

CASE NO.

6356

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APPLICATION,  
TRANSCRIPTS,  
SMALL EXHIBITS,

ETC.

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
State Land Office Building  
Santa Fe, New Mexico  
25 October 1978

EXAMINER HEARING

-----  
IN THE MATTER OF: )

Application of Amoco Production Company )  
for salt water disposal, )  
Lea County, New Mexico. )

CASE  
6356

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BEFORE: Daniel S. Nutter

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Lynn Teschendorf, Esq.  
Legal Counsel for the Division  
State Land Office Bldg.  
Santa Fe, New Mexico 87501

For the Applicant: Guy Buell, Esq.  
Amoco Production Company  
P. O. Box 3092  
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I N D E X

J. E. PEASE

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MR. NUTTER: Call Case Number 6356.

MS. TESCHENDORF: Case 6356. Application of Amoco Production Company for salt water disposal, Lea County, New Mexico.

MR. BUELL: May it please the Examiner, for Amoco Production Company, my name is Guy Buell.

We have one witness, Mr. Examiner, Mr. Pease, who was previously sworn in Case Number 6355.

MR. NUTTER: Mr. Pease is still under oath.

MR. BUELL: And he was also qualified as a petroleum engineer in that same case, Mr. Nutter. Would you waive the necessity of going through the qualifications?

MR. NUTTER: Mr. Pease is qualified under oath.

J. E. PEASE

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

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Pease, in connection with your testimony in this particular case, Number 6356, I want you to look first at what has been identified as Amoco's Exhibit Number One. What is that exhibit?

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1 A Exhibit Number One is a map of the Lovington  
2 Pool area of Lea County, New Mexico.

3 Q All right, sir. How have you highlighted for  
4 ease of locating the well that we are asking to convert  
5 to salt water disposal?

6 A It's highlighted by a red arrow.

7 Q And it appears to be in the northeast quarter  
8 of Section 2?

9 A Yes. The location is 550 feet from the north  
10 line and 1600 feet from the east line of Section 2, which  
11 places it in Unit "B".

12 Q Mr. Pease, looking at Exhibit One, I notice  
13 a circle around the immediate area of our proposed disposal  
14 well, No. 21. What is the significance of that circle?

15 A That represents the half mile radius around  
16 the well.

17 Q All right, sir, and in conformance with the  
18 Commission's rules, I believe it's Rule 701, did you submit  
19 to the Commission along with our application, the names  
20 and addresses of all the operators within this half mile  
21 radius?

22 A Yes, sir, they were shown on Form C-100.

23 Q All right, sir. Moving on to outside that  
24 first circle that I observe, I observe another one that is  
25 much wider in scope, covers a much wider area. What is the

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significance of that circle?

A. This represents the two mile radius around the proposed injection well.

Q. All right, sir, and again in conformance with rule 701, you've identified the operators and the wells that are producing within this two mile circle?

A. And also the zone in which the wells are producing.

Q. And speaking of zones, let me ask you this. In the Lovington-Abo Area, is it a multi-pay area?

A. Yes, it is.

Q. We have production from more than the Abo?

A. That's correct.

Q. Do you have a legend at the bottom of your Exhibit Number One that through a color method identifies the producing interval of all of the wells on Exhibit One, which are within your two mile circle?

A. Yes, sir.

Q. All right, sir, since we propose to use the Abo as the disposal interval in Well No. 21, rather than ask you to go through all of those color legends, since they're self-explanatory, I'll just ask you how have you identified the Abo producers on Exhibit Number One?

A. These are shown with a small purple dot.

Q. All right, sir. Looking immediately to the

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1 west of the location of our Well No. 21, I see two wells  
2 that are highlighted by thick, short, blue arrows. What's  
3 the significance of those wells and why did you highlight  
4 them?

5 A. These are existing salt water disposal wells  
6 where the disposal zone is the Abo. One of them is oper-  
7 ated by Rice Engineering; the other one is by Arahoe.

8 Q. All right, sir, and both those wells are  
9 located in the northwest quarter of Section 2 and our pro-  
10 posed well is in the northeast quarter of Section 2.

11 A. That's correct.

12 Q. They're immediate offsets to our well to the  
13 west, is that correct?

14 A. Yes, sir.

15 Q. All right, sir, with respect to those two  
16 existing disposal wells, do you have any idea of the volumes  
17 that the -- those two operators said they might be injecting?

18 A. The records for the hearings on the Rice  
19 Engineering disposal, they listed 5000 to 3500 barrels of  
20 water per day.

21 The application for Arahoe listed 8000 bar-  
22 rels of water per day initially.

23 Q. All right, sir, let me ask you this. With  
24 respect to the Rice well, are they disposing through per-  
25 forations or open hole?

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1 A. A combination of perforations and open hole.

2 Q. And the Arahoe well?

3 A. It's open hole.

4 Q. And I believe our proposed disposal in 21  
5 will be through open hole.

6 A. That's correct.

7 Q. All right, sir. Turn now, if you would --  
8 don't get Exhibit One out of the way, we may come back to  
9 it -- but turn now, if you would, to what has been identified  
10 as our Exhibit Number Two. What is that exhibit?

11 A. Exhibit Two is a copy of the Form C-108.

12 Q. And that's a form the Commission has prepared  
13 to use when you're applying to dispose of salt water?

14 A. That's correct.

15 Q. All right, sir, most of these data are self-  
16 explanatory. With regard to the casing and tubing data,  
17 you'll be showing that in more particularity on later ex-  
18 hibits. Is there anything you would like to mention for  
19 the record and the benefit of the Examiner while we're  
20 looking at Exhibit Number Two?

21 A. Well, our request is for a minimum of 6000  
22 barrels of water per day and a maximum of 10,000 barrels  
23 of water per day on a closed system with a pressure injection  
24 with a surface pressure limitation of 100 pounds.

25 Q. Anything else?

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1 A. No, sir.

2 Q. You want to mention? All right, turn then,  
3 if you would, to what has been identified as our Exhibit  
4 Number Three. What is that exhibit?

5 A. Exhibit Three is a sketch showing the current  
6 wellbore arrangement. It shows the various casing strings  
7 that have been run in the well, which is three. It shows  
8 the well was originally completed open hole and this has  
9 been plugged off by means of a cast iron bridge plug set  
10 at 8380 feet, which has been capped by seven feet of cement,  
11 and there's perforations that have been squeezed off at  
12 8287-to-89 and 8301-to-11 feet.

13 The current perforation interval is 8330-to-40  
14 feet.

15 Q. I'm not an expert on these things, Mr. Pease,  
16 but looking at this exhibit, it looks like this well was  
17 completed with three strings of casing, surface casing, an  
18 intermediate string, and then a production string.

19 A. That's correct.

20 Q. Do you have any other comments on Exhibit  
21 Number Three?

22 A. No, sir.

23 Q. Turn then, if you would, to what has been  
24 identified as our Exhibit Number Four. What is that exhibit?

25 A. Exhibit Four shows the wellbore as it would

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1 be arranged after approval and the well equipped for salt  
2 water disposal.

3 The cast iron bridge plug -- well, first  
4 we'll squeeze off the current perforations that are 8330-  
5 to-40, and then the well will be cleaned out by drilling  
6 up the cast iron bridge plug, and a new hole will be made  
7 from 8470-to-9100 feet.

8 3-1/2 inch internally coated tubing will be  
9 run and set on a packer at 8350 feet.

10 Q And then the disposal will be through that  
11 plastic coated tubing set in this packer through an open  
12 hole interval 8350 feet to total depth of 9100 feet?

13 A Well, the open hole interval would be 8391 to  
14 9100 feet.

15 Q I see, the packer is going to be set at 8350.

16 A That's correct.

17 Q All right, sir. Do you have any other comments  
18 on Exhibit Number Four?

19 A No, sir.

20 Q Turn then, if you would, to what has been  
21 identified as our Exhibit Number Five. What is that exhibit?

22 A Exhibit Five is a gamma ray log which was  
23 run on the well which we are asking approval for the salt  
24 wster disposal, this being State "E" Tract 18 Well No. 21.

25 Q For the benefit of the record, have you identi-

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1 fied any particular intervals on the log of this well, our  
2 Exhibit Five?

3 A. The major producing formations have been shown  
4 in red on the log and the -- also shown are the current  
5 perforations in this well, and those that have been squeezed  
6 off.

7 Q. Do you identify the top of the Abo?

8 A. Yes, it's on there at 8170 feet.

9 Q. All right, sir, if the Commission approves  
10 our application here today, will it serve conservation in  
11 that it will allow us to utilize an existing wellbore with-  
12 out the necessity of drilling a well specifically to dispose  
13 of salt water?

14 A. That's correct. This well is currently pro-  
15 ducing one barrel of oil per day.

16 Q. From the standpoint of increased recovery,  
17 do you feel that approval of this application will allow  
18 us to more efficiently operate our State "E" Tract 18 lease?

19 A. Yes, it will.

20 Q. And do you think that will result in increased  
21 ultimate recovery?

22 A. Yes, sir.

23 Q. Do you have anything further you'd care to  
24 add at this time, Mr. Pease?

25 A. No, sir.

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1 MR. BUELL: May it please the Examiner, that  
2 is all we have by way of direct. I would like to formally  
3 offer Amoco's Exhibits One through Five, inclusive.

4 MR. NUTTER: Amoco's Exhibits One through  
5 Five will be admitted in evidence.

6  
7 CROSS EXAMINATION

8 BY MR. NUTTER:

9 Q Mr. Pease, disposal here is going to be into  
10 the Abo Formation, is that correct?

11 A Yes, sir, it will be Abo water being redispersed  
12 of in the Abo Zone.

13 Q Now, I notice that your present perforations  
14 in the Abo are in the neighborhood of 8300 feet. The  
15 previous perforations were 8200 to 8300, but disposal will  
16 be done at a minimum depth of 8391, so all disposals will  
17 be beneath the producing intervals that are presently open  
18 or have been open in this particular well.

19 How about the producing intervals in other  
20 wells in the vicinity? Do you know what the perforated  
21 intervals, for instance, in Well No. 22, which is south of  
22 this, would be? And what's the position of this well  
23 structurally with relation to the other Abo producers is?

24 A Well, the highest structure position is over  
25 on the Amerada "LA" lease. These wells are located sub-

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1 structurally lower on the Abo Zone.

2 Q Is the structure dipping to the west there on  
3 that side of the pool?

4 A Yes, it's an anticlinal structure. And most  
5 of the wells over here on the east side have been perforated in  
6 higher intervals.

7 MR. BUELL: You said east; you meant west.

8 A To the west, excuse me.

9 MR. BUELL: He'll get that specific answer  
10 to your question, Mr. Nutter.

11 He inquired, Mr. Pease, as to our well No. 22.

12 A Well, in Well No. 22 the perforations that  
13 are open now are at a subsea depth of minus 4442 to minus  
14 4466, assuming that the elevations are about the same,  
15 which is probably true.

16 MR. BUELL: I think that would be a safe  
17 assumption.

18 A That would -- elevation on 21 is 3853. The  
19 proposed zone in 21 would be below the current completions.

20 Q What would the minus elevations of your dis-  
21 posal zone be in the No. 21, then?

22 A It would be minus 4538 to minus 5247.

23 Q Okay. Now these two disposal wells to the  
24 west, what are they disposing into?

25 A The Abo Zone.

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1 Q Both into the Abo?  
2 A Yes, sir.  
3 Q And they would be lower yet structurally, I  
4 presume?  
5 A They'd -- they'd be about a equivalent to  
6 what we're disposing of.  
7 Q Now, with respect to Exhibit Number Four, Mr.  
8 Pease, you show tubing here. What size is this tubing?  
9 A It would be 3-1/2 inch.  
10 Q And it would be plastic lined?  
11 A Yes.  
12 Q And how about the annulus, how will that be  
13 treated?  
14 A It would have treated salt water in it.  
15 Q Now, are there any plugged and abandoned  
16 wells within a half a mile of this proposed disposal well,  
17 Mr. Pease?  
18 A Not that I'm -- well, it looks like up in  
19 Section 35 there, right -- the twin, the No. 44, is an  
20 abandoned well, No. 1.  
21 Q Have you given us the plugging program on  
22 that well?  
23 A No, sir.  
24 Q Will you obtain the plugging program after  
25 you go home and send that in to us?

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1 A Yes, sir.

2 MR. NUTTER: Mr. Ramey?

3

4

CROSS EXAMINATION

5 BY MR. RAMEY:

6 Q Mr. Pease, I notice you have 7-inch -- let's  
7 look at Exhibit Three or Four, either one.

8 You have 7-inch set 8391 with 550 sacks of  
9 cement, and your cement top is only 8250.

10 A Yes, sir.

11 Q So in essence, you have San Andres and Paddock  
12 open in the annulus in this well, is that not correct? San  
13 Andres?

14 A Yes, that would be correct.

15 Q Pay zone, and the Paddock pay zone is open?

16 A Yes, sir.

17 Q And is there San Andres injection in the  
18 area?

19 A Yes, there's a San Andres waterflood,

20 Q And also a Paddock waterflood?

21 A Yes, sir.

22 Q If at some future time the Commission reviews  
23 those waterfloods, and they would probably determine that  
24 this well could lead to leakage from one zone to the other,  
25 would you think it would be a good idea to maybe go in and

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1 put some more cement behind this 7-inch while you're in  
2 squeezing this well?

3 A. Yes, sir.

4 Q. Would you be willing to do that and cover  
5 those two production zones as they should be covered?

6 A. If the Commission requests it, we certainly  
7 will.

8 MR. BUELL: Amoco is willing to do anything  
9 within reason that you require to allow us to use this  
10 well for disposal.

11 MR. RAMEY: I personally feel, Mr. Buell,  
12 that those pay zones should have been covered when the well  
13 was initially cemented.

14 Now that waterflooding is going on, you're  
15 going to get some high pressures. This well looks like it's  
16 offset to the north and east by Paddock injection. You  
17 should be possibly getting some pressure in there that  
18 should be contained.

19 MR. BUELL: Mr. Ramey, I would certainly  
20 agree that if we knew then what we know now, cement would  
21 probably have been put across the San Andres and Paddock.

22 MR. RAMEY: Thank you, Mr. Buell. I will  
23 probably request that the Examiner put that requirement in  
24 the order before you use this as a disposal well.

25 MR. NUTTER: Are there any further questions

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1 of this witness? He may be excused.

2 Do you have anything further, Mr. Buell?

3 MR. BUELL: No, Mr. Examiner, I do not.

4 MR. NUTTER: Does anyone have anything they  
5 wish to offer in Case Number 6356?

6 We'll take the case under advisement and  
7 call Case Number 6357.

8 (Hearing concluded.)  
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REPORTER'S CERTIFICATE

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I, SALLY WALTON BOYD, a Court Reporter, DO HEREBY CERTIFY that the foregoing and attached Transcript of Hearing before the Oil Conservation Division was reported by me; that said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability, knowledge, and skill, from my notes taken at the time of the hearing.

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*Sally W. Boyd C.S.R.*  
Sally W. Boyd, C.S.R.

I do hereby certify that the foregoing is a correct and true transcript of the hearing held by me on 10/28 1978.  
*[Signature]*, Examiner  
Oil Conservation Division



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. 6356  
Order No. R-5855

APPLICATION OF AMOCO PRODUCTION 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 October 25, 1978, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 14th day of November, 1978, 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, Amoco Production Company, is the owner and operator of the State "E" Tract 18 Well No. 21, located in Unit B of Section 2, Township 17 South, Range 36 East, NMPM, Lovington-Abo Pool, Lea County, New Mexico.

(3) That the applicant proposes to utilize said well to dispose of produced salt water into the Abo formation, with injection into the open-hole interval from approximately 8391 feet to 9100 feet.

(4) That the injection should be accomplished through 3 1/2-inch plastic lined tubing installed in a packer set at approximately 8350 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. 6356  
Order No. R-5855

(5) That the injection well or system should be equipped with a pop-off valve or other acceptable device which will limit the wellhead pressure on the injection well to no more than 1675 psi.

(6) That the subject well is presently equipped with 13 3/8-inch surface casing set at 269 feet with cement circulated to the surface; 9 5/8-inch intermediate casing set at 3300 feet and cemented with 300 sacks, calculated top of cement being at 2800 feet; and 7-inch long string set at 8391 feet and cemented with 550 sacks, with top of cement being at 8250 feet.

(7) That the above-described casing and cementing program leaves the San Andres and Paddock formations open without any protective cement opposite these formations around the long string of casing in the subject well.

(8) That secondary recovery water injection operations are currently being conducted in both the San Andres and Paddock formations within one-half mile of the subject well.

(9) That in order to prevent the subject well from becoming an avenue of escape for waters injected into the San Andres and Paddock formations in nearby wells, or into the Abo formation in the subject well, it (the subject well) should be recemented from the present top of cement on the long string to a point well above the top of the San Andres formation.

(10) That prior to its use as a salt water disposal well, the subject well should be recemented in such a manner as to cause cement around the 7-inch casing to come from the present top of cement at 8250 feet to a point at least 300 feet above the top of the San Andres formation.

(11) That the operator should notify the supervisor of the Hobbs district office of the Division of the date and time of recementing operations on the subject well and also of the installation of disposal equipment so that the same may be witnessed and/or inspected.

(12) 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.

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

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Case No. 6356  
Order No. R-5855

IT IS THEREFORE ORDERED:

(1) That the applicant, Amoco Production Company, is hereby authorized to utilize its State "E" Tract 18 Well No. 21, located in Unit B of Section 2, Township 17 South, Range 36 East, NMPM, Lovington-Abo Pool, Lea County, New Mexico, to dispose of produced salt water into the Abo formation, injection to be accomplished through 3 1/2-inch tubing installed in a packer set at approximately 8350 feet, with injection into the open-hole interval from approximately 8391 feet to 9100 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 pop-off valve or other acceptable device which will limit the wellhead pressure on the injection well to no more than 1675 psi.

(3) That upon conversion to salt water disposal, applicant shall recement the 7-inch casing in the subject well in such a manner as to cause cement to come from the present top of cement at 81.50 feet back up to a point at least 300 feet above the top of the San Andres formation.

(4) That the operator shall notify the supervisor of the Hobbs district office of the Division of the date and time of the recementing operations on the subject well and also of installation of disposal equipment.

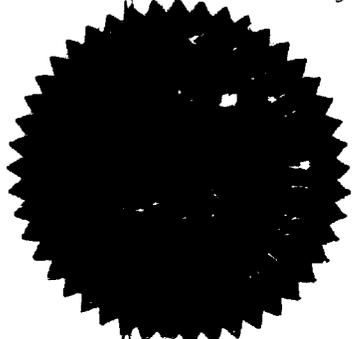
(5) That the operator shall immediately notify the supervisor of the Division's Hobbs district office of the failure of the tubing, casing, or packer, in said well or the leakage of water from or around said well and shall take such steps as may be timely and necessary to correct such failure or leakage.

(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.

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Case No. 6356  
Order No. R-5855

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



SEAL

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

*Joe D. Ramey*  
JOE D. RAMEY  
Director

fd/



J. R. Barnett  
Regional Engineering  
Manager

November 3, 1978

File: TBM-986.51NM-1200

Re: Case 6356  
Salt Water Disposal Application  
Lovington Abo Pool  
Lea County, New Mexico

New Mexico Department of Energy and Minerals  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, NM 87501

Attention: Mr. Dan S. Nutter

Gentlemen:

Attached is a wellbore sketch of the abandoned well which is within one-half mile of Amoco's proposed salt water disposal well, State "E" Tract 18 Well No. 21, Lovington Abo Pool, Lea County.

Yours very truly,

*J. R. Barnett*

JEP:sam  
Attachment

NOV - 6 1978

Amoco Production Company

Houston Region  
500 Jefferson Building  
Post Office Box 3092  
Houston, Texas 77001

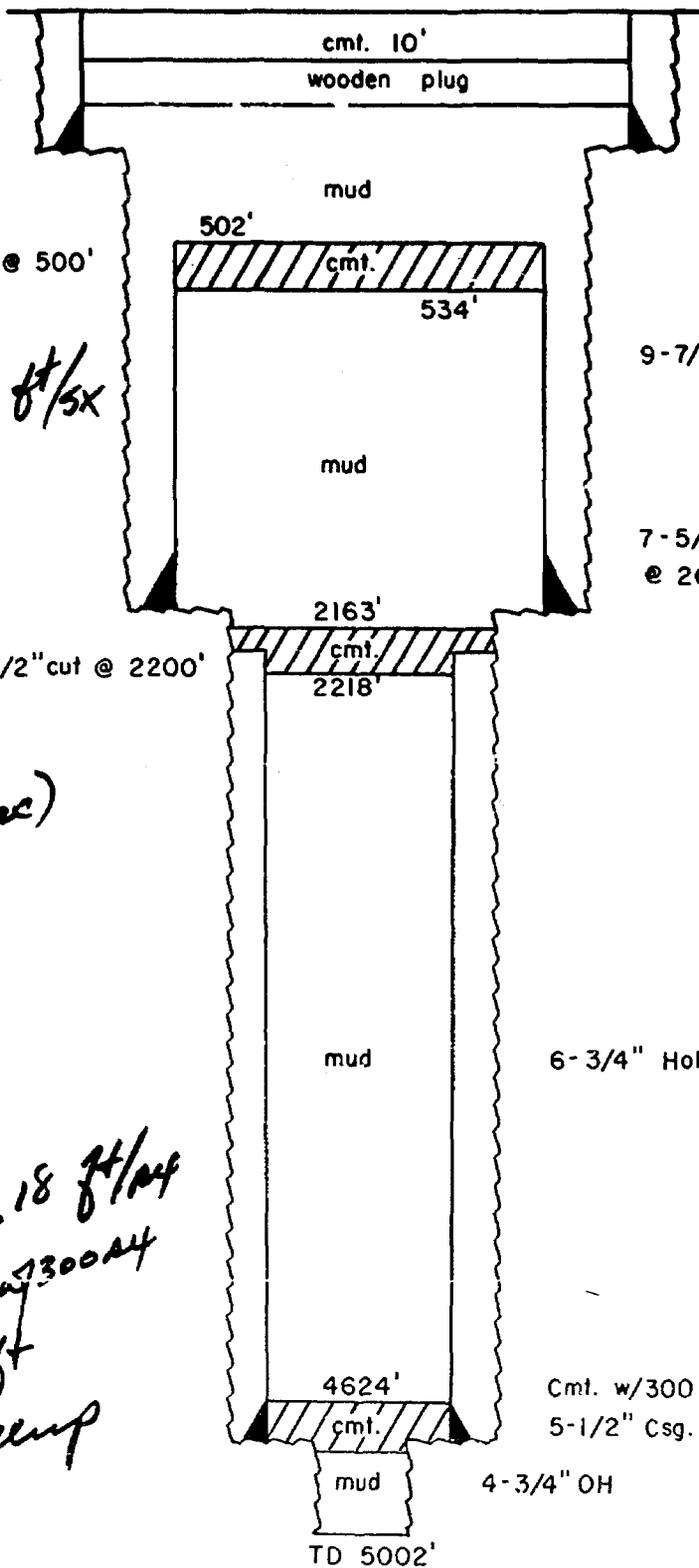
6356

*P & B*  
*OK - release*  
*order*  
*[Signature]*

NOV - 6 1978

Lovington Pool - Lea County  
Abandoned Wellbore Sketch  
Phillips No. 1 Lovington  
Unit "O" Sec. 35 T16S R36E

Abandoned 5-29-47



13-3/4" Hole  
10-3/4" Csg. cmt. w/250 sx  
@ 289'

7-5/8" cut @ 500'

9-7/8" Hole

7-5/8" Csg. cmt. w/600 sx  
@ 2043'

5-1/2" cut @ 2200'

6-3/4" Hole

Cmt. w/300 sx  
5-1/2" Csg. @ 4679'

4-3/4" OH

TD 5002'

$7\frac{5}{8} \times 9\frac{3}{4}$   
fillup = 5.46 ft/sx  
max fillup  
w/ 600 sx  
= 3276  
(circ)  
w/ 75% fillup  
= 2457  
(still circ)

$5\frac{1}{2} \times 6\frac{3}{4}$   
fillup = 13.18 ft/sx  
max fillup w/ 300 sx  
= 3954 ft  
w/ 75% fillup  
2966

NEW MEXICO OIL CONSERVATION COMMISSION  
APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR <b>Amoco Production Co.</b>		ADDRESS <b>P. O. Box 3092, Houston, TX 77001</b>			
LEASE NAME <b>State 'E' Tract 18</b>	WELL NO. <b>21</b>	FIELD <b>Lovington(Abo)</b>	COUNTY <b>Lea</b>		
LOCATION UNIT LETTER <b>B</b> ; WELL IS LOCATED <b>660</b> FEET FROM THE <b>north</b> LINE AND <b>1650</b> FEET FROM THE <b>east</b> LINE, SECTION <b>2</b> TOWNSHIP <b>17 south</b> RANGE <b>36 east</b> NMPM.					
<b>CASING AND TUBING DATA</b>					
NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING	13-3/8"	269'	275	surface	circulated
INTERMEDIATE	9-5/8"	3300'	300	2300'	calculated
LONG STRING	7"	8391'	550	8250'	survey
TUBING	3-1/2"	8350'	NAME, MODEL AND DEPTH OF TUBING PACKER <b>Guiberson Uni-Pkr '6' packer set @ 8350'</b>		
NAME OF PROPOSED INJECTION FORMATION <b>Abo</b>		TOP OF FORMATION <b>8350'</b>		BOTTOM OF FORMATION <b>9250'</b>	
IS INJECTION THROUGH TUBING, CASING, OR ANNULUS? <b>Internally coated tubing</b>		PERFORATIONS OR OPEN HOLE? <b>open hole</b>		PROPOSED INTERVAL(S) OF INJECTION <b>8391' - 9100'</b>	
IS THIS A NEW WELL DRILLED FOR DISPOSAL? <b>no</b>		IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED? <b>Development of Abo</b>		HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE? <b>no</b>	
LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH <b>8287'-89' &amp; 8301'-11' w/100 sks cmt; perfs: 8330'-40'*</b>					
DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA <b>80'</b>		DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA <b>6800'</b>		DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA <b>9500'</b>	
ANTICIPATED DAILY INJECTION VOLUME (BBL/D)	MINIMUM <b>6000</b>	MAXIMUM <b>10,000</b>	OPEN OR CLOSED TYPE SYSTEM <b>closed</b>	IS INJECTION TO BE BY GRAVITY OR PRESSURE? <b>Pressure</b>	APPROX. PRESSURE (PSI) <b>100</b>
ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE -			WATER TO BE DISPOSED OF <b>yes</b>	NATURAL WATER IN DISPOSAL ZONE <b>yes</b>	ARE WATER ANALYSES ATTACHED? <b>no</b>
NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL L)					
<b>City of Lovington, New Mexico</b>					
LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (1/2) MILE OF THIS INJECTION WELL					
<b>Getty Oil Co., P. O. Box 730, Hobbs, NM 88240</b>					
<b>Cities Service, P. O. Box 69, Carlsbad Highway, Hobbs, NM 88240</b>					
<b>Marathon Oil Co., P. O. Box 552, Midland, TX 79702</b>					
<b>Phillips Petroleum Co., Exploration &amp; Production Dept., Attn.: J. O. Woodson, District Supt., 4001 Penbrook St., Odessa, TX 79761</b>					
HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?		SURFACE OWNER <b>no</b>		EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL <b>no</b>	
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)		PLAT OF AREA <b>yes</b>		ELECTRICAL LOG <b>yes</b>	
				DIAGRAMMATIC SKETCH OF WELL <b>yes</b>	

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

*David A. Boatwright* (Signature)      *Senior Engineer* (Title)      *9-29-78* (Date)

NOTE: Should waivers from the surface owner and all operators within one-half mile of the proposed injection well not accompany this application, the New Mexico Oil Conservation Commission will hold the application for a period of 15 days from the date of receipt by the Commission's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.

\*These perforations are to be squeezed prior to deepening operations with at least 50 sks of cement.

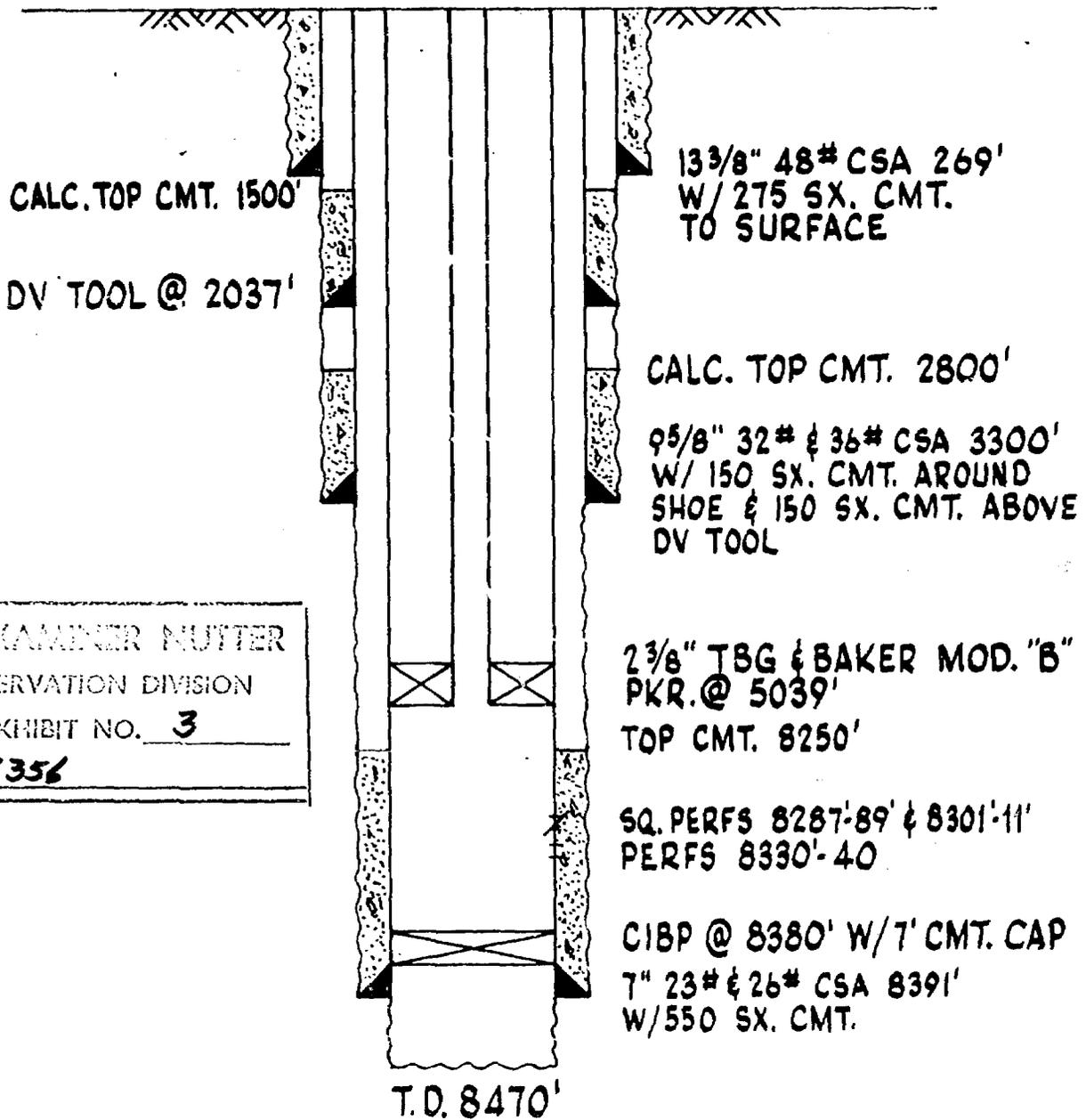
BEFORE EXAMINER NUTTER  
 OIL CONSERVATION DIVISION  
 EXHIBIT NO. 2  
 Amoco  
 CASE NO. 6356

# LOVINGTON ABO FIELD

LEA COUNTY, NEW MEXICO

STATE "E" TRACT 18 NO. 21

## CURRENT WELLBORE ARRANGEMENT



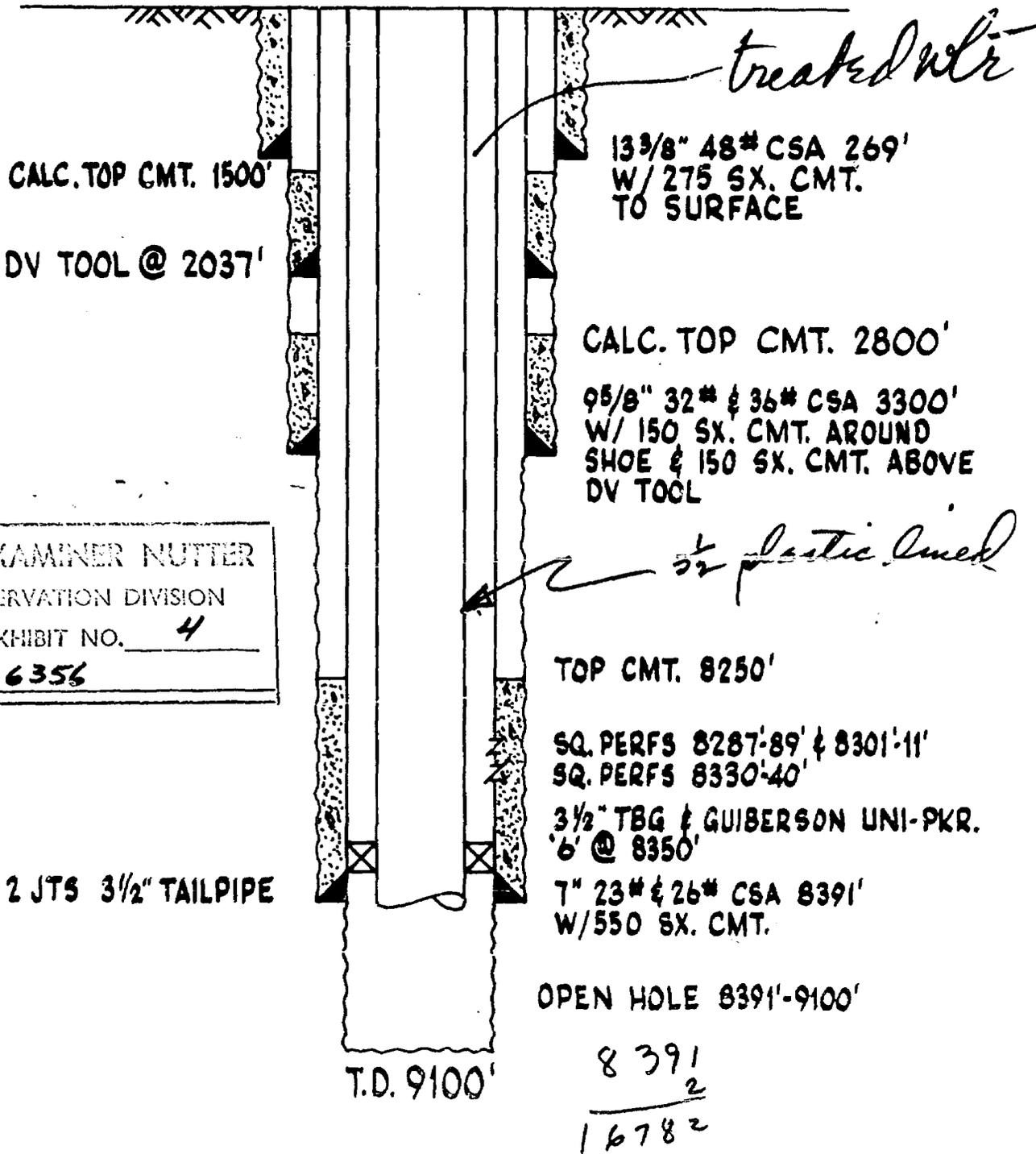
BEFORE EXAMINER MUTTER  
OIL CONSERVATION DIVISION  
*Amoco* EXHIBIT NO. 3  
CASE NO. 6356

# LOVINGTON ABO FIELD

LEA COUNTY, NEW MEXICO

STATE "E" TRACT 18 NO. 21

## PROPOSED WELLBORE ARRANGEMENT FOR DISPOSAL



BEFORE EXAMINER NUTTER  
OIL CONSERVATION DIVISION  
*Amoco* EXHIBIT NO. 4  
CASE NO. 6356

$$\begin{array}{r} 8391 \\ \hline 2 \\ \hline 1678.2 \end{array}$$

OCT 20 1978

ATWOOD, MALONE, MANN & COOTER

A PROFESSIONAL ASSOCIATION  
LAWYERS

JEFF D. ATWOOD [1883-1960]  
ROSS L. MALONE [1910-1974]

P. O. DRAWER 700  
SECURITY NATIONAL BANK BUILDING  
ROSWELL, NEW MEXICO 86201  
[505] 622-6221

October 19, 1978

CHARLES F. MALONE  
RUSSELL D. MANN  
PAUL A. COOTER  
BOB F. TURNER  
ROBERT A. JOHNSON  
JOHN W. BASSETT  
ROBERT E. SABIN  
BRIAN W. COPPLE  
-----  
RANDAL W. ROBERTS

Mr. Joe D. Ramey  
Secretary-Director  
Oil Conservation Commission  
Post Office Box 2088  
Santa Fe, New Mexico 87501

RE: Examiner Hearing October 25, 1978  
Case No. 6355

Dear Mr. Ramey:

Please file the enclosed Entries of Appearance  
in Case Nos. 6355 and 6356.

Thank you and with regards, I am,

Very truly yours,

  
Charles F. Malone

CFM:sgs  
Enc.

cc: Guy Buell, Esquire  
w/enc.

Oct 20 1973  
Oil Conservation Division  
S. 1000

BEFORE THE OIL CONSERVATION DIVISION  
STATE OF NEW MEXICO

IN THE MATTER OF THE )  
APPLICATION OF AMOCO )  
PRODUCTION COMPANY FOR )  
SALT WATER DISPOSAL IN ABO )  
FORMATION, UNIT B, SECTION ) Case No. 6356  
2, TOWNSHIP 17 SOUTH, RANGE )  
36 EAST, LOVINGTON-ABO POOL, )  
LEA COUNTY, NEW MEXICO. )

ENTRY OF APPEARANCE

The undersigned hereby enter appearance herein in  
behalf of AMOCO PRODUCTION COMPANY, with Guy Buell of Houston,  
Texas.

ATWOOD, MALONE, MANN & COOTER, P.A.

By Charles Malone  
Post Office Drawer 700  
Roswell, New Mexico 88201

Attorneys for Amoco Production Company

Dockets Nos. 35-78 and 36-78 are tentatively set for hearing on November 8 and 21, 1978. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - OCTOBER 25, 1978

9 A.M. - OIL CONSERVATION DIVISION 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:

CASE 6290: (Continued from September 13, 1978, Examiner Hearing)

In the matter of the hearing called by the Oil Conservation Division on its own motion to permit R. A. Crane, Jr., Great American Insurance Co., and all other interested parties to appear and show cause why the Donella Well No. 1 located in Unit P of Section 3, Township 29 North, Range 15 West, San Juan County, New Mexico, should not be plugged and abandoned in accordance with a Division-approved plugging program.

CASE 6339: (Continued from October 11, 1978, Examiner Hearing)

Application of Amoco Production Company for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the S/2 of Section 22, Township 23 South, Range 28 East, Eddy County, New Mexico, 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. 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 6355: Application of Amoco Production Company for two unorthodox well locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the unorthodox locations of its South Mattix Unit Well No. 32 located 1535 feet from the North line and 330 feet from the East line and its South Mattix Unit Well No. 34 located 1650 feet from the North line and 2310 feet from the West line, both in Section 22, Township 24 South, Range 37 East, Fowler-Upper Yeso Pool, Lea County, New Mexico, the S/2 NE/4 and the E/2 NW/4 of Section 22 to be dedicated, respectively, to the wells.

CASE 6356: Application of Amoco Production 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 Abo formation through the perforated interval from 8391 feet to 9100 feet in its State "E" Tract 18 Well No. 21 located in Unit B of Section 2, Township 17 South, Range 36 East, Lovington-Abo Pool, Lea County, New Mexico.

CASE 6357: Application of Enserch Exploration, Inc., for pool creation and special pool rules, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks an order creating a new oil pool in the Pennsylvanian formation for its Lambirth Well No. 4 located in Unit O of Section 31, Township 5 South, Range 33 East, Roosevelt County, New Mexico, and for promulgation of special pool rules, including provision for 80-acre spacing and special well location requirements.

CASE 6358: Application of Jake L. Hamon for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Devonian formation through the perforated interval from 12,997 feet to 13,036 feet in his State K-33 Well No. 2 located in Unit N of Section 30, Township 16 South, Range 36 East, East Shoe Bar-Devonian Pool, Lea County, New Mexico.

CASE 6359: Application of Getty Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Gallup and Dakota production in the wellbore of its Jicarilla "C" Well No. 27 located in Unit E of Section 33, Township 25 North, Range 5 West. Applicant further seeks provision for administrative approval for downhole commingling of the Gallup and Dakota formations in others of its wells on its Jicarilla "B" and Jicarilla "C" leases in Sections 5 and 6, Township 24 North, Range 5 West, and Sections 21, 22, 27, 28 and 31 thru 34, Township 25 North, Range 5 West, all in Rio Arriba County, New Mexico.

CASE 6368: Application of Getty Oil Company for the amendment of Order No. R-5388, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-5388 to provide an administrative procedure to permit the downhole commingling of Pictured Cliffs and Chacra production in wells on its Jicarilla "B" and "C" Leases in Sections 21, 22, 27, 28, and 31 thru 34, Township 25 North, Range 5 West, and Sections 5 and 6, Township 24 North, Range 5 West, all in Rio Arriba County, New Mexico.

CASE 6360: Application of Continental Oil Company for a non-standard gas proration unit and simultaneous dedication, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 228-acre non-standard gas proration unit comprising the SW/4 and S/2 SE/4 of Section 18, Township 21 South, Range 36 East, Eumont Gas Pool, Lea County, New Mexico, to be simultaneously dedicated to applicant's Lockhart A-18 Wells Nos. 3 and 4, located in Units K and M, respectively, of said Section 18.

- CASE 6361: Application of Continental Oil Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the Buffalo-Pennsylvanian Gas Pool, Lea County, New Mexico, to provide for 320-acre spacing rather than 160 acres. In the absence of objection, this pool will be placed on the standard 320-acre spacing for Wolfcamp and Pennsylvanian gas pools rather than the present 160-acre spacing.
- CASE 6362: Application of Continental Oil Company for an unorthodox gas well location and a non-standard proration unit, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of a 294.9-acre non-standard gas proration unit comprising the S/2 of partial Section 19, Township 17 South, Range 29 East, Eddy County, New Mexico, to be dedicated to a well to be drilled 660 feet from the South line and 3300 feet from the East line of said Section 19 to test the Morrow formation.
- CASE 6363: Application of Phoenix Resources 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 well to be drilled 660 feet from the North and West lines of Section 16, Township 19 South, Range 21 East, Eddy County, New Mexico, to be drilled to the Mississippian formation, the W/2 of said Section 16 to be dedicated to the well.
- CASE 6364: Application of Adobe Oil Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface to the base of the Ellenburger formation underlying the NW/4 SE/4 of Section 23, Township 20 South, Range 38 East, Lea County, New Mexico, to be dedicated to a proposed oil well to be drilled at a standard location thereon. Applicant seeks the pooling of the SE/4 of said Section 23 in the event said drilling results in a gas well. 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 6365: Application of Michael P. Grace II for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp and Pennsylvanian formations underlying the W/2 of Section 25, Township 21 South, Range 26 East, Burton Flat Field, Eddy County, New Mexico, 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. 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 6366: Application of Phillips Petroleum Company for statutory unitization, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order unitizing, for the purpose of a pressure maintenance project, all mineral interests in the East Vacuum Grayburg-San Andres Unit encompassing 7,025 acres, more or less, underlying all or portions of the following lands in Lea County, New Mexico: Section 24, Township 17 South, Range 34 East; Sections 18 thru 29 and 31 thru 35, Township 17 South, Range 35 East; and Sections 4 and 5, Township 18 South, Range 35 East.
- The unitized interval would be the Grayburg-San Andres Formation between the depths of 4,050 feet and 5,050 feet in Exxon's NM State "K" Well No. 19, located in Unit P of Section 28, Township 17 South, Range 35 East.
- Among the matters to be considered at the hearing will be the necessity of unit operations; the designation of a unit operator; the determination of the horizontal and vertical limits of the unit area; the determination of a fair, reasonable, and equitable allocation of production and costs of production, including capital investment, to each of the various tracts in the unit area; the determination of credits and charges to be made among the various owners in the unit area for their investment in wells and equipment; and such other matters as may be necessary and appropriate for carrying on efficient unit operations, including, but not necessarily limited to, unit voting procedures, selection, removal, or substitution of unit operator, and time of commencement and termination of unit operations.
- CASE 6367: Application of Phillips Petroleum Corporation for a pressure maintenance project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pressure maintenance project on its East Vacuum Grayburg-San Andres Unit, Lea County, New Mexico, by the injection of water into the Grayburg-San Andres formation; and the establishment of an administrative procedure for approval of injection and producing wells at unorthodox locations.



**Amoco Production Company**

500 Jefferson Building  
P.O. Box 3092  
Houston, Texas 77001

J. M. Brown  
Division Engineering  
Manager

September 29, 1978

*Case 6356*

File: TBM-986.51TX-5180

Re: Application for Hearing  
Salt Water Disposal  
Lovington Abo Pool  
Lea County, New Mexico

New Mexico Department of Energy and Minerals (3)  
Oil Conservation Division  
P. O. Box 2088  
Santa Fe, NM 87501

Attention: Mr. Joe D. Ramey

Gentlemen:

Amoco Production Company requests a hearing to obtain approval of salt water disposal into Lovington Abo Pool through its State "E" Tract 18 Well No. 21, located in Unit B, Section 2, T-17-S, R-36-E, Lea County.

In support of our request, attached is Form C-108 complete with attachments. Please direct any questions to Mr. Jim Pease, telephone number 713-652-5461.

Yours very truly,

*J M Brown*

JEP:sam  
Attachments

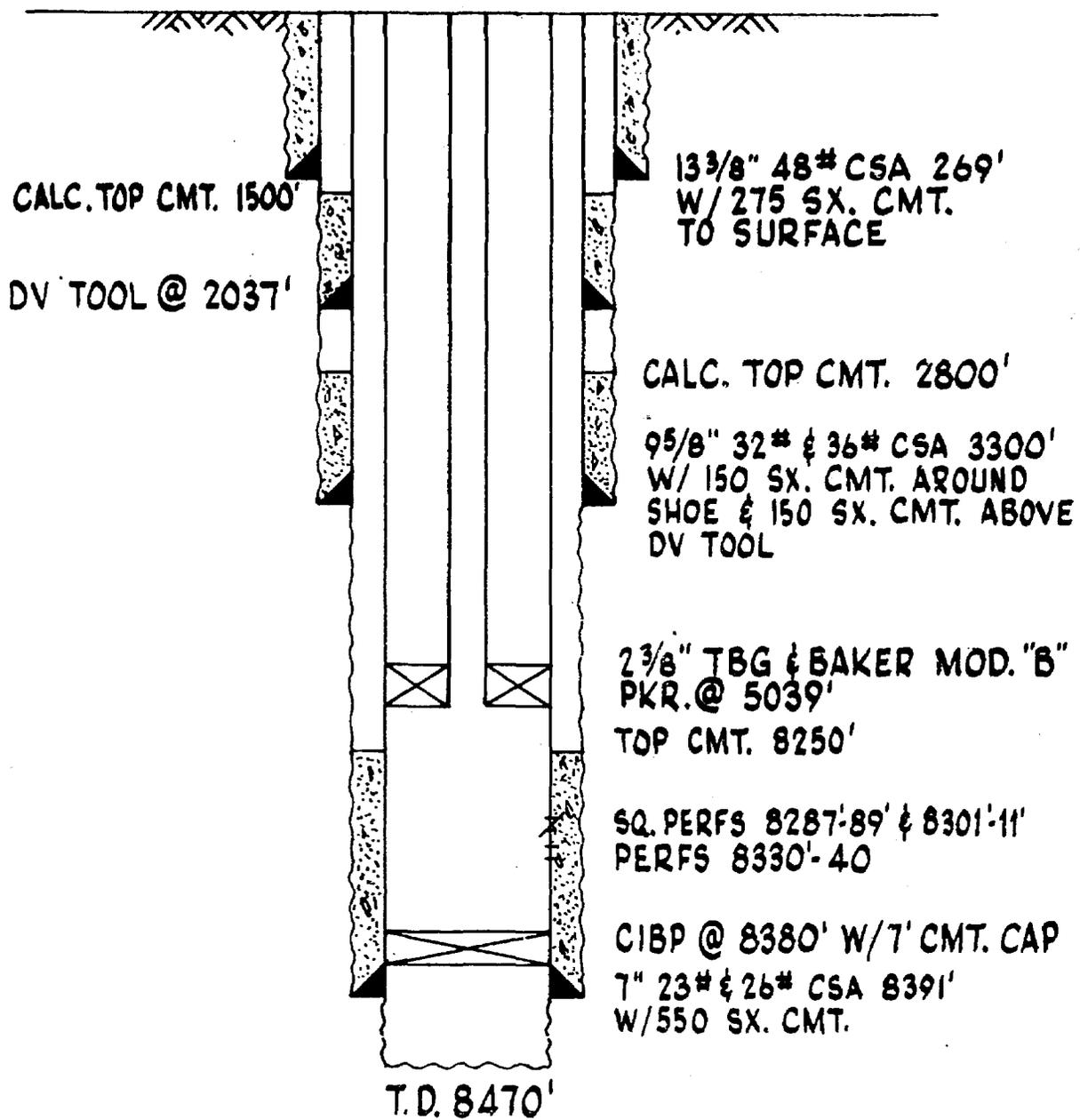
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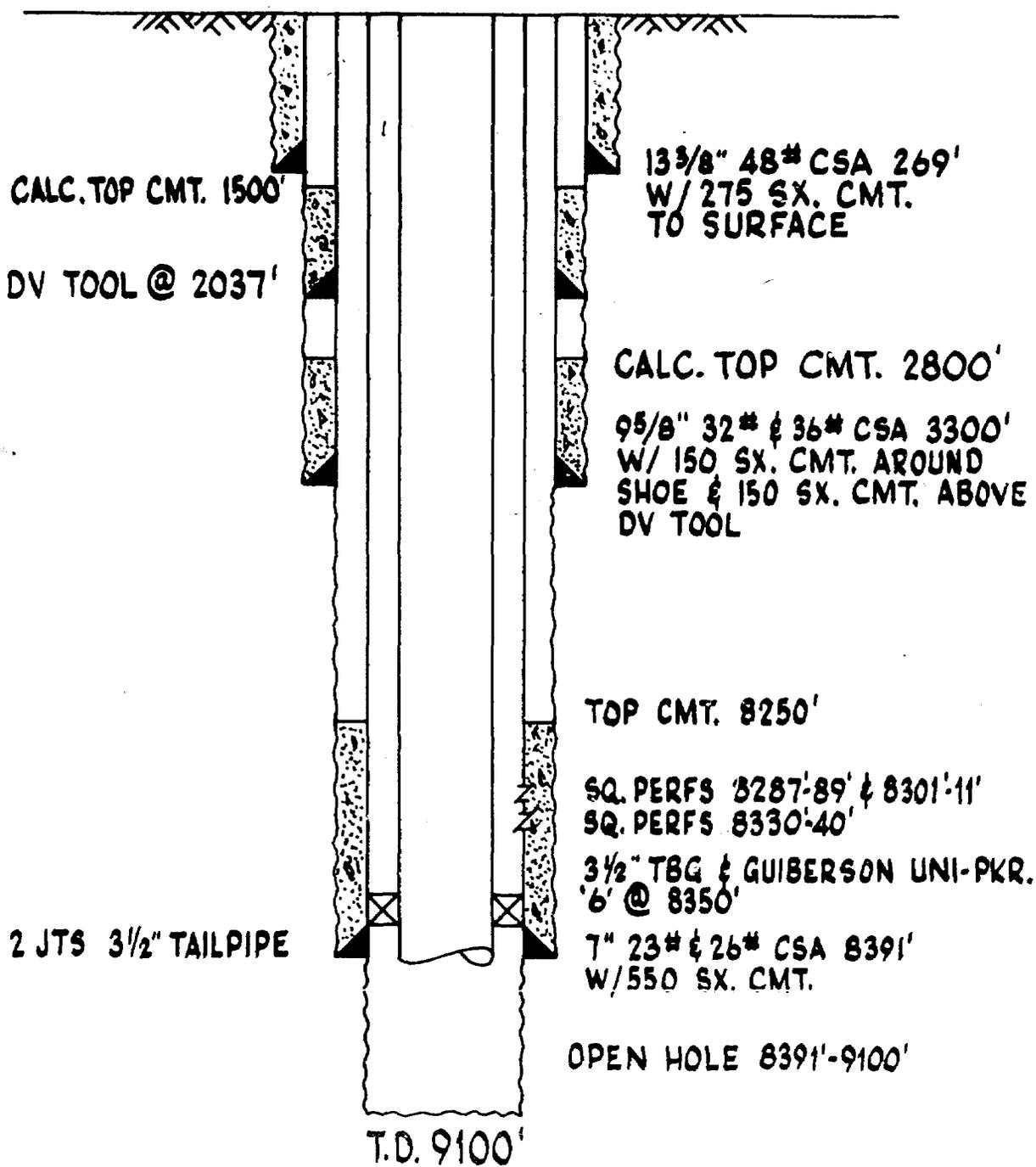
**LOVINGTON ABO FIELD**  
LEA COUNTY, NEW MEXICO  
STATE "E" TRACT 18 NO. 21

**CURRENT WELLBORE ARRANGEMENT**



**LOVINGTON ABO FIELD**  
**LEA COUNTY, NEW MEXICO**  
**STATE "E" TRACT 18 NO. 21**

**PROPOSED WELLBORE ARRANGEMENT**  
**FOR DISPOSAL**



ROUGH

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION

dr/

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

CASE NO. 6356

Order No. R- 5855

APPLICATION OF AMOCO PRODUCTION 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 October 25  
19 78, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter  
NOW, on this November day of October, 1978, the Division  
Director, having considered the testimony, the record, and the  
recomendations 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, Amoco Production Company,  
is the owner and operator of the State "E" Tract 18 Well No. 21,  
located in Unit B of Section 2, Township 17 South,  
Range 36 East, NMPM, Lovington-Abo Pool,  
Lea County, New Mexico.

(3) That the applicant proposes to utilize said well to  
dispose of produced salt water into the Abo  
formation, with injection into the perforated open hole  
interval from approximately 8391 feet to 9100 feet.

(4) That the injection should be accomplished through 3 1/2  
-inch plastic lined tubing installed in a packer set at approxi-  
mately 8350 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 or <sup>other</sup> acceptable <sup>device</sup> ~~substitute~~ which will limit the wellhead pressure on the injection well to no more than 1675 psi.

(6) That the subject well is presently equipped with 13<sup>3</sup>/<sub>8</sub>-inch surface casing set at 269 feet with cement circulated to the surface; 9<sup>7</sup>/<sub>8</sub> inch intermediate casing set at 3300 feet and cemented with 300 sacks, calculated top of cement being at 2800 feet; and 7-inch long string set at 8391 feet and cemented with 550 sacks, with top of cement being at 8250 feet.

(7) That the above-described casing and cementing program leaves the San Andres and Paddock formations open without any protective cement opposite these formations around the long string of casing in the subject well.

(8) That secondary recovery water injection operations are <sup>currently</sup> being conducted in both the San Andres and Paddock formations within one-half mile of the subject well.

(9) That in order to prevent the subject well from ~~being~~ becoming an avenue of escape for waters injected into the San Andres and Paddock formations in nearby wells, or into the Abo formation in the subject well, it (the subject well) should be recemented from the present top of cement on the long string to a point well above the top of the San Andres

formation.

(10) That prior to its use as a salt water disposal well, the subject well should be recemented in such a manner as to cause cement around the 7-inch casing to come from the present top of cement at 8250 feet to a point at least 300 feet above the top of the San Andres formation.

(1) That the operator should notify the supervisor of the Hobbs district office of the Division of the <sup>of recommissioning operations on the subject well and</sup> date and time of the installation of disposal equipment so that the same may be ~~inspected~~ <sup>witnessed and/or inspected.</sup>

(2) 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.

(3) 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, Amoco Production Company is hereby authorized to utilize its State "E" Tract 18 Well No. 21 located in Unit B of Section 2, Township 17 South, Range 36 East, NMPM, Lovington-Abo Pool, Lea County, New Mexico, to dispose of produced salt water into the Abo formation, injection to be accomplished through 3 1/2 -inch tubing installed in a packer set at approximately 8350 feet, with injection into the ~~perforated~~ <sup>open hole</sup> interval from approximately 8391 feet to 9100 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 pop-off valve or <sup>other</sup> acceptable <sup>device</sup> ~~substitute~~ which will limit the wellhead pressure on the injection well to no more than 1675 psi.

(3) That upon conversion to salt water disposal, applicant shall recement the 7-inch casing in the subject well in such a manner as to cause cement to come from the present top of cement at 8250 feet back up to a point at least 300 feet above the top of the San Andres formation.

(4) That the operator shall notify the supervisor of the Hobbs district office of the Division of the date and time *resumming operations on the subject well and also of* of the installation of disposal equipment. ~~so that the same may be inspected without~~

(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.