

CASE 1962: Application OF McGRATH AND
SMITH for a special allowable for
the TIDEWATER-STATE WELL NO. 1.

Case No.

1962

Application, Transcript,
Small Exhibits, Etc.

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 6/2/60

CASE 1962

Hearing Date 9am 5/11/60
DSN @ SF

My recommendations for an order in the above numbered cases are as follows:

Enter an order denying the application of McGrath and Smith for a special allowable for their Tidewater State Well No. 1, located 2310 feet from the South and East lines of Section 18, Township 13 South, Range 32 East, Lea County, New Mexico.

My reasons for the above recommendation are as follows:

1. Applicants drilled their well as close to an existing water flood as possible (330' from the boundaries of the 40-acre tract) and in all probability expected to benefit from the water flood project conducted by another operator. If the subject well is to be considered as part of the water flood, it would have to be converted to a water injection well to continue the pattern of injection.
2. Both parties agree that although applicant's acreage is ~~being~~ affected by three injection wells on the North Central Caprock Queen Unit, the oil that is currently being produced from the subject well is ~~not~~ primary oil and is not coming from the North Central Caprock Queen Unit area.

Staff Member

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date _____

CASE _____

Hearing Date _____

My recommendations for an order in the above numbered cases are as follows:

3. assuming injection of water into the three said injection wells, ^(18-6, 18-8, & 18-14) it is reasonable to assume that higher pressures will exist on the Unit acreage than on the applicants acreage, and although there may be migration of oil to ~~a~~ ^{some} degree from applicants acreage toward the two producing wells on the Unit acreage, there will probably be a ^{more than} compensating amount of migration of oil from the high pressure unit area to applicants acreage, thus assuring adequate protection of correlative rights though application is denied.
4. That an impermeability barrier exists along the east flank of the Caprock Queen Pool, which barrier will prevent the migration of oil away from the productive limits of the pool on the east side, thus the denial of the request will not cause waste.

I would also recommend that the order include the following provisions:

- ① That every ^{reasonable} effort be made by the applicant and by the working interest owners of the ~~Caprock Queen Unit~~ ^{Caprock Queen Unit} to incorporate the subject well in the unit area.
- ② That Gt. Western Dry Co as operator ^{Staff Member} of the N. Central Caprock Queen Unit be admonished to make every reasonable effort to restore their 18-8 and 18-14 to effective water injection.

Dan
DOCKET: EXAMINER HEARING MAY 11, 1960

Oil Conservation Commission - 9 a.m., Mabry Hall, State Capitol, Santa Fe.

The following cases will be heard before Daniel S. Nutter, Examiner, or Oliver E. Payne, Attorney, as alternate examiner:

- CASE 1958: Application of Texaco Inc., for approval of an automatic custody transfer system. Applicant, in the above-styled cause, seeks an order authorizing the installation of an automatic custody transfer system to handle the production from the Echol-Devonian Pool from all wells on its State "AR" Lease, consisting of the N/2 SW/4 and Lots 3 and 4 of Section 2, Township 11 South, Range 37 East, Lea County, New Mexico.
- CASE 1959: Application of Sinclair Oil & Gas Company for approval of an automatic custody transfer system. Applicant, in the above-styled cause, seeks an order authorizing the installation of an automatic custody transfer system to handle the production from the Empire-Abo Pool from all wells presently completed or hereafter drilled on its M. Yates "B" Lease, consisting of the S/2, NE/4, S/2 NW/4, and NE/4 NW/4 of Section 33, Township 17 South, Range 28 East, Eddy County, New Mexico.
- CASE 1960: Application of Gulf Oil Corporation for approval of a unit agreement. Applicant, in the above-styled cause, seeks approval of its North Caverns Unit Agreement, which unit will embrace approximately 6,303 acres of Federal and State land in Townships 22 and 23 South, Range 24 East, Eddy County, New Mexico.
- CASE 1961: Application of Gulf Oil Corporation for permission to commingle the production from four separate pools and for approval of an automatic custody transfer system to handle said commingled production. Applicant, in the above-styled cause, seeks permission to commingle the production from the Blinebry, Drinkard, Paddock, and Penrose-Skelly Pools from all wells located on its C. L. Hardy lease comprising the SW/4 of Section 20, Township 21 South, Range 37 East, Lea County, New Mexico, after separately metering only the production from the Blinebry Pool and to allocate the Drinkard Paddock and Penrose-Skelly Pool production without prior metering or measurement but on the basis of monthly individual well tests. Applicant further seeks approval of an automatic custody transfer system to handle the said commingled production from all wells on the said C. L. Hardy lease.

CASE 1962:

Application of McGrath and Smith for a special allowable for one well in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico. Applicant, in the above-styled cause, seeks a special allowable for one well offsetting a capacity water-flood project in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico. Said well is the Tidewater-State Well No. 1, located in the NW/4 SE/4 of Section 18, Township 13 South, Range 32 East, Lea County, New Mexico.

CASE 1963:

Application of Aztec Oil & Gas Company for an unorthodox gas well location and for approval of two non-standard units. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Blanco-Mesaverde Gas Pool for its Richardson Well No. 6, to be located in the SE/4 of Section 22, Township 31 North, Range 12 West, San Juan County, New Mexico. Applicant further seeks establishment of a 297-acre non-standard gas proration unit in the Blanco-Mesaverde Gas Pool and a 297-acre non-standard unit in the Dakota Producing Interval, each consisting of the E/2 of said Section 22 and to be dedicated to the said Richardson Well No. 6.

CASE 1964:

Application of Aztec Oil & Gas Company for an unorthodox gas well location and for approval of two non-standard units. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Blanco-Mesaverde Gas Pool for its Richardson Well No. 7, to be located in the SE/4 of Section 15, Township 31 North, Range 12 West, San Juan County, New Mexico. Applicant further seeks establishment of a 309.55-acre non-standard gas proration unit in the Blanco-Mesaverde Gas Pool and a 309.55-acre non-standard unit in the Dakota Producing Interval, each consisting of the E/2 of said Section 15, and to be dedicated to said Richardson Well No. 7.

CASE 1965:

Application of Aztec Oil & Gas Company for approval of an unorthodox gas well location. Applicant, in the above-styled cause, seeks approval of an unorthodox location in the Blanco-Mesaverde Gas Pool for its Thompson Well No. 6, to be located in the SE/4 of Section 28, Township 31 North, Range 12 West, San Juan County, New Mexico.

CASE 1966:

Application of Texas National Petroleum Company for an oil-gas dual completion utilizing parallel strings of casing cemented in a common well bore and for an unorthodox gas well location. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of a well to be located at an unorthodox location 660 feet from the North and West

-3-
Docket No. 13-60

CASE 1966:
(Cont.)

lines of Section 1, Township 25 North, Range 9 West, San Juan County, New Mexico, in such a manner as to permit the production of oil from the Gallup formation and the production of gas from the Dakota Producing Interval through 2 7/8-inch casing and through 2-inch tubing set in 4 1/2-inch casing respectively with the casing being cemented in a common well bore.

ig/

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

June 7, 1960

Mr. Jack Campbell
Box 766
Roswell, New Mexico

Dear Sir:

On behalf of your client, McGrath and Smith, we
enclose two copies of Order R-1689 in Case No. 1962,
issued by the Oil Conservation Commission this date.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ir/

Enclosures: (2)

Carbon copy of Order R-1689 sent to:

Mr. Sim Christy - Roswell
Oil Conservation Commission:
Artesia
Hobbs

*This order sent to
Supreme Court June 8, 1960
sh*

C
O
P
Y

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 11, 1960

EXAMINER HEARING

IN THE MATTER OF:

Application of McGrath and Smith for a special allowable for one well in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico. Applicant, in the above-styled cause, seeks a special allowable for one well offsetting a capacity waterflood project in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico. Said well is the Tidewater-State Well No. 1, located in the NW/4 SE/4 of Section 18, Township 13 South, Range 32 East, Lea County, New Mexico.

CASE 1962

BEFORE:

Mr. Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: The hearing will come to order, please.
The first case this afternoon will be Case Number 1962.

MR. PAYNE: Case 1962: Application of McGrath and Smith for a special allowable for one well in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico.

MR. CAMPBELL: Mr. Examiner, I'm Jack M. Campbell, Campbell and Russell, Roswell, New Mexico, appearing in behalf of the Applicant.

MR. NUTTER: Any other appearances?

MR. CHRISTY: Sim Christy of Hervey, Dow and Hinkle for interested operators in the immediate area, Great Western

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



I N D E XWITNESSPAGE

GUY SWARTZ

Direct Examination by Mr. Campbell	6
Cross Examination by Mr. Payne	14
Cross Examination by Mr. Christy	19
Cross Examination by Mr. Payne	32
Cross Examination by Mr. Nutter	34
Cross Examination by Mr. Payne	40
Cross Examination by Mr. Nutter	41

DEWEY THORNTON

Direct Examination by Mr. Christy	43
Cross Examination by Mr. Payne	48
Cross Examination by Mr. Nutter	49
Cross Examination by Mr. Campbell	52
Redirect Examination by Mr. Christy	53
Recross Examination by Mr. Campbell	54

MERRILL WILSON

Direct Examination by Mr. Christy	55
Cross Examination by Mr. Campbell	68
Cross Examination by Mr. Nutter	72
Cross Examination by Mr. Payne	76
Cross Examination by Mr. Nutter	76
Cross Examination by Mr. Payne	77
Redirect Examination by Mr. Christy	78
Recross Examination by Mr. Payne	79
Recross Examination by Mr. Campbell	81
Redirect Examination by Mr. Christy	85
Recross Examination by Mr. Campbell	86
Recross Examination by Mr. Nutter	88
Recross Examination by Mr. Campbell	89

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



Delfern Oil Company, Wolverine Oil and Whaley Company, who collectively own approximately 43.6 percent of offset acreage. I have also been authorized to speak for Graridge, who owns 26.2 percent, in application for motion for continuance.

We would appreciate a continuance of this case for what we believe to be an excellent reason. We have no objection if the Applicant wishes to present his testimony today. Our reason for it is that the well in question and the lands in question immediately offset the North Central Caprock-Queen Unit, and a meeting has been called for May 19 among the working interest owners, and Mr. Smith and Mr. McGrath have been notified, at which time it will be considered the possible taking of this acreage into the Unit and the formula or percentage of participation factors. Those things will be discussed. In which event, if it were taken in, the application would be, so to speak, moot.

MR. NUTTER: Are you making that motion on behalf of all these people?

MR. CHRISTY: Yes, all the people. It amounts to about 60 percent of the offset operators.

MR. NUTTER: We have a continuance request from Whaley Company.

MR. CHRISTY: That is included in my 60 percent.

MR. NUTTER: We have a communication from Ambassador.

MR. CHRISTY: That is not included in my 60 percent.

Ambassador owns --

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



MR. NUTTER: I stand corrected. We have a communication from the Graridge Corporation.

MR. CHRISTY: That is included in the 60 percent.

MR. NUTTER: That's included in your list of clients?

MR. CHRISTY: Yes, sir. I do not represent Graridge in connection with the application, other than the motion for continuance.

MR. CAMPBELL: It's my understanding, Mr. Examiner, that negotiations to include this well as a part of the Unit had been in process verbally for some time, now, since the completion of the well, as a matter of fact. The meeting that is being referred to here, of course, is for the purpose of trying to determine the basis on which this well may be brought into the Unit. That is a matter of contractual negotiation between the present operators in the Unit and the Applicant here.

Even if the meeting is held on the 19th, the chances of a decision being made on the 19th, it seems to me if it's been dragging on now for a month, are rather remote, and it's the position of the Applicant here that if they're correct that damage can occur over a period of that length of time. In the meantime, they're going to have to, I presume, reduce this well to its normal unit allowable for a period of some time here, and we feel it would damage them and their correlative rights; and all we are actually seeking here is some relief while the negotiations to get into the Unit on some reasonable basis can be completed.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

We don't feel that the Commission should be asked by either of us, as a matter of fact, to put either party in the position of negotiation that is relatively untenable insofar as this Unit is concerned, and all we're asking is that during this period of time we are given an opportunity to operate on the same basis as other people in the Unit. We feel that the continuance would work to our detriment so far as correlative rights are concerned.

MR. NUTTER: Mr. Campbell, is your application for a special allowable on a temporary basis?

MR. CAMPBELL: Yes, sir. As a matter of fact, the allowable that we would presently seek would be an allowable based on the present producing tests on this well for a limited period of time, until we can determine whether there is a meeting ground on which this acreage can be brought into the Unit. As I understand it, it's the extent of the participation and determination of the primary and secondary reserves under this tract. The Commission doesn't, I'm sure, intend to get into that, but while that's pending, we don't like to be in the position of sitting there at what we think is a disadvantage over a period of time. It certainly wouldn't be any inducement for anybody to negotiate with us if we have a shutin well.

MR. NUTTER: You are objecting to the continuation of the hearing?

MR. CAMPBELL: Yes.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

MR. CHRISTY: The Unit Agreement in question was approved by the Commission in Case 1564. The subsequent joinder problem is covered in Article 31, under Section 4, Point 2 of the Unit Operating Agreement, to which Smith and McGrath are a party. They are a party to this Unit Agreement. It provides for fourteen days notice before anyone can be brought into the Unit. Smith and McGrath's application to get into the Unit is dated May 2, 1960. I believe it was actually received the 3rd. At any event, on May 2 we knew it could not come in until at least the 16th of May or subsequent to this meeting.

The meeting has been called. We have to give the fourteen days' notice. The meeting was called for the 19th, based on a letter of the 6th which is exactly fourteen days, as soon as we could hold the meeting. We don't feel that he is being penalized by virtue of his own actions. This well, I believe the testimony will bring out, was completed in March or early April, and it was not until May 2nd that he asked to be admitted to the Unit.

For that reason we feel that the continuance is in order, in order to give the interested parties an opportunity to negotiate the question. If we fail in the negotiations, fine, come back and make this application.

MR. NUTTER: Mr. Christy, inasmuch as the Applicant is asking for a special allowable on a temporary basis, and also inasmuch as any party that is affected by an order entered as a result



of an Examiner hearing has a right to a hearing de novo before the Commission, we feel we should go on with the hearing today.

MR. CHRISTY: I would like to have my name entered for the Great Western, Delfern, Wolverine, and Whaley, my name entered for the people I spoke of.

MR. CAMPBELL: Are you ready to proceed?

MR. NUTTER: Yes, sir, Mr. Campbell.

MR. CAMPBELL: Would you state your name, please?

MR. PAYNE: We haven't sworn the witness yet.

MR. CAMPBELL: Excuse me, this is the only witness.

(Witness sworn.)

GUY A. SWARTZ

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q Will you state your name, please?

A My name is Guy A. Swartz.

Q Where do you live, Mr. Swartz?

A In Roswell, New Mexico.

Q What is your profession?

A I'm a Consultant Engineer and Geologist.

Q Have you testified previously before this Commission in your capacity as a Consulting Engineer and Geologist?

A I have.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6631

ALBUQUERQUE, NEW MEXICO



Q Are you presently employed by the Applicant here as a consultant in this particular matter?

A I am.

MR. CAMPBELL: Are the witness' qualifications acceptable to the Examiner?

MR. NUTTER: Yes, sir, Mr. Campbell. Proceed.

(Applicant's Exhibits Nos. 1, 2 & 3 marked for identification.)

Q (By Mr. Campbell) Mr. Swartz, I hand you what has been identified as Applicant's Exhibit No. 1 in this case and ask you to state what that is, please.

A Exhibit No. 1 is a plat of the area surrounding the McGrath and Smith Tidewater-State lease located in Section 18, Township 13 South, Range 32 East, in Lea County, New Mexico.

Q What are the green border lines shown on Exhibit No. 1?

A The green border line shows the eastern portion of the North Caprock-Queen Unit which does offset the McGrath and Smith lease, which is further outlined in red.

Q Is that the North Central Caprock-Queen Unit, instead of the North Caprock-Queen?

A That is the North Central Caprock-Queen Unit, yes, sir.

Q What are the contour lines shown on Exhibit No. 1?

A The contours are in ten foot intervals, and it has been contoured on top of the Queen pay.

Q You have referred to the well situated in the Southeast Quarter of Section 18; how is that well designated now?

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A That well is further located --

Q No, what is the name now?

A The name of the well is McGrath and Smith No. 1 Tidewater-State.

Q Where is it located geographically?

A It is located 2310 feet from the South and East lines of Section 18, Township 13 South, Range 32 East.

Q When was that well completed?

A That well was completed on April 4th -- I'm sorry, that's 4-12-60; that would be April 12, '60.

Q Mr. Swartz, do you know why that particular well was drilled at this date?

A That well was drilled on a geologic position there in relation to the other wells and partly influenced by the examination of cores in the north offset well, which was drilled by the North Central Caprock-Queen Unit.

Q Is that the well designated as Well 18-7?

A That is correct.

Q Did that well core demonstrate the possibility to McGrath and Smith of a commercially producing location in the Southeast Quarter of Section 18?

A Yes, sir, it did.

Q I hand you what has been identified as Applicant's Exhibit No. 2 and ask you please to state what that is.

A Exhibit No. 2 is merely the request for oil and gas



allowable filed by McGrath and Smith on this particular well. It's further designated as being C-104 of the New Mexico Oil Conservation Commission forms.

Q What does that particular report reflect with regard to the initial tests on that well?

A This report indicates that after a treatment of 250 gallons of acid --

MR. CHRISTY: Excuse me. Is he testifying as to what the report says or what he knows? I'm unclear.

Q (By Mr. Campbell) Are you acquainted with the well test on this well?

A I did not personally take the test.

MR. CAMPBELL: Are you objecting to his testifying as to what's on the report to the Commission?

MR. CHRISTY: No, if I just understand that he is testifying as to what this paper says, is that correct?

Q (By Mr. Campbell) Is that your testimony?

A Yes, I guess that would be correct.

Q You haven't tested the well yourself?

A I haven't personally taken any tests myself.

Q What does the form reflect with regard to the initial test on this well?

A After a treatment of 250 gallons of acid and 7,500 gallons of sand frac, the well was completed and potentialized for 64 barrels of oil and 43 barrels of water in 24 hours by pump.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Do you know what the well is now producing or can produce?

A On May the 6th, last Friday, the well was subsequently tested and it produced the same amount as it was originally potentialized for by pump.

MR. NUTTER: Is that amount of oil the same, and also the water?

A Yes, the water was approximately the same.

Q (By Mr. Campbell) Has this well been cored?

A Yes, sir. The well was cored and the cores were analyzed by Core Lab.

Q Have you studied the core analysis that was furnished by Core Lab on the core from this well?

A Yes, sir.

Q Just a minute. I hand you what has been identified as Applicant's Exhibit No. 3, and ask you to state what that is, please.

A Exhibit No. 3 is a copy of the analysis with the summary and the detailed chart which was derived by analysis of the core in the McGrath and Smith No. 1 Tidewater-State.

Q Do you have the original core analysis report from Core Laboratories, Inc., here with you available?

A Yes, sir.

Q What does this core analysis of Core Laboratories, Inc., reflect, Mr. Swartz?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A The analysis reflects that the well is better than normal, or better than average for the Caprock-Queen area. It reflects ten feet of pay having 39, an average of 39 millidarcies permeability, an average porosity of 18.3 percent, and an average total water saturation of 48.1 percent. These figures reflect that this well is probably better than the normal wells that have been cored throughout the Caprock-Queen area.

Q Are you acquainted with any of the data from the core analysis on the Unit Well 18-7?

A I do not have that analysis in hand; however, this core analysis is indicated to be better both, well, at least in amount of total pay thickness.

Q Have you made any study of the condition of the wells immediately offsetting the Southeast Quarter of Section 18 to the North and the West?

A Yes, I have. The well in the North -- the well in the Southeast of the Northeast, which is designated as 18-8, and which is a Northeast diagonal offset to the subject well, has been placed as an injection well. However, according to the progress report of the North Central-Caprock-Queen Unit, that's progress report 15, they haven't been able to maintain injection in this well. The North offset to the subject well, which is designated as 18-7, is a new well and has been shown in the progress report 15 to be producing 60 barrels of oil per day with no water. The diagonal Northwest offset, designated as 18-6 of the North



Central Caprock-Queen Unit, is an injection well which is reported to be injecting or taking 153 barrels of water per day injection, which could be considered a fair injection well.

The West offset, designated as the 18-11 of the North Central-Caprock-Queen Unit, has been shown by progress report 15 to be producing 130 barrels of oil per day with no water; and the Southwest offset to the subject well, designated as 18-14, is an injection well which is taking water at the rate of 64 barrels of water per day with 900 pounds pressure.

Q Mr. Swartz, considering the status of the injection wells and the producing wells immediately offsetting the well involved in this application, to the North and to the West, what is your opinion as to what might occur with regard to that well, to those properties, the property in question here, if temporary allowable relief sought here is not granted?

A Well, it is felt that with the North offsetting producer producing twice, approximately twice the amount of the normal allowable in this area, and the West offset producing approximately four times the normal allowable, it is felt that these two wells would probably drain and lower the pressure under the area which would normally be drained by McGrath and Smith No. 1 Tidewater-State, to such an extent that it would, that that particular oil would probably not be recovered or that the lease would be damaged.

Q Would that occur at a time before there was any stimulation of the well, the McGrath and Smith, by the water drive from

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

the injection?

A I don't believe that there can be too much water or too much help derived from the injection wells 18-8, which is not at the present time injecting, and the 18-14 which is one of the poorest injection wells of the North Central Caprock-Queen Unit. There probably will not be any assistance drive from water flood from those two particular wells. The other closest well, which is the 18-6, the Northwest diagonal offset to the subject well is updip and would probably, if it affected this subject well at all, would probably push the oil downdip and pass the McGrath and Smith well and not be recovered unless the capacity allowable was given to the subject well.

Q What is the situation with regard to the balance of the Tidewater-State lease there on which the McGrath and Smith well is drilled?

A The remainder of the lease is shown on the contour map to be downdip, and inasmuch as some water was encountered upon the completion of the McGrath and Smith No. 1 Tidewater-State, it is felt that further development on this particular lease downdip would have considerable risk and may not merit further development.

Q So far as you know, Mr. Swartz, are McGrath and Smith, in this instance do they prefer to become a part of the Unit if it's possible for them to do so?

A McGrath and Smith applied to the Unit for participation of this well on May the 2nd, 1960.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q What is your opinion as to whether the correlative rights of McGrath and Smith will be adversely affected if this relief is not granted?

A It would be, I believe their correlative rights would be damaged from drainage, first from drainage and secondary by possible loss of any oil from the injection wells, the sweep of the water pushing the oil away from the particular subject well.

MR. CAMPBELL: That's all I have at this time.

MR. NUTTER: Does anyone have any questions of the witness?

MR. PAYNE: Yes, sir.

MR. NUTTER: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Swartz, I believe you've testified that in large part the drilling of this Tidewater-State Well No. 1 was due to the core analysis of the 18-7 well?

A That is correct.

Q When was the 18-7 well drilled?

A It is a recent well, I don't believe I have that completion right in front of me.

Q Did this well ever produce on primary?

A I believe the 18-7 well could be considered to be producing primary oil at the present time.

Q Even though it's surrounded by injection wells on three



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

sides?

A Yes, sir, because of the injection of the surrounding wells has not been in effect for a very long period of time. It may be influenced by the injection wells surrounding it; however, neither the 18-7 or the 18-11 are making any water at the present time. Their production is probably as a result of re-pressuring.

Q Now, Mr. Swartz, this well, the Tidewater-State Well No. 1, it made water at the very start, is that correct?

A Yes, sir, that's correct.

Q Is that somewhat unusual in a solution gas drive reservoir?

A No, sir. There is a water table in this area; however, that water table is not, is very difficult to pin it down exactly in this particular area. In Section 8, 13 South, 32 East, 660 from the South line and 1980 from the East line, there is a dry hole which encountered water upon drilling, it tested water. In Section 9 -- I am sorry, in Section 17, at 1980 from the North and West lines, there is another well which encountered water on testing.

MR. NUTTER: Is that the Superior No. 3 Well?

A Yes, sir, that would be 1980 from the North and West. I think we have it designated as No. 9 here on our particular plat.

Q (By Mr. Payne) Yet the direct offset to the North of this subject well and the direct offset to the west, they don't make any water?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A No, they are not reported to be making any water.

Q Now the fact that the Tidewater-State Well No. 1 does make water, that doesn't indicate to you that the water and the oil are coming from the North Central Caprock-Queen Unit?

A No, sir. Inasmuch as there have been very small injections into the 18-8 or the 18-14, the 18-8, there has been considerable problems with that particular well and I don't believe that there has ever been any established injection rate into that well. In the 18-14, it is only taking 64 barrels of water per day with an injection pressure of 900 pounds per square inch. Some of the better wells, better injection wells in the North Central Caprock-Queen Unit, as a comparison, are taking as high as 495 barrels of water per day with an injection pressure of only 580 pounds.

Q Now what is the producing capacity of the Tidewater-State Well No. 1 on its most recent test?

A It is the same as the potential, which would be 64 barrels of oil and 43 barrels of water per day.

Q It has actually been tested since the initial potential test?

A Yes, sir. That well was re-tested this last Friday, or on May the 6th.

Q What was the initial potential of the 18-7 Well?

A I don't believe I have that in front of me here. I may be able to find that here. I believe that it was 60 barrels of



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

oil per day with no water, but --

Q The same thing as it's producing now?

A Yes, sir, I believe that's correct. I'm not positive of that, though.

Q Is that the basis for your conclusion that the 18-7 has not actually responded yet to the injection of water into the two offset wells, or three offset wells?

A No, sir. The 18-7 may be responding to the water flood in there in this particular area. However, if it is responding, it is responding to water injected from the North and West and not from water injected from the East. I say that because there has been very small amounts of water injected into the 18-8, the East offset to the 18-7.

Q If you are correct in assuming that particularly the 18-6 injection well will result in oil being pushed downdip in the direction of your Tidewater-State Well No. 1, and that if you don't have a capacity allowable it will go even beyond that, why would it not be feasible to drill an additional well on the McGrath and Smith Tidewater-State lease in order to get any such oil?

A At the present time I don't believe it would be feasible because the additional well would be further downdip and it would probably not obtain any oil initially. It would be theoretically possible that it may obtain oil after a period of time when that lease would be affected more by the water flood.

Q Are you saying then that the oil to be recovered from the



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Tidewater-State No. 1 is actually being pushed to it from the North Central Caprock-Queen Unit?

A No, sir, the core analysis indicates otherwise.

Q Mr. Swartz, did McGrath and Smith attempt to work out a line agreement here prior to the drilling of this well, and if not, why?

A I don't believe any agreement was worked out ahead of time. I don't believe that there would be authority within the rules of the North Central Caprock-Queen Unit to do so on an undrilled well.

Q Well, any two operators can get together and work out a line agreement, can't they, Mr. Swartz? I mean that's up to them, both parties wish to do so?

A However, I believe it's customary to have a well on the lease before there could be any negotiations in process.

Q Mr. Swartz, has McGrath and Smith considered drilling an injection well on the Tidewater-State lease?

A No, sir, they haven't at this time.

Q Have they considered that that might be necessary if something can't be worked out to get this lease in the North Central Caprock-Queen Unit?

A That consideration has not been taken up at this present time.

Q It might be feasible, might it not, for you to start your own water flood on this 160-acre lease?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Not without further study in this area. I doubt that it would justify drilling several injection wells on this small amount of acreage.

Q You don't have the exact date the 18-7 was drilled?

A No, sir, I don't have that completion date.

MR. CAMPBELL: We can probably get that in the record.

When was that well completed?

MR. CHRISTY: October, '59, I believe, Mr. Campbell.

MR. CAMPBELL: Thank you.

Q (By Mr. Payne) So you felt that you had to drill this Tidewater-State Well No. 1 in order to protect your correlative rights, inasmuch as its a direct offset, is that right?

A The Tidewater-State No. 1 was drilled as a well because it was thought that this particular acreage would be oil productive and it was found to be so.

MR. PAYNE: Thank you.

MR. NUTTER: Any further questions of the witness?

MR. CHRISTY: We have one or two questions, Mr. Examiner.

MR. NUTTER: Mr. Christy.

BY MR. CHRISTY:

Q Mr. Swartz, as I understood, that you are familiar with the Caprock-Queen Pool and the wells in the area?

A Yes, sir.

Q Are you familiar with this Smith and McGrath acreage we are speaking of?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Yes, sir.

Q When did they acquire it, incidentally?

A That acreage was acquired in the month of March, 1960.

Q Is that why you didn't drill it in October of 1959 to protect your correlative rights, you didn't own it?

A They did not own it at that time.

Q What did you acquire, did you acquire the 40 acres the well's on, did you acquire the 160, what do you own?

A They acquired the 160 acres.

Q Are there any further drilling commitments to earn the 160, or do you own the whole 160 as it stands?

A There is a further drilling commitment.

Q What happens if you don't drill the additional acreage, do you lose it?

A The acreage will probably go back to Tidewater.

Q Would you recommend drilling any additional 40's in the 160 involved?

A At the present time I would observe the producing capacity of the No. 1 Well, and based upon that I would make my recommendation at that time.

Q Did I understand you a minute ago in response to Mr. Payne's question that at this time you would not recommend drilling an injection, or additional well on the 160 acres involved?

A No, sir. We do not have enough performance data on those particular --



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q How long do you have to commence the additional well before you lose the acreage?

A Ninety days without an extension.

Q From the day of completion, from April 12th?

A Yes.

Q Do you feel that that ninety days from April 12th will be sufficient time for you to determine whether or not additional wells ought to be drilled?

A If this particular well is allowed to produce at capacity. If this particular well is allowed to produce at capacity, we could probably tell much easier, we would have a better idea.

Q But supposing it's allowed to produce only at top unit allowable?

A We probably could still make our decision at that time.

Q I believe in the normal pattern of the units up there, the well in question this morning would be an inject well, rather than a producing well, is that correct?

A This particular well would have been drilled as an injection well.

Q On the normal pattern in the area?

A That's correct.

Q If you drill another well and, for example, in the Southwest portion of this 160-acre tract, would you then convert the present well into an inject well, or would you make both of those producing wells?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A I believe that decision would have to be made at the time that particular well was drilled.

Q You don't know yet?

A No, sir, I don't believe that that decision could be made at this present time.

Q As it stands today, we may have two producing wells and no inject wells on that 160?

A That would be possible, yes.

Q Now, Mr. Swartz, you gave us the present production on the surrounding wells. Do you feel that it is fair for Smith and McGrath to recover secondary recovery oil, or are you seeking to recover your primary oil under your tract? Which is it you are seeking?

A At the present time we're seeking primary oil.

Q Yes. As an Engineer, do you feel that it's reasonable to use as a basis for determining primary oil or one of the guide posts, shall we say, the primary production obtained by the other wells in the immediate vicinity? Do you feel that's a reasonable guide post or test for determining primary production of your well?

A Not entirely; in this area the porosity and permeability, as can be observed by the amounts of water injected into the various injection wells and the amount each producing well is producing, one cannot assume that each well is the same capacity or that each well will have the same total amount of cumulative.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

Q In evaluating and determining estimated primary recovery, do you not actually look and determine the other primary production from other wells in the area, in arriving at your conclusions?

A That is sometimes taken into account.

Q What is the primary recoverable oil from the -- I believe there will be five wells surrounding the Smith and McGrath. That is, the wells shown on your Exhibit 1 as 18-6, 7, 8, 11, and 14?

A Those wells did not have high cumulative production. Part of that may be due to their completion methods. Some of the wells in this area are relatively old and were completed by shooting with nitroglycerine. Since that time, in some of the newer areas of the Caprock, it is found that by sand-oil fracturing areas which were thought to be uncommercial before have proved to be commercial today.

Q Were any of these wells, these five wells I just asked you about, were any of those fracked or shot with nitroglycerine or some other treatment given?

A They have had treatment; I believe several of the wells have been treated in order to obtain injections, and I believe on completion originally they were shot.

Q I'm speaking of during their primary recovery period.

A I don't know. I don't have a complete, I wouldn't have a complete record on their entire process.

Q I see. Now I'm sorry, I didn't get your answer to my question on what the primary recovery was, actually, of the five



DEARNLEY-MEIER REPORTING SERVICE, Inc.
ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

wells. Perhaps I missed it. Did you give me that figure?

A No, sir, I did not.

Q Or average figure, sir.

A In the 18-8, the primary oil recovered to the time that it was made an injection well was 20,722 barrels. The 18-7, of course, is a new well and has been completed since the flood has been into effect. The 18-6, now an injection well, had a cumulative of 8405 barrels. The 18-11 had a cumulative of 12,562; and the 18-14 produced 2124 barrels.

MR. NUTTER: What was that figure again?

A 2124.

Q (By Mr. Christy) Let's see, that gives us a total of about 43,700 for the four wells that had primary?

A That's true, at that time.

Q That is their primary recovery?

A Yes, sir.

Q Which is an average of slightly in excess of 10,000?

A That is correct. There are other wells adjacent to these particular wells which had very much higher cumulatives, however.

Q I was just speaking of the five wells around the well in question. Do you have any estimate as to what you expect primary recovery to be from the McGrath and Smith 40 acres upon which this well is situated?

A Based upon the core analysis, the primary oil for 40



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

acres with a recovery of 173 barrels per acre foot would normally be 69,200 barrels for 10 feet of pay.

Q That is your net feet of pay in the hole?

A That is correct.

Q You arrive at that by multiplying the 40 acres times the 10 feet of pay times the 173 barrels per acre foot?

A That is correct.

Q You come up with what, 70,000 approximately?

A Yes, sir.

Q Now that figure that's used by Core Lab of 173, they told you, did they not, that that was the maximum theoretical possible recovery?

A That is correct.

Q That's not as a practical matter the actual recovery, is it?

A No, sir. The recoveries would probably be somewhat less than that. It would be impossible to accurately determine how much that figure would be reduced by the pressure decline caused by the offset producers.

Q Does that figure also assume that the pressure in the pool is the original pressure of the pool?

A That assumes that the pressure is near the original, yes, sir.

Q Which, of course, it's not?

A There was no pressure taken on this particular well.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

Q As a Petroleum Engineer, though, you do know, I'm sure, that the pressures decline, do they not, in a pool as it goes on in its productive history?

A That is correct.

Q This is an old productive pool?

A Yes, sir.

Q Also that 173 barrel figure by Core Analysis or Core Lab, assumed 100, that you produced to 100 percent water cut, did it not?

A No, sir.

Q I'm sorry, I withdraw the question. I mis-spoke it.

MR. CAMPBELL: Why don't you let him answer it?

Q (By Mr.Christy) Excuse me, Mr. Swartz, I mis-spoke myself in my ignorance. That assumes that you produce until you produce down to zero pressure, does it not?

A That is correct.

Q Now as a Petroleum Engineer, isn't it true that you never reduce pressure down to zero pressures?

A There are some areas, and this area is one in which there is a certain amount of gravity drainage, and so the amount of bottom hole pressure would be very low in the final period of primary production. The core analysis, by virtue of the permeability, would indicate that there would be a certain amount of gravity drainage; well, there is a water table in this particular area, but that water table is not considered to be very active.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6601

ALBUQUERQUE, NEW MEXICO

Q Did Core Lab, in reaching this 173 figure that we have been talking about, what average connate water saturation percent of the pore space were they utilizing?

A Would you repeat that question?

Q I refer you up at the top of your Exhibit 3, I notice on the right hand column, Average Total Water Saturation, 48.1 percent; then below that, Average Connate Water Saturation, 35.

A Yes, sir.

Q Do you know which figure they used in arriving at the 173-barrel figure?

A They used the average total water saturation.

Q They used the 48.1?

A Yes, sir.

Q You say the core analysis on this well was considerably better than the average of the other wells in the Caprock Pool?

A It is. I do not have an average figure for all of the wells in the Caprock-Queen Pool. However, from many different core analyses which I have observed during my period of employment with Gulf Oil Corporation in which the major part of the pool is drilled, this particular core analysis does indicate both a higher porosity and a total pay thickness in excess of the average.

Q Is that the ten foot figure we were speaking of a moment ago?

A Yes, sir.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6591

ALBUQUERQUE, NEW MEXICO

Q You say that is above average in the pool?

A Yes, sir. That is above average for this particular Caprock-Queen Pool.

Q Are we speaking in the whole Caprock Pool, or speaking in the immediate area? I didn't quite understand you, Mr. Swartz.

A I was taking that for the entire Caprock-Queen Pool.

Q You are not relating as better than average in the immediate vicinity?

A I haven't observed the core analyses and I do not have those at hand of any of the wells within a mile of this particular subject well.

Q I think I understand your answer, then. It relates to the whole pool?

A Yes.

Q Better than average in the whole Caprock Pool. Conclusion on the core analysis, we round up with a theoretical maximum of 70,000 barrels of primary recovery. I believe we have agreed that is only a theoretical maximum and must be cut to determine true primary recoverable, is that true?

A That is based, of course, upon 40-acre drainage.

Q Yes. What, in your opinion, is a reasonable figure that you would expect to recover primary production under the 40 acres?

A I don't believe that question can be answered directly, inasmuch as this particular well, if no other wells are drilled in this particular area, may drain more than 40 acres.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q This well may?

A This well, it may be possible for this particular well to drain more than 40 acres.

Q Well, are you seeking in this application the right to produce more than the primary oil under this 40 acres?

A No, sir.

Q That's all you are seeking?

A Yes, sir.

Q My question is, what is that figure?

A At the present time I believe a person would have to stay pretty close to the 69,200 figure, barrels.

Q You think the theoretical maximum is the actual recovery?

MR. CAMPBELL: If the Commission please, I'm not going to object directly to these questions. It appears to me that we're getting into the field of negotiating for the participation in this Unit, rather than in the question here of drainage or waste. Perhaps I don't follow what you are getting at.

MR. CHRISTY: What I'm getting at, Mr. Examiner, is that the witness has stated that he seeks here the right to recover the primary production under the 40 acres. All I want to know, how many barrels of oil that is, and then we can look to the test of the top unit allowable as it is and find out how many months before he thinks he will be flooded out, and we will know whether he needs any additional relief.

MR. NUTTER: I think you are right, Mr. Christy, that



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

we should know something about the primary reserves under the tract.

MR. CHRISTY: He may not need it. I don't know how many barrels he's entitled to.

MR. CAMPBELL: The witness has answered it 69,000 barrels, I think.

MR. CHRISTY: Thank you.

Q (By Mr. Christy) Now did I understand you to say that the offset injection wells, the 18-6, 18-14, were going to in due time flood you out?

A No, sir. I believe that they will have an effect in the later life, or the later periods of production, of this particular area.

Q You aren't in any immediate prospect of being flooded out, are you?

A No, sir,, we're in the immediate process of being drained.

Q Now you have mentioned a water table to the Southeast, is that correct, of the 40 acres in question here?

A Yes, sir.

Q Would that prevent the oil being pushed to the Southeast, would that prevent it in any way, the water table?

A I don't believe it would prevent it, no, sir.

Q Is there any permeability barrier off there that might prevent it?

A There is none indicated.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q So that in your opinion the oil could pass on past you and sweep on out into the other lands to the southeast?

A That is quite true.

Q Now is any oil migrating towards you? You say some is migrating away from you. Is any migrating towards you?

A At the present time it would not be indicated unless it would be from the northwest. However, the amount of injection in volume into the 18-6 is more than offset by the amount of withdrawals by the 18-7 and 18-11, so that I would not think that there would be any immediate effect of the water flood encroaching water upon this particular lease at the present time.

Q It would not be pushing oil towards your 40 acres?

A Not at the present time, no, sir.

Q Did you testify that there had been no response on 18-7 and the 18-1 -- I'm sorry, I have forgotten that.

A I don't believe that with the data I have, I don't believe that I could show that there would be any response to those.

Q What response was shown in those two wells; would you then expect oil to be migrated to the McGrath and Smith acreage?

A I'll -- there has been a response shown in the 18-11 well, a very decided response. However, the 18-7, I don't have enough background on that well to answer that prior question.

Q Would you think that when such a response is shown, you would anticipate oil to be migrating toward the McGrath and Smith acreage?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A If the amount of water volume injected were greater than the amount of withdrawal by those particular wells. However, in this particular situation I believe the amount of withdrawals are greater than the amounts of water that would be directed in that particular direction.

Q Mr. Swartz, in the absence of this water flood in the area, would you have recommended to McGrath and Smith to drill the well we're talking about here today?

A Yes, sir.

MR. CHRISTY: That's all.

BY MR. PAYNE:

Q Mr. Swartz, in view of the fact that you have testified that no oil is presently being pushed to the McGrath and Smith lease, I take it that you are predicating your application here solely on the protection of your correlative rights?

A Yes, sir. It is mainly concerned with the drainage problem at the present time.

Q Because the offsets are allowed to produce at capacity and you are limited to top allowable?

A Yes, the north offset is producing at approximately twice the normal allowable, and the west offset is producing at approximately four times the normal allowable.

Q But at the present time, at least, there's no danger of this oil being lost on this McGrath and Smith lease by being pushed?



A Not at the present time, I believe the water encroachment would be of secondary importance there.

MR. PAYNE: Thank you.

MR. CHRISTY: Mr. Examiner, may I ask one more question? Perhaps Mr. Campbell would prefer to answer it. As I understand, Mr. Campbell, you are seeking a temporary capacity allowable. How long a temporary time are you speaking of?

MR. CAMPBELL: Long enough to get in the Unit if we can.

MR. CHRISTY: Could we have that in days or weeks or something?

MR. CAMPBELL: That depends on the Unit. As I understand it, ninety percent of the working interest owners must agree on a participation formula in order to get into the Unit, is that correct?

MR. CHRISTY: Yes, sir, that is correct.

MR. CAMPBELL: I believe that's a factor that is pretty hard to determine. It certainly will be determined generally at the time you have the conference, I would assume, on May 19th, whether it appears to be feasible that there will be either a meeting ground of approach or participation, or whether it's feasible to get ninety percent of the working interest owners in there. We prefer to be in the Unit, and of course, if we were in the Unit we would not have to be here at all.

MR. CHRISTY: The basis for my question is, I don't know how the Examiner could draw an order for temporary unless he



knows how long the temporary would be.

MR. CAMPBELL: It has been done in one case, we will go on the same basis, when Ambassador had such an application.

MR. CHRISTY: Ninety days. Thank you.

BY MR. NUTTER:

Q Do you know of any other wells along the eastern flank of the pool which were drilled in a similar structural position and showed a core water saturation of 48.1 percent, or on the initial potential test made 40 percent water?

A I wouldn't have any of those in hand. However, there have been wells drilled in a similar position on the east flank with water saturations in that nature.

Q Anywhere in this vicinity?

A Further on to the south, I don't happen to have those particular locations.

Q You know the water cut on the initial potential of any of the wells on your Exhibit No. 1, when they were initially potentialized?

A No, sir.

Q Mr. Swartz, of the five wells that immediately offset McGrath and Smith Tidewater-State No. 1, the one that has shown the most cumulative production is the 18-8, I believe, is that correct?

A That is correct.

Q What did you say is happening to that well at the present

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

time?

A At the present time it shows no injection. That well is not shown on injection, it has had injection in the past.

Q Why was injection ceased in that well, do you know?

A I do not know entirely. I do know they have had mechanical difficulties with the well, and that they did have to fracture the well in order to initiate injection; and after fracturing, their injection rate steadily declined.

Q And pressures went up?

A And pressures went up, yes, sir.

Q How do you account for the fact that the well that produced most oil on primary recovery is having the most difficulty getting water on injection?

A I would assume that the area immediately around the well bore had more porosity and permeability and perhaps thickness than adjacent areas. The Queen pay is somewhat erratic in the amount of porosity and permeability and pay thickness, throughout the Caprock-Queen Pool.

Q I would assume that there's a high pressure area around that well at the present time, wouldn't you?

A Yes, sir. I would assume that the pressures would probably be high.

Q How about the 18-14, what's the current injection rate there?

A That is 64 barrels of water per day.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6091

ALBUQUERQUE, NEW MEXICO

Q What's the injection pressure?

A 900 pounds.

Q So there's probably a high pressure area around that well, also, is there not?

A There's probably a high pressure area, yes, sir.

Q Do you think that there's a high pressure area around the 18-6 well that's taking 153 barrels of water per day?

A Yes, sir.

Q That leaves out of the five wells that surround your well two wells that we haven't covered and established that there's a high pressure area around. Do you think there's any possibility of your oil on your 40-acre tract migrating to the 40-acre tracts that we've discussed, that have high pressure areas?

A Yes, sir.

Q Is your pressure higher than pressure around those wells?

A I would have no indication of that. We had taken no pressure tests in that particular well, and the well was completed, production was initiated by fracture stimulation.

Q Do you know what the producing rate of the 18-11 was prior to water injection in this area?

A The producing rate of the 18-11 in August in 1959 was 36 barrels of oil per day. That was taken from the progress report of the North Central Caprock-Queen Unit.

Q Was that prior to any stimulation by the water injection in the area, or was it lower than that previous to that date?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A That is the first record I have of production from that well for a period of time. I don't know whether that well was down, but certainly its change in production from 36 barrels of oil per day to 130 barrels of oil per day would indicate that it was being affected by the water flood.

Q You made some sort of correlation, Mr. Swartz, to the amount of oil that's being withdrawn from the 18-11 Well and the 18-7 Well, and compared that with the amount of water that's being put in the 18-6 Well. What was the basis of making that comparison?

A I don't believe I gave any figures on that. I don't know, I don't have the exact volumes.

Q I think you mentioned that the reason you suspected that these two producing wells may be draining the McGrath and Smith acreage was because they were withdrawing more oil than was being put in the 18-6 in the form of water injection.

A There are other wells around the 18-6, there are other producers which would be withdrawing the total fluids from the area, too.

Q There is some other water injection wells that may be contributing to the producing wells?

A It would be very difficult to obtain exact figures to the degree of effect of each well upon the other.

Q Would a water injection well in the extreme southeast corner of the Northwest Quarter of the Southeast Quarter of Section 18 enhance the productivity of the Tidewater-State No. 1 Well?



DEARNLEY-MEIER REPORTING SERVICE, Inc.
ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

A Could you give me that location once again?

Q In the extreme southeast corner of the Northwest Quarter of the Southeast Quarter of Section 18.

A Yes, sir, I believe it would.

Q Would you recommend to the management that they drill a water injection well at that location, if it would enhance the recovery?

A I believe I would, yes, sir.

Q Mr. Swartz, I believe you stated that you felt that the No. 1 McGrath and Smith Well had better than average porosity and permeability, insofar as the Caprock-Queen Pool as a whole is concerned. How do you account for that, seeing as how the well is on the flank of the pool?

A The porosity and permeability is not the limiting factor of the pool in this particular case. I believe the limiting factor of the Caprock-Queen Pool in this area is the water in the particular Queen pay. Does that answer your question?

Q Well, does the water make a well a better than average well?

A No, sir. The limiting factors to the Caprock-Queen Pool in this area is the water table, the proximity of the water table to the production; and the wells which are dry in this area would more than likely have adequate porosity and permeability for production, would it not be for the high water content.

Q Mr. Swartz, I believe you said you had your core analysis



with you. Would you go through the core analysis and give me the various headings of the columns on Exhibit 3, please?

A Yes, sir.

MR. CAMPBELL: The original.

A The first column is the Sample Number; the second column is the Depth in Feet; the third column is the Permeability, in millidarcies; the fourth column in this particular case is blank; and the fifth column indicates the Percentage of Porosity; the sixth column is the Residual Saturation.

Q (By Mr. Nutter) Oil?

A Of oil; and the seventh column is the Total Water Saturation.

Q Now on the symbols there, what's the first column with the little circles?

A That particular column shows the permeability in millidarcies, each vertical line indicates a division of two millidarcies. The next column over indicates the porosity, and each vertical line indicates an increment of porosity of two percent. The final column on the right side of the chart indicates the oil saturation, which is designated by the dashed line marked with x's, and each vertical line indicates a porosity of five percent.

Q That's reading from left to right?

A Increasing from left to right. The line, solid line connected with circles, indicates the percent of total water saturation, and the vertical lines indicate, each vertical line

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CN 3-6691

ALBUQUERQUE, NEW MEXICO



indicates a porosity of, or percentage of five percent, decreasing from left to right.

MR. NUTTER: Thank you. Mr. Payne.

BY MR. PAYNE:

Q Mr. Swartz, inasmuch as the subject well potentialed at 64 barrels a day, and the most recent test also shows 64 barrels a day, I take it that the special allowable that you are asking for is 64 barrels a day, is that right?

A That is correct.

MR. PAYNE: Thank you.

A We were asking for capacity allowable and had not anticipated at this present time that the capacity would increase.

Q (By Mr. Payne) If you produced at more than 64, presumably that oil would be coming from the North Central-Caprock-Queen Unit, would it not?

A I don't know whether that can be determined exactly or not.

Q Would there be any reason why this well should go up in productivity during its producing life, rather than down as they usually do?

A Normally it probably would not, sometimes wells clean up a little better during a process of production after a short period of time of their initial completion. However, that is not anticipated in this particular case.

MR. PAYNE: Thank you.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



BY MR. NUTTER:

Q Mr. Swartz, what's the cumulative water production in these three offsetting water injection wells?

A The total cumulative?

Q Yes, sir, by well.

A Let's see, the total cumulative of the three offsetting, in the 18-14, the total amount of water is 42,650 barrels. In the 18-8, the total amount is 14,777 barrels, and in the 18-6 it is indicated to be 80,715 barrels.

Q Mr. Swartz, you mentioned that perhaps due to the extremely good permeability that the McGrath and Smith No. 1 Tidewater-State may actually drain more than 40 acres. Now by virtue of its 330 foot location out of the Northwest Quarter of that Quarter Section, which 40 acres is it going to drain?

A I don't believe that could be determined, because of the erratic nature of the water table in this particular area.

Q Is there a tendency in the Caprock-Queen Pool, as you go down structure, to encounter decreasing permeability and porosity as well as encounter a water table?

A I don't think that could be stated as a general rule, no, sir.

Q Do you think that the ten foot of pay which was encountered in the well is uniform throughout that 40, or would it have a tendency to decrease as you go down structure?

A Inasmuch as there have not been any wells drilled to

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



the south and east, I don't believe that could be accurately determined. I don't believe I could say one way or the other.

MR. NUTTER: I believe that's all. Thank you. Any further questions of the witness? He may be excused.

(Witness excused.)

MR. CAMPBELL: I would like to offer Applicant's Exhibits 1, 2, and 3 in evidence.

MR. NUTTER: Applicant's Exhibits 1 through 3 will be entered. Do you have anything further, Mr. Campbell?

MR. CAMPBELL: Mr. Examiner, I might just state what our position is here before the opponents put on their case. What we're seeking here, actually, is temporary allowable on the basis of the present producing capacity of this well for a limited period, until an attempt can be made to get this area or tract into the Unit. If we are unsuccessful in arriving at such a fair participation formula negotiating it, then of course, we would have to come back to the Commission with whatever attempt at relief we had. Our present application is predicated entirely upon a belief or fear that there might be drainage off of this unit, and that our correlative rights are being adversely affected by withdrawal rates of these offset wells.

That's the substance of what we're asking for, and the basis of it.

MR. NUTTER: You have nothing further on your case at the present time?

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



MR. CAMPBELL: No.

MR. NUTTER: Mr. Christy, do you have anything further?

MR. CHRISTY: Yes, we have two witnesses.

(Witnesses sworn.)

(Great Western, et al's Exhibit
A marked for identification.)

DEWEY THORNTON

called as a witness, having been first duly sworn on oath, testified
as follows:

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you please state your name, address and occupation?

A My name is Dewey Thornton. I live in Midland, Texas,
and I'm a Geologist.

Q Have you previously testified before this Commission
as a Geologist and had your qualifications accepted?

A No, sir, I haven't.

Q Would you briefly tell the Examiner the schools of
higher learning you have attended, the degrees, if any, you have
received, and the year?

A I attended Henderson County Junior College in Athens,
Texas, two years, and attended Texas Tech in Lubbock, Texas, two
years, graduating from that college in 1951 with a B. S. in
Geology.

Q Since 1951 what have you done in the field of Geology?

A Since that time I have worked continually for Great

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

Western Drilling Company in the capacity of Geologist.

Q In what areas, primarily?

A I have had more experience in the Caprock area of Chaves and Lea Counties, New Mexico, than any other area; primarily, though, Southeast New Mexico and West Texas.

Q Are you familiar with the geological history and characteristics of the Caprock- Queen area and particularly with reference to the lands involved in this application, being in Township 13 South, Ranges 31 and 32 East?

A Yes, sir, I am.

MR. CHRISTY: Does the Examiner have any questions on the qualifications of the witness as a geologist?

MR. NUTTER: No, sir, proceed.

Q (By Mr. Christy) Now I'll refer you to what has been marked as Great Western, et al's Exhibit A, and I'll ask you briefly if you will just identify the exhibit first.

A Exhibit A is a contour plat of the immediate area in question, and extends three or four miles north and south of that area, and also east and west of that area. It is contoured on the top of the Gray sand of the Queen formation, which is Permian age, 25 foot contour interval. The red line --

Q Just a minute, sir, and we'll get into the red line. That sufficiently identifies it. What are the red numbers by the wells?

A The red numbers by the wells are subsea datums, which



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

in this case are all plus numbers, indicating that the top of the pay was encountered above sea level.

Q Now referring to this red line on Exhibit A, and let us start up at the top in Section 32, 12 South, 32 East, I notice a No. 4 well marked there within this red line as a dry hole. Could you tell me when that was drilled and what was encountered?

A That is the Great Western No. 4 "Q" Well. That well was drilled in 1948 and was non-productive. It encountered 800 foot of water in the hole in the Queen sand.

Q All right, now, coming down to a well in Section 8, Township 13 South, 32 East, I notice another dry hole within this red line marked No. 1. What well is that and what was encountered?

A That is the Manry and Bruce No. 1 State, which was drilled in 1948, encountered nothing but water in the Queen sand. It pumped four barrels of water per hour.

Q I believe the next well in the red line is in Section 17, 13 South, 32 East, marked with a "3", shows a dry hole, what is that well?

A That is the Cities Service No. 3 State.

Q What was encountered in the drilling of that well?

A That well was drilled in with cable tools and encountered a hundred foot of salt water in the hole in a period of thirty minutes.

Q Now we come to the No. 1 "B" Well, also in that same Section 17. I notice it falls just to the southeast of the red



line. When was that drilled, and what was encountered?

A That is the Cactus No. 1 "B", Ohio State. It was drilled in 1955 and upon entering the Queen sand, which is the regular pay for the Caprock Field, they encountered the sand very tight and the well produced three gallons of oil and three gallons of water per hour. They fracked the well, did not recover their load, indicating that as you go beyond your very thin column of water on the east side of the Caprock Field, you encounter a permeability barrier which produces neither oil nor water.

Q Following on down, I notice another well in Section 29, 13, South, 32 East, marked Chambers "A". I notice it's on the east side of the red line that you have drawn. When was that well drilled and what was encountered?

A That is the Chambers and Kennedy No. 1 "A" State, drilled in 1958. That well encountered the Queen sand quite low, quite tight. The well was fracked and recovered load oil only, then was re-fracked, recovered load oil only, and was plugged and abandoned. It was also in this permeability barrier.

Q Did it have the same geological prospects as the prior well you just mentioned--

A Yes.

Q -- here, that encountered this barrier that you just spoke of?

A That is correct.

Q Let's drop down in Section 31 of the same Township and

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691



Range. I notice a well in the Northwest Northeast marked No. 1, shown as a dry hole. When was that well drilled and what was encountered?

A That is the Lusk No. 1 Amerada State, and I believe that well was drilled in 1959. The sand was tight and wet, no completion attempts were made.

Q Now the last well I'll mention to you is in the Southwest Northwest of that same Section 31, marked with a 2-X. What was encountered and when was that drilled?

A That is the Great Western Drilling Company State "X" No. 2, I believe that well was drilled -- just a minute -- in 1956. The Queen sand was encountered very tight, made a very small amount of oil and water, naturally was fracked and recovered load oil only.

Q Now, Mr. Thornton, are you further familiar with the geological information and history of the other wells within this general vicinity shown to the immediate west of this red line you have depicted on Exhibit A?

A Yes, sir, I am.

Q What, in your opinion, does the red line depict, based upon this testimony you have been giving us?

A It indicates to me that there is a very thin column of water on the east flank of the Caprock Field, separating the Caprock Field from an impermeable barrier.

Q I notice the blue hashmarks on Exhibit A. What do those

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

depict?

A That indicates that the area adjacent to and east of the red line would be impermeable.

Q In the permeability barrier?

A Or within the permeability barrier.

Q I also notice a blue slash mark in the center of the exhibit here.

A That is a re-entrant which for some reason back during geological time, your Gray sand, which is the normal productive zone in this area, became filled with fine red shale and for that reason it is impermeable, non-productive.

Q Was that Exhibit A prepared by you or under your direct supervision?

A Yes, sir, it was.

MR. CHRISTY: I believe that's all.

MR. NUTTER: Any questions of the witness?

MR. PAYNE: One question.

MR. CAMPBELL: No.

MR. NUTTER: Mr. Payne.

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Thornton, does this exhibit reflect, in your opinion, that the McGrath State Well No. 1 is making as much water as it is because this water, as well as the oil, is coming from the North Central Caprock-Queen Unit?



A No, sir. I don't believe that water is coming from the North Central Caprock-Queen Unit. I believe its formation water being produced.

Q Being produced from this red area?

A Yes, sir.

Q So the McGrath Well is drawing this water over?

A That is correct.

MR. PAYNE: I see. Thank you.

BY MR. NUTTER:

Q Mr. Thornton, upon what basis did you gauge the width of your red line? I notice it varies from place to place.

A That is correct. On geological information gleaned from these dry holes that encountered the water table, as well as the permeability barrier.

Q How do you know the location of the permeability barrier?

A Only from well control like in Section 17, 13, 32, for instance, the Cactus Chio State 1-B, with a very tight and impermeability could not recover their load oil, so we know it was drilled in the barrier. The well directly north of it, the Graridge No. 4 Morgan State, cored the Queen sand pay section and had some water indicated right in the bottom of their core. Their production is ninety-one percent water. We know the water table is between these two wells.

Q Now most of the wells that you mentioned as you came down the line here produced water on their completion, is that

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691



DEARNLEY-MEIER REPORTING SERVICE, Inc.
ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

correct?

A I would say greater percentage of them produced water than were beyond the permeability barrier, yes, sir.

Q If they produced water, that means that the well was permeable or encountered permeable sand?

A Yes, sir.

Q Now, is everything to the left of the red line productively productive of oil?

A Yes, sir. Of course, you would have zero feet of pay at your red line, and as you go at right angles to the red line, your pay thickness would increase until you get to a thickness of about eleven feet, which in this immediate area in question would be the maximum. I believe the well in question had ten feet of pay.

Q Do you know whether the water table is generally regarded as being a flat plane on top or whether it's tilted to conform to the structure here?

A I believe it would be a flat plane on top, because it is such a thin column of water to start with you don't have room for much tilting. That red line represents anywhere from one foot to four feet from its thinnest point to its widest point.

Q There was no water encountered in the re-entrant back here?

A Small amounts of water. Most of the wells, if you fracked them, however, you do not recover your load.



Q To your knowledge is there any correlation on permeability and porosity of wells that run along the east flank of the pool just to the left of the red line?

A That permeability and porosity will vary from one end of this trend to the other, yes, sir.

Q Are you acquainted with the operation of the North Central Caprock-Queen Unit?

A To some extent. I am not working actively with the boys in the water flood department. I'm working as a Geologist only.

Q Were you present a while ago when Mr. Swartz was testifying as to certain injection wells, on certain wells in that Unit area?

A Yes, sir, I was.

Q How do you account for the fact that it appears that the No. 18-8 Well produced 20,702 barrels of oil on primary recovery and yet has apparently filled up with water and doesn't take water any more, after a cumulative water injection of 14,700 and some?

A I haven't looked into that matter.

MR. CHRISTY: I might state, Mr. Examiner, we have another witness who I believe is more familiar with the water flood wells themselves.

MR. NUTTER: I'll defer that question until later, then. I believe that's all. Any further questions?



BY MR. CAMPBELL:

Q Mr. Thornton, do I understand correctly that this dash-marked line on the east side of this red meandering line here indicates a permeability barrier?

A That is true.

Q And you reached the conclusion that there is a permeability barrier all the way from the north part of the red line to the south part of the red line, by virtue of the two wells that you referred to that didn't recover the load oil?

A I believe I referred to four wells, Mr. Campbell.

Q Which other wells?

A Starting at the top and going down, the Cities Service No. 3 State -- pardon me, in the South Half of Section 17; the Cactus No. 1-B Ohio State; the Chambers and Kennedy No. 1 "A" State, in Section 29; the Great Western Drilling Company State "X" No. 2 in Section 31; and the Lander No. 1 Phillips State in Section 1, 14, 31, which was not previously mentioned.

Q Are there other factors that can enter into the recoverability of that oil other than the permeability? Pressure is a factor?

A If you don't have any permeability you can't have any pressure.

Q Can you have permeability and not much pressure?

A You could have a well bore condition where that would be true. Otherwise, I don't think so.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Based upon your knowledge of the permeability variations and porosity variations in this Caprock-Queen area, do you believe you can say with any degree of certainty as a geologist that this identical situation exists throughout the east side of this area, Mr. Thornton?

A I can certainly say that with the information I have at my disposal it runs both north and south of the well in question.

Q Do you believe that the information that you have at your disposal is adequate to draw a firm conclusion?

A Yes, sir.

MR. CAMPBELL: That's all.

REDIRECT EXAMINATION

BY MR. CHRISTY:

Q Mr. Thornton, you believe that a well drilled in the southeast portion of this 40-acre tract we are speaking of here today, would that encounter the Queen sand pay zone?

A It would encounter the Queen sand pay zone, yes.

Q Would it contact oil?

A But it would be saturated with water only.

Q Would it be a productive well, of oil?

A No, sir, in my opinion it would not be.

MR. CHRISTY: That's all.

MR. CAMPBELL: I have one other question, if I may.

MR. NUTTER: Yes, sir.



RE CROSS EXAMINATION

BY MR. CAMPBELL:

Q I don't quite understand, with regard to the control you have here of this permeability situation, what is to prevent you from drawing that permeability line from the Ohio State well in the South Half of Section 17 right down to the Chambers and Kennedy well, directly south along that section line?

A The data which I have just passed on to you, I will elaborate a little bit if you would like. Down in Section --

Q Just answer my question, if you can. If you need to elaborate to do that, that's fine. What control is there to prevent you drawing the permeability barrier line, if there is one, more north and south instead of swinging it over to the west there?

A Because history of this area reveals to us that this permeability barrier is directly east of a very thin column of water which has never been over four or five feet, and I couldn't assume that all of a sudden it was twenty or twenty-five feet.

Q Well, that water zone doesn't exist over here in this other area that you have drawn out to the west, as far as the relationship to permeability is concerned?

A No, sir, it does not.

MR. CAMPBELL: That's all.

MR. CHRISTY: That's all from this witness.

MR. NUTTER: He may be excused.

(Witness excused.)

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



(Great Western, et al's Exhibit
B marked for identification.)

MERRILL WILSON

called as a witness, having been first duly sworn on oath, testified
as follows:

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you please state your name, address, and occupation?

A Merrill Wilson, Box 1659, Midland, Texas, and I'm a
Petroleum Engineer by background. My present position is Vice-
President, Production, Great Western Drilling Company.

Q Mr. Wilson, have you previously testified before this
Commission as a Petroleum Engineer and had your qualifications
accepted?

A Yes, sir.

Q Are you familiar with not only the field of Petroleum
Engineering, but the inter-related field of Reservoir Engineering
and Waterflood Engineering?

A Yes, sir.

Q How many waterfloods have you worked in, Mr. Wilson?

A Oh, let's see, at the present time we have, of course,
the several units in Caprock; a couple in Texas, and some in
Kansas. Total about 715 or 20 wells that we operate.

Q I take it from that last statement with reference to
the Caprock that you are familiar with the engineering aspects
of this area in question here today in this application?

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Yes, sir.

Q And the surrounding wells?

A Yes, sir.

MR. CHRISTY: Is there any question concerning the witness' qualifications?

MR. NUTTER: No, sir, please proceed.

Q (By Mr. Christy) You have heard the previous witness testify in connection with the Exhibit A, is that correct?

A Yes, sir.

Q I'll now hand you what has been marked Exhibit B, and ask you if you will please identify it for us.

A Exhibit B represents a cross-section designated AA' on Exhibit A showing the top of the pay across that cross-section and of course, the bottom of the pay and the several wells that this cross-section is carried through.

Q I also notice a dashed line in the extreme right end of the exhibit. What does that depict, sir?

A The dashed line indicates a normal location, that is, regular insofar as proration unit is concerned in New Mexico.

Q On the McGrath acreage we're speaking about?

A On the McGrath acreage.

Q You mean the 660, 660 location?

A Yes.

Q Then progressing from right to left, the next line, the drill site of the Tidewater-State No. A?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

A Yes.

Q The next line is the 18-6?

A Yes.

Q Then the 18-4 well?

A Yes.

Q What is the width of the two parallel lines going across the southeast portion of the Exhibit?

A As I indicated on this cross-section, it is eleven feet.

Q What is it, though?

A The actual thickness?

Q Yes.

A Eleven feet.

Q It's the thickness of pay?

A Yes, and shown to be the eleven feet.

Q I note the red marking indicating water?

A Yes, the red indicates water. The yellow indicates oil, and of course, the blue indicates the permeability barrier to coincide with the previous exhibit.

Q Now how many feet of net pay were encountered in the McGrath well?

A I believe that was ten feet.

Q Do you have a copy of the core analysis on that well?

A Yes, sir, I do.

Q I believe that's been Applicant's Exhibit 3?

A Yes, sir.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q If I remember the markings correctly, we have a total of thirteen feet been represented here on the core analysis?

A Yes, sir.

Q And the first two feet, are they productive?

A The first two feet are dry.

Q Then the next ten feet, is that the productive area?

A Yes, sir.

Q What's this figure, thirteen, the thirteen foot?

A The thirteen feet appears to be water productive.

Q Do you reflect that thirteen foot on Exhibit B?

A Yes, sir, that is represented by the penetration of the black well bore into the water.

Q The pay section appears to be running at a slanting line southeast on Exhibit B, is that true in the Caprock-Queen area?

A Yes, that is true that the dip of the formation, the Queen pay formation, is from generally northwest to southeast.

Q So it's downdip from the unit in question here toward the McGrath acreage?

A Yes, sir.

Q Have you attempted to determine the net pay thickness or number of net acres in the McGrath 40 acres here involved today? Have you made a study of that?

A Yes, sir, I have. Based on the general slope, that is, dip of the immediate area as established by the several wells in the area, and as the water table has been established by the



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

subject well, that is, the McGrath and Smith Tidewater-State No. 1; and based on our, all of our information available, we have arrived at an opinion as to the pay under the Tidewater-State No. 1.

Q The number of net acre feet?

A Yes, sir.

Q What, in your opinion, is that number?

A Our calculations indicate that it's on the order of 120.

Q 120?

A Acre feet.

Q I see. Within this 40-acre tract?

A Within this 40-acre tract.

Q Now in arriving at that calculation, what number of feet did you utilize to the northwest of the well here?

A Eleven feet of pay, which is indicated by the cross-section.

Q And then did you use ten at the well?

A Yes, sir.

Q And then a decreasing amount down to zero at the water table shown on Exhibit A?

A Yes, sir.

Q How many barrels of oil would that number of net acre feet be, and how do you calculate it?

A That, of course, is arrived at by using the physical data



from the McGrath and Smith Tidewater-State No. 1 core analysis, as reported by Core Lab. That is the permeability -- I am sorry, pardon me, the porosity and the water saturation and the formation volume factor.

Q Now based on those figures and utilizing the 120 net acre feet of pay down there, theoretically how many barrels of oil may be recovered?

A I presume we're speaking of primary recovery?

Q Yes, sir, I am speaking of primary.

A Again a recovery factor based on the total or whole information that we have developed from the many years of Caprock information, that would be on the order of 20,000.

Q That is actually recovered or theoretically possible, which are we speaking of?

A I think that would be actually recoverable. Now I might add one point to that, that's assuming again that you have original reservoir and declining down to a reasonable operating pressure, that is, on the order of 50 to 100 psi bottom hole pressure.

Q Based on the present top unit allowable in the southeast part of the State of New Mexico, how long will it take McGrath and Smith to produce this 20,000 barrels that you say is actually primary oil that's recoverable?

A Based on the normal unit allowable as we have at this time, which I believe is 33, that would be on the order of 18 to 20 months.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Now let's turn to the wells in the general area and I'll again refer you to Exhibit A.

A Yes, sir.

Q What is the oldest of the five wells surrounding the McGrath well?

A The oldest well, Mr. Christy, is now designated 19-8.

Q About when was that drilled?

A Drilled, oh, I would say the early part of 1948.

Q I believe it's previously been testified that the primary recovery was in the neighborhood of 20,702 barrels, is that correct?

A I believe that's right. That is correct.

Q Has that well ever been fracked or shot?

A That well was shot on its original completion. It, as you recall, it had been converted to a water injection well in March of 1959, and that well had also had a liner set in it. The reason for the liner being that the original pipe was set up high into the red beds. The liner was to prevent water escaping into the red beds and be contained into the Queen formation. Apparently we had some cement contamination or contamination on cementing the liner, and the injectivity was not of the order that we thought it should be. Subsequently the well was fracked in an effort to increase the water injectivity; subsequent tests showed that the frac had fractured the liner instead of the pay formation; in other words, burst the liner, and that water of course was going to the red beds instead of to the Queen sand pay, and



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

that mechanical difficulty, of course, is still in existence. It has been authorized to go ahead and repair that so that we can begin injecting water into the Queen sand.

Q Is that the reason it is not shown as an injection well on the March, '60, report?

A That's right.

Q That's in No. 8 well. Let's move on to the No. 7 well, about when was that drilled?

A That well was completed, I believe, in October, 1959.

Q It had no primary?

A No, sir.

Q And the 18-6 well?

A Was drilled, I believe, in about 1956, and of course, that well was fractured at the time it was completed.

Q Yes. That was the well, I believe, that was testified had recovered about 8400 barrels of oil, is that your remembrance of the primary recovery?

A Yes, sir, I believe that's correct.

Q The 18-11 well, when was that drilled, and was it fracked?

A I believe 18-11 was drilled in 1954 or 1955, and of course that well was also fractured.

Q The figure on that, as previously testified, was 12,562 of primary?

A Yes, sir.

Q The last well, when was that drilled and when was it



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

fracked?

A That well was drilled about the same time as 18-11, that is, late 1954 or '55, and that well was fracked on completion.

Q Again the previous testimony was 2,100 some odd barrels, is that your recollection of primary recovery?

A Yes, sir.

Q Mr. Wilson, you heard the testimony this morning with reference to the Core Lab report, the theoretical maximum recovery, did you hear that testimony?

A Yes, sir, I did.

Q Are you familiar with this core analysis and core report?

A Yes, I am.

Q Have you studied them?

A Yes, sir.

Q Would you please comment, if you do have one, in connection with the testimony previously offered with particular reference to the theoretical maximum recoverable? I believe the figure stated was somewhere in the neighborhood of 70,000 barrels primary recovery. Would you please comment on that?

A May I quote from the standard letter that Core Lab encloses with each of its core reports: "Actual recovery will be less than these theoretical maximum values, due to prior production and to the various economic limiting factors affecting ultimate recovery."

Q In actual field experience, have you found that statement



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

to be true?

A Very definitely so.

Q So I assume by that that you do not feel the theoretical maximum recovery of 70,000 barrels is realistic in actual recovery?

A That is my opinion, that this represents the very theoretical maximum and does not take into consideration the practicalities of oil production.

Q Now I believe water is being produced from the McGrath well at this time?

A That is my understanding, yes, from their report.

Q In your opinion, is that flood water or connate water?

A No, sir, in my opinion that is not flood water, but that is connate water; or to further amplify, water that was naturally found in the well bore.

Q Do you have any basis upon which that opinion is made?

A Yes, sir, we do. Briefly, 18-11 produces no water, 18-7 produces no water, and those two wells are closer to water injection wells than the McGrath and Smith well. Secondly --

Q Incidentally, have those wells received a response from the injection?

A Yes, sir, they very definitely have.

Q All right, you said secondly, pardon me.

A Secondly, in the core analysis we see that in my opinion that water production is indicated in the bottom of the McGrath and Smith core.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691

Q Have you a water analysis taken on that?

A Yes, sir.

Q On the McGrath water?

A Yes, sir.

Q What was the result of that test?

A The result was, in the water experts' opinion, or was that that is connate water that is being produced.

Q Mr. Wilson, would you have any estimate, based upon your experience in this area, as to the minimum time in which we might expect the McGrath well to be flooded out by the other injection wells surrounding it?

A Of course, we have, I think at this particular time that we cannot give the maximum.

Q No, sir, I asked minimums.

A The minimums I would indicate in this manner, that the Graridge flood to the north, that is the North Caprock-Queen No. 1 Flood, the North Caprock-Queen No. 2 Flood operated by Ambassador, in both of those floods which have some three and a half years history behind them, there has been no well that has been shut down because of water production, excessive water production.

Q So the history in the pool is at least we have three and a half years before they would be flooded out, as a minimum?

A That is a very good indication.

Q Was Exhibit B prepared by you or under your direct supervision?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Yes, sir.

Q Mr. Wilson, do you believe that there's any migration of oil from the unit boundaries here to the McGrath acreage?

A Yes, sir, I believe that there is, from the date of first production of the McGrath and Smith well, that the oil began at that date to be diverted toward the McGrath and Smith well.

Q Why would it be diverted towards it?

A As you recall, we have water injection wells in 18-14 and in 18-6, and that 18-8 has had water injected and will again; that the day before the pressure differential was towards the producing wells, that is, towards 18-11 and 18-7, as of the date of first production the pressure, the removed fluid, the pressure was lowered in the McGrath and Smith well. Therefore, the pressure network was diverted and will continue to be diverted towards the McGrath and Smith well, and of course, pressure is represented by the water that we injected, and of course, that is energy that we injected, and as of the date of first production there, we start pushing oil toward the McGrath and Smith well that previously had been pushed towards the producing wells in the unit.

Q In your opinion, can that oil be pushed toward the McGrath acreage escape and be lost or wasted?

A No, sir.

Q Why?

A As we have testified, there seems to be a permeability barrier, and of course, the permeability barrier having no permea-



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

bility, little or no permeability, that the oil cannot migrate past the permeability barrier.

Q What would the oil do when it hit the permeability barrier, where would it go?

A The oil would be diverted along the permeability barrier towards an area of lessened pressure.

Q That is, it would flow in a southeast-northwest line against the barrier?

A Generally.

Q By virtue of the withdrawal by the 18-11 and the 18-7 well, wouldn't oil be migrating from the McGrath acreage towards the unit acreage?

A No, sir.

Q Why?

A The pressure differential, of course, is towards 18-7 and 18-11, but it's not only, in 18-11, it's not only from a south direction but it's also from a west direction. There's an injection well in 18-6, an injection well that would be pushing towards not only 18-11 but the McGrath well. There's an injection well, No. 18-2, north of 18-7 that would certainly have a tendency to push in that direction; that is, a south direction, the direction of the McGrath.

Q So the whole push from the unit is towards the barrier?

A Yes, sir.

Q Based on that, Mr. Wilson, how could McGrath and Smith's



correlative rights be violated?

A They aren't, Mr. Christy, in my opinion; that the North Central Caprock-Queen Unit will lose oil to the McGrath and Smith well, even under a normal unit allowable.

Q How could oil be wasted, could any oil be wasted?

A In my opinion there will be no waste of oil.

MR. CHRISTY: That's all.

CROSS EXAMINATION

BY MR. CAMPBELL:

Q Mr. Wilson, as I understand your position, it is that under present conditions, with the completion of the McGrath well, that there has been a tendency for the movement of oil from the unit to that area, is that correct?

A Yes, sir.

Q And yet you say and Mr. Thornton agrees that none of the water present in this well is water flood water, is that right?

A It is not water flood water, that's our opinion.

Q If you are withdrawing oil from the 18-11 well and the 18-7 well at a rate four times and two times in excess of the normal unit allowable, and there is no pressure exerted to date from water directly into the area here involved, how can you reverse the normal direction of flow of oil to lower pressure areas from higher pressure areas?

A I believe I would agree with you that oil would migrate from a high pressure area to the low pressure area.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Isn't the pressure reduced by the higher withdrawal of oil?

A That's correct.

Q Then until such time as there is an actual stimulation across that Quarter Section line either from the north or from the west, wouldn't the tendency of the drainage be toward the wells of the highest productive rate?

A When we speak of reduced, I refer to a reduction in pressure and not reduction to zero in any particular area.

Q What I'm getting at, Mr. Wilson, is what exactly is your objection to this present application, assuming as you have and we have that the flood is not yet affecting movement of oil across the section lines onto the tract where this well is involved?

A Let me say that my assumption is that the water injection in the North Central Caprock-Queen Unit has already affected you in this respect, in that it has increased your pressure from a very low pressure up to whatever it might be, not represented by your production capacity.

Q Of course, in a matter of degree, in a common reservoir, that's true from the time they started injecting water in the top of the North Caprock Queen Unit as to the pressure in that area and ten miles away, except as to a matter of degree, is it not?

A In a limited area, a local area, you have a matter of time that I would not assume that water injection -- let's see, two miles away, for lack of a number, that due to the time involved,



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

that that water injection up there has not affected the McGrath and Smith well; too, I would say the near proximity of the injection wells in the area have affected the reservoir wells.

Q Yet you can see there is no water flood water on this tract at this time?

A I agree with you there.

Q Now with regard to the assumption or position that you have taken as to the permeability barrier existing, I assume as appears on your Exhibit B that is a factor in your calculation of the amount of pay involved?

A Yes, sir.

Q In adjusting the Core Lab statistics as you have done?

A It is a factor used in adjusting the acre feet.

Q Yes, that's what I mean.

A In other words, there's a limit over to the southeast side.

Q Now the curve of this, both the water table and the permeability barrier, there, is generally on the basis of the curve of the contour, is it not, on Exhibit A?

A No, sir.

Q Well, what is it on? How did you move in there unless it was to go along with the 1300 foot contour line there?

A The general idea, the general basis, the factor, is that is as McGrath and Smith have testified, that they are producing considerable amounts of water, which is connate water and further,



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

from the establishment from other areas of the field, that this seems to be a relatively narrow band of water; that the permeability barrier exists up and down in conjunction with the narrow band of water.

Q Well, the narrow band of water does in fact follow the 1300 foot contour along the north extension here?

A Only in a very broad manner.

Q If you will look at it, it appears to me it's almost the same. What I'm getting at, Mr. Wilson, is this. You are aware, are you not, that the conditions from one place to another, and even from one location to another in the Caprock-Queen Pool, will vary widely, will they not?

A I will agree with you.

Q And that you may drill one well in the Caprock-Queen Pool and find it to be a very tight, with regard to permeability, and have wells near it which seem to have good permeability, isn't that right?

A Yes, sir. And in the general, you'll also have this correlation, that this narrow band of water exists close to these tight wells.

Q Isn't it true, also, Mr. Wilson, that there have been people who have stepped out beyond that water table line and actually drilled wells that produced in that formation; the Shelton wells to the south, for example?

A May I ask what section?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Well, it's off this map. Are you acquainted with any such wells?

A The Shelton wells to the south, no.

Q Are you acquainted with any wells that have been drilled where production has been obtained below the water table?

A Not in this immediate area.

Q Within this pool?

A No.

MR. CAMPBELL: I believe that's all the questions I have.

MR. NUTTER: Any further questions of the witness?

BY MR. NUTTER:

Q Mr. Wilson, I'm having a difficult time trying to correlate Exhibit B with Exhibit A here.

A Yes.

Q You show that a 660 foot location would have penetrated the permeability barrier in blue on your Exhibit No. B?

A Yes, sir.

Q And yet doesn't the blue cross-hashed line on Exhibit A indicate the presence of the permeability barrier?

A Let me explain this in this manner, that on Exhibit A indicates that on the top of the pay that you would at that point where you first encounter the red coming from the northwest, that at that point you would not have an oil column, you would penetrate water. That is at the top of the pay.

Q Well, now, does Exhibit B show the presence in any



place where the water penetrates close to the top of the pay and oil doesn't exist?

A No, sir. That would be, as we have previously testified, that this water seems to be very narrow, that if you projected it out entirely across there, that might be some 1200 feet, based on the general depth, et cetera, that we have seen from some of these others up here, that probably you would encounter the permeability barrier before you encountered water in the top of the pay.

Q Well, you couldn't encounter water if you encountered the permeability barrier, could you?

A Yes, sir.

Q Where would the water be?

A I agree with you, in other words.

Q Also, Mr. Wilson, it seems to me, according to Exhibit A, that a 660 location would be right in the center of that 40 and would miss the red area, which is the water area, is it not?

A Again I see I haven't made this completely clear; that these two exhibits do not entirely correlate in this respect. On Exhibit B, if you extend the water and assuming that it has a flat inter-face completely out there, that it would intersect the top of the pay at some point approximately 1200 feet to the east or southeast.

Q If you extended it through this permeability barrier?

A Let's neglect the permeability barrier for the moment. Assuming pay, or the permeable Queen sand extended on, and this

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6651



water existing at this point, projecting a water flat would encounter the top of the pay at some 1200 feet. Now for the permeability barrier, we believe from the evidence that we have given that the water is very narrow in width and think very likely that the permeability barrier would exist at the 660 location; therefore, with the projections on the water you would never get into the water at the regular location, 660 location.

Q In other words, this red line on Exhibit A is supposedly reflecting the top of the water column when it meets the top of the pay?

A Yes, sir.

Q Provided there's no permeability barrier present?

A Yes, sir.

Q Now where does the horizontal limits of the water, as depicted here in red on Exhibit B, where does that lay on Exhibit A?

A That would lay approximately just in effect, just under the location that was drilled and just some short distance, very short distance to the northwest.

Q In other words, that would be another line almost parallel to the existing red line?

A Yes, sir.

Q But northwest of it?

A And would also represent the contact of the water with the bottom of the pay.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Well, the extreme left edge of the line would?

A Yes.

Q So this in itself does not represent the water-oil contact at all, this red line on Exhibit A then?

A No, sir.

Q I am sorry, I thought it did.

A It is somewhat confusing.

Q You stated that the recovery as estimated by Core Lab would be extremely optimistic; however, they've assumed that there was 810 acre feet of oil present, 800 in barrels per acre foot --

A In place.

Q -- in place, and that the recovery down to zero psig would be 173 barrels per acre foot. That's a recovery of approximately only 21 percent. Is this an unusually high recovery rate for solution gas drive reservoirs?

A Not unusually. From other data in the field back here, we think that recovery, from the original time, that the recovery was more on the order of 18 percent, Mr. Nutter.

Q Then that's taken down to what pressure?

A That's from the original pressure down to 100 pounds.

Q That's in some of these areas in the pool that had reached a stripper state and had recovered in the order of 18 percent of the oil in place?

A Yes, sir. Both calculations and experience indicate that



PHONE CH 3-6651

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

is the order of magnitude.

BY MR. PAYNE:

Q Mr. Wilson, was the 18-11 well ever cored?

A Cored?

Q Yes.

A No, sir.

Q Was there ever an analysis made which predicted how much oil that well should recover?

A Primary?

Q Yes.

A I'm sure you are referring to, yes.

Q Did it live up to expectations or was it above or below?

A The time that the analysis was made, and the reason that it was made was at the time that we were considering the formation of the North Caprock-Queen Unit; it did not reach the last primary barrel. I think it was very close, but as you recall, this was indicated to be a stripper area and producing on the order of just a very few barrels a day. As I recall, that January, 1959, production from the 18-11 well was 103 barrels for the month.

Q Did Core Lab make the analysis on the 18-11?

A On the 18-11?

Q Of course, that one was not cored; this was just your own estimate then?

A Yes, sir.

BY MR. NUTTER:



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6591

ALBUQUERQUE, NEW MEXICO

Q To what do you attribute the low productivity of the 18-14 well on primary?

A Of the 18-14 on primary?

Q Yes.

A I attribute the low productivity there to, of course, one, point one being that this area was depleted in pressure to a great extent at the time that the well was drilled.

Q In 1954?

A In 1954. That the two wells to the east of it, that is, I am sorry, the well to the west of it and the well to the northwest had been drilled sometime previously. The whole area to the north and the northwest had been drilled at a substantial amount of time previously, thereby draining reservoir energy from the whole reservoir; in other words, lowering the pressure of the reservoir.

Q Do you know what your company estimates the net feet of pay to be in that well?

A In 18-14?

Q Yes.

A My thought on that is that it's on the order of about thirteen feet of pay, the quality as to which I cannot testify.

BY MR. PAYNE:

Q Mr. Wilson, I take it that you believe that the North Central Caprock-Queen Unit will have pushed oil to the Tidewater-State lease, regardless of whether they drilled a well on it or not?



A Yes, sir.

Q What would eventually happen to that oil in the absence of the McGrath and Smith Well No. 1?

A With the permeability barrier existing here, I think the physical factors are such that eventually the North Central Caprock-Queen Unit would probably have recovered that oil through the water flood. In other words, water flooding along a barrier is rather efficient.

MR. PAYNE: Thank you.

MR. NUTTER: Any further questions of Mr. Wilson?

REDIRECT EXAMINATION

BY MR. CHRISTY:

Q Mr. Wilson, in response to Mr. Payne's question, he asked you what would happen if the Smith and McGrath well had not been drilled, you would have pushed oil over into that 40. How would the oil have been recovered by the North Central, where would the oil go?

A Essentially in this manner: that we have several injection wells around there, that the water goes from the well and, of course, in ever-increasing directions, and is essentially a circle in the beginning and then is distorted by either an area of low pressure, that being a producing well; or in this particular instance here, that as the water emanated from the injection well and pushed up to the barrier, it would have pushed oil ahead of it, and as it got to the barrier then the water would push along the

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



barrier, pushing water ahead of that. I believe that concept is fairly well established in the literature.

Q In other words, push it along the barrier on back into the Unit?

A Right.

RECROSS EXAMINATION

BY MR. PAYNE:

Q When this pushing effect begins to happen, Mr. Wilson, isn't some of the oil underlying the 40-acre tract in question going to be pushed back into the, or be pushed to the North Central Caprock-Queen Unit, some of the oil that's actually under the McGrath and Smith 40 acres?

A Yes, sir. Eventually, as McGrath and Smith have testified that the water flood in this area is not moving at a rapid rate, that the two wells in question here, being 18-8 and 18-14 are wells of quite low injectivity, that it would be a matter of time and probably a matter of great time until that did happen. At the present time they are pushing towards that, it would be my opinion.

Q Eventually, you are going to get some of their oil. Might it not be reasonable to let them get some of yours now?

A Again there we get into the matter of rates, that to the north and to the west of the McGrath well or the acreage, you have a certain amount of volume there, that is, reservoir volume; that certainly you can practically demonstrate on an order of magnitude what the relative volumes are under the McGrath and Smith acreage, under the area affected by these wells. As a practical matter,

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

we have the water injection wells that helped to limit this particular area. If you could proceed in this manner, that taking the acreage between the line of wells, starting with 18-6, proceeding south through 18-14, from 18-6 going east to 18-8, that being the north and the west line, and the area of the, or the north line and the west line of the Tidewater -- pardon me, of the McGrath and Smith acreage, you have approximately 700 acre feet. We have previously testified that we think that McGrath and Smith have an order of 120 acre feet. I believe that the pure mathematics there indicate that they have approximately 14 percent of the oil in that area.

Q Do you believe at the present time the McGrath and Smith well is producing any oil from other than the 40-acre tract on which it's located?

A They aren't producing the oil in the well bore at this time. The oil is moving across the boundary line onto the McGrath and Smith acreage.

Q I see, so you believe that the higher the rate they produced it, the faster the oil will move across the lease line?

A From the unit.

MR. CHRISTY: Did I understand that you estimate that the primary recoverable oil will be recovered in twenty months?

A Yes, sir.

MR. CHRISTY: The minimum time that they can be flooded out in the field is three years?



A Yes, sir.

BY MR. CAMPBELL:

Q I am intrigued by your statement that you believe that oil is now moving across that line, at the time when you know that you are producing, at least presently, twice as much oil from 18-11 as they're producing from their well.

A Yes.

Q As a matter of reservoir engineering, isn't that an anomaly of some sort, if that is occurring?

A No, sir.

Q How do you analyze that?

A In this manner, Mr. Campbell. First, as we have just indicated, we have reservoir voidage in the area, in the area I previously outlined, which I believe you understand; that McGrath and Smith have approximately 15 percent of the void area, 18-11 and 18-7 are producing, and I think that is approximately 130 a day for 18-11 and 50 for 18-7.

Q The testimony was 60, maybe 50 is correct, whatever the record shows.

A Whatever the record shows. You will notice also that those wells are backed up, that is, 18-11 and 18-7 are backed up by very good injection wells, comparatively speaking, to these two down here. Therefore, you can expect that at least half the influence of the production from 18-11 is coming from the west and northwest, and in 18-7 from the north, at least, and from the

DEARNLEY-MEIER REPORTING SERVICE, Inc.
ALBUQUERQUE, NEW MEXICO

PHONE CH 3-5691



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6651

ALBUQUERQUE, NEW MEXICO

18-6. Just on the basis of the reservoir voidage that the McGrath and Smith have 14 percent of it, then if they void at the rate of 14 percent of the void space, then the withdrawal is equal that you have; two of those wells, let's say the total of them are 180 or 190, and of course, at least half of their influence is coming from the north and west. Therefore, that influence would be half of 190, what is that, 95, to strictly mathematically balance it, then the McGrath and Smith should be 14 percent of 95.

Q That's on the basis of long range permanent allowables, if you are correct in your assumptions and calculations, as to what they have under their tract, isn't that right?

A Yes, sir.

Q Now we're talking here, as you are aware, of the temporary allowable based on the same type of allowable that the Unit has?

A Yes.

Q Until such time as an attempt can be made, at least, at this meeting that you have called to negotiate this matter, isn't that right?

A We have called a meeting.

Q I have told you that's what we are talking about. In connection with the negotiation of these things, it's always the most serious problem of a Unit of this type to determine the participation, is it not --

A Yes, sir.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q --between the various people in the Unit?

A Yes.

Q That is arrived at after long discussion and comparisons and negotiation, is it not?

A "Long" is a comparative term, sometimes it's very short.

Q With the more operators, the more difficult normally it is, I assume; it's certainly not something that everybody comes in agreement on?

A In five minutes, if that is your comparative time, no. The operators in the North Central Caprock-Queen arrive at participation in a very short period of time.

Q It's never arrived at, of course, solely on the basis of the core, for example, is it? It wouldn't be realistic, would it?

A Would you repeat that question?

Q Well, we don't expect and you don't expect in a negotiation of this type to obtain the amount of reserves indicated by the maximum calculations in the Core Lab analysis, no one does that, do they?

A No, sir, they do not.

Q Neither do they very frequently arrive at a fixed figure immediately, it's a matter of contractual negotiation, isn't it?

A Yes.

Q And argument, such as we have been having here all afternoon?



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

A Yes, sir.

Q Based upon the statement that I made concerning what we're seeking here, Mr. Wilson, and based upon your statements as to time involved in the movement of this oil and the further fact that everybody admits that there's no water flood oil being produced from this well at the present time --

A May we qualify that, not produced by the well, but moving onto the McGrath.

Q Not being produced from the well at this time?

A Yes.

Q -- and the element of time involved, do you believe that the correlative rights of the Unit could be seriously affected by a 90-day order here which would permit them to at least avoid the risk of the proposition that they may be right, while they're negotiating this matter that they've discussed?

A As we have testified, we think that oil will be moving onto the McGrath and Smith acreage. We could extent that a little further, suppose that the several people involved could not agree, then oil has been irrevocably moved -- if we assume all these things are correct -- has been moved to the McGrath and Smith acreage.

Q If you are correct in your analysis?

A If our several assumptions are correct.

MR. CAMPBELL: I believe that's all.



REDIRECT EXAMINATION

BY MR. CRISTY:

Q Mr. Wilson, with respect to the correlative rights of the Unit, are there any other instances in this area where a similar well could be drilled and perhaps ask for and be in a similar position to the McGrath and Smith acreage, with respect to maximum or capacity allowables?

A Yes, sir, there are. We consider this to be a very precedent-setting case, that all up and down the Unit.

Q What's the location, if you will, please, so we can get descriptions in the record. Let's start at the north end of the red line on Exhibit A, and if you will, give it by description, please.

A If I may, I will give it by Quarters. That would be the Southwest of the Southeast of Section 32, 12 South, 32 East. The Northwest of the Northeast, Section 5, 13 South, 32 East; the Northeast Quarter of the Northwest Quarter of Section 8, 13 South, 32 East; the Southwest of the Southeast of Section 8, 13 South, 32 East.

Q That's only a maybe, isn't it, it's close?

A That's close, but it would be a maybe.

Q Are there any others?

A Yes, of course. Then in the Northeast of the Northwest of Section 19, 13 South, 32 East; and on the Southwest of the Southwest, Section 20, 13 South, 32 East; the Northwest of the

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



Southwest, Section 29, 13 South, 32 East; the Southeast of the Southeast, Section 30, 13 South, 32 East; and of course that brings us down by the Rock Unit.

Q So on Exhibit A there are some six or seven additional potential places similar to the McGrath?

A Yes, sir.

Q Is that the basis for your statement that this is a precedent-setting case?

A Yes, sir. I believe this is a precedent-setting case, that these locations may be drilled, not only those but there's possibility of others; that with the granting of this allowable it might become a common practice for operators, some operators whomever they might be, to snuggle up to these units and get capacity allowables and take oil from the Units, thereby violating their correlative rights.

MR. CAMPBELL: May I ask a question or two there?

MR. NUTTER: Yes.

RECROSS EXAMINATION

BY MR. CAMPBELL:

Q Now in the interest of the greatest recovery of oil along that line, shouldn't those locations be drilled?

A I think that those, of course, would be advantageous along this side; with this permeability barrier, I think that the oil would be recovered, and as previously testified about the efficient of flooding against the barrier.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

Q Now, Mr. Wilson --

A Yes.

Q -- you aren't taking the position that there's a permeability barrier established on the east side of that red line like this wall over here that's going to bounce all the oil along it and be recovered by some other well in a particular unit, are you? Is there that much certainty to that permeability barrier that you are talking about there, and that much uniformity to it?

A By data we have presented to the Commission today, we have supported our belief, and it is our belief that this permeability barrier exists, that of course permeability is a measure of the ability of fluids to flow. If that is a barrier, as we believe and we firmly believe that, it is, then fluids will not, oil nor water will flow through that barrier.

Q Neither will they bounce back from that barrier into a low pressure area, will they, even assuming it's a barrier of that nature?

A The term "bounce" I would not use. I would say just from fluid dynamics that there would be good efficiency of recovery in the area, that I believe that the efficiency of recovery along a barrier is better than a five-spot, the efficiency of the five-spot in the center of the field somewhere.

Q So if someone owns property along that barrier, that's not in a unit, then if they don't drill for it you are going to



get it, aren't you?

A I think that the operator should be afforded the right to drill and produce the fair share of oil that is under his property. I do not feel that he should be allowed to drill and to take oil from the Unit.

Q But you do believe it's fair to let the Unit take oil from him?

A I do not say that. I say that a man who believes he has oil should drill and produce it.

MR. CAMPBELL: That's all.

BY MR. NUTTER:

Q I notice that you have got, Great Western has a couple of leases up here in Section 5.

A Yes, sir.

Q When were those wells drilled on the State "R" lease and State "S" lease?

A Those wells were drilled, let's say, last July and August.

Q Was that after the water injection program commenced in the North Caprock-Queen Unit No. 1?

A Yes, sir.

Q Do those wells produce any oil?

A Yes, sir.

Q What are they capable of producing?

A Several of those are capable of quite good production.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

ALBUQUERQUE, NEW MEXICO

PHONE CH 3-6691



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6191

ALBUQUERQUE, NEW MEXICO

Without getting my data out, let me say that a couple of them can produce in excess and greatly in excess of the top unit allowable. Further, this position today that Great Western has taken, that an operator should not be allowed to get on the edge of the Unit with a well and produce oil from the Unit at a capacity rate, was not thought up yesterday, that we drilled those last summer. We have not and we will not ask for additional allowables on those wells until such time that we have converted two of those wells to injection wells.

MR. NUTTER: I believe that's all. Thank you.

BY MR. CAMPBELL:

Q Mr. Wilson, those wells are in the Unit, aren't they?

A They are not in the Unit.

Q Are you getting them in the Unit?

A We have talked with the Unit operator to get those in the Unit and have reached the conclusion that the Unit operator, I am sorry that all the Unit operators, and incidentally, in that Unit you have to have 100 percent consent from all the people for wells to be admitted, that we will in the very near future convert two of those on pattern to injection wells and cooperate with the Unit. As a matter of fact, our tentative arrangements are to obtain water for injection from the North Caprock-Queen Unit No. 1, operated by Graridge.

MR. CAMPBELL: That's all.

MR. CHRISTY: That's all we have from this witness.



MR. NUTTER: Any further questions? He may be excused.

(Witness excused.)

MR. CHRISTY: We would like to offer in evidence Great Western, et al's Exhibits A and B.

MR. NUTTER: Great Western, et al's Exhibits A and B will be admitted in evidence. Do you have anything further, Mr. Christy?

MR. CHRISTY: That's all for the respondents.

MR. NUTTER: Does anyone have anything further they care to offer in Case 1962? Does anyone have any statements to make?

MR. PAYNE: Mr. Examiner, we received statements from two parties not represented in the hearing today, Graridge and Ambassador. They're rather long, we will just place them in the record, please.

MR. CAMPBELL: May I see them, please?

MR. PAYNE: Yes.

MR. CHRISTY: What is the essence of them, please?

MR. PAYNE: They're both objections.

MR. NUTTER: If there's nothing further in Case 1962, we will take the case under advisement.

DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEX.



DEARNLEY-MEIER REPORTING SERVICE, Inc.

PHONE CH 3-6691

ALBUQUERQUE, NEW MEXICO

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) ss

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in Stenotype, and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

DATED this 18th day of May, 1960, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:
June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1962, heard by me on May 11, 1960.
Vernon B. Martin, Examiner
New Mexico Oil Conservation Commission



CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (1-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA085 DA308

D LUA277 PD=LUBBOCK TEX 9 150P CST=
HERVEY DOW AND WINKLE, ATTN S B CHRISTY=
HINKLE BLDG ROSWELL NMEX=

1960 MAY 9 PM 1 09

WITH REFERENCE TO MCGRATH AND SMITH APPLICATION HEARING
MAY 11TH DELFERN DESIRES TO SUPPORT POSITION TAKEN BY
GREAT WESTERN IN OPPOSITION TO CAPACITY ALLOWABLE FOR
WELL IN SECTION 18 13 SOUTH RANGE 32 EAST LEA COUNTY
AND REQUEST YOU TO MAKE APPEARANCE FOR US AT THE
HEARING BEFORE OIL CONSERVATION COMMISSION
DELFERN OIL CO J D DUNCAN=

RECEIVED
MAY 9 1960

HERVEY DOW & HINKLE
ROSWELL, NEW MEXICO

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

DA086 DEA229

DE GPB159 PD=GRAND RAPIDS MICH 9 1201P EST=
GREAT WESTERN DRILLING CO=
MIDLAND TEX=

1960 MAY 9 AM 11 22

WE SUPPORT YOU ON YOUR STAND OF THE MC GRATH AND SMITH
WELL=

WOLVERINE OIL CO SIDNEY JANSMA.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

SYMBOLS

DL=Day Letter

NL=Night Letter

LT=International Letter Telegram

1220
(R 11-54)

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

LA178 DB231

D FWB426 LONG PD=FORT WORTH, TEX 9 312P CST=1960 MAY 9 PM 2 55
NEW MEXICO OIL CONSERVATION COMMISSION=

ATTN DANIEL S NUTTER EXAMINER SANTA FE NMEX=

IN ACCORDANCE WITH MY TELEPHONE CALL TO YOU THIS MORNING
PLEASE REFER TO OIL CONSERVATION COMMISSION DOCKET #13-60,
CASE #1962 APPLICANTS: MCGRATH & SMITH (STOP) AS AN OWNER
IN THE NORTH CENTRAL CAPROCK QUEEN WATERFLOOD UNIT
OPERATED BY GREAT WESTERN DRILLING COMPANY AND AS OWNER
OF NEW MEXICO STATE OIL AND GAS LEASES OFFSETTING BOTH
THE GRARIDGE UNIT OPERATED BY AMBASSADOR OIL COMPANY AND
NORTH CENTRAL CAPROCK QUEEN UNIT OPERATED AS ABOVE WE
RESPECTFULLY URGE THAT THIS HEARING BE POSTPONED FOR A
PERIOD OF NOT LESS THAN 30 DAYS FROM ITS PRESENT SETTING,
MAY 11, 1960 (STOP) IT IS TRUE WE HAD NOTICE PUBLISHED BY
THE COMMISSION OF THIS HEARING APPROXIMATELY 10 DAYS AGO,
BUT OUR FIRST ACTUAL NOTICE OCCURRED THIS MORNING
IMMEDIATELY PRIOR TO MY CALL TO YOU. (STOP) THE MATTER IS
SO INVOLVED THAT EVEN HAD WE BEEN ADVISED IMMEDIATELY OF
THE SETTING OF THE CASE WE WOULD NOT HAVE HAD TIME TO
COMPLETE THE ENGINEERING AND GEOLOGICAL DATA WE THINK SHOULD
BE PRESENTED FOR THE CONSIDERATION OF THE COMMISSION. UNDER
PRESENT CIRCUMSTANCES WE ARE TOTALLY UNPREPARED TO PRESENT
PROPER EVIDENCE IN THE MATTER (STOP) WE HAVE REQUESTED
OUR NEW MEXICO ATTORNEYS TO PUT IN AN APPEARANCE BEFORE
YOUR BODY AND SO ADVISE THE COMMISSION AND TO URGE THAT

CLASS OF SERVICE
This is a fast message
unless its deferred char-
acter is indicated by the
proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1220
(R 11-54)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International
Letter Telegram

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

THE HEARING BE POSTPONED TO A LATER DATE AS REQUESTED
ABOVE. THIS REQUEET IS ADDRESSED TO YOUR MR DANIEL S
NUTTER DUE TO THE FACT THAT WE KNEW HE WAS FAMILIAR
WITH IT AND WE RESPECTFULLY REQUEST THAT HE REFER THIS
TELEGRAPHIC REQUEET TO THE HON JOHN BURROUGHS, CHAIRMAN,
THE HON MURRAY E MORGAN, MEMBER AND HON. A L PORTER, JR
SECRETARY AND MEMBER OF THE COMMISSION OR TO ANY OTHER
NECESSARY ADMINSTRATIVE OFFICERS OR MEMBERS OF THE STATE
OF NEW MEXICO OIL CONSERVATION COMMISSION. THIS REQUEST
IS RESPECTFULLY SUBMITTED=
WHALEY COMPANY INC BY WILLIAM D MORRIS=

=#13-60 #1962 11 1960 30

RECEIVED

MAY 2 PM 3 07

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE.

This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

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

SYMBOLS

DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

1201

PA 12 56

LA118 DB203

D MDA135 PD=MIDLAND TEX 14 135PMC=
NEW MEXICO OIL CONSERVATION COMMISSION=
SANTA FE NMEX=

ATTN MR A L PORTER JR PLEASE CONSIDER THIS APPLICATION
FOR EXCEPTION TO ALLOWABLE ON MCGRATH AND SMITH
TIDEWATER-STATE NO 1, J-18-13-32, LEA COUNTY. WELL
OFFSETS NORTH CENTRAL CAPROCK QUEEN UNIT WHERE WELLS
PRODUCE FULL CAPACITY. LETTER WILL FOLLOW=
POMEROY SMITH.

Cwp 1964

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

DOCKET: EXAMINER HEARING MAY 11, 1960

Oil Conservation Commission - 9 a.m., Mabry Hall, State Capitol, Santa Fe.

The following cases will be heard before Daniel S. Nutter, Examiner, or Oliver E. Payne, Attorney, as alternate examiner:

- CASE 1958: Application of Texaco Inc., for approval of an automatic custody transfer system. Applicant, in the above-styled cause, seeks an order authorizing the installation of an automatic custody transfer system to handle the production from the Echol-Devonian Pool from all wells on its State "AR" Lease, consisting of the N/2 SW/4 and Lots 3 and 4 of Section 2, Township 11 South, Range 37 East, Lea County, New Mexico.
- CASE 1959: Application of Sinclair Oil & Gas Company for approval of an automatic custody transfer system. Applicant, in the above-styled cause, seeks an order authorizing the installation of an automatic custody transfer system to handle the production from the Empire-Abo Pool from all wells presently completed or hereafter drilled on its M. Yates "B" Lease, consisting of the S/2, NE/4, S/2 NW/4, and NE/4 NW/4 of Section 33, Township 17 South, Range 28 East, Eddy County, New Mexico.
- CASE 1960: Application of Gulf Oil Corporation for approval of a unit agreement. Applicant, in the above-styled cause, seeks approval of its North Caverns Unit Agreement, which unit will embrace approximately 6,303 acres of Federal and State land in Townships 22 and 23 South, Range 24 East, Eddy County, New Mexico.
- CASE 1961: Application of Gulf Oil Corporation for permission to commingle the production from four separate pools and for approval of an automatic custody transfer system to handle said commingled production. Applicant, in the above-styled cause, seeks permission to commingle the production from the Blinebry, Drinkard, Paddock, and Penrose-Skelly Pools from all wells located on its C. L. Hardy lease comprising the SW/4 of Section 20, Township 21 South, Range 37 East, Lea County, New Mexico, after separately metering only the production from the Blinebry Pool and to allocate the Drinkard Paddock and Penrose-Skelly Pool production without prior metering or measurement but on the basis of monthly individual well tests. Applicant further seeks approval of an automatic custody transfer system to handle the said commingled production from all wells on the said C. L. Hardy lease.

CASE 1962: Application of McGrath and Smith for a special allowable for one well in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico. Applicant, in the above-styled cause, seeks a special allowable for one well offsetting a capacity water-flood project in the Caprock-Queen Pool, Lea and Chaves Counties, New Mexico. Said well is the Tidewater-State Well No. 1, located in the NW/4 SE/4 of Section 18, Township 13 South, Range 32 East, Lea County, New Mexico.

CASE 1963: Application of Aztec Oil & Gas Company for an unorthodox gas well location and for approval of two non-standard units. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Blanco-Mesaverde Gas Pool for its Richardson Well No. 6, to be located in the SE/4 of Section 22, Township 31 North, Range 12 West, San Juan County, New Mexico. Applicant further seeks establishment of a 297-acre non-standard gas proration unit in the Blanco-Mesaverde Gas Pool and a 297-acre non-standard unit in the Dakota Producing Interval, each consisting of the E/2 of said Section 22 and to be dedicated to the said Richardson Well No. 6.

CASE 1964: Application of Aztec Oil & Gas Company for an unorthodox gas well location and for approval of two non-standard units. Applicant, in the above-styled cause, seeks approval of an unorthodox gas well location in the Blanco-Mesaverde Gas Pool for its Richardson Well No. 7, to be located in the SE/4 of Section 15, Township 31 North, Range 12 West, San Juan County, New Mexico. Applicant further seeks establishment of a 309.55-acre non-standard gas proration unit in the Blanco-Mesaverde Gas Pool and a 309.55-acre non-standard unit in the Dakota Producing Interval, each consisting of the E/2 of said Section 15, and to be dedicated to said Richardson Well No. 7.

CASE 1965: Application of Aztec Oil & Gas Company for approval of an unorthodox gas well location. Applicant, in the above-styled cause, seeks approval of an unorthodox location in the Blanco-Mesaverde Gas Pool for its Thompson Well No. 6, to be located in the SE/4 of Section 28, Township 31 North, Range 12 West, San Juan County, New Mexico.

CASE 1966: Application of Texas National Petroleum Company for an oil-gas dual completion utilizing parallel strings of casing cemented in a common well bore and for an unorthodox gas well location. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of a well to be located at an unorthodox location 660 feet from the North and West

-3-

Docket No. 13-60

CASE 1966:
(Cont.)

lines of Section 1, Township 25 North, Range 9 West, San Juan County, New Mexico, in such a manner as to permit the production of oil from the Gallup formation and the production of gas from the Dakota Producing Interval through 2 7/8-inch casing and through 2-inch tubing set in 4 1/2-inch casing respectively with the casing being cemented in a common well bore.

ig/

McGrath & Smith

~~McGrath & Smith~~

Midland, Texas

Case 1962
~~Mutual 2082~~ 2-7956

209 Petroleum Life Building

April 14, 1960

Re: McGrath & Smith
Tidewater-State No. 1
NW-SE Section 18, T-13-S,
R-32-E
Lea County, New Mexico

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.

Gentlemen:

Further to our telegram of April 14, 1960, we wish to apply
for an exception to allowable on subject well.

The North Central Caprock Queen Unit #18-7 is our direct
offset to the north and produced 1800 barrels of oil in March.
Their #18-11 is our direct west offset and this well produced
3380 barrels in March. Production on both of these wells is
increasing. It is our feeling that our lease will be drained
by these wells if we are held to the present allowable.

We will appreciate your consideration of this application at
your earliest convenience.

Respectfully submitted,

McGRATH & SMITH

By: *Pomeroy Smith*

Pomeroy Smith ✓

PS:ph

CC: New Mexico Oil Conservation Commission
Hobbs, New Mexico
Attention: Mr. Jos. Ramy

*Rec'd
Mailed
4-28-60
JR*

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. 1962
Order No. R-1689

APPLICATION OF McGRATH AND SMITH
FOR A SPECIAL ALLOWABLE FOR ONE
WELL IN THE CAPROCK-QUEEN POOL,
LEA AND CHAVES COUNTIES, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on May 11, 1960, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 7th day of June, 1960, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, and being fully advised in the premises,

FINDS:

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

(2) That the applicants are the owners and operators of the Tidewater-State Well No. 1, completed in April of 1960 and located in the NW/4 SE/4 of Section 18, Township 13 South, Range 32 East, NMPM, Lea County, New Mexico, at a point 330 feet from the South and East boundaries of an existing capacity waterflood project in the North Central Caprock Queen Unit.

(3) That the applicants seek a special allowable for the said Tidewater-State Well No. 1 in an amount equal to the present ability of the well to produce, basing this request upon the ground that the offset wells to the North and West, which wells are in the North Central Caprock Waterflood Project, are producing considerably in excess of top unit allowable, and that restricting the production of the subject well to top unit allowable will impair the applicants' correlative rights.

(4) That the applicants and the protestant agree that

-2-

CASE No. 1962
Order No. R-1689

although the applicants' tract is offset by three injection wells, the oil that is currently being produced from the subject well is primary oil and is not coming from the North Central Caprock Queen Unit.

(5) That assuming water is injected into the three injection wells which offset the applicants' tract (Well No. 18-6, Well No. 18-8 and Well No. 18-14), it is only reasonable to infer that higher pressures will exist on the North Central Caprock Queen Unit than on the applicants' tract, and while there may be migration of oil to some degree from applicants' tract toward the two offset producing wells on the Unit, there should be a more than compensating amount of oil migration from the high pressure unit area to the applicants' tract, even though the application is denied.

(6) That an impermeable barrier exists along the East flank of the Caprock-Queen Pool, which barrier will prevent the migration of oil away from the productive limits of said Pool on the East side regardless of the producing rate of the subject well, thus denial of the subject application will not cause waste.

(7) That the operator of the North Central Caprock Queen Unit should make every effort to restore its Well No. 18-8 and Well No. 18-14 to effective water injection immediately, not only in the interest of greater ultimate recovery, but since it is the injection of water into the three wells offsetting the applicants' tract that keeps the pressure in the unit area higher than the pressure on applicants' tract, thereby protecting correlative rights.

(8) That every reasonable effort should be made by all parties concerned to incorporate the subject well into the North Central Caprock Queen Unit, particularly since in order to continue the present water injection pattern the subject well should be converted to injection.

(9) That should conditions warrant it, the Commission would not be adverse to hearing this case again at some future date.

IT IS THEREFORE ORDERED:

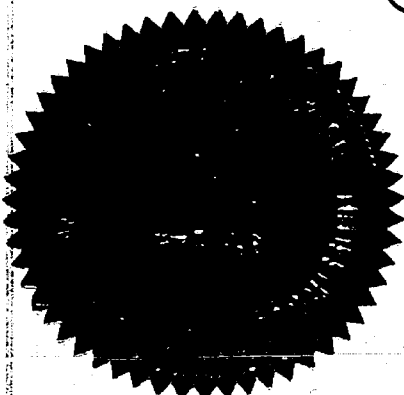
That the application of McGrath and Smith for a special allowable for its Tidewater-State Well No. 1, located in the NW/4 SE/4 of Section 18, Township 13 South, Range 32 East, Caprock-Queen Pool, Lea and Chaves Counties, New Mexico, be and the same is hereby denied.

-3-

CASE No. 1962
Order No. R-1689

DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


John Burroughs
JOHN BURROUGHS, Chairman

Murray E. Morgan
MURRAY E. MORGAN, Member

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

esr/

CLASS OF SERVICE
This is a fast message
unless its deferred char-
acter is indicated by the
proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1220
(R 11-54)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International
Letter Telegram

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

LA170 DC293

1960 MAY 9 1 PM 2 18

D ABA159 LONG PD=BRECKENRIDGE TEX 9 245P CST=

MERRILL WILSON, GREAT WESTERN DRILLING CO=

CARE THE DESERT INN SANTA FE NMEX=

GRARIDGE CORPORATION AS AN INTEREST HOLDER IN THE NORTH
CENTRAL CAPROCK UNIT OPPOSES THE GRANTING OF A SPECIAL
ALLOWABLE OVER NORMAL UNIT ALLOWABLE TO MCGRATH AND SMITH
ON THEIR TIDEWATER STATE NO 1 AS REQUESTED IN CASE NO
1962. THIS SPECIAL ALLOWABLE SHOULD NOT BE GRANTED UNTIL
SUFFICIENT TIME HAS ELAPSED TO NEGOTIATE FOR THE ENTRANCE
OF THIS WELL INTO THE UNIT ON A REASONABLE BASIS.
WE FEEL THAT CORRELATIVE RIGHTS WILL NOT BE VIOLATED OR
OIL LOST BY DEFERRING ACTION ON THIS UNTIL NEGOTIATIONS
HAS BEEN CARRIED OUT WITH MCGRATH AND SMITH TO SEE IF THE
WELL CAN BE BROUGHT INTO THE UNIT. IT IS REQUESTED THEREFORE
THAT ANY ACTION BE DELAYED UNTIL NEGOTIATIONS HAVE TAKEN
PLACE. NORTH CENTRAL CAPROCK UNIT HAS MEETING CALLED FOR
MAY 19TH=

GRARIGE CORP O H RAUG VICE PRESIDENT.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

Class **VICE**
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION

TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA 169 DB 2 05

1960 MAY 9 PM 2 16

D ABA157 PD=BRECKENRIDGE TEX 9 245P CST=
NEW MEXICO OIL CONSERVATION COMMISSION,
ATTN DAN NUTTER= SANTA FE NMEX=

John
5/9

GRARIDGE CORPORATION AS AN INTEREST HOLDER IN THE NORTH CENTRAL CAPROCK UNIT OPPOSES THE GRANTING OF A SPECIAL ALLOWABLE OVER NORMAL UNIT ALLOWABLE TO MCGRATH AND SMITH ON THEIR TIDEWATER STATE NO 1 AS REQUESTED IN CASE NO 1962. THIS SPECIAL ALLOWABLE SHOULD NOT BE GRANTED UNTIL SUFFICIENT TIME HAS ELAPSED TO NEGOTIATE FOR THE ENTRANCE OF TH'S WELL INTO THE UNIT ON A REASONABLE BASIS. WE FEEL THAT CORRELATIVE RIGHTS WILL NOT BE VIOLATED OR OIL LOST

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

ASS OF SERV
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION

TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS
DL=Day Letter
NL=Night Letter
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

BY DEFERRING ACTION ON THIS UNTIL NEGOTIATIONS HAVE BEEN CARRIED OUT WITH MCGRATH AND SMITH TO SEE IF THE WELL CAN BE BROUGHT UNTO THE UNIT IT IS REQUESTED THEREFORE THAT ANY ACTION BE DELAYED UNTIL NEGOTIATIONS HAVE TAKEN PLACE. NORTH CENTRAL CAPROCK UNIT HAS MEETING CALLED FOR MAY 19TH=
GRARIDGE CORP O H REAUGH VICE PRESIDENT.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE
This is a fast message unless its deferred character is indicated by the proper symbol.

WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

SYMBOLS
DL = Day Letter
NL = Night Letter
LT = International Letter Telegram

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

1220
(R 11-54)

1960 MAY 9 1PM 6 50

LA239 DA524

D FWB609 LONG NL PD=DAX FORT WORTH TEX 9=
OIL CONSERVATION COMMISSION=
SANTA FE NMEX=

REGARDING CASE NO 1962, MAY 11TH DOCKET, AMBASSADOR OIL
OPPOSES GRANTING ANY SPECIAL ALLOWABLE TO SMITH AND MCGRATH
#1 WELL UNTIL APPLICANTS ENGAGE IN ACTUAL WATERFLOOD
OPERATIONS. APPLICANTS HAVE ADDITIONAL CONTIGUOUS ACREAGE
ON WHICH SUCH WATERFLOOD OPERATIONS COULD BE CONDUCTED.
IF APPLICANTS HAD ONLY THE SINGLE 40-ACRE TRACT UPON
WHICH HIS #1 WELL IS COMPLETED AND IF HE HAD BEEN
UNSUCCESSFUL IN NEGOTIATING AN EQUITABLE PARTICIPATION WITH
ADJOINING UNIT, THEN AMBASSADOR WOULD NOT OPPOSE SUCH
REQUEST FOR SPECIAL ALLOWABLE=
AMBASSADOR OIL CORP BY KENNETH L SMITH=

=1962 11 #1 40 #1.

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

(Form C-104)
Revised 7/1/57

REQUEST FOR (OIL) - (GAS) ALLOWABLE

New Well
Recompletion

This form shall be submitted by the operator before an initial allowable will be assigned to any completed Oil or Gas well. Form C-104 is to be submitted in QUADRUPPLICATE to the same District Office to which Form C-101 was sent. The allowable will be assigned effective 7:00 A.M. on date of completion or recompletion, provided this form is filed during calendar month of completion or recompletion. The completion date shall be that date in the case of an oil well when new oil is delivered into the stock tanks. Gas must be reported on 15.025 psia at 60° Fahrenheit.

Midland, Texas

April 13, 1960

(Place)

(Date)

WE ARE HEREBY REQUESTING AN ALLOWABLE FOR A WELL KNOWN AS:

McGrath & Smith

Tidewater-State

Well No. 1, in NW 1/4 SE 1/4,

(Company or Operator)

(Lease)

J
Unit Letter

Sec. 18

T. 13S

R. 32E

NMPM,

Caprock Queen

Pool

Lee

County. Date Spudded 3-15-60

Date Drilling Completed 3-22-60

Please indicate location:

Elevation 4382 KB Total Depth 3075 PBD 3070

Top Oil/Gas Pay 3050 Name of Prod. Form. Queen Sand

PRODUCING INTERVAL -

Perforations 3052-58

Open Hole - Depth Casing Shoe 3075 Depth Tubing 3058

OIL WELL TEST -

Natural Prod. Test: - bbls. oil, - bbls water in - hrs, min. Size

Test After Acid or Fracture Treatment (after recovery of volume of oil equal to volume of Choke load oil used): 64 bbls. oil, 43 bbls water in 24 hrs, 0 min. Size

GAS WELL TEST -

on pump

Natural Prod. Test: MCF/Day; Hours flowed Choke Size

Method of Testing (pitot, back pressure, etc.):

Test After Acid or Fracture Treatment: MCF/Day; Hours flowed

Choke Size Method of Testing:

Acid or Fracture Treatment (Give amounts of materials used, such as acid, water, oil, and sand): 250 gals. breakdown acid, 7500 gals. oil, 15000# sand

Casing Tubing Date first new 4-12-60
Press. Press. oil run to tanks

Oil Transporter Indiana Oil Purchasing Co.

Gas Transporter none

Remarks:

I hereby certify that the information given above is true and complete to the best of my knowledge.

Approved, 19.

McGrath & Smith

(Company or Operator)

OIL CONSERVATION COMMISSION

By: (Signature)

By: BEFORE EXAMINER NUTTER

Title Agent

Title OIL CONSERVATION COMMISSION

Send Communications regarding well to:

Name McGrath & Smith

Address 209 Petroleum Life Bldg.
Midland, Texas

EXHIBIT NO. 2
CASE NO. 1962

BEFORE EXAMINER NI

CORE LABORATORIES, INC.

Petroleum Reservoir Engineering

DALLAS, TEXAS

OIL CONSERVATION COM.

EXHIBIT NO. 3
CASE NO. 1962

Page 1 of 1 File WP-3-1446

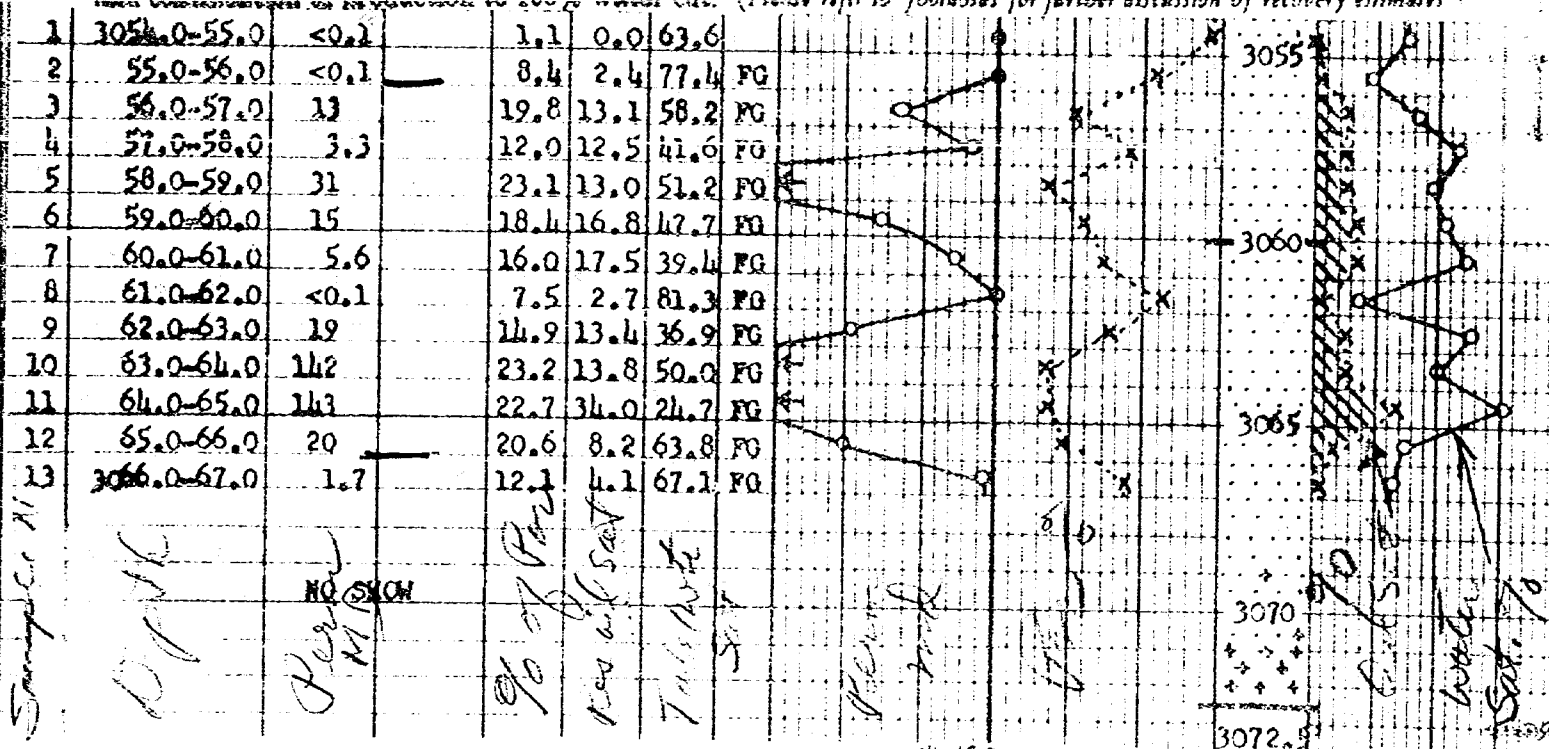
Well Tidewater State No. 1

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Queen 3054.0 - 3067.0

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	13.0	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	48.1
FEET OF CORE INCLUDED IN AVERAGES	10.0	AVERAGE GONIMATE WATER SATURATION: PER CENT OF PORE SPACE (e)	35
AVERAGE PERMEABILITY: MILLIDARBY	39	OIL GRAVITY: °API (e)	32
PRODUCTIVE CAPACITY: MILLIDARBY-FOOT	390	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL (e)	230
AVERAGE POROSITY: PER CENT	18.3	ORIGINAL FORMATION V. SATURATED OIL PER BA JME FACTOR: BARRELS EL STOCK-TANK OIL (e)	1.14
AVERAGE RESIDUAL OIL SATURATION: PER CENT OF PORE SPACE	14.6	CALCULATED ORIGINAL BARRELS PER ACRE-FOOT STOCK-TANK OIL IN PLACE:	810

Calculated maximum solution gas drive recovery is 173 barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is 604 barrels per acre-foot, assuming full maintenance of original reservoir pressure, 100% areal and vertical coverage, and continuation of production to 100% water cut. (Please refer to footnotes for further discussion of recovery estimates)



These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressure; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed predictions of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to overall reservoir characteristics and economic factors.

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, they are made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but the client and its officers and employees assume no responsibility and make no warranty or representation as to the accuracy, completeness, or operation, or the use of the data or of the material well or sand in connection with which such report is used or relied upon.