

CASE NO. 5443: SUN OIL COMPANY  
FOR POOL CREATION AND SPECIAL  
POOL RULES, LEA COUNTY, NEW MEXICO

CASE No.

5443

Application,

Transcripts,

Small Exhibits

ETC.

**sid morrish reporting service**

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

Page 1

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
April 28, 1976

EXAMINER HEARING

IN THE MATTER OF:

Case 5443 being reopened pursuant to  
the provisions of Order No. R-4994,  
which order established special rules  
and regulations for the East Lusk-  
Bone Spring Oil Pool, Lea County,  
New Mexico.

CASE  
5443  
(Cont'd.)

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: William F. Carr, Esq.  
Legal Counsel for the Commission  
State Land Office Building  
Santa Fe, New Mexico

For the Applicant: W. Thomas Kellahin, Esq.  
KELLAHIN & FOX  
Attorneys at Law  
500 Don Gaspar  
Santa Fe, New Mexico

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

Page 2

I N D E X

	<u>Page</u>
1	
2	
3	<u>HERBERT A. SEIDEL, JR.</u>
4	Direct Examination by Mr. Kellahin 3
5	Cross Examination by Mr. Stamets 14
6	
7	
8	

EXHIBIT INDEX

	<u>Page</u>
9	
10	
11	Sun's Exhibit No. Six, Log 14
12	Sun's Exhibit No. Seven, Recovery Calculations 14
13	Sun's Exhibit No. Eight, Drainage Calculations 14
14	Sun's Exhibit No. Nine, Economics Calculations 14
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

1 MR. STAMETS: We will call the next Case 5443.

2 MR. CARR: Case 5443 reopened and continued. In the  
3 matter of Case 5443 being reopened pursuant to the provisions  
4 of Order No. R-4994, which order established special rules and  
5 regulations for the East Lusk-Bone Spring Oil Pool, Lea County,  
6 New Mexico, including a provision for one hundred and sixty  
7 acre spacing and proration units.

8 MR. KELLAHIN: Tom Kellahin of Kellahin and Fox  
9 appearing on behalf of Sun Oil Company and I have one witness  
10 to be sworn.

11 MR. STAMETS: Will you stand and be sworn, please?

12 (THEREUPON, the witness was duly sworn.)

13  
14 HERBERT A. SEIDEL, JR.

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

17  
18 DIRECT EXAMINATION

19 BY MR. KELLAHIN:

20 Q Would you please state your name, by whom you are  
21 employed and in what capacity?

22 A I'm Herbert A. Seidel, S-e-i-d-e-l, Jr. I work  
23 for Sun Oil Company as a Senior Professional Engineer in their  
24 Dallas Production Region, Dallas, Texas.

25 Q Have you previously testified before this Commission

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

Page 4

1 and had your qualifications as an expert witness accepted and  
2 made a matter of record?

3 A Yes, I have.

4 Q Have you made a study of and are you familiar with  
5 the regulations concerning the Casey-Strawn Pool, Lea County,  
6 New Mexico?

7 A Yes, I am.

8 MR. KELLAHIN: If the Examiner please, are the  
9 witness' qualifications acceptable?

10 MR. STAMETS: They are.

11 Q (Mr. Kellahin continuing.) Mr. Seidel, would you  
12 refer to what has been marked as Sun Oil Company Exhibit Number  
13 One and identify it?

14 A Excuse me, would this be Exhibit One or Six?

15 MR. KELLAHIN: This is a continuation. Let me  
16 renumber those if you don't mind, Mr. Stamets.

17 MR. STAMETS: Start with Six.

18 MR. KELLAHIN: We'll start with Six. The previous  
19 five exhibits were presented by Mr. Larson in the hearing of  
20 this case a couple of weeks ago.

21 Q (Mr. Kellahin continuing.) Beginning then with  
22 Exhibit Number Six, Mr. Seidel, would you identify it?

23 A Yes, sir, this is a semi-log plot of the daily oil  
24 production for this one well in this field, Sun Oil Company's  
25 Jennings Federal No. 1. Production began in February, 1975.

1 I might point out the scale on the left there has a line  
2 drawn through it and it is supposed to represent a decimal  
3 point. In February of '75, for example, is three hundred  
4 barrels a day production and averaged about that for about  
5 eight or nine months and has begun to decline.

6 We have installed a pump just a few days ago and  
7 on pump the well produced three hundred barrels a day. That's  
8 not shown on this exhibit.

9 What we have done here is tried to show in our  
10 opinion what the minimal reserves would be for this well and  
11 to date they have produced a hundred and four point eight  
12 thousand barrels and have a remaining reserve of about ninety-  
13 seven thousand barrels for a total ultimate recovery of  
14 about two hundred and two thousand barrels of oil.

15 Q Would you please refer to Exhibit Number Seven and  
16 identify it?

17 A This is an exhibit showing recovery calculations  
18 assuming three different drainage areas as well as the original  
19 stock tank oil in place based on the porosity and water  
20 saturations calculated from log analysis in the Jennings  
21 Federal No. 1.

22 The original stock tank oil in place, the equation  
23 at the top there is seventy-seven, fifty-eight times the  
24 porosity of point oh six five times the difference in one minus  
25 the water saturation, point three, divided by the formation

1 volume factor at bubble point conditions of one point three  
2 seven. This gives you two hundred and fifty-seven point seven  
3 stock tank barrels per acre foot in place.

4 The first assumption of a hundred and sixty acre  
5 drainage, we have original oil in place of two hundred and  
6 fifty-seven point seven barrels per acre foot times sixteen  
7 feet times a hundred and sixty acres or six hundred and fifty-  
8 nine thousand, seven hundred stock tank barrels.

9 Our ultimate recovery projected at two hundred  
10 thousand barrels indicates a recovery efficiency of thirty  
11 point three percent of the original stock tank oil in place.  
12 Our current recovery of a hundred and five thousand barrels  
13 indicates a recovery efficiency of fifteen point nine percent.

14 On eighty acre spacing, using the same equation,  
15 we have a recovery efficiency of sixteen point six for two  
16 hundred thousand barrels ultimate recovery and thirty-one  
17 point eight percent for a hundred and five thousand current.

18 On forty acre spacing we are expected to produce  
19 more than the original oil in place or a hundred and twenty-  
20 one percent. Current recovery would be sixty-three point  
21 seven percent of the original oil in place.

22 Q. What was the reference you used to make the calcula-  
23 tions for the recovery of the above bubble point calculations?

24 A. We used Stannings Correlations and a six hundred and  
25 seventy-four cubic feet per barrel, initial gas oil ratio from



1 our potential test.

2 Q And for using the calculations under B, the  
3 recovery below bubble point, what was your source of  
4 authority?

5 A Now, you are moving on to Exhibit Number Eight, am  
6 I right, Tom?

7 Q No, I'm talking about notations down here at the  
8 bottom.

9 A I'm sorry, I've been reading off of this exhibit.  
10 This was my Exhibit Seven.

11 MR. KELLAHIN: Did we get it renumbered here?

12 MR. STAMETS: I've got the same Exhibit Seven as  
13 the witness has.

14 MR. KELLAHIN: I'm sorry I've got mine -- go ahead.

15 A I think that's about all I had to say about this  
16 exhibit. We may refer back to it after we get through with  
17 this Exhibit Number Eight.

18 Q (Mr. Kellahin continuing.) Fine. Let's go now  
19 to Exhibit Number Eight.

20 A This is an exhibit showing the drainage calculations  
21 from the material balance calculations and some statistical  
22 equations developed by John Arps, et al, and published in an  
23 API Bulletin D14 in October, 1967.

24 Starting up at the top we have some recovery above  
25 the bubble point and note we referenced Craft & Hawkins,

sid morrish reporting service

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

1 Applied Petroleum Reservoir Engineering, (Prentice-Hall, Inc.,

2 1959) and we have barrels per acre foot of two hundred and  
3 fifty-seven point seven, which we had calculations shown on  
4 Exhibit Seven, times the initial pressure, minus the bubble  
5 point pressure of thirty-nine, twenty-seven minus two thousand,  
6 times the oil saturation, which is point seven, times the  
7 compressibility of the oil which is eight times ten to the  
8 minus six, the water saturation at point three times the  
9 compressibility of water at two point eight, times ten to  
10 the minus six, the raw compressibility of formation compressi-  
11 bility is six times ten to the minus six. All of this divided  
12 by one minus water saturation point three, all of this times  
13 the initial formation volume factor, which is determined from  
14 an equation, it is equal to the compressibility of the oil  
15 times the bubble point formation volume factor times the  
16 difference in the initial pressure minus the bubble point  
17 pressure. All of this plus the formation volume factor at  
18 the bubble point, divided by this one point three seven bubble  
19 point formation volume factor which as we earlier said was  
20 developed from Stannings Correlations, using a gas-oil ratio  
21 of six hundred and seventy-four cubic feet per barrel which  
22 was observed on a potential test. This gives us an eight point  
23 seven barrels per acre foot of three point four percent  
24 recovery of the original stock tank oil in place.

25 For recovery below the bubble point we have used this

1 John Arps correlation that I mentioned earlier which is  
2 published in the API Bulletin D14 and this is a rather  
3 complex equation. It's a regression analysis using the  
4 groupings of variables as shown on the exhibit in B.

5 I might point out that we used the six point five  
6 percent porosity water saturation point three, the formation  
7 volume factor of bubble point of one point three seven, a  
8 perm in darcies of point one seven eight or one hundred and  
9 seventy-eight millidarcies of viscosity of oil at bubble point  
10 conditions of point five, five centipoise, again water satura-  
11 tion of point three, bubble point pressure of two thousand  
12 and we assumed an abandonment pressure of two hundred pounds.

13 This equation gives us a recovery of fifty-three  
14 point two barrels per acre foot or twenty point six percent  
15 of original stock tank oil in place.

16 The total recovery under Item C is sixty-one point  
17 nine barrels per acre foot or twenty-four percent of the  
18 original oil in place.

19 I might mention that in the original hearing that  
20 we had assumed a twenty percent recovery but we had used a  
21 four hundred pound abandonment pressure in that case. We are  
22 just trying to show that even if we do have as high a recovery  
23 as twenty-four percent we are draining a relatively large area.

24 These calculations are shown in D using the two  
25 hundred thousand barrels expected recovery, the sixty-one

sid morrish reporting service

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

1 point nine barrels per acre foot and sixteen feet of pay, we  
2 have an indicated minimum drainage area from this well of  
3 two hundred and two acres.

4 Now, referring back to Exhibit Seven, you can see  
5 for a hundred and sixty acre drainage we are talking about  
6 an ultimate of thirty point three percent recovery, which is  
7 significantly greater than the twenty-four percent we would  
8 expect.

9 Q What conclusion then do you draw from that comparison?

10 A That we are draining in excess of one hundred and  
11 sixty acre spacing.

12 Q Please refer to Exhibit Number Nine and identify it?

13 A All right, sir, these are before tax, economics  
14 calculations for the three different cases of development  
15 density on a hundred and sixty acre spacing, eighty acre  
16 spacing and forty acre spacing.

17 We have assumed the same areal extent for each one  
18 of these cases, a hundred and sixty acres, so for the eighty  
19 acre spacing we are talking about two wells, for the forty  
20 acre spacing we are talking about four wells to develop the  
21 area.

22 We have an expense interest of a hundred percent,  
23 revenue interest of eighty-seven point five or royalty of  
24 one eighth, oil price of twelve dollars and eight cents a  
25 barrel, gas price of fifty-one point nine cents per barrel,

1 production tax of seven-and-a-half percent, operating expense  
2 based on our 1975 experiences of a thousand and fifty dollars  
3 per well a month. The cost per completed well is three hundred  
4 and forty-nine thousand dollars, which was provided us by  
5 Sun Oil Company's Regional Drilling Engineer.

6 I might point out that these costs do not include  
7 artificial lift equipment which we anticipate to be about  
8 eighty-four thousand dollars or any surface facilities  
9 indicated would be around thirty-two thousand dollars.

10 At the original hearing we testified that the cost  
11 of a well would be five hundred and thirty-seven thousand  
12 dollars and this is the cost that we had estimated for the  
13 well at the time of the hearing and which included the cost  
14 of some testing in the Wolfcamp, unsuccessful testing in the  
15 Wolfcamp zone.

16 Q That was the cost of the Jennings Federal No. 1  
17 Well?

18 A. The cost of the Jennings Federal No. 1 Well was  
19 five hundred and eighty-three thousand dollars but we estimated  
20 at the time of our first hearing that the cost would be five  
21 hundred and thirty-seven thousand dollars. We were not clear  
22 in our testimony as to whether the new well would cost as  
23 much as five hundred and eighty-two. Actually when you add  
24 the cost of surface equipment in here you are talking about  
25 four hundred and sixty-five thousand dollars, but again in

**sid morrish reporting service**

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

1 the interest of showing a very conservative situation on  
2 drainage area and profitability, we have assumed just the  
3 cost of drilling and completing the well.

4 The ultimate recovery, using twenty-four percent  
5 of the original oil in place is sixty-one point nine barrels  
6 per acre foot, sixteen feet of pay and a hundred and  
7 sixty acres, we have a hundred and fifty-eight thousand,  
8 four hundred and sixty-four stock tank barrels. This plus  
9 the three hundred million cubic feet of casinghead gas.

10 Our gross revenue, using the twelve oh eight dollars  
11 per barrel and the fifty-one point nine cents per MCF is  
12 two million, sixty-nine thousand, nine hundred and forty-five  
13 dollars. Taking out the royalty burdens, it leaves us with  
14 one million, eight hundred and eleven thousand and taking  
15 out the production tax it leaves us with one million, six  
16 hundred and seventy-five thousand dollars for all three  
17 cases.

18 A total investment for the hundred and sixty acre  
19 case, three hundred and forty-nine thousand dollars; the  
20 eighty acre case, six hundred and ninety-eight thousand for  
21 two wells, the forty acre case would be one million, three  
22 hundred and ninety-six thousand dollars for four wells.

23 The total operating cost is a hundred thousand, eight  
24 hundred dollars for an eight-year life on a hundred and  
25 sixty acres, for four-year life on the eighty acre and a two-

1 year life on the forty acre spacing. This leaves us with  
2 a profit on the hundred and sixty acre case of one million,  
3 two hundred and twenty-six thousand dollars and a profit  
4 ratio of three point five one to one. On eighty acre  
5 spacing we have eight hundred and seventy-seven thousand  
6 dollars profit or one point two six to one. On forty acre  
7 spacing we have a profit of a hundred and seventy-nine thousand  
8 dollars or a profit ratio of thirteen cents to one.

9 Again I will point out that these are real conserva-  
10 tive numbers as far as the profitability is concerned and  
11 that the total cost involved is not that that was used. We  
12 also have applied no risk factor at all in the area and our  
13 indications are from historical evidence that the success  
14 ratio will be something on the order of one and three.

15 Q Your calculations here don't take into account  
16 any risk factor at all?

17 A That is correct.

18 Q They assume a one hundred percent success?

19 A That's right.

20 Q In your opinion then, Mr. Seidel, can you economically  
21 drill a well based on less than a hundred and sixty acre  
22 spacing?

23 A No, we cannot based on Sun's investment decisions.  
24 Now we would not develop the reservoir on eighty acre spacing.

25 Q In your opinion is the area being drained in excess

1 of a hundred and sixty acres?

2 A. Yes, sir, it is.

3 Q In your opinion will the continuation of the existing  
4 pool rules for the Casey-Strawn Pool be in the best interests  
5 of conservation, prevention of waste and the protection of  
6 correlative rights?

7 A. Yes, sir, it will.

8 Q Do you have a recommendation to the Commission as to  
9 whether these pools should continue on a temporary basis  
10 or whether they should be made permanent at this time?

11 A. I would recommend that the Commission approve our  
12 application for hundred and sixty acre spacing in this field.

13 Q And that the rules be made permanent or temporary?

14 A. That they be made permanent.

15 Q Were Exhibits Six, Seven, Eight and Nine prepared  
16 by you or under your direction and supervision?

17 A. Yes, sir, they were.

18 MR. KELLAHIN: If the Examiner please, we move the  
19 introduction of those exhibits.

20 MR. STAMETS: These exhibits will be admitted.

21 (THEREUPON, Sun's Exhibits Six through  
22 Nine were admitted into evidence.)

23 MR. KELLAHIN: That concludes our direct examination.

24 CROSS EXAMINATION

25 BY MR. STAMETS:



1 Q Mr. Seidel, referring to Exhibit Nine, the reason  
2 you have shown ultimate recovery on that exhibit as a hundred  
3 and fifty-eight thousand barrels instead of two hundred and  
4 two thousand is that you converted that two hundred and two  
5 acre recovery back to a hundred and sixty acre recovery, is  
6 that right?

7 A That is the best in effect pretty much what I'm  
8 saying. I've just said that this well now is draining more  
9 than a hundred and sixty acres. It is really recovering more  
10 than the twenty-four percent of the original oil in place on  
11 the hundred and sixty acres. Additional development in the  
12 area if it weren't done on a hundred and sixty acre spacing,  
13 each well would be expected on an average to recover this  
14 hundred and fifty-eight thousand barrels.

15 Q In this case is it probable that this one well is  
16 draining the entire reservoir and there is no additional  
17 reservoir being developed?

18 A We have a relatively high permeability in the  
19 area, in this well, we've got about a hundred and seventy-  
20 eight millidarcies and with that kind of perm and assuming  
21 the reservoir covers a relatively large area, the well could  
22 feasibly drain fairly efficiently the entire reservoir. Our  
23 calculations to date indicate that we have energy present in  
24 the reservoir that would suggest that we have something on  
25 the order of three million barrels of oil in place and with

**sid morriss reporting service**

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

1 this I think an area something on the order of eight hundred  
2 acres and this would require for efficient drainage of the  
3 reservoir recovery additional development. At this time,  
4 however, Sun Oil Company is not prepared to develop the  
5 reservoir any further than where we are right now. I think  
6 this could change, of course, with development, future  
7 development. As a matter of fact, there is one well currently  
8 being completed. We are trying to get a log on the well, it  
9 hasn't been released yet but it is in Section 9 and it would  
10 be the northwest offset to Jennings Federal No. 1 in  
11 Section 15.

12 This reservoir obviously, I think from previous  
13 testimony, is very thin in one direction away from this well  
14 and we suspect that it is probably down to the southwest  
15 and then the reservoir would probably have to move in  
16 another direction. We feel that direction is probably  
17 subtended by an arc of something like twenty degrees, so it  
18 is going to be hard to find where it is going.

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

21 (THEREUPON, the witness was excused.)

22 MR. STAMETS: Anything further in this case?

23 MR. KELLAHIN: Mr. Stamets, I would like to correct  
24 my statement awhile ago. I had intended to ask the witness  
25 questions with reference to the East Lusk-Bone Spring Oil

1 Pool and I think I said Casey-Strawn. I would like to correct  
2 the record to that extent.

3 MR. STAMETS: The record should show that correction.

4 If there is nothing further we will take the case  
5 under advisement and that concludes the hearing.

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

6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

REPORTER'S CERTIFICATE

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

*Sidney F. Morrish*  
Sidney F. Morrish, C.S.R.

I do hereby certify that the foregoing is  
a complete record of the proceedings in  
the Examiner hearing of Case No. 5443  
heard by me on 5-28-76 19 76.  
*Richard R. Lamb*, Examiner  
New Mexico Oil Conservation Commission

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

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

sid morrish reporting service

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

Page 1

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
April 14, 1976

EXAMINER HEARING

IN THE MATTER OF:

Case 5443 being reopened pursuant to  
the provisions of Order No. R-4994.

CASE  
5443  
(Reopened)

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil  
Conservation Commission:

William F. Carr, Esq.  
Legal Counsel for the Commission  
State Land Office Building  
Santa Fe, New Mexico

For the Applicant:

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

I N D E X

	<u>Page</u>
<u>KENNETH W. LARSON</u>	
Direct Examination by Mr. Kellahin	3
Cross Examination by Mr. Nutter	10

EXHIBIT INDEX

	<u>Page</u>
Sun's Exhibit No. One, Structural Contour Map	10
Sun's Exhibit No. Two, Cross Section	10
Sun's Exhibit No. Three, Graphs	10
Sun's Exhibit No. Four, Production History	10
Sun's Exhibit No. Five, Data	10

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

sid morrish reporting service  
General Court Reporting Service  
825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501  
Phone (505) 982-9112

1 MR. NUTTER: The hearing will come to order, please.  
2 The next case will be Case Number 5443.

3 MR. CARR: Case 5443, in the matter of Case 5443  
4 being reopened pursuant to the provisions of Order No. R-4994,  
5 which order established special rules and regulations for the  
6 East Lusk-Bone Spring Oil Pool, Lea County, New Mexico,  
7 including a provision for one hundred and sixty acre spacing  
8 and proration units.

9 MR. KELLAHIN: Tom Kellahin, Kellahin and Fox,  
10 appearing on behalf of Sun Oil Company and I have one witness  
11 to be sworn.

12 (THEREUPON, the witness was duly sworn.)  
13

14 KENNETH W. LARSON  
15 called as a witness, having been first duly sworn, was  
16 examined and testified as follows:  
17

18 DIRECT EXAMINATION

19 BY MR. KELLAHIN:

20 Q Please state your name, by whom employed and in  
21 what capacity?

22 A Kenneth W. Larson, Staff Professional Geologist,  
23 Sun Oil Company of Delaware, Dallas Production Region, Dallas,  
24 Texas.

25 Q Mr. Larson, have you made a study of and are you

1 familiar with the facts surrounding this particular application?

2 A. Yes, I have.

3 Q And did you testify before this Commission on  
4 March 19th, 1975 which resulted in the promulgation of the  
5 current rules for the East Lusk-Bone Spring Oil Pool?

6 A. I did.

7 MR. KELLAHIN: If the Examiner please, are the  
8 witness' qualifications acceptable?

9 MR. NUTTER: Yes, they are.

10 Q (Mr. Kellahin continuing.) Mr. Larson, will you  
11 refer to what has been marked as Applicant's Exhibit Number  
12 One and identify it and state what information it contains?

13 A. Exhibit Number One is a structure contour map of  
14 the East Lusk-Bone Spring Field, Lea County, New Mexico which  
15 was prepared by me in April of 1976. The mapping datum is the  
16 top of the second Bone Spring. The scale of the map is one  
17 inch to one thousand feet and the contour interval is fifty  
18 feet. The structural configuration is that of an east-dipping  
19 monocline, with a dip rate of approximately one hundred feet  
20 per mile.

21 For clarification purposes the map is color coded,  
22 the red dot denoting a Bone Spring producer and the green dots  
23 denoting Bone Spring penetrations which were used for mapping  
24 control points. The red arrow identifies the type of log for  
25 the Sun Oil Company No. 1 Sharon Federal in the southwest

**sid morrish reporting service**

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



1 quarter of Section 15, Township 19 South, Range 32 East. The  
 2 Bone Spring pay is colored red on the type log. The line of  
 3 cross section, AA prime, which is Exhibit Number Two is posted  
 4 on the map. The shaded area consisting of the northwest  
 5 quarter of Section 15, Township 19 South, Range 32 East is  
 6 a hundred and sixty acre temporary unit for which Sun Oil  
 7 Company is proposing to make permanent.

8 Q The discovery well for this pool is which well?

9 A It is the Sun Oil Jennings Federal No. 1.

10 Q And at the time of the hearing last March of '75,  
 11 that was the only well in this pool, is that correct? The  
 12 subsequent wells on this cross section were drilled after  
 13 that date?

14 A No, they were not. In the southwest quarter of  
 15 Section 16, the Cleverock Petco State No. 1 was completed as  
 16 a gas well. However, inasmuch as it produces some forty feet  
 17 structurally lower than the oil completion in the Jennings  
 18 Federal we did not consider it to be in the same reservoir.

19 Q All right.

20 A In addition the Sloan Federal has been drilled  
 21 since the hearing in March of last year.

22 Q That's the one in Section 22?

23 A The northwest quarter of Section 22, yes, sir.

24 Q The current horizontal limits of this pool, I assume  
 25 are represented by hatch marks in the northwest quarter of

**sid morrison reporting service**

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

1 Section 15?

2 A. That is correct.

3 Q Please refer to what has been marked as Exhibit  
4 Number Two and identify it?

5 A Exhibit Number Two is a four-well stratigraphic  
6 cross section, AA prime. It starts with the Sun No. 1 Sloan  
7 Federal in the northwest quarter of Section 22, extends north-  
8 west to the Cleverock No. 1 Petco State in the southeast  
9 quarter of 16 and eastward to the Sun No. 1 Sharo Federal in  
10 the southwest quarter of Section 15 and terminates with the  
11 Sun No. 1 Jennings Federal to the northeast.

12 The datum per hang line is the top of the second  
13 Bone Spring pay and the log vertical scale is one inch equals  
14 twenty feet. There is no horizontal scale.

15 The porosity is colored red and the perforations  
16 are posted on the logs.

17 There is only one well currently producing in the  
18 field, the Sun No. 1 Jennings Federal to the right of the  
19 cross section. In the Sun No. 1 Sloan Federal the zone of  
20 porosity was perforated, acidized with five thousand gallons,  
21 fraced with six thousand gallons, plus sixteen thousand,  
22 eight hundred pounds of sand and produced on pump an average  
23 of ten to fifteen barrels of oil, plus about ten or fifteen  
24 barrels of water a day between the period December 11th, 1975  
25 and February 2nd, 1976. It was temporarily abandoned as of

**sid morrish reporting service**

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

1 February 7th, 1976. The study is now being made to determine  
2 what course of action to pursue next.

3 As previously mentioned, the Petco State was completed  
4 in the Wolfcamp, it was recompleted in the second Bone Spring  
5 as a gas well and is presently temporarily abandoned.

6 There is definitely a barrier between this well and  
7 the Sun No. 1 Jennings Federal because the top of the perfora-  
8 tions in the Cleverock gas well are twenty-three feet  
9 structurally lower than the base of the perforations in the  
10 oil producing Jennings Federal Well.

11 The second Bone Spring section in the Sun No. 1  
12 Sharon Federal Well has not been tested, however, it probably  
13 will be upon depletion of the current producing zone in the  
14 Wolfcamp.

15 Q Please refer to what has been marked as Exhibit  
16 Number Three?

17 A Exhibit Number Three consists of three production  
18 related graphs for the Sun No. 1 Jennings Federal. The lower,  
19 a graphic presentation of the average rate, barrels of oil  
20 per day. The middle, the GOR ratio history and the upper,  
21 the flowing tubing pressure, the psig history of the well,  
22 has shown the average yearly production rate varies from a  
23 high of three hundred and twenty-seven barrels of oil per day  
24 to the present low of two hundred and ten barrels of oil a  
25 day. The GOR range is not extreme, averaging about seven

sid morish reporting service

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

1 hundred cubic feet per barrel. The flowing tubing pressure  
2 has been on a steady decline since the well's potential on  
3 January 30th, 1975, from eight hundred and fifty pounds psig  
4 to its current low of a hundred and twenty pounds psig.

5 Q The existing rules for this pool provide for a  
6 special depth bracket allowable of five hundred and fifteen  
7 barrels. Your current production for this well was two hundred  
8 and ten barrels of oil per day?

9 A Yes, at the time this graph was prepared. However,  
10 you will note on the lower graph that there is a rapid decline  
11 during the latter part of '75 and the early part of this. We  
12 were having difficulty with paraffin build up, consequently  
13 the production fell off substantially.

14 In March of this year they scraped the paraffin,  
15 placed the well on pump and on a test on March 12th it pumped  
16 two hundred and sixty-nine barrels of oil plus seven barrels  
17 of water a day.

18 Q In your opinion is there any need to change the  
19 depth bracket allowable assigned to this pool?

20 A No, I don't.

21 Q And your current GOR ratio is averaging about seven  
22 hundred?

23 A That is correct.

24 Q And that is within the state-wide rules?

25 A Oh, yes.

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

**sid morrish reporting service**

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

1 Q Please refer to Exhibit Number Four?

2 A Exhibit Number Four is the well's production history  
3 in tabular form as of March 1st, 1976. It had produced a  
4 hundred and four thousand, seven hundred and ninety-two  
5 barrels of oil, seventy thousand, four hundred and twenty  
6 thousand cubic feet of gas, no water and an additional ninety-  
7 seven thousand barrels of oil are anticipated for a total  
8 recovery of approximately two hundred and two thousand barrels  
9 of oil.

10 Q Exhibit Number Five?

11 A Exhibit Number Five consists of reservoir fluid and  
12 bottom-hole pressure data.

13 Q In your opinion, Mr. Larson, is the discovery well's  
14 performance showing that it is draining an area of not less  
15 than a hundred and sixty acres?

16 A Yes, I believe so.

17 Q What is the cost of drilling in this area?

18 A A dry hole amounts to about two hundred and sixteen  
19 thousand dollars. A successful completion, assuming you only  
20 treat it one zone, would be approximately three hundred and  
21 forty-nine thousand.

22 Q As an economic venture could you develop this  
23 acreage on less than a hundred and sixty acres?

24 A I believe not.

25 Q In your opinion will continuation of the current pool

1 rules be in the best interest of conservation, prevention of  
2 waste and the protection of correlative rights?

3 A. Yes, I do.

4 Q. Does Sun Oil Company desire that the present temporary  
5 rules be made permanent?

6 A. We do.

7 Q. Were Exhibits One through Five either prepared by  
8 you or under your direction and supervision?

9 A. They were.

10 MR. KELLAHIN: If the Examiner please, we move the  
11 introduction of Exhibits One through Five.

12 MR. NUTTER: Sun's Exhibits One through Five will  
13 be admitted into evidence.

14 (THEREUPON, Sun's Exhibits One through  
15 Five were admitted into evidence.)

16 MR. KELLAHIN: That concludes our direct examination.  
17

18 CROSS EXAMINATION

19 BY MR. NUTTER:

20 Q. Mr. Larson, you stated that the reservoir performance  
21 data indicates that it is draining not less than a hundred and  
22 sixty acres, in reply to Mr. Kellahin's question?

23 A. Yes, sir.

24 Q. What information is here that indicates that?

25 A. Well, we took on Exhibit Number Five, Mr. Examiner,

**sid morrison reporting service**

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

1 we took the net pay, the average porosity, the average water  
2 saturation, temperature, bubble point and so on and this  
3 information was provided to me by our reservoir engineering  
4 section.

5 Q Well, still I don't see anything that says that it  
6 is draining forty acres or eighty acres or a hundred and sixty  
7 acres.

8 A Well, on the Exhibit Two, the cross section, there  
9 is evidence that the zone of porosity does extend to the  
10 southwest, so I think, or it is my opinion at least, that the  
11 hundred and sixty acres could be reasonably considered as  
12 productive.

13 Q But is it draining it or not?

14 A Well, I suspect so because the well to the north,  
15 which is not on the cross section, the log has not been  
16 released, did not have any porosity in this whatsoever, so  
17 the areal extent of this is limited. I think it extends over  
18 the one hundred and sixty but the exact definition of the  
19 reservoir I frankly don't know.

20 Q Again we are talking about two separate things, Mr.  
21 Larson. You are talking about the range of the porosity, the  
22 extent of the reservoir and I'm talking about the capability  
23 of the well to drain acres. What evidence do we have that  
24 it is draining forty acres, much less a hundred and sixty?

25 MR. KELLAHIN: Let me ask you this, Mr. Larson, how

**sid morish reporting service**

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

Page 12

1 did you calculate your recoverable reserves of two hundred  
2 and two thousand barrels?

3 A. That was done by our reservoir engineering service.

4 MR. KELLAHIN: Using what information in calculating  
5 those reserves?

6 A. Let me see if I have their figures here. Excuse me.  
7 No, I'm sorry, I do not.

8 MR. KELLAHIN: I assumed that the figures here on  
9 Exhibit Five represented the reservoir information that  
10 was used to make the volumetric calculations from which you  
11 derived the recoverable reserves?

12 A. That's correct.

13 MR. KELLAHIN: All right, of your recoverable  
14 reserves, how much of that figure has been produced?

15 A. A hundred and four thousand, seven hundred and  
16 ninety-two barrels.

17 MR. KELLAHIN: And when was that well completed?

18 A. January 30th, 1975.

19 MR. KELLAHIN: I wonder if we could do this, Mr.  
20 Examiner, if we could provide you by mail with the volumetric  
21 calculations that were used to determine the drainage area  
22 for this particular well. Apparently Mr. Larson has not  
23 brought those figures with him.

24 MR. NUTTER: I think it would be preferable to  
25 continue the case until we have the information because I



1 don't feel like with the information we've got here today I  
2 could make a recommendation to the Commission to continue  
3 the spacing rules in the pool. It would either be a matter of  
4 making a recommendation for it to revert to state-wide or  
5 else to continue the case until you can get that information  
6 and the testimony to back it up.

7 MR. KELLAHIN: Well, I think that would be preferable  
8 for us to continue further evidence in this case until a  
9 later date and allow us to bring in the calculations at a  
10 later date.

11 MR. NUTTER: Very good. Case Number 5443 will be  
12 continued to the Examiner Hearing scheduled to be held at  
13 this same place at nine o'clock A.M. on April 28th, 1976.

14 MR. KELLAHIN: Thank you very much.

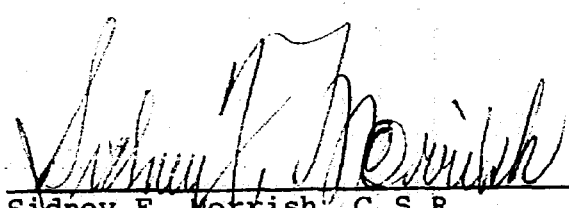
15 MR. NUTTER: Yes, sir.  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

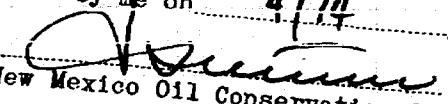
**sid morrish reporting service**

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

REPORTER'S CERTIFICATE

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

  
Sidney F. Morrish, C.S.R.

I do hereby certify that the foregoing is  
a complete record of the proceedings in  
the Examiner hearing of Case No. 5442 (renewed)  
heard by me on 4/14, 1976  
, Examiner  
New Mexico Oil Conservation Commission

**sid morrish reporting service**

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

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
19 March 1975

EXAMINER HEARING

IN THE MATTER OF:

Case 5443. Application of Sun Oil  
Company for pool creation and special  
pool rules, Lea County, New Mexico.  
Applicant in the above styled cause  
seeks the creation of a new oil pool  
for Bone Spring production for its  
Jennings-Federal Well No. 1, located  
in Unit F of Section 15, Township 19  
South, Range 32 East, Lea County,  
New Mexico, and the promulgation of  
special pool rules therefor, including  
a provision for 160-acre proration  
units.

CASE # 5443

BEFORE: Daniel S. Nutter, Examiner.

For the New Mexico Oil  
Conservation Commission:

William H. Carr, Esq.  
Legal Counsel for the Commission  
State Lands Office Building  
Santa Fe, New Mexico 87501

For the Applicant,  
Sun Oil Company:

Thomas Kellahin, Esq.  
KELLAHIN AND FOX  
500 Don Gaspar  
Santa Fe, New Mexico 87501

THE NYE REPORTING SERVICE  
STATE-WIDE DEPOSITION NOTARIES  
225 JOHNSON STREET  
SANTA FE, NEW MEXICO 87501  
TEL. (505) 982-0386

CASE 5443

Page..... 2

I N D E X

Testimony of Kenneth W. Larson

Direct Examination by Mr. Kellahin  
Questions by Mr. Nutter

3  
8

Testimony by Charles R. Price

Direct Examination by Mr. Kellahin  
Questions by Mr. Nutter

10  
15

E X H I B I T S

Exhibits 1 through 4

15

THE NYE REPORTING SERVICE  
STATE-WIDE DEPOSITION NOTARIES  
225 JOHNSON STREET  
SANTA FE, NEW MEXICO 87501  
TEL. (505) 982-0386

MR. NUTTER: Case 5443.

MR. CARR: Case 5443. Application of Sun Oil Company for pool creation and special pool rules, Lea County, New Mexico.

MR. KELLAHIN: I'm Tom Kellahin, Kellahin and Fox, Santa Fe, New Mexico, appearing on behalf of the applicant, Sun Oil Company, and I have two witnesses to be sworn.  
(Witnesses sworn.)

KENNETH W. LARSON

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you please state your name, by whom you are employed and in what capacity?

A Kenneth W. Larson. I'm employed as a staff professional geologist, Sun Oil Company, Production Department, Dallas Region, Dallas, Texas.

Q Mr. Larson, have you previously testified before this Commission and had your qualifications as an expert witness accepted and made a matter of record?

A Yes, I have.

Q And are you familiar with the facts surrounding this particular application by Sun Oil Company?

A Yes, I am.

MR. KELLAHIN: If the Examiner please, are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kellahin) Mr. Larson, would you please refer to what has been marked as Applicant's Exhibit Number 1, and identify it and state briefly what Sun Oil Company is seeking?

A The Sun Oil Company is seeking to create a new oil pool for Bone Spring oil production for its Jennings-Federal Well located in the northwest quarter of Section 15, Township 19 South, Range 32 East, Lea County, New Mexico, and the promulgation of special pool rules, including a provision for 160-acre proration units.

Q Would you please refer to Exhibit Number 1 and describe the information contained on that Exhibit?

A Exhibit G-1 is a structure map of the East Lusk Field and adjacent areas at a scale of 1 inch equals 1000 feet. The datum is the top of the second Bone Spring formation and the contour interval is 50 feet. The control points are color coded in red and blue. The red de-

note wells which are currently producing from the second Bone Spring while the blue dots denote second Bone Spring penetrations. In areas of little or no well control, seismic data was utilized. On the right side of the map is a portion of the borehole compensated sonic gamma ray of the Sun Oil Company Shearn-Federal Number 1, with various formations of interest marked on the log. This well is marked by a red arrow on the map. Line of cross-section A-A prime and a proposed 160-acre unit consisting of the northwest quarter of Section 15 are also posted on the map. The entire area falls within Township 19 South, Range 32 East.

Q Please refer to Exhibit Number 2, identify it and explain what information it contains.

A Exhibit G-2 is a stratigraphic cross-section A-A prime, the datum of which is the top of the second Bone Spring pay. The vertical scale is 1 inch equals 20 feet. There is no horizontal scale. The perforations are marked on the logs and the zones of porosity using an approximate 4% cutoff are quoted in red. As shown on the structure map, it extends from west to east. The Cleve-rock Energy Corporation Pedco State Number 1 in the southeast quarter of Section 16 is the well to the left, or

west of the cross-section. This well was completed in the Wolfcamp limestone with a flowing potential of 42 barrels of oil plus 7 barrels of water per 24 hours on September 28, 1974. It was recompleted in the second Bone Spring as a gas well on October 17th, 1974, after producing about 341 barrels of oil from the Wolfcamp. The calculated open flow for the second Bone Spring was 9683 MCF gas per day. Gas-oil ratio, 9263; condensate gravity of 59.9. I assign this well 18 feet of porosity.

Q Which, excuse me, which well was that?

A The Cleverock well.

Q All right, go ahead.

A The next well to the east is the Sun Oil Company Shearn-Federal, which is a Wolfcamp oil completion. There were no tests taken in the second Bone Spring pay. This well has 8 feet of porosity. The cross-section then extends northeast to the Sun Oil Company's Number 1, Jennings-Federal, which was completed as an oil well in the second Bone Spring on January 30th, 1975, with a flowing potential of 669 barrels of oil plus 1 barrel of water in 24 hours. It was on a 16/64 score inch; GOR, 674/1; flowing tubing pressure, 950-850; gravity of oil, 41.4 API. This well has 16 feet of porosity.



Q With regard, excuse me, for the porosity on this Jennings-Federal Number 1 well used the cutoff, same cutoff of 4%?

A 4% was utilized on all three wells on the cross-section.

Q Please continue.

A It's apparent from Exhibits 1 and 2 that the second Bone Spring is of considerable areal extent and underlies the area of interest.

The producing zones in the Cleverock Pedco State and the Sun Oil Company Jennings-Federal are obviously not in a common reservoir. The completion in the Pedco State is in a lower portion of the second Bone Spring pay while the Jennings-Federal is producing from the upper portion. In addition, the base of the perforations in the Jennings-Federal oil zone is 13 feet structurally higher than the top of the perforations in the Pedco State gas zone.

Q Mr. Larson, were Exhibits 1 and 2 prepared by you directly or under your direction and supervision?

A They were directly prepared by me.

MR. KELLAHIN: If the Examiner please, that concludes our geologic testimony.

EXAMINATION BY MR. NUTTER:

Q Mr. Larson, now I understood you to say that the Pedco Well originally was completed in the Wolfcamp.

A Yes, sir.

Q And after only 342 barrels cumulative production was recompleted in the Bone Spring?

A That is correct.

Q And it is a gas well. What is the potential on that well?

A Just a moment, I have it here in my notes. Oh, the calculated open flow was 9683 MCF of gas per day with a GOR of 9263. The condensate gravity was 59.9.

Q 59.9?

A Yes, sir.

Q And I believe you mentioned that the oil gravity in your well, your Jennings-Federal, is 41.4?

A That is correct.

Q Okay. Now I see the perforated interval on the Pedco Well. Now, on your Jennings-Federal these little arrows up there at the top, are those perforations?

A They are single entry perforations, Mr. Nutter.

Q So the perforated interval in your well is the equivalent of what, actually, on the log over there on the

on the Pedco Well?

A It would be approximately 97, oh, 70 to 80.

Q Is it that little red tic that's been colored up at the top there?

A That is correct.

Q Those are the equivalent zones, then?

A Yes.

Q I see. And no tests were made in the Bone Spring and the Shearn Wells?

A That is correct.

MR. NUTTER: Are there any further questions of Mr. Larson?

(No response.)

MR. NUTTER: He may be excused. Oh, wait, Mr. Larson, I didn't write down the feet of porosity you attribute to each of these three wells in the second Bone Spring. 4% was your cutoff.

A That is correct. To the left, Mr. Nutter, in the Pedco State I assigned that 18 feet of porosity; the Shearn-Federal, 8 feet of porosity; and in the Jennings-Federal, 16 feet of porosity.

MR. NUTTER: Thank you. You may be excused.

MR. KELLAHIN: Mr. Price.

CHARLES R. PRICE

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you please state your name, by whom you are employed and in what capacity?

A My name is Charles R. Price. I'm employed by Sun Oil Company in Midland, Texas, as a production engineer.

Q Mr. Price, have you previously testified before the Commission?

A No, I have not.

Q Would you state briefly when and where you obtained your degree in engineering?

A I got my Bachelor of Science in Petroleum Engineering from the University of Texas in 1972.

Q Subsequent to that time where have you been employed and in what capacity?

A Since June of 1973 I've been employed by Sun Oil Company as a production engineer in Midland, Texas.

Q Mr. Price, have you made a study of the facts surrounding this particular application by Sun Oil Company?

A Yes, I have.

Q If the Examiner please, are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are.

Q (By Mr. Kellahin) Mr. Price, would you please refer to what's been marked as Applicant Exhibit 2 -- I'm sorry, 3. Identify it and explain what information it contains.

A Exhibit Number 3 shows the production history of the Jennings-Federal Number 1 since it was completed in the Bone Spring interval. Shown here are plots for the recording of tubing pressure, the production rate, and the barrels of oil per day, and the GOR cubic feet per barrel.

Q What was the date of completion?

A The date of potential was January 30th, 1974. Initial completion was on December -- excuse me, January 28th.

Q Would you please refer to Exhibit 4 and identify it and explain what information it contains?

A Exhibit 4 is an economic comparison of 80-acre spacing versus 160-acre spacing for the proposed East Lusk Bone Spring oil pool. The cost to successfully drill,

complete and equip a well in this pool would be \$537,000 in the above cases. Unsuccessful completion would cost \$310,000 for above 80-acre and 160-acre spacing. For 100% probability of successful completion a 16-foot net pay interval was used and reserves calculated at 65,540 barrels for 80-acre spacing and 131,080 barrels for 160-acre spacing.

Q Is that the calculated recoverable reserves?

A That's the recoverable reserves using a porosity of 6.6% and a water saturation of 30% based on log analysis, and that also includes a 20% recovery factor, which I believe is reasonable for this type of reservoir.

Q Let me ask you about your 20% recoverability factor. How is that determined?

A Well, that's mainly an experience factor based on performance of similar reservoirs.

Q Have you calculated the permeability of this reservoir?

A The permeability has been calculated from build-up analysis, which was done -- which was done during the period shown shut in on Exhibit 3. Permeability was calculated to be 178 millitarses (sic).

Q Please continue with your explanation of Exhibit 4.

A Okay. For probabilities of success less than 100% decrease in pay thickness was assigned and the reserves calculated are shown on Exhibit 4. The last table on Exhibit 4 is a profitability table using 40% and 60% success ratios; net cash flow for 40% success ratio under 80-acre spacing is a negative \$49,907. 10% net present value is a negative \$59,329. Cost per barrel of oil is calculated to be \$14.6 dollars and there is a loss on drilling the well. With a 60% probability of successful completion, net cash flow is \$13,264; rate of return 10%; 10% net present value, a negative \$869; cost per barrel of oil, \$10.47 dollars; profit dollar for dollar invested was .03 cents.

Q That's on 80-acre spacing?

A That's on 80-acre spacing. Pay out was approximately one year.

For a 40% probability of successful completion under 160-acre spacing, net cash flow is \$138,274; rate of return is greater than 50%; 10% net present value is \$112,973; cost per barrel of oil is \$7.23; profit is .37 cents per dollar invested; pay out is .78 years. For a 60% probability of successful completion, net cash flow is \$295,536; rate of return greater than 50%; 10% net present value, \$251,585; cost per barrel of oil, \$5.24;

profit .73 cents per dollar invested and pay out is .61 years.

Q In your opinion, Mr. Price, would it be economical to drill a well in this pool on less than 160-acre spacing?

A No, sir, not in my opinion.

Q With regards to your reservoir calculations and your reservoir performance, do you have any opinion with regards to the ability of one well to drain a 160-acre unit?

A Well, based on the high permeability calculated *millidarcies* 178 millitarses (sic), I feel that this well should drain 160 acres.

Q Do you have a proposed name for this new pool?

A Yes. The East Lusk Bone Spring is the name we propose for this pool.

Q Were Exhibits 3 and 4 prepared by you or prepared under your supervision and direction?

A Yes, they were.

Q In your opinion, Mr. Price, will approval of this application be in the best interests of conservation, the prevention of waste, and the protection of *correlative* public rights?

A Yes, in my opinion it will be.



Q In addition Sun Oil Company is asking that the special pool rules be made on a temporary basis for a period of one year, is that correct?

A That is correct.

MR. KELLAHIN: That concludes our direct examination of this witness, Mr. Examiner, and we move the introduction of Exhibits 1, 2, 3, and 4.

MR. NUTTER: This is identified as 5; it's supposed to be 3.

MR. KELLAHIN: Yes, that's a mistake.

MR. NUTTER: That is Exhibit 3?

MR. KELLAHIN: Yes, sir.

MR. NUTTER: Exhibits 1 through 4 will be admitted in evidence.

QUESTIONS BY MR. NUTTER:

Q Mr. Price, what was the depth that this Jennings-Federal Number 1 was drilled to?

A It was drilled to the total depth of approximately 10,800 feet.

Q And the perforated interval in that well is approximately a little less than 9900, is that correct?

A Yes, sir, that's correct.

Q Now, what's this \$537,000? That's the cost of

Q In addition Sun Oil Company is asking that the special pool rules be made on a temporary basis for a period of one year, is that correct?

A That is correct.

MR. KELLAHIN: That concludes our direct examination of this witness, Mr. Examiner, and we move the introduction of Exhibits 1, 2, 3, and 4.

MR. NUTTER: This is identified as 5; it's supposed to be 3.

MR. KELLAHIN: Yes, that's a mistake.

MR. NUTTER: That is Exhibit 3?

MR. KELLAHIN: Yes, sir.

MR. NUTTER: Exhibits 1 through 4 will be admitted in evidence.

QUESTIONS BY MR. NUTTER:

Q Mr. Price, what was the depth that this Jennings-Federal Number 1 was drilled to?

A It was drilled to the total depth of approximately 10,800 feet.

Q And the perforated interval in that well is approximately a little less than 9900, is that correct?

A Yes, sir, that's correct.

Q Now, what's this \$537,000? That's the cost of

a completed successful well. Is that the actual cost on this well?

A Well, it's based on the cost of this well, yes, sir.

Q How much did this well actually cost to drill?

A I don't have the exact figure but it would be in this range, \$537,000. It would cost approximately \$537,000 to drill another well in this field.

Q But this well was actually drilled almost a thousand feet deeper than the productive interval, wasn't it?

A Yes, sir.

Q So an extra 1000 feet of drilling is included in this well cost here?

A I'm not sure of that.

MR. NUTTER: Mr. Larson?

MR. LARSON: The primary target for the Jennings-Federal was the Wolfcamp. We hoped to encounter the same productive zone that we enjoyed in the Shearn-Federal and the Wolfcamp was perforated and it produced between, oh, 30 and 35 barrels of oil a day, and our log analysis indicated that it was a much better zone of porosity in the Bone Spring, so a retrievable bridge plug was placed between

the Wolfcamp and the Bone Spring and it was completed in the Bone Spring.

MR. NUTTER: But \$537,000 that we've got quoted here as the cost of the well, is the cost of a well drilled to the Wolfcamp and then completed in the Bone Spring, is that it?

MR. LARSON: To the Bone Spring. These figures were given from the logs in our Dallas office.

MR. NUTTER: But what would it cost to drill a well to the second Bone Spring pay?

A According to the figures used by our resident reservoir engineer, it would cost \$537,000 to drill a well to Bone Spring.

Q (By Mr. Nutter) Yeah, I see, but we don't have the actual cost of this well to the Bone Spring. Okay, now you've calculated expected reserves for 16 feet, 10 feet and 6 feet of net pay.

A Yes, sir.

Q Now, I think you've mentioned that you calculated 6.6 porosity.

A Yes, sir.

Q Is this the actual porosity that you mention in this Jennings-Federal?

A That is based on the logs from there, that's correct.

Q Where did you get your 30% water saturation?

A That's also based on logs from the Jennings-Federal.

Q I see, and you took a 20% recovery factor as being a reasonable factor for similar wells?

A Yes, sir.

Q Now, what's the gas/oil ratio in here, in the Jennings Federal Well?

A It's plotted on Exhibit 3 by day. The average is approximately 650 cubic feet per barrel.

Q All right. Do you have a formation volume factor that's used in determining your produceable reserves?

A Yes, sir, we used a formation volume factor of 1.4 for these calculations.

Q And how as it arrived at?

A It was arrived at based on the gravity of the oil and published data.

Q Do you think this 650 barrels per -- 650 to 1 GOR is the solution ratio in here?

A Yes, sir.

Q And with that solution ratio you come up with a

formation volume factor of 1.4?

A That's correct.

Q Okay. Then we come to a figure that you described as being the net cash flow. What does that include, Mr. Price?

A Well, the net cash flow includes -- that's the net present value; that includes the net present value drilling the well plus the salvage value of the well.

Q Okay. Now, you're assuming that the well will produce at what rate? It appears that a decline has been set. Is the net cash flow based on the total recoverable reserves from the well?

A Yes, sir.

Q And what price do you calculate the value of the oil?

A At \$12.00 per barrel.

Q And have you calculated the value of the gas that would be produced from that and included it in your net cash flow?

A Yes, sir, it has been included and we calculated the value at .51 cents per thousand cubic feet.

Q And we've got an estimate of the reserves of oil. Do you have a calculation as to how much gas will be

produced from the well?

A I have not included it on Exhibit Number 4, and I cannot give you the exact figure; however, it was included in the calculation. The reserves for 80-acre spacing and 16 feet of net pay would be 128 million cubic feet.

Q Or 128,000 MCF, then?

A Yes, sir, that's correct.

Q And what would you do, just double that for 160-acre spacing?

A That's correct.

Q And so taking into consideration all the value of all the oil that you can produce, you come up with this net cash flow that you calculate?

A Yes, sir.

Q Now, what's this 10% net present value?

A That is the net present value of drilling a well using a 10% discount factor.

Q Is that the value of the net cash flow discounted at 10%?

A No, sir, that's the expected worth of drilling the well to Sun Oil Company today, discounting our money

at 10%.

Q Well, I mean is it -- it's not the present value of drilling the well, it's the present value of the return that you'll get on the well, isn't it?

A Yes, sir.

Q So it is a 138, and take the case of the 4/10ths case, on 160 you've got a net cash flow expected of \$138,000.

A That's correct.

Q Then if you discount that at 10% you get a \$112,000 and that's for two year life, is that it?

A That's basically correct, yes, sir.

Q And that's all you expect this well to produce in about two years?

A Yes, sir, I think we can recover our reserves in two years, in two year life.

MR. NUTTER: Are there any further questions of Mr. Price?

MR. RAMEY: Mr. Price, do you have a recommendation for well locations?

A No, sir, not at this time.

MR. RAMEY: You don't propose original location of the northwest quarter of the southwest or southeast or --



A No, sir, not at this time. Don't propose any additional locations.

MR. NUTTER: Any further questions?

MR. RAMEY: No, that's all.

MR. NUTTER: Does anybody have any questions of Mr. Price?

(No response.)

MR. NUTTER: You may be excused. Does anyone have anything they wish to offer in case 5443?

(No response.)

MR. NUTTER: We'll take the case under advisement.

(Hearing concluded.)

CASE 5443

Page..... 23

STATE OF NEW MEXICO )  
COUNTY OF SANTA FE )

REPORTER'S CERTIFICATE

I, SALLY WALTON BOYD, Notary Public and General Court Reporter, Santa Fe, New Mexico, DO HEREBY CERTIFY that the facts stated in the caption hereto are true and correct; that I reported the captioned proceedings; that the foregoing 22 pages, numbered 1 through 22 inclusive, is a full, true and correct transcript of my notes taken during the hearing.

WITNESS my hand and seal, this 14th day of April, 1975, at Santa Fe, New Mexico.

Sally Walton Boyd  
Sally Walton Boyd  
Notary Public and General Court Reporter

My Commission expires:  
10 September 1975

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5443 heard by me on 3/19, 19 75  
[Signature] Examiner  
New Mexico Oil Conservation Commission

THE NYE REPORTING SERVICE  
STATE-WIDE DEPOSITION NOTARIES  
225 JOHNSON STREET  
SANTA FE, NEW MEXICO 87501  
TEL. (505) 982-0386



# OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

I. R. TRUJILLO  
CHAIRMAN

LAND COMMISSIONER  
PHIL R. LUCERO  
MEMBER

STATE GEOLOGIST  
A. L. PORTER, JR.  
SECRETARY - DIRECTOR

Mr. Tom Kellahin  
Kellahin & Fox  
Attorneys at Law  
Post Office Box 1769  
Santa Fe, New Mexico

Re: CASE NO. 5443  
ORDER NO. R-4994

Applicant:  
**Sun Oil Company**

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

Very truly yours,  
A. H. Porter, Jr.

A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC	<u>          x          </u>
Artesia OCC	<u>                          </u>
Aztec OCC	<u>                          </u>

Other \_\_\_\_\_



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

April 16, 1975

I. R. TRUJILLO  
CHAIRMAN  
LAND COMMISSIONER  
PHIL R. LUCERO  
MEMBER  
STATE GEOLOGIST  
A. L. PORTER, JR.  
SECRETARY - DIRECTOR

Mr. Tom Kellahin  
Kellahin & Fox  
Attorneys at Law  
Post Office Box 1769  
Santa Fe, New Mexico

Re: CASE NO. 5443  
ORDER NO. R-4994-A

Applicant:

Sum Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced  
Commission order recently entered in the subject case.

Very truly yours,

*A. L. Porter, Jr.*

A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC       X        
Artesia OCC             
Aztec OCC           

Other

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

CASE NO. 5443  
Order No. R-4994-A

NOMENCLATURE

APPLICATION OF SUN OIL COMPANY  
FOR POOL CREATION AND SPECIAL  
POOL RULES, LEA COUNTY, NEW MEXICO.

NUNC PRO TUNC

BY THE COMMISSION:

It appearing to the Commission that Order No. R-4994, dated April 1, 1975, does not correctly state the intended order of the Commission,

IT IS THEREFORE ORDERED:

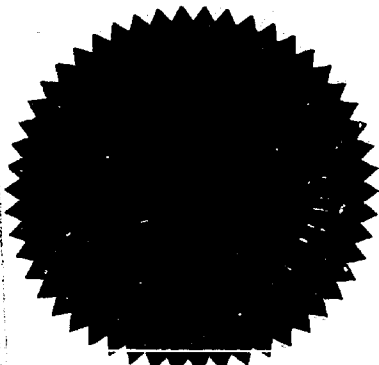
(1) That in Findings Nos. (4), (5), (6), (8), and (9), prior to the words "Bone Spring Oil Pool," the words "East Lusk-" be inserted.

(2) That in Sections (1) and (2) of "IT IS THEREFORE ORDERED," including the title and Rule 1 of the special rules for the pool, prior to the words "Bone Spring Oil Pool," the words "East Lusk-" be inserted.

(3) That in Sections (1), (2), and (3) of "IT IS FURTHER ORDERED," prior to the words "Bone Spring Oil Pool," the words "East Lusk-" be inserted.

(4) That this order shall be effective nunc pro tunc as of April 1, 1975.

DONE at Santa Fe, New Mexico, this 15th day of April, 1975.



STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

*I. R. Trujillo*  
I. R. TRUJILLO, Chairman

*Phil R. Lucero*  
PHIL R. LUCERO, Member

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

S E A L

dr/

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. 5443  
Order No. R-4994

NOMENCLATURE

APPLICATION OF SUN OIL COMPANY FOR  
POOL CREATION AND SPECIAL POOL  
RULES, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 19, 1975,  
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 1st day of April, 1975, the Commission,  
a quorum being present, having considered the testimony, the  
record, and the recommendations of the Examiner, and being  
fully advised in the premises,

FINDS:

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

(2) That the applicant, Sun Oil Company, seeks the creation  
of a new oil pool for Bone Spring production in Lea County, New  
Mexico, and the promulgation of temporary special rules and  
regulations governing said pool, including provisions for 160-  
acre spacing and proration units.

(3) That the applicant further seeks to have such temporary  
special pool rules apply to its Jennings-Federal Well No. 1  
located in Unit F of Section 15, Township 19 South, Range 32 East,  
NMPM, Lea County, New Mexico.

(4) That Sun Oil Company's Jennings-Federal Well No. 1 has  
discovered a separate and common source of supply which should  
be designated the Bone Spring Oil Pool, that the vertical limits  
of said pool should be the Bone Spring formation and that the  
horizontal limits of said pool should be the NW/4 of said Section  
15.

(5) That the evidence presently available indicates that  
one well in the Bone Spring Oil Pool can efficiently and economic-  
ally drain and develop 160 acres.

*Corrected made pursuant to Nunc Pro Tunc Order R4994*

-2-

Case No. 5443

Order No. R-4994

*East Lusk*

(6) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 160-acre spacing units should be promulgated for the Bone Spring Oil Pool.

(7) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pool and protect correlative rights.

*East Lusk-*

(8) That the temporary special rules and regulations for the Bone Spring Oil Pool should apply only to wells located within the horizontal limits of said pool.

*East Lusk*

(9) That this case should be reopened at an examiner hearing during the month of April, 1976, at which time operators in the Bone Spring Oil Pool should appear and show cause why said pool should not be developed on 40-acre spacing.

IT IS THEREFORE ORDERED:

*East Lusk-*

(1) That a new pool in Lea County, New Mexico, classified as an oil pool for Bone Spring production, is hereby created and designated as the Bone Spring Oil Pool, consisting of the following described area:

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM  
Section 15: NW/4

*East Lusk-*

(2) That, effective April 15, 1975, Temporary Special Rules and Regulations for the Bone Spring Oil Pool, Lea County, New Mexico, are hereby promulgated as follows:

TEMPORARY SPECIAL RULES AND REGULATIONS  
FOR THE

*EAST LUSK*-BONE SPRING OIL POOL

*East Lusk-*

RULE 1. Each well completed or recompleted in the Bone Spring Oil Pool or in the Bone Spring formation within one mile thereof, and not nearer to or within the limits of another designated Bone Spring Oil Pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 160 acres, more or less, substantially in the form of a square, which is a quarter section being a legal subdivision of the United States Public Land Surveys.

-3-

Case No. 5443  
Order No. R-4994

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit consisting of less than 160 acres or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located no nearer than 660 feet to the outer boundary of the proration unit nor nearer than 330 feet to any governmental quarter-quarter section line nor nearer than 1320 feet to the nearest well drilling to or capable of producing from the same pool.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions for the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (158 through 162 acres) shall be assigned a 160-acre depth bracket allowable of 515 barrels, subject to the market demand percentage factor, for allowable purposes, and in the event there is more than one well on a 160-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 160 acres.

IT IS FURTHER ORDERED:

*East Fork*

(1) That the locations of all wells presently drilling to the Bone Spring Oil Pool are hereby approved; that the operator of any well having an unorthodox location shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before April 30, 1975.



-4-

Case No. 5443  
Order No. R-4994

*East Lusk*  
(2) That, pursuant to Paragraph A. of Section 65-3-14.5, NMSA 1953, contained in Chapter 271, Laws of 1969, existing wells in the Bone Spring Oil Pool shall have dedicated thereto 160 acres in accordance with the foregoing pool rules; or, pursuant to Paragraph C. of said Section 65-3-14.5, existing wells may have non-standard spacing or proration units established by the Commission and dedicated thereto.

*East Lusk*  
Failure to file new Forms C-102 with the Commission dedicating 160 acres to a well or to obtain a non-standard unit approved by the Commission within 60 days from the date of this order shall subject the well to cancellation of allowable. Until said Form C-102 has been filed or until a non-standard unit has been approved, and subject to said 60-day limitation, each well presently drilling to or completed in the Bone Spring Oil Pool shall receive no more than one-fourth of a standard allowable for the pool.

*East Lusk*  
(3) That this cause shall be reopened at an examiner hearing during the month of April, 1976, at which time the operators in the Bone Spring Oil Pool may appear and show cause why said pool should not be developed on less than 160-acre spacing.

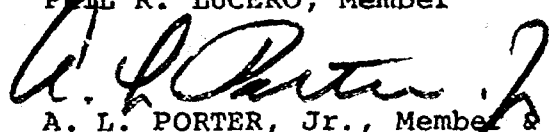
(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
I. R. TRUJILLO, Chairman

  
PHIL R. LUCERO, Member

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

  
S E A L

jr/



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO  
P. O. BOX 2088 - SANTA FE  
87501

DIRECTOR  
JOE D. RAMEY

LAND COMMISSIONER  
PHIL R. LUCERO  
May 18, 1976



STATE GEOLOGIST  
EMERY C. ARNOLD

Mr. Tom Kellahin  
Kellahin & Fox  
Attorneys at Law  
Post Office Box 1769  
Santa Fe, New Mexico

Re: CASE NO. 5443  
ORDER NO. R-4994-B

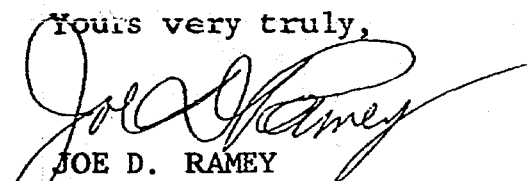
Applicant:

Sun Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Yours very truly,

  
JOE D. RAMEY  
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x  
Artesia OCC \_\_\_\_\_  
Aztec OCC \_\_\_\_\_

Other \_\_\_\_\_  
\_\_\_\_\_

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. 5443 (Reopened)  
Order No. R-4994-B

IN THE MATTER OF CASE 5443 BEING REOPENED  
PURSUANT TO THE PROVISIONS OF ORDER NO.  
R-4994, WHICH ORDER ESTABLISHED SPECIAL  
RULES AND REGULATIONS FOR THE EAST LUSK-  
BONE SPRING OIL POOL, LEA COUNTY, NEW  
MEXICO, INCLUDING A PROVISION FOR 160-  
ACRE SPACING AND PRORATION UNITS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 14 and April 28, 1976, at Santa Fe, New Mexico, before Examiners, Daniel S. Nutter and Richard L. Stamets, respectively.

NOW, on this 18th day of May, 1976, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiners, 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 by Order No. R-4994, dated April 1, 1975, temporary special rules and regulations were promulgated for the East Lusk-Bone Spring Oil Pool, Lea County, New Mexico, establishing temporary 160-acre spacing units and proration units.

(3) That pursuant to the provision of Order No. R-4994, this case was reopened to allow the operators in the subject pool to appear and show cause why the East Lusk-Bone Spring Oil Pool should not be developed on less than 160-acre spacing units.

(4) That the evidence establishes that one well in the East Lusk-Bone Spring Oil Pool can efficiently and economically drain and develop 160 acres.

(5) That the Special Rules and Regulations promulgated by Order No. R-4994 have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil and gas in the pool.

-2-

Case No. 5443 (Reopened)  
Order No. R-4994-B

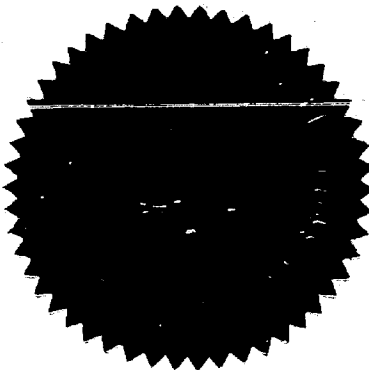
(6) That the Special Rules and Regulations for the East Lusk-Bone Spring Oil Pool should be made permanent.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the East Lusk-Bone Spring Oil Pool, promulgated by Order No. R-4994, shall remain in full force and effect until further order of the Commission.

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

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



STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

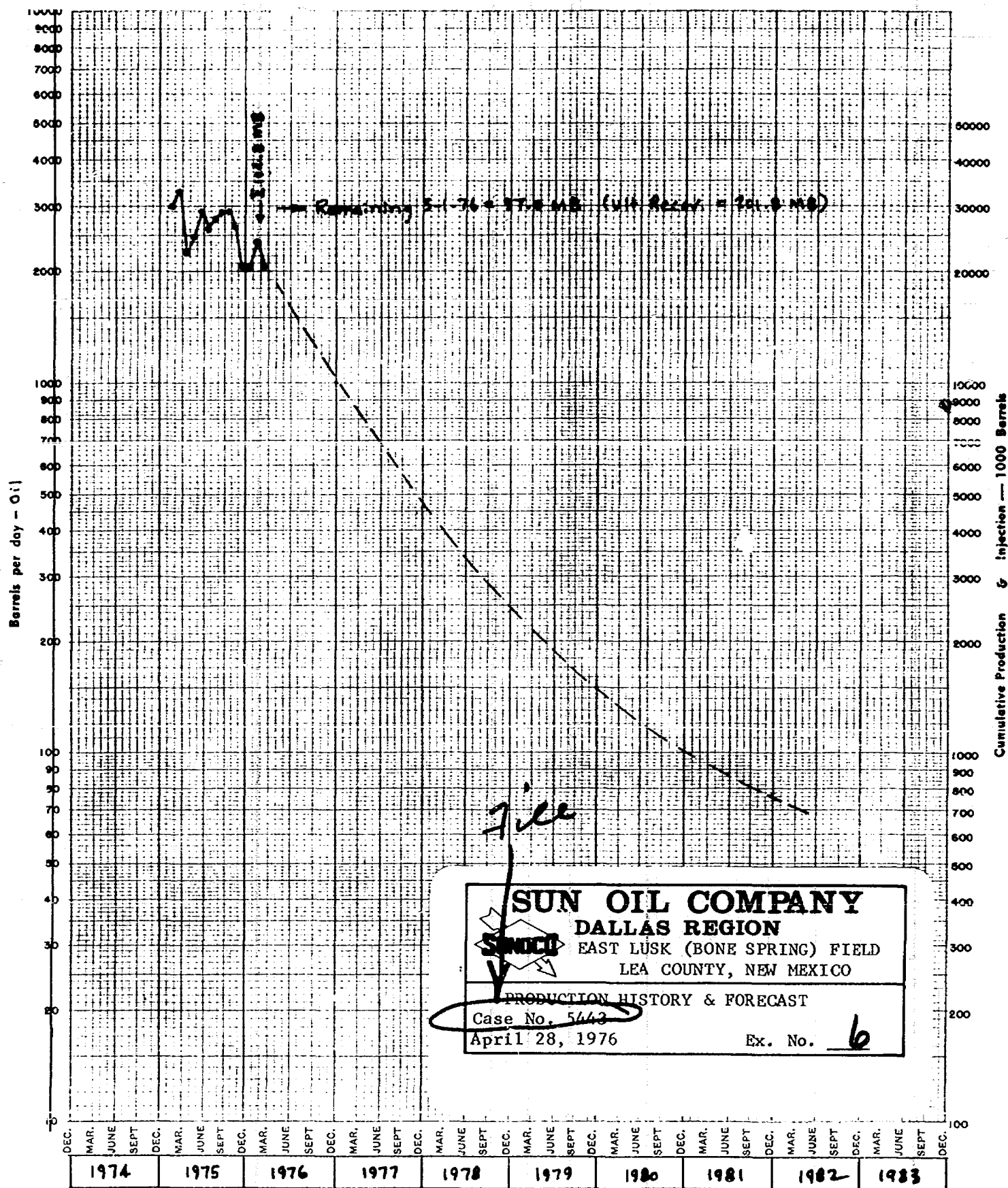
*Phil R. Lucero*  
PHIL R. LUCERO, Chairman

*Emery C. Arnold*  
EMERY C. ARNOLD, Member

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

S E A L

jr/



RECOVERY CALCULATIONS  
EAST LUSK (BONE SPRING) FIELD  
LEA COUNTY, NEW MEXICO

$$\text{OSTOIP} = \frac{7758 \phi (1-S_w)}{B_o}$$

$$= \frac{7758 \times .065 \times (1-.3)}{1.37}$$

$$= 257.7 \text{ STB/AF}$$

Assuming 160-acre drainage

OIP 160 Ac. :	257.7 x 16 x 160 = 659,700 STB		
Ult. Rec. :	200,000 STB	Current Rec. :	105,000 STB
Rec. Eff. :	30.3% of OSTOIP	Rec. Eff. :	15.9% of OSTOIP

Assuming 80-acre drainage

OIP 80 Ac. :	257.7 x 16 x 80 = 329,900		
Ult. Rec. :	200,000 STB	Current Rec. :	105,000 STB
Rec. Eff. :	60.6% of OSTOIP	Rec. Eff. :	31.8% of OSTOIP

Assuming 40-acre drainage

OIP 40 Ac. :	257.7 x 16 x 40 = 164,900		
Ult. Rec. :	200,000 STB	Current Rec. :	105,000 STB
Rec. Eff. :	121.2% of OSTOIP	Rec. Eff. :	63.7% of OSTOIP

<b>SUN OIL COMPANY</b>	
<b>DALLAS REGION</b>	
EAST LUSK (BONE SPRING) FIELD	
LEA COUNTY, NEW MEXICO	
RECOVERY CALCULATIONS	
Case No. 5443	Ex. No. <b>27</b>
April 28, 1976	

DRAINAGE CALCULATIONS  
EAST LUSK (BONE SPRING) FIELD  
LEA COUNTY, NEW MEXICO

A. Recovery Above Bubble Point (2)

$$\begin{aligned} B/AF &= 257.7 \frac{(P_i - P_{bp}) \times (S_o C_o + S_w C_w + C_f) \times \frac{(B_{of})}{B_{ob}}}{1 - S_w} \\ &= 257.7 \times \frac{(3927 - 2000) \times (.7 \times 8 + .3 \times 2.8 + 6) \times 10^{-6}}{1 - .3} \times \frac{1.3488}{1.37} \\ &= 257.7 \times \frac{(1927) \times (12.44 \times 10^{-6})}{.7} \times \frac{1.3488}{1.37} \\ &= \underline{8.7} \quad (3.4\% \text{ OSTOIP}) \end{aligned}$$

B. Recovery Below Bubble Point (1)

$$\begin{aligned} B/AF &= e^{8.0845} \times \left\{ \frac{\phi (1 - S_w)}{B_{ob}} \right\}^{1.1611} \times \left( \frac{K}{u_{ob}} \right)^{0.0979} \times (S_w)^{0.3722} \times \left( \frac{P_b}{P_a} \right)^{0.1741} \\ &= e^{8.0845} \times \left\{ \frac{.065 \times (1 - .3)}{1.37} \right\}^{1.1611} \times \left( \frac{0.178}{0.55} \right)^{0.0979} \times (.3)^{.3722} \times \left( \frac{2000}{200} \right)^{.1741} \\ &= 3243.8 \times (.0192) \times (.895) \times (.639) \times (1.493) \\ &= \underline{53.2} \quad (20.6\% \text{ OSTOIP}) \end{aligned}$$

C. Total Recovery (#A + #B) = 53.2 + 8.7 = 61.9 B/A-F  
= 20.6% + 3.4% = 24.0% of OSTOIP

D. Drainage Area =  $\frac{200,000 \text{ Bbls.}}{61.9 \text{ B/AF} \times 16'} = \underline{202} \text{ Acres}$

Nomenclature

$\phi$  - Fraction Porosity  
S - Fraction Fluid Saturation  
B - PVF Res. Bbls./S.T. Bbl.  
K - Permeability, ~~in~~ darcys  
u - Viscosity, Cp  
P - Pressure psia  
C - Compressibility, vol/vol/psi

Subscripts:

o = oil  
bp or b = bubble point  
w = water  
f = formation  
a = abandonment  
i = initial

- (1) J. J. Arps, et al, API Bulletin ~~D~~ (October, 1967): A Statistical Study of Recovery Efficiency  
(2) Craft & Hawkins: Applied Petroleum Reservoir Engineering, (Prentice-Hall, Inc., 1959)

<b>SUN OIL COMPANY</b>	
<b>DALLAS REGION</b>	
EAST LUSK (BONE SPRING) FIELD	
LEA COUNTY, NEW MEXICO	
DRAINAGE CALCULATIONS	
Case No. 5443	Ex. No. <b>8</b>
April 28, 1976	

EAST LUSK (BONE SPRING) FIELD  
TYPICAL DEVELOPMENT ECONOMICS

ASSUMPTIONS:

Expense Interest  
Revenue Interest  
Oil Price  
Gas Price  
Prod. Tax  
Oper. Exp.  
Cost Per Completed Well  
\* Ultimate Recovery

160-ACRE SPACING

100%  
87.5%  
\$12.08  
\$ 0.519/MCF  
7.5%  
\$1,050/Well-Month  
\$349,000  
158,464 BBLS + 300 MMCF

80-ACRE SPACING

100%  
87.5%  
\$12.08  
\$ 0.519/MCF  
7.5%  
\$1,050/Well-Month  
\$349,000  
158,464 BBLS + 300 MMCF

40-ACRE SPACING

100%  
87.5%  
\$12.08  
\$ 0.519/MCF  
7.5%  
\$1,050/Well-Month  
\$349,000  
158,464 BBLS + 300 MMCF

TOTAL INCOME TO FULL W.I.:

Gross Revenue  
Less Royalty Burdens  
Less Prod. Tax (7.5%)

\$2,069,945  
1,811,202  
1,675,362

\$2,069,945  
1,811,202  
1,675,362

\$2,069,945  
1,811,202  
1,675,362

TOTAL INVESTMENT

\$ 349,000

\$ 698,000 (2 Wells)

\$1,396,000 (4 Wells)

TOTAL OPER. EXP.

\$ 100,800

\$ 100,800

\$ 100,800

TOTAL PROFIT TO FULL W.I.

\$1,225,562

\$ 876,562

\$ 178,562

UNDISC. PROFIT/INVESTMENT RATIO

3.51/1

1.26/1

0.13/1

\* 160 Acres @ 24.0% Recov. (61.9 B/A-F)  
61.9 x 16 x 150 acres = 158,464 ST Bbls.

<b>SUN OIL COMPANY</b>	
<b>DALLAS REGION</b>	
EAST LUSK (BONE SPRING) FIELD	
LEA COUNTY, NEW MEXICO	
TYPICAL DEVELOPMENT ECONOMICS	
Case No. 5443	Ex. No. 9
April 28, 1976	



Dockets Nos. 14-76 and 15-76 are tentatively set for hearing on May 12 and May 26, 1976. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - APRIL 28, 1976

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

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

CASE 5670: Application of Read & Stevens, Inc. for an unorthodox location and directional drilling, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to deviate its Harris-Federal Well No. 3, the surface location of which is 660 feet from the South line and 1980 feet from the East line of Section 27, Township 15 South, Range 28 East, Chaves County, New Mexico, by directionally drilling said well from a kick-off point at approximately 6000 feet and bottoming it at an unorthodox location in the Pennsylvanian formation within 250 feet of a point 990 feet from the South line and 1650 feet from the East line of said Section 27, the S/2 of the Section to be dedicated to the well.

CASE 5671: Application of Ard Drilling Co. for directional drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to deviate its State 10 Well No. 1, the surface location of which is 660 feet from the South and East lines of Section 10, Township 10 South, Range 32 East, North Mescalero-Cisco Pool, Lea County, New Mexico, by directionally drilling said well from a kick-off point at approximately 7800 feet and bottoming it in the Cisco formation within 100 feet of a point 810 feet from the South line and 660 feet from the East line of said Section 10.

CASE 5672: Application of Horace F. McKay, Jr. for downhole commingling and simultaneous dedication, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Aztec-Fruitland and Aztec-Pictured Cliffs gas production in the wellbore of his Beardon "A" Well No. 1, located in Unit C of Section 19, Township 29 North, Range 10 West, San Juan County, New Mexico. Applicant further seeks approval for the simultaneous dedication of the NW/4 of said Section 19 to the above-described well and his Beardon Well No. 1 in Unit E of said Section 19.

CASE 5673: Application of David Fasken for approval of an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be drilled 1980 feet from the South line and 660 feet from the West line of Section 32, Township 20 South, Range 25 East, Cemetery-Morrow Gas Pool, Eddy County, New Mexico, the S/2 of said Section 32 to be dedicated to the well.

CASE 5674: Application of Agua, Inc. for an extension of time and amendment of Orders Nos. R-4495-A and R-4495-B, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Orders Nos. R-4495-A and R-4495-B to permit disposal, after the current May 7, 1976, deadline, of produced salt water through perforations from 4230 feet to 4320 feet in its SWD Well No. C-2, located in Unit C of Section 2, Township 22 South, Range 37 East, Lea County, New Mexico. Applicant seeks the amendment of said orders to permit such disposal for an additional 90-day period after May 7, 1976, and thereafter until 30 days after the entry of an order favorable to the applicant in Case No. 5644.

CASE 5675: Application of Merrion & Bayless for a dual completion and downhole commingling, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (combination) of its Jicarilla 428 Well No. 2, located in Unit A of Section 31, Township 23 North, Range 4 West, Sandoval County, New Mexico, by cementing parallel strings of 2 7/8-inch casing and 4 1/2-inch casing in a common wellbore, completing said well in such a manner as to commingle undesignated Pictured Cliffs and undesignated Chacon gas production in the 2 7/8-inch casing, and to commingle various undesignated Mesaverde, Mancos, Gallup, Carlisle, and Graneros gas stringers in the 4 1/2-inch casing.

CASE 5443: (Reopened & Continued)

In the matter of Case 5443 being reopened pursuant to the provisions of Order No. R-4994, which order established special rules and regulations for the East Lusk-Bone Spring Oil Pool, Lea County, New Mexico, including a provision for 160-acre spacing and proration units. All interested parties may appear and show cause why said pool should not be developed on less than 160-acre spacing units.

Dockets Nos. 13-76 and 14-76 are tentatively set for hearing on April 28 and May 12, 1976. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - APRIL 14, 1976

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

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

- ALLOWABLE:** (1) Consideration of the allowable production of gas for May, 1976, from seventeen prorated pools in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.
- (2) Consideration of the allowable production of gas for May, 1976, from five prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico.

**CASE 5663:** Application of Anne Burnett Tandy dba Windfohr Oil Company for 12 unorthodox oil well locations and an administrative procedure, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of 12 oil wells to be drilled to the San Andres formation at the following locations in the Grayburg-Jackson Unit, Township 17 South, Range 30 East, Eddy County, New Mexico:

in Section 13: extreme SE/corner of Units E and O, the extreme SW/corner of Unit N, the extreme NE/corner of Units J and K, and the extreme NW/corner of Units M, N, O, and P;

in Section 14: the extreme SE of Unit H;

in Section 24: the extreme SW/corner of Unit C and extreme NW/corner of Unit D.

Applicant further seeks the establishment of an administrative procedure whereby the above wells could be relocated and other similar unorthodox locations approved without notice and hearing.

**CASE 5664:** Application of Mesa Petroleum Company for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Nash Unit Well No. 2, located in Unit F of Section 18, Township 23 South, Range 30 East, Eddy County, New Mexico, to produce gas from the Atoka and Morrow formations through parallel strings of tubing.

**CASE 5665:** Application of Howard Boatwright Company, Inc. for salt water disposal, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Delaware formation through the open-hole interval from 2979 to 3180 feet in its State CS Well No. 1 located in Unit L of Section 17, Township 21 South, Range 27 East, Burton Flats Field, Eddy County, New Mexico.

**CASE 5666:** Application of Belco Petroleum Corporation for compulsory pooling and an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in and below the Pennsylvanian formation underlying the E/2 of Section 7, Township 22 South, Range 27 East, Eddy County, New Mexico, to be dedicated to a well to be drilled 2410 feet from the North line and 560 feet from the East line of said Section 7. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

**CASE 5667:** Application of Belco Petroleum Corporation for approval of an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a Morrow test well to be drilled 660 feet from the North line and 1480 feet from the West line of Section 19, Township 21 South, Range 35 East, Osado-Morrow Gas Pool, Lea County, New Mexico, the N/2 of said Section 19 to be dedicated to the well.

**CASE 5443:** (Reopened)

In the matter of Case 5443 being reopened pursuant to the provisions of Order No. R-4994, which order established special rules and regulations for the East Lusk-Bone Spring Oil Pool, Lea County, New Mexico, including a provision for 160-acre spacing and proration units. All interested parties may appear and show cause why said pool should not be developed on less than 160-acre spacing units.

**CASE 5446:** (Reopened)

In the matter of Case 5446 being reopened pursuant to the provisions of Order No. R-4992, which order established special rules and regulations for the Casey-Strawn Pool, Lea County, New Mexico, including a provision for 80-acre spacing. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

CASE 5652: (Continued & Readvertised)

Application of Continental Oil Company for downhole coringline, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Basin-Dakota gas and Otero-Gallup oil production in the wellbores of the following wells on its Northeast Haynes Lease in Township 24 North, Range 5 West, Rio Arriba County, New Mexico:

- No. 1 in Unit L of Section 9
- No. 2 in Unit D of Section 16
- No. 3 in Unit P of Section 16
- No. 4 in Unit E of Section 21
- No. 5 in Unit E of Section 22
- No. 6 in Unit D of Section 15
- No. 7 in Unit L of Section 10
- No. 8 in Unit P of Section 15

CASE 5668: Application of Anadarko Production Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced water into the Queen formation through the perforated interval from approximately 4553 to 4881 feet in its New Mexico "W" State Well No. 1, located in Unit O of Section 21, Township 18 South, Range 34 East, East E-K Queen Pool, Lea County, New Mexico.

CASE 5669: Southeastern New Mexico nomenclature case calling for an order for the creation and extension of certain pools in Chaves, Eddy, Lea, and Roosevelt Counties, New Mexico.

a) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for Queen production and designated as the Eidson-Queen Pool. The discovery well is the Hanson Oil Corporation Caldonia Well No. 1, located in Unit N of Section 11, Township 16 South, Range 34 East, NMPM. Said pool would comprise:

TOWNSHIP 16 SOUTH, RANGE 34 EAST, NMPM  
Section 11: S/2  
Section 12: SW/4

b) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Atoka production and designated as the McKittrick Hills-Atoka Gas Pool. The discovery well is the Southern Union Production Company Shelby Federal Well No. 1, located in Unit H of Section 13, Township 22 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 22 SOUTH, RANGE 24 EAST, NMPM  
Section 13: N/2

c) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Strawn production and designated as the McKittrick Hills-Strawn Gas Pool. The discovery well is the Southern Union Production Company Shelby Federal Well No. 1, located in Unit H of Section 13, Township 22 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 22 SOUTH, RANGE 24 EAST, NMPM  
Section 13: N/2

d) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Upper Pennsylvanian production and designated as the McKittrick Hills-Upper Pennsylvanian Gas Pool. The discovery well is the Southern Union Production Company Shelby Federal Well No. 2, located in Unit K of Section 12, Township 22 South, Range 24 East, NMPM. Said pool would comprise:

TOWNSHIP 22 SOUTH, RANGE 24 EAST, NMPM  
Section 12: S/2

e) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Strawn production and designated as the South Newmill-Strawn Gas Pool. The discovery well is the Marathon Oil Company State 27 Well No. 1, located in Unit M of Section 27, Township 4 South, Range 27 East, NMPM. Said pool would comprise:

TOWNSHIP 4 SOUTH, RANGE 27 EAST, NMPM  
Section 27: W/2

f) CREATE a new pool in Roosevelt County, New Mexico, classified as an oil pool for Wolfcamp production and designated as the South Prairie-Wolfcamp Pool. The discovery well is the SNB Operating Company New Mexico Federal Well No. 1, located in Unit I of Section 20, Township 8 South, Range 36 East, NMPM. Said pool would comprise:

TOWNSHIP 8 SOUTH, RANGE 36 EAST, NMPM  
Section 20: SE/4

g) CREATE a new pool in Lea County, New Mexico, classified as an oil pool for Bone Springs production and designated as the Salt Lake-Bone Springs Pool. The discovery well is the Flag-Redfern Oil Company Hanson State Well No. 1, located in Unit N of Section 13, Township 20 South, Range 32 East, NMPM. Said pool would comprise:

TOWNSHIP 20 SOUTH, RANGE 32 EAST, NMPM  
Section 13: SW/4

h) CREATE a new pool in Chaves County, New Mexico, classified as a gas pool for Atoka production and designated as the Sand Ranch-Atoka Gas Pool. The discovery well is the Depco, Inc. Midwest Federal Well No. 1, located in Unit O of Section 23, Township 10 South, Range 29 East, NMPM. Said pool would comprise:

TOWNSHIP 10 SOUTH, RANGE 29 EAST, NMPM  
Section 23: S/2

i) CREATE a new pool in Eddy County, New Mexico, classified as a gas pool for Strawn production and designated as the Sheep Draw-Strawn Gas Pool. The discovery well is the Corinne Grace Cueva Unit Well No. 1, located in Unit K of Section 6, Township 23 South, Range 26 East, NMPM. Said pool would comprise:

TOWNSHIP 23 SOUTH, RANGE 26 EAST, NMPM  
Section 6: W/2

j) EXTEND the Atoka-Pennsylvanian Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM  
Section 13: All

k) EXTEND the South Carlsbad-Canyon Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 23 SOUTH, RANGE 26 EAST, NMPM  
Section 13: S/2

l) EXTEND the South Carlsbad-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 22 SOUTH, RANGE 26 EAST, NMPM  
Section 36: W/2

TOWNSHIP 22 SOUTH, RANGE 27 EAST, NMPM  
Section 32: E/2

TOWNSHIP 23 SOUTH, RANGE 26 EAST, NMPM  
Section 10: E/2  
Section 34: N/2

TOWNSHIP 23 SOUTH, RANGE 27 EAST, NMPM  
Section 20: S/2

m) EXTEND the Catclaw Draw-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 25 EAST, NMPM  
Section 2: Lots 9 through 16 & S/2  
Section 28: All

n) EXTEND the Cato-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 9 SOUTH, RANGE 30 EAST, NMPM  
Section 8: NW/4

o) EXTEND the Chaveroo-San Andres Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 32 EAST, NMPM  
Section 1: SE/4  
Section 2: NW/4

p) EXTEND the Golden Lane-Strawn Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 30 EAST, NMPM  
Section 33: W/2

Docket No. 12-76

Examiner Hearing - Wednesday - April 14, 1976  
-4-

q) EXTEND the Kennedy Farms-Morrow Gas Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 26 EAST, NMPM  
Section 15: E/2

r) EXTEND the South Lucky Lake Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM  
Section 16: S/2 SE/4  
Section 21: NE/4 NE/6

Dockets Nos. 8-75 and 9-75 are tentatively set for hearing on April 2, and April 16, 1975. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - MARCH 19, 1975

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

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

- ALLOWABLE: (1) Consideration of the allowable production of gas from seventeen prorated pools in Lea, Eddy, Roosevelt, and Chaves Counties, New Mexico, for April, 1975;
- (2) Consideration of the allowable production of gas from five prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for April, 1975.

CASE 5415: (Continued from the February 19, 1975, Examiner Hearing)

Application of Burk Royalty Co., for a unit agreement, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Double L Queen Unit Area, comprising 2670 acres, more or less, of Federal, State, and fee lands in Townships 14 and 15 South, Ranges 29 and 30 East, Chaves County, New Mexico.

CASE 5409: (Continued & Readvertised)

Application of Atlantic Richfield Company for a non-standard gas proration unit, an unorthodox gas well location, and simultaneous dedication, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 320-acre non-standard gas proration unit comprising the SE/4 of Section 12 and the NE/4 of Section 13, both in Township 24 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, to be simultaneously dedicated to its George W. Toby WN Wells Nos. 4, 1, and 1-A, located, respectively, in Units I and P of said Section 12 and in Unit A of said Section 13.

CASE 5438: Application of Exxon Corporation for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of temporary special rules for the Fairview Mills-Wolfcamp Gas Pool, Township 25 South, Range 34 East, Lea County, New Mexico, including a provision for 640-acre spacing units.

CASE 5439: Application of Gulf Oil Corporation for the amendment of Order No. R-4079, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-4079, which order, as amended, authorized the commingling, prior to measurement, of Hobbs Crayburg-San Andres, Hobbs-Blindery, and Rowers-Seven Rivers production from its W. D. Grimes "A" and "B" Leases in Sections 32 and 33, Township 18 South, Range 38 East, Lea County, New Mexico, to include in said commingling authority Hobbs-Drinkard production.

CASE 5440: Application of Gulf Oil Corporation for two unorthodox oil well locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its South Penrose Skelly Wells Nos. 220 and 262 to be located, respectively, 1034 feet from the South line and 2635 feet from the West line of Section 5 and 1300 feet from the South line and 1139 feet from the East line of Section 8, both in Township 22 South, Range 37 East, Penrose Skelly Pool, Lea County, New Mexico. Applicant further seeks the amendment of Order No. R-2794 to provide an administrative procedure for the approval of additional unorthodox locations for injection and producing wells within the South Penrose Skelly Unit Area.

CASE 5441: Application of J. Gregory Merrion and Robert L. Bayless for down-hole commingling, Rio Arriba County, New Mexico. Applicants, in the above-styled cause, seek authority to commingle undesignated Gallup and Basin-Dakota production in the wellbore of the El Paso Canyon Largo NP Well No. 1, located in Unit K of Section 3, Township 24 North, Range 6 West, Rio Arriba County, New Mexico.

CASE 5442: Application of David Fasken for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of his Feil Federal Well No. 1, to be drilled 660 feet from the North and West lines of Section 28, Township 20 South, Range 25 East, Cemetery-Morrow Gas Pool, Eddy County, New Mexico, the N/2 of said Section 28 to be dedicated to the well.

CASE 5443: Application of Sun Oil Company for pool creation and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Bone Spring production for its Jennings-Federal Well No. 1, located in Unit F of Section 15, Township 19 South, Range 32 East, Lea County, New Mexico, and the promulgation of special pool rules therefor, including a provision for 160-acre proration units.

CASE 5444: Application of C & K Petroleum, Inc., for pool creation and special pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of a new gas pool for production from the Wolfcamp formation for its Harold Olive Com No. 1 Well, located in Unit O of Section 14, Township 22 South, Range 26 East, Eddy County, New Mexico, and the promulgation of temporary special rules therefor, including a provision for 320-acre spacing units.

CASE 5445: Application of C & K Petroleum, Inc., for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp formation underlying the S/2 or, in the alternative, the SE/4 of Section 14, Township 22 South, Range 26 East, Eddy County, New Mexico, to be dedicated to its Harold Olive Com Well No. 1, located at an orthodox location in the SE/4 of said Section 14. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of the applicant as operator of the well and a charge for the risk involved in drilling said well.

- CASE 5446: Application of C & K Petroleum, Inc., for pool creation and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the establishment of a new oil pool for Strawn production for its Shipp "27" Well No. 1, located in Unit 0 of Section 27, Township 16 South, Range 37 East, Lea County, New Mexico, and the promulgation of temporary special rules therefor, including a provision for 80-acre proration units.
- CASE 5447: Application of C & K Petroleum, Inc., for amendment of Order No. R-4857, Lea County, New Mexico. Applicant, in the above-styled cause, seeks amendment of Order No. R-4857, which order pooled all mineral interests in the Pennsylvanian formation underlying the SW/4 SE/4 of Section 27, Township 16 South, Range 37 East, Lea County, New Mexico, to pool all such mineral interests underlying the S/2 SE/4 of said Section 27.
- CASE 5428: (Continued from the February 19, 1975, Examiner Hearing)
- Application of Amax Chemical Corporation for the extension of the Potash-Oil Area, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the Potash-Oil Area in Eddy County, New Mexico, as defined by Order No. R-111-A, as amended, by the addition of the following described lands:

TOWNSHIP 19 SOUTH, RANGE 29 EAST

Section 13: S/2 SE/4  
Section 14: W/2 SW/4  
Section 23: N/2 NW/4, SE/4 NW/4, S/2 NE/4  
Section 24: NW/4, W/2 NE/4, NE/4 NE/4

TOWNSHIP 19 SOUTH, RANGE 30 EAST

Section 14: W/2 NE/4  
Section 18: SW/4



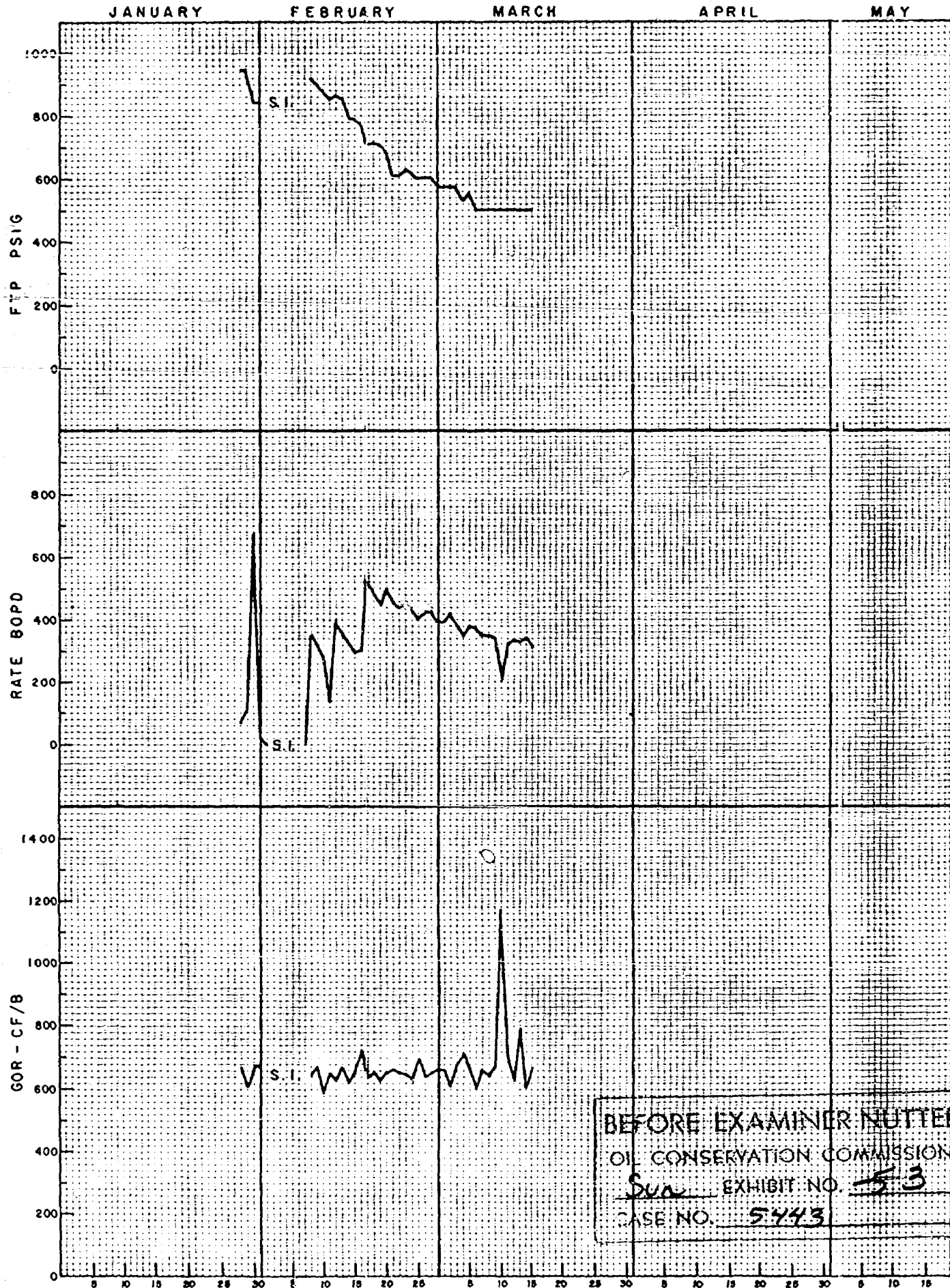
# innocent

- (1) That in Findings Nos. 4, 5, 6, 8, and 9, prior to the words "Bone Spring Oil Pool," the words "East Lusk" he inserted. <sup>Sections</sup>
- (2) That in ~~Paragraphs~~ <sup>Sections</sup> (1) and (2) and in ~~Rule 1 of the Special Temporary Rules and Regulations of~~ "IT IS THEREFORE ORDERED," including the title of and Rule 1 of the special rules for the pool, prior to the words "Bone Spring Oil Pool," ~~inserted~~ the words "East Lusk" he inserted.
- (3) That in ~~Paragraphs~~ <sup>Sections</sup> (1), (2), and (3) of "IT IS FURTHER ORDERED," prior to the words "Bone Spring Oil Pool," the words "East Lusk" he inserted.

FROM:  
JOE RAMEY

Order No. R-4994 created a new pool  
designated as the Bone Spring Oil  
Pool. Joe and I are wondering if  
something was omitted from the name  
of the pool in the order, since we  
have not had in recent years a pool  
name like this.

*Melba*



TD 10,800

650/1000

SUN OIL COMPANY  
ECONOMIC COMPARISON  
80-ACRE VS. 160-ACRE SPACING  
PROPOSED EAST LUSK BONE SPRING  
LEA COUNTY, NEW MEXICO

	80-ACRE	160-ACRE
TOTAL COST:		
SUCCESSFUL, DC & E	\$537,000	\$537,000
UNSUCCESSFUL	310,000	310,000
EXPECTED RESERVES		
PROB. OF SUCCESS = 1.0 (16')	65,540	131,080
PROB. OF SUCCESS = 0.6 (10')	39,324	78,648
PROB. OF SUCCESS = 0.4 (6')	26,216	52,432
PROFITABILITY - S.R.:	0.4	0.6
NET CASH FLOW	(49907)	13264
RATE OF RETURN, %	-	10
10% NET PRESENT VALUE	(59329)	(869)
COST - \$/BBL.	14.6	10.47
PROFIT - \$/\$	LOSS	.03
PAYOUT, YEARS	-	0.95
LIFE YEARS	1	2

Permeability  
Joint Val Factor 1.4  
Wti rat  
Recovery Factor

6.6 permeability  
30% Wti Sat.  
20% Recovery Factor

Perm calc 178 md.

proposed name:  
East Lusk Bone Spring

value of oil  
12.00  
gas .51/MCF

total gas  
expected.  
80 acre 16'  
128,000 MCF

BEFORE EXAMINER NUTTER	
OIL CONSERVATION COMMISSION	
SUN	EXHIBIT NO. 4
CASE NO.	5443

OIL COM.

BEFORE THE  
OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION  
OF SUN OIL COMPANY FOR THE CREATION  
OF A POOL AND POOL RULES FOR PRODUC-  
TION FROM THE BONE SPRING FORMATION,  
LEA COUNTY, NEW MEXICO

A P P L I C A T I O N

COMES NOW SUN OIL COMPANY, by and through its  
attorneys, KELLAHIN & FOX, and applies to the New Mexico  
Oil Conservation Commission for the designation of  
a new pool for production from the Bone Spring formation,  
and for pool rules therefor, and in support thereof  
would show the Commission:

1. Applicant is the operator of the Jennings-Federal  
Well No. 1, located 1980 feet from the West line and  
1980 feet from the North line of Section 15, Township  
19 South, Range 32 East, Lea County, New Mexico.
2. Said well is completed in an undesignated Bone  
Spring formation in the East Lusk Field area.
3. Applicant seeks the creation of a new pool for  
production by subject well from the Bone Spring formation.
4. Applicant further seeks the promulgation of pool  
rules for said pool, including, but not limited to provi-

DOCKET MAILED

Date 3/6/75

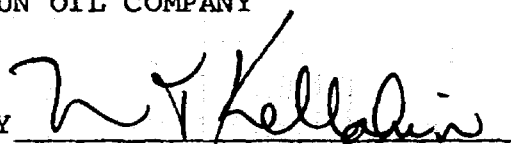
sions for the location of wells, proration and spacing units of not less than 160 acres, and for such other rules as the Commission deems appropriate.

WHEREFORE, Applicant respectfully requests that this application be set for hearing before the Commission's duly appointed Examiner and that after notice and hearing an order be entered granting the application as requested.

Respectfully submitted,

SUN OIL COMPANY

BY



KELLAHIN & FOX  
Post Office Box 1769  
Santa Fe, New Mexico 87501

ATTORNEYS FOR APPLICANT

DRAFT

dr/

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. 5443 (Reopened)

Order No. R-4994-B

IN THE MATTER OF CASE 5443 BEING REOPENED  
PURSUANT TO THE PROVISIONS OF ORDER NO. R-4994,  
WHICH ORDER ESTABLISHED SPECIAL RULES AND  
REGULATIONS FOR THE EAST LUSK-BONE SPRING OIL  
POOL, LEA COUNTY, NEW MEXICO, INCLUDING A PROVISION  
FOR 160-ACRE SPACING AND PRORATION UNITS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 14 and April 28,  
19 76, at Santa Fe, New Mexico, before Examiners Daniel S. Nutter  
and Richard L. Starnes, respectively.

NOW, on this        day of       , 19 76, the  
Commission, a quorum being present, having considered the  
testimony, the record, and the recommendations of the Examiners,  
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 by Order No. R-4994, dated Apr. 11, 1975,  
19 76, temporary special rules and regulations were promulgated  
for the East Lusk-Bone Spring Oil Pool, Lea  
County, New Mexico, establishing temporary 160-acre spacing  
units and proration units, ~~and a limiting gas-oil ratio of~~

       to       

(3) That pursuant to the provisions of Order No. R-4994,  
this case was reopened to allow the operators in the subject  
pool to appear and show cause why the East Lusk-Bone Spring Oil  
Pool should not be developed on less than 160-acre spacing units, ~~and a~~  
~~limiting gas-oil ratio of~~        to

-2-

Case No. \_\_\_\_\_  
Order No. \_\_\_\_\_

(4) That the evidence establishes that one well in the  
East Lusk-Bone Spring Oil \_\_\_\_\_ Pool can efficiently and  
economically drain and develop 160 acres.

(5) That the Special Rules and Regulations promulgated by  
Order No. R-4994 \_\_\_\_\_ have afforded and will afford to the owner  
of each property in the pool the opportunity to produce his just  
and equitable share of the oil and gas in the pool.

*(6) That the Special Rules and Regulations*  
~~(6) That this case should be reopened at an examiner~~  
*for the East Lusk-Bone Spring Pool*  
~~hearing in \_\_\_\_\_, 19\_\_\_\_, at which time the~~  
*should be made permanent.*  
~~operators in the subject pool should appear and show cause why~~  
~~the East Lusk-Bone Spring Oil \_\_\_\_\_ Pool should not be~~  
~~developed on less than 160 acre proration units with a~~  
~~limiting oil gas ratio of \_\_\_\_\_ to \_\_\_\_\_.~~

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the  
East Lusk-Bone Spring Oil \_\_\_\_\_ Pool, promulgated by Order  
No. R-4994 \_\_\_\_\_, shall remain in full force and effect for an  
additional period of one year. *until further order of the Commission.*

*2.4.1*  
~~(2) That this case shall be reopened at an examiner hearing~~  
~~in \_\_\_\_\_, 19\_\_\_\_, at which time the operators in~~  
~~the subject pool shall appear and show cause why the~~  
~~East Lusk-Bone Spring Oil pool should not be developed on less~~  
~~than 160 -acre proration units with a limiting oil gas ratio~~  
~~of \_\_\_\_\_ to \_\_\_\_\_.~~

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

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



DRAFT

DSN/dr

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

CASE NO. 5443  
Order No. R-4994-A

NOMENCLATURE

APPLICATION OF SUN OIL COMPANY  
FOR POOL CREATION AND SPECIAL  
POOL RULES, LEA COUNTY, NEW MEXICO.

NUNC PRO TUNC

BY THE COMMISSION:

It appearing to the Commission that Order No. R-4994,  
dated April 1, 1975, does not correctly state the intended  
order of the Commission,

IT IS THEREFORE ORDERED:

(1) That in Findings Nos. (4), (5), (6), (3), and (9),  
prior to the words "Bone Spring Oil Pool," the words "East  
Lusk" be inserted.

(2) That in Sections (1) and (2) of "IT IS THEREFORE  
ORDERED," including the title and Rule 1 of the special  
rules for the pool, prior to the words "Bone Spring Oil Pool,"  
the words "East Lusk" be inserted.

(3) That in Sections (1), (2), and (3) of "IT IS  
FURTHER ORDERED," prior to the words "Bone Spring Oil Pool,"  
the words "East Lusk" be inserted.

(4) That this order shall be effective nunc pro tunc as of  
April 1, 1975.

DONE at Santa Fe, New Mexico, this \_\_\_\_\_ day of April,  
1975.

1 (3) That the applicant further seeks to have such temporary  
2 special pool rules apply to its Jennings-Federal Well No. 1  
3 located in Unit F of Section 15, Township 19 South, Range 32 East,  
4 NMPM, Lea County, New Mexico.

5 (4) That Sun Oil Company's Jennings-Federal Well No. 1 has  
6 discovered a separate and common source of supply which should  
7 be designated the Bone Spring Oil Pool, that the vertical limits  
8 of said pool should be the Bone Spring formation and that the  
9 horizontal limits of said pool should be the NW 1/4 of  
10 said Section 15.

11 (5) That the evidence presently available indicates that one  
12 well in the Bone Spring Oil Pool can efficiently and economically  
13 drain and develop 160 acres.

14 (6) That in order to prevent the economic loss ~~xxx~~ caused  
15 by the drilling of unnecessary wells, to avoid the augmentation  
16 of risk arising from the drilling of an excessive number of wells,  
17 to prevent reduced recovery which might result from the drilling  
18 of too few wells, and to otherwise prevent waste and protect  
19 correlative rights, temporary special rules and regulations  
20 providing for 160-acre spacing units should be promulgated for  
21 the Bone Spring Oil Pool.

22 (7) That the temporary special rules and regulations should  
23 provide for limited well locations in order to assure orderly  
24 development of the pool and protect correlative rights.

25 (8) That the temporary special rules and regulations for the  
26 Bone Spring Oil Pool should apply only to wells located within  
27 the horizontal limits of said pool.

28 (9) That this case should be reopened at an examiner  
29 hearing during the month of April, 1976, at which  
30 time operators in the Bone Spring Oil Pool should appear and show  
31 cause why said pool should not be developed on 40-acre spacing.

32

IT IS THEREFORE ORDERED:

1 (1) That a new pool in Lea County, New Mexico, classified  
2 as an oil pool for Bone Spring production, is hereby created and  
3 designated as the Bone Spring Oil Pool, consisting of the following  
4 described area:

5 TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM  
6 Section 15: NW/4

7 (2) That, effective April 15, 1975, Temporary  
8 Special Rules and Regulations for the Bone Spring Oil Pool, Lea  
9 County, New Mexico, are hereby promulgated as follows:

10 TEMPORARY SPECIAL RULES AND REGULATIONS  
11 FOR THE  
12 BONE SPRING OIL POOL

13 RULE 1. Each well completed or recompleted in the Bone Spring  
14 Oil Pool or in the Bone Spring formation within one mile thereof,  
15 and not nearer to or within the limits of another designated Bone  
16 Spring oil pool, shall be spaced, drilled, operated, and produced  
17 in accordance with the Special Rules and Regulations hereinafter  
18 set forth.

RULE 2. Each well shall be located on a standard unit containing  
160 acres, more or less, substantially in the form of a square, which  
is a quarter section being a legal subdivision of the United States  
Public Land Surveys.

RULE 3. The Secretary-Director of the Commission may grant an  
exception to the requirements of Rule 2 without notice and hearing when  
an application has been filed for a non-standard unit consisting of less  
than 160 acres or the unorthodox size or shape of the tract is due to a

26

27

28

29

30

31

32

-4-

Case No. 5443  
Order No. R-

1

2

variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located no nearer than 660 feet to the outer boundary of the proration unit nor nearer than 330 feet to any governmental quarter-quarter section line nor nearer than 1320 feet to the nearest well drilling to or capable of producing from the same pool.

RULE 5. The Secretary-Director may grant an exception to the requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon. All operators offsetting the proposed location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (158 through <sup>515</sup> 162 acres) shall be assigned a 160-acre depth bracket allowable of ~~560~~ barrels, subject to the market demand percentage factor, for allowable purposes, and in the event there is more than one well on a 160-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 160 acres.

~~RULE 7. A limiting gas-oil ratio of 4000 cubic feet of gas per barrel of oil is established for the pool.~~

24

25

26

27

28

29

30

31

32

-5-

Case No. 5443

Order No. R-

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to the Bone Spring Oil Pool are hereby approved; that the operator of any well having an unorthodox location shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before April 28, 1975.

(2) That, pursuant to Paragraph A. of Section 65-3-14.5, NMSA 1953, contained in Chapter 271, Laws of 1969, existing wells in the Bone Spring Oil Pool shall have dedicated thereto 160 acres in accordance with the foregoing pool rules; or, pursuant to Paragraph C. of said Section 65-3-14.5, existing wells may have non-standard spacing or proration units established by the Commission and dedicated thereto.

Failure to file new Forms C-102 with the Commission dedicating 160 acres to a well or to obtain a non-standard unit approved by the Commission within 60 days from the date of this order shall subject the well to cancellation of allowable. Until said Form C-102 has been filed or until a non-standard unit has been approved, and subject to said 60-day limitation, each well presently drilling to or completed in the Bone Spring Oil Pool shall receive no more than one-fourth of a standard allowable for the pool.

(3) That this cause shall be reopened at an examiner hearing during the month of April, 1976, at which time the operators in the Bone Spring Oil Pool may appear and show cause why said pool should not be developed on ~~160-acre~~ less than spacing.

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

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

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

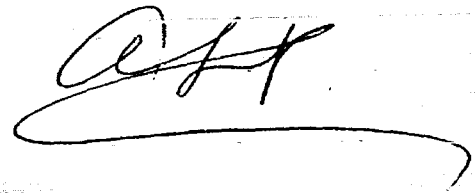
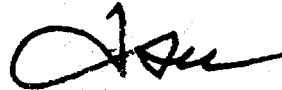
IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
COMMISSION OF NEW MEXICO FOR  
THE PURPOSE OF CONSIDERING:

CASE NO. 5443

Order No. R-4994

NOMENCLATURE

APPLICATION OF SUN OIL COMPANY FOR  
POOL CREATION AND SPECIAL POOL  
RULES, LEA COUNTY, NEW MEXICO.



ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 19, 1975  
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this        day of       , 1975, the Commission,  
a quorum being present, having considered the testimony, the record,  
and the recommendations of the Examiner, and being fully advised  
in the premises,

FINDS:

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

(2) That the applicant, Sun Oil Company, seeks the creation  
of a new oil pool for Bone Spring production in Lea County,  
New Mexico, and the promulgation of temporary special rules  
and regulations governing said pool, including provisions for  
160-acre spacing and proration units.

EAST LUSK (BONE SPRING) FIELD  
TYPICAL DEVELOPMENT ECONOMICS

ASSUMPTIONS:

Expense Interest  
Revenue Interest  
Oil Price  
Gas Price  
Prod. Tax  
Oper. Exp.  
Cost Per Completed Well  
\* Ultimate Recovery

160-ACRE SPACING

100%  
87.5%  
\$12.08  
\$ 0.519/MCF  
7.5%  
\$1,050/Well-Month  
\$349,000  
158,464 BBLS + 300 MMCF

80-ACRE SPACING

100%  
87.5%  
\$12.08  
\$ 0.519/MCF  
7.5%  
\$1,050/Well-Month  
\$349,000  
158,464 BBLS + 300 MMCF

40-ACRE SPACING

100%  
87.5%  
\$12.08  
\$ 0.519/MCF  
7.5%  
\$1,050/Well-Month  
\$349,000  
158,464 BBLS + 300 MMCF

TOTAL INCOME TO FULL W.I.:

Gross Revenue  
Less Royalty Burdens  
Less Prod. Tax (7.5%)

\$2,069,945  
1,811,202  
1,675,362

\$2,069,945  
1,811,202  
1,675,362

\$2,069,945  
1,811,202  
1,675,362

TOTAL INVESTMENT

\$ 349,000

\$ 698,000 (2 Wells)

\$1,396,000 (4 Wells)

TOTAL OPER. EXP.

\$ 100,800

\$ 100,800

\$ 100,800

TOTAL PROFIT TO FULL W.I.

\$1,225,562

\$ 876,562

\$ 178,562

UNDISC. PROFIT/INVESTMENT RATIO

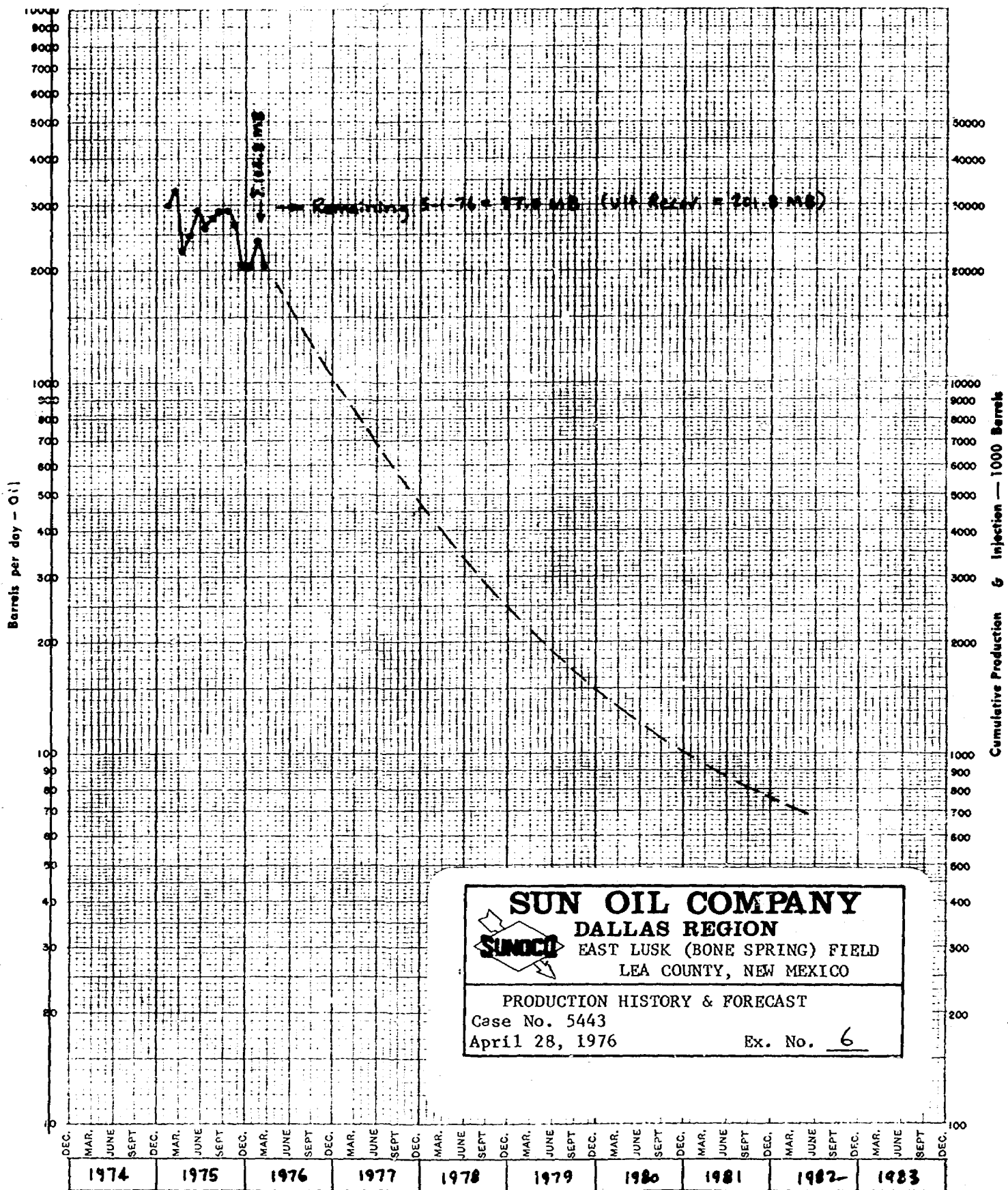
3.51/1

1.26/1

0.13/1

\* 160 Acres @ 24.0% Recov. (61.9 B/A-F)  
61.9 x 16' x 160 acres = 158,464 ST Bbls.

<b>SUN OIL COMPANY</b>	
<b>DALLAS REGION</b>	
EAST LUSK (BONE SPRING) FIELD	
LEA COUNTY, NEW MEXICO	
TYPICAL DEVELOPMENT ECONOMICS	
Case No. 5443	Ex. No. 9
April 28, 1976	





RECOVERY CALCULATIONS  
EAST LUSK (BONE SPRING) FIELD  
LEA COUNTY, NEW MEXICO

$$\begin{aligned}\text{OSTOIP} &= \frac{7758 \phi (1-S_w)}{B_o} \\ &= \frac{7758 \times .065 \times (1-.3)}{1.37} \\ &= 257.7 \text{ STB/AF}\end{aligned}$$

Assuming 160-acre drainage

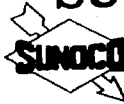
OIP 160 Ac. :	257.7 x 16 x 160 = 659,700 STB		
Ult. Rec. :	200,000 STB	Current Rec. :	105,000 STB
Rec. Eff. :	30.3% of OSTOIP	Rec. Eff. :	15.9% of OSTOIP

Assuming 80-acre drainage

OIP 80 Ac. :	257.7 x 16 x 80 = 329,900		
Ult. Rec. :	200,000 STB	Current Rec. :	105,000 STB
Rec. Eff. :	60.6% of OSTOIP	Rec. Eff. :	31.8% of OSTOIP

Assuming 40-acre drainage

OIP 40 Ac. :	257.7 x 16 x 40 = 164,900		
Ult. Rec. :	200,000 STB	Current Rec. :	105,000 STB
Rec. Eff. :	121.2% of OSTOIP	Rec. Eff. :	63.7% of OSTOIP

<b>SUN OIL COMPANY</b>	
<b>DALLAS REGION</b>	
	EAST LUSK (BONE SPRING) FIELD
	LEA COUNTY, NEW MEXICO
RECOVERY CALCULATIONS	
Case No. 5443	Ex. No. 7
April 28, 1976	

DRAINAGE CALCULATIONS  
EAST LUSK (BONE SPRING) FIELD  
LEA COUNTY, NEW MEXICO

A. Recovery Above Bubble Point (2)

$$\begin{aligned} B/AF &= 257.7 \frac{(P_i - P_{bp}) \times (S_o C_o + S_w C_w + C_f)}{1 - S_w} \times \frac{(B_{oi})}{B_{ob}} \\ &= 257.7 \times \frac{(3927 - 2000)}{1 - .3} \times \frac{(.7 \times 8 + .3 \times 2.8 + 6) \times 10^{-6}}{1.37} \times \frac{1.3488}{1.37} \\ &= 257.7 \times \frac{(1927)}{.7} \times \frac{(12.44 \times 10^{-6})}{1.37} \times \frac{1.3488}{1.37} \\ &= \underline{8.7} \text{ (3.4\% OSTOIP)} \end{aligned}$$

B. Recovery Below Bubble Point (1)

$$\begin{aligned} B/AF &= e^{8.0845} \times \left\{ \frac{\phi (1 - S_w)}{B_{ob}} \right\}^{1.1611} \times \left( \frac{K}{\mu_{ob}} \right)^{0.0979} \times (S_w)^{0.3722} \times \left( \frac{P_h}{P_a} \right)^{0.1741} \\ &= e^{8.0845} \times \left\{ \frac{.065 \times (1 - .3)}{1.37} \right\}^{1.1611} \times \left( \frac{0.178}{0.55} \right)^{0.0979} \times (.3)^{.3722} \times \left( \frac{2000}{200} \right)^{.1741} \\ &= 3243.8 \times (.0192) \times (.895) \times (.639) \times (1.493) \\ &= \underline{53.2} \text{ (20.6\% OSTOIP)} \end{aligned}$$

C. Total Recovery ( #A + #B) = 53.2 + 8.7 = 61.9 B/A-F  
= 20.6% + 3.4% = 24.0% of OSTOIP

D. Drainage Area =  $\frac{200,000 \text{ Bbls.}}{61.9 \text{ B/AF} \times 16'} = \underline{202} \text{ Acres}$

Nomenclature

$\phi$  - Fraction Porosity  
S - Fraction Fluid Saturation  
B - FVF Res. Bbls./S.T. Bbl.  
K - Permeability, ~~md~~ darcys  
u - Viscosity, Cp  
P - Pressure psia  
C - Compressibility, vol/vol/psi

Subscripts:

o = oil  
bp or b = bubble point  
w = water  
f = formation  
a = abandonment  
i = initial

- (1) J. J. Arps, et al, API Bulletin D14 (October, 1967): A Statistical Study of Recovery Efficiency  
(2) Craft & Hawkins: Applied Petroleum Reservoir Engineering, (Prentice-Hall, Inc., 1959)

<b>SUN OIL COMPANY</b>	
<b>DALLAS REGION</b>	
EAST LUSK (BONE SPRING) FIELD	
LEA COUNTY, NEW MEXICO	
DRAINAGE CALCULATIONS	
Case No. 5443	Ex. No. <u>8</u>
April 23, 1976	

# SUN OIL COMPANY

NEW MEXICO OIL CONSERVATION COMMISSION

CASE NUMBER 5443

EAST LUSK (BONE SPRING) FIELD

LEA COUNTY, NEW MEXICO



APRIL 14, 1976

CASE FILE

5443

# 127

CASE FILE

5443

#127

CASE FILE

5443

#127

MAP

CASE FILE

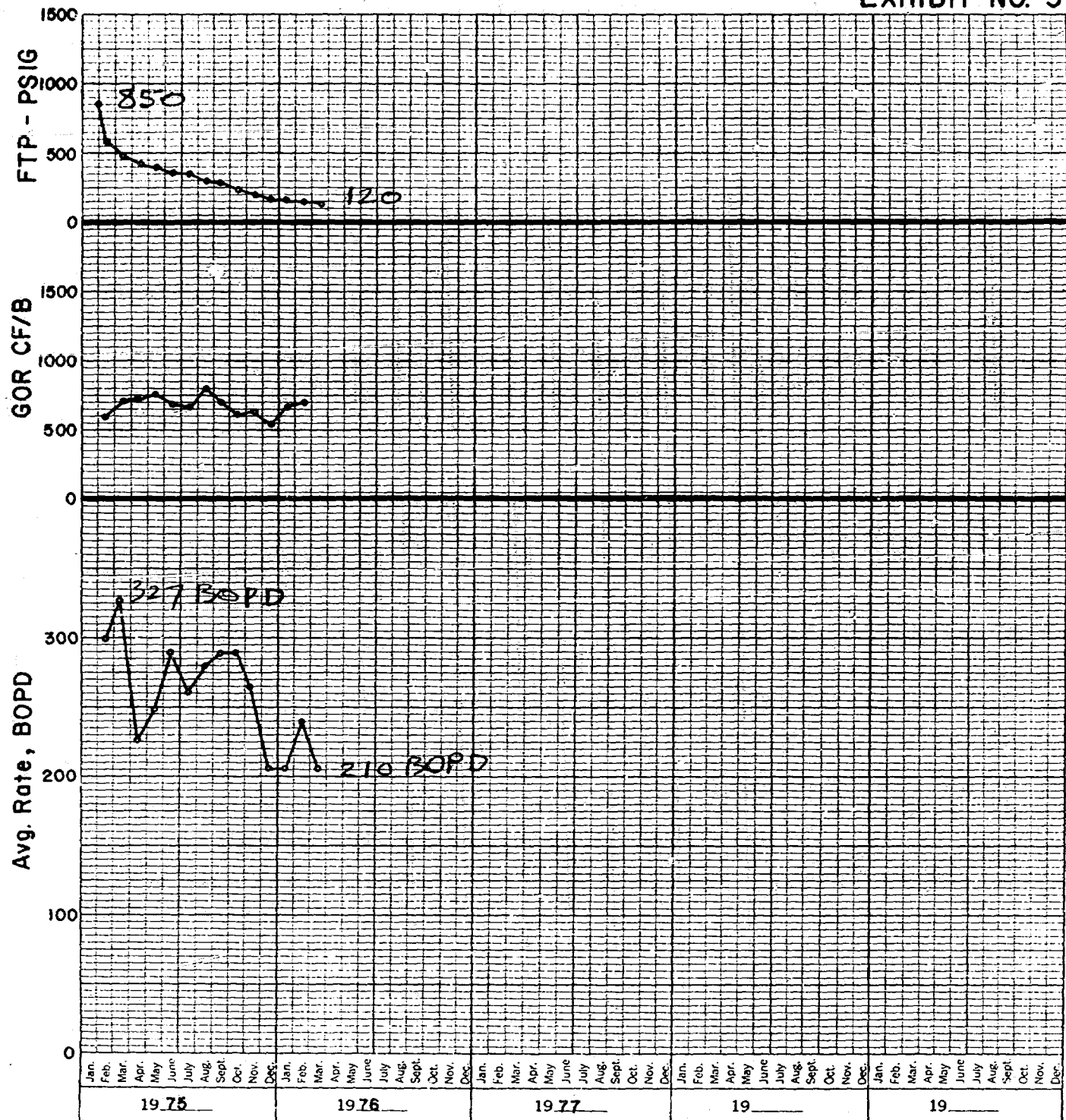
5443

# 127

Map

SUN OIL COMPANY  
Jennings - Federal #1  
Bone Spring Reservoir  
E. LUSK FIELD  
Lea County, New Mexico

CASE NO. 5443  
EXHIBIT NO. 3



BEFORE EXAMINER NUTTER  
OIL CONSERVATION COMMISSION  
SUN EXHIBIT NO. 3  
CASE NO. 5443



CASE NO. 5443  
EXHIBIT NO. 4

BEFORE EXAMINER NUTTER  
OIL CONSERVATION COMMISSION  
SUN EXHIBIT NO. 4  
CASE NO. 5443

SUN OIL COMPANY  
MONTHLY PRODUCTION AND COMPLETION DATA  
EAST LUSK (BONE SPRING) FIELD  
LEA COUNTY, NEW MEXICO

YEAR MONTH	JENNINGS FEDERAL #1		
	OIL BBLs.	GAS MCF	WATER BBLs.
1975			
JAN	1,052	-	0
FEB	8,384	4,927	0
MAR	10,163	7,283	0
APR	6,767	4,880	0
MAY	7,673	5,851	0
JUN	8,697	5,947	0
JUL	8,061	5,382	0
AUG	8,650	6,903	0
SEP	8,632	5,961	0
OCT	8,983	5,556	0
NOV	7,959	4,990	0
DEC	<u>6,401</u>	<u>3,470</u>	<u>0</u>
TOTAL	91,422	61,150	0
1976			
JAN	6,398	4,273	0
FEB	<u>6,972</u>	<u>4,997</u>	<u>0</u>
TOTAL	13,370	9,270	0
CUMULATIVE	<u>104,792</u>	<u>70,420</u>	<u>0</u>

1-30-75

Potential - 669 BOPD, +1 BW, GOR 674-1,  
41.4° API, TP 950-850#, 1/2" Choke, Perfs. 9874-9890  
Acidized with 6,000 Gallons.

CASE NO. 5443  
EXHIBIT NO. 5

SUN OIL COMPANY  
RESERVOIR, FLUID & BOTTOM HOLE PRESSURE DATA  
JENNINGS - FEDERAL #1  
EAST LUSK (BONE SPRING) FIELD

NET PAY	16'	RESERVOIR TEMPERATURE - 145° F
AVERAGE PROSITY	6.5%	BUBBLE POINT PRESSURE (EMPIRICAL) - 2000#
AVERAGE WATER SATURATION	30%	FVF @ B.P. PRESSURE 1.37 RB/STB

AVERAGE PERMEABILITY TO OIL - 178 MD. (PRESSURE BUILD-UP INTERPRETATION)

<u>DATE</u>	<u>PRESSURE @ 9890', PSIG (HRS. S.I.)</u>	<u>EXTRAPOLATED*</u>
2-7-75	3886 (187.3)	3927
4-8-75	2745 (71.75)	2912
4-2-76	1957 (68 )	1996

\*INFINITE SHUT-IN TIME

	<u>ESTIMATED CURRENT WELL COST - \$1,000'S</u>		
	<u>CAPITAL</u>	<u>INTANGIBLE</u>	<u>TOTAL</u>
DRY HOLE	52	198	250
SUCCESSFUL COMPLETION	133	216	349

BEFORE EXAMINER NUTTER  
OIL CONSERVATION COMMISSION  
SUN EXHIBIT NO. 5  
CASE NO. 5443