between your formations so that your isolation of your lower zone formation from your upper zone will be complete, and a seal between the casing and the tubing effected so that the lower zone production is directed through the bore of the tubing. At that time, and when the tubing is landed, this condition occurs.

The lower zone is then in the tubing and the upper zone is trying to enter the tubing from between

the two packers. And at that time, if you will glance down here, I think I have some prints here if you would like to show them that --

Q Well, are these the reproductions of what we have there?

A I believe those are faithful reproductions with the extent that they don't show some of the detail of the packer arrangements; but essentially they do.

MR. PEACOCK: We would like to introduce these, than, as Applicant's Exhibit 7.

MR. SPURRIER: Without objection, they will be received.

A Gentlemen, if you will glance at the drawing there - and I think you can look at this exhibit or item on display here and correlate the two---you will see down here at the bottom of the page a set of ports beneath the Baker packer, where the upper zone - which allow the upper zone to come in through an annular space between the flow tube and the tubing seal nipples. I want to bring that out at this time so that you will fully understand the path of the two fluids up to this point right here where my hands are, which is the lower portion of the Otis cross-over nipple assembly.

The upper zone fluid, then, comes up underneath the seal nipples and on the outside of the inner flow

tube, and up this channel right here.

Beneath the outer case of the nipple assembly, and on up above, are some horizontal ports that will come out in a diagonal direction from the tubing bore. The upper zone can enter the tubing at this point some four to six inches above the horizontal ports coming out from the tubing into the tubing casing annulus.

That condition exists at the time the casing is landed. From this time on, with your normal well completion practice on the surface, the tubing hanger and casing hanger will correspond to raise and control the device at the surface. We can then, either under pressure or no pressure, install by means of a wire line - what we call a wire line operation - the subsurface control, which will then separate the two zones and direct either zone you desire into the tubing casing annulus.

By means of this you will then produce simultaneously both zones; one through the casing and one through the tubing. Production from the casing string and the production from the tubing and the normal Christ as tree head.

This tool I have in my hand, and shown in the sketch distributed to you, is known as the cross-over choke. The word "choke" is used colloquially in our

business as a sub-surface control which backs off and seals and directs the flow.

This tool operates in this manner: It has a locking device on it, and is dropped into the tubing, at which point it seals in a locking - locking itself - so that in the upper movement of that tool, that tool is locked into place.

13b I am going to ask your indulgence. The packing on this has been intentionally chipped so that we won't have to get up with a hammer and drive it in and out. But if you will visualize that tool is in that position during the productive life of the well, and is then what we called crossed over - the crossed over position then allows the lower zone, coming up the internal bore of the tubing, to impinge on this bottom of this control by means of the bore of the choke being sealed up, and the upper rings sealing the internal bore of the tubing, and the flow of the lower zone. Directed out through these ports.

I think, if you look on your diagram there, you can see the ports. And from that point on, the lower zone in this particular [illegible] is directed up the tubing, passing ports and out the casing ring valve.

The upper [illegible] has a [illegible] different [illegible]; so as to the tubing [illegible] in the event of

the nipple assembly until it hits these ports here. And they are not external. Covered by a steel sheet. The upper zone fluids hit this manifold. The nozzles go up or down by means of the packing and plug in the choke, and are then directed into the choke bore; and from there on come right up to the surface through the tubing.

If at any time in the productive life of the well you desire for any reason to change that flow, the wonderful advantage this tool performs is the fact that you can then extract this choke and replace it with another, which has the hollow bore through it all the way down, and it changes the set of the packing to a point below these ports. And the lower zone then is forced through the bore of the packing right on up the tubing. And the upper zone fluid is then forced into here. It can no longer go into the bore of the choke. It is then forced out this point here into your tubing casing annulus.

And with this installation now in place here, you have what we call a regular flow condition for a dual completion. In other words, you normally carry the upper zone up the tubing casing and the lower zone through the tubing.

I think that about covers it. The advantages to this tool are that you can work over each zone as you wish, while producing the other, by the use of the proper

a wire line operation.

Q I have a couple of more questions I would like to ask both Mr. Charles Taylor and Mr. Don Taylor.

Mr. Charles Taylor, the equipment you have demonstrated and explained to the Commission, could that be used in a 5½-inch casing for an oil-oil dual completion with the producing zones at approximately 9200 feet and 12,000 feet?

A Yes, sir; it can be.

Q Could either of the zones or both zones be pumped with your equipment installed in the casing?

A You can only, with that installation, pump one zone.

Q With this installation?

A You can pump either zone through your tubing, either the upper or lower zone.

Q Yes.

A But to my knowledge, with that particular installation you cannot pump both zones.

Q Do you have equipment, types of installations, with which both zones can be pumped?

A We do not have that equipment. That equipment is available, I understand.

Q What differential and pressure between the upper and lower zones will these packers sustain without

leaking?

A We have tested this particular packer to 9500 pounds per square inch at 350 degrees Fahrenheit temperature.

MR. WHITE: Did it stand the test?

A Sir?

MR. WHITE: Did it stand the test?

A Yes, sir; it stood the test.

Q Now, Mr. Don Taylor, is the equipment which you have demonstrated to us here today the nature and type which could be used in a 5½-inch casing, a dual oil-oil completion with pay zones at 9200 feet and 12,000 feet?

A Yes, sir.

Q Is the type of choke which you have demonstrated the kind which would be used when both zones are flowing?

A Yes, sir.

Q Do you have equipment with which one or both zones could be pumped?

A The present equipment could be adapted to pump one zone through the tubing by means of an appropriate setting nipple and exchanging the appropriate sub-surface choke to throw the desired zone into the tubing, and allow the other zone to be flowed out the casing. By that

means you can pump one zone and flow the other.

Q Does your company have equipment which could be used in an installation where both zones are pumped?

A Yes, sir.

Q And is it used today for that purpose?

A Yes, sir.

Q In oil-oil dual completions?

A Yes, sir.

Q Mr. Charles Taylor, would you repeat, if you have not already -- I mean if you have already said so -- would you repeat whether or not you would recommend the installation of the packers in a well such as the type I asked you about, approximately - you don't have to say within so many feet -- what I want to know is will one packer be placed between the two zones and another packer in the upper pay zone?

14 A Yes, sir. One packer will be beneath the two zones and one above.

Q You mean between the two zones and one above?

A One between the two zones and one above.

Q Does the equipment which you have demonstrated here prevent commingling of the oil produced from two different pay zones when properly installed?

A Yes, sir; it does.

Q What are these?

A Those are the seal nipples. These are the chevron seals.

Q Is that the usual number of seals you would recommend for installation in the type of well of which I spoke to you a while ago?

A We suggest a flow tube that has twice this many seal rings. In other words, we have both to offer for sale; one with double seals, or this particular one with single seals.

Q With a pressure differential of 1700 or 2000 pounds between the two pay zones, what would you recommend on the number of seals there?

A I would recommend two sets of seals. They cross over the flow tube with two sets of seals with a hanger type flow tube.

Q Do your service men assist and advise the operators in the installation of your equipment?

A Yes, sir; our service men assist and advise in the installation.

Q Do they actually do the installation?

A They only assist and advise in the installation.

Q Do your service men, Mr. Don Taylor, assist and advise?

A We do.

Q What do you actually do in the installation?

A If the operator wishes us to, we will assist and advise in the installation.

MR. PEACOCK: No further questions.

MR. SPURRIER: Does anyone have a question of either of the Mr. Taylors?

MR. SELINGER: Yes.

MR. SPURRIER: Mr. Selinger.

BY MR. SELINGER:

Q Mr. Taylor with Baker: How many installations do you have of Baker retainer packers in 5½-inch casing? That is, your whole assembly installed in 5½-inch casing wells. Do you have any?

A We have made in the -- Do you mean this particular hookup?

Q Yes.

A This identical arrangement?

Q Yes.

A The best of my recollection, we have made approximately 45 installations in the past year and a half.

Q Where were they mostly?

A They were in the Goldsmith Field of Ector County; in the Wheeler Field. I believe that is in Winkler County. I'm not sure. Maybe borders on Winkler in Ector. In the Pegasus Field. In the Benedum Field. In Upton County. In

the Linwell Field in Ector County.

Q That is all 5½-inch casing?

A Well, we have made a number of 5½ --

Q Let's start over. I am asking just about installation in 5½-inch wells, not 7-inch.

A I can't answer the exact number. I don't know the exact number.

Q What I want from you is whether or not you have any installation in 5½-inch casing.

A Yes, sir; we have.

Q Do you know where they are?

A Yes, sir.

Q Just roughly.

A I know a number are in the Pegasus Field.

Q That is 5½-inch casing?

A That is 5½-inch casing; in the Pegasus Field. And in the Wheeler Field they have 5½-inch casing. In the Benadum Field of Upton County they have 5½-inch installations.

Q Do any of those installations of yours go as deep as [illegible],500?

A Yes, sir.

Q Which one?

A In the Pegasus Field, I believe it is; to the best of my knowledge; [illegible],000.

Q But, are you talking about a 5½-inch casing pro-

duction packer with a special change-over head - is that what you are talking about?

A Yes, sir.

Q And that has been designed to replace the by-pass collar of your regular change-over flow tube? Is that what you are talking about?

A Yes, sir; that's correct.

Q And you say it has been manufactured and used and tested in 5½-inch OD casing wells?

A Yes, sir.

Q Who is R. D. McBrine with your company?

A R. D. McBrine was district manager of West Texas and New Mexico.

Q Would he know whether or not in West Texas the Baker retainer production packer for 5½-inch casing was tested and used in the wells in the West Texas district? Would he know that?

A Yes, sir.

Q Now, your installation you're talking about - with respect to flowing wells, is that correct?

A We install the packers --

Q I'm saying you are talking about installations of packers in flowing wells?

A Well, I am talking about the installation of packers.

Q Regardless whether flowing or artificial lift- or pumping.

A Yes, sir.

Q And so far as packers are concerned, it makes no difference which type of production, by what means you secure your production, the packer has nothing to do whether it is flowing or artificial lift or pumping; is that correct?

A No, sir.

Q Well, then, what is this installation you are talking about? Which method of production?

A Well, this particular one in question here is the isolation of two zones. And we are talking about the exact installation here, which is flowing.

Q Now, with respect to your 5½-inch size well, the installation you are talking in West Texas was with respect to flowing?

A To the best of my knowledge, they were flowing.

Q As a matter of fact, all the installations you are talking about in West Texas are confined to flowing conditions, are they not?

(No response.)

Q If you don't know, we will go on. But I am asking whether or not you know if they are confined to flowing conditions.

A I believe at the initial installation they were confined to flowing.

Q Now, if artificial means is to be employed after the initial flowing stage, is there any change in the set-up of those wells for production purposes? From the change over of natural flow to artificial lift.

A We do not make pumping equipment or artificial lift equipment.

Q Then your testimony is confined to the equipment you have with respect to flowing wells; is that correct?

A Yes, sir.

Q Now, Mr. Taylor, I will get to you, with the Otis. Do you want to say something, Mr. Peacock?

MR. PEACOCK: That wasn't the impression I got from the gentleman's testimony.

14b MR. SELINGER: Well, the witness can take care of himself. That's what he said. If he has something else to say, I will be glad to hear it.

A I will be glad to renew it. I am not familiar with it.

MR. PEACOCK: You did testify you don't know what type production methods are used in all those wells, didn't you?

MR. SELINGER: I asked him if he didn't know, to

say so and we would go on. And he said so far as he knew, it was confined to flowing wells.

A Our equipment is confined to flowing wells. This equipment here is confined to flowing wells. The auxiliary equipment would be of someone else's manufacture.

MR. SELLINGER: Thank you, Mr. Taylor. That is all -- That's what I understood you to say.

Q Now, Mr. Taylor with the Otis.

Your equipment is used with respect to what type of production, whether flowing or artificial lift or pumping?

A This equipment can be used in any type of production you mentioned.

Q Is it used for 5½-inch casing?

A Yes, sir.

Q To what extent have you tested your equipment in 5½-inch casing with respect to depth?

A Oh, we have made so many installations it is hard to recall just exactly how many.

Q I didn't ask how many. I just asked as to the depth.

A We test-- to answer the question this way: We test the cross-over nipple assembly, each one of them, at the time we assemble them in our plant in Dallas, with

a hydrostatic head.

Q I believe you misunderstood my question. I am referring with respect to depth only. To what extent has your equipment been used, to what depth?

A It goes to any depth that there is an oil well that has a dual completion in it.

Q Then answer the question correctly, Mr. Taylor. Point out the specific well to the furthest depth you have had your equipment installed.

A I believe Pegasus is a good example of that. I don't recall just how deep it is. I do know we have several dual completions. I don't know whether oil and oil in the Pegasus Field —

Q Let's take that. Is there anything deeper than Pegasus in Texas you know of?

A Yes, sir; there are deeper wells in Texas than Pegasus.

Q That your equipment has been used in in 5½-inch?

A Yes, sir.

Q In which fields? I won't put the wells. Which fields?

A Well, there again I don't believe I am qualified to say which wells in which fields.

Q All right. We will go on. Now, what installation you have there is for flowing, did you say?

A No, sir; I said it was adapted and could be adapted to any kind of production that would carry the flow through that nipple assembly.

Q Now, what, in addition to that equipment, can you tell this Commission is necessary for artificial lift from one or two zones?

A Well, in the Otis equipment there is nothing that we furnish in this setup that is required additionally. There are manufacturers, other manufacturers' equipment, that can be placed in your tubing string and other types of artificial lift that can be placed on the tubing and on the surface to produce an oil well.

Q In addition to the Baker people and the Otis people, it is necessary for other equipment people to come in and give the Commission the complete picture?

A No, sir; it is the standard pumping equipment, standard lifting equipment. If you prefer to define gas list as artificial lift --

Q What instrument is prepared for gas lifting purposes?

A It can be adapted to it.

Q Is it right now adapted to it?

A No, sir.

Q What else do you have to use with it?

A You have to use additional equipment with it.

This machine, as you call it, right here, directs the flow of the fluids of each zone.

Q What other equipment do you have to put in that?

A You must put on there, if going to gas lift, put on the appropriate gas lift equipment.

Q Who manufactures that equipment?

A There are several manufacturers of that. Kamco manufactures some of it.

Q Let's stop at Kamco. Do you know whether or not the Kamco people recommend the use of their equipment for 5½-inch casing at a depth of 12,000 feet?

A I am not prepared to say.

Q You don't know.

A No.

Q Those people are located in Houston, are they not?

A Their field offices are all over.

Q Their main office is in Houston?

A I don't know, frankly.

Q In addition to the Kamco people, who else?

A Oh, I will refer you to the composite catalog.

(Laughter.)

If you don't know there are other people.

(Laughter.)

A I don't recall anyone in particular that comes

in mind.

Q Here is a chance to give other people some free advertising.

MR. SHUNIER: Strike that.

Q Now, with respect to pumping, what other devices are necessary for pumping a well with the adaptability of your equipment there?

A Oh, if you would envision pumping that well from the specified depth, you would simply add a setting nipple at the time the pump was on the - with certain specifications it would be full opening so that we could get our wire line tools to this nipple assembly.

Q You have to run through the macaroni string inside the casing and tubing?

A You can but it isn't necessary.

Q You can pump these wells through this instrument you have there?

A With a rod string you can pump that tubing with no additional tubing equipment except with a setting nipple and the rod string and the pump and the surface equipment.

Q For both zones?

A No.

Q What do you have to do for both zones?

A For both zones we manufacture a two-zone pump.

Q Yes.

A You must pull out all this equipment.

Q Yes.

A You must take out the top packer, or you may adapt the setting nipple for the two-zone pump to set at some point above this upper packer and take production from both zones as you will from whatever elevation you desire.

Q Now, Mr. Taylor, from what depth have you utilized the Otis two-zone pump?

A I believe we have an installation now at an average depth of about 8000 feet. I say an average depth. The lower zone is somewhat lower and the upper zone is somewhat - pumped from somewhat higher. If you got the depths and ran them both together, it would come our right close to 8000 feet.

Q Is your instrument restricted as to the maximum ability of fluid?

A The two-zone pump?

Q Yes.

A It is restricted only by the mechanical lifting devices attached at the surface.

Q And naturally within the 5½-inch casing there is more restriction than within a 7-inch casing; is that

correct?

A Let's put it this way. If the intake of the pumps can be placed opposite or near the perforations in the casing, then we can take as much oil as one - either of the zones will give up - or your surface equipment will allow you to pump - move the plunger of our pumps.

Q Will you go over that explanation again?

(Laughter.)

Q I don't see how it can be right, but I may be a little dense.

A You may have equipment which will exceed the capacity of the well to produce oil, or oil and water, or oil and gas.

Q Yes.

A In that case you would definitely pump off. Your pumps would be operating inefficiently through no fault of their own.

Q Yes.

A Simply having a greater length or capacity than the zones have a capacity to give up.

Q You mean if the Bolivar and the Benton field was capable of producing 500 barrels and the Devonian capable of producing 500 barrels, you could produce one thousand barrels from each horizon.

A If you had the proper equipment to [illegible]

ent to do it with.

Q Could you do it in 5½-inch casing?

A Not 1000 barrels.

Q How much could you produce, total fluid? You know the mathematical calculations as to the maximum volume of the equipment.

A Yes.

Q Now, with this installation, your 5½-inch casing, maximum, and 2⅜ or 1¼ and 1, now, what would be the maximum fluid that could be produced?

A Well, that is a question that is eliminated even when you calculate it. It isn't a question of how much we can produce so much as it is a question of satisfying the producer of an allowable, and the ability of the oil zone to give it up. In other words, we have pumps in the ground now that are not producing the proper amount of fluid in that the surface equipment has not been redesigned or reinstalled, of whatever it is, to increase the length of the stroke necessary to give the oil to satisfy the deeper allowable. In other words, the operator is taking what he can get with his surface equipment at the time the pump is put in. If you have a long enough stroke and you can get that stroke out of the oil zone by the gravity to follow that pump up to the full length of the stroke -- I am talking of

Q Yes, I follow you. Go ahead.

A Then you can take that amount of production with a certain pump efficiently.

Q Suppose, as has been testified by Mr. Washburn of Phillips, the Wolfcamp in the particular well is a very uneconomic well, very small capacity well, do you think your instrument there could successfully operate in an instance where the Wolfcamp is a low producing capacity and the Devonian was a top allowable well?

A I think that we could bring the equipment to bear that would satisfy the operation.

Q Now, I want to ask you, Mr. Taylor, with respect to the total recovery of oil. Presumably a well has all the installations. Now, you can take it in three classifications, flowing, gas lifting and pumping of both horizons. Now, your well on 5½-inch casing, having the equipment of both Baker and Otis and others in the matter of flowing, would you recover more oil by a single completion rather than a dual completion under flowing conditions?

MR. MACEY: Objection. I don't believe the gentleman has qualified himself to answer that.

MR. SPURRIER: Does the witness wish to answer?

A I don't believe I am qualified to answer that. We manufacture the equipment.

Q Are you an engineer, Mr. Taylor?

A May I finish?

Q Yes.

A And we have it for sale for those who want to use it. We will work with those that desire to use that. And if in our estimation it isn't a feasible application, we will so recommend. The mechanics of your depletions, we have never gone into.

15b Q Mr. Taylor, are you an engineer by profession?

A Yes, sir.

Q Have you made any study of oil recoveries brought about by installation of your equipment?

A No, sir. That is up to the oil companies and I don't believe we have ever asked them for that information.

Q I believe you, in answer to a question from Mr. Peacock, said a number of instances the producer-operator goes to you for advice as to the installation of packer equipment suited to his particular purpose.

A Yes, sir; he goes to us with the idea he has in mind how much money he wants to spend.

Q Suppose I am Operator A and I come to you for equipment for a well in the Denton Pool on 5½-inch casing. Would you recommend I utilize such an installation under dual completion practices under 9500 and 10,000 feet, or recommend I drill a single well for such a production?

A We are no recommendations of that kind. We recom-

send only as to the equipment we have available.

Q As an engineer, what would your recommendation be?

MR. PEACOCK: Mr. Taylor isn't qualified to answer that. I object.

A I don't want to answer that. I'm not qualified on that.

MR. SELINGER: He said he didn't want to answer it. It is all right with me.

MR. SPURRIER: Let's take a ten minute recess.

(Recess.)

.....

MR. SPURRIER: Mr. Selinger.

MR. SELINGER: I want to ask Mr. Taylor of Baker - -

Q In this proposed installation of packers at 9500 and 12,500 feet, where would you set the two packers? About what approximate depth?

A That would be entirely up to the operator.

Q Do you have any recommendation where that should be?

A No, sir.

Q Have you looked at the Phillips exhibit as to the depth they state where they are going to put it?

A Well, as far as we would be concerned, that would be entirely up to - -

Q What is the depth indicated on that exhibit?

- 7 -

A 9150 on the upper packer and 9350 on the lower packer -- No; wait a minute. 12,215 on the lower packer and 9,150 on the upper packer.

Q Now, if the lower zone fails to produce, how would that oil get up that 3000-foot string?

A If the lower zone failed to produce?

Q Yes, sir.

A I suppose they would artificially lift the zone if the lower zone failed to produce.

Q I mean if the lower zone quit flowing. I will put it that way. If the lower zone quit flowing, how would that oil get up the 3000-foot separation between the upper packer and the lower packer?

A You could confine the lower zone to your tubing or your annulus, either way you desired to.

Q Suppose you have to pump it?

A I don't know about pumping it.

MR. SELLINGS: That's all.

MR. MAGEE: I want to ask one question or two here.

Mr. Charley Taylor, does your jurisdiction of your district extend over into the Collarhide field of West Texas?

A Yes, sir, it does.

Q Have you assisted and advised in any other dual completions of Magnolia wells in that area?

A Yes, sir; we have run our packers in the Collarhide.

Q Are you familiar with how many wells you have dually completed for Magnolia in that field?

A No, sir; I'm not familiar with the number.

Q Isn't it approximately twelve wells?

A I couldn't say; I couldn't say.

Q Are you familiar with the packer failures on those dually completed wells?

A No, sir.

Q You haven't been called out for repair work or advice on the repair?

A I don't know those particular wells and I am not familiar enough to say if we were called out on those wells or not.

Q But they have had packer failures in those wells, haven't they?

A I couldn't say they were packer failures. I don't know if they were packer failures or communication behind the pipe or between -- by the cement job -- or tubing failures.

Q But you did have communication, didn't you?

A Yes, sir; I believe that's correct.

Q Now, with reference to those packers, what is your estimate of the average life of one of those packers in a hole, assuming comparable conditions we are talking about as represented in the Carter field?

A I don't know the average life. I don't know the-

ther packers -- I have been back in West Texas -- I know of packers that have been in wells since 1947, I believe. I do not know exactly what the life of the packer will be.

Q Those are your good jobs. Let's talk about some of the bad jobs. What is the estimated life in some of those?

A Actually, I believe the life of the packer will be as long as the life of the well equipment, your tubing equipment, for instance.

Q Do you all have any written guarantee of that?

A No, sir; I sure wouldn't have. No, sir.

Q I would like to present you a few bills if you do.

Do you, Mr. Don Taylor? Are you familiar with the failures in the Dollarhide Field of dual completions?

A No, sir.

Q Have you supervised, or advised - whatever you do - with reference to those completions?

A No, sir.

Q You have never had any experience in the Dollarhide field?

A No, sir, I haven't.

Q You are aware some of your equipment is installed there?

A I am aware of the fact that there is some of our equipment in the field.

Q Does your company have a written guarantee?

A No, sir. We guarantee against defects in workmanship and material on the surface. We do everything to assist you once it goes into the ground.

Q Once it goes into the ground, do you help pay for the cost of it where it won't work?

A No, sir.

Q Have you had any experience in the Shafter Lake area?

A A little.

16 Q Are you acquainted with any equipment failures or packer failures due to dual completion wells in that field?

A Yes, I am acquainted to this extent: where we have used our equipment to dually pump in the Shafter Lake.

Q Is this by pump or by artificial lift?

A By pump.

MR. HADLEY: That's all.

MR. SPURRIER: Does anyone else have a question of either of the Mr. Taylors?

MR. PEACOCK: There is one other question I think Mr. Charles Taylor might have had an opportunity - or did not fully explain as to his equipment on these pumping operations. And I would like to ask you this. Is this the type of equipment that you have demonstrated to us here, the type that would be used in a pumping operation?

A Yes, sir.

Q If the well were pumped?

A Yes, sir.

Q Either one or both zones.

MR. SELLERS: I would like to object to the question because on interrogation of Mr. Taylor for Baker, he said he knew nothing about the pumping part of it. I dropped any cross examination about pumping. If you are taking it up, I will interrogate further.

MR. PEACOCK: I asked if this was the type of equipment that would be used. Is there any change in this equipment necessary - if the well ceased flowing of its own accord, would they have to come to you and buy something else when they install the pump?

A No, sir, they wouldn't

MR. SELLERS: Mr. Taylor, with respect to that, if both zones had to be produced by pump, would there be any additional equipment necessary in the well? I asked you a while ago, and if you are going to answer Mr. Peacock that way, I will ask about two zones --

MR. PEACOCK: I asked if they would have to come to him and buy any more equipment and he said no.

MR. SELLERS: That is the point. This gentleman doesn't handle that equipment. He told me he had nothing to do with the pumping part of it.

A That's right.

MR. SMITHER: Can you answer the question, Mr. Taylor, if both zones have to be pumped what additional equipment is necessary in addition to the packers you have?

A I don't know what additional equipment is necessary.

Q How do you know additional equipment is necessary?

A There isn't any of our equipment required additional.

Q You mean insofar as the packers furnished by Baker are concerned, it requires - it makes no difference whether pumper or flowing or artificial lift?

A No, sir.

MR. PEACOCK: That is all we were trying to show, I think.

MR. SMITHER: I will take it one step further.

Q Is it possible to pump both zones without the use of any of the Baker equipment?

A I am sure it is.

MR. MACEY: You mean any more packer equipment?

MR. SMITHER: No; any Baker equipment. The witness just said yes, he felt sure it was.

MR. SPURLOCK: Anyone else? Do you have any further witnesses?

MR. PEACOCK: That is all we have.

MR. MACEY: We have one of ours, if the Commission please.

MR. [illegible]: If there is no further questions of the Taylors, we will excuse them.

(Witnesses excused.)

.....

EARL G. THURMAN,

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MIDDLE:

Q State your name, please.

A Earl G. Thurman.

Q Are you a graduate engineer?

A Yes, sir.

Q What school did you attend?

A Oklahoma University.

Q What degree do you hold?

A B.S. in Petroleum Engineering.

Q When were you graduated?

A January 1950.

Q Since that time, whom have you been employed?

A [illegible]

Q [illegible]

A [illegible]

Q [illegible]

A [illegible]

A Yes, sir.

[illegible]: I don't ask the Commission. Will you accept his qualifications?

[illegible]: We will.

Where is the Silverhide Bell located?

In the southeastern part of Andrews County, Texas.

Magnolia has multiply completed wells in that field?

Yes, sir.

Also, we might add, for the record, it is in Lea [illegible]. We have never been fortunate enough to produce oil therefrom.

From what formations are the wells completed?

A Magnolia dual well completions are completed in the Devonian and Silurian formations.

What is the approximate depth of the two formations?

The Devonian is an average depth of about 7500 feet and the Silurian 8500 feet.

What type drive is present in the [illegible]

[illegible] Devonian formation is a depletion type [illegible]

[illegible]

[illegible]

[illegible]

the Devonian gas is not the prime pay but could be here, and the Silurian is about 1100 to 1200 grains per hundred cubic feet.

Q How many dual completions does Magnolia have in the field?

A Twelve.

Q What type of equipment is utilized in that operation?

A Baker and Otis.

Q Could you -- in your last three years of experience -- Could you outline to the Commission the existence of any cases of communication between zones as a result of packer failure or otherwise, in the field?

A Yes. Dual completions were first started in the latter part of 1947, and really began in earnest in 1948. And Magnolia has completed twelve.

Since that time, we have experienced twelve packer leaks. I won't say packer leaks, communications, on seven wells. Five of the original twelve wells have never had communication. Of the twelve communications, it is my opinion nine of them have been the result of packer element failures and the side-door choke failure and one hole in the tubing.

Q In that, in your opinion, cement would be the

correct?

A Well, we have had cement [illegible] not-

withstanding that there was cement. We believe in the

instances we can attribute communication between the Devonian and the Silurian being a direct result of damage to the Silurian reservoir.

Q Are you through?

A I was going to add a little more and explain how it was determined.

We had two top allowable wells dually completed and flowing when communication occurred. And unfortunately it isn't always possible to detect communication at the instant it occurs. Maybe a month or several months. But before communication was detected, the wells began to pump water. We worked over and corrected communication. And after the workover, the water percentage increased to about as high as 96% on the two wells, and our production decreased almost half. And we had to install lifting equipment.

It is my opinion the communication resulting in the Silurian formation, which is the strong water drive, charging the depletion Devonian reservoir to such an extent that water was coned into the Silurian formation prematurely, which, in my opinion, has shortened the life of two of those wells.

Q Do you agree with Mr. [illegible]'s statement [illegible] to detect failures or other instances of communication between the formations?

A No; not entirely. I have run a number of packer

leakage tests and on occasion it is very easy to detect a leak. On other occasions it has been very difficult. We have resorted to the bottomhole pressure bomb on some occasions, and have not been able to detect communication, yet we knew we had communication by the gas-oil ratio and the bottomhole pressure performance.

In one case the Silurian charged the Devonian zone reservoir pressure about 500 pounds. That was indication enough we had communication between the Devonian zone and the Silurian, for the Devonian zone was charged to such an extent you could determine from surface equipment or the bottomhole pressure bomb test.

Q Are workovers of this nature difficult?

A We have found workovers at Lollarhide to be difficult and costly and hazardous too. It is necessary, since the Silurian zone is the higher pressure zone, - that wasn't brought out, but it is quite a bit higher pressure than the Devonian - it is necessary to mud up and use water to kill it. Whenever you do this, the upper pressure zone acts as such zone and takes mud and water. And when you put the well back on production, it has been our experience [illegible] or three months [illegible] around in order to get back in production.

Q I haven't brought out [illegible] pressure differential. Will you outline for us that informa-

tion?

A On November 1st, 1952, the latest pressure figures I have, the Devonian reservoir had a pressure of 1970 pounds. The Silurian reservoir at that same date had a pressure of 3151 pounds, approximately. That is an absolute pressure differential of about 1181 pounds bottomhole pressure.

So acting is an oil column of about the third gradient of about 940 pounds across the packer.

Q Substantially less than in the - than is the differential in the Denton field?

A Yes, sir.

Q Does Magnolia have any dual wells artificially lifting in the Dollarhide field?

A Yes; we have five dual gas lift installations.

Q Has there been any problems with that artificial lifting equipment?

A Unfortunately there is a problem. And we have had some specific problems. We have used gas lift entirely to lift both zones of the dual wells. Since the Silurian zone in the wells in which we have dual gas lift equipment produces water, we have had a particularly harrassing problem of scale formation forming in our tubing and gas lift valve. And this has not only reduced the amount of production we have been able to lift because of the decrease in the effective bubble area size, but has also resulted in

having to pull the well on several occasions, increasing workover costs. We have not been able to handle the volume of oil from our dual gas lift installations we had hoped to do initially.

MR. MADOLE: I have no further questions.

.....

CROSS EXAMINATION

BY MR. PEACOCK:

Q Mr. Thurman, is the type of packer installed in the wells in the Dollarhide Field the same type as has been demonstrated here?

A Yes, sir.

Q Were you present at the installation of these packers?

A Some of them.

Q At what time have these wells been dually completed, -- You mentioned '47 and '48 -- all twelve completed then?

A They were completed over the interval from late 1947 to late 1951.

Did you say there were twelve of those?

A Yes, sir.

MR. MADOLE: Twelve failures in seven wells. Not all twelve wells.

Q Oh, well, you did, then, have packer failures in

not all twelve?

A Yes, sir.

Q But you did in seven of the wells?

A Yes, sir; that's right.

Q When did the first of these failures occur?

A About the middle of 1948.

Q Why did Magnolia continue installing them?

A We had -- That was really before my time. I don't believe I could answer that question.

Q Have they installed any since your time?

A No; I don't believe they have.

Q Then, you are not actually --

A I mean drilled the wells. I mean actually drilled the wells since my time. That is what I mean by that.

Q Has your experience been limited to this one field?

A Not entirely. I have had some experience in the Pegasus field.

Q About how much?

A About three months.

Q Is Magnolia presently fully completing any wells in the Pegasus?

A Yes, sir.

Q In the light of their experience in the Pegasus field, with all these packer failures, would you [illegible]

A It wasn't the recommendation of the engineering department, and that is all I could say.

(Laughter.)

Q You say it was or it wasn't?

A It wasn't.

17 Q Are you familiar with any of the Magnolia operations at places other than the Collarhide and Pegasus?

A Not personally.

Q Does your company to your knowledge have any policy against oil-oil dual completions?

A No; to my knowledge they don't.

Q Does it have any oil-oil-dual completions?

A Yes.

Q Do you know where?

A Collarhide, Pegasus; the only ones I am acquainted with. I understand we have some in South Texas.

Q Do you have communication between the two zones in the Collarhide, the one in particular you spoke of you had the great difficulty in locating? Could that have been communication around the outside of the casing?

A No, sir.

Q Have you had any experience with communication on the outside of the casing?

A No, sir; we [illegible] knowledge.

Q Is that well still locking?

A No, sir.

Q Did you get it fixed?

A Yes, sir.

Q It wasn't impossible, was it, then?

A No, sir.

Q Mr. Thurman, are you aware of Magnolia's having obtained a special order from the Railroad Commission of Texas on February 26th, 1951, granting them permission to dually complete the Lux No. 6 well in the East Abell-Waddell and Abell-Silurian-Montoya Fields in Pecos County, Texas?

A No, sir.

Q Are you aware of the fact that your company, Magnolia, on March the 12th, 1951, obtained a special order from the Railroad Commission of Texas, granting it permission to dually complete its Russel No. 7 well in the Falfurrias Field in Jim Wells County, Texas?

A No, sir.

Q Are you aware your company, Magnolia Petroleum Company, on November 13th, 1951; August 4th, 1952; February 25th, 1952; August 2nd, 1951; October 13th, 1952 --

MR. MADDOX: Are these all oil-oil completions?

MR. PARROTT: No, sir; all dual completions.

MR. MADDOX: That is what I thought.

October 5th, 1951; March 13th, 1952; and August 4th, 1952, obtained special orders from the Railroad Com-

mission of the State of Texas, authorizing it to dually complete wells?

A No, sir.

MR. PEACOCK: That is all we have, Mr. Spurrier.

.....

REDIRECT EXAMINATION

BY MR. MADOLE:

Q Just one question. Did I understand those are oil-oil completions?

MR. PEACOCK: Not all of them. You want to know which ones are?

MR. WHITE: There has been no evidence introduced there have been any so far.

MR. MADOLE: The man said he didn't know anything about them. I think they are gas-oil completions. I think we will skip it and go on with the witness.

MR. PEACOCK: If you want the information, we have it here.

MR. MADOLE: I don't care.

MR. SPURRIER: I don't care.

Q Mr. Thurman, there was reference to dual completions in the Pegasus field. We have only one dual completion there; is that correct?

A To the best of my knowledge that is correct; yes, sir.

Q Are you familiar with the fact that the direct offset to that dual completed well is a dually completed well?

A No, sir.

Q You are not familiar with the fact that we protested that application?

MR. PEACOCK: Objection.

A I am familiar with the fact that we protested it; yes, sir.

Q Are you familiar with the fact that we protested the application for dual completion as a diagonal offset to that well prior to the time we drilled it?

A I don't know on that.

Q This is the third well drilled in the Pegasus field on dual completion, isn't it?

MR. PEACOCK: Mr. Spurrier --

A I believe that's correct.

(Off the record.)

[illegible]: I have no further questions.

[illegible]: Does anyone have a further question of Mr. Thurman? If not, the witness may be excused.

(Witness excused.)

[illegible]: I [illegible]

[illegible]: I would like to [illegible],

if statements are in order, as to our position for Kelly Oil Company.

We don't have a fixed policy of opposing dual completions as such. However, we don't look with much favor on such completions. We originally opposed Gulf's application in Cases 92, 93 and 94, as some of the members of the Commission may well know. We did it on the grounds that all the equipment had to be under the most ideal conditions in order for it to function 100%.

Now, in my attempted cross examination I attempted to show the Commission in a 5½-inch casing well you had to put in all this equipment. Now, the applicant brought the Otis and Baker people, and we found out there was additional equipment that had to be put in, depending upon the stage of the development. You have not only this equipment, but have two macaroni strings that had to be in there. And it became evident with all that equipment in a 5½-inch hole you just weren't going to recover [illegible] all through that [illegible] compared with a single completion from the surface.

[illegible]

two years before. It will accept the equipment just like the oil industry generally will accept all progressive equipment.

And I think in this case in the Benton field that when you take into consideration a well can be drilled to the Bellefonte and a well can be drilled to the Devonian, and from Phillips' own testimony they failed to show economically they cannot drill separate wells to each of the formations. And for that reason and that reason alone we think they should be denied their application for dual completions in the Benton Pool.

MR. MABEE: I think Magnolia's position in this case is clear. The only observation I would like to make, without getting into a further argument, is the economics as testified to by Mr. Washburn as to the cost of these wells. On the testimony of Mr. Collingsworth as assessed by Mr. Washburn, it was brought out that the taxes on this recovered oil, the income tax, is deducted. Well, if that is true, [illegible] by drilling all wells [illegible]

this up.

MR. [illegible]: I have a statement for the Shell Oil Company in Cases 556 to 559, inclusive, and I will have a copy for the court reporter.

The Oil Conservation Commission of the State of New Mexico has previously stated that it has yet to be convinced of the soundness of oil-oil dual or multiple completions as a general practice in New Mexico and has denied all previous requests for such completions. Most recent examples were Order Number R-78 in Case Number 274, Order Number R-79 in Case Number 275 and Order Number R-233 in Case Number 426. It is Shell's understanding that the principles heretofore controlling the Commission's action with reference to oil-oil dual or multiple completions have been (1) that such completions do not assist it in the performance of its duty of conservation of oil and gas and the protection of correlative rights except in the instance where one of the affected pools will not justify development on its own merits, and (2) that such completions are more likely to result in waste or violation of correlative rights than are single completions in the following respects:

1. [illegible]

2. [illegible]

times are more expensive than workovers of ordinary completions and will on the average occur at least twice as often, and risk of damage to each reservoir occurs whenever a workover occurs though the occasion therefor may have involved only one of them.

2. Artificial lift in dual completions where production from both horizons must be lifted simultaneously is not as efficient or as practical as in ordinary completions. It seems probably that both the Devonian and Wolfcamp zones at Denton will require artificial lift at the same time. Recent data indicate that eleven Denton Wolfcamp wells are now on artificial lift and that artificial lift installations are pending in at least eight additional wells. This total figure of nineteen wells represents 37 per cent of the 51 field wells.

3. Annular flow is less efficient than flow through tubing and consequently waste of reservoir energy occurs when an oil zone is flowed through the annulus.

4. The danger of communication of reservoir fluids from one zone to another which exists in any well is greatly increased in a dually completed well. This is true because [illegible] dual completion [illegible] reservoirs are [illegible] single well bore are separated only by a packer which is subject to deterioration with [illegible] exposure to the reservoir fluids.

5. [illegible]

New Mexico is without sufficient engineers and technical employees to act as a policing group in the checking of packer tests and in the preventing of damage resulting from careless dual completion operations.

It is Shell's opinion that such principles are sound and should continue to be the basis for action by this Commission with reference to requests for oil-oil dual completions. Shell Oil Company therefore respectfully requests that the Commission deny the applications of the Phillips Petroleum Company in Case Numbers 556, 557, 558 and 559, and this even though Shell Oil Company is a part owner with Phillips Petroleum Company in the Fort 1 and Fenzo 1 wells involved in Cases Numbered 556 and 557.

MR. SPURRIER: Anyone else?

MR. JOHNSON: J. F. Johnson with the Atlantic Refining Company.

The Atlantic Refining Company concurs with the Phillips Petroleum Company in their application to effect four dual oil-oil completions in the Denton Field. Atlantic has 50% interest in two of the wells in this application; namely, Phillips' Denton 10 and 13 wells now completed in the Devonian reservoir. In addition to interest in these two wells, Atlantic is owner and operator of 12 wells in the Field, in which it has an interest in 9 of the 12 operated wells.

and oil-oil completions between the Devonian and Wolfcamp pools are precluded from the standpoint of mechanical feasibility. Atlantic has had experience with numerous dual completion operations and found them to be mechanically and economically feasible.

Atlantic is of the opinion that the paramount consideration here is whether the production can be separated effectively, and the evidence presented on behalf of Phillips Petroleum Company and our past experience indicates it can be done. It is believed proper maintenance and separation of production can be insured by the Commission by appropriate rules and regulations calling for periodic checks to be performed by the operator.

MR. SPURRIER: Anyone else?

MR. CHRISTIE: W. A. Christie of Amerada.

I just wanted to note our position which we have stated before.

While we have no direct interest in these cases, we are still opposed to oil-oil dual completions as a general principle.

MR. SPURRIER: Anyone else?

MR. [illegible]: [illegible] appears for the Shell Company.

MR. [illegible] is opposed to the granting of Phillips' application for dual oil-oil completion in the Warren field.

..e do not believe the reservoirs are the type which would justify dual completions, and therefore it would be better conservation practice to continue sin.le completions in each reservoir.

M.. .Pi.ien: Anyone else? Mr. Peacock.

M.. PEACOCK: To add to what the gentleman from Atlantic so well stated, I would like to say this: First of all, Shell's interest in these two wells he mentioned is one plus per cent. It is less than 2..

(Laughter.)

M.. PEACOCK: We believe that we have presented testimony in evidence to this Commission which proves that dual completion of wells in the Fenzo, Fort and Denton 12 and 13 wells is feasible and practicable. Every company here that has opposed us has dually completed wells. And although they are not here in New Mexico in oil-oil, most of them have oil-oil completions outside of the [illegible]

[illegible]

-19-

ort and Fonzo wells, which I admit wouldn't apply to the Lemon No. 1 or No. 2. We could drill twin wells there and pay them out, but could not do so in the Fort and Fonzo No. 1. The Fort will not pay back drilling costs - the Fonzo will not pay back drilling costs. The Fort, we will break even. That is according to the estimates of our engineers. That is the way we determine whether we will or will not drill wells. The same as every company determines the matter.

The Fonzo and Fort won't be drilled and it will result in this, that the oil will lie there in the Wolfcamp formation and it won't be produced under these two 40-acre units. The royalty owners will lose their royalty. I don't believe any of them could maintain an action against us successfully for failure to drill wells to the Wolfcamp formation in either the Fonzo or Fort 40-acre tracts. They would have to prove that a reasonably prudent operator would drill such a well, and no court in this state will hold a reasonably prudent operator will drill a well where he will lose money or where he will just break even, unless it is most unusual circumstances.

Only one other item here I would like to bring to the attention of the Commission. There are no oil-oil-gas conditions in this area. In addition to that, under its powers, you had the opportunity to study these oil-oil

dual completions, and it has not determined they are not feasible. Nor it has continued to permit completions, dual completions for gas-oil production. Now, if there were an oil-oil dual completion available for study to this Commission, it could, as a result of its study and as a result of the information which would be available to it, which is not available to it at this time, - those oil-oil completions lie outside this jurisdiction - it would be in a better position to regulate the production of oil from two zones out of the same hole.

Now, I think that all the proponents and opponents of these applications have agreed in the past few years there have been very - at least some improvement - in the equipment for dual completions. Now, Mr. Olinger said his company might in two years change its mind on this dual completion --

MR. STAMETS: Or in five years.

MR. PACK: Or in five years. That is a recognition of the fact that this type of equipment is improving.

[illegible]

[illegible]: Does anyone else have a comment in this case? If not, we will take the case under advisement and move on to the nomenclature cases.

.....

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO

CASE 556: (Re-hearing) Notice is hereby given by the State of New Mexico, through its Oil Conservation Commission, that Phillips Petroleum Company, upon proper petition, has requested a re-hearing in Case 556; that in said petition, petitioner asks recision of Order No. R-350, which order refused petitioner's application for permission to effect dual completion of its Fort No. 1 Well, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, NMPM, Lea County, New Mexico, in such manner as to permit production of oil from both the Devonian and Wolfcamp formations; that the Commission, by its Order No. R-350-A, has granted said re-hearing and set it for 9 a.m. on October 15, 1953, at Mabry Hall, Santa Fe, New Mexico, at which time and place petitioner and other interested parties will be heard.

CASE 557: (Re-hearing) Notice is hereby given by the State of New Mexico, through its Oil Conservation Commission, that Phillips Petroleum Company, upon proper petition, has requested a re-hearing in Case 557; that in said petition, petitioner asks recision of Order No. R-351, which order refused petitioner's application for permission to effect dual completion of its Fonzo No. 1 Well, NW/4 NW/4 Section 35, Township 14 South, Range 37 East, Lea County, New Mexico, in such manner as to permit production of oil from both the Devonian and Wolfcamp formations; that the Commission, by its Order No. R-351-A, has granted said re-hearing and set it for 9 a.m. on October 15, 1953, at Mabry Hall, Santa Fe, New Mexico, at which time and place petitioner and other interested parties will be heard.

TRANSCRIPT OF HEARING
October 15th, 1953

BEFORE: Honorable Ed. L. Mechem, Governor
Honorable E. S. Walker, Land Commissioner
Honorable R. R. Spurrier, Director, OCC

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss

I hereby certify that the within transcript of proceedings before the Oil Conservation Commission is a true record of the same to the best of my knowledge, skill, and ability.

DONE at Santa Fe, N. M., this 17th day of October 1953.

/s/ Marjorie C. Allan
Reporter

SWORN TO before me this 17th day of October 1953.

/s/ Not legible
Notary Public

My Commission Expires:

Jan. 24, 1954 (SEAL)

CASE 556: In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of
Re-hearing its Fort Well No. 1, NE/4 NE/4 Section 34, Township 14 South, Range 37 East, N.M.P.M., Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,536 to 12,710 feet, and oil from the Wolfcamp formation after perforating from 9,680 feet to 9,360 feet.

CASE 557: In the matter of the application of Phillips Petroleum Company for permission to effect a dual completion of
Re-hearing its Fonzo Well No. 1, NW/4 NW/4 Section 35, Township 15 South, Range 37 East, N.M.P.M., Lea County, New Mexico (in the Denton Pool), in such manner as to permit production of oil from the Devonian formation through existing casing perforations 12,456 to 12,680 feet, and oil from the Wolfcamp formation after perforating from 9590 feet to 9260 feet.

* * * * * * * * * * * * * *

COM. SHURRIER: We will now take up Cases 556 and 557.

(Mr. Graham reads the advertisement of the case.)

JUDGE FOSTER: If it please the Commission, I have Mr. Jacob L. Williams here as a witness. He has not previously testified before the Commission, and therefore I will qualify him.

* * * * * * * * * * * * *

JACOB L. WILLIAMS

having been first duly sworn testified as follows:

DIRECT EXAMINATION

BY JUDGE FOSTER:

Q Will you please state your name to the Commission.

A Jacob L. Williams.

Q Where do you reside?

A Midland, Texas.

Q By whom are you employed?

A Phillips Petroleum Company.

Q In what capacity?

A Geologist.

Q From what school are you a graduate?

A Iowa State College.

Q What year did you graduate?

A 1943.

Q With what degree?

A Bachelor of Science.

Q And how long have you practiced your profession as geologist?

A Eight years.

Q All of that time with Phillips Petroleum Company?

A Yes.

Q What are your duties and where are you located?

A Midland, Texas.

Q You are familiar with West Texas, New Mexico area of oil and gas production, are you?

A Yes.

Q And you have made a study of the Denton Pool in which Phillips has some wells?

A Yes.

Q And you have made a study of the area that is at issue here in respect to the application of Phillips Petroleum Company to dually complete some oil wells?

A Yes.

Q What area is that?

A Denton Pool.

Q And have you prepared some Exhibits and cross-sections with respect to testimony you wish to present?

A Yes.

JUDGE FOSTER: We submit the witness has been qualified, Mr. Commissioner.

COM. SPURRIER: He is qualified.

Q (By Judge Foster): Mr. Williams, will you turn here to the board and just designate the first instrument on the board there as Phillips Petroleum Exhibit No. 1?

(Phillips Petroleum Exhibit No. 1 is identified by Mr. Williams.)

Q Now, will you please tell just what that exhibit represents?

A Exhibit No. 1 is a map of the top of the Wolfcamp formation. This particular map I should explain to be on a scale of one inch equals two thousand feet and, some copies I have made here are on a scale that one inch equals four thousand feet.

Q That is a map that reflects the Phillips Petroleum Company's Fort No. 1 and its Fonzo No. 1 wells in the Denton Pool?

A Yes.

Q Will you tell the Commission what that map shows in respect to those two wells.

A This is a map on top of the Wolfcamp formation. It shows which wells are situated higher on the structure and which are located on the fringe, in this position here.

Q What do you mean by "in this position here"?

A Sections 11, 15, 37 and Sections 2, 15, 37 are located on the crest of the Wolfcamp structure. The Phillips' Fonzo Well No. 1 and Fort No. 1 are located off of the crest of the Northwest fringe of this structure.

Q On what quarter section are those located?

A The No. 1 Fort is located on the NE/4 of the NE/4 of Section 34, Township 14 South, Range 37 East, NMPM.

Q And the other ones?

A The Fonzo Well No. 1 is located on the NW/4 of the NW/4 of Section 35, Township 14 South, Range 37 East, NMPM.

Q In respect to the structural position, what do they show?

A That the No. 1 Fort and No. 1 Fonzo are located on the northwest flank of the down structure.

Q I see you have some legend on the map. Will you explain it?

A The blue encircling the different wells designate that that well is producing from the Wolfcamp and the red pertains to the Wolfcamp formation.

Q There is some other color there, is there not?

A Yes. Yellow shows the leases in which Phillips has an interest.

Judge Foster: We offer in evidence Phillips Exhibit No. 1.

COM. SPURRIER: Without objection, it will be admitted.

(Phillips Exhibit No. 1 received in evidence.)

Q Will you please take that Exhibit down and put up Phillips Exhibit No. 2, identifying it please?

(Phillips Exhibit No. 2 identified.)

Q Now, will you just tell the Commission, without explaining anything that is on the map, just what that map is? What is that?

A That is a cross section drawn North-South through the Phillips No. 1 Fort and showing the relation of the Wolfcamp to the lower formations.

Q What is the source of the information reflected on that map?

A Electro-logs.

Q And was that prepared by you or under your supervision?

A Yes.

Q And that correctly reflects the condition there as you have pictured it on the Exhibit in respect to wells shown on there?

A Yes.

Q Will you please explain that to the Commission and tell them what facts are on there and draw any conclusions from that?

A I will show the cross sections which are on the map, Exhibit No. 1.

Judge Foster: I have had some folders made up that contain all of these maps and you might want to look at them and follow them along with the testimony.

(Whereupon, the folders are distributed.)

A It sets forth the two locations of Phillips - No. 1 Fort starting at Magnolia going into Magnolia and Phillips No. 1 Fonzo and south to Atlantic 8-34 and Atlantic through Jones.

Q You say it extends north to the locations. What is the distance of the locations in that area?

A 1300 feet.

Q You are speaking about well location?

A Yes.

Q And that is on the 40 acres proration units in that area?

A Yes, sir. This map is pretty much of Wolfcamp, so it does not show much structure on this particular cross section, but it does show the relationship of the Wolfcamp to the underlying formations. For instance, the distance from the top of Wolfcamp on No. 1 Fort at this base and west on top here is 750 feet, and the distance from here to here,

Q Where is from here to here?

A From the top of Wolfcamp then to the top of Devonian is about 3100 feet. Another thing it shows is the drill tests in the upper Wolfcamp. You will notice tests in the upper Wolfcamp recover oil in many cases, but the lower Wolfcamp offered nothing.

Q You are pointing to those drill stem wells. What have you got on the map?

A Magnolia - Monument. This shows above the Wolfcamp that tests have gotten nothing but mud and at the top of the Wolfcamp, 7245 feet, of oil.

Q That is oil in the pipe or hole?

A In the pipe.

Q And beyond that, by a drill stem test, it recovered mud?

A Yes.

Q You speak about a drill stem test. Where was that?

A That was on Phillips' No. 1 Fort.

Q What did it show?

A On these two tests in the upper part of the Wolfcamp, we got 11.3 barrels of oil on the first and 32 barrels of oil on the second. There were three tests there below that and they recovered mud.

Q Compare Phillips' Petroleum Company's No. 1 Fort with No. 1 Magnolia Monument with drill stem tests. How does that compare? How do those wells compare?

A Magnolia recovered 7,245 barrels of oil and this one recovered 11.3 barrels of oil on the first test and 32 barrels of oil on the second test.

Q What well do you mean when you say "this one"?

A The Phillips Fort No. 1.

Q And that is one of the wells involved in this case?

A Yes.

Q And so the Magnolia well appears to be a substantially better well than Phillips No. 1 Fort?

A Yes.

Q Would you say it is a substantially better well than Phillips' No. 1 Fort on drill stem basis?

A Yes.

Q If you were to select the best one, which one would that be?

A Magnolia No. 1 Maxwell. We do not have any information on the Atlantic well.

Q How far from the Phillips Fort No. 1 was the Atlantic's No. 1 Dickson?

A About 2600 feet.

Q Would that be about one-half mile?

A Yes.

Q And, on the basis of drill stem test comparison, how does the Phillips' Fort No. 1 compare with Atlantic No. 2 Dickson 834?

A Fort No. 1 recovered 1200 feet of oil and Atlantic No. 2 Dickson 834 recovered about 1990 feet of oil.

Q Would you say that Atlantic No. 2 Dickson was substantially a better well than Phillips No. 1 Fort on the basis of the drill stem tests?

A It is somewhat better.

Q You are looking at the map - which one would you take as the best well?

A Atlantic No. 2 Dickson 834.

Q What is the next well shown?

A Atlantic No. 2 Jones. They took one drill stem test on top of Wolfcamp and recovered 3109 feet of oil and on another test recovered fifteen feet of mud.

Q Comparing Atlantic No. 2 Jones with Phillips Fort No. 1 on drill stem tests, how did they compare?

A I would say this one had a much better test.

Q You would take Atlantic No. 2 Jones against Phillips' No. 1 Fort, would you?

A Yes.

Q What other info rmation have you collected on that map?

A Another thing of interest is that the oil recovered is from the very top of the Wolfcamp.

Q In what well?

A In all of them.

Q And the tests below the top did not get any?

A No.

Q How do you account for that?

A Through lack of permeability.

Q When you say "lack of permeability", that does not mean anything to me. What are you talking about? Put that in the record.

A Permeability is the ability of the formation to allow fluid to pass through it.

Q To turn it loose and get it into the well hole?

A Yes.

Q How does the permeability of Phillips Fort No. 1 compare with the other wells shown here on the cross section?

A It is much lower.

Q Does that mean better or worse?

A It is worse.

Q Does that mean that you are less likely to recover substantial amounts of oil from Phillips Fort No. 1 than from the other wells?

A Yes.

Q It is just a poor well?

A Yes.

Q That is what these facts represent?

A Yes.

Q Is that what the map is for?

A Partially, and also to show the relationship between the Wolfcamp and the underlying formations.

Q Just show us, if you will, what the relationship is between the Wolfcamp and the underlying formations, well by well.

A It is pretty much the same for all of them. It shows the Wolfcamp is about 1750 feet thick.

Q The Wolfcamp formation from the top to the base?

A Yes.

Q That does not mean you have 1750 feet of pay section, does it?

A No. Underlying that we encounter the Upper Mississippi Lime which, in this particular cross-section is about 200 feet thick. Below that is the Lower Mississippi Lime which is 150 feet thick. Below that is Woodford 210 feet thick shale and then Devonian.

Q In what formation can you get production in that area, from those wells shown in the cross section?

A In the very uppoer part of the Wolfcamp and in the Devonian.

Q These other formations, the Upper Mississippi and the Lower Mississippi and other formations, are not productive of oil and gas?

A Not in this cross section.

Q They do not produce?

A There was one well that produced for a while, but it is in the Upper Mississippi.

Q Those formations are not productive formations in this pool?

A No.

Q What other information is reflected on that map?

A That is about all.

Q Will you take that down and go to the next one. Just before you take that down, let me ask you what is the distance from Phillips' Fort No. 1 to Atlantic No. 1 Jones?

A About three-quarters of a mile.

Q That is about three locations away?

A Yes.

Q Over there, get to the very end of the map, what is that well?

A That is the Magnolia No. 3 Maxwell.

Q Do you have a drill stem test on that one?

A No, I do not. There is a twin to this well, but this Devonian well is not tested.

Q Just the Devonian is reflected in this cross section?

A Yes.

JUDGE FOSTER: It is please the Commission, we would like to offer in evidence Phillips' Petroleum Exhibit No. 2.

COMM. SPURRIER: Without objection, it will be admitted.

(Phillips Petroleum Co. Exhibit No. 2 admitted in evidence.)

Q (By Judge Foster) Will you mark that Exhibit on the board as Phillips' Exhibit No. 3 please?

(Phillips Petroleum Co. Exhibit No. 3 identified.)

Q Without stating what Exhibit No. 3 reflects, just state what it is.

A This is a North-South cross section through Point B shown on the map.

Q What map?

A On the Wolfcamp map of Denton Pool. It shows essentially the same thing as Exhibit No. 2 except it goes through Phillips No. 1 Fort. It is one location East up depth from Exhibit No. 2, which is cross section.

Q You mean Fonzo No. 1 instead of Fort, do you not?

A Yes.

Q The other cross section went through Fort No. 1?

A Yes.

Q Also, at the extreme left hand side of the map you have the Magnolia No. 16 Pope reflected in the Wolfcamp formation?

A Yes, this is the top of the Wolfcamp formation, and the well is in the process of being completed now.

Q Is there anything that you want to add in effect to that cross section that you did not talk about on the other one?

A No.

Q On Phillips Fonzo Well No. 1, what did the drill stem tests show?

A There were two tests in the upper part, which is the most prospective. The two tests taken recovered no formation fluid.

Q You got nothing on that?

A No.

Q That makes it still a poor well as well as the other Phillips well?

A I do not think so, because the upper part was not tested. Some of these other drill stem tests are of interest. Magnolia No. 16 Pope tested the upper, most prospective part, and recovered 1630 feet of oil and ninety feet oil and gas test mud.

Q Is that a good or bad well?

A To me it would indicate there is not much there. It is a pretty poor well.

Q How far is that from Phillips No. 1 Fonzo?

A Thirteen hundred feet.

Q One location West?

A Two locations North.

Q That would be about 2600 feet?

A Yes.

Q. Have you any other drill stem tests that may be of interest?

A The Magnolia No. 4 Pope well flowed 27 barrels of oil in one hour and, when they tested it the second time, they got no fluid.

Q What does that mean?

A It indicates that it might make a well in the upper Wolfcamp.

Q Referring to Phillips Fonzo No. 1, how does it compare?

A It is hard to say because it was not tested in the same zone.

Q Why did you not test it?

A I do not know.

Q There is nothing unusual about it?

A No; it could probably be tested.

Q But you do not know why it was not tested?

A No, I do not.

Q Have you some other drill stem tests?

A Between 3 D, Deck A was tested in the upper part and recovered 580 feet of oil and 270 feet of oil and salt water.

Q What does that indicate?

A It indicates to me there is not as much oil as there was here on the Pope and that the water is connate water.

Q Now, in the No. 2 Deck you had a drill stem test?

A Yes, the test recovered 6,450 feet of oil.

Q That indicates a pretty fair well?

A Yes.

The Atlantic No. 1 Jones tested 390 feet of oil and gas mud and 150 feet or slightly over of gas mud.

Q In the upper Wolfcamp?

A Yes.

Q When you say "the upper Wolfcamp", what do you mean?

A I am meaning the upper 100 to 150 feet that has the best permeability.

Q Does that indicate the Atlantic No. 1 Jones is a pretty good well?

A Not to me.

Q Any other statements you want to make?

A No.

JUDGE FOSTER: We would like to offer in evidence Phillips Petroleum Company Exhibit No. 3.

COM. SPURRIER: Without objection, it will be admitted.

(Phillips Petroleum Company's Exhibit No. 3 admitted in evidence.)

Q (By Judge Foster) Will you please identify the Exhibit on the board as Phillips Exhibit No. 4?

(Phillips Petroleum Company's Exhibit No. 4 marked for identification.)

COM.SPURRIER: We will take a recess until 1:30.

(thereupon, at 12:05 p.m. the meeting recessed until 1:30 p.m. of the same day.)

AFTERNOON SESSION

1:30 p.m.

COM. SPURRIER: The meeting will come to order please. Judge Foster, will you continue please?

JUDGE FOSTER: I want to get a correction in the record, in the testimony of Mr. Williams about the feet of oil on the drill stem test in our Fort No. 1 Well.

Q I believe you said you had 1200 feet of oil in the hole?

A Yes.

Q That should have been what?

A Approximately three thousand. The number of barrels was correct.

Q You miscalculated the number of feet of oil in the drill stem?

A Yes.

Q What size is that drill stem?

A Three and one-half inches I believe.

Q Now, as we adjourned, you had just identified Exhibit No. 4 up there and, without stating what Exhibit 4 reflects, will you tell what it is?

A Exhibit 4 is a cross section, East-West, through the Phillips No. 2 Fort, No. 1 Fort and No. 1. Fonzo and Magnolia #13 Pope starting from a point above the Wolfcamp through the Devonian.

Q For what purpose did you prepare that cross section?

A To show the relationship between the formations below the Wolfcamp, East and West; the T.D in the area.

Q What is "T.D."?

A Total Depth.

Q Going over to Phillips No. 2 Fort - what is reflected on Exhibit 4 in respect to that well?

A It shows the top of the Wolfcamp and total depth of 9780' at which it was broken.

Q That is Phillips No. 2 Fort?

A Yes.

Q Are you saying that was a dry hole?

A Yes.

Q How close what that dry hole to Phillips No. 1 Fort?

A About thirteen hundred feet.

Q What direction from Fort No. 1?

A West.

Q How far west?

A Thirteen hundred feet.

Q You mean approximately thirteen hundred feet?

A Yes.

Q You got a dry hole in Wolfcamp?

A Yes.

Q You did not drill on to the Devonian?

A No.

Q Why?

A Because we thought it would be low on the structure - below the water.

Q What does the Exhibit reflect with respect to Phillips No. 1 Fort, one of the wells at issue here?

A. It shows Phillips No. 1 Fort is up on the Devonian structure, up from the No. 2 Fort.

Q But it is still down structurally?

A Yes, from the other wells located on the cross section.

Q On Phillips No. 1 Fort, do you have any drill stem tests there?

A I do not know them on this cross section, but I did on the other ones.

Q You show Phillips No. 1 Fonzo. Where is it located with respect to Phillips No. 1 Fort as shown on the Exhibit?

A It is one location east.

Q And what will this Exhibit reflect with respect to No. 1 Fonzo and No. 1 Fort? What wells?

A It shows that Phillips No. 1 Fonzo is struct rally about the same as Phillips No. 1 Fort.

Q But still on the down structure?

A Yes.

Q What do you mean by saying they are "down structure"?

A That they are closer to water.

Q They are not as well located as other wells?

A Yes.

Q Do you mean they are, or are not?

A They are not as well located on the structure.

Q And what effect is that likely to have in respect to getting a good or bad well?

A If it is low on the structure, there would not be as much prospective as above water.

Q As there would likely be up on the structure?

A Yes. It is better developed on the upper structure than on the lower structure.

Q Then you would expect from the structural position of Phillips Fort No. 1 and Fonzo No. 1 wells that they would not be as good wells as those would be further up structure?

A In general.

Q You would expect they would produce less oil than other wells?

A Other things being equal, yes.

Q In respect to this Exhibit, the other two cross sections that we have been talking about, Exhibits 2 and 3, I notice you have the logs on there. How did you get them on there?

A Just glued them on.

Q Did you just photograph them?

A Those are the electro-logs which have been photostated. Then I had the photographer shoot them down to one-half size.

Q But they are the actual reproductions of the actual logs of the well? Is that correct?

A Yes.

Q And the Atlantic No. 5 Dickson would be up structure from Phillips No. 1 Fonzo? Is that right?

A Yes.

Q Is there any special information shown in respect to that well that you have not testified about?

A No.

Q Just that it is higher than Magnolia No. 13 Pope, is that true also?

A It is shown to be down on the flank of the Wolfcamp as you go West.

JUDGE FOSTER: If it please the Commission, we would like to offer Phillips Petroleum Company Exhibit No. 4 in evidence.

COM. SPURRIER: I accept it. It will be admitted.

(Whereupon Phillips Petroleum Company Exhibit No. 4 was admitted in evidence.)

JUDGE FOSTER: We will go now to the next Exhibit, No. 5.

Q Will you please mark that cross section as Phillips Petroleum Company's Exhibit No. 5?

(Phillips Petroleum Company's Exhibit No. 5 marked for identification.)

Q Mr. Williams, before I interrogate you about Exhibit 5, I want to return to our discussion about these comparative drill stem tests. I want this record to be clear and do not want anybody to be confused about the matter and I want you to state for the record here what the value of a drill stem test is.

A I would say that that test is an indication of what a well might produce in general.

Q In the industry, as a rule of thumb in the early stages of drilling, you do rely on these drill stem tests to give you some indication of what kind of a well you might get, do you not?

A Yes, as an indication.

Q Now, it is true, of course, that in comparing drill stem tests, that one drill stem test there has gotten less in the hole than another drill stem test would show in another well, but that does not necessarily indicate that the well that has got the least oil in the hole is the poorest well, does it?

A Not necessarily.

Q By taking the law of averages and not by using it as a rule of thumb, it does indicate that the lower drill stem test is most likely to produce the poorest paying well, is that not so?

A In general.

Q There are some exceptions?

A Yes.

Q But I mean on the over all picture generally, the lower the drill stem test in the well the less productive well you might expect to get?

A I would say the poorer the drill stem test, the worse it would look in general.

Q Tell us what is represented here on Exhibit No. 5.

A Exhibit No. 5 is another cross section covering just a part of the Wolfcamp. It is constructed of micro-logs of Wolfcamp pay sections and covers the same wells that were shown on Exhibit 4.

Q I want to be sure that this record shows what a micro-log is.

A It is an electro-log in much greater detail, designed to show the porosity of a pay zone.

Q They kind of act as a looking glass for the industry so they can look down in the ground and tell what is down there?

A It shows the porosity but does not indicate the permeability.

Q Is it the most accurate way you know of to determine the porosity?

A In the absence of cores, I would say yes.

Q It is the only recognized way of doing it?

A Yes.

Q These micro-logs are generally relied on by the industry as being accurate in respect to information that they reflect?

A Yes.

Q I mean in a practical way. I am not talking theoretically. That is what the industry puts its money on?

A It is what we complete wells from.

Q This cross section here, Exhibit 5, reflects the micro-logs of what wells?

A Phillips No. 2 Fort west and going east, Phillips No. 1 Fort, Phillips No. 1 Fonzo and Atlantic's Dickson and below that are Magnolia's No. 22 Pope and Magnolia's 33 Pope. These two wells are not on scale.

Q For what purpose did you prepare that Exhibit?

A I prepared it to show the structure, which is similar to the

other cross sections showing that you are coming down going West and also to show the characteristics of the Wolfcamp pay interval is from the top of Wolfcamp to water.

Q What is the characteristic of Wolfcamp pay zone there, as reflected by that Exhibit?

A This Exhibit shows it to be lenslike. The black represents porosity. It does not represent pay. And, in between, is the impervious zone. It shows the zones of porosity regardless of fluid. The sands in that area are limestone but linticular formation.

Q What do you mean by"linticular"?

A It is just like your fingers spread out.

Q It just comes to nothing?

A Yes.

Q If a zone of sand on which you might expect you pay, what would you say about a linticular sand?

A You cannot depend upon a given porosity being present in an offsetting well. It might peter out.

Q Starting from the top of Wolfcamp sand, where you have it illustrated on the Exhibit, at what depth would you encounter the top of that sand?

A This line represents the top of the structure, and the top on the West is 9350 feet.

Q And where do you get the bottom of it?

A We have a water level that is very poorly established at 5800 feet. The reason it is poorly established is that the pay is so linticular that you do not get water because of lack of porosity.

Q You have a pay zone of what thickness?

A On an oil bearing zone, from the top to the bottom.

Q What thickness? From where you first hit it to where you can get it?

A There is some porosity almost to the top of Wolfcamp and maybe 20 feet to 30 feet in depending on wells, but from the top of Wolfcamp to minus 5800, which is approximately water, the interval bears to 245 feet to about 471 feet over here and higher over there on the crest of the Wolfcamp structure. (Illustrating on map).

Q On Phillips No. 1 Fort, what is the area?

A The Phillips No. 1 Fort has about 208 feet from the top of the Wolfcamp to minus 5800, but not all of this is pay.

Q You do not mean that you have 280 feet of sand there that will produce oil?

A That is the interval in which it would be found. Beyond this depth, you would not expect it.

Q Now, that is about 280 feet?

A Yes.

Q In the Phillips No. 1 Fort?

A Yes.

Q What is it in the Phillips No. 1 Fonza?

A It is close to 400 feet - about 370 feet.

Q That is from where you first strike the top of the Wolfcamp horizontally until you run out of it?

A Yes.

Q Going back to Phillips No. 1 Fort, how much effective pay sand do you have in that well?

A I think according to the micro-logs, there is twenty-nine feet indicated porosity, but I do not feel that all of that is pay because in the drill stem actually, that is five feet on top of Wolfcamp from which we got our oil on the drill stem test.

Q Did you say out of the 280 feet distance from the top of the Wolfcamp sand down to the bottom of the Wolfcampsand in Phillips No. 1 Fort, you have only five feet on which you can expect oil?

A That five feet looks the best and below twenty-two feet of this we could not depend upon. It may yield a little oil but not much.

Q You would not expect much production?

A No.

Q So the effective pay sand does not exceed five feet, is that right?

A Yes.

Q How does that compare with the effective pay zone in the Magnolia No. 22 Pope?

A Magnolia No. 22 Pope has about eleven feet and that is the best part of Wolfcamp and sixteen feet developed by micro-log.

Q Now, in Magnolia No. 13 Pope what would you say?

A About the same.

Q How does that compare with Atlantic's No. 5 Dickson on the map?

A It has more - in the neighborhood of 14 feet.

Q Comparatively speaking then, the micro-logs show Phillips No. 1 Fort, as compared to the Atlantic's No. 5 Dickson and the two Magnolia wells, No. 13 and #22 Pope, is relatively poor?

A Yes.

Q And you would not expect to get anything from the recovery of oil from Phillips No. 1 Fort like the two Magnolias?

A No.

Q What would you say in reference to Fonza No. 1?

A It has about 28 feet developed throughout the best part. Where we were talking about, No. 1 Fort was possibly seven feet.

Q Does that indicate to you that as you go up structure your effective pay zone increases?

A Not necessarily. In general it is true, but there are wells that are high that have not effective pay zones.

Q But you do not have a record of them here?

A One of those is down toward the south. There is about 42 feet effective pay zone.

Q Comparing Phillips No. 1 Fonza with Atlantic's No. 2 Dickson, Magnolia's 22 Pope and Magnolia's 33 Pope, relatively

speaking, would you say that Phillips No. 1 Fonzo is a poor well?

A I would say according to micro-logs it would indicate it was not a good well.

Q You say according to micro-logs - do you have anything else to go by?

A We do not have a drill stem test.

Q But you do have your micro-logs?

A Yes.

Q And it shows it a relatively poor well?

A As compared with other wells I mentioned, yes.

Q It shows it to be a little better well than Phillips Fort No. 1?

A Yes.

Q And you would expect some more oil out of No. 1 Fonzo than you would out ofNo. 1 Fort? Is that right?

A Yes.

Q Now, let me ask you this question. Are there any other factors reflected on this cross section that you want to call to the Commission's attention?

A I do not know whether we have gone over it in detail or not. I think the drill stem tests are interesting. With very few weels, we do not get very much formation fluid above this upper porosity - 50 to 100 feet below Wolfcamp. That porosity in the micro-logs has not yielded anything on drill stem test.

Q You mean in the lower porosity zones?

A Yes.

Q You mean when you are talking about lower porosity zones, you are talking about sands?

A Yes, I am not talking about pay sands. There are dolomites and limes, etc. As I already said, we tested No. 1 Fort through these zones.

Q That does not mean anything. You will have to tell me what zones are.

A Zones show porosity.

Q Where are they located?

A Between depths of 9518 feet and 9600 feet.

Q The drill stem tests on those zones shows what?

A Just mud. They did not give up any formation fluid. The Phillips No. 2 hold, one location west, tested the lower porosity zones from a depth of 9620 feet to 9730 feet, part of which, having minus 5800 figure for water, and recovered mud on three tests and water on the 4th test.

Q Indicating there is nothing there?

A Yes and we perforated these porosity zones and the first one was from 9677 to 9690 for twelve hours and we recovered sixteen barrels of salt water.

Q What well had that?

A Phillips No. 2 Fort. Then we perforated the porosity from 9608 to 9630, allowed four barrels of mud in five hours and swabbed

dry and attempted five gallons of acid and it was impervious. After that we perforated 9550 to 9578, swabbed dry, attempted acid, and it did not take. It does not show much on the micrologs, however. After that we perforated from 9460 - it happens to be in the upper Wolfcamp - and swabbed dry and got seven barrels of mud in eight hours.

Q Are you still talking about Phillips Fort No. 2?

A Yes. These drill stem tests and perforations on Phillips No. 2 Fort here, two of them were these lower porosity zones that were encountered on No. 1 Fort.

Q What did you do on drill stem tests and further tests on Phillips No. 1 Fort?

A We just took drill stem tests and tested it down to the bone.

Q How about the Fonzo No. 1 respecting the drill stem test?

A We took two drill stem tests.

Q At what levels?

A The first was from 9350 to 9550, for a term of two hours, and the recovery was seven feet of slightly gas cut mud. We took the second drill stem test at 9605 to 9705 and were over one hour and twenty-five minutes and recovered 100 feet of mud and this one happens to be mostly below what we could call water.

Q Still in Wolfcamp?

A Yes. We did not test the upper, most prospective zone of Wolfcamp.

Q Now let me ask you something: There is some oil that is to be recovered from Phillips No. 1 Fort and Phillips No. 1 Fonzo? There is some oil there to be recovered, is there not?

A Yes.

Q Unless we twin this No. 1 Fort and No. 1 Fonzo, or the Commission here permits us to complete those two weeks, what is going to happen to that oil - that is, in the effective pay zones of those two wells?

A A good share of it would just stay there.

Q Where will the rest of it go?

A Some of it will be produced by other wells.

Q What surrounding wells are there?

A The Magnolia Maxwell No. 2.

Q Where is it located with respect to Fort No. 1?

A The Magnolia Maxwell is one location north.

Q The next location north from Fort No. 1?

A Yes.

Q What other wells around there might get some of that oil?

A Magnolia's No. 4 Pope is diagonally northeast offset and direct north offset to the Fonzo.

Q Do you expect that well to get some of that oil from the effective pay zone?

A Yes.

Q What other wells?

A Just from the Fort No. 1?

Q Yes.

A I believe that Atlantic is drilling immediately south of us.

Q That might bet some of it when it gets going?

A Yes.

Q In respect to Phillips No. 1 Fonzo, there is some oil there to be recovered?

A I believe so.

Q And, if you are going to get the oil out of there, you are going to twin that or dually complete it?

A Yes.

Q Suppose we do not complete it, where is that oil going to go?

A Some of it would stay there and some of it would be produced by surrounding wells.

Q What wells surround it?

A The Magnolia No. 4 Pope to the north.

Q Just one location north?

A Yes.

Q Is that not No. 8?

A Yes, that is No. 8 Pope. And to the East is the Low 90 Dickenson.

Q One location away?

A Yes, east. And to the south I believe there is Atlantic. No, I do not believe it is Atlantic, but Low 11 B Dickenson, which is

producing from Devonian.

Q That would get some of it?

A Yes.

Q Assuming - but I do not suppose you know about well pay out and things of that sort?

A No. I do not.

Q But, assuming for the purpose of this question that this No. 1 Fort and No. 1 Fonzo would not be what we would call a paying well, and that Phillips Petroleum Company, in discharging their duty to royalty owners would not be obliged to drill that well if it was not a paying well, the only way to get the oil out is to complete the well?

A Yes.

Q You have to get it out of a hole somewhere. You have to get it out of the hole or drill one, is that not true?

A Yes.

Q So, the net result is some of that oil in those two wells we are talking about will never be produced, is that not true?

A If it is not twined or dualed, it will not be produced.

Q It will just stay there and nobody get the benefit of it?

A Yes.

Q Mr. Williams, let me ask you this question: I may have overlooked something that may be of important to the Commission in settling this matter, and, if I have, will you please tell us what it is, if I have failed to ask you something that I should have asked

you as to what is reflected here by this Exhibit 5, that you would like to explain?

A I think we have covered most of it. The only thing that is of more interest to me than anything else is that it seems in this part of the field, and possibly throughout the field, the best prospective porosity is found in the upper part of the Wolfcamp and not further down.

Q What is the upper part of the Wolfcamp?

A I would say the upper one hundred to one hundred and fifty feet and sometimes closer to the top than that. It may be within thirty feet of the top, but within an interval of from one hundred to one hundred and fifty feet of the upper Wolfcamp would be found the most effective pay. That is indicated by the drill stem tests and comparative methods that have been attempted in lower zones below one hundred to one hundred and fifty feet I am speaking of. The micro-logs would indicate the prospective in the upper zone is just as good - down in here.

Q Where is "down in here"?

A Well, starting about one hundred and fifty feet on down. From a point one hundred and fifty feet below the top on down.

Q The micro-logs indicate what?

A The porosity indicates it may be just as good but drill stem tests do not substantiate that. It did not give up anything from the formation.

Q If anything was there, would you expect to get it on drill

stem test?

A Generally, not always. Wells are completed at 100 to 150 feet. These lower zones, below the depth of 150 feet, samples indicate the porosity is a pinpoint and not as permeable.

Q Do you know of any productive wells in Wolfcamp in what you describe as a lower zone?

A There are some completed in both zones, but the upper zone would be contributing most of the oil and although some of them are completed in the lower zones, they would be in the minority. I think the cross section would indicate porosity in the lower part, but most of the pay will come from the upper part, 100 to 150 feet.

Q I want to call your attention to something. If you cannot answer it, just say so. It is already in this record by Mr. Washburn that in the Fort No. 1, you have 22 feet of six percent porosity. What does that mean to you?

A He is counting 22 feet porosity from the micro-logs and core information on other wells. I count about 29 feet from the micro-logs alone and the fact they had six percent porosity does not mean you would have effective permeability in all of it.

Q We have the same testimony with respect to Fonzo, that yougot 35 feet six percent porosity effective pay zone. What does that mean to you?

A Just the same. Not all of these thirty-five feet would be effective pay. It may not be permeable. I do not think it is from the drill stem tests.

Q The drill stem test indicated it would not be?

A A lot of this includes this down here which we did not get anything on.

Q That is being liberal on it?

A Yes, I would say so.

Q Not that there is anything wrong in being liberal, but I just wanted to make it clear. I believe that it all.

COM. SPURRIER: Does anyone have any question?

CROSS EXAMINATION

BY MR. MADOLE:

Q Judge Foster, I would like to ask your witness a question: Mr. Williams, in the micro-logs that you have made a cross section East and West, did you look at micro-logs North and South to make a comparison there?

A No, I have not made a cross section of it.

Q Why not?

A Because I did not have time.

Q Would it paint a better picture?

A Going South, some of the wells are better. The Atlantic No. 4 Ted Jones which is situated in the SE/4 of the SE/4 of Section 34, Township 14, Range 37, the micro-log indicates about 42 feet.

Q How about the North - on Maxwell No. 2?

A To the North, on Maxwell No. 2, I found it to be twelve feet.

Q How about Pope No. 8 on the north of Fonzo No. 1?

A I count 28 feet throughout the log that had been run but six feet at the top, but I had figured in the more prospective pay zone.

Q The comparison is almost identical to Fonzo No. 1?

A Yes.

Q How about to the South of Fonzo #1?

A Five feet on the low 3 V Dickenson. The twin is -

JUDGE FOSTER: While he is looking for this, I will submit Phillips Petroleum Exhibit No. 5 in evidence.

COM. SPURRIER: So long as there is no objection, it will be admitted.

(Whereupon, Phillips Petroleum Company's Exhibit No. 5 is received in evidence.)

Q (By Mr. Modole) In other words, the wells to the North and South, the Fort and Fonzo No. 1, according to the micro-logs, they are almost identical to the logs you found on Fort No. 1 and Fonzo No. 1.

A Immediately north and south of us.

Q Are you familiar with the accumulative recovery of those wells.

A No, I am not.

MR. MADOLE: If the Commission please, we have asked Mr. Macey to take off the figures from the Commission's report on the accumulative recovery of all the wells on the Wolfcamp in the Denton field. He has not had an opportunity to check his figures. We

would like to request permission that they be placed in the record.

COM. SPURRIER: The accumulative figures on the production of the various wells in the Wolfcamp formation in the Denton Field is requested from the records of the Commission. Is there any objection?

(No objection voiced.)

Q (By Mr. Madole) : I ask first on this five feet of pay that you find in Fort No. 1, what is your estimated recovery in barrels of oil?

A I do not have that.

Q Have you any opinion as to how much is recovered?

A No. Mr. Washburn would have to answer that.

Q Your opinion as to the footage of pay, etc. is based on micro-logs and comparison of drill stem tests - is that correct?

A Yes.

Q You have not taken into consideration the actual production in offset wells?

A I have taken into account the fact the surrounding wells, most of them, are producing only from their upper zone.

Q Would that be an indication of the amount of oil that could be produced from Fort No. 1 and Fonzo No. 1?

A I do not know how it could when you do not know how much they are going to produce.

Q You have the figures on actual production by months from

the time they have been in?

A We did know we did produce that much, but how would we know how long that would produce that?

Q It is as good an indication as drill stem tests, is it not?

A Yes.

Q Is it not a fact that drill stem tests at best are indications of mud conditions in the hole and everything else will affect that test?

A It is an indication.

Q But the mud indication of the well will affect recovery on the drill stem tests?

A Yes.

Q Then what that well will give up is best determined by the actual oil that comes out of the hole?

A Yes.

JUDGE FOSTER: I object - the question is argumentive.

MR. MADOLE: It behooves Foster to raise an objection - and he has been arguing with his own witness all through this case.

JUDGE FOSTER: I want to show it is argumentive.

Q (By Mr. Madole): If Maxwell No. 2, in six months' period, has produced 27,537 barrels of oil, would that not be a pretty good indication that Fort No. 1, which is directly off of that, will produce oil?

A Yes.

Q And in approximately the same amounts?

A I would not say that.

Q You found the micro-log had pay footage accrual?

A Just about.

Q What factors are you going to subtract from recovery in No. 1?

A By the same line of reasoning, you cannot use a drill stem test to tell what a well can produce, I do not see how you can use production from one well to say that the offset well will produce the same.

Q It is a pretty good indication, is it not?

A Yes.

Q In general or specific detail?

A In general.

Q Now you said on these micro-logs, on cross sections, that all of the wells indicate that production is from the first 150 feet?

A I said in general.

Q What do you mean by "in general"?

A Because there are some wells completed in both the upper pay zone and some have perforated in the lower part.

Q I am talking about this Exhibit. Is there any in the lower zone?

A There may be one or two.

Q Which ones?

A I believe Atlantic's #3 Ted Jones is run on cross section B-B Prime which would be Exhibit 3, is completed in both zones.

Q I am talking about those pictured on Exhibit No. 5. That is the one I am talking about.

A Four of those are Devonian wells and this one and this one (illustrating on map) are Wolfcamp ones which are completed in the upper zone.

Q Then, in your Fort No. 1 and Fonzo No. 1 you had 150 feet of Wolfcamp formation?

A You mean above water?

Q Yes.

A We had more than that.

Q Then your Fort No. 1 and Fonzo No. 1 have in them the same pay formation that is being produced toward the East, is that not so?

A Yes.

Q Now, if the Commission decides not to complete and if you decide to twin these wells, where can you locate Fonzo No. 1 Twin on Fonzo No. 1?

A We would not twin them.

Q Is it not true that if you move the Fort No. 1 to 330 feet from the East line and 330 feet from the North line on the contour map that you used as Exhibit 1, would not that well be structurally almost on the same structural level as Magnolia's Maxwell no. 2?

A You say 330 feet from the North and East?

Q Yes.

A Yes, it would.

Q Then, under the rules of the Commission at this time you are permitted to so locate such a well, are you not?

A I believe that is right.

JUDGE FOSTER: I do not know whether it is or not.

Q (By Mr. Madole) Will you mark on Exhibit with an "X" where that would be on your contour line?

A Yes.

(Whereupon he marks Exhibit #5 with an "X")

Q Let us go on the Fonzo - On that same contour map, and go 330 feet to the North and East line of Fonzo, which you have marked with an "X", and tellme whether or not it would be on a structure comparable to Magnolia's Pope No. 8?

A It would be just a little higher.

Q Now in the twinning of a well, your location of that twin well would not be identical with the Devonian location?

A No.

Q Then if these formations are linticular, there is a strong possibility of your hitting more porosity in that diffent location than inyour Devonian location?

A More or less porosity.

Q But, as you move to the north and east, by your own testimony, you are gettingmore on structure, are you not?

A But I said in general the porosity -

Q In general?

JUDGE FOSTER: He has answered the question.

A It is hard to get specific because porosity does not change that much in relation to structure. This Atlantic well in the southeast of Section 34 is low on structure but it has high porosity, indicating it is quite eratic.

Q Did I understand your testimony correctly that, in general, as you move up structure you found more porosity?

A That is why I said "generally". There are exceptions to this.

Q What you are telling this Commission is, until you drill a hole that you do not find in Fort No. 1 or Fonzo No. 1, is that right?

A I did not say that. You can tell something by Devonian wells that have already been drilled.

Q You get general when it is necessary and you get specific when it is not necessary. I want you to stay on one side of the fence or the other. If, in general, going up structure you are going to get more permeability?

A I was speaking of the pool as a whole.

Q What is the purpose of this Exhibit 5?

A I was not speaking in respect to twin wells. On the crest of the Denton Pool the porosity is better - even that in general - but I think, in respect to twins, we could tell something about what

the porosity would be since the porosity on the immediate offsets are similar, which we already discussed.

Q Then if those wells would pay out, your wells should pay out?

A Yes, I think they would.

Q That is all.

REDIRECT EXAMINATION

BY MR. FOSTER

Q Did I ask you the extent of the pay zone was that you found in Fonzo No. 1?

A Seven feet.

Q That is all.

MR. L. C. WHITE: Mr. Williams, how conclusive is a drill stem test?

A I think you can say if you get a flowing test, it is a good indication. It does not mean anything about what that well will produce. It is just an indication of the production of the fluid in the drill stem test interval. I do not think it can be taken as any kind of a measurement.

MR. SELINGER: I am with the Shell Oil Company and I would like to ask Mr. Williams some questions.

CROSS EXAMINATION

BY MR. SELINGER:

Q Mr. Williams, referring back to Exhibit 5, micro-log cross section. This Exhibit ends at the so-called credt. If you

had this Exhibit protrude out to the right, it would show the crest dipping down as you go over to the right, would it not?

A My map indicates no completed wells over there unless the completion is very recent and, east of 13, there is the 21. Is that completed? My map does not show it completed. East of that well is Sinclair, which is still being drilled.

Q Looking on the structure indicated by Exhibit I, other wells have been producing on the other side of the crest, in the southeast or easterly direction. Is that not true?

A Yes.

Q Mr. Williams, I believe your testimony was with respect to Exhibit 3, and which Judge Foster this afternoon had you correct your original testimony of this morning, in respect to drill stem test calculations you made on your well?

JUDGE FOSTER: I did not have him correct it! He called my attention to it and wished to have that corrected himself.

Q Well, in which you attempted to correct your testimony this morning, there being an error in your calculations as indicated on your Exhibit No. 3. It is your testimony now that your estimate there would be a 3,000 fill up on drill stem test?

A Approximately.

Q And your testimony still remains in respect to Atlantic's well - 1990 fill up on a drill stem test - that still remains?

A Yes.

Q Faced with a drill stem test of 1990 on Atlantic's well

and 3000 or more on the Phillips well, could you answer Judge Foster as to which is the better well?

A I would say the one at 3000.

Q You would prefer your well to the Atlantic well?

A Yes.

Q And, in that respect, you are correcting Judge Foster's question in which you gave an answer just opposite to this morning's answer?

A Judge Foster did not have the correct information.

Q And now you wish your testimony to be changed, that you prefer the Phillips well?

A Yes.

COM. SPURRIER: Does anyone else have a question of this witness? If not, the witness may be excused.

(Witness excused)

COM. SPURRIER: We will take a short recess.

(Whereupon, at 3:10 p.m. a ten minute recess was taken.)

COM. SPURRIER: We will continue now. Judge Foster, did you have another witness?

JUDGE FOSTER: Mr. Washburn, will you be sworn please?

E. N. WASHBURN

having been first duly sworn testified as follows:

DIRECT EXAMINATION

BY JUDGE FOSTER:

Q Will you please state your name?

A E. N. Washburn.

Q You are the same Mr. Washburn who testified before in this case, are you not?

A Yes.

Q Mr. Washburn, how many barrels of oil at present prices will it taketo pay out a Wolfcamp well?

MR. SELINGER: We wish to object to this question on the ground that the matter has been gone into in the original hearing on July 16th here.

JUDGE FOSTER: I understand it would take 116,000 barrels to pay out. I wish to get the correct understanding about it. I think it is a fair question.

COM. SPURRIER: Let us get some new testimony.

JUDGE FOSTER: May I, for the purpose of the record, state what the answer would be? It is very important if there should ever be a court contest. They try it on the record and you can rule on the advisability or in inadvisability of the evidence, but I think it is important this witness be permitted to answer.

COM. SPURRIER: If it is new testimony we will hear it, but, if it is the same as the last hearing, I can see no reason to go over it again.

MR. SELINGER: My objection still stands that we went over this whole thing - the cost of the well by the amount of recoverable oil: The amount of oil necessary for each forty acres to pay out, and I see no reason to rehash it all over again.

JUDGE FOSTER: It is not my intention to do so.

COM. SPURRIER: If it is not in the record, put it in. What is your answer?

A 116,000 barrels of gross oil.

Q What do you mean by gross oil?

A Total oil.

Q Have you made any computation of the number of dual oil completed wells that Phillips Petroleum Company has operating today?

MR. SELINGER: I also wish to renew my objections, because he went into this at the last hearing.

COM. SPURRIER: Have you answered that before?

A I have similar data that is of a later date.

JUDGE FOSTER: It is a little different testimony.

MR. WHITE: I might state this to the Commission, that under this petition for rehearing, in my mind, I question the materiality of all the evidence introduced this morning and afternoon in this hearing. The grounds for rehearing are: 1. That Order 351 entered here was for further evidence. 2. As to the date of the Order. 3. That the Commission, in issuing said Order, acted unreasonably, arbitrarily and capriciously. I think the evidence should be set forth on the grounds set forth in the petition and not go over the whole case!

MR. SELINGER: That is why I objected. He is retrying it without the introduction of new testimony and this went through all of this morning and now this afternoon it is still testimony

of the last hearing!

JUDGE FOSTER: That while he testified as to the number of these wells, there is nothing in this record to show that Phillips has had ten years' experience in dually completing oil wells, and there is nothing in this record now to show that the depth, the range of the depth to which these dually completed wells have been completed by Phillips Petroleum Company, and if we are permitted to do so, we will show that we started in 1943 and, up to the present time, that we have dually completed seventy oil wells and that insofar as these seventy oil wells are concerned that no mechanical failure of the packers in those wells have ever resulted in any injury to the reservoir in which we have completed these wells. I think that is important in this case. There has been much said here and much objection about packer failures. We do not say that packers do not fail. Any mechanical device will fail at times as far as that is concerned, but I think it has very much probative value to show over ten years' experience by Phillips Petroleum Company that we have dually completed these seventy oil wells in widely varying areas from depths less than involved here to depths greater than involved here and that there has been very few failures in those wells and the few failures that have occurred, have not resulted in any injury to these reservoirs.

MR. WHITE: If that is your contention, what is it that you have to support your petition for rehearing on - your statement that the Order was unreasonable, arbitrary and capricious. What

testimony do you have to show that the order was unreasonable, arbitrary and capricious?

JUDGE FOSTER: I call your attention to Paragraph F under No. 3 of the Petition which reads that the Order will require the drilling of several wells. That will mean a terrific loss and that is the purpose of this testimony, to show that those excess number of wells would be required under the Order.

MR. WHITE: That is your ground for claiming that the Order is unreasonable, arbitrary and capricious?

JUDGE FOSTER: That is correct.

MR. WHITE: The Order would have to be based on what was introduced at the last hearing.

JUDGE FOSTER: We asked for a rehearing and it seemed to me we should have one.

MR. WHITE: The whole testimony is out of the scope of the petition.

MR. MADOLE: All of the testimony outlined by Judge Foster was available at the previous hearing - all of this testimony given this morning and so far this afternoon - was available. There was no Motion for continuance to present additional testimony. The Motion as I understand it, and it was apparently created to show they have newly discovered evidence that had developed since the last hearing. This here is simply a rehash and simply an accumulation of testimony that could have been put forth at the previous hearing. If they had prepared themselves to adequately prepare their

Petition at the first hearing and I do not understand that a Motion is granted for rehearing for them to bolster their own inadequacies. If they have some new evidence developed since the previous hearing, certainly the Commission is within its jurisdiction to permit that evidence to come in, but not simply to retry the evidence of the previous hearing. I do not think that is the function of this Motion for rehearing.

JASON KELLAHIN: I would call your attention to Paragraph D of the petition which alleges that the equipment proposed to be used will provide adequate protection to the horizon which is clearly shown, and also will protect all correlative rights, and I do think we can present such testimony at this time.

MR. MADOLE: They presented their Otis pressure group and we had a demonstration of the effectiveness of packers and crossover nippels, etc. , but Paragraph D wholly refers to prior testimony.

COM. SPURRIER: If you have new testimony, let us hear it.

JUDGE FOSTER: Do you consider this testimony new?

COM. SPURRIER: If it is not in the previous record, it is new.

JUDGE FOSTER: I think what I am offering here is new testimony.

COM. SPURRIER: Proceed, and we will see.

Q (By Judge Foster) I have here a tabulation showing dually completed oil wells that Phillips Petroleum Company has as of July 1st, 1953 giving the pool, lease, well number - in the lower zone its name and depth perforated and, in the upper zone, its name, the depth of perforation, and the date it was dually completed. Will you hand that to the reporter please so that she can mark it Phillips Petroleum Company's Exhibit No. 6.

(Phillips Petroleum Company Exhibit No. 6 marked for identification.)

MR. MADOLE: We object to that!

MR. SELINGER: They were here on July 16th and all this testimony was available.

A (By Mr. Washburn) It is dated July 1st in the field but it is not received in Bartlesville office until September.

Q (MR. MADOLE:) You could have accumulated it at the time of the last hearing, could you not?

A Yes.

COM. SPURRIER: Proceed.

MR. MADOLE: May we have a ruling as to where we stand on this record?

COM. SPURRIER: Your objection is overruled. Proceed, Judge, but confine your testimony to new testimony.

JUDGE FOSTER: I will try to do that. You will have to decide whether it is new or not. Somebody is going to have to decide that question.

Q (By Judge Foster) Mr. Washburn, directing your attention to Exhibit 6, between what depth ranges were those seventy dually

completed oil wells?

A For the upper ones about 4400 down to a depth of 12,500.

Q Now, between what dates were those wells completed?

A From April of 1943 to August of 1953.

Q Now, to whatever extent you may have had any power failure in those wells, do you know of any power failure resulting in any damage to the reservoir?

A No, sir.

JUDGE FOSTER: That is all.

CROSS EXAMINATION

BY MR. SELLERS:

Q Mr. Chairman, we objected to this witness' testimony entirely and also to the introduction of this Exhibit. However, we wish to ask Mr. Washburn, in this Denton field, what is the difference in depth between the Devonian production and the Wolfcamp production? How much of an interval?

A I would guess about three thousand feet.

Q Can you show this Commission where in your wells of dual completion there is an interval of three thousand feet in dually completed oil wells?

A I cannot.

Q What is the maximum interval of dual oil completion on your Exhibit?

A About eighteen hundred feet I believe.

Q Now, in respect to packer failures, have you had any production

packer failures - the type of packer you run on your turbine?

A Yes.

Q Do you recall at the July 16th hearing I asked whether there had been any production packer failures and whether there had been anydual oil well packer failures?

A I do not know about the question of production packer failures, but I do remember your asking if we had a dual-dual packer failure.

Q How do you know a packer failure in a dual-dual oil completion?

A There are several ways you might identify it. You might catch it from a change in flowing of the two zones or change in capacity in stock tank return or in the gas oil ratio.

Q It is a matter of policing which is the realm of the operator, is that not correct?

A It is.

CROSS EXAMINATION

BY MR. MADOLE:

Q Mr. Washburn, you say in these seventy wells, you have never had a packer failure?

A No, I did not say that.

Q What did you say? What was the significance of your Exhibit?

A That is a list of Phillips dually completed wells.

Q You have had packer failures in these wells?

A I know of no instance in this bunch.

Q Have you investigated your records and checked on these wells in particular to see if they have had some packer failures or are you just relying on your general knowledge?

A I have not individually investigated them.

Q You do not know there have not been packer leaks?

A They have not been reported.

Q This information was not available at Bartlesville at the time of your previous testimony, is that right?

A Yes, sir.

Q Then the record of packer failures is not available to you at Bartlesville, is it?

A During my time in Bartlesville I have never known of any letter or correspondence or Report 903, in which a packer had failed.

Q But, to find out if there have been packer failures on these seventy wells, you would have to go to the district in which one was located?

A Yes.

Q And you have not done that, have you?

A No.

MR. [illegible]: That is all.

FURTHER CROSS EXAMINATION

BY MR. [illegible]:

Q On this list of dually completed oil wells that Phillips operates, how many have five and one-half inch casing?

A. I can only answer that for the part that covers West Texas. I have never worked in the Oklahoma Area. On all of the Allenburger wells we use five and one-half inch casing. Goldsmith's are five inch to the best of my knowledge, but those shown in West Texas are five and one-half inch casings.

REDIRECT EXAMINATION

BY JUDGE FOSTER:

Q. If you had a packer failure, would a report be made up?

A. Yes.

Q. Where does that report go?

A. Through all channels and Bartlesville.

Q. And that would have been available to you, would it not?

A. Yes.

Q. And, in compiling your records, you did not find any reports of a packer failure?

A. No, sir.

RECROSS EXAMINATION

BY MR. HADLEY:

Q. Let us go back now. You stated at the previous hearing that you did not have available this information. Now, is that report made on dually completed wells to Bartlesville?

A. Yes, on individual wells it comes to Bartlesville.

Q. And that is on packer failures?

A. Yes, because that would come under reconditioning.

Q. But it was not at Bartlesville at the time of the last hearing?

A. I gave the date before in the previous hearing - that it was made January 1st. We get a report semi-annually. This is the July report which got into Bartlesville after the last hearing.

Q. Are you telling this Commission that every packer failure is reported and would be there at Bartlesville?

A. Yes.

Q. Then your testimony a minute ago - to find out about packer failures you would have to go to a District - is not correct?

A. I was in error. They do come to Bartlesville.

Q. To avoid a rehash, we would like to state to the Commission - he threw in this figure of 116,000 barrels, his previous testimony in the record - and we do not agree with that figure. There is testimony as to the payout on these wells in detail in the previous hearing, but we do not want, in any way, to be bound by this 116,000 figure, especially in view of the fact that it does not coincide at all with his testimony at the previous hearing. Are you going to accept that over our objection? If you are, then we want to break down that 116,000 figure.

COL. SPURRIER: We would like to have you break that down. Do you have a calculation on that 116,000 figure?

Q. (Mr. [illegible]) How did you arrive at it? Can you outline it?

A. I used oil at 2.3. I took 7/8ths of that to deduct royalties, giving me a value of 2.4%. I took 6.4% sales tax and various state taxes out.

Q. (Mr. [illegible]): You mean gross production tax? Is that cents or percent?

A. That makes $2.476 oil worth $2.316. I assume a sixty cents per barrel lifting cost, which ends up with an oil, before income tax of $1.716 per gross barrel.

Q. (Mr. Madole): What after income tax?

A. These wells will not pay out. There is not any income tax on depletion allowance.

Q. You have $1.71 per barrel. What figure do you use for recovery?

A. I valued the Wolfcamp well at $200,000 and divided $200,000 by $1.716 and I got 116,000 barrels by slide rule. In my previous testimony I had considered income tax in that, which was why the value of my oil was less.

Q. Then you say your Fonzo would not pay out?

A. Yes, sir.

Q. Are you changing your testimony as to ultimate recovery from Fonzo?

A. I estimate Fonzo will produce 102,000 barrels.

Q. You used 120,000 before and the price of oil at $1.25.

A. I was in error but, again, I would have to pay income tax.

Q. How does income tax affect barrels to be recovered? You testified that 120,000 barrels of oil was going to be produced from your Fonzo?

A. I cannot check that figure. I arrived at 102 [illegible] the data given.

Q. I am asking about -

JUDGE PORTER: He is not denying what he has said. He is saying that he will get 107,000 barrels from Fonzo.

Q. (MR. MADOLE:) Let me read from Page 5 of the transcript of the previous hearing: "Q. What would the estimated total recovery from the Fonzo No. 1 well?" "A. I would estimate the Fonzo would have approximately 3000 barrels per acre, or about 120,000 barrels on a 40-acre unit." Now you say 116,000 barrels will be your pay out. If you took 116,000 or 120,000, then Fonzo #1 will pay out?

A. On those figures it would pay out - yes, sir.

MR. MADOLE: That is all I have to ask.

MR. MASHBURN: I cannot get but thirty-five feet of porosity.

MR. MADOLE: Let me read again from the transcript: "How thick is the Wolfcamp pay sand in the Fonzo and the Denton Nos. 12 and 13 wells?" "A. I don't have a micro-log of those wells. We estimate the footage in the Fonzo is about 35 feet of productive porosity, and that the two Denton wells will have probably fifty feet of productive porosity." That is what you testified previously.

MR. MASHBURN: I probably had an error in my calculation. You take 35 and then take 6 in all our wells and multiply that and you will come out with 107,500 barrels I believe.

JUDGE PORTER: Don't argue! Calculate it out!

MR. MADOLE: There has been a lot of mistakes, but it is on a million words!

Q. (By Mr. Nadole) Will you give us a breakdown of this $200,000 cost of your well?

A. I base that on cost of wells we have drilled.

Q. Let us just get figures. How many tangibles and how many intangibles and how much did you charge to each?

A. I did not break it down that way. I went to the Accounting Department and got the actual cost of drilling six Wolfcamp wells.

Q. What was the footage cost?

A. I do not have that. I used the over all gross cost of drilling the well - the price it cost us. I have those cost estimates here.

MR. NADOLE: We got in that circle last time - estimates of actual cost.

MR. WASHBURN: I have actual costs.

MR. NADOLE: Let us have the actual costs.

MR. WASHBURN: Denton 4 - this was the first well drilled. I will give them in order here. Denton 4 cost $190,373.55. Denton 5 cost $168,644.33; Denton 8 cost $185,360.43; Denton 10 cost $176,359.95; Denton 11 cost $196,325.57; Denton 14 cost $210,616.24. The average was $187,880.01. The last two wells is what I used for my basis, because the location of Denton 8 is not as good as these wells and we anticipate more trouble of completing the well.

Q. (By Mr. Nadole) You say you used the six wells to calculate the $200,000?

A. The question was what it would cost to drill Denton 8. I think we got into this argument before.

Q. This $200,000 is your estimate and it is not the average of the six wells.

A. It is approximately the average of the last two wells drilled.

Q. Do you have the breakdown of the last two as to how much additional work was required in these wells in the way of mechanical difficulty?

A. It was mostly perforating and swabbing at this west edge and it takes more time to get a well in.

Q. Your tangibles remain constant?

A. Yes.

Q. Your intangibles?

A. At least 90% of increase is due to intangibles.

Q. What do you estimate of the $200,000 is intangibles?

A. About $160,000.00.

Q. You would get credit on your income tax for that approximately if your income was in the 50% bracket, you would get credit for $80,000.00.

A. If you want to drill a well that would not return your money you would. However, that is not a good way to operate.

Q. That is the $64.00 question in this. We do not agree with your figures, but, if you suffered this catastrophe, you would get about $0,000 credit on your income tax.

A. You would not to charge off all your intangibles the first year.

COL. SPURRIER: If no further question, the witness may be excused.

JUDGE FOSTER: I have not quite closed the case yet. Mr. Selinger had a witness he wanted to put on. I want to take up one other matter here to which I would like to call the Commission's attention. In Order R. 351 A, which is the Order of the Commission granting this rehearing and not the Order R 350 A, which is the Order granting the rehearing on another well. In each one of those Orders I called the Commission's attention to the fact that it says that Order R 350 was heretofore entered as of August 28th, 1953 and, in Order R 351 it says it was heretofore entered on August 28th, 1953. Now, it would indicate on the face of the Order that our application for rehearing was filed too late. That being purely a jurisdictional matter, I would like to get the matter straight and, for the purposes of this record, I want to say that on July 31st, 1953, Mr. Lacey sent a telegram to Mr. Colley at Bartlesville saying our application to dually complete all four wells involved in the original hearing had been denied by the Commission and then, on September 4th, Mr. Lacey wrote me a letter which I received on September 10th saying: "We [illegible] of your order [illegible] in Cases 356, 357, 358 and 359 in which your company presented testimony at the July 16 hearing. Inasmuch as these orders were dated August 28, 1953 and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]."

-11-

I mentioned that is in the file here in this case, sent by Mr. Macy. I am not criticising anybody. I appreciate the notice given in the matter. I would also like to put into the record the duplicate signed originally by the Commission of Order A 350 and A 351, if I may do so. Now, the rest of the matter on the question which I have presented here will be handled by Mr. Kellahin, if the Commission please.

MR. MUTTER: I might state that it is well for him to state on the record what he did, in view of the fact it recites in Order A 351 as to the date of the request being placed. In view of the fact that that date does not coincide with the filing of the order in the Commission's records, which was on or about the eighth of September, let the record show the order A 350 and 351 were entered of record on September 11th.

MR. MUTTER: I assume that is what happened and regardless of the date it is signed or allowed, it is effective as of the entry which is appearing as of September 5th. On the face of the order it shows the filing date, but that brings him well within twenty days. The date it was filed in Supreme Court was September 11th. If that stands as a fact, that is all right.

MR. [illegible]: That will not truly reflected in the order itself.

MR. [illegible]: In the twenty days from which the order was [illegible] in view of the question of rehearing, in view of Mr. [illegible] statement, it is the statement by the Commission as to

the time the record reflects that the order was in and, if that is true, we have no further testimony to offer, if the Commission please.

COM. SPURRIER: The record is available, Judge, and Mr. White got his date from the record.

JUDGE AUSTIN: If that is the record, that is it. I am satisfied. Mr. Hellstrin was going to give testimony on it, but Mr. White has given that information.

MR. SELINGER: We now wish to renew our objection to the testimony given by the applicant as being all a part of the previous record of July 16th and we would like to have a ruling now on it - as to whether the Commission considers this new testimony or not.

COM. SPURRIER: Proceed with your witness, Mr.Selinger.

MR. WHITE: We are withholding our decision.

MR. SELINGER: Mr. Cooper, will you please take the stand?

J. F. COOPER

having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY Mr. Selinger:

Q. Will you please state your name.

A. J. F. Cooper.

Q. [illegible]

A. [illegible]

A. At that capacity.

Q. Petroleum Engineer.

Q. Mr. Cooper, you were here on July 16th covering this same application?

A. Yes.

Q. Does Skelly Oil Company have any Wolfcamp wells in the Benton Field?

A. We have six.

Q. Have they all been drilled and completed?

A. Yes.

Q. And all producing?

A. Yes.

Mr. SELINGER: Will you please mark this as Skelly Exhibit No. 1 please?

(Skelly Exhibit No. 1 marked for identification.)

Q. I hand you what has been identified as Skelly Exhibit No. 1. Does that reflect the extent of Skelly Oil Company's operations in Benton field in a sort of report?

A. Yes, as far as Wolfcamp is concerned, yes.

Q. When was the first oil well started?

A. February of 1952.

Q. And the last well completed?

A. April of 1952.

Q. And what was the average [illegible] per day?

A. Well, I would [illegible]

A. The average cost was [illegible].

Q. What was the payout time per well?

A. Per well was about 12.7 months.

Q. I will ask you whether or not at this time Skelly Oil Company wells in the Wolfcamp in the Benton Field are paid out.

A. I cannot answer that directly, but based on a projection on the rate they would pay out as of June 30th, they should have paid out by October 1st.

Q. And the reason you cannot get definite information is the fact that all the bills are not all in and debited yet?

A. The bills, runs, and everything has not hit the books.

Q. But, from February, 1952 to April of 1953 and down to July 1st, you have had the benefit of six wells' production?

A. They were completed at various times and we have had their benefit. All six wells have not been producing for that period of time, however.

Q. Mr. Cooper, would you say the cost of drilling a Wolfcamp well, as far as the Skelly Oil Company is concerned, is an average of $47,000 plus?

A. Yes.

[illegible]: That is all.

[illegible]: Any further questions of the witness?

(No further questions were asked.)

[illegible]: If not, the witness may be excused.

[illegible]: We understand the oral deposition is part

of the case and also there will be included in the record as Magnolia's Exhibit No. 1, the accumulative runs from each of the wells in the Wolfcamp in the Benton field. Is that correct, sir?

COL. SPURRIER: Mr. Selinger's objection was overruled. You are asking if this evidence that is presented is accepted as new?

MR. HADDEN: I am just asking if the original record in the July hearing will be considered with this testimony and that we will be allowed to supply the accumulative production on the Wolfcamp wells as reflected from the records of this Commission which Mr. Lacey is going to check and supply as our Exhibit No. 1.

COL. SPURRIER: Do you have anything else, Judge?

JUDGE FOSTER: I have a few remarks. I want to point out one or two things. Sooner or later it seems to me that this Commission must reach the point where it is willing to grant applications for dual completion of oil wells. I do not know whether you have got to that point in your thinking or not but, in any event, it is just the march of time. Everybody else is doing it. It is being done fairly successfully according to this record. Now, I know that you will find packer failures. You will find them in oil wells that are dually completed - oil and gas wells. You find failures in anything that is mechanical but that is no reason for not permitting us to complete these wells. Now, Virginia fell out of the sky due to mechanical failure. I never signed his drilling

-3-

wrecks and the wrecks causing deaths. There are mechanical defects on automobiles, but, because of these mechanical failures, nobody would argue that you should stop flying, going on railroads or automobiles and it is just as logical to say that because there may be a mechanical failure in one of these packers, that you should not grant a dual completion of an oil well. It is in the record, if the Commission please, of the Phillips Petroleum Company's experience and that is all the experience we have had over ten years of dually completed wells - oil wells - not oil and gas, but dually completed oil wells, that we have not had any report of packer failures in those wells and we do not know of any reported packer failure in any wells that have caused any damage to the reservoir due to contamination in the two zones. It is all right to say that can happen but I am sure if there had been such instances that the opposition here, as strong as it is, would have dug it up and presented it to this Commission. They did not. They are simply content to argue that it could happen.

On the economic side of this picture, I do not know what kind of an operator Shelly is, as I have said, poor by virtue of his record in his figures, but it is in the record that my good, [illegible] business man who would go into this, would [illegible]

[illegible]

[illegible]

formation, if it is not feasible, then it is only to get it out of the hole we have already got - the hole in the Devonian. If the Commission does not do that, then this record is clear and not denied that the productive oil that is in the Wolfcamp zone in these two wells will be produced by these offset operators - a large portion of it will. Some of it will not. That will be a loss for the people of the State of New Mexico. It will just stay there. We just ought to be practical and hardheaded about this thing. It would seem to me to protect the interest of our royalty owners, you should permit us to dually complete these wells and produce this oil that we can produce through a dually completed well and pay that royalty to the royalty owners and I believe that we have a legal obligation to the royalty owners, and, if it is not legal, it is certainly moral. We are trying to protect everybody's interest. What have the opposition here to lose? Just briefly, how can Skelly get hurt if this Commission grants this dual completion? What has Magnolia to lose? What has Shell to lose? What has Amerada to lose? It is no skin off their nose as they are here fighting it is something I do not understand. Or the fact that they have drilled wells in the same formation of the same characteristics, etc. does not prove that every well should be drilled. Now, why is it that Magnolia objects to this? How can it be harming injure. They will not be any barrels of oil as they could ever get if you permit us to do this to our wells as, they will get a lower , if you don't.

these things get pretty plain to me just what the issue is and you just deny us the right to dual these wells and get that productive oil under our land there and deny us the right to dual and that productive oil will go to these other operators in this field and that is not something you can just laugh off. I think we have shown this Commission, in good faith, the way we see it, that we cannot twin these wells and pay them out. There is a serious question about it. Sooner or later in New Mexico you are going to be dually completing these oil wells. I know there is some objection to dually completing wells, and I do not say you should establish a policy of dually completing wells, but it is only after you have found the facts and I think when the Commission sits down conscientiously and digests these facts, you would be amply justified to let us complete these two wells. We have done all we can to remove any question of doubt you have in your minds. If anybody has failed, perhaps it is me. There may be some argument about these figures, as to what it takes to pay out a well. Mr. Washburn told us when he used thirty-five feet and six percent that he was wrong and you will get 116,000 barrels of oil and that, multiplied out, gives you so many thousand dollars.

I respectfully ask this Commission to give favorable consideration to our request and grant our application to dually complete these two wells.

I [illegible] on behalf of

Magnolia. I am not planning to make any lengthy statement, but Judge Foster is implying here that we are coming here with an evil intent to steal his oil. We are here to oppose the dual completion on the ground that it embodies risk to the reservoir. He says there is no direct evidence in this record of packer failure. Either he is not reading his mail right or I am not because -

JUDGE FOSTER: I did not mean to say there is no record of packer failure.

L.C. LABOLE: We brought our engineer from Texas and proved to our satisfaction that we had suffered twelve packer failures over there in a field - a total of twelve failures, of which he attributed nine to packer failure. He further testified that he found evidence of injury to the reservoir. That is not conjecture. Now, Mr. Foster refers to planes and railroads and automobiles. You have rules and regulations of running those automobiles. If you are a safe driver you stay on the right side of the road. All we suggest is that they stay on the right side of the road and put another hole down in that field and they will experience no difficulty or injury to the reservoir. He says no matter of injury. If there is injury to the reservoir, and we are already offsetting these wells, we would be affected and if there was correlation in the zone or area, it would adversely affect our well. Now, he is in the oil kind of a mess to make it and object his application so that we can block his

oil. That is not true. We suspect that Judge Foster is using this Commission to wash a little dirty linen of his own - his royalty owners demands for drilling. If we are going to get into personalities and what is behind this, I think a full disclosure would reveal that they have had a demand for drilling these two Wolfcamp wells and that is the purpose of this hearing to avoid and try to tie down a possible lawsuit action in the Courts of New Mexico.

[illegible]: Do you wish to speak?

J. H. VICKERY: My name is J. H. Vickery and I represent the Atlantic Refining Company. Atlantic Refining Company has approximately twenty percent of Denton field and we have no objection to the application of Phillips Petroleum Company to dually complete their Fort No. 1 and Fonzo No. 1. Atlantic has found that dual oil completions have been feasible in other areas where the Company operates and I would like to go on record to favor dual oil completions in the State of New Mexico.

[illegible]: If the Commission please, Shelly Oil Company wishes to remove its objection to Phillips Petroleum [illegible]

the Commission. I also want to point out that the matter of policing is a difficult one. It rests entirely with the operator, and we think that is a very important consideration of this Commission - this policing. Outside of bottom hole tests and gas returns, there is no way that the State or offset operator can be advised of such contamination if it exists and that is our sole interest in opposing Phillips - the danger of contamination. If they wish to contaminate their property, that is their business, but, when it comes to a common reservoir, where we might get injured, that is our objection. We wish to particularly call this Commission's attention to it here. We have also indicated that their equipment was unproven at great depths where there is also a casing interval in respect to five and one-half inch casing. I think all these things should be thought of by the Commission in regard to the State as a whole and particularly to the Denton pool.

B. A. BASKIN: My name is B. A. Baskin and I represent Shell Oil Company. As explained before, even though [illegible] part owners with the Phillips Petroleum Company in the [illegible] wells, to refer again to our previous statement [illegible] request for orally completing [illegible] wells.

[illegible]: [illegible], I would like to [illegible] to show this [illegible] this hearing [illegible] should.

[illegible]: [illegible], I will take the case under advisement.