

CASE 6945: ARCO OIL AND GAS COMPANY FOR  
SALT WATER DISPOSAL, LEA COUNTY, NEW  
MEXICO

CASE NO.

6945

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APPLICATION,  
TRANSCRIPTS,  
SMALL EXHIBITS,  
ETC.

- CASE 6944: Application of Benson-Montin-Greer Drilling Corporation for a pressure maintenance project, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pressure maintenance project by the injection of gas, air, LPG, water, or chemicals into the Mancos formation thru 7 wells on its East Puerto Chiquito-Mancos Unit Area.
- CASE 6945: Application of ARCO Oil and Gas Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Yates-Seven Rivers formation in the interval from 3550 feet to 4000 feet in its Fletcher Well No. 4 in Unit J of Section 27, Township 20 South, Range 34 East, Lynch Field.
- CASE 6946: Application of Knox Industries, Inc. for an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be recompleted in the Morrow formation at a point 1980 feet from the North line and 660 feet from the East line of Section 1, Township 19 South, Range 34 East, the N/2 of said Section 1 to be dedicated to the well.
- CASE 6947: Application of Knox Industries, Inc. for pool contraction and creation and an NGPA determination, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order deleting certain lands from the La Rica-Morrow Gas Pool and creating a new gas pool from said lands together with a determination that applicant's NM State Well No. 1 located in Unit F of Section 2, Township 19 South, Range 34 East, has discovered a new onshore reservoir pursuant to Section 102 of the NGPA.
- CASE 6948: Application of Maralo, Inc. for dual completions and simultaneous dedication, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) and simultaneous dedication in the Jalmat Pool of four wells in its Jalmat Yates Unit to produce oil from, and later on to inject water into, its Yates formation waterflood, and to produce oil from the Seven Rivers formation from two of the wells, the Nos. 19 and 20 located in Units C and D and to produce gas from the Seven Rivers from the other two wells, the Nos. 25 and 31 located in Units F and K, all in Section 18, Township 25 South, Range 37 East.
- CASE 6949: Application of Grace Petroleum Corporation for four compulsory poolings, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Escrito-Gallup Pool underlying four 80-acre proration units, being the E/2 NE/4, the S/2 NW/4, and the W/2 NW/4 of Section 28, and the W/2 SE/4 of Section 29, all in Township 24 North, Range 7 West, each to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said wells and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the wells, and a charge for risk involved in drilling said wells.
- CASE 6950: Application of Bass Enterprises Production Company for an unorthodox gas well location, Eddy 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 1980 feet from the East line of Section 4, Township 25 South, Range 31 East, the E/2 of said Section 4 to be dedicated to the well.
- CASE 6951: Application of Bass Enterprises Production Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Morrow formation underlying the E/2 of Section 21, Township 22 South, Range 30 East, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.
- CASE 6952: Application of Exxon Corporation for a non-standard gas proration unit, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 378.11-acre non-standard gas proration unit comprising Lots 1 and 2 and the N/2 NE/4 of Section 31, and Lots 1, 2, 3, 4, and the N/2 N/2 of Section 32, all in Township 26 South, Range 26 East, Morrow formation, to be dedicated to its Milepost Federal Co. 2 Well No. 1 located in Unit A of said Section 31.
- CASE 6925: (Readvertised)
- Application of Caribou Four Corners, Inc. for two exceptions to Rule 306, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 306 of the Division Rules and Regulations to permit the permanent flaring of gas from its Kirtland Wells Nos. 1 and 2, located in Units A and B, respectively, of Section 13, Township 29 North, Range 15 West.



STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

August 6, 1980

POST OFFICE BOX 2088  
STATE LAND OFFICE BUILDING  
SANTA FE, NEW MEXICO 87501  
(505) 827-2434

Mr. Owen Lopez  
Montgomery, Andrews & Hannahs  
Attorneys at Law  
Post Office Box 2307  
Santa Fe, New Mexico 87501

Re: CASE NO. 6945  
ORDER NO. R-6414

**Applicant:**

ARCO Oil and Gas Company

**Dear Sir:**

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

Yours very truly,

JOE D. RAMEY  
Director

**JDR/fd**

Copy of order also sent to:

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

**Other**

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:

CASE NO. 6945  
Order No. R-6414

APPLICATION OF ARCO OIL AND GAS  
COMPANY FOR SALT WATER DISPOSAL,  
LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on June 25, 1980, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 5th day of August, 1980, the Division Director, 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 Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, ARCO Oil and Gas Company, is the owner and operator of the Fletcher Well No. 4, located in Unit J of Section 27, Township 20 South, Range 34 East, NMPM, Lynch Field, Lea County, New Mexico.

(3) That the applicant proposes to utilize said well to dispose of produced salt water into the Yates-Seven Rivers formation, with injection into the open hole interval from approximately 3643 feet to 4000 feet.

(4) That the injection should be accomplished through 2 3/8-inch plastic lined tubing installed in a packer set at approximately 3530 feet; that the casing-tubing annulus should be filled with an inert fluid; and that a pressure gauge or approved leak detection device should be attached to the annulus in order to determine leakage in the casing, tubing, or packer.

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Case No. 6945  
Order No. R-6414

(5) That the injection well or system should be equipped with a pressure limiting switch or acceptable substitute which will limit the wellhead pressure on the injection well to no more than 730 psi.

(6) That the Director of the Division should be authorized to administratively approve an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected waters from the Yates-Seven Rivers formation.

(7) That the operator should notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment so that the same may be inspected.

(8) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

(9) That approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, ARCO Oil and Gas Company, is hereby authorized to utilize its Fletcher Well No. 4, located in Unit J of Section 27, Township 20 South, Range 34 East, NMPM, Lynch Field, Lea County, New Mexico, to dispose of produced salt water into the Yates-Seven Rivers formation, injection to be accomplished through 2 3/8-inch tubing installed in a packer set at approximately 3530 feet, with injection into the open hole interval from approximately 3643 feet to 4000 feet;

PROVIDED HOWEVER, that the tubing shall be plastic-lined; that the casing-tubing annulus shall be filled with an inert fluid; and that a pressure gauge shall be attached to the annulus or the annulus shall be equipped with an approved leak detection device in order to determine leakage in the casing, tubing, or packer.

(2) That the injection well or system shall be equipped with a pressure limiting switch or acceptable substitute which will limit the wellhead pressure on the injection well to no more than 730 psi.

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Case No. 6945  
Order No. R-6414

(3) That the Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Yates-Seven Rivers formation.

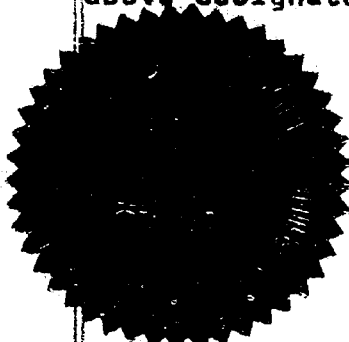
(4) That the operator shall notify the supervisor of the Hobbs district office of the Division of the date and time of the installation of disposal equipment so that the same may be inspected.

(5) That the operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing, or packer, in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

(6) That the applicant shall submit monthly reports of its disposal operations in accordance with Rules 704 and 1120 of the Division Rules and Regulations.

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

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



SEAL

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

*Joe D. Ramey*  
JOE D. RAMEY  
Director

fd/

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BLDG.  
SANTA FE, NEW MEXICO  
23 June 1980

EXAMINER HEARING

IN THE MATTER OF:

Application of ARCO Oil and Gas Com- ) CASE  
pany for salt water disposal, Lea ) 6945  
County, New Mexico. )

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation  
Division:

Ernest L. Padilla, Esq.  
Legal Counsel to the Division  
State Land Office Bldg.  
Santa Fe, New Mexico 87501

For the Applicant:

Owen Lopez, Esq.  
MONTGOMERY & ANDREWS P. A.  
PASEO DE PERALTA  
Santa Fe, New Mexico 87501

SALLY W. BOYD, C.S.R.  
Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409



## I N D E X

TERRY B. MCCALLISTER

Direct Examination by Mr. Lopez 3

Cross Examination by Mr. Stamets 10

## E X H I B I T S

Applicant Exhibit One, Map 5

Applicant Exhibit Two, Schematic 5

Applicant Exhibit Three, Schematic 6

Applicant Exhibit Four, Plat 7

Applicant Exhibit Five, Information 8

Applicant Exhibit Six, Cross Section 8

Applicant Exhibit Seven, List 9

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

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MR. STAMETS: We'll call next Case 6945.

MR. PADILLA: Application of ARCO Oil and Gas Company for salt water disposal, Lea County, New Mexico.

MR. LOPEZ: My name is Owen Lopez, from the Montgomery Law Firm, Santa Fe, appearing on behalf of ARCO Oil and Gas, and I have one witness to be sworn.

(Witness sworn.)

TERRY B. McCALLISTER

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

DIRECT EXAMINATION

BY MR. LOPEZ:

Q Would you please state your name and where you reside?

A Terry B. McCallister. I live in Midland, Texas.

Q By whom are you employed and in what capacity?

A ARCO Oil and Gas Company as a petroleum engineer in the west area, working in New Mexico.

Q Have you previously testified before the

1 Commission and had your qualifications accepted as a matter  
2 of record?

3 A. No, I have not.

4 Q. Would you then briefly describe your  
5 educational background and employment experience?

6 A. I have a BS degree in engineering manage-  
7 ment from the University of Missouri at Rolla. I graduated  
8 in 1978 and went to work for ARCO at that time in Wyoming as  
9 production engineer. I moved to Denver a short while later  
10 and worked for ARCO as a reservoir engineer, and a little  
11 over a year ago I moved to Midland and am working as a petro-  
12 leum engineer since then.

13 Q. And I believe you just previously stated  
14 that your responsibilities include New Mexico and the area  
15 that is the subject of the application in this case.

16 A. That's correct.

17 MR. LOPEZ: Are the witness' qualifica-  
18 tions acceptable?

19 MR. STAMETS: They are.

20 Q. What does ARCO seek in this case Number  
21 6935?

22 A. We seek authority to dispose of produced  
23 salt water into the Yates-Seven Rivers formation in an inter-  
24 val from 3550 feet to 4000 feet in our Fletcher Well No 4  
25 in Unit J of Section 27, Township 20 South, Range 34 East,

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-D  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 in the Lynch Field.

2 Q Why is this work necessary at this time?

3 A Our previous disposal well, the Ballard  
4 No. 6, shown and highlighted in blue on Exhibit Number One  
5 in Section 22, developed mechanical problems last year and  
6 could not be economically repaired. This well disposed of  
7 approximately 450 barrels of water per day at 2100 psi surface  
8 pressure.

9 Q Well, let's turn to Exhibit Number One and  
10 I'd ask you to describe it.

11 A Exhibit One is a land map of Township 20,  
12 Range 34 East, Lea County, New Mexico. The area is in the  
13 Lynch Field and is the area surrounding the proposed salt  
14 water disposal well. It contains the names of all the leases  
15 and a color coded system indicating the last producing inter-  
16 val of all wells within a 2-mile radius of the proposed well.

17 The circles represent producing or plugged  
18 and abandoned wells, and the triangles represent the dis-  
19 posal wells.

20 The arrow in the center indicates the  
21 proposed salt water disposal well in Section 27.

22 Q Now I ask you to refer to what has been  
23 marked as Exhibit Number 2 and identify it.

24 A Exhibit Number Two is a schematic diagram  
25 which is not to scale by the way, of the present wellbore

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 diagram in the proposed well, indicating amounts and tops of  
2 cement plugs used when the well was abandoned. Casing size  
3 and depths are also shown with the tops of the cement indi-  
4 cated.

5 Note that both casing strings have been  
6 cemented to the surface. The well is currently at a total  
7 depth of 3681 feet.

8 Q Now I'd ask you to refer to what has been  
9 marked Exhibit Number Three and identify it.

10 A Exhibit Three is another schematic of  
11 the proposed wellbore diagram. It shows tubing size, which  
12 will be 2-3/8ths inch plastic coated. It will be set on a  
13 packer at a depth of approximately 3530 feet. And it also  
14 shows the open hole interval to a total depth of 4000 feet.

15 Should we make a successful disposal well  
16 and the water is taken on vacuum, as we predict, then the  
17 tubing-casing annulus will have to be pressured up and it  
18 will be monitored in some way by a pressure gauge so that we  
19 will know when any tubing leaks should develop.

20 This completion method is similar to  
21 Texaco's No. 11 and No. 10 disposal wells to the south in  
22 Section 34. Both of these wells are injecting into an open  
23 hole interval at depths near 4000 feet.

24 The No. 11 Well takes 2500 barrels, plus  
25 or minus, of water per day, and the No. 10 takes 3700 barrels

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 of water per day, both of these on a vacuum. This is similar  
2 to what ARCO Oil and Gas is trying to do by the recompletion  
3 of our No. 4 Well.

4 Q Now I refer you to what has been marked  
5 Exhibit Number Four and ask you to identify it.

6 A Exhibit Four is a plat showing current  
7 rates and cumulatives for some of the wells surrounding the  
8 proposed well. These rates and cumulatives are from March,  
9 1980, from all the wells with the exception of the Gulf "DE"  
10 Federal No. 1, which is highlighted in blue on that map and  
11 is in Section 27. This rate figure is the number from last  
12 year, particularly March, 1979, when the well was on full-  
13 time production.

14 Since the loss of our disposal well it only  
15 produces one or two days a month because there is no source  
16 of disposal for the produced water. It's a high rate well  
17 and produces approximately 500 barrels of water per day and  
18 the water cannot feasibly be trucked.

19 As a result there is also lost oil pro-  
20 duction of 500 to 600 barrels of oil per month from this  
21 well.

22 Should the water have to be trucked in-  
23 definitely, this would mean loss of reserves of approximately  
24 15,000 barrels of oil from this one well alone. Also, because  
25 of the high trucking costs, premature abandonment of the other

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 wells on the leases that use this disposal system will result  
2 in about 3000 more barrels of lost reserves.

3 Disposal of water into the disposal wells  
4 at high rates has not hurt production in the area. Our wells  
5 have not experienced high water cuts. This is due to the  
6 fact that the majority of the wells producing -- or producing  
7 wells are completed in a higher zone than the Yates formation  
8 and the completion interval of the disposal wells.

9 The upper zone is also tighter than the  
10 lower zone and does not take water as easily.

11 Our Fletcher Federal No. 4 was particularly  
12 tight in the productive zone, only having 13,000 barrels of  
13 cumulative reserves before it was abandoned; therefor, it  
14 should probably cause no problem with water trying to go to  
15 the upper zone.

16 Q Now I turn your attention to Exhibit  
17 Number Six and ask you to explain it. Exhibit Five, I mean.

18 A Exhibit Five is merely a sheet of some  
19 pertinent information. It shows that the Ballard, Fletcher,  
20 and Gulf leases will be using the disposal well and will be  
21 disposing of approximately 13,000 barrels of salt water per  
22 month into the Yates formation at a depth of 3550 to 4000  
23 feet.

24 Q Now I refer you to Exhibit Number Six and  
25 ask you to describe it.

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 A. Exhibit Six is a 4-well cross section of  
2 our proposed salt water disposal well and three of Texaco's  
3 salt water disposal wells.

4 There is a small outtake of a land map  
5 on the righthand corner, which shows which wells are on here.

6 This cross section is intended to show  
7 that our well will be completed in the same zone as Texaco's  
8 wells, and our completion into an open hole interval will be  
9 similar to theirs. The dashed line on the Fletcher well  
10 shows the proposed wellbore. The proposed TD is 4000 feet.

11 This depth should allow us to dispose of  
12 water below a water/oil contact and result in a successful  
13 completion of the salt water disposal well.

14 Note that Texaco operates all of the salt  
15 water disposal wells in Section 35 to the south of our pro-  
16 posed well. The No. 10 and No. 11 Wells are deeper than the  
17 No. 8 and take water on a vacuum, whereas the No. 8, being  
18 shallower, requires pressure to dispose of water and therefor  
19 is presently shut in and only used when Texaco deems neces-  
20 sary.

21 Q Now I'd ask you to refer to Exhibit Number  
22 Seven and explain it.

23 A. Exhibit Seven is merely a list of all  
24 offset operators to that acreage and a signed waiver by four  
25 of these, Gulf, Sivley, Burk, and Engwall to any objection

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409



1 for use of this well as a disposal well.

2 Verbal approval was obtained from the  
3 remainder of the operators, offset operators, that is,  
4 Texaco, Phillips, and Union, by telephone by me this past  
5 week, and they informed me that there is no problem with it;  
6 it's just a matter of getting the paperwork through.

7 Q In your opinion will the granting of this  
8 application be in the interest of the prevention of waste and  
9 protection of correlative rights?

10 A Yes.

11 Q Were exhibits One through Seven prepared  
12 by you or under your supervision?

13 A They were.

14 MR. LOPEZ: I will tender Exhibits One  
15 through Seven.

16 MR. STAMETS: These exhibits will be ad-  
17 mitted.

18  
19 CROSS EXAMINATION

20 BY MR. STAMETS:

21 Q Mr. McCallister, are you aware of Memo  
22 3-72?

23 A No, I'm not.

24 Q 3-72 says that the Division won't consider  
25 any applications either hearings or administratively, for

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 injection wells unless there is a summary of all wells within  
2 a half mile of the proposed injection well, showing all appro-  
3 priate detail, owner, lease name, well number, casing strings,  
4 cement, cement tops, plugging detail, in order to assure us  
5 that all the wells within that half mile radius are properly  
6 completed and assure us we'll have no escape of injected water  
7 from another zone.

8 MR. LOPEZ: My apologies to the Commission.  
9 I was aware of 3-72. I just forgot about it last night.

10 Could I suggest that we obtain that in-  
11 formation and submit it to the Commission and we leave the  
12 record open until that evidence is received and then I don't  
13 think it would need further testimony and we'll just submit  
14 it on that basis and the Commission can take whatever action  
15 it deems appropriate?

16 MR. STAMETS: That would be fine. Also,  
17 in that same memorandum there is .2 of a pound per foot pres-  
18 sure limitation; that's .2 at the surface calculated at the,  
19 in this case the top of the open hole, as the pressure limita-  
20 tion.

21 Q. What's the top of the open hole in this  
22 well?

23 A. That would be 3681.

24 Q. You're looking at something, 700 pounds,  
25 720, is that going to give you sufficient pressure?

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 A. For disposal? We're anticipating a  
2 vacuum.

3 Q. Right.

4 A. And no disposal pressure involved.

5 Q. Okay. What are the nature of the mechan-  
6 ical problems in your original injection well?

7 A. It was a very old well and there was some  
8 casing problems, some collapse, a collapse which could not  
9 be worked back out. We tried to shoot it off and pull some  
10 of it and it was so old it just kept collapsing and we  
11 couldn't ever get it fixed. I know they worked on it for  
12 quite a long while trying to fix it, and at a certain point  
13 it was just deemed economically infeasible to keep trying any  
14 more; mechanically impossible at that point.

15 Q. Has this area, to your knowledge, been  
16 the subject of surveys by representatives of the Oil Conser-  
17 vation Division?

18 A. Surveys?

19 Q. Bradenhead surveys, whatever. We've got  
20 a program going now.

21 A. Right.

22 Q. We're running bradenhead surveys to see  
23 if there are leaks from these injection projects.

24 A. To my knowledge I don't know whether it  
25 has been done down on Texaco's lease, but to my knowledge it's

1 not been done on our leases. It may well have been; I know  
2 we did a great deal of it, but I don't know whether that  
3 field has ever done it.

4 Q The Division's records reflect that and  
5 it would seem like perhaps they should be consulted before  
6 authorizing another injection well in the area, although on  
7 the surface there does not appear to be any kind of a problem  
8 here.

9 MR. STAMETS: Any other questions of the  
10 witness?

11 We will hold the record open in this case  
12 for that summary. I can get you a copy of 3-72.

13 A I'm sure we have one.

14 MR. STAMETS: Before we leave.

15 Anything further in the case?

16 The case will be taken under advisement.

17 If there is nothing further, the hearing  
18 is adjourned.

19  
20 (Hearing record open.)  
21  
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SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 454-7409

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

**SALLY W. BOYD, C.S.R.**

**Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7403**

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. \_\_\_\_\_ heard by me on \_\_\_\_\_ 19\_\_\_\_.

Oil Conservation Division, Examiner

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0100



June 30, 1980

Mr. R. L. Stamets  
New Mexico Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Dear Sir:

Attached is the additional information required in Case No. 6945 on June 25, 1980. This is the information for rule 3-77 and cement tops, casing size and depths, and producing intervals are accurate to the best of my knowledge. This information was obtained from well files and scout tickets.

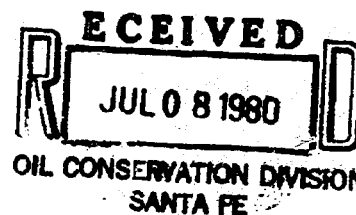
In addition to this information, please note that on Exhibit No. 1, the Fletcher Federal No. 1 located 1650' FSL and 660' FWL, Section 27, T-20S, R-34-E, should be shown as a Yates 7-Rivers well and not an abandoned Yates 7-Rivers.

Sincerely,

*TDM*  
*Terry D. McCallister*  
Terry D. McCallister  
Petroleum Engineer

TDM:jaf

Attachment



Fletcher "A" DE Fed. No. 3  
990 FEL & 1650' FWL,  
Section 27, T-20-S, R-34-E,  
Lea County, New Mexico

Total Depth - 3688'

<u>Casing</u>	<u>Setting Depth</u>	<u>Cement (Sacks)</u>	<u>Cement Top</u>
13-3/8"	70'	50	Surface
5-1/2"	3640'	1680	Surface

Plug and Abandonment Record

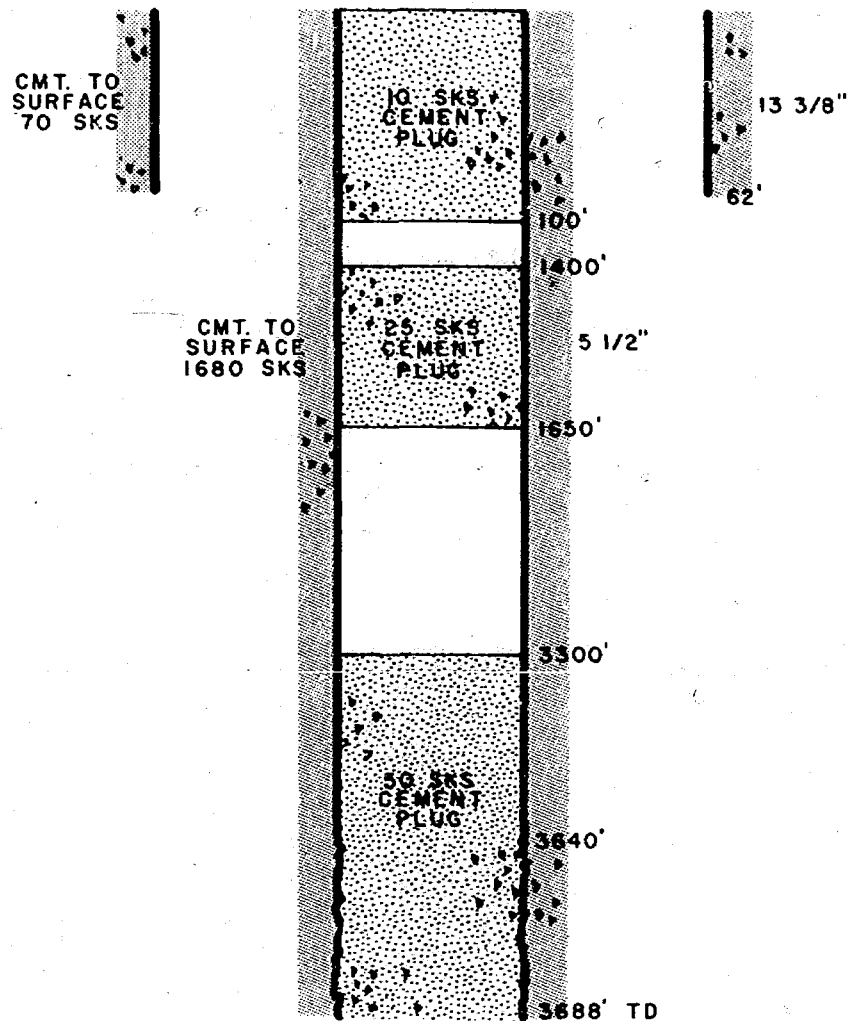
50 sacks	3300'-3688'
25 sacks	1400'-1650'
10 sacks	0'-100'

Date of Abandonment: August 7, 1972

# FLETCHER "A" DE FEDERAL NO. 3

LEA COUNTY, NEW MEXICO

## WELLBORE DIAGRAM





Ballard No. 1  
1980' FNL & 1980' FWL,  
Section 27, T-20-S, R-34-E,  
Lea County, New Mexico

Total Depth - 3799'

<u>Casing Strings</u>	<u>Setting Depth</u>	<u>Cement (Sacks)</u>	<u>Cement Top</u>
13-5/8"	67'	50	Surface
5-1/2"	3205'-3642'	150	3200'

Plugging Record

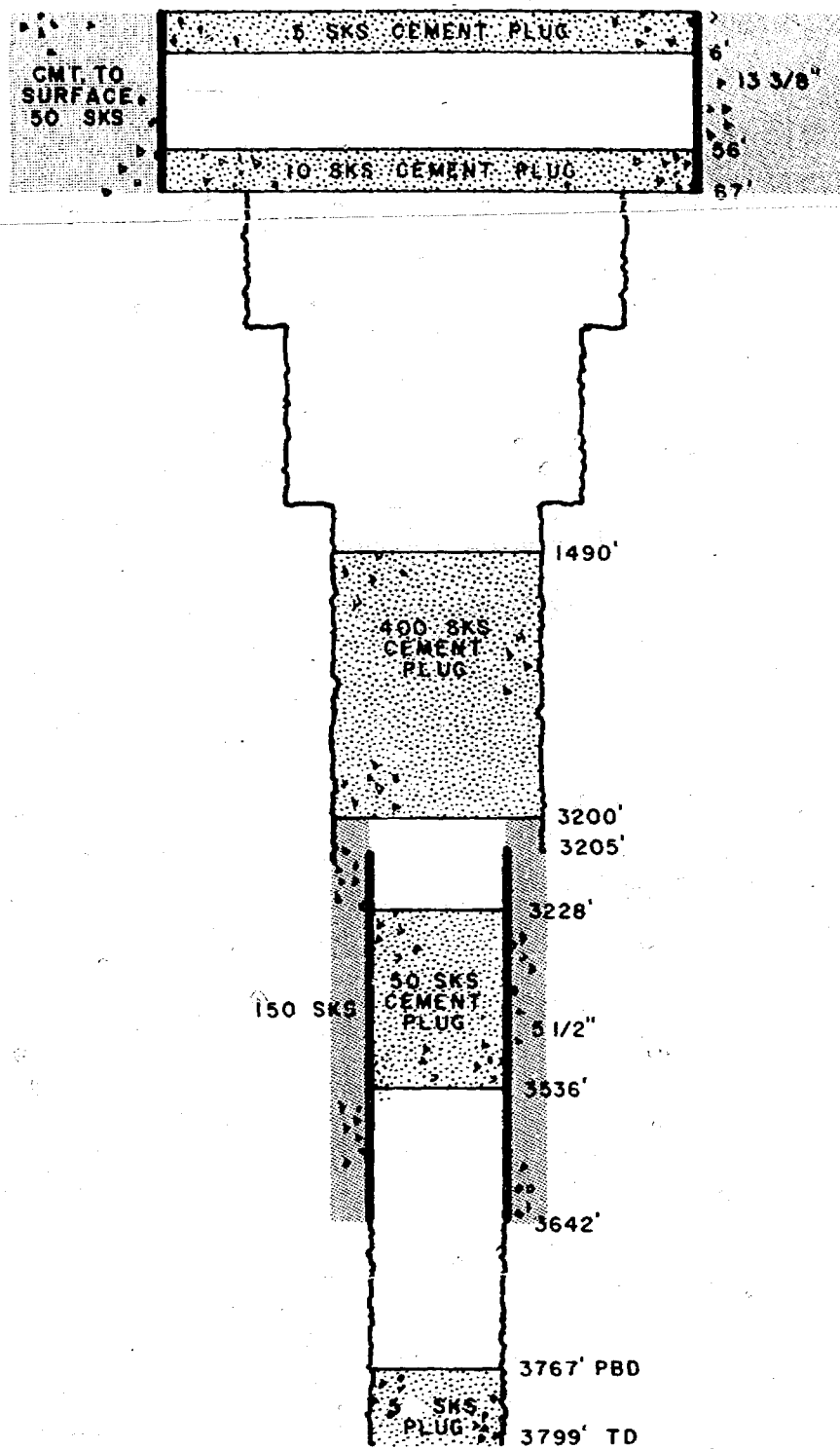
5 sacks	0' - 6'
10 sacks	56' - 67'
400 sacks	1490' - 3200'
50 sacks	3228' - 3536'

Abandonment Date: February 9, 1959

# BALLARD NO. 1

LEA COUNTY, NEW MEXICO

## WELLBORE DIAGRAM



<u>Well Name &amp; No./Location*</u>	<u>Producing Interval</u>	<u>Total Depth</u>	<u>Casing</u>	<u>Setting Depth</u>	<u>Sacks Cement</u>	<u>Cement Tops</u>
✓ Fletcher "A" No. 2 330' FEL & 330' FSL, Section 27, T20S, R34E	3648'-3705' 3580'-90' 3510'-15'	3705'	5-1/2"	3648'	1650	Surface
✓ Keohane "A" No. 1 1650' FEL & 330' FSL, Section 27, T20S, R34E	3516'-32' 3539'-43' 3554'-58' 3565'-94' 3616'-46'	3760'	8-5/8" 5-1/2"	304' 3760'	275 1000	Surface Surface
✓ Lynch "B" No. 2 660' FSL & 1980' FWL, Section 27, T20S, R34E	3570'-3610'	3805'	12-1/2" 8-1/4" 5-3/16"	148' 1607' 3526'	60 100 50	Surface 1367 3208
✓ Cruces No. 2 1651' FSL & 330' FWL, Section 26, T20S, R34E	3668'-3718'	3718'	8-5/8" 5-1/2"	157' 3668'	150 1710	Surface Surface
✓ Hanson Fed "B" No. 1 3210' FNL & 467' FWL, Section 26, T20S, R34E	3700'-06 3645'-60'	3767'	8-5/8" 4-1/2"	190' 3767'	53 250	49 2560
✓ Fletcher Fed No. 1 1650' FSL & 660' FWL, Section 27, T20S, R34E	3558'-68'	3718'	9-5/8" 7" 4-1/2" LNR	363' 3480' 3450'- 3717'	175 1200 50	Surface Surface 3450'
✓ Rider Fed No. 1 2310' FNL & 467' FEL, Section 27, T20S, R34E	**	3797'	8-5/8" 4-1/2"	187' 3197	150 365	Surface 851

\*All wells located in Lea County, New Mexico.  
 \*\*Was dry and abandoned but not plugged.

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0100



June 30, 1980

Mr. R. L. Stamets  
New Mexico Oil Conservation Commission  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Dear Sir:

Attached is the additional information required in Case No. 6945 on June 25, 1980. This is the information for rule 3-77 and cement tops, casing size and depths, and producing intervals are accurate to the best of my knowledge. This information was obtained from well files and scout tickets.

In addition to this information, please note that on Exhibit No. 1, the Fletcher Federal No. 1 located 1650' FSL and 660' FWL, Section 27, T-20S, R-34-E, should be shown as a Yates 7-Rivers well and not an abandoned Yates 7-Rivers.

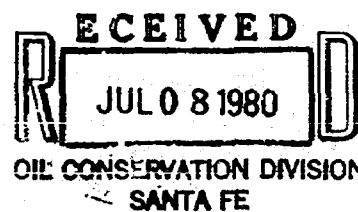
Sincerely,

*Terry D. McCallister*

Terry D. McCallister  
Petroleum Engineer

TDM:jaf

Attachment



Fletcher "A" DE Fed. No. 3  
990 FEL & 1650' FWL,  
Section 27, T-20-S, R-34-E,  
Lea County, New Mexico

Total Depth - 3688'

<u>Casing</u>	<u>Setting Depth</u>	<u>Cement (Sacks)</u>	<u>Cement Top</u>
13-3/8"	70'	50	Surface
5-1/2"	3640'	1680	Surface

Plug and Abandonment Record

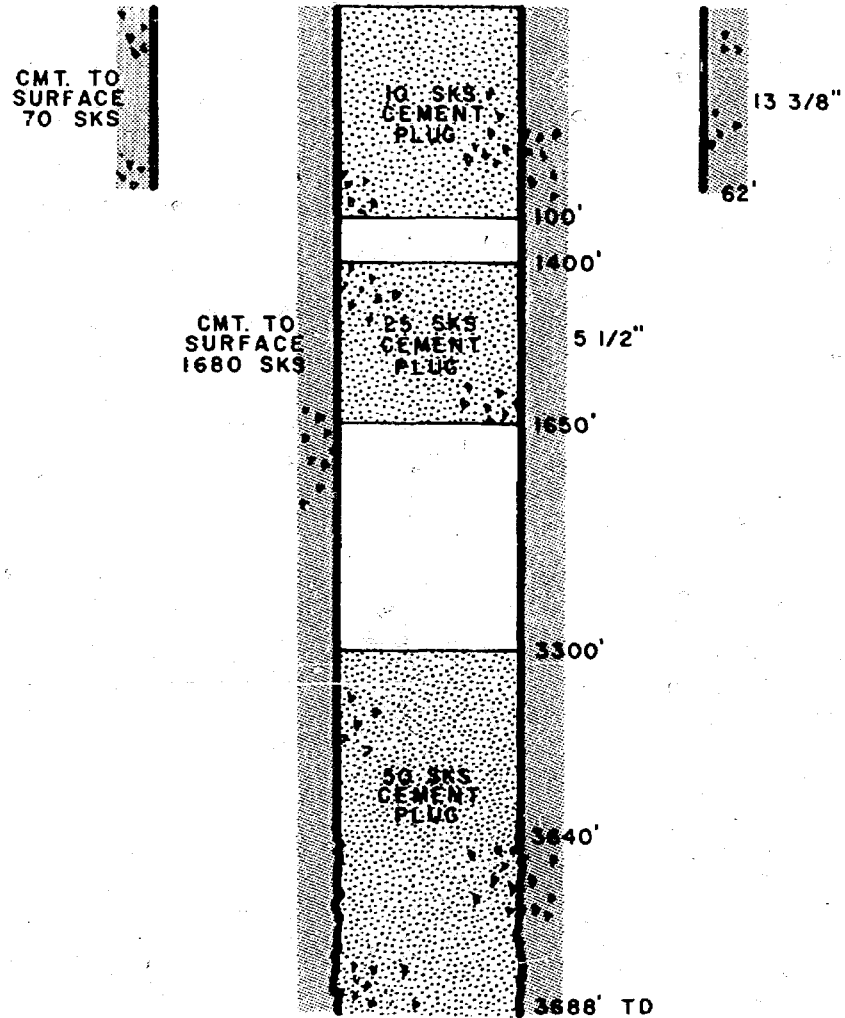
50 sacks	3300'-3688'
25 sacks	1400'-1650'
10 sacks	0'-100'

Date of Abandonment: August 7, 1972

# FLETCHER "A" DE FEDERAL NO. 3

LEA COUNTY, NEW MEXICO

## WELLBORE DIAGRAM



Ballard No. 1  
1980' FNL & 1980' FWL,  
Section 27, T-20-S, R-34-E,  
Lea County, New Mexico

Total Depth - 3799'

<u>Casing Strings</u>	<u>Setting Depth</u>	<u>Cement (Sacks)</u>	<u>Cement Top</u>
13-5/8"	67'	50	Surface
5-1/2"	3205'-3642'	150	3200'

Plugging Record

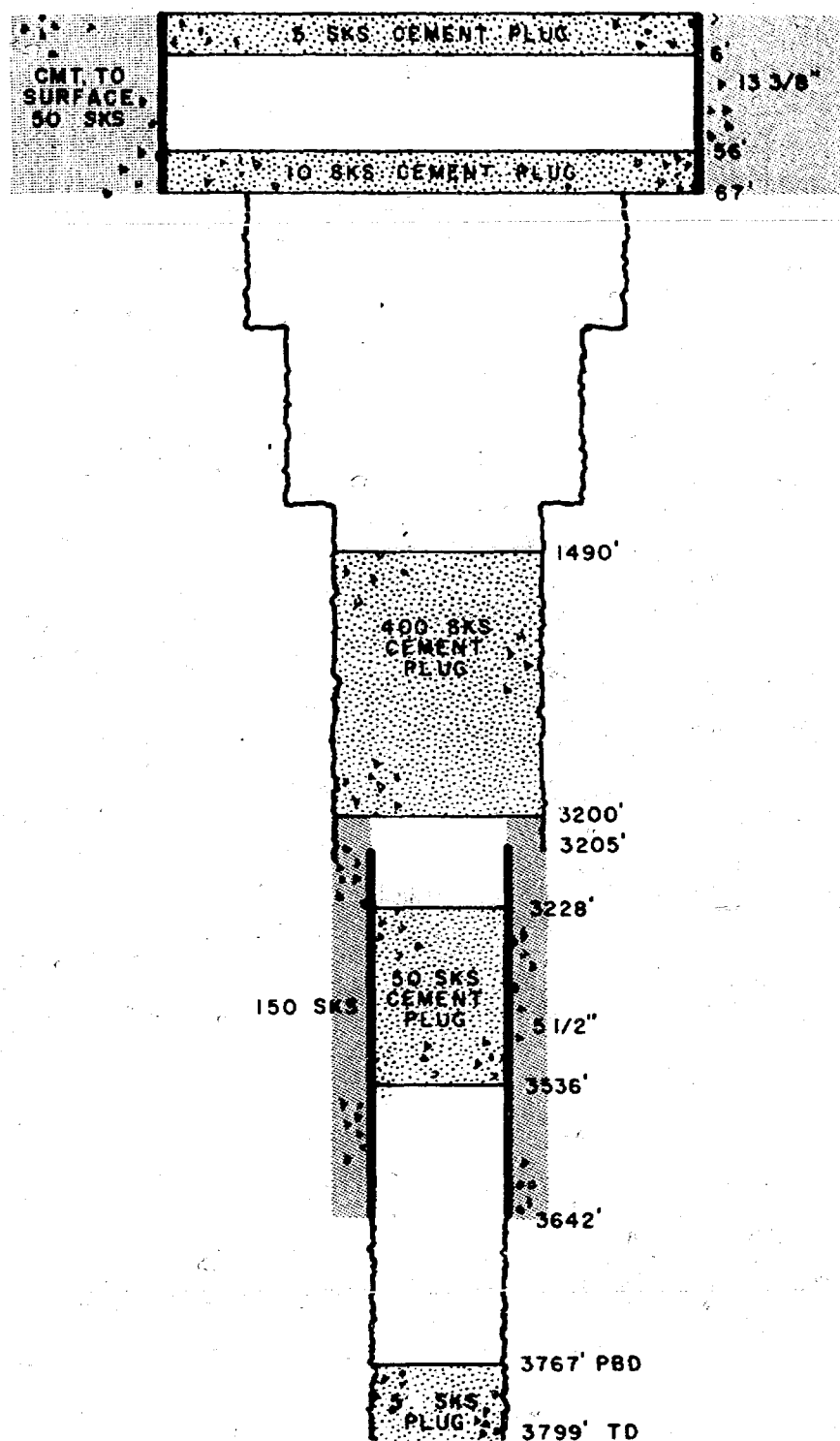
5 sacks	0' - 6'
10 sacks	56' - 67'
400 sacks	1490' - 3200'
50 sacks	3228' - 3536'

Abandonment Date: February 9, 1959

# BALLARD NO. 1

LEA COUNTY, NEW MEXICO

## WELLBORE DIAGRAM



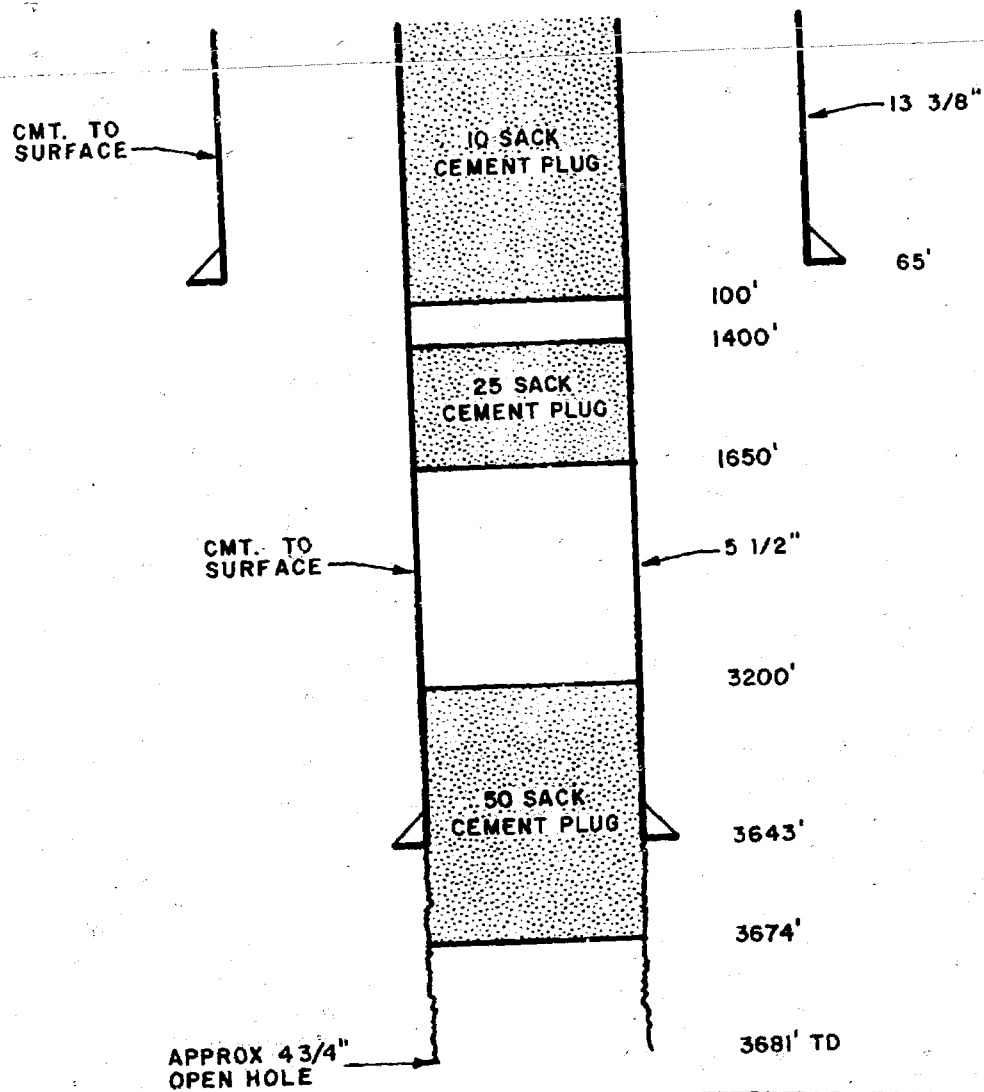


<u>Well Name &amp; No./Location*</u>	<u>Producing Interval</u>	<u>Total Depth</u>	<u>Casing</u>	<u>Setting Depth</u>	<u>Sacks Cement</u>	<u>Cement Tops</u>
Fletcher "A" No. 2 330' FEL & 330' FSL, Section 27, T20S, R34E	3648'-3705' 3580'-90' 3510'-15'	3705'	5-1/2"	3648'	1650	Surface
Keohane "A" No. 1 1650' FEL & 330' FSL, Section 27, T20S, R34E	3516'-32' 3539'-43' 3554'-58' 3565'-94' 3616'-46'	3760'	8-5/8" 5-1/2"	304' 3760'	275 1000	Surface Surface
Lynch "B" No. 2 660' FSL & 1980' FWL, Section 27, T20S, R34E	3570'-3610'	3805'	12-1/2" 8-1/4" 5-3/16"	148' 1607' 3526'	60 100 50	Surface 1367 3208
Cruces No. 2 1651' FSL & 330' FWL, Section 26, T20S, R34E	3668'-3718'	3718'	8-5/8" 5-1/2"	157' 3668'	150 1710	Surface Surface
Hanson Fed "B" No. 1 3210' FNL & 467' FWL, Section 26, T20S, R34E	3700'-06 3645'-60'	3767'	8-5/8" 4-1/2"	190' 3767'	53 250	49 2560
Fletcher Fed No. 1 1650' FSL & 660' FWL, Section 27, T20S, R34E	3558'-68'	3718'	9-5/8" 7" 4-1/2" LNR	363' 3480' 3450'- 3717'	175 1200 50	Surface Surface 3450'
Rider Fed No. 1 2310' FNL & 467' FEL, Section 27, T20S, R34E	**	3797'	8-5/8" 4-1/2"	187' 3197	150 365	Surface 851

\*All wells located in Lea County, New Mexico.  
 \*\*Was dry and abandoned but not plugged.

FLETCHER "A" DE FEDERAL NO. 4  
LEA COUNTY, NEW MEXICO

PRESENT WELLBORE DIAGRAM



BEFORE EXAMINER STAMETS  
OIL CONSERVATION DIVISION  
EXHIBIT NO. 2

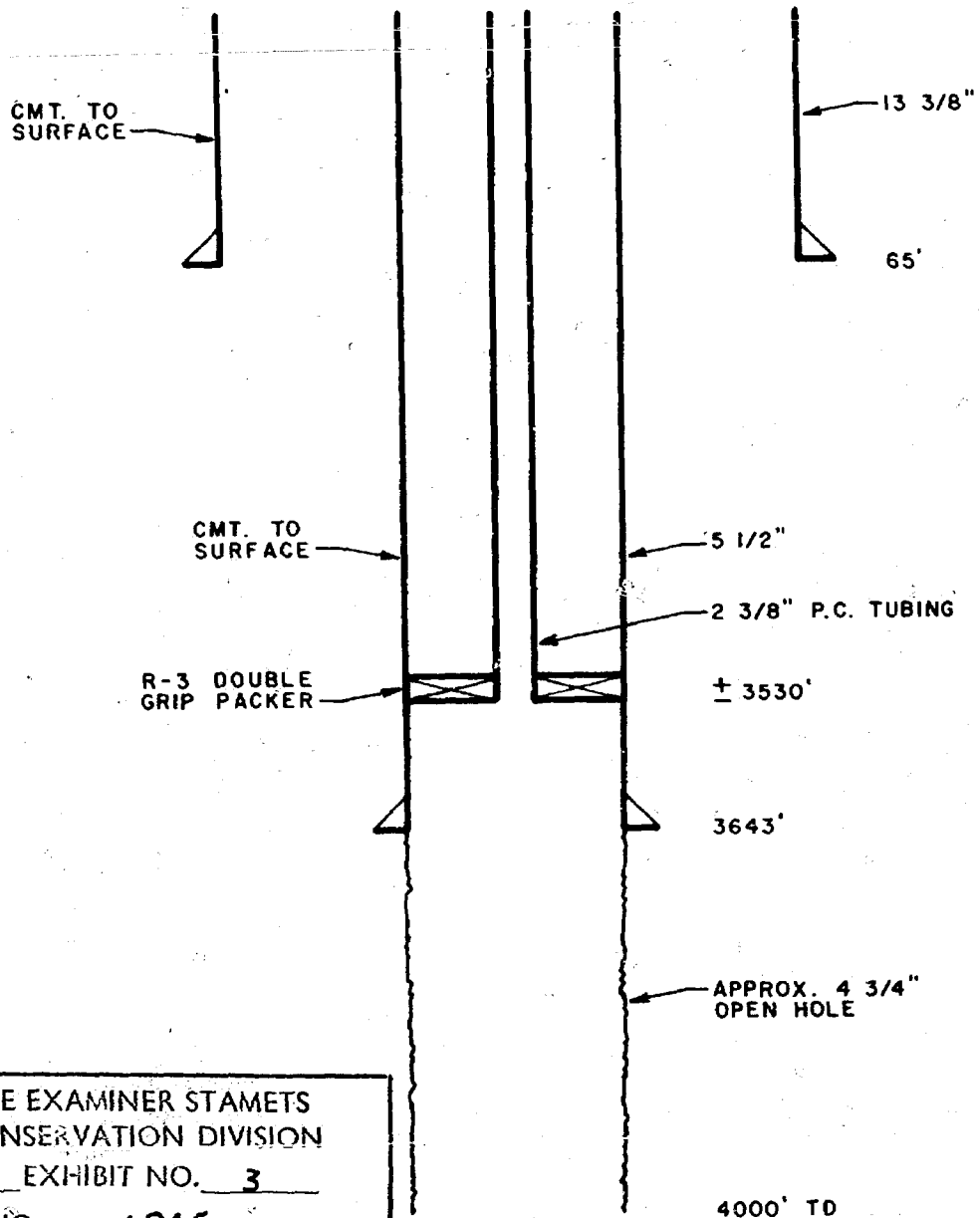
CASE NO. 6945

Submitted by Arco

Hearing Date 6/25/80

FLETCHER "A" DE FEDERAL NO. 4  
LEA COUNTY, NEW MEXICO

PROPOSED  
WELLBORE DIAGRAM



BEFORE EXAMINER STAMETS  
OIL CONSERVATION DIVISION  
EXHIBIT NO. 3

CASE NO. 6945

Submitted by ARLO

Hearing Date 6/25/80

[illegible]

\_\_\_\_\_

By: T. McALLISTER	Drawn By:	Date: 6 - 80
Date: 6 - 80	Revised By:	Date:
Dept: WEST AREA ENGR.	Owg No:	

By: T. McALLISTER	Drawn By:	Date: 6 - 80
Date: 6 - 80	Revised By:	Date:
Dept: WEST AREA ENGR.	Owg No:	

FLETCHER "A" DE FEDERAL #4

Formation for Disposal - Yates

Depth of Disposal - 3550' to 4000'

Type of Fluid - Salt Water

Anticipated Volume - 13,000 BWPM

Source of Disposed Water - Ballard Lease

Fletcher Lease

Gulf Lease

BEFORE EXAMINER STAMETS  
OIL CONSERVATION DIVISION

EXHIBIT NO. 5

CASE NO. 6945

Submitted by ARW

Hearing Date 6/25/80

OFFSET OPERATORS

T. J. Sivley

Carl Engwall

Phillips Petroleum

Union of California

Burk Royalty Company

Texaco

Gulf

BEFORE EXAMINER STAMETS  
OIL CONSERVATION DIVISION

EXHIBIT NO. 7

CASE NO. 6945

Submitted by ACLO

Hearing Date 6/25/80

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed*  
J. L. Tweed

TDM:jaf

Approved: *C. F. Kaltefleiter*  
C. F. Kaltefleiter - Chief Fracturing Engineer

Company: Gulf Oil Corporation

Date: June 17, 1980

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed for J. L. Tweed.*  
J. L. Tweed

TDM:jaf

Approved: *Carl Engwall*

Company: *Self*

*June 10, 1980*

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company



ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed*  
J. L. Tweed

TDM:jaf

Approved: *T. J. Sivley*

Company: T J SIVLEY  
PO DRAWER GG  
ARTESIA NM 88210

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed for J. L. Tweed*  
J. L. Tweed

TDM:jaf

Approved: *J. A. Berry*

Company: *Buck Royalty Co*

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company

FLETCHER "A" DE FEDERAL NO. 4  
LEA COUNTY, NEW MEXICO

PRESENT WELLBORE DIAGRAM

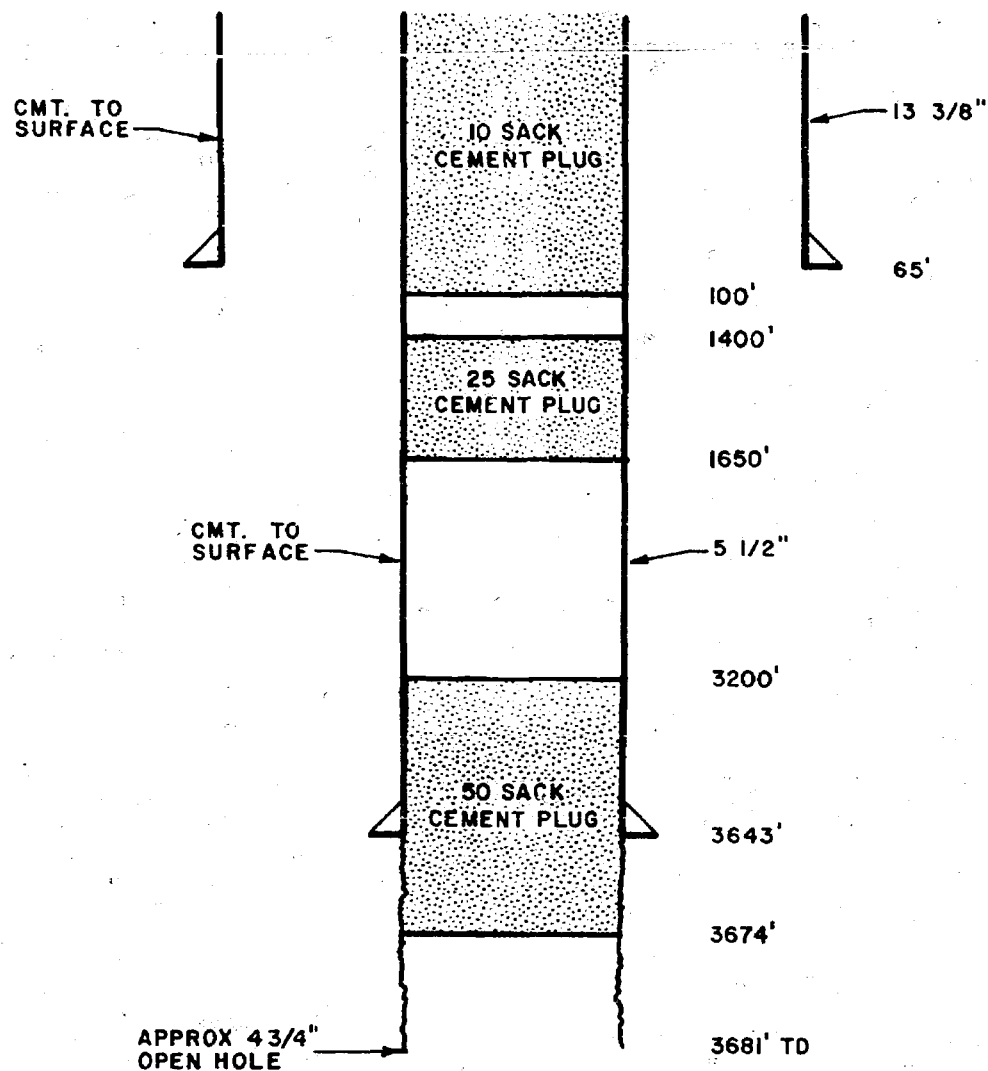


Exhibit 2  
Case 6945

# FLETCHER "A" DE FEDERAL NO. 4

LEA COUNTY, NEW MEXICO

## PROPOSED WELLBORE DIAGRAM

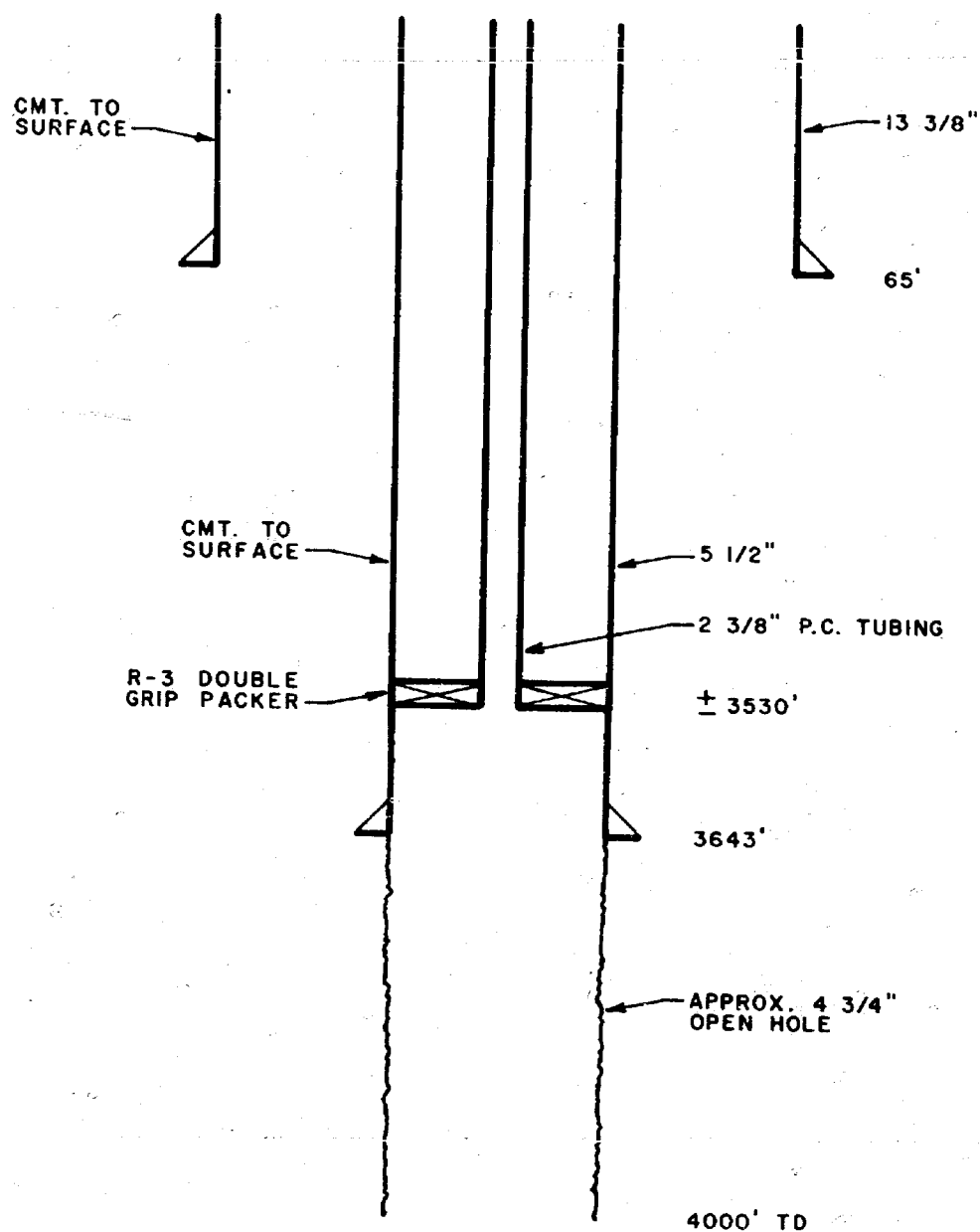
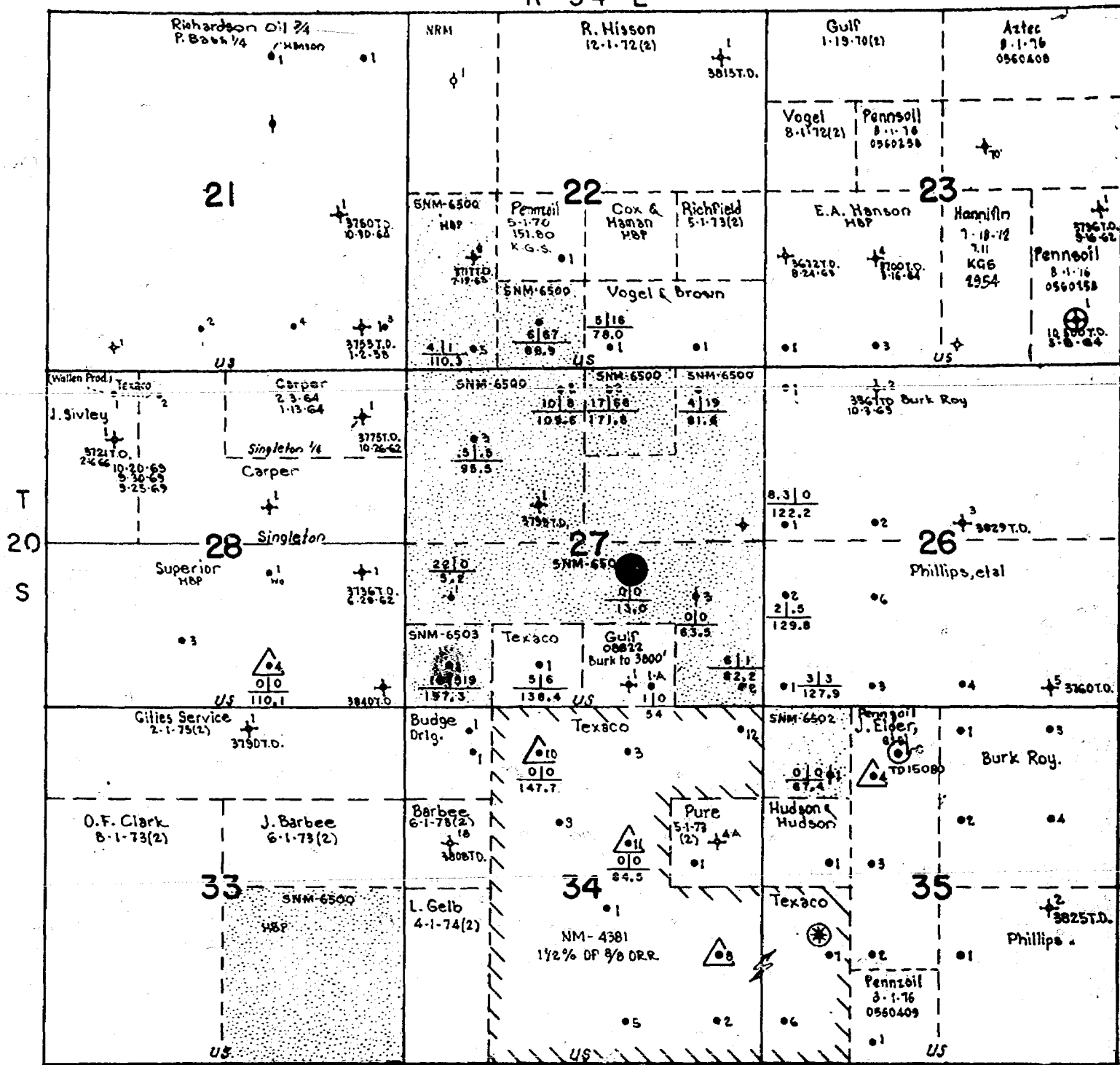


Exhibit 3  
Case 6945

R 34 E



**LEGEND**  
(MAR. '80)  
5/6 BOPD BWPD  
138 OIL CUM

Exhibit 4  
Case 6945

**ARCO Oil and Gas Company**  
Division of Atlantic Richfield Company  
Permian District Midland, Texas

**LYNCH FIELD**  
LEA COUNTY, NEW MEXICO

SCALE: 1" = 2000'

By T. McALLISTER	Drawn By	Date 6-80
Date 6-80	Revised By	Date
Dept WEST AREA ENGR.	Des No	

FLETCHER "A" DE FEDERAL #4

Formation for Disposal - Yates

Depth of Disposal - 3550' to 4000'

Type of Fluid - Salt Water

Anticipated Volume - 13,000 BWPM

Source of Disposed Water - Ballard Lease

Fletcher Lease

Gulf Lease

Exhibit 5  
Case 6946

OFFSET OPERATORS

T. J. Sivley

Carl Engwall

Phillips Petroleum

Union of California

Burk Royalty Company

Texaco

Gulf

Exhibit 7  
Case 6945

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed*  
J. L. Tweed

TDM:jaf

Approved: *C. F. Kaltefleiter*  
C. F. Kaltefleiter - Chief Proration Engineer

Company: Gulf Oil Corporation

Date: June 17, 1980

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company



ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Johnston for J. L. Tweed*  
J. L. Tweed

TDM:jaf

Approved: *Carl Engwall*

Company: *Self*

*June 10, 1980*

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed*  
J. L. Tweed

TDM:jaf

Approved: *[Signature]*

Company: T J SIVLEY  
— PO DRAWER GG  
ARTESIA NM 88210

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company

ARCO Oil and Gas Company  
Perinian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0149  
Jerry L. Tweed  
District Engineer



June 2, 1980

Offset Operators

Fletcher DE Federal  
Lea County, New Mexico

Re: Salt Water Disposal System  
Lynch Field  
Lea County, New Mexico

Gentlemen:

ARCO Oil and Gas Company has requested State permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980 feet FSL and 1980 feet FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6, on a neighboring lease was approved for disposal into the Lynch Yates-Seven Rivers pool in September, 1968. It developed a casing leak last year and had to be plugged and abandoned as a result of some mechanical problems.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000 feet to encounter an aquifer that is suitable for disposal operations and which Texaco has encountered in its disposal well to the south of our leases. ARCO feels that this disposal well is necessary for the effective operation of its leases and plans to dispose of approximately 13,000 barrels of water per month in this well. If you have no objection to converting and using this well for salt water disposal, please indicate by signing below and returning one copy of this letter in the attached envelope.

Yours very truly,

*J. L. Tweed for J. L. Tweed.*  
J. L. Tweed

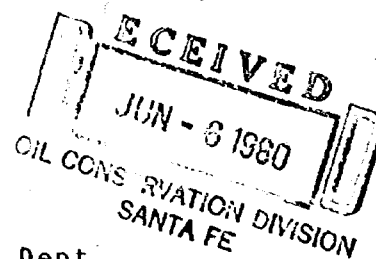
TDM:jaf

Approved: *J. L. Tweed*

Company: *Buck Royalty Co*

ARCO Oil and Gas Company is a Division of Atlantic Richfield Company

ARCO Oil and Gas Company  
Permian District  
Post Office Box 1610  
Midland, Texas 79702  
Telephone 915 684 0100



May 23, 1980

Mr. Joe D. Ramey  
New Mexico Energy and Minerals Dept.  
P. O. Box 2088  
Santa Fe, New Mexico 87501

Case 6945

Dear Mr. Ramey:

ARCO Oil and Gas Company requests permission to use the Fletcher "A" DE Federal Well No. 4 as a salt water disposal well. This well is located 1980' FSL and 1980' FEL, Section 27, T-20-S, R-34-E, Lea County, New Mexico.

The previous disposal well, the Ballard DE No. 6 on a neighboring lease, was approved for disposal into the Lynch Yates-Seven Rivers pool by Order No. R-3498, Case No. 3854 on September 12, 1968. It developed a casing leak late last year and had to be plugged and abandoned as a result of mechanical problems. The loss of the disposal system is now resulting in lost production.

The Fletcher No. 4 is presently plugged and abandoned and it is ARCO's intent to re-enter and drill an additional 300 feet of hole to a total depth of 4000' to encounter an aquifer that is suitable for disposal operations and which has been encountered in other parts of the field.

ARCO feels that this disposal well is necessary for the effective operation of its leases. Attached is pertinent information for the application.

Very truly yours,

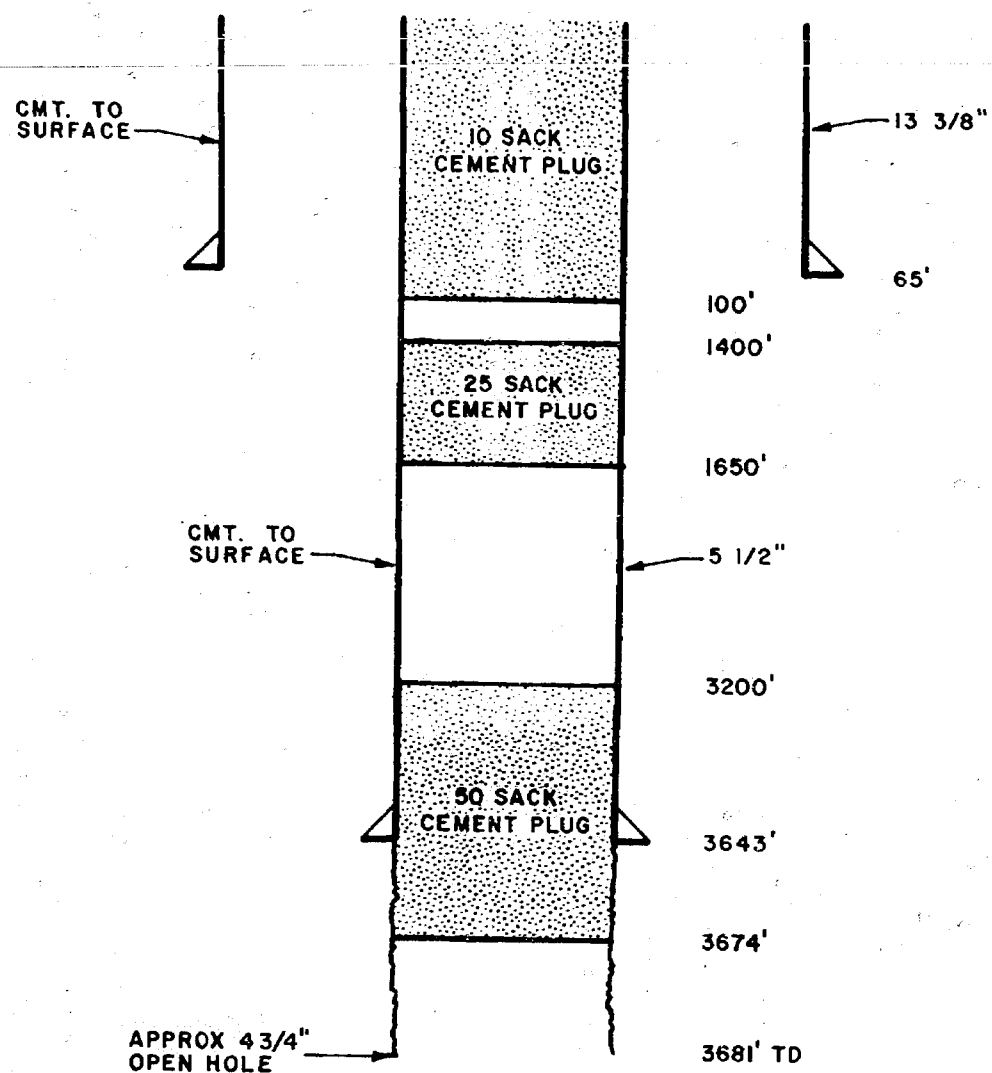
J. L. Tweed  
District Engineer

TDM:jaf

Attachment

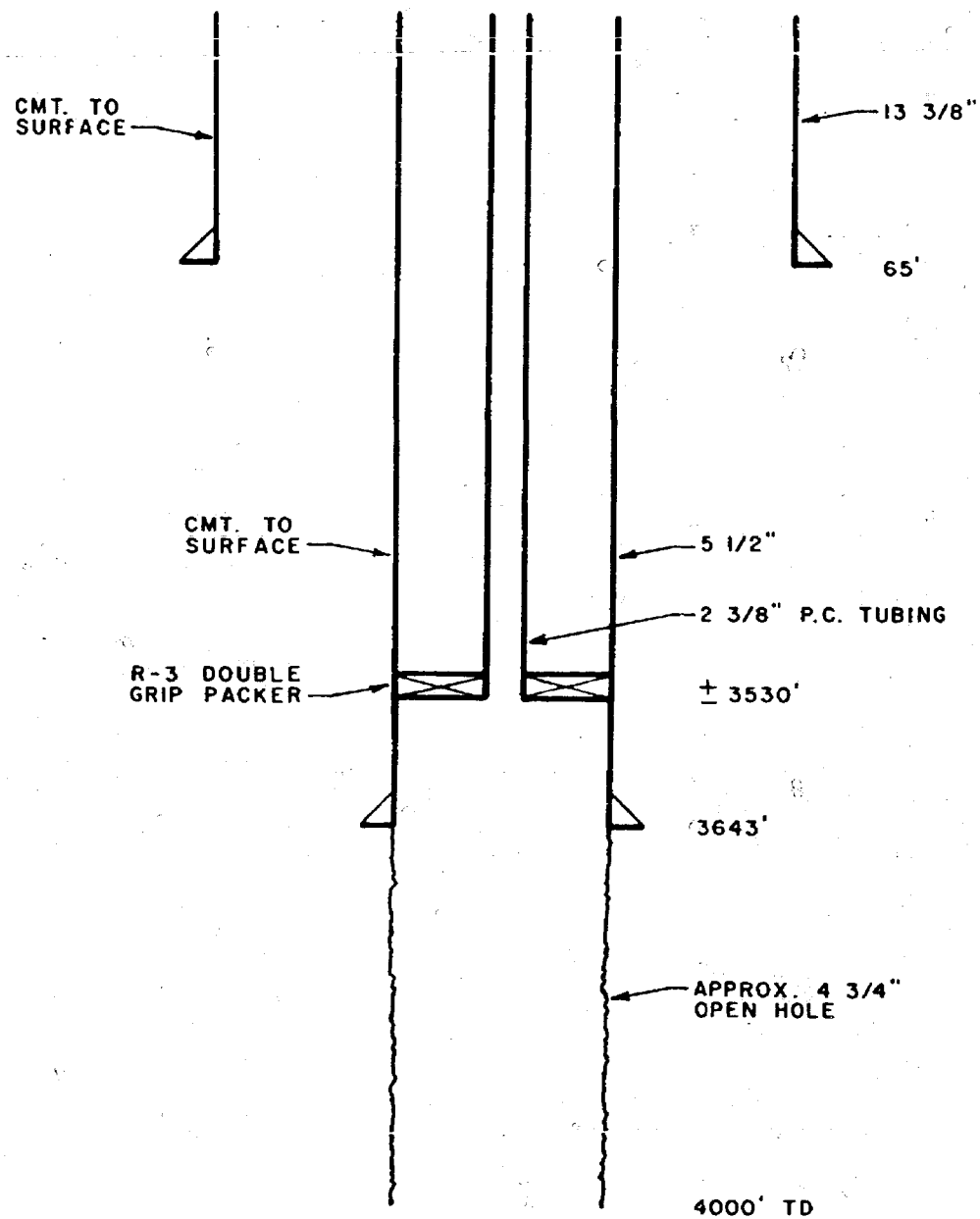
FLETCHER "A" DE FEDERAL NO. 4  
LEA COUNTY, NEW MEXICO

PRESENT WELLBORE DIAGRAM



FLETCHER "A" DE FEDERAL NO. 4  
LEA COUNTY, NEW MEXICO

PROPOSED  
WELLBORE DIAGRAM



FLETCHER "A" DE FEDERAL #4

Formation for Disposal - Yates

Depth of Disposal - 3550' to 4000'

Type of Fluid - Salt Water

Anticipated Volume - 13,000 BWPM

Source of Disposed Water - Ballard Lease

Fletcher Lease

Gulf Lease

WORKOVER PROCEDURE

DATE: 3/28/80

AFE/WO NO: \_\_\_\_\_

WELL & JOB TITLE: Fletcher "A" DE Federal #4 Re-entry for SWDS

FIELD: Lynch ENGR: Albright PROD SUPV. Ferris

TOTAL DEPTH: 3681 PSD: P&A ELEVATION GL: 3699' RKB \_\_\_\_\_

TUBINGHEAD MAKE: \_\_\_\_\_ SERIES \_\_\_\_\_ PRESSURE \_\_\_\_\_

TUBING SIZE: \_\_\_\_\_ THD: \_\_\_\_\_ NO. JTS: \_\_\_\_\_ BOTTOM: \_\_\_\_\_

CASING INFO: SIZE: 5 1/2" 15.5 3643 TOC @ surface  
13 3/8" WT. 48 SET AT: 65 TOC @ surface

LINER INFO: SIZE: \_\_\_\_\_ WT. \_\_\_\_\_ TOP: \_\_\_\_\_ BOTTOM: \_\_\_\_\_

PRESENT PERFS: 3 holes @ 3211 believed to have been squeezed, 3544-64, 80-86,

OPEN HOLE: SIZE: 3681 FROM: 3643 TO: \_\_\_\_\_ FROM: \_\_\_\_\_ TO: \_\_\_\_\_  
& 3610-20 w/cement plug set in casing

PACKER & MISC: see diagram

PROCEDURE

1. Install wellhead for 5 1/2" casing
2. RUPU & reverse unit & install BOPS's. Prepare to drill w/4 3/4" bit & 9# brine water
3. Drill out first cement plug from surface to  $\pm$  100'. Test casing to 1500 psi. Isolate & squeeze as necessary.
4. Drill out second cement plug from  $\pm$  1400' to 1650'. Test casing to 1500 psi. Isolate & squeeze as necessary.
5. Drill out  $\pm$  300' of third cement plug from  $\pm$  3200' to 3500'. Test casing to 1500 psi. Isolate & squeeze as necessary.
6. Drill out remaining 143' of casing, 38' of open hole, & 319' of new hole to 4000'. Clean hole & RD reverse unit. POH
7. RU loggers & run Density, Neutron, Gamma Ray, Casing Collar locator, & cement Bond Logs. RD loggers.
8. TIH w/tubing to TD & spot 500 gal. 15% NEA acid. Pickup to  $\pm$  3530' & reverse acid from hole. POH.
9. TIH w/R-3 double grip packer. Set packer @  $\pm$  3500' and Test annulus.
10. Acidize as follows w/4500 gal. 15% NEA acid for 5000 gal total.
  - a. Pump 1000 gal acid
  - b. Drop  $\pm$  500# rock salt in 10 bbls. brine water. Watch for blocking action in 1st stage. An increase in blocking material may be needed in the following stages.
  - c. Repeat steps a & b until all acid (5000 gal total treatment) is used.
  - d. Following last acid stage, displace w/25 bbls 9# brine water.

(continued next page)



11. POH & laydown packer. TIH w/bit to TD and reverse hole clean.
12. POH & laydown workstring. Pick up, test above slips, & TIH w/R-3 double grip packer & - 3530' of 2 3/8" plastic coated tubing.
13. Mix 100 BBL 2% KCL water w/5 gal C198 corrosion inhibitor in kill truck. Pump 70 bbl in annulus. Set packer. Fill annulus & test to 1500 psi. Remove BOP's, hang tubing into wellhead & complete wellhead assembly.
14. RDPU & TOTPS

ROUGH

dr/

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:

CASE NO. 6945

Order No. R- 6414

APPLICATION OF ARCO OIL AND GAS  
COMPANY FOR SALT WATER DISPOSAL,  
LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on June 25  
19 80, at Santa Fe, New Mexico, before Examiner Richard L. Stamets  
NOW, on this \_\_\_\_\_ day of June, 1980, the Division  
Director, 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 Division has jurisdiction of this cause and the subject  
matter thereof.

(2) That the applicant, ARCO Oil and Gas Company,  
is the owner and operator of the Fletcher Well No. 4,  
located in Unit J of Section 27, Township 20 South,  
Range 34 East, NMPM, Lynch Field,  
Lea County, New Mexico.

(3) That the applicant proposes to utilize said well to  
dispose of produced salt water into the Yates-Seven Rivers  
formation, with injection into the open hole  
interval from approximately 3550 feet to 4000 feet.

(4) That the injection should be accomplished through 2 3/8  
-inch plastic lined tubing installed in a packer set at approxi-  
mately 3530 feet; that the casing-tubing annulus should be  
filled with an inert fluid; and that a pressure gauge or approved  
leak detection device should be attached to the annulus in order

to determine leakage in the casing, tubing, or packer.

(5) That the injection well or system should be equipped with a ~~pop-off valve~~ <sup>pressure limiting switch</sup> or acceptable substitute which will limit the wellhead pressure on the injection well to no more than 730 psi.

(6) That the Director of the Division should be authorized to administratively approve an increase in the injection pressure upon a proper showing by the operator that such higher pressure will not result in migration of the injected waters from the ~~Devonian~~ formation.   
 See under

(8) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface.

(9) That approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, ARCO Oil and Gas Company, is hereby authorized to utilize its Fletcher Well No. 4 located in Unit J of Section 27, Township 20 South, Range 34 East, NMPM, Lynch Field, Lea County, New Mexico, to dispose of produced salt water into the Yates-Seven Rivers formation, injection to be accomplished through 2 3/8 -inch tubing installed in a packer set at approximately 3530 feet, with injection into the open hole interval from approximately 3443 <sup>3550</sup> feet to 4000 feet;

PROVIDED HOWEVER, that the tubing shall be plastic-lined; that the casing-tubing annulus shall be filled with an inert fluid; and that a pressure gauge shall be attached to the annulus

or the annulus shall be equipped with an approved leak detection device in order to determine leakage in the casing, tubing, or packer.

(2) That the injection well or system shall be equipped with a <sup>pressure limiting switch</sup> ~~pop-off valve~~ or acceptable substitute which will limit the wellhead pressure on the injection well to no more than 730 psi.

(3) That the Director of the Division may authorize an increase in injection pressure upon a proper showing by the operator of said well that such higher pressure will not result in migration of the injected fluid from the Devonian formation.

*See under*

be inspected.

(5) ~~(4)~~ That the operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing, or packer, in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

(6) ~~(5)~~ That the applicant shall submit monthly reports of its disposal operations in accordance with Rules 704 and 1120 of the Division Rules and Regulations.

(7) ~~(6)~~ That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

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

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BLDG.  
SANTA FE, NEW MEXICO  
25 June 1980

EXAMINER HEARING

IN THE MATTER OF:

Application of ARCO Oil and Gas Com- ) CASE  
pany for salt water disposal, Lea ) 6945  
County, New Mexico. )

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation  
Division:

Ernest L. Padilla, Esq.  
Legal Counsel to the Division  
State Land Office Bldg.  
Santa Fe, New Mexico 87501

For the Applicant:

Owen Lopez, Esq.  
MONTGOMERY & ANDREWS P. A.  
PASEO DE PERALTA  
Santa Fe, New Mexico 87501

SALLY W. BOYD, C.S.R.  
Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 435-7409

I N D E X

TERRY B. McCALLISTER

Direct Examination by Mr. Lopez	3
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E X H I B I T S

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SALLY W. BOYD, C.S.R.  
Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B

Santa Fe, New Mexico 87501

Phone (505) 455-7409

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MR. STAMETS: We'll call next Case 6945.

MR. PADILLA: Application of ARCO Oil and Gas Company for salt water disposal, Lea County, New Mexico.

MR. LOPEZ: My name is Owen Lopez, from the Montgomery Law Firm, Santa Fe, appearing on behalf of ARCO Oil and Gas, and I have one witness to be sworn.

(Witness sworn.)

TERRY B. MCCALLISTER

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

DIRECT EXAMINATION

BY MR. LOPEZ:

Q Would you please state your name and where you reside?

A Terry B. McCallister. I live in Midland, Texas.

Q By whom are you employed and in what capacity?

A ARCO Oil and Gas Company as a petroleum engineer in the west area, working in New Mexico.

Q Have you previously testified before the

1 Commission and had your qualifications accepted as a matter  
2 of record?

3 A. No, I have not.

4 Q Would you then briefly describe your  
5 educational background and employment experience?

6 A I have a BS degree in engineering manage-  
7 ment from the University of Missouri at Rolla. I graduated  
8 in 1978 and went to work for ARCO at that time in Wyoming as  
9 production engineer. I moved to Denver a short while later  
10 and worked for ARCO as a reservoir engineer, and a little  
11 over a year ago I moved to Midland and am working as a petro-  
12 leum engineer since then.

13 Q And I believe you just previously stated  
14 that your responsibilities include New Mexico and the area  
15 that is the subject of the application in this case.

16 A That's correct.

17 MR. LOPEZ: Are the witness' qualifica-  
18 tions acceptable?

19 MR. STAMETS: They are.

20 Q What does ARCO seek in this case Number  
21 6935?

22 A We seek authority to dispose of produced  
23 salt water into the Yates-Seven Rivers formation in an inter-  
24 val from 3550 feet to 4000 feet in our Fletcher Well No 4  
25 in Unit J of Section 27, Township 20 South, Range 34 East,

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Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409



1 in the Lynch Field.

2 Q Why is this work necessary at this time?

3 A Our previous disposal well, the Ballard  
4 No. 6, shown and highlighted in blue on Exhibit Number One  
5 in Section 22, developed mechanical problems last year and  
6 could not be economically repaired. This well disposed of  
7 approximately 450 barrels of water per day at 2100 psi surface  
8 pressure.

9 Q Well, let's turn to Exhibit Number One and  
10 I'd ask you to describe it.

11 A Exhibit One is a land map of Township 20,  
12 Range 34 East, Lea County, New Mexico. The area is in the  
13 Lynch Field and is the area surrounding the proposed salt  
14 water disposal well. It contains the names of all the leases  
15 and a color coded system indicating the last producing inter-  
16 val of all wells within a 2-mile radius of the proposed well.

17 The circles represent producing or plugged  
18 and abandoned wells, and the triangles represent the dis-  
19 posal wells.

20 The arrow in the center indicates the  
21 proposed salt water disposal well in Section 27.

22 Q Now I ask you to refer to what has been  
23 marked as Exhibit Number 2 and identify it.

24 A Exhibit Number Two is a schematic diagram  
25 which is not to scale by the way, of the present wellbore

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Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 diagram in the proposed well, indicating amounts and tops of  
2 cement plugs used when the well was abandoned. Casing size  
3 and depths are also shown with the tops of the cement indi-  
4 cated.

5 Note that both casing strings have been  
6 cemented to the surface. The well is currently at a total  
7 depth of 3681 feet.

8 Q Now I'd ask you to refer to what has been  
9 marked Exhibit Number Three and identify it.

10 A Exhibit Three is another schematic of  
11 the proposed wellbore diagram. It shows tubing size, which  
12 will be 2-3/8ths inch plastic coated. It will be set on a  
13 packer at a depth of approximately 3530 feet. And it also  
14 shows the open hole interval to a total depth of 4000 feet.

15 Should we make a successful disposal well  
16 and the water is taken on vacuum, as we predict, then the  
17 tubing-casing annulus will have to be pressured up and it  
18 will be monitored in some way by a pressure gauge so that we  
19 will know when any tubing leaks should develop.

20 This completion method is similar to  
21 Texaco's No. 11 and No. 10 disposal wells to the south in  
22 Section 34. Both of these wells are injecting into an open  
23 hole interval at depths near 4000 feet.

24 The No. 11 Well takes 2500 barrels, plus  
25 or minus, of water per day, and the No. 10 takes 3700 barrels

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Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 of water per day, both of these on a vacuum. This is similar  
2 to what ARCO Oil and Gas is trying to do by the recompletion  
3 of our No. 4 Well.

4 Q Now I refer you to what has been marked  
5 Exhibit Number Four and ask you to identify it.

6 A Exhibit Four is a plat showing current  
7 rates and cumulatives for some of the wells surrounding the  
8 proposed well. These rates and cumulatives are from March,  
9 1980, from all the wells with the exception of the Gulf "DE"  
10 Federal No. 1, which is highlighted in blue on that map and  
11 is in Section 27. This rate figure is the number from last  
12 year, particularly March, 1979, when the well was on full-  
13 time production.

14 Since the loss of our disposal well it only  
15 produces one or two days a month because there is no source  
16 of disposal for the produced water. It's a high rate well  
17 and produces approximately 500 barrels of water per day and  
18 the water cannot feasibly be trucked.

19 As a result there is also lost oil pro-  
20 duction of 500 to 600 barrels of oil per month from this  
21 well.

22 Should the water have to be trucked in-  
23 definitely, this would mean loss of reserves of approximately  
24 15,000 barrels of oil from this one well alone. Also, because  
25 of the high trucking costs, premature abandonment of the other

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 wells on the leases that use this disposal system will result  
2 in about 3000 more barrels of lost reserves.

3 Disposal of water into the disposal wells  
4 at high rates has not hurt production in the area. Our wells  
5 have not experienced high water cuts. This is due to the  
6 fact that the majority of the wells producing -- or producing  
7 wells are completed in a higher zone than the Yates formation  
8 and the completion interval of the disposal wells.

9 The upper zone is also tighter than the  
10 lower zone and does not take water as easily.

11 Our Fletcher Federal No. 4 was particularly  
12 tight in the productive zone, only having 13,000 barrels of  
13 cumulative reserves before it was abandoned; therefor, it  
14 should probably cause no problem with water trying to go to  
15 the upper zone.

16 Q Now I turn your attention to Exhibit  
17 Number Six and ask you to explain it. Exhibit Five, I mean.

18 A Exhibit Five is merely a sheet of some  
19 pertinent information. It shows that the Ballard, Fletcher,  
20 and Gulf leases will be using the disposal well and will be  
21 disposing of approximately 13,000 barrels of salt water per  
22 month into the Yates formation at a depth of 3550 to 4000  
23 feet.

24 Q Now I refer you to Exhibit Number Six and  
25 ask you to describe it.

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Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 A Exhibit Six is a 4-well cross section of  
2 our proposed salt water disposal well and three of Texaco's  
3 salt water disposal wells.

4 There is a small outtake of a land map  
5 on the righthand corner, which shows which wells are on here.

6 This cross section is intended to show  
7 that our well will be completed in the same zone as Texaco's  
8 wells, and our completion into an open hole interval will be  
9 similar to theirs. The dashed line on the Fletcher well  
10 shows the proposed wellbore. The proposed TD is 4000 feet.

11 This depth should allow us to dispose of  
12 water below a water/oil contact and result in a successful  
13 completion of the salt water disposal well.

14 Note that Texaco operates all of the salt  
15 water disposal wells in Section 35 to the south of our pro-  
16 posed well. The No. 10 and No. 11 Wells are deeper than the  
17 No. 8 and take water on a vacuum, whereas the No. 8, being  
18 shallower, requires pressure to dispose of water and therefor  
19 is presently shut in and only used when Texaco deems neces-  
20 sary.

21 Q Now I'd ask you to refer to Exhibit Number  
22 Seven and explain it.

23 A Exhibit Seven is merely a list of all  
24 offset operators to that acreage and a signed waiver by four  
25 of these, Gulf, Sivley, Burk, and Engwall to any objection

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 for use of this well as a disposal well.

2 Verbal approval was obtained from the  
3 remainder of the operators, offset operators, that is,  
4 Texaco, Phillips, and Union, by telephone by me this past  
5 week, and they informed me that there is no problem with it;  
6 it's just a matter of getting the paperwork through.

7 Q In your opinion will the granting of this  
8 application be in the interest of the prevention of waste and  
9 protection of correlative rights?

10 A Yes.

11 Q Were exhibits One through Seven prepared  
12 by you or under your supervision?

13 A They were.

14 MR. LOPEZ: I will tender Exhibits One  
15 through Seven.

16 MR. STAMETS: These exhibits will be ad-  
17 mitted.

18  
19 CROSS EXAMINATION

20 BY MR. STAMETS:

21 Q Mr. McCallister, are you aware of Memo  
22 3-72?

23 A No, I'm not.

24 Q 3-72 says that the Division won't consider  
25 any applications either hearings or administratively, for

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 injection wells unless there is a summary of all wells within  
2 a half mile of the proposed injection well, showing all appro-  
3 priate detail, owner, lease name, well number, casing strings,  
4 cement, cement tops, plugging detail, in order to assure us  
5 that all the wells within that half mile radius are properly  
6 completed and assure us we'll have no escape of injected water  
7 from another zone.

8 MR. LOPEZ: My apologies to the Commission.  
9 I was aware of 3-72. I just forgot about it last night.

10 Could I suggest that we obtain that in-  
11 formation and submit it to the Commission and we leave the  
12 record open until that evidence is received and then I don't  
13 think it would need further testimony and we'll just submit  
14 it on that basis and the Commission can take whatever action  
15 it deems appropriate?

16 MR. STAMETS: That would be fine. Also,  
17 in that same memorandum there is .2 of a pound per foot pres-  
18 sure limitation; that's .2 at the surface calculated at the,  
19 in this case the top of the open hole, as the pressure limita-  
20 tion.

21 Q What's the top of the open hole in this  
22 well?

23 A That would be 3681.

24 Q You're looking at something, 700 pounds,  
25 720, is that going to give you sufficient pressure?

SALLY W. BOYD, C.S.R.  
Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

1 A. For disposal? We're anticipating a  
2 vacuum.

3 Q. Right.

4 A. And no disposal pressure involved.

5 Q. Okay. What are the nature of the mechan-  
6 ical problems in your original injection well?

7 A. It was a very old well and there was some  
8 casing problems, some collapse, a collapse which could not  
9 be worked back out. We tried to shoot it off and pull some  
10 of it and it was so old it just kept collapsing and we  
11 couldn't ever get it fixed. I know they worked on it for  
12 quite a long while trying to fix it, and at a certain point  
13 it was just deemed economically infeasible to keep trying any  
14 more; mechanically impossible at that point.

15 Q. Has this area, to your knowledge, been  
16 the subject of surveys by representatives of the Oil Conser-  
17 vation Division?

18 A. Surveys?

19 Q. Bradenhead surveys, whatever. We've got  
20 a program going now.

21 A. Right.

22 Q. We're running bradenhead surveys to see  
23 if there are leaks from these injection projects.

24 A. To my knowledge I don't know whether it  
25 has been done down on Texaco's lease, but to my knowledge it's



1 not been done on our leases. It may well have been; I know  
2 we did a great deal of it, but I don't know whether that  
3 field has ever done it.

4 Q The Division's records reflect that and  
5 it would seem like perhaps they should be consulted before  
6 authorizing another injection well in the area, although on  
7 the surface there does not appear to be any kind of a problem  
8 here.

9 MR. STAMETS: Any other questions of the  
10 witness?

11 We will hold the record open in this case  
12 for that summary. I can get you a copy of 3-72.

13 A I'm sure we have one.

14 MR. STAMETS: Before we leave.

15 Anything further in the case?

16 The case will be taken under advisement.

17 If there is nothing further, the hearing  
18 is adjourned.

19

20

(Hearing record open.)

21

22

23

24

25

SALLY W. BOYD, C.S.R.

Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd C.S.R.

SALLY W. BOYD, C.S.R.  
Rt. 1 Box 193-B  
Santa Fe, New Mexico 87501  
Phone (505) 455-7409

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 6945, heard by me on SEP 6-25 1980,  
Richard L. Stearns, Examiner  
Oil Conservation Division