

CASE 3551: OCC TO CONSIDER ORDER
PROHIBITING DISPOSAL OF OIL FIELD
BRINES IN SURFACE PITS. (SE)

CASE No.
3551

Application,
TRANSCRIPTS,
SMALL Exhibits
ETC.

JAN 15 1967

New Mexico Press Clipping Bureau
Albuquerque, N. M.

Conservation Commission Plans Brine Pit Hearings

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SANTA FE — The New Mexico Oil Conservation Commission will soon schedule hearings to look into the possibility of prohibiting the disposal of oil field brines in surface pits throughout Southeast New Mexico, A. L. Porter, Jr., Secretary-Director, announced today.

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approximately 75 million barrels of salt water were disposed of in this manner in Southeast New Mexico in 1966.

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data for months now concerning the quality of fresh water supplies, volumes of salt water produced and likelihood of contamination.

The proposed hearings will mark the first time the Commission has considered the problem of salt water on an area-wide basis. All previous hearings have been limited to

single oil fields or groups of fields. The latest order of the Commission on this subject was issued Dec. 9, 1966, and prohibits surface disposal in fifteen oil fields in the Vacuum area of Lea County after May 1, 1967, according to Porter.

Hobbs Daily News-Sun

JAN 16 1967

New Mexico Press Clipping Bureau
Albuquerque, N. M.

Hearings on Brine Disposal Planned by Oil Commission

²²
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The Albuquerque Tribune

JAN 18 1967

New Mexico Press Clipping Bureau
Albuquerque, N. M.

Hearing Set On Oil Brine

²²
SANTA FE — The State Oil Conservation Commission, seeking ways of preventing water contamination in oil fields, will begin hearings at Hobbs in April on a proposed order.

The order would prohibit the disposal of oil field brines in surface pits in southeast New Mexico fields.

The order is aimed at eliminating surface disposal of brines in areas where shallow fresh water might be contaminated by the salt water soaking back into the earth, A. L. (Pete) Porter Jr., executive director of the commission, said.

Pumping salt water back into the ground into deep formations which do not contain fresh water is one acceptable means of disposal.

About 75 million barrels of salt water were disposed of in southeast New Mexico in 1966, Porter said.

ALBUQUERQUE JOURNAL

JAN 17 1967

A-5

Oil Commission to Probe Brine Dumping Prohibition

²²
SANTA FE (UPI) — The State Oil Conservation Commission will schedule hearings soon to investigate prohibiting dumping of oil field brine in open pits in southeast New Mexico.

The prohibition if levied would be another in a series of moves begun in 1956 aimed at eliminating surface disposal of brines in areas where fresh water might be tainted by salts soaking into the earth.

Commission Secretary-Director A. L. Porter Jr. said the proposed hearings will be held in Hobbs in April. Testimony will come from commission engineers and geologists and state engineer's representatives who have

gathered data on the likelihood of contamination.

Porter said the water affected by the brine lies in shallow lakes beneath the surface of the earth.

He added an acceptable means of disposal is to pump salt water back into the ground in deep formations that don't contain fresh water.

The hearings mark the first time the commission has considered the problem of water salts on an area-wide basis. Previous hearings were limited to single oil fields or groups of fields.

The most recent commission order prohibiting dumping of salt water was Dec. 9 of last year when it forbade

surface dumping in 15 oil fields in the vacuum area of Lea County after May 1. Porter said approximately 75 million barrels of salt water were disposed of by pumping into deep formations in southeast New Mexico in 1966.

Oil Field Brines Problem Will Get State Attention JAN 16 1967

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ARTESIA DAILY PRESS

New Mexico Press Clipping Bureau
Albuquerque, N. M.

Hearings Set On Disposal of Salt Brines

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LUBBOCK AVANCE-JOURNAL

JAN 16 1967
New Mexico Press Clipping Bureau
Albuquerque, N. M.

IOCC Committee Schedules Meet

OKLAHOMA CITY (Special) — Gov. Paul B. Johnson of Mississippi, chairman of the Interstate Oil Compact Commission, has called a meeting of the Executive committee of the Commission for 9 a.m., March 6, at the Broadwater Beach Hotel in Biloxi, Miss.

This will be the first meeting of the Executive committee this year and several important items will be discussed. Among the items to be considered will be committee appointments and the budget for the year.

The eleven states elected to comprise the membership of the committee are Arkansas, Colorado, Illinois, Kansas, Louisiana, Mississippi, Montana, New Mexico, Ohio, Oklahoma, and Texas. In addition to the above, any member of the Commission present at any Executive committee meeting shall have the same power, authority, and responsibility as an elected committee member.

The El Paso Times
EL PASO, TEXASNew Mexico Press Clipping Bureau
Albuquerque, N. M.

Hobbs Oil Hearings Scheduled

SANTA FE, N.M. (AP) — Hearings are expected to start in Hobbs in April on a proposed order prohibiting the disposal of oil field brines in surface pits in the Southeastern New Mexico oil fields.

A. L. (Pete) Porter Jr., executive director of the state oil conservation commission, said the proposed order is part of the OCC's program started in 1956 aimed at eliminating surface disposal of brines in areas where shallow fresh water might be contaminated by the salt water soaking back into the earth.

Porter said one acceptable means of disposal is to pump the salt water back into the ground into deep formations which do not contain fresh water.

He said about 75 million barrels of salt water were disposed of in this manner in the Southeast fields in 1966.

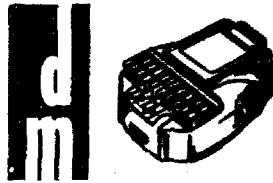
Porter said commission engineers and geologists and representatives of the State Engineer's Office have been gathering data for months now concerning the quality of fresh water supplies, volumes of salt water produced and the likelihood of contamination.

State of New Mexico Oil Conservation Commission

P. O. BOX 2088
SANTA FE
87501

CLIPPINGS REGARDING APRIL 19, 1967 REGULAR HEARING
TO BE HELD IN HOBBS REGARDING SALT WATER DISPOSAL

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS



dearnley-meier reporting service, inc.

May 1, 1967

Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Dear Ida:

Enclosed is a carbon copy of the hearing in Case 3551. It has not been completely checked and corrected as yet. I didn't realize it was going to be such a large transcript or that it would require such a long time in checking. So I am sending the carbon for your use in order that the order can be written in this case. You can dispose of it when you are through with it for there are many mistakes that need to be corrected in it.

I will keep the original here and make the corrections on it and then send you the original and one at least by the end of this week.

Sincerely,


Ada Dearnley

AD/rmc
Enc.

MR. PORTER: We will take up Case 3551.

MR. HATCH: Case 3551. In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider an order prohibiting the disposal of oil field brines in surface pits in Lea, Chaves, Roosevelt and Eddy Counties, New Mexico.

If the Commission please, George Hatch appearing on behalf of the Commission Staff and I will have two witnesses.

MR. PORTER: We are going to call for appearances in the case and we are going to try to get a microphone over to the end of the table so that the witness may sit there and testify. I know that one of the Commission's witnesses has very extensive testimony and might get tired standing at the microphone, but in the meantime, I would like to call for appearances in the case of those who desire to present testimony. Now, as all of you know, who are familiar with our procedures, after testimony has been presented, after it is concluded, we allow anyone present at the hearing to make a statement of position in the case so we will conclude the testimony before we call for statements of positions.

When the case was publicized we emphasized the fact that the Commission would have extensive testimony in the case due to several months of study by the Commission Staff members, so we indicated at the time that we were not discouraging

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anyone else from coming in and putting on testimony. As a matter of fact, we welcome it from any source. Our Commission's witness will go on first, all witnesses, and after that, why we will have an opportunity, anyone here will have an opportunity to present whatever testimony he desires. At this time I would like to have an indication of those who would desire to present testimony in the case, that is, a witness, sworn testimony. I know Mr. Hatch, you have some testimony, or your witnesses. How many witnesses do you have, please?

MR. HATCH: Two witnesses.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: Jason Kellahin, appearing for Standard Oil Company of Texas. We will have one witness who is to present testimony. I would also like to enter an appearance for Continental Oil Company who will not offer any testimony.

MR. PORTER: You say you have one witness?

MR. KELLAHIN: Yes, sir, very brief.

MR. PORTER: Thank you.

MR. LOSEE: Mr. Porter.

MR. PORTER: Mr. Losee?

MR. LOSEE: A. J. Losee, Losee and Stewart, Artesia, New Mexico representing Wilson Oil Company. We may have one witness with brief testimony.

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MR. PORTER: Mr. Heidel?

MR. HEIDEL: I am appearing as attorney for the City of Lovington, Southeastern Land Owner's Association, various individuals and myself and as State Representative. We do not propose to present any witnesses. We do have a letter with an exhibit attached that we would offer into evidence and make a brief statement.

MR. PORTER: Thank you, Mr. Hiddle. Is there anyone else who desires to put on testimony?

MR. CARR: My name is Harvey Carr. I am with South Oil and Royalty Company. I have a statement to make.

MR. PORTER: I see. Well, I'll tell you what, if there is no one who desires to put on testimony, we will just take the statements as they come at the close of the testimony and that way we will save time at this point. Mr. Hatch?

MR. HATCH: I would like to call Mr. Joe Ramey to the stand at this time, please.

MR. PORTER: Would you like for me to swear the witness?

(Witness sworn)

JOE RAMEY, called as a witness on behalf of the New Mexico Oil Conservation Commission, first having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HATCH:

Q Mr. Ramey, in your capacity as Supervisor of District Number One of the New Mexico Oil Conservation Commission, is it your duty to make recommendations to the Commission concerning disposal of produced water?

A Yes, it is.

Q Mr. Ramey, let me back up first and have you state your name and position, for the record, please.

A Joe D. Ramey. I am supervisor of District One for the New Mexico Oil Conservation Commission.

Q And your answer to the question I just asked you will still be the same?

A That's right.

Q Mr. Ramey, are you familiar with Case 3551 and what it proposes?

A Yes, sir.

Q Would you please give the Commission a short summary of the background of the salt water disposal in the southeast and what is being sought?

A You want me to answer that question, Mr. Hatch?

Q Yes.

A The first salt water disposal well in southeast New Mexico was approved by the Commission in 1951 as a result of an

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application by Gulf Oil Corporation. In April of 1956, hearings were commenced on Case 1053 which was for an order to establish rules for disposal of salt water in certain areas in Lea County. This hearing came after a period of development of D production, particularly from the Devonian formation in northern Lea County. And in the year or two preceding this hearing, water production had increased considerably. The hearings on this case lasted several months and in addition numerous committee meetings were called as a result of this problem. As a result of this hearing the Commission issued Order R-12.4A which prohibited disposal of oil field brine and open surface pits in ten areas in Lea County.

Since the original hearing, the Commission has heard three additional cases which have resulted in no-pit orders for a total of nineteen pools in Lea County and no-pit orders for several pools along the Pecos River. Now, in addition to these hearings, the Commission has held many formal and informal conferences with operators which have resulted in disposal systems. In this respect, we periodically check water production or in some instances we had a direct complaint from an interested party and we tried to determine what we term "danger areas." When we do run across one of these areas, we will talk to the operator or operators involved and suggest that they find another means of disposing of well

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produced water. In the majority of cases, this is all that has been necessary to obtain some surface disposal. In some cases our suggestions have met opposition where we did not feel that sufficient progress was being made toward disposal. In these instances, we have held hearings.

Now, in addition to these, many of our operators will install a disposal system strictly on a voluntary basis. As a matter of fact, it appears that some operators now seem to find salt water disposal systems as part of their development plans for a lease.

To date, the Commission has issued orders for a total of one hundred and seventeen salt water disposal wells and the latest available figures indicate that seventy-five of these are being utilized for active salt water disposal systems. In addition, many barrels of produced water is being injected into secondary recovery projects. For some time now, the number of complaints that have reached my office have been increasing considerably. Also, evidence of fresh water contamination is present in areas in the southeast. Therefore, the staff feels that the Commission should be advised of this situation in southeast New Mexico and let them decide if the situation warrants an order prohibiting open surface pit disposal of oil field brines.

Q Mr. Ramey, has the Commission received a letter

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designating fresh water supply in the State of New Mexico?

A Yes, it has.

Q Does the letter have attached to it a memorandum of that amount?

A Would you re-word that question?

Q Did the letter have attached to it a memorandum and a map?

A Yes, sir, it did.

Q Would you summarize, give a brief summary of the contents of the memorandum?

A Perhaps -- Would you like me to read the letter first, Mr. Hatch?

Q Yes. Perhaps that would be better.

A This is a letter to Mr. A. L. Porter, Jr., Secretary-Director, Oil Conservation Commission, Santa Fe, New Mexico.

"Dear Mr. Porter: All underground waters in the State of New Mexico containing 10,000 parts per million or less of dissolved solids is hereby designated by the State Engineer pursuant to Section 65-311-15 NM SA 1953 compilation, except that this designation shall not include any water for which there is no present or reasonably foreseeable beneficial use that would be impaired by contamination. This designation supersedes all previous designations pertaining to underground water.

For your information, I am attaching a memorandum

dated April 10th, 1967 and the map mentioned herein, which shows the areas and formations in which water of ten thousand parts per million or less, commonly occurs. The surface water designation previously made remains unchanged." It is signed, "Very truly, S. E. Reynolds, State Engineer, by Frank E. Erby, Chief of the Water Rights Division."

Q All right. Now, would you give a brief summary of the contents of the memorandum?

A This is a memorandum from the Chief of the Hydrology Section, to the Chief of the Water Rights Division. The memo first explains why the designation of fresh water supplies by the State Engineers, should include water containing up to ten thousand parts per million total solids.

Next, it briefly explains the manner by which contamination of underground water supplies could occur as a result of the disposal of oil field wastes. The hydrologist also declares that all formations, deposits or rocks younger than cretaceous in age, that most places in the State of New Mexico, contain fresh water supply if they contain water at all and these should be afforded protection.

Q Does the letter also mention a map?

A Yes, sir. This map we have placed on the board back here. This map shows the areas in which various rocks, cretaceous or older are near the surface and commonly contain

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fresh water. It should be noted that all of the southeast producing area, is so designated as having these rocks present.

MR. HATCH: If the Commission please, I would like to introduce this into evidence at this time. Mr. Ramey, has this been marked, the letter and attachment?

A Yes, sir, this has been marked Exhibit Number One.

MR. HATCH: I would like to move the introduction of Exhibit Number One including the attachment, into evidence at this time.

MR. PORTER: Any objections? The Exhibit will be admitted.

(Whereupon Oil Conservation Commission's Exhibit Number One was admitted into evidence.)

Q (By Mr. Hatch) Mr. Ramey, what geographical area are we concerned with in this case?

A This would be the southeast producing area which is the Counties of Lea, Eddy, Chaves and Roosevelt.

Q What oil and gas pools might be affected by an order issued as a result of this hearing?

A It would be all of the pools in these Counties.

Q Have you prepared an exhibit that would show the names and locations of the oil and gas pools that might be affected by an order issued as a result of this hearing?

A Yes, sir.

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Q What exhibits are those?

A Those are Exhibits two through five and the accompanying sheets 2a through 5a.

Q Will you explain to the Commission how that is shown on Exhibits two through five, please?

A Yes. Just one moment. These Exhibits which are the first four maps, briefly cover the entire southeast producing area. They don't entirely cover all of the Counties, but they do contain the area which is oil and gas productive. Now, on these maps we have outlined the pools and we have color-coded the pools as to volumes of water which go into pit. Now, we have also outlined all water basins in the area which include the Lea County Water Basin, the Capitan Water Basin, Carlsbad Water Basin and the Roswell-Artesia Basin. There are two areas on the map which are not in the water basin and those are the south central area. It should be that area and then the north area which commences here and extends to the top of the maps.

Q Is there oil and gas production or oil or gas production in all of those declared water basins?

A Yes, there is.

Q Is there any production outside of the basins?

A Yes, sir, there is also production outside of the basins.

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Q Mr. Ramey, why do you have three exhibits covering the same geographical area, that would be Exhibits 3, 5 and 6, is it?

A It would be Exhibits 4, 5 and 6. No, wait a minute. It would be 3, 4 and 5, I'm sorry. Exhibit 2 covers the, that is the exhibit on my far right. Exhibit 2 covers the north half of the producing area and Exhibit 4, no, 3, 4 and 5, cover the south half. It was necessary to split this up into three exhibits because of the great number of overlapping pools, particularly in the area here, well it would be south of the Lea County water basis, primarily.

Q What is the reason -- you have numbers by each of those pools up there?

A Yes, sir.

Q What is the purpose of the numbers?

A The numbers are strictly for identification purpose only. The numbers on the map correspond to the numbers on the master sheets for which all the information that we weren't able to get on the maps is posted on the master sheets.

Q Would you explain the color coding to the Commission, please?

A Yes. The color coding designates waters that are going into open surface pits only. The color coding is as follows up to five.

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Q Mr. Ramey, is there any oil or gas production that might be affected by an order that is not reflected on exhibits 2 through 5?

A Mr. Hatch, I don't believe I ever answered the previous question concerning the color coding. Would you like me to answer that?

Q All right.

A We have color coded these maps on the basis of water volumes going into open pits. The green represents volumes up to five hundred barrels a month and the dark blue is for five hundred to a thousand barrels. The light blue, a thousand to two thousand, the yellow, two thousand to four thousand, brown, four thousand to ten thousand, violet, ten thousand to twenty thousand, orange, twenty thousand to fifty thousand, light red, fifty thousand to a hundred thousand and dark red, all those above a hundred thousand.

Q All right, then, let's come back to the next question. Is there any oil or gas production that might be affected by an order that is not reflected on exhibits 2 through 5?

A Yes. Since these exhibits were prepared, why there have been, of course, new pools created in our regular nomenclature and also there are undesignated wells which lie outside of the pool boundaries. These would be affected by this order.

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Q Now, you have spoken of the coloring up here and how it has represented the amount of -- Exhibits 2 to 5 and the tabulation sheet that you spoke of show the amount of oil field brine produced during what period of time?

A This is December 1966.

Q What happens to these brines?

A These are -- they are either put into salt water disposal systems and used for injection water in waterflood. They go in, in some cases they go into line surface pits and then in the rest of the cases it goes into open surface pits.

Q Where are those pits located?

A That of course, depends primarily on the size of the lease. In some cases we will have a forty-acre lease so the pit would be near the producing well, but in other cases, or a large co-mingling system, why one pit would serve many wells.

Q How many barrels of brine were produced during December 1966 by the pools shown on your exhibits 2 through 5?

A The total reported water production for this period was twelve million nine hundred thirty-two thousand, two hundred eighty-nine barrels.

Q That was for the month of December, 1966?

A Yes, sir.

Q Why did you use that month?

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A When these exhibits were prepared, why that was the last available or the most recent available information.

Q Now you gave the total production from all of those pools, how many barrels of brine went into surface unlined pits?

A Four million three hundred and ninety-eight thousand nine hundred and eighty-four barrels.

Q And again, that is only for one month, December 1966?

A Yes, sir.

Q Did the Exhibit show the amount of brines produced by each pool?

A The Exhibits 2a through 5a will reflect the total volumes produced by each pool, yes, sir.

Q Do the exhibits also reflect the disposition of the brine to each pool?

A Yes, sir, they do.

Q Would you explain to the Commission how that is shown?

A Of course, the tabulation is on the Exhibit 2a through 5a under disposition of the water. We have classified that as either salt water disposal or pit. The salt water disposal will include actual salt water disposal systems, waterflood and line pits and then the pit explanation is strictly for surface pits. The exhibits actually show the status, or the exhibits 2 through 5 actually show the status of the used

waters that are going into pit only. Let me explain a little further on that. If you will refer to exhibit 2 and 2a.

Q Have those exhibits 2 and 2a been marked and distributed?

A Yes, sir, I believe that the Commissioners have copies of those in front of them. If you will go to Pool 30 in Exhibit 2a which is this particular pool here, now this represents the San Andres gas and the Devonian oil pool. These pools indicated no produced water during December and we have no coding whatsoever on the exhibits. Next we will go to Pool 37. This is the Crossroads San Andres gas and South Crossroads Devonian Oil. The total water production was fifty eight thousand eighty-nine barrels for the month, all of which is being disposed of into open surface pits. This is color-coded light red to indicate the fifty to a hundred thousand production bracket for water.

Next, we have Pool 13 which is the Noma Sand Abo and Noma Sand Ten and Noma San Andres. The total water production was forty-two thousand one hundred and eighty-four barrels of which twenty-one thousand three hundred and forty-three barrels is going into a salt water disposal system and twenty thousand six hundred and sixty, into open pits. This is color-coded light orange to represent the twenty thousand plus category. We have also designated on these maps, black

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triangles also. Now these will represent water disposal of some kind. We didn't try to differentiate between salt water disposal and waterflood, but we did designate in Pool 13 the black triangle which represents a salt water disposal system. And then Pool 32 which is the Crossroads Devonian, Crossroads Mississippian and Crossroads Pennsylvanian Pools, the total water production for the month of December, was four hundred and thirty four thousand nine hundred and eighteen barrels all of which is being disposed of into salt water disposal systems. So in this case, it is not color-coded since the water going into pits was zero, but we have designated the salt water disposal system in the pool. So from a compilation of these exhibits we can see the status of the water production, in other words zero water production, water production with no disposal, water production with partial disposal and water production with one hundred percent disposal.

Q Go ahead, did you have something else? What percent of the total produced brines from these pools goes into surface pits?

A Excuse me, Mr. Hatch. I want to go back to Exhibit 2 while I am there. I wanted to call your attention to Pool number 51 which kind of a setting in among a bunch of salt water disposal systems. Anyway, this is the North Bagley area which has production from several different horizons. On

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February 7th of this year, a meeting of the operators was held and at this meeting they were informed that the produced water volumes were such that I consider this to be a critical area. I informed them that they should take immediate action to sub-surface disposal. Also, they were informed that this hearing would be held today and were advised that I would make a definite recommendation for no further open-pit disposal in this area. The December water production for this field was a hundred and twelve thousand, five hundred and seventy-two barrels or nearly four thousand barrels per day.

Q All right. Do you have anything else to say there?

A I think that one operator has made application for a disposal well in this pool and I think there are other plans that have been made.

Q Mr. Ramey, going back to the question I asked you a moment ago. What percent of the total produced brines goes into surface pits from all of these pools?

A It is approximately thirty-four percent.

Q The rest of it then, approximately sixty-six percent is going underground in some manner?

A Yes, sir. That is correct.

Q All right. You have testified as to the production of oil field brines and disposition of the brines. Do you have any information as to the chloride content of those brines?

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A Yes, sir, these are listed by pools in the six columns on Exhibit 2a through 5a.

Q That is the same exhibit we have already used?

A Yes, sir, that is correct.

Q I notice there --

A I should say, Mr. Hatch, that we didn't attempt to have these waters analyzed as to total solid content. We were able to, in our office with our meter lab facilities, we were able to analyze chlorides, but chlorides are one of the main contaminants of fresh water and this should furnish us with a representative sample or representation of what the produced waters are like in each of the pools.

Q What is the highest chloride content shown on that exhibit?

MR. PORTER: Mr. Ramey, just a moment.

(Whereupon an off the record discussion was held)

Q (By Mr. Hatch) I will repeat the question. What was the highest chloride content shown on that exhibit?

A One hundred and eighty-six thousand twenty parts per million.

Q And the lowest chloride content?

A One thousand four hundred and twenty parts per million.

Q Do you have a chloride content shown by each of those

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wells on this exhibit?

A Not on all of them.

Q The pools, I should say.

A Yes, thank you.

Q Why not?

A First, of course, the pools make no water and then in some instances, we were unable to obtain a sample because of the small volumes involved or that the wells were not producing at the time that we attempted to get the sample. In other instances we made no attempt to obtain samples because we had samples of, from nearby pools which were producing from the same formation which we felt were representative of the quality of waters involved. Just for an example, the Carlsbad Delaware Pool, the water was analyzed at ninety-nine thousand forty-five parts per million chloride. The Dartanian Delaware, the analysis showed slightly over a hundred thousand so we can assume that Delaware water would test around a hundred thousand barrels.

Q Mr. Ramey, where did you get the information as to the chloride content?

A These were either by our own analysis or from sample analysis which we had on file.

Q All right, you have testified now to the amount of brines produced in each pool during the month of December, 1966.

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Do exhibits 2 and 5, 2 through 5 and 2a through 5a show how much is produced in a section?

MR. PORTER: Just a minute Mr. Hatch, while we are on this chloride content, approximately how many samples did you take, Mr. Ramey, that are being considered here in this exhibit?

THE WITNESS: I believe it was approximately two hundred and fifty that we ran ourselves.

MR. PORTER: And these were scattered over the four county area?

THE WITNESS: Yes, sir.

MR. PORTER: Thank you.

Q (By Mr. Hatch) Do you have any testimony or exhibits that will show how much water is produced in each section?

A Yes, sir, I do.

Q What exhibit is that?

A Those are Exhibits 6 and 7 which again, are the large maps on the board and Exhibit 8 which is a tabulation by section, township and range of the water production.

Q What period of time does that cover?

A These were for the year 1966.

Q Would you point out to the Commission your color scheme again?

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A The color scheme -- I won't go into the whole thing, but the color scheme is very similar to what I explained on the other exhibits except that we added a few more colors. They range from, dark green and dark blue are the low volumes and then again, the light red and dark red are the high volumes.

Q Again, this Exhibit would show the total production of water through oil and gas operations during the year 1966?

A Yes, sir, on a per-section basis.

Q All right. Where did you get that information?

A This was furnished by our Santa Fe office which in turn came from information that the operator submitted on their monthly production report.

Q This is the amount of water reported by the operators?

A Yes, sir.

Q And how much is that?

A The -- I've got it here someplace. The total water production for the southeast producing area for the year 1966 was one hundred and fifty-eight million, one hundred ninety-four thousand, seven hundred and sixty-eight barrels.

Q Well, can you give us how much water, is that a large amount of water?

A Well, it is a reasonably large amount of water, of course, it depends on what you compare it with, but this is

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sufficient water to cover thirty-two sections of land to a depth of slightly over one foot.

Q Of course, it isn't all concentrated in one place like that is it?

A No, sir, as you can see from the exhibit, it is pretty well scattered.

Q Do Exhibits 6, 7 and 8 show the quality of the water?

A No, sir.

Q Do Exhibits 6, 7 and 8 show the disposition of the water?

A No, they do not. A combination of exhibits 2 through 8, why you could fairly well, I think, tell the disposition of the water to a certain extent, anyway. Not in all instances. For example, I just picked a few sections at random. Now, the, we will refer to Section 2 of 15 South, 37 East, let's see if I can locate that. It would be this particular section which is marked dark red. Now, the records indicated that this section produced two million, five hundred and seventy-eight thousand barrels during the year of 1966. Now, if you will transfer this to the other exhibits we will find that this is in the Denton Pool, so we can see in the Denton Pool all the water goes into salt water disposal systems. Another one would be Section 29, Township 8, South Range 33 East, which is in the

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Toe Bank Pool. Now, this produced two hundred and ninety-eight thousand five hundred barrels and from Exhibit 2 again we can see that all the water in this pool goes into open pits. It would be in this particular pool which is -- and then too, take another section, Section 22, Township 19, South Range 35 East. This is in the Pearl Queen Pool. This section produced two hundred and two thousand four hundred barrels. If we will transpose this section to Exhibit 3, it will be here which is one of those pools which is labeled both water and pits and salt water disposal systems. So in this particular instance we would need additional information which we do have, but it would take a, we would have to know the ownership of the lease and we would have to know who has the disposal system and what wells go into the system. We do have this information on file, but we weren't able to reflect it on these exhibits.

Q Are you through?

A Yes, sir.

Q You have been testifying as to the quality of water produced by oil and gas wells. Have you had an occasion in your duties as supervisor of District One, to make a study of the quality of the water in any water wells?

A Yes, sir.

Q Is it a duty of your office to make investigations as to possible contamination of water wells by brine disposal?

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A Yes, it is.

Q Are you prepared to give testimony and present exhibits concerning wells that your office has investigated?

A Yes, I am.

Q What are those exhibits?

A This will be Exhibit 9a through 9f.

Q I suggest that we change the title of those exhibits. Have those been distributed?

A I believe they are in front of the Commissioners, yes, sir.

Q The Exhibits should have "Water" at the top of them rather than "Contaminated Water", so if you will make that correction on the exhibits, please.

A I am ready to proceed.

Q All right. If you will go to Exhibit 9a.

A Exhibit 9a, now we have labeled these or color-coded these again, about the same, the red dots indicate a water well.

Q Mr. Ramey, let me interrupt you a moment. As you go through each of these, be sure to give the Commission all the information as to where you received your information.

A All right, I will. The blue oval shapes are the disposal pits, they may be active or abandoned. The Exhibit 9a shows a water well in the northeast quarter of the northeast

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quarter of Section 2, Township 18, South Range 34 East. The information as to chloride content was furnished us by the State Engineer's office in Roswell. This well, the chloride content on the original test, was thirty-five parts per million. On a test taken November 17, 1964, they indicated one hundred and seventy parts per million and then on a test taken September 20th, 1965, the chloride were two thousand and sixty. Would you like to have me point out the area of each of these wells, Mr. Hatch?

Q Yes, I wish you would.

A The well in Exhibit A would be in the vacuum pool area, it would be at this location on the south edge of the vacuum pool.

Q Is that in one of the designated or declared water basins?

A Yes, sir, that is in the Lea County Water Basin. The Exhibit 9b -- one thing I should mention in going back to Exhibit 9a, that is, there was a pit a little over a quarter of a mile west of this well. The pit is now abandoned and all the waters in this area are going into disposal systems. As a matter of fact, this is the area covered by the Commission's most recent order on salt water disposal. It was effective March the 1st for a certain area and then the remainder of the pool will be effective on June the 1st.

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I might mention going back to the Exhibit, I did show the vacuum pool area as under salt water disposal system but on my tabulation I showed the water going into the pit because the majority of the water at the time was going into the pit. Now back to Exhibit 9b, this shows a water well in the northwest quarter of the southeast quarter of Section 19, Township 18, South Range 38 East. This is on the northwest side of Hobbs. Now, these chloride analysis were those which were analyzed from samples which we collected from the well. The chloride content of this well in February of '61, was one thousand and seventy parts per million and the chloride tested one thousand and seven hundred and seventy-five parts per million in June of 1964. The well has a pit within a quarter of a mile to the west which is an abandoned pit which was abandoned under the first order that the Commission issued, R-1224A, that is, the Hobbs Pool was one of the ten areas that was listed in this order.

MR. PORTER: That was 1958?

THE WITNESS: Yes, sir. It seems like it was effective January 1, 1959.

The Exhibit 9c indicates two water wells located in the northwest quarter of Section 27, Township 21 South Range, 37 East. This is on the north outskirts of the town of Eunice. Chlorides for one well and in looking at these, I

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think we might have gotten our samples switched, but regardless this is the way we have them posted, but the chloride on one well indicated to be three hundred and ninety-two in 1954 and nine hundred and twenty in 1966. For the other well, the chloride indicated to be eight hundred and eighty-seven in '64 and four hundred and fifty in 1966. Now, one of these wells have been abandoned and the other one is being used and the one that we show the highest chloride content in '66 is the one that is being used, so I kind of feel like we got our samples switched on that.

Q But you haven't run any other samples to check it?

A No, sir, not at this time. Of course, these were from analysis that we took from the well or from samples we took from the well and had analyzed. This shows several pits in the immediate area, two in the same section and then several to the, in the sections to the north and west. Now the section directly west of these wells is under salt water disposal which is designated on the plat.

Q Are the pits shown there still active pits?

A Yes, sir, they are.

Q They are unlined?

A Unlined pits, yes, sir. Exhibit 9b shows a water well in the southwest quarter of the southeast quarter of Section 9, Township 22, South Range 36 East. It would be in

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this area. More of an illustration, it would be in this general area. We have no initial analysis on this well, but we took a sample on the well in April of '67 and our analysis showed that the chloride content was two thousand nine hundred and forty-nine parts per million chloride. There is a pit directly west of this well and then a pit to the, not directly west, but directly north of the well and then a pit, an abandoned pit to the northeast.

Exhibit 9e shows a water well in the southeast quarter of the northeast quarter of Township 25, South Range 37 East. Did I say Section 24? It would be in this area. (Indicating) The chloride contents were furnished to us by the owner of the well and these came from samples which were analyzed by one of the El Paso gasoline plants in the Jal area. The chlorides on this well indicated three thousand one hundred forty-three in June of 1965 and they have increased to twelve thousand two hundred in April of 1966.

Q But you didn't -- these were not taken by the Oil Conservation Commission?

A We took the last sample.

Q You took the last sample?

A Yes, sir. The last Exhibit which is 9f is a water well located in the southeast quarter of Section 31, Township 16, South Range 37 East. The information for the chlorides

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on this well were furnished us by the City of Lovington. The chlorides, let me point out this well first. In this area (indicating). The chlorides on this well indicated, on the original test, thirty parts per million. In February of 1966, they indicated eighty-four parts per million and the chlorides taken again in December of 1966 indicated four hundred eighty parts per million and than a sample taken this month by the State Engineer which was also furnished to us, indicated four hundred and thirty-three parts per million. The well had been shut down on this, prior to the last sample. This shows numerous pits in the area and also some abandoned pits from what we were able to, from our inspection of these pits, we did not find any water going into the pits and our records indicate that all of the water from the Lovington Pool is going into salt water disposal system.

Q Were all of these water wells located in declared water basins?

A Yes, sir, primarily, I think part of them were located in the Lea County Water Basin and the remainder in the Capitan Water Basin.

MR. PORTER: Mr. Ramey, at this point, could you tell us approximately the depth of the water, of the water wells that you have examined here?

THE WITNESS: These wells all range in the depth from

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ninety feet to two hundred eighty feet. I think the first well was bottomed at around two hundred and eighty feet, I'm not completely sure of those depths, but they are --

MR. PORTER: It is in that range?

THE WITNESS: It is what we determine, shallow, fresh water. This is above the Santa Rosa and it is probably in Diluvian or Ogallala.

MR. HAYES: That two hundred and eight some-odd foot well, do you happen to know where it is?

THE WITNESS: Yes, sir, it is, that was the first well which is in the vacuum pool area.

MR. HAYES: You don't know what level they're using this water from, do you?

THE WITNESS: Yes, sir, that is Ogallala, it is Ogallala water.

Q (By Mr. Hatch) Mr. Ramey, do you have anything else you would like to offer?

A Yes, I would like to discuss just in general, the two areas which are reflected on these Exhibits. The first area is that from the Maljimar Pool to the City of Artesia. This trend is one of the oldest producing areas in the southeast and some of the wells having been drilled well over thirty years ago. Now, most of these wells produced as strippers for a number of years and the water production over

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the life of these pools has been negligent, however, some years back secondary recovery by waterflooding was attempted. Now, almost the entire area has responded to this stimuli, however, with waterflooding you necessarily have large volumes of produced water so that an area which ten years ago produced less than ten thousand barrels of water in the month of December, now produces some seven hundred and thirty-eight thousand barrels of which three hundred and twenty thousand barrels go into open surface pits. The chloride content for these waters ranges from fifty-four thousand to a hundred and fifty thousand and most of the operators of these waterflood projects either collect or produce water and reinject it or they intend to do so in the future. However, some operators have stated that they do not intend to reinject the water, but will continue to dispose of it in open pits. Now, to my knowledge we have never received a complaint from this area at all, so, but we do have a situation where the operators have created a possible problem, this secondary recovery in water production in the pits which could lead to water contamination in the area. However, the operators could go in and solve their own problem by picking up this produced water and reinjecting it back into their waterfloods.

Now, the secondary is that of the Capitan Reef Pools, particularly those in southern Lea County, it would be this

area here (indicating). Now, here again we have another area of extremely over-production, particularly that portion of it which lies south of the Lea County Water Basin in the recently established Capitan Water Basin. These are --

MR. PORTER: Mr. Ramey, when you refer to stripper wells, about what is the level of production in the area would you say, oil production?

A I think the proper classification is below ten barrels a day, but we have numerous wells which are lower than that. Ten barrels would be a lot of oil to some of these wells, but back to this area, of course, this is an area of old production, also, none like the others. These are active water-dried pools and the pools have produced substantial amounts of water for several years. Now, three of the pools in this area, the Jalmat, the Arrowhead and the Scarborough produced a reported nine hundred twelve thousand seven hundred barrels last December.

To dispose of these volumes of water, it has been necessary for the operators to dig large surface pits and in many cases, a series of water pits. In many areas through this trend, the operators have been unable to contain their produced waters in the pits which had resulted in surface damage to the land outside the pits. Now, our analysis of the waters produced from the Capitan Reef Pools indicated a level of

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two thousand seven hundred seventy-nine parts per million and a high of some twenty-six thousand parts per million. This is chlorides, of course. In the three pools mentioned previously, the Arrowhead, the Scarborough and the Jalmat, the chlorides tested at two thousand seven hundred seventy-nine, three thousand four hundred forty-three and four thousand three hundred eighty-two parts per million respectively, which is really not bad water. Now, to give you an idea of the type of water we are talking about here, I have a letter in my files from my rancher in South Lea County concerning the use of water from a disposal pit in the area. We have found a siphon line coming out of the surface pit and have requested the operator to move the line and combine his water to the pit. The operator informed us that the rancher had installed the siphon and was using the water for stock water. We requested a letter from the rancher to verify this and in his letter the rancher states that this is the only available water for his stock and that the water going out of the pits vegetation very well. However, the chloride content is much too high for human consumption.

MR. PORTER: What is the chloride content, do you know, in that particular pool?

A In this particular pool, this was in the Arrowhead Pool and the chlorides were two hundred and seventy-nine parts

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per million.

MR. PORTER: Maybe those cattle haven't read the analysis on it.

THE WITNESS: That's all I have Mr. Hatch.

Q (By Mr. Hatch) Mr. Ramey, where Exhibits 2 through 9 and Exhibits 2a through 5a prepared by you or under your supervision?

A Yes, sir, they were.

MR. HATCH: I would like to ask the Commission to accept Exhibits 2 through 9 and Exhibits 2a through 5a into evidence at this time.

MR. PORTER: 2 through 9, 2a through 5a?

MR. HATCH: Yes, sir.

MR. PORTER: If there are no objections, the Exhibits will be admitted.

(Whereupon Oil Conservation Commission's Exhibits 2 through 9 and 2a through 5a were admitted into evidence.)

MR. HATCH: That's all the questions I have of Mr. Ramey, but I would like permission to recall him after all other testimony is in for the purpose of possibly making recommendations.

MR. PORTER: The Counsel for the Commission has requested for approval to recall the witness to make some recommendations. Do you think, perhaps, it would be better to

hear any other testimony that may be presented prior to making his recommendations? He will be available for cross examination, of course. At this time, on what he has testified to, up to now, and the witness has requested time to get a cup of coffee, let's take a ten minute break and let's keep it to ten minutes because the Governor has pressing business elsewhere and he wants to stay and hear as much of this as he can.

(Whereupon a recess was taken)

MR. PORTER: The hearing will come to order, please. Mr. Hatch, do you have any further questions on direct at this time?

MR. HATCH: Not of Mr. Ramey, no. I have another witness to call when he is through.

MR. PORTER: The witness is available for cross-examination. Are there any questions? If you want to cross-examine the witness, I suggest you come forward to the front. If there are no questions, the witness may be excused and recalled later. Mr. Hatch, will you call your next witness?

MR. HATCH: I call Dr. Zane Spiegel to the stand, please.

(Witness sworn)

ZANE SPIEGEL, called as a witness on behalf of the New Mexico Oil Conservation Commission, first having been duly

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sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HATCH:

Q Dr. Spiegel, will you please state your name, profession and by whom you are employed?

A Zane Spiegel, Oil Reserve Engineer employed by the State Engineer's office.

Q Have you testified before this Commission before?

A Yes, I have.

Q In that capacity?

A Yes.

MR. HATCH: Will the Commission accept the witnesses qualifications?

MR. PORTER: Yes, sir.

Q (By Mr. Hatch) Dr. Spiegel, in your profession as a Hydrologist for the State Engineer's office, is it one of your duties to make reports to the State Engineer, the presence of water and its quality in particular areas of the State, including the Counties of Lea, Eddy, Chaves and Roosevelt?

A Yes.

Q Are you familiar with Case 3551 and what it proposes?

A Yes, I am.

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Q Are you also familiar with the letter and the attachments prepared by the State Engineer and sent to the Commission and previously entered in this Case?

A Yes.

Q Are you familiar with the fresh water standards used in making the designation?

A Yes, I am.

Q Would you explain to the Commission the quality of water that is suitable for various uses including human use, agriculture and others, and other animals?

A Yes. The water that is suitable for human use, under Public Health Service recommended standards, for interstate carriers, is a total of five hundred parts per million with two hundred and fifty parts per million chloride or two hundred and fifty parts per million sulphate. If water is not available of this quality, they permit the use of water twice these contents, these values, that is up to five hundred parts per million chlorides, five hundred sulphate and one thousand total solids. Occasionally, if water is not available they have permitted use of water somewhat greater in these constituents in certain cases, for interstate carriers. These standards which are usually quoted as being Public Health standards, are standards only for interstate carriers. They have not established a similar standard as absolute maximum

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limits which can be used by people who, for their own private use and humans can drink water considerably greater in total solids, chlorides or sulphates, than the interstate limits that have been established. I don't think that there are any definite limits, it depends upon individuals. It goes up to two to three thousand and I have heard of up to four thousand particles being consumed by individuals with no apparent ill effects, after they have become accustomed to it. However, most people cannot become accustomed to such water and suffer serious consequences if they drink water much above two thousand, fifteen to two thousand parts per million total solids. Irrigation water can be considerably higher above five thousand parts per million depending upon total solids, depending upon individual constituents. Stock can drink water exceeding ten thousand parts per million, again like humans they must become accustomed to the water and I'm sure that individuals vary their maximum tolerance and the tolerance depends considerably upon the amount of water that they take in in their feed, the amount of moisture in the feed. For instance, in the wet year with green feed, they may be able to exist on very much higher water because they will not need to drink so much of it. The tolerance for industry is extremely variable. It depends upon industry and the cost which they are willing to go to, to make water suitable for modifying the

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industrial requirement . I think that they can use water up to ten thousand parts per million for certain things such as cooling. When water quality gets worse than that, it becomes much more expensive, the maintenance of the cooling apparatus.

Q You have stated that you have made studies pertaining to the quality of water in the four Counties under consideration at this hearing. Do you have any exhibits that you used in making your studies?

A Yes.

Q What are those exhibits?

A The first exhibit consists of four sheets, it is labeled 10. The sheets are labeled 10a, 10b, 10c and 10d. They consist of maps of Roosevelt, Lea, Eddy and Chaves County, Chaves County being in two sheets, a total of five maps altogether prepared by the planning division of the New Mexico State Highway Department.

Q Let me interrupt you a moment. I see five County maps on your --

A There are four County --

Q Three here and two over here.

A Yes, there are four counties. Chaves County is in two pieces. The two on the East wall are both Chaves County. I'm sorry, they are labeled 10a to 10e.

Q 10e?

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A That's right. And in addition, I have exhibits that are labeled 11a, b, c and d. These consist of County maps of the same counties prepared from sepias of the original county maps and on these maps are, on the sepia, reproduction of the county maps, have been located certain wells from which samples have been taken and analysis made by the U. S. Geological Survey over the period of years from 1929 up until 1964 and '65.

In addition I have a set of maps in six sheets, labeled Exhibit 12 which cover the Capitan Water Basin in Eddy and Lea Counties.

Q Going back to Exhibit 10, that is 10a, b, c, d and e, five County maps, who prepared those maps?

A These maps were prepared by the planning division of the State Highway Department.

Q You didn't make them yourself, then?

A No, I did not.

Q What do those maps show, again, that you would like to --

A The principal purposes of introducing these maps, the highway department maps, are to show the distribution of windmills that are used for stock watering throughout these four counties. You have to look very closely at the map because the windmills are not, otherwise, marked in color,

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they are represented by a small circle with two little horns representing the windmill blades, at the top, a little "v" mark and if you will look carefully at these maps, I'm sure most of you have looked at such maps in the past, you will see that in nearly every section of these four counties, you will find one and sometimes more of these windmill symbols which represent the location of stock wells. I might add that the maps are made from aerial photographs and stock wells are visible and identifiable on the aerial photographs, quite easily.

Q Well, how do those windmills show the presence and quality of water?

A Well, the windmills show that a well, as it exists at a particular place, that it is used for stock and stock use is one of the uses which is, to which fresh water is put to, in these four counties.

Q Have you used those maps on many cases to locate windmills?

A Yes, I have used these maps for a period of eighteen years in every County of New Mexico. I have used maps similar, identical to these, but in smaller format, quadrangle size, in much of the area of New Mexico, and I find them to be reasonably accurate. They do not represent, however, all of the windmills that occur in the given area, but all of the windmills that are

shown on them, engine or with few exceptions, can be found in the field. Sometimes the windmill may have been taken down since the photographs were taken, or the maps made, but you can usually identify the location of the well under which the windmill was located.

Q All right. Let's go on to Exhibit 11 just a moment. Did you prepare, that would be, 11a, b, c and d and those are again the County maps, they show the counties? Did you prepare those?

A No, these maps were prepared by the U. S. Geological Survey in cooperation with the State Engineer Office. However, I did not prepare the maps, but I did check the location indicated for each of the analysis and the values that are written on the map representing the analysis and I checked these data by going to the Geological Survey office in Albuquerque, and to the State Engineer office in Roswell, which has photocopies of the original analysis and I checked card by card, each of the locations against the location and the data plotted on the four maps.

Q You have found them to be accurate, then?

A Yes, they are accurate.

Q Now, you have not displayed Exhibit 12.

A I'm sorry, it is right behind you on the chair. I don't think we had room to put it up, perhaps at the time we

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introduced it.

Q Who prepared Exhibit 12?

A Exhibit 12 was prepared by or under the direction of Jim Light, Engineer from the State Engineer office in Roswell.

Q That is by the office you work for?

A Yes.

Q All right, Dr. Spiegel, would you refer to the Exhibits 1 through -- excuse me, this will be 2 through 5 of Mr. Ramey's?

A Yes.

Q And to your own exhibits and give the Commission your opinion as to whether or not there is a fresh water supply in close proximity to the Cato's San Andres Pool or do you have that one located?

A Yes, just one moment. I have some work maps with me upon which I have located additional data, not on the geological survey maps and the location of the pools, the base maps, my work maps are the same as Exhibit 11 and I may refer to them from time to time to give you the answers to your specific questions. I also have some notes here. Cato's Pool is in Township 8, South 30 East, Chaves County, right here. It is number 17 on Exhibit 2, There is fresh water in this entire township, 8 south, 30 east, that is in parts of the entire township. There are several stock wells, two houses, one

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which is now abandoned which have windmills, water supplies which we can presume were used for domestic use, one of the houses is quite large and substantial and, we don't have any water samples from these wells, from any of the wells in this area, but there are these two domestic wells and numerous stock wells, all of them showed in Diluvian or in triassic routes.

Q Have you seen those wells?

A Yes, I have.

Q All right, would you locate the Chaveroo San Andres Pool, please?

A The Chaveroo Pool is in Roosevelt County, 7 South, 33 East, the southern part of it, I believe that is number 16 on this map. I'm sorry, 6 on this map, it covers quite an extensive area in the red area here. There is ground water in the Ogallala formation in most of the Township and surrounding and all of the surrounding townships, the water is of good to fair quality and the water is used for stock and domestic use. Now, in the center of this Township, 7 south, 33 east, there are some areas where the rock surface, that is the triassic surface, is above the general water table in the Ogallala and in these areas, the Ogallala may be dry in small areas, however, the underlying rocks, triassic rocks, do contain fresh water. There are some wells in the triassic

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rock area where the Ogallala has been reported to be dry. There have been some wells drilled in this area which have been reported to be "dry", but, dry, in reference to wells, is a relative term. I think we all know that, that a dry oil well may be one which does not have economic production at the particular time that it is drilled or one in which no petroleum of consequence was identified. We all know that such wells have been reentered at times to produce oil. A dry well referred to, in the petroleum industry, may be one that produces large quantities of water and no oil. When we refer to a dry water well, when a water well is referred to as being dry, it means that insufficient water for the purpose at hand, in mind, was obtained at the time of drilling. For instance, a dry well that was drilled for irrigation purposes in an area where the wells are normally expected to produce three thousand gallons a minute, may produce four to five hundred gallons a minute and yet be considered a dry well by the driller or the owner. Therefore, I conclude from the data we have on the Chaveroo Pool area, that there is water in the entire Township and surrounding townships of the Chaveroo Pool.

Q Would you next locate the Allison Pennsylvania Pool?

A The Allison Pool is in 8 South 37 East, southern part,

I believe it is number 10. The magenta-colored one on this map. If we refer to Exhibit 10, map number 8a, Roosevelt County, we'll see that there are a number of stock wells shown in the area of this oil pool. On this particular, in this particular township, the oil wells are also indicated, show the location of the pool. The pool name is not identified but the wells are shown. This particular area is in the heart of the high plains, the eastern part of the New Mexico high plains, where ground water is found of good quality in the Ogallala and at times in underlying rocks of cretaceous or triassic age and therefore there is fresh water in the entire area.

We also note that from water level contours that have been constructed from the quality of water in the entire portion of Lea County and southern Roosevelt County, that fresh water is obtained, that fresh water moves generally eastward or south-eastward or south-southeastward and this sort of information is quite different from, the interpretation of this sort of information is quite different from the interpretation of oil pool data. Oil pools occur only in certain isolated localities. The oil is static and you must have very detailed data to determine whether or not oil is present in a particular place. But you do not need such specific data to determine whether or not water is present in

an area or whether or not the quality is of a particular type, because ground water occurs everywhere at some depth.

MR. PORTER: Excuse me. Dr. Spiegel, I believe they are requesting that now you talk into the microphone.

THE WITNESS: I'm sorry.

A The ground water occurs everywhere and it moves in determinable directions and once the general direction and formation in which water is, ground water moves, is determined one can make quite positive predictions as to the depth at which water will be found and the water level which will be measured or would be measured in a well drilled in a particular location and the quality of the water which you can expect in the location.

Q (By Mr. Hatch) Dr. Spiegel, would you locate the Artesia Pool?

A The Artesia Pool is in Eddy County, 18 South, 28 East. I believe it is this one in orange color, number 14 on the map. Is that right? 18 South, 28 East, no I think it is on this other map. This one in yellow, I am sorry, number 43. The ground water in this area is present in the creternia illuvian and the rustler formation. The water in the creternia illuvian in the vicinity of the pool, is excellent, very low in chlorides, from six to twenty-seven parts per million chloride. The water in the rustler in some parts of this area

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is on the poor side. We have water analysis in which the water is one thousand seven hundred and seventy parts per million chloride, the water is used for stock, the depth of this well is a hundred and sixty feet.

Q Dr. Spiegel, do you have any other particular pools that you want to talk about at this time?

A No, I have none, specifically, I have additional information on other pools specifically and I also have general information on the occurrence of fresh water in the entire area.

Q Of course, there are many pools here and you have visited some of these as you have stated that you have. You haven't, of course, visited all of these pools, have you?

A No, I have not.

Q But using the information that you do have available and your experience and your education and without going to each pool in particular here in pointing out each pool, do you have an opinion as to whether or not there is fresh water or supplies of fresh water existing in substantially all areas?

A Yes.

Q On these four county areas where oil and gas production occurs?

A Yes, I think there is fresh water in substantially all of the areas of these four counties in which oil production

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has been obtained and in fact fresh water exists in substantially all of the four counties. There are some areas in which water is extremely high in chlorides and dissolves solids, particularly in the Slato and certain portions of the rustler formation where the heads in the salt water from the underlying formation are higher than the rustler water heads and therefore have caused some salt water to enter by natural means into the rustler. However, except for this particular case of the formation in certain areas of the rustler, I think there is fresh water in substantially all of the remainder of these four counties. I have no knowledge that would indicate that there is not fresh water in or in very near proximity to each and every one of the oil fields, oil pools in these four counties.

Q Now you are familiar with the map that was introduced as Exhibit 1, that accompanied the letter from the State Engineer's office?

A It is gone now, but, yes, I think I know which one you mean, yes. This is it, I think.

Q Do you agree that the statement that that map would show the existence of fresh water or formations that commonly contain fresh water existing all over the entire four county area?

A Yes.

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Q Did you hear Mr. Ramey testify as to the amount, type and location of the produced water in the counties of Lea, Eddy, Chaves and Roosevelt?

A Yes.

Q And to the surface disposal of a part of that water?

A Yes.

Q Did you also hear his testimony as to the chloride content of certain water wells?

A Yes.

Q And to the location of water wells in relation to surface disposal pits?

A Yes, I did.

Q Those were exhibits 9a through 9f, do you have a copy of that exhibit handy? Do you have an opinion as to whether or not those wells are contaminated at this time and if so how they, what caused the contamination?

A I think that each and every one of the wells referred by by Mr. Ramey this morning, have been contaminated on the basis of the information which he provided, and also on the basis of information which I have obtained independently in most cases not knowing the exact data that he had to present today, and I am quite certain that each and every one of these wells has been contaminated by artificial cause. There is absolutely no reason whatsoever, to suspect that water of such

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high chloride could possibly have gotten into these wells by the normal process of pumping water from these aquifers. In the areas of each of these wells, the water levels in the shallow aquifers are higher than the water levels pertaining to the deeper aquifers and much higher by several hundred feet than the water levels in the very deep aquifers which contain high chlorides. There is no way for water from these deep aquifers to get to the shallow ones unless it is pumped out and put into the shallow aquifers, either by direct injection, by leakage from oil field tubing and casing or from the pits into which the water pumped out of the deeper saline aquifers is placed. Since the pits into which this water is commonly placed and has been placed in the past in nearly every oil pool, leak and if they don't leak under natural conditions or made to leak, it is to be expected that this would be the principal method of contamination. That is possible that in certain areas contamination is artificial by such processes as leakage from a water line used to convey saline water from a well to an injection well or disposal pit or leakage from the conduits containing mixtures of petroleum and water, but I think that the conduit containing mixtures of oil and water are policed very carefully to avoid such leaks. I'm quite sure that there are occasionally leaks in spite of efforts to avoid the loss of petroleum and the accompanying water, but since the

efforts to prevent leakage from pits has been negligible in many cases, in fact just the opposite, the pits have been so constructed so that they would leak, I think it is likely that the pits in general, are the most common source of contamination. Now, since the quality of the water --

Q Dr. Spiegel, is it your testimony that water in those wells should have had a lower chloride content than is shown on the exhibits and by Mr. Ramey's testimony?

A If they were not contaminated, yes, because either of the earlier analysis of the same wells showed that the chloride was very low or we have other wells in the same formations in the new vicinity that show that the quality is generally low in those areas.

Q Do you have any information as to what you would have expected the quality to be in each of those wells under natural conditions?

A Yes.

Q Would you give it for each of those, please?

A I think that Exhibit 9A shows that the original quality of water in a well, in a well located in Section 2 of 18 South 34, was 35 parts per million chloride. I don't have the date of that original analysis, but I do have analysis which show that the normal chloride in that area in the Ogallala formation is between 24 and 47 parts per million of

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chloride. The water level in that area is normally about thirty-nine hundred and twenty-five feet and the water moves southeastward. The water level in the triassic rocks is at least twenty-five feet deeper and the quality is somewhat different in the triassic rocks, but the chloride is still low and water levels in deeper aquifers with high chlorides are a hundred to two hundred feet deeper or more.

Q Would you go on to the next one please?

A Exhibit 9b, a well in Section 19, 18 south 38, the analysis, the first analysis reported was one thousand and seventy chloride in the vicinity of this well, data taken in 1955, another well nearby showed two hundred and seventy chloride and in 1958 another well, two hundred chloride. However, both of these wells in my opinion, are also contaminated since the normal chloride in the Hobbs area, northwest of Hobbs, ranges from thirty-eight to approximately fifty. There are some analysis as high as sixty-five, but these may also be contaminated. Exhibit 9c, reported data from two wells in Section, I believe that was 27, north of Eunice. The data from one well shows a large increase from three ninety to nine hundred and twenty chloride. I want to refer to my work map on this area to see what the quality -- I don't have the notes on this one, I don't think. I have two analysis in this area, short distances to the northeast in Section 24 of

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22 South, 37 East, one of which has chloride of five hundred eighty parts per million. The other seven hundred and seventy. However, I think that these both represent contaminated waters. The normal chloride in this area as represented by wells a few miles to the northeast is about a hundred or less parts per million, in fact, we had a difficult time in this area because there has been so much water production, salt water disposal that practically none of existing analysis are to be considered as uncontaminated.

Exhibit 9d. In a well in Section 9 of 22 South 36 East, the chloride reported two thousand nine hundred and thirty-nine in April of 1967, my data show that in the cretaceous or cretarnia rocks overlying the triassic rocks, the water is of generally good quality in this area, normally less than a hundred parts per million, again generally contaminated in local areas. The water in deeper rocks, the triassic, is twenty-five feet lower in water level has good quality water and analysis made in 1965 by the State Engineer's office shows two hundred chloride in triassic rocks.

Q If on each of the others you will just give what you in your opinion, would expect in its natural condition.

A All right. The Exhibit 9e, in Section 24 of 25 South 37 East, the normal quality of water in this area would be on the order of fifty parts per million chloride. Exhibit 9f, a

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well in Section 31 of 16 South, 37 East and I believe that is called the Number 8 Well of Lovington. I have analysis from the Public Health Department as well as the State Engineer's office and that data reported by Mr. Ramey and an analysis of the nearby well number 5 of the Lovington Supply which corroborate the increase in chlorides in the last two years. The normal chloride in that area would be from thirty to fifty chloride, thirty to fifty parts per million chloride.

Q Dr. Spiegel, I don't think you have identified how you used Exhibit 12 and Exhibit 12 is made up of how many parts?

A Exhibit 12 is the Capitan Basin, I guess I didn't refer to that. That Exhibit has additional data on the quality of water in the Capitan Basin that is not shown on Exhibit 11.

Q What additional information is shown on Exhibit 12?

A These analysis are analysis made by the State Engineer's office in a routine investigation of water level and quality of the water in the Capitan Basin in 1965 and 1966.

Q Does it show all of the wells in the area?

A The Exhibit shows what is estimated to be about ninety percent of all water wells in the area.

Q So it shows the depth of the wells as well as water quality?

A It shows the depth of the well, it shows water level,

if the water level could be measured or has been reported by the owner and it shows the chlorides of wells which were pumping at the time of visits and the total solids of water from those wells at the time of visit. Wells which had produced water into a stock tank were not sampled because there can be minor changes in quality in the tank either by dilution of drain water or concentration by evaporation.

Q You say that just covers the Capitan area?

A Just the Capitan area.

Q Dr. Spiegel, did you testify in Case 1053?

A Yes.

Q Do you recall your testimony in that Case?

A Yes, I think I do.

Q Did you testify in that case as to the presence of fresh water in certain parts of the southeast?

A Yes.

Q And as to the definition of fresh water?

A Yes.

Q Did you also testify as to how contamination has occurred and as to the probability of future contamination?

A Yes, I did.

Q Would your testimony to such matters be substantially the same today?

A My testimony with respect to the method of

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contamination and the actual contamination in Lea County, would be substantially the same. I would make, if I were to testify to the same questions today, I would be much more emphatic that the saline water put into disposal pits goes down into fresh water, that it goes to the base of the aquafer or aquifers in the area and that the water, I would be much more emphatic that the water moves in a general direction of the ground water movement, but I would add that the details of the movement of water at the base of the principal fresh water aquifers would be guided very strongly by the configuration of the base of the aquifers. That is the original valleys and possible sink-hole valleys that occur in what are called the red bed or other rocks which lie below the Ogallala and Deluvian in Lea County and the fresh water being the salt water which goes to the bottom of this aquafer and moves very slowly, generally southeast, along these valleys does contaminate the fresh water supplies in the area. However, the contamination is identifiable principally in the vicinity of heavily pumping wells that happen to be located near these areas of accumulation of the brine.

Q Dr. Spiegel, if a well becomes contaminated, how long will it remain contaminated or is it easy to decontaminate?

A Well, the well would remain contaminated until all of the brine had been pumped out of the well. Now, if the

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brine is pumped out and put on the surface again, of course, it will move back into the aquafer and recirculate and therefore it will remain eternally. If there is no known natural method of purifying the brine or for the brine to become purified as it moves through the aquafer.

MR. HATCH: If the Commission please, I would like to move to incorporate the record in Case 1053 into the record of this hearing and would also like the Commission to take administrative notice of Order R-1224 and 1224A that was issued as a result of the hearing held in that Case.

MR. PORTER: If there are no objections these will be included in the record and incorporated into the record of this hearing.

Q (By Mr. Hatch) Dr. Spiegel, do you have anything else you would like to add to your testimony?

A No.

Q It is your testimony that fresh water exists in substantially all areas of the four counties under consideration?

A Yes.

Q And is it your testimony that disposal of produced brines into open pits or unlined pits presents a hazard to that fresh water.

A Yes.

MR. HATCH: That's all the questions I have on

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direct. I would like to --

Q Dr. Spiegel, you have already said that you did not prepare Exhibit 10a, b, c, d and e or 11 a, b, c and d, but you have used those, right?

A That's right. And I have checked the accuracy of these maps.

Q And that the State Engineer's office did prepare Exhibit 12?

A Yes.

MR. HATCH: I would like to move the introduction of Exhibits 10a through 10e, 11a through 11d and Exhibit 12, at this time.

MR. PORTER: Any objections? The Exhibits will be admitted.

(Whereupon Oil Conservation Commission's Exhibits 10a through 10e, 11a through 11d and Exhibit 12 were admitted into evidence.)

MR. PORTER: Dr. Spiegel will be available for Cross Examination, at 1:00 o'clock. We will recess the hearing now until 1 P.M.

MR. PORTER: Mr. Hatch, have you concluded with your direct examination of the witness?

MR. HATCH: Yes, I have.

MR. PORTER: The witness now, is subject to cross examination if anyone would like to ask him a question, please

come forward and use one of these microphones, please. Mr. Losee?

CROSS EXAMINATION

BY MR. LOSEE:

Q Dr. Spiegel, is it your testimony that contamination has occurred to all of the fresh waters in all of the four counties in southeastern New Mexico?

A I believe I testified that the water from, that has leaked from pits, wherever there are pits, has contaminated the fresh water supply in that vicinity.

Q Now, is that all of the fresh waters, not just the Ogallala?

A The fresh waters that are contaminated include water in triassic rocks, the sand zones of the Tingley formation and the Santa Rosa formation and possibly some areas where it is present in subsurface cretaceous rocks.

Q But that is all of the fresh waters that are present in southeastern New Mexico?

A Excuse me, and also in the rustler formation.

Q Dr. Spiegel, if I am correct, the only specific examples of contamination which you referred to on your direct examination were Exhibits 9a through f?

A Yes.

Q Is that correct?

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A Those are the only ones I referred to.

Q What other sources do you have available as to why or where contamination occurred in southeastern New Mexico?

A I have a list of a number of other wells which the evidence shows have been contaminated.

Q But those have not been introduced before the Commission at this time.

A No.

Q Dr. Spiegel, would you locate with the pointer, please, each of these wells on those two easterly maps which I think are Exhibits 2 and 3, right behind you. I will give you the Section, the Township and the Range. The first one shown on Exhibit 9a is located in Section 2, Township 18, South Range 34 East.

A Witness complies.

Q The second one is located in Section 19, Township 18 South Range 38 East. There ought to be a light circle where I have drawn during the noon hour.

A Section 19?

Q Yes. Township 18, South Range 38 East.

A There is a light circle, but it is in 17. This is 19 here.

Q Exhibit 9c is Section 27, Township 21, South Range 37 East, 21, 37 Doctor. Township 21, South Range 37 East.

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A 21 South?

Q 37 East.

A 37 East. There is a circle here. Section 14, did you say?

Q Well, it is actually Section 27, but I think that is in the colored area.

A Yes, 27 is here, just north of the town of Eunice.

Q Incidentally, while you have mentioned that Doctor, do you know if it is not a fact that these wells shown on 9a through 9f are all high withdrawal rate wells?

A I don't know that, no.

Q Does that well serve the City of Eunice that you are just now referring to?

A I don't recall whether it is or not. I may have it in my notes. No, I don't know who owns the well or for what purpose it is used.

Q Or the withdrawal rates out of any of these wells?

A No, I don't think I do.

Q Well, let me ask you this question, doctor. Isn't it true that a well with a high withdrawal rate is more likely to show an increase in chloride than one with a steady withdrawal rate?

A You mean a low? One with a high withdrawal rate is more likely to show contamination, other things being equal

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than one with a low rate when it is not being pumped, yes.

Q And isn't it also true Doctor, that the amount of recharge to the water-bearing formation surrounding the well, one with a high recharge rate would show less chlorides than one with a lower recharge rate?

A If a well had near it an unusually large source of recharge of fresh quality water, of good quality water, compared to another well and in the vicinity of both these wells there were brines that could contaminate the wells, probably the one with the larger recharge rate would show less, indicate less contamination, but this is not definite.

Q Well --

A It depends upon --

Q Well recharge is a factor in contamination, isn't it?

A No, recharge, if it is normal recharge that goes on from year to year, is the same and, is a steady condition, in other words. The contamination from brine is not a steady condition, it is something that is superimposed on, in the natural system and if in both of these two cases you are talking about the recharge being different values were steady, it would not affect, it would only affect what is the normal quality of water in the area anyway and if the qualities of water were the same in both, the amount of recharge would not affect the conditions. Now, if in the vicinity of one well,

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the recharge were increased, this would be something else. The water level would continue to rise and the quality might become a bit better.

Q Well, Doctor, let me ask you a simple question. Is recharge, the volume of recharge a factor or is it not a factor in determining contamination or the increase or decrease of chloride, the recharge of fresh water?

A Not if the recharge is a steady thing. If it suddenly increases, yes. If you, of course, --

Q Well it is a factor then if it increases?

A If the recharge increases it would become a factor.

Q Thank you Doctor. Let's go back to the map, Exhibit 9b, Township 22 South Range 36 East, Section 9.

A In the north central part of this orange pool, labeled number 88 in Section 9.

Q Refer to what is marked Exhibit 9e and that well is located in Township 25 South Range 37 East, Section 24.

A Section 24 is on the east edge of this very large red area labeled number 95, east of Jal.

Q And now Exhibit 9f locates a well in section 31, Township 16, South Range 37 East, 16, 37.

A Well, Section 31.

Q Yes.

A Would be here near this number 1 on the map.

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Q Now, Doctor, these six wells that you have just located for us on the map, are the only six wells in which you have offered any specific data with respect to contamination to the Commission, is that correct?

A Yes.

Q Would you take the pointer and draw a circle not larger than the area, the uttermost area of those wells?

A I'm sorry, I don't understand what you want me to do.

Q If you will take the pointer and cover that particular area in southeastern New Mexico of which any of those wells are located.

A Oh.

Q Just encompass the area.

A Well, I think 16 South near Lovington is the farthest north.

Q North.

A And the farthest south is somewhere in 25 South near Jal and --

Q The furtherest easterly well, is the first one?

A Yes.

Q It is located in 18, 34?

A The furthest westerly you mean.

Q Westerly, excuse me.

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A Over here, yes. Okay. It is roughly the south east quarter of Lea County.

Q Now, that map that you have been referring to, with the pointer, covers Eddy and Lea Counties and the map above it covers Chaves and Roosevelt, does it not?

A There is part of Lea County in the upper map, part, yes, there is part, essentially, but there is part of Lea County in the upper map also.

Q But there has been no specific evidence of contamination offered in any wells on that northerly map or in any wells westerly on the southern map of the point you located.

A There has none been offered by Mr. Ramey, but I have evidence that there is contamination in other parts of the map.

Q But it hasn't been offered at this time?

A No.

MR. LOSEE: I think that's all.

MR. PORTER: Does anyone else have a question of the witness? You may be excused.

(Witness excused)

MR. PORTER: The Commission will recognize Mr. Heiddel at this time.

(Witness sworn)

MR. PORTER: Take the stand at the end of the table Mr. Hiddle.

MR. HEIDEL: Gentlemen of the Commission. I appear here as I mentioned earlier, as an attorney for the City of Lovington.

PHINAS HEIDEL, first having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HATCH:

Q Would you give your name for the record, please?

A Phinas Heidel of Lovington, New Mexico and I appear as attorney for the City of Lovington, Lea County, New Mexico and also for the southeastern Lea County Fee Land Owners' Association which is an association of various land owners in the south part of Lea County. I appear also on behalf of various individuals and myself, individually and as State Representative of District One, Lea County, New Mexico and first with reference to the City of Lovington Wells. The City of Lovington about two years, floated a bond issue of a million three hundred thousand dollars and bought a farm ranch approximately six miles, five or six miles southeast of Lovington and that is in the vicinity, I believe, of south Lovington oil field and there were a few irrigation wells located on part of the premises. The City of Lovington, I

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believe did not purport, or use any of those for Lovington municipal purposes, but the city did drill nine new wells and built a pipeline and a pumping system to pump that water to the City of Lovington for municipal supplies. The nine new wells were drilled, each of them to the red bed or approximately so averaging about two hundred and forty feet deep and were cased all the way to the bottom and developed from that point. They were developed and each of them were generally capable of a thousand gallons or more per minute. When they were equipped and put on pipeline they were equipped with six inch pumps set for a pumping rate of three hundred gallons per minute and have been on line for oh, say, a year or a year and a half, more or less, and these wells, this water field is located generally, in the area of Section 31, Township 16, South Range 37 East, NM TM, Lea County, New Mexico. There has already been testimony here with reference to Well Number 8 and the Commission, I believe, has already placed into evidence the reports on that well. I have also information with reference to Well Number 5 that is pumping more chloride and other solids than are more than desired. Some question has been raised as to what the area, immediate area there of the other wells might be producing. I might submit for consideration -- now, I believe the February 1966 report on Well Number 8 was in the record, but if not, the

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chlorides at that time was 84 and then you have a report, I believe of December 15th, 1966 showing chlorides, 480.

When the City purchased this or before they purchased these water rights in this area, and developed this field, they tested several wells in the area, one of them called the North Well in the area, it tested chlorides of 32. The south well at the south edge of the area tested chlorides 65 and some of the other wells that the City has in the area, the Booster Station Number 2, chlorides 46 and well number 4, chlorides 54; well number 7, chlorides 43; well number 9, chlorides 40; well number 11, chlorides 41; well number 12, chlorides 79 and well number 13, chlorides 85 and so forth. So I bring that to your attention, generally, to show what some of the wells in the area, the content is and then the matter of, particularly well number 8 and then well number 5. So much for the Lovington Wells.

MR. HAYES: May I ask you when you tested these wells, you didn't give the date, I don't believe. If you did, I missed it.

MR. HEIDDEL: I did not give the dates on those various tests. This north well was September 3, 1964, the south wells September 3, 1964, Booster Station Number 2, June 28th, 1966, well number 5, there was two tests on it, there was a February 14, 1966 when it showed 36 and then there was

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another test on it in December of this year that showed a higher content, I will have to locate it here in my notes, but going on here, well number 4 was October 5, 1966, well number 7, October 5, 1966, well number 9, October 5, 1966, well number 11, October 5, 1966, well number 12, October 5, 1966, well number 13, October 5, 1966, well number 7, I don't know whether I have given that or not, but here is another one that was tested February 14, 1966 and well number 9, another report on February 14, 1966.

MR. HAYES: Thank you.

MR. HEIDDEL: And if the Commission desires why these analysis by the State Health Department, will be made available on these additional wells to which I have testified.

Now with reference to other problem areas, first I would like to mention in passing, that the Texas Legislature held a hearing down in Big Springs, Texas, last Fall and there was a newspaper story, El Paso Times Associated dateline of August 6th, 1966 and that news story showed that the west Texas area had the problem that you are considering today. This hearing was testimony before the House, inland salt water pollution control commission and appearing there, according to this newspaper story, was G. L. Hamilton, the Kent County Commissioner testified, Aubrey C. Simpkins, water superintendent for Sweetwater testified, Ed Perkins, County Judge of

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Fisher County testified, Roy D. Payne, director of Field Operations for the Railroad Commission of Texas, testified; Gerald Nugent, Akron County Judge testified; Martin Cleveland who was assistant manager of the water district in that area, testified; Creek Reservoir, excuse me, he is the Texas municipal water district and no doubt, many others. But they all generally testified that their areas were being contaminated by oil wells and in particular salt water disposal. And I have here a clipping from the Oil and Gas Journal of April 10th, 1967. There is a news story that the State of Texas and is headlined "Unlined Brine is Banned in Texas" by the Railroad Commission. It won't take effect until January 1, 1969 and while it prohibits the use of unlined pits for storage or evaporation of brines, they will permit some collecting pits, but must be with approved salt water disposal program. Individual exceptions may be obtained for good and sufficient cause, and so forth.

I would call the Commission's attention to some additional wells that I have information on. I have handed the Commission a letter summarizing this problem and I will condense it as far as I can that the Marathon Oil Company Well has a water well in the northeast quarter of the northeast quarter of Section 13, Township 22, South Range 36 East, Lea County, that was originally drilled for domestic purposes for

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a pumper dwelling house, but the house was ultimately moved away and I am informed that one of the reasons was there was not sufficient water for domestic purposes. I am now informed that the well is now flowing and the quality of the water is unfit for human consumption. And on the, attached to my letter on Exhibit B, what I have marked as attached to my letter as Exhibit B, the analysis of the water in that well is shown and for instance, the chloride content is 610, six hundred and ten total dissolved solids three thousand two hundred. There are several pit locations in the area, some about a half a mile west, serving four or five producing wells, oil wells producing from about thirty-eight hundred feet and the water from those wells, from that pit is shown on Exhibit C attached to my letter. Also there is another pit located about a half mile south and it is shown on Exhibit B of the letter. So it is rather significant that this water well is now flowing from a shallow formation and I believe this is the well that was testified to earlier today, that there was a rancher using the water from the pit for livestock purposes, but I call your attention that the analysis of this water from this pit shows that it is unfit for human consumption.

Paragraph three of my letter, I call your attention, to the McCall Well on Exhibit B. This well is located in the northwest quarter of Township 21, Range 37 East, Lea County,

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at the north edge of Eunice. The analysis on this well shows that the chloride content is seven hundred and ninety and total solids, two thousand six hundred. Another well on Exhibit E is the Barclay Well, no wait a minute, it is on Exhibit E in the same general area, this likewise is, I believe within the town site and I believe at the north edge of Eunice. The Barclay resident well shows chloride content of one thousand three hundred and fifty, total solids, three thousand seven hundred.

Then on Exhibit F of my letter, the Pilcher Well, John Pilcher residence at 400 Avenue I, Eunice, New Mexico, the chloride content is, by the analysis shown to be two thousand four hundred and twenty-eight, total hardness, two thousand six hundred and eighty. I am also informed, I do not have detailed information, but I am informed that Skelly Oil Company has approximately five domestic wells in the area that are, if tests were run would probably show similar conditions.

I call the Commission's attention that there are many salt pits in the areas of these wells and I would call your attention that there is an oil well located in the southeast quarter of the northeast quarter of Section 27, Township 21, South Range 37 East, NM PM, which has a faulty bradenhead and the water is draining out on the surface. The

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quality test of this water is shown as item four of Exhibit G of my letter and it shows that the chloride content is six hundred and three and it shows a total hardness of two seventy, but I think that is in error, but anyway, because it doesn't jive with the chloride content, but I would call your attention to the other two tests shown on Exhibit G, particularly the third item on Exhibit G which concerns a water well in the northwest quarter of the northeast quarter of Section 27, Township 22, South Range 37 East, Lea County, that there is oil and gas in the water and that no reliable test could be made on the McCall well. I just mentioned is located very close to the oil well that has the faulty bradenhead. I would go to item four of my letter. I call the attention of the Commission and ask you to take judicial notice of, that Union Oil Company filed application No. CP-364 and CP 364-K with the State Engineer on May 23, 1966, to change location of shallow wells by amendment, existing wells, and commencing the use of new existing wells in the same section and these new wells were, are already drilled to the depth of one hundred and twenty-eight feet, another one a hundred and forty feet and for the purpose of continuing the rights of, for creating six hundred and thirty-six acre feet for industrial use located in the Dollarhyde Gasoline plant in Andrews, Texas. My information is that one of the reasons for this application

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was for the , because the old well had commenced to produce so much salt that the water was not useable in the gasoline plant and it is to be noted that there are salt water disposal pits in the area of the old wells.

The next item is paragraph five of my letter. I am informed that there is a recently drilled well, perhaps it is two or three years old now, approximately three hundred feet deep, a water well at the Burke Junior High School at Jal, New Mexico, and the water that is now being pumped from that is not potable for human consumption and is being used only for watering grass, but a more disturbing fact is that they are flaring gas from this water well. Item six, the Brock well has already been touched upon.

Item 7 doesn't deal with the immediate problem, but I do call attention to the State Engineer since he is here today, that the Windmill Oil Company at the northwest edge of Hobbs has about fifty wells in the process of skimming off oil off of our fresh water depths of about sixty feet, but other wells that I call to the attention of the Commission are each in my letter and I call the attention to the Snyder well located in the southeast quarter of the southeast quarter of Section 22, Township 22, South Range 36 East, NM PM, as shown on Exhibit E attached to my letter and it shows that this well, the analysis, chloride thirteen hundred, total

solids, three thousand.

The item nine of my letter as I call your attention to a filling station water well in the northwest quarter of Township 21 South Range 36 East, NM PM and the Simms water well located in the northeast part of the southeast quarter of Section 32, Township 21, South Range 37, East, NM PM, the analysis as shown on Exhibit E of my letter. The filling station well has total chlorides four hundred and fifty-four, total solids seventy-five hundred. The Simms well has total chlorides of four hundred and fifty-six and a total dissolved solids, two thousand one hundred. On these two wells you will note the date of these reports was shown on the Exhibit. This analysis report is dated April 12th, 1967. I am informed that out on the Lynum Ranch, five or six miles west of Hobbs, that there are one or more good water wells that have recently become unfit for human consumption and that there are several brine pits nearby. I do not have analysis or detailed information. Other wells that I have just recently received information on, but no analysis, is a well in the southwest quarter of the southwest quarter of Section 34, Township 23, South Range, 36, East, NM PM, that there is complaint on.

I would also call attention to a problem I think that perhaps the Oil Conservation Commission might have in its

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files. If not, I am sure that the State Engineer has in his files and that is the Curmack Potash Wells out to the southwest of Hobbs. I am not sure of the exact Section number, but I think it was a problem there a year or a year and a half ago, after putting their wells or their pipeline over there to the potash lines between Hobbs and Carlsbad, that at least one, perhaps one of the wells became salty and such salt content that they could not be used in the mining operation. In the area of Section 2, Township 21, Range, 33 East, NM PM, known in the area as part of the DC Berry Ranch, the well at the house used to supply house water at least, was abandoned in 1957. It became unfit for irrigation, livestock and human consumption. Previously there was a good well there. The analysis of water from that general area and the sources shows chloride content of one thousand seven hundred and forty-seven. The new well was located and is being used for domestic purposes and livestock purposes and so forth and it contains 8 parts per million. And I have a picture here of some of the salt water disposal pits in the area. Here is one picture in the northwest quarter of the southeast quarter of Section 34, Township 20, Range 34, one in the northwest quarter of the southeast quarter of Section 2, Township 21, South Range, 33 East, another one in Section 2, Township 21, South Range 33 East, another one in the southeast

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quarter of the southeast quarter, Section 2, Township 21, South Range 33 East and I might say that is to the amount of water going into these pits in this last one, there is approximately two thousand barrels of water per day going into that one and the one before that is four hundred and fifty barrels and that pit is only a quarter of a mile away from the present Berry supply well and then the first pit that I mentioned, it is now receiving approximately twelve hundred barrels per day. However, it may be greater today, I think that on some new pumps recently, there is another pit in the southeast quarter of the northwest quarter, Section 35, Township 20 Range, 34 East, that is producing eight hundred barrels -- there is eight hundred barrels per day going into that pit, so I think there is a real contamination problem there and these pictures I would offer to the Commission for whatever use they might like to make of them.

Leaving the -- well before leaving that area, I have some letters here from land owners. Here is a letter signed by Clyde N. Cooper that calls attention to the southwest quarter of Section 1, Township 25 South Range 37 East. Well, this talks about the Union Oil Company of California, the two wells that became salty in 1966 and which they had to abandon. On this Section and on Section 2 adjoining Section 1 on the west, there is a number of large salt water disposal pits and another letter

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from the same gentleman, on the southeast quarter of Section 28, Township 25, South Range 37 East, we have the water well making considerable amount of gas. On this quarter section there are two old Queen Sand wells which have been shut in for at least fifteen years and one deeper well which is still producing. A letter from Fred D. Cooper, "In the fall of 1947, I bought the Madge Humphries Ranch, south and west of Jal, New Mexico. Ralph Lowe was drilling their Lynley No. 2 in the center of the southeast quarter of the northeast quarter of Section 23, Township 25, South Range 36 East. It was parked as dry, but the driller told me that there was lots of water at about fifty-five feet. I soon drilled and found it as he said and although I knew the water was not entirely fresh, I set a windmill and watered my cattle. A year or so later, some pits three-quarters of a mile east of there belong to the City Service dried up and so did my well."

Another letter from the same gentleman, "There is some thirty to forty acres in the southwest quarter of Section 14, Township 24, South Range 36 East that Continental Oil Company has destroyed the salt water pits piece by piece. This land will probably never be reclaimed and certainly not in my lifetime."

Now to move on to another area. To the north end of Lea County and the south edge of Roosevelt County, I have three

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color slides here of pictures, one relates to the Ingram State Number One, Section 32, Township 8, South Range 38 East, submitted by Mr. W. E. Bilbree -- M. E. Bilbree, I guess it is. And another one, Ingram State One, Section 32, Township 8, South Range 38 East, submitted by the same gentleman. And another one the Ingram Number One State, Section 32, Township 8, South Range 38 East submitted by the same gentleman. These pictures show some of the operations up there. Mention was made earlier about the new oil field west of Tatum which I believe, that is the North Bagley that I pointed to there on the map, that in the operations there there is instances of perhaps, of the water not staying in the pits and there is also instances of

the pits so the water would drain more freely, and that was called to the attention of the Oil Conservation Commission in Hobbs and part of the other problems there and I believe, Mr. Timmons, of the Hobbs office made a field inspection and found that, and I will leave this up to the records of the Commission, found that perhaps there was a minimum of the problem. In other words, records showing that wells were producing, say a hundred barrels per day when in fact they were producing a great deal more of that. In other words, apparently, to show that there is no real problem in that area, so I think the Commission is well-versed in that problem. I believe that completes my initial presentation. I will try to answer any

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questions.

MR. HATCH: Do you have all of those exhibits marked?

A They are marked and attached to my letter except these pictures which I have just handed over to the Commission.

MR. PORTER: It is your desire to offer these exhibits into the record, Mr. Heiddel?

MR. HEIDDEL; I do.

MR. PORTER: Is there any objection to the admission of Mr. Heiddel's exhibits? They will be admitted.

(Whereupon Phinas Heiddel's Exhibits were admitted to evidence)

MR. PORTER: Is there any questions of Mr. Heiddel? I never thought engineers would overlook an opportunity to cross examine a lawyer. He may be excused.

MR. HEIDDEL: Thank you, Commissioner.

(Witness was excused)

MR. PORTER: Does anyone else desire to present testimony? Mr. Kellahin?

MR. KELLAHIN: Jason Kellahin, appearing for Standard Oil Company of Texas. We have one witness I would like to have sworn at this time.

(Witness sworn)

D. C. HELM, called as a witness, first having been

duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A D. C. Helm.

Q By whom are you employed and in what position, Mr. Helm?

A I am Production Foreman for Standard Oil Company of Texas Division of Chevron Oil Company.

Q And where are you located?

A Here, in Hobbs.

Q Do you have anything to do with the production of oil and the disposal of produced brines in the southeastern New Mexico, the four Counties covered by this hearing?

A Yes, sir.

Q Have you prepared an exhibit, Mr. Helm, that shows the disposition that is being made of water produced by Standard Oil Company of Texas?

A Yes, sir, I have.

Q Would you have that marked as Standard's Exhibit Number One, please?

A It has been so marked, yes, sir.

Q Now, referring to what has been marked as Exhibit Number One, on the original exhibit there was one pool omitted,

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is that correct?

A Yes, sir, there was. It produced so little oil and so much water, that we overlooked it.

Q Now, going through the exhibit of the pools in which you are operating, what disposition is being made of the water?

A Well, generally, this exhibit is a tabulation of this, sir, and we are producing at this time, from a total of one hundred and thirty-five wells that Standard operates here in Lea and Eddy Counties, a total of about fifty-eight hundred barrels of water a day and at the present time all, about eight-tenths of one percent of that is being put into some type of disposal system. We are presently pitting about forty-five barrels of water a day from these total eleven fields that we operate.

Q Now, the exhibit shows as to the Bagley field, you are disposing of all of that water by sub-surface disposition, is that correct?

A Yes, sir. Basically, we have one lease that has not as yet been connected to the vacuum salt water disposal system, but it should be this week.

Q So that will cover all of your wells in the vacuum?

A Yes, sir.

Q Now, as to the surface disposal, would you outline which pools are affected by that?

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A Yes, sir. We basically have two pools which we are not disposing of water through an underground system or have some plans to do so and that would be the Scarbones Springs Field in Lea County where we produce approximately eleven to fifteen barrels of oil a day and about thirty-seven barrels of water and that is pitted and in the State Line Ellenberger Field in Lea County, where we have three wells, we are producing approximately eight barrels of water a day from those three wells that is pitted.

Q Now, you are producing water in the Maljamar that is not being disposed of?

A We are, at this time, the Maljamar Field is under a secondary recovery project and we are using approximately ninety percent of the produced water for reinjection purposes and we do have plans to use a hundred percent of the reproduced water for reinjection purposes.

Q That will be in the very near future?

A Yes, sir, within the next ninety days.

Q Now, as to the Scarbones Springs Pool, what disposition do you propose to make of that water?

A Well, if the Commission enters an order as they are considering, we will explore the possibility of a cooperative disposal system as has been installed in other areas or look at an individual disposal system using the well that we have. If,

in fact, it appeared that this produced water would furnish a possible source of contamination.

Q Now, have you had any experience with entering into cooperative disposal systems?

A Yes, sir.

Q Does it take a little time to work those out, Mr. Helm?

A It certainly does.

Q On the basis of your experience, would you make any recommendations to this Commission as to the effective date of any no-pit order?

A Well, my opinion and our opinion, would be that any no-pit order should grant completely sufficient time to allow for the formation of these things. We would look on something in the order of six months or eight months, delay to be something reasonable.

Q Now, as to your State Line Ellenberger Pool, you are producing approximately eight barrels of water a day. What do you propose to do as to that pool?

A We would like to see some means provided should the Commission take the action that it is proposing here for exception to be granted in instances where investigations showed the amount of water produced or the location of where it is produced, would not bring a great amount of potential

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damage on any fresh water that might be developed, to allow us means for exception in this, some reasonable means for exception in these types of instances.

Q Would you propose an administrative procedure for granting the exception?

A We definitely would, yes, sir.

Q How would you propose to give notice to those parties who might be affected by the disposal of brine in open pits?

A Our viewpoint would be that, say, newspaper notice might possibly be satisfactory and provide the means necessary to inform all those concerned under some type of provision as set up by the appropriate authority or some other type of public notice that might be deemed better.

Q Then, in the event of an objection, you propose to have a hearing on the application, is that correct?

A Yes, sir.

Q Was Exhibit Number One prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time, I would like to offer in evidence, Exhibit Number One.

MR. PORTER: If there are no objections, the Exhibit will be admitted. Does anyone have any questions of the witness?

CROSS EXAMINATIONBY MR. PORTER:

Q As I understand, you would recommend some means of administrative exception in case the Commission should enter a no-pit order and that instead of limited notices as we have for other administrative procedures, that you would recommend that the matter be advertised and that a time limit be put on it for objections?

A Yes, sir, this is our viewpoint. It would be rather hard to determine, we feel, initially, who all the interested parties might be and it is our feeling that public notice, perhaps in a newspaper, would provide this without the chance of overlooking an interested party and that at some reasonable time after such notice has been posted, that the Commission could take such action as deemed appropriate.

MR. PORTER: Does anyone else have a question?
The witness may be excused.

THE WITNESS: Thank you, sir.

(Witness excused)

MR. KELLAHIN: That's all we have, Mr. Porter. Thank you.

MR. PORTER: Does anyone else desire to present testimony? Mr. Losee?

MR. LOSEE: If Commission please, I have one witness

to be sworn.

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

DIRECT EXAMINATION

BY MR. LOSEE:

Q Would you state your name and residence, please?

A I am Raymond Lamb from Artesia, New Mexico.

Q What is your occupation?

A I am a Geological Engineer.

Q And employed by what company?

A By Wilson Oil Company of Santa Fe.

Q Are you an officer of that company?

A Yes, sir, Vice President of Production and Engineering.

Q Have you previously testified before this Commission as a Geological Engineer?

A I have, yes.

MR. LOSEE: Are Mr. Lamb's qualifications acceptable?

MR. PORTER: They are.

Q (By Mr. Losee) Mr. Lamb, did this Commission appoint you in 1958 to any water study committee?

A Yes, I was appointed Chairman of the Wilson Pool Water Study Committee.

Q Now, would you locate the Wilson Pool area on the map directly behind you?

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A This area here, immediately across the Township line of 21, 34 and 21, 35.

Q Is Wilson Oil Company one of the producers of oil within that pool?

A At the present time, we are the only producer.

Q From what formation does the pool produce?

A The major part of oil production is from the Seven Rivers Reef.

Q What force drives the oil in this pool?

A Very active water drive.

Q During the period that you have been chairman of this water study committee, have you maintained any records with respect to the quality of produced water and of the water wells in the area?

A Yes, I have.

Q Do you have before you, the figures on the amount of produced water from your wells in this Wilson field for the period from 1957 down to date?

A Yes, I have.

Q What is the total amount of water that has been produced in this field?

A The total amount or accumulative amount is fifteen million, one hundred and seventy thousand, nine hundred and twenty-three barrels through January 1st, 1967.

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Q All right. What was the greatest amount of water produced in any one year?

A We produced one million, two hundred and eighty--one thousand, seven hundred and eighty-two barrels in 1958.

Q All right, what is the least amount of water produced in any one year?

A The least amount was in 1965, however, it was a close race with 1966 at four hundred and thirty-eight thousand, six hundred barrels.

Q Now, the water production is evidently falling off, is that also true of the oil?

A That's right.

Q What is the remaining life, if you have an opinion on the subject, of the Wilson Pool?

A Approximately, three years.

Q Now, would that be with the present rates or would there be any change in rates of oil production?

A Well, there will be a decreasing rate in oil production.

Q Would the same thing be true of water production?

A Yes.

Q Have you called the produced water to be analyzed as to its chloride content?

A Yes, I have, a number of times.

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Q You have the high and low chloride content being produced with the oil in that field?

A The high chloride content is 2240 with hydrogen sulphide at 650 and, that is the low. The high is 4280 with three hundred and thirty hydrogen sulphide.

Q Those are parts per million?

A Yes, that's right.

Q Have you, during this period from 1956 down to date, had any analysis made of any water wells in the area?

A Yes, we are the sole producer of fresh water in this area with the exception of a few windmills that belong to the rancher.

Q Please refer to the windmill that belongs to the rancher in Section 30, Township 21, South Range 35 East, and give the chloride content of that well in '56 and then again in '67, if you have those figures?

A The chloride content in 1956 was ninety-three with a .0069 hydrogen sulphide. In 1967, it was one hundred and fifty chloride and no hydrogen sulphide.

Q Please refer to one of Wilson's water wells located in Section 13 of the same township and range and give the chloride of that well in '56 and then again in '67?

A In 1956, it was 91.6 with no hydrogen sulphide and a hundred and fifty in 1967 with still no hydrogen sulphide.

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Q Refer again to Wilson's water well in Section 6, Township 21, South Range 35 East and give the chloride content for the well for 1956 and the present 1967?

A In Section 7, it is 24.8 in 1956 and one hundred in 1967.

Q Now, were these analysis, how did you determine the chloride content of these wells?

A These were a chemical analysis by Laboratory Service Company.

Q Now, are these water wells still within Dr. Spiegel's range for human consumption after eleven years and placing over fifteen million barrels of produced water on the ground?

A Well within the range that he specified in his testimony this morning.

Q Do your field employees drink any of the water from these wells?

A This is the sole source of water for our camp which includes four houses and an office, and so forth.

MR. LOSEE: I think that's all.

MR. PORTER: Does anyone have a question of Mr. Lamb?

CROSS EXAMINATION

BY MR. COOPER:

Q Can he give us the chemical analysis of the water he

produces?

A Of the water we produce with the oil, you want detailed?

Q Yes.

A Or do you want the chlorides or the solids?

MR. PORTER: The question was, can you give us chemical analysis of the water you produce, I assume with the oil?

A Well it may have preface what I am going to give you with the statement that in the various zones of the Seven Rivers Reef there is a wide range of percentages in solids. As a matter of fact, some of the upper reef zones will contribute fresh water useable in a house, other parts of the particular horizon will go on up to six thousand parts per million, but our normal that we use, the maximum is thirty-one thousand chloride -- thirty-one hundred chloride against forty-two hundred chloride. This is a random figure and you should know that because the chemical analysis of water in the Seven Rivers Reef is not uniform by any means.

Q That has all been pitted?

A I beg your pardon?

Q Has this water all been pitted?

A Yes, it has.

Q Open pits?

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A Yes, that's right.

MR. PORTER: For the record here, the questioner in this case, was Mr. Cooper.

MR. HEIDDEL: Mr. Porter?

MR. PORTER: Mr. Heidel?

MR. HEIDDEL: I have a question.

CROSS EXAMINATION

BY MR. HEIDDEL:

Q How deep are your wells that you just testified as being fresh water wells, at what depth are these producing?

A For the water wells?

Q Yes.

A It will run anywhere from two hundred sixty feet to four hundred and eighty feet and down to a thousand feet.

Q In other words, they are not what we call Ogallala wells on top of the red bed?

A No, we are out of the area of the Ogallala formation.

MR. PORTER: Does anyone else have a question of Mr. Lamb? He may be excused.

(Witness excused)

MR. PORTER: Does anyone else desire to put on a witness, put on testimony? Before we have statements, we are going to take a ten minute break.

(Short recess was taken)

MR. PORTER: If no one else desires to present testimony at this time, the Commission will recall Mr. Ramey.

JOE RAMEY, recalled as a witness on behalf of the New Mexico Oil Conservation Commission, having previously been sworn, was examined and testified as follows:

DIRECT EXAMINATION
(Continued)

BY MR. HATCH:

Q Mr. Ramey, you have already testified in this case before?

A Yes, sir.

Q You are still under oath?

A Yes, sir.

Q Do you have any statements that you would like to make at this time?

A Yes, sir, I do have.

Q The staff made this recommendation that the Commission write an order prohibiting the disposal of oil field brines in open surface pits in the southeast producing area?

A Now, in line with this, we have worked up proposed rules which are labeled, "Special Rules and Regulations Governing Produced Oil Field Waters in Lea, Chaves, Roosevelt and Eddy Counties, New Mexico" and this is marked Exhibit Thirteen.

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Q These are just proposals by some members of the staff?

A Yes, sir. This is staff proposals.

Q Would you go through that exhibit, please, thirteen, and explain it to the Commission?

A Yes, sir. Under Section A, the disposal of water produced in conjunction with the production of oil or gas or both, on the surface of the ground or in any pit, pond, lake, depression, draw, stream bed or arroya or any other manner which will constitute a hazard to any fresh water supply, is prohibited. Now, in line with this recommendation or in line with this order should the Commission write it, it would be our recommendation that the effective date be January 1, 1969. This would be for the area-wide disposal.

Now, it is further recommended that an effective date of July 1, 1967 be specified for the North Bagley lower Penn, the North Bagley middle Penn, the North Bagley upper Penn and the North Bagley Wolfcamp and the northeast Bagley Wolfcamp Pool. Further, in waterflood projects, the areas known only as waterflood projects, it is recommended that the effective date be January 1, 1968.

MR. PORTER: Only in waterflood areas?

THE WITNESS: Yes, sir. Now, the staff has also worked up for us some exceptions which we are offering at this

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time to the Commission, under Section B, exceptions to the foregoing prohibition to permit surface disposal of water, may be considered by the Secretary-Director of the Commission provided, one, water to be disposed of is potable water and contains less than one thousand parts per million, total dissolved solids. I think that portion is self-explanatory. Two, water to be disposed of contains more than one thousand parts per million, total dissolved solids, but contains less parts per million total dissolved solids than the shallow water occurring naturally within a radius of three miles to the proposed disposal site as evidenced by the analysis of the water produced by all water wells three hundred feet deep or less within such three mile radius, or under three, water to be disposed of contains more than one thousand parts per million, total dissolved solids and there are no shallow fresh water wells, three hundred feet deep or less within the three mile radius of the proposed disposal site or, four, water to be disposed of constitutes a total of not more than one barrel per day for the forty-acre tract being served by the proposed disposal site, but in no event shall exceed sixteen barrels per day. Five, water to be disposed of by evaporation of a surface pit of approved design which is equipped with an impervious lining and which provides adequate protection against overflow and accidental or intentional leakage or spilling.

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Q Those would be the five recommendations for administrative approval?

A Yes, sir.

Q Are those only the methods of applying?

A These would be the grounds for applying. Now, the method of applying, I will cover later.

Q All right. But, the Commission would not be bound by these determinations?

A No, sir.

Q Would you go on to the next part?

A In Section C, to obtain an exception to the Rule A of these rules, an operator shall first determine the section of Rule B under which he desires to qualify and shall then file two copies of the application with the Santa Fe office of the Commission and one copy with the appropriate district office of the Commission and each copy of the application shall be accompanied by the items specified. Qualification under Section One, Rule B, the application shall be accompanied by Item B1.

Q Mr. Ramey, I think you can skip that part, now and go on to part D, the attachments to the application.

A All right. Part D, attachments to the application. One, a complete analysis of a representative sample of the produced water to be disposed of. The sample to be taken by

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and the analysis conducted by a governmental agency or a recognized independent water analysis laboratory. The analysis shall show total dissolved solids and shall include, but not be limited to, parts per million sodium, calcium, magnesium, chloride, sulphate and bicarbonates.

Q All right, now, those are attachments that will be required under, if you were applying under Section One of Rule B. Would that be all that would be required of that?

A Yes, sir, as I understand.

Q All right. Now, to qualify under Section Two, of Rule B, application shall be accompanied by items D1, D2, D4 and D6. Would you explain what each of those provides for?

A Of course --

Q Section Two is the water to be disposed of contains more than a thousand parts per million?

A Yes, right. That shall be accompanied by items D1, D2, D4 and D6. Now, D1, I just covered. D2 is as follows. The complete analysis of a representative sample of water currently produced by ever producing water well, with a depth of three hundred feet or less located within a three mile radius of the proposed disposal site. Water samples shall be taken by an analyzed analysis conducted by a governmental agency or a recognized independent water analysis laboratory. Analysis shall show total dissolved solids, shall include, but not be

limited to parts per million of sodium, calcium, magnesium, chloride, sulphate and bicarbonates. In the event a sample of water of any well within three miles of the proposed disposal site could not be obtained for analysis, the applicant shall state the reason why and describe the efforts made to obtain such samples. That covers Section D2 for administrative exception to Section 2.

Q It would also require D4?

A It would also require D4 which is a plat showing the lease on which the proposal site is located indicated there on the disposal site and showing the location, depth and ownership of all producing water wells within a three mile radius of the site.

Q All right. Then D6?

A D6, a publisher's affidavit of publication establishing that notice of intention to apply for authority to use the proposed disposal facilities has been given one, to the newspaper of general circulation published at Santa Fe, New Mexico, and one in a newspaper of general circulation published in the County or in each of the Counties if there be more than one wherein lie lands within three miles of the proposed disposal site. The notice shall advise all concerned of the quantity and quality of the water to be disposed of and shall specify under which section of Rule B, the applicant intends to qualify.

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Guide forms for assistance and preparation of notice may be obtained from the Santa Fe office of the Commission.

Q Mr. Ramey, Item 2, I mean Section 2 requires four attachments, while the first Section 1 only required one. What is the difference here?

A Well, in the first place we are talking about potable water in Item 1 which would not, probably not contaminate any fresh water supplies so there would be no hazard to any underlying fresh water supplies. Item 2 allows you to put non-potable water into pits wherein there is non-potable water or else water of worse quality than what you are disposing of underlying the disposal site, so it is necessary to furnish additional information in this case.

Q To qualify under Section 3, application shall be accompanied by Item D1, D4 and D6 and you have already read those?

A Yes, sir.

Q And they would be the same as the third one. To qualify under Section 4 of Rule B, it says, application shall be accompanied by Item D3. Have you read D3?

A No, sir, I haven't read it. I will read it.

Q Would you read that now?

A Yes, sir. Of course, D3 covers the portion of the proposed exception where water to be disposed of contains more

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than three - more than a thousand parts per million total dissolved solids and there are no shallow fresh water wells within that three mile radius, so Section D3 is the plat of the lease which will be served by disposal facility indicating where the proposed disposal site is located and showing the name and number of each producing well in the formations from which it is producing and the latest oil and gas and water production tests.

Q All right, to qualify under Section 5 of Rule D, application shall be accompanied by and it is D3 and D5. You have already read all of those, I think, except D5, haven't you?

A That is correct and D5 states that, of course, to go back to Item 5, this is water to be disposed of into a lime pit for evaporation purposes and D5, a drawing shall include -- a drawing including plan and cross section of the proposed disposal facility together with a complete description of the construction method proposed and including specifications of materials to be used. Description shall also be given of the methods proposed to insure against overflow and leakage.

Q Mr. Ramey, going back to Number 4 of the exceptions, do you think it would be necessary to set up any sort of metering device?

A Yes, sir, I would think so. I would think that the water going into the pits should be metered in this case.

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Q To insure that no more than one barrel per day -

A Yes, sir.

Q I think we have covered all of those points. Will you go on to page 5?

A Page 5 under E. Upon receipt of the application with required attachments, the Secretary-Director may consider immediate approval of four exceptions under Sections 1, 4 and 5 of Rule B. He may consider approval of exceptions under Sections 2 and 3 of Rule B only if no objection has been received within fifteen days after date of application of the notice of intention. In the event objection is received, the Secretary-Director shall notify the applicant of such facts and shall set the matter for public hearing if the applicant so desires.

Under F, exception to Rule A of these rules shall be granted based on conditions existent at the time of approval of the exception. Any change of conditions brought to the attention of the Secretary-Director which in his opinion justifies suspension of the exception, shall result in such suspension pending notice and hearing of the matter and entry of an order.

Q Do you have anything else you want to add to your testimony?

A No, sir, not at this time.

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Q Was Exhibit 13 prepared by you?

A It was prepared by the staff.

MR. HATCH: I would like to move the introduction of Exhibit 13 into evidence at this time.

MR. PORTER: Exhibit 13, being the proposed rules?

THE WITNESS: Yes, sir.

MR. HATCH: Yes, sir.

MR. PORTER: If there are no objections, the Exhibit will be admitted.

(Whereupon Oil Conservation Commission's Exhibit 13 was admitted into evidence)

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Ramey, I'm a little confused on your recommendations for deadlines. I notice you have recommended a deadline in the Bagley, the general area of the North Bagley and so forth, as July 1, 1967. Does that mean that there would be a, your recommended deadline would apply to all other areas, January 1, 1969?

A Yes, sir, with the exception of waterflood areas wherein the, I feel they should pick up their produced water and reinject it by January 1, 1968.

Q So you have recommended three dates, one being January 1, 1968 for salt water produced in waterflood?

A Yes, sir.

MR. PORTER: Does anyone have a question of the witness?

THE WITNESS: I might clarify this North Bagley. Now as I testified earlier, we did have a meeting and I would have requested a hearing before the Commission had not this hearing been on the agenda for this area exclusively. I think the operator in that pool had ample warning back in February.

Q (By Mr. Porter) In other words, if this hearing had not been pending, there probably would have been a special hearing?

A Yes, sir, that would be our recommendation to the Commission.

MR. PORTER: Mr. Gray, would you come forward and use the microphone, please.

MR. GRAY: Mr. Porter, I was just going to ask Mr. Ramey, to repeat one of the exceptions.

MR. PORTER: Which one is it Mr. Gray?

MR. GRAY: Number 4.

MR. PORTER: Would you repeat Number 4, Mr. Ramey?

THE WITNESS: Number 4. Water to be disposed of constitutes a total of not more than one barrel per day per forty-acre tract being served by the proposed disposal site, but in no event shall exceed sixteen barrels per day, perhaps

I should add, per section, so the intent of this is that this is not one barrel per well, but it is one barrel per forty-acre tract and if an operator has a lease that is fully developed and contains three hundred and twenty acres, he would in this case, get eight barrels a day into a pit. If his lease covered a whole section, he would get sixteen barrels a day.

Q (By Mr. Porter) Now, would that apply to any area in the four counties that we have been discussing?

MR. PORTER: Mr. Anderson?

MR. ANDERSON: Mr. Porter, I have a formal closing statement, but I would like to make a comment at this time. This is the first time -- I am R. M. Anderson of Sinclair Gas Company. This is the first time that I have heard the proposals of the Commission Staff in Hobbs and I can see right quick that this is a rather complicated, intricate situation. I believe that a matter of this nature might lend itself better to a better solution if it were placed in the hands of an industry committee appointed by the Commission with Commission members serving on the Committee, and possibly somebody from the State Engineer's office serving on the committee in much the same manner as we worked on the deviation rule and on the co-mingling manual and I would like to suggest that you consider that as a more satisfactory to handle this problem. I prepared Sinclair's position in this matter, but I am not prepared to

analyze a complicated proposal such as I have just heard.

MR. PORTER: Mr. Anderson, you will be given an opportunity to state the position of your company later. Does anyone else have a question? Will you come forward please?

MR. MORGAN: Mr. Porter, the exception Mr. Ramey discussed is, I believe, is exception Number 4. Would that apply to any previous orders issued by the Commission such as the Vacuum Pool order?

THE WITNESS: If the Commission would see fit, why it would.

MR. MORGAN: Thank you.

THE WITNESS: However, I would say that the facility is already under disposal and there would be no reason to take it out of the disposal system and put it back into the pit.

MR. PORTER: Will each questioner please identify himself as he comes to the microphone.

CROSS EXAMINATION

BY MR. BLUM:

Q My name is Paul Blum and I am an attorney for State Engineer's office. I would like to ask you to refer to B3 on page 2 of your recommended special rules and regulations.

A Yes, sir, I have that before me.

Q I would like for you to tell us if you can, the

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general extent of the area in these four counties where fresh water, the water level of the fresh water is more than three hundred feet deep?

A I think you're asking me a question that Dr. Spiegel could probably answer. I will give an answer and qualify it. It may not be correct, but where water will be more than three hundred feet deep?

Q Yes. Where the water level is more than three hundred feet deep.

A We're not talking about the water level being three hundred feet deep, we are talking about the depth of the well, fresh water wells.

Q All right, where will it be more -- what percentage of this area or how much of this area where the wells will be more than three hundred feet deep?

A The Indian Hills or the Indian Basin, that is kind of a -- well it is a hard question, frankly, for me to answer because I don't have all of the information on water. I think Dr. Spiegel testified that fresh water can be found just about anywhere in this area, but I think his terminology of fresh water went down to and probably, including the formation directly above the south section, but there are some areas in the southeast producing area where there are no wells and possibly no water at a depth of three hundred feet.

Q Well, how did you reach this figure, three hundred feet?

A This is what we termed, probably the overall depth of the red beds.

MR. BLUM: Thank you.

MR. PORTER: Does anyone else have a question of the witness? The witness may be excused.

(Witness excused)

MR. PORTER: We will now hear statements from any interested party. Mr. Loe, would you come forward to the microphone?

MR. LOE: Mr. Hays, Mr. Porter, I am Jim Loe, Amerada Petroleum Corporation, Vice President and General Production Superintendent. I would like for you to bear with me for just a minute or two here while I reminisce, if you will. Amerada and I came to Hobbs thirty-seven years ago and have been intimately associated with the growth of the oil industry in this State since that time. I am particularly pleased to be here today and appear before this Commission in support of the regulations that are being discussed. I think we will find here that a majority of the oil industry will favor reasonable regulations that will serve to eliminate future contamination of our water supply.

To an outsider not familiar with the history of the

oil and gas industry of New Mexico, this might seem strange, but to me it is simply a continuation of the cooperation between the industry and this Commission that has been going on over the years and safeguarding New Mexico's natural resources.

We have grown up together, much has happened since Amerada and I came here thirty-seven years ago. The quality of living, of course, has improved tremendously and in a large measure, oil is responsible. New Mexico's crude production in 1930 wasn't quite thirty thousand barrels a day. Today, it is ten times that amount and has a value of over a third of a billion dollars a year and you know what that means to the State and its people. The oil industry has a good record of helping New Mexico in its efforts to conserve its resources. Within a few months after the Humble Bowers Number One was drilled in Hobbs, the operators in the Hobbs field band together and set up an organization known as the Lea County Operators' Committee to enable them to develop the Hobbs field in an orderly manner. This was done on a voluntary basis as no statutes then existed whereby the industry could be regulated.

Early, in the life of the field when it became evident that flaring gas on top of the structure was wasteful, the operators, by mutual agreement, imposed a restriction on this waste. Later the Lea County Operators' Committee assisted

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in the promulgation of a set of rules and regulations that are today among the most progressive and efficient in the country. Meanwhile, other things have changed. New Mexico's population has more than doubled since 1930. It's use of fresh water from underground sources has more than tripled, clearly than fresh water, along with oil and gas is vital to New Mexico's future and we all have a stake in that future. Emphasizing Amerada's stake in that future, our permanent growth force in the state has grown from, oh, a handful in 1930 to well over a hundred today. Our children go to New Mexico schools, we drive on New Mexico's streets and highways, we drink New Mexico water, in fact, we are New Mexicans. What has the industry done to protect this water. It wasn't until 1961 that jurisdiction of any state agency was clearly established over oil field pollution. Nevertheless, five years earlier, the industry and this Commission cooperated to prevent what might have been a serious pollution problem in certain Lea County oil fields.

Many of you recall that first industry meeting here in Hobbs, August 1956 and field by field studies that followed. The result was construction of underground disposal facilities in critical areas such as Hobbs, Monument, Bagley and the East Caprock and many more, and at a cost of several million dollars. I am happy to say that Amerada played a major role in this effort, in fact, even earlier, and we were not the only

ones, Amerada was disposing of water underground.

I would like to illustrate that the cost of salt water disposal is quite significant. Amerada produces nearly seven percent of the oil in Lea County. Unfortunately, we don't have any in the other three counties under consideration here today. I assume that we produce about the same amount of water percentage wise as all of the water that is produced. At any rate, we do dispose of nearly nine million barrels of water a year underground and at a cost of about a hundred and sixty thousand dollars annually and have a capital investment of well over a million dollars in those facilities. Now, if you multiply that by, we will say fifteen, why that will be a sizeable, and I don't know if those are the figures, I am just assuming that the percentage might hold true. And in addition to disposing of salt water as waste, a lot more is used in secondary recovery projects and these are being expanded.

The problem the industry faced in 1956, but not permanently solved for since then the amount of salt water produced in the four county area, has nearly tripled. We think it is time to consider additional measures and we think the adoption of a no-pit order for the four county area is a practical answer. If the Commission should adopt such an order, we propose that it incorporate the following points. The order should apply only to unlined pits. The order should

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exempt a mud pit or reserve pits used in drilling, re-working and so forth. B. Emergency pits that are used to collect pollutants in case of breakdown or mechanical failure. C. Burn pits used solely for the purpose of burning waste oil or other inflammable materials. The order should exempt existing pits. I have not put a timetable on this as Mr. Ramey did, but other than the fact, I would not care to comment on the North Bagley, I have no information. The other timetables seemed logical, but this, some time needs to be allowed for the operator to work out economical means of disposing of water and as far as possible, prevent premature abandonment of the marginal well.

The order should provide a method of obtaining an exception for unlined pits in areas where such pits would not be a pollution hazard. This to be done only after notice and hearing, administrative examiner hearing.

With these parts considered, we support the proposed no-pit order and that is without here endorsing any of Mr. Ramey's suggestions in that I feel we should all have a little more time to study those, but we do endorse the idea as another cooperative step in the conservation of New Mexico's resources.

Thank you.

MR. PORTER: Mr. Kastler.

MR. KASTLER: Bill Kastler with Gulf Oil Corporation.

Gulf recognizes the need for sub-surface disposal of oil field brine in some cases and is anxious to cooperate in any way reasonable with the efforts to eliminate any pollution of fresh water in connection herewith, we make the following recommendations. 1. Any order by the Commission should provide for exceptions on a reasonable basis to provide for the use of lined pits for water production is small. Also, if no potable water exists near an operation, an ordinary pit ought to be regarded as a reasonable protection.

Finally, we believe that there are many cases where it is necessary to run water into pits due to an emergency and in these cases, the use of pits for a period up to one hundred and eighty days ought to be provided for by administrative order.

2. In the event a blanket order should be adopted Gulf suggests that in absence of finding that an emergency exists after notice and hearing in the areas within the blanketed zone, the Commission should provide a period of up to three years from July 1, 1967 in which all operators may comply. The reason for this is that the cost of total compliance is expected to be extremely high and this time would be utilized for planning and obtaining the necessary budgeted funds and completing the work without impairing ordinary operations.

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3. Finally, Gulf believes that a sufficient public benefit in prevention of waste and prevention of natural resources is obtained by underground disposal of waste water to warrant legislation which would permit operators either individually or through units or through disposal systems to condemn private land in order to obtain rights-of-way and an easement for disposal lines and wells.

In line with this, we suggest that such legislation be obtained before any no-pit order becomes absolutely effective.

Thank you.

MR. PORTER: Anyone else? Mr. Yates, would you come forward?

MR. YATES: I think, in many respects, I will agree with Gulf's position, however, I would like to add this. The testimony here reveals a possibility of pollution from open pits overlying the Ogallala formation. Now the testimony given here today, supports pollution of any other aquifer in any other portion of this four county area. It is our belief that to apply a blanket order to the entire area is not warranted by the evidence. It would be prohibitively expensive in many cases and work undue hardships on the operators. Thank you.

MR. HOLLOWAY: I am H. D. Holloway with Texas Pacific Oil Company and we would like to simply reiterate the statements previously here in regard to our position regarding the general

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elimination of pits in the southeast New Mexico area, and specifically, I would like to state Texas Pacific's position in regard to a specific cited area. Texas Pacific, an operator in the Counties previously cited in southeast New Mexico and in the specifically cited North Bagley Pool in cooperation with the Oil Conservation Commission and with operators in the North Bagley Pool area has conducted a study of salt water disposal in the North Bagley area. This study concludes that disposal of produced water from wells in the system owned and operated independently by a single operator, will be virtually prohibitive from the standpoint of cost to the operator, thus a jointly owned system is practically the most practical means of accomplishing salt water disposal to pursue elimination of unlined surface pits in the area. Operators in the area, have in general, reached this same conclusion and have indicated their desire to jointly pursue negotiation of participation of such a system as rapidly as economically feasible in the interest of protection of fresh water resources and hydrocarbon resources in that area.

Texas Pacific believes that it will require a minimum of six months and possibly up to a year to negotiate participation, develop all of the detailed aspects of such a joint system and to physically install a system for operation in the North Bagley Pool. It is therefore respectfully requested

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that this minimum period from the date of issuance of a formal order be allowed to operate in the North Bagley Pool to eliminate the open unlined pit disposal in that area.

Current development activity precludes precise assessment of ultimate disposal system designed requirements. Continued oil resources development activity is expected in this area. This and the reasons stated above is the basis for the minimum time request. The Commission's favorable action in this regard will provide the operators at least minimum reasonable time in which to adequately plan a workable system and at the same time permit each operator in that area to continue to protect the interests of royalty and mineral owners as well as the invested capital that each operator has contributed to the development of this area in the west of southeast New Mexico. Thank you.

MR. PORTER: Mr. Girand?

MR. GIRAND: If the Commission please, I am W. D. Girand. I am here on behalf of Metex Supply Company and several individuals. It is our suggestion to the Commission that any no-pit order be entered as by pool rather than as to the large area covered by the entire four counties. In looking at the exhibits, it occurs to me that there is far more undeveloped land than there is developed land as far as oil and gas is concerned and the no-pit project would certainly put an

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undue hardship on any wildcatting because of the doubt of the operator as to what he could do should he obtain any production water. I think as another suggestion we would propose that the Commission circulate its proposed order and authorize all operators a given period of time in which to file exceptions or call attention to the Commission of ideas or thoughts they had which might be more workable.

Basically, we are against the pollution of our fresh water. We will not tolerate that, we don't believe in that, but we do believe that before the Commission enters into an order based on the testimony we have had today, that each of the operators ought to have a right to submit to the Commission their own problems and the circumstances which they think stand in the way of any such order covering all of the counties. There was nothing in the testimony that showed that one pit would influence or affect an area having a radius of three miles. We think it goes too far.

MR. BARB: I am Glen Barb with Mobil Oil Corporation. Mobil Oil Corporation commends the New Mexico Oil Commission for their great strides and advancements it has made in seeking to prevent pollution hazards to fresh water. Mobil also supports the issuance of constructive regulation designed to control possible pollution hazards.

The present practice of dealing with the field wide area

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in the industry seems to offer a better opportunity for operators to present evidence showing the need for local use exceptions where little or no threat to fresh water is . This insures the industry that the operating costs will not be unnecessarily increased or drilling operations curtailed and prevent the premature abandonment of leases producing to the benefit of the State for tax revenue on royalty income. It is our belief the opportunity to present such evidence can best be preserved under the present successful practice. If the Commission would issue an order abandoning the use of unlined earthen pits in southeastern New Mexico, Mobil Oil Corporation urges the Commission to one, allow a minimum period of twenty-four months to complete installation of the compliant facilities; two, to provide sufficient flexibility in the order so as to not preclude technical logical advances in the handling of brine water. Three, establish administrative procedure at the local level for the granting of exception from such order for the use of unlined earthen pits in drilling operations and for emergency use of such pits in waterflood operation disposal systems, to clean out operations and other such reasonable exceptions as may appear. Thank you.

MR. CARR: I am Harvey Carr with the South and Royalty Company. This concerns the North Bagley area. We have recently received an administrative order to re-enter

carbon drilled State B in the southeast quarter Section 31, Township 10, South Range 33 East and if we are successful in re-entering this well, we propose to lay a line from our Emby Wells to our Graham State Number One in the North Bagley field and from there about two miles north to this well and we will be soliciting water to help defray the cost of re-entry.

MR. PORTER: Mr. Buell?

MR. BUELL: May it please the Commission, my name is Guy Buell. I am representing Pan American Petroleum Corporation. At the outset, I would like to express my appreciation and gratitude to the Commission for including my reference into the record of this subject case, the record in case 1053. As the record of case 1053 will reflect initially some broad and sweeping charges were made in that case that oil field brines placed in a surface pit had contaminated fresh water. The Commission very graciously gave the operators an opportunity to make a study of their own. Pan American made an exhaustive study of the fresh water supplies in the Lea County Water Basin. We presented that study to the Commission. In my opinion, our study conclusively proved that not one iota of contamination could be traced to oil field brines that had been placed in a surface pit, but regardless of the conclusion of our study,

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Pan American cooperated one hundred percent with the Commission, the other operators and the State Engineer in eliminating surface pits in that area. We did this even though our study showed no contamination was occurring, because we realized that salt water, if it does get to fresh water, is harmful and is a contaminant. We still take that position and Pan American will do everything it can to eliminate even the opportunity for salt water to reach fresh water.

We came out here today to support the Commission in the issuance of a general no-pit order. For that reason we did not cross examine either Mr. Ramey or Dr. Spiegel although I will state quite frankly that we do not agree with all of their opinions, but I would like the record to reflect that our silence was simply because we do support the Commission in the issuance of a no-pit order because of the possible harmful results of putting salt water on the surface of the ground.

I would like to suggest to the Commission, if I may, that has already been suggested, that the order, when issued, will provide for exceptions of meritorious cases and I would also recommend to the Commission the effective date of January 1, 1969.

I would like to, if I may comment briefly on the North Bagley. That pool has been singled out today as sort of

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a thorn among the roses. From what I know about it, it is a very unlikely candidate. In the first place, it is in an active stage of development. Drilling operations are going on continuously. Secondly, there are many operators in the pool. Pan American is an operator, Pan American is a minor operator. With regard to the meeting that was recently held, although Mr. Ramey mailed us a notice of that meeting, it failed to reach us so Pan American was not able to participate in the meeting through no fault of Mr. Ramey's and we only learned about it later on. The Penn in that area is a reservoir engineer's nightmare in that producing characteristics of the well change very rapidly. Because of this, it is an extremely hard area to evaluate from the standpoint of any kind of field services like a field wide salt water disposal system or something of that nature.

I really shouldn't need to say this, but I will. I have very tremendous respect for Mr. Ramey, both personally and professionally, but in all candidness, I must say his July 1, '67 deadline for the North Bagley Pool area, in my opinion, is both unrealistic and unreasonable due to all of these very conflicting factors that we have in this pool. If the Commission issues a July 1, '67 deadline on that pool in effect, it is going to be a shut-in order, either that or the operators will have to go to the prohibitive extent of

trucking their water out.

I would urge the Commission to, if they could find it possible to do so, to be more lenient to North Bagley because of our immense problems there. Thank you.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: If the Commission, please, I would like to make a brief statement on behalf of Standard Oil Company of Texas in regard to the testimony that was presented here. I think we support the conclusion that there should be a reasonable time in which to comply with any order which is entered and that there should be reasonable exceptions available to the operators and we would recommend an administrative procedure for that purpose. Standard, not only has no objection to a no-pit order, they see a necessity for such an order and are in general support of the Commission in that regard. We have no objections to the staff recommendations with the exception of one item. It was prepared, as I recall, that one basis for an application for administrative approval would be where the production was not more than one barrel per forty-acre tract not to exceed sixteen barrels per section. We would propose that this be increased to three barrels per forty-acre tract not to exceed forty-eight barrels per section.

I would like also, if the Commission please, to make a statement on behalf of Continental Oil Company. I believe

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that in general, Mr. Ramey has already stolen all of our recommendations. It is remarkable how perceptive he is at times when he agrees with us. Continental Oil Company is well aware of the importance of fresh water resources, particularly in the areas in New Mexico. It is recognized that a large number of situations, the disposal of produced water in unlined pits, may constitute a threat to the fresh water resources and some action should be taken to prevent any contamination. On the other hand, I believe that the testimony presented here today, shows that there are situations where the disposal of produced water does not constitute a threat to fresh water supplies and such situations would include instances, for example, where produced water has little or no validity, where there are no fresh water aquifers or where fresh water supplies are protected from pollution by impermeable barriers. In this connection, I think the Commission should give consideration and any order or any exception that may be granted to such an order to the volume of water that is being produced, the quality of the produced water, the presence of underlying water strata, the quality of this water and the danger of pollution that actually exists in the particular area.

It would appear then, that the general prohibition against unlined pits would work a hardship on the oil industry

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which would be unreasonable and for this reason, Continental urges that the matter be considered on an area by area basis or a pool by pool basis. I believe that the testimony offered by the Wilson Oil Company shows that there are certainly instances where area-wide exception should be granted and perhaps this should be done at the outset when the order is entered. Should the Commission consider, however, that the evidence presented indicates a situation requiring area-wide no-pit order as has been proposed, there should be ample provisions for exception included in the order along the lines as suggested by Mr. Ramey.

Continental would like to point out further that in most instances the disposal of produced water, other than by surface pits, will be quite expensive and will require the cooperation of other operators and will call for negotiations for rights-of-way and other matters which will take a considerable amount of time. Mr. Ramey has proposed, in general, that it will not become effective until January the 1st, 1969 and perhaps that may be enough time to take care of the situation. In any event, we urge not less than one year where the situation appears to be critical in order to comply with the order and two years where the danger of pollution is not so serious.

It is further recommended that provisions be made for

the use of lined pits to be used in connection with waterflood operations and I believe Mr. Ramey's recommendations covered that. Exceptions are also needed, we feel, during drilling and testing operations and for emergency use. Thank you.

MR. PORTER: Does anyone else have a statement?

Mr. Losee?

MR. LOSEE: If the Commission, please. Wilson Oil Company recognizes that contamination has occurred in southeastern New Mexico, that we deny that an appreciable contamination has occurred throughout the entire area. In fact the subsidy of evidence offered at this hearing indicates that it only occurs in certain areas. We recommend that any effective date of any order be delayed until the operators can take the proper steps to diligently comply with the order and we would ask that the order either cover only those pools upon which the Commission has of evidence in its files of contamination with provision for subsequent conclusion of new and old pools, or two, if the order is blanket-wide and covers the entire southeastern portion of New Mexico, provision should be made for realistic exceptions in fields where no contamination has existed or no danger is present. We do not believe that all of these realistic exceptions are mentioned in the order proposed by Mr. Ramey for the Commission staff.

MR. PORTER: Mr. Reynolds?

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MR. REYNOLDS: Distinguished Commissioners, I am Steve Reynolds, State Engineer. It is obvious that it is my view that it is not necessary for the State Engineer to take a primal position on the rules, orders, prescriptions and measures that may be needed for the Commission to discharge its responsibility to provide reasonable protection to fresh waters designated by the State Engineer. I am pleased to have had this opportunity to present for the Commission's consideration the results of the investigation of my office and the services of expert witnesses employed by the State Engineer office. I do want to invite the careful consideration by the commission to some of the problems that may be related to paragraph B3 under the heading, "Exceptions in the proposed order", particularly, attention should be given to the extent of the area in which the first fresh water may be at depths greater than three hundred feet. Furthermore, the Commission should very carefully consider the possibility of contamination resulting at distances greater than three miles downstream from disposal pits and again I thank you for this opportunity.

MR. PORTER: Mr. Merchant?

MR. MERCHANT: I trust that all of the people who are experts in the petroleum business and attorneys have talked because I invite you to descend to the level of a cowboy and it may be more comfortable to some of you. I am

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president of the -- I am legitimately a cattle grower, live-stock operator. My wife and my three daughters and I own a ranch in south Lea County, but I have some extra-curricular activities. I am head of the Southeast New Mexico Grazing Association and, along with _____ and co-chairman of Agricultural Water Liaison Committee and I think I do less than I should in saying a word or two in explanation of our position, and as sort of a justification for our being in the picture. As a real compliment we have been given credit for having some part in precipitating this meeting in the study that Mr. Ramey and his staff have made. It is more of a compliment than it is accurate because when we got into the water situation it seemed to me and our groups represented on the water committee which include the cattle growers, the wool growers, the farm and livestock bureau, my grazing association, the southeast Lea County land owners, have all taken the view that there is an inner relation of interest between the petroleum industry and the livestock industry and the agricultural industry in general, because both of us are land buddies as you probably know or most of you or maybe all of you. There is a code of ethics presently being brought up to date by Oscar Jordan and a committee people interested which sets out the responsibilities when an oil company has the mineral rights under the surface of land which is held on the surface

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by the ranchers and farmers which sets out pretty definitely the responsibilities of each, and I think that the code of ethics in a parallel way confines the water because we both need water, we both have to have water. There are a few

facts about the agriculture business particularly cattle raising, that are not always thought of by petroleum people. For instance, you people might be able to wait six months or a year or two years to do some of the things you need to do, but when my cattle come in the morning for that long fifteen-gallon drink, they have got to have it and if you don't have it the second day, you are in a crisis and if you don't have it in four days, you are out of business because we are operating with nature and animals and you people can make long range plans and probably get by with some delays, but remember the fact that when you are dealing with nature, why there is no alcoholic that has got to have a drink like that cow every morning when she comes in.

There are some other things that have been brought up here today that through personal knowledge, I want to speak about. It is true that we wrote Mr. Porter and told him that we thought that some of the requests and objections of the livestock industry were not receiving attention from the Commission. Mr. Porter wrote me a most interesting and courteous letter in which he stated the history efforts of the Commission

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to dispose of brackish water which was information to me and which I passed on to my association in my quarterly newsletter, so an opportunity like we have had today to learn what is going on in connection with petroleum industry is most helpful and just for a minute I would like to turn you around and have you know some of the things that occurs to the fellow that is raising cattle. My friend, Raymond Lamb pointed out the Wilson field. It happens that the ranch on which I had been brought up and which I am part owner, completely surrounds the Wilson field and it has been there, I believe, for something like thirty years and the disposal has been open pit and our shallow water wells have never been affected adversely at all. I expect to get a dinner out of Raymond for that, but it is true. There has been a statement that open pit disposal has no authentic record of contaminating wells, but the well over at Dan Berry's that has been made completely contaminated for many years as long as thirty or fifty years ago, I drank that water, at least mixed some bourbon and it was potable, but the well has been completely ruined and it was a good well until open pit disposals surrounding it was practiced and maybe as the Pan American executive says, that there is no real evidence that it has been contaminated, but it just so happens that this well went all to pieces when they put the contamination around it, but I will enter in complimenting Joe Ramey, your

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Hobbs supervisor who under Mr. Porter's arrangements, went all over this field with me and two other cattle growers and I never found anybody more open-minded or more anxious to do away with the contamination of pollution of water and remember we must have that water and it is not in any particular strata, the shallow water, the head water of merchant livestock, the water table is eleven feet under the surface. If you are going to wonder how deep your water is, that at least is one level. On my end of the ranch they spun me off in '62, every well I had except one, is more than three hundred feet deep. I mean the Santa Rosa, so there is a first-hand fact. I have no worry about the contamination.

Now, there is an interlacing, intertwined interest between the oil industry and the cattle growers and the agricultural people and it won't stop at this order which I think is a step in the right direction, if it is put into effect. The question of use of the surface for right-of-way will come up immediately. On my ranch, all of the antelope field, antelope ridge field of the shell is on my ranch and if present they use an open pit disposal of about two hundred gallons per minute that they have on their own accord arranged to inject all of their water at a level of four thousand and eighty on down to about twenty-five hundred feet. There will be a right-of-way of some eight to ten miles on the

area that I either own or am purchasing or am leasing.

They asked me the other day what they had to do to get the right-of-way. Mr. Brown, down there at the Suffering Plant and I asked him how much I owed him to take it because it is all for my benefit. Now, that will be general, but we will use whatever influence we have, gentlemen, to get the people using the surface on the ground to be reasonable and their requests and demands when it becomes necessary for you to lay the pipelines that you have to lay and we trust we can cooperate in that way, the way the oil people have cooperated with us. Thank you.

MR. PORTER: Mr. Merchant, I haven't had that kind of applause for anything I have said today. Mr. Jordan?

MR. JORDAN: I am Oscar Jordan, attorney for the New Mexico Land Office. During the break I spoke to the Commissioner about, or made a few notes before this about what I thought should be said here on our behalf and I asked the Commissioner about it, but it looks like everything has been said by Mr. Merchant and the oil people here today. My notes just follow right down the line with a couple of exceptions. One is, there is a possibility here that there might be a conflict of interests, my appearing here before the Commission, in one of the Commissioners is my boss, but in this particular

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interest, we are interested from both angles. We are interested in the oil for the simple reason that ninety-five percent of our revenue comes from the oil. In addition, from the State's standpoint, thirty-seven percent of all the revenue from the federal ends also goes to the State, but not through our office, so we are interested in oil from that standpoint, the revenue end of it. And we are also interested on the other hand, in the surface, because after the oil has been produced or after some other fuel has replaced it, if that is possible, we are still going to need the land and we are still going to need the water. We are interested from that standpoint, so I don't see really a conflict. I think that the evidence today presented has shown that there are some areas in here that there is definite pollution. There are other areas that there is no pollution in this large area, so with that I would recommend to the Commission, that they consider that there is going to have to be some kind of no-pit order issued and I would suggest either a partial order or a series of partial orders or a blanket order with exceptions, and those exceptions have pretty well been set out here today already.

There is one thing that no one has mentioned today in this connection, that something should be done about where there is pollution where we know and we can see there is

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definite pollution. Something has got to be done and this reason is for no other at all, and this is my personal feeling, is that the State has shown to its Oil Commission, that it can take care of conservation of oil and we don't need any federal intervention and I think we can show them now that we can take care of this water problem and pollution without federal intervention and we will do it to keep them from stepping in because as you know, when the federal government has taken over a problem, I have yet to see one they have solved, but I have seen them spend a lot of money, but I think it is serious that we should do this where there is pollution because there is a national kick on air pollution, water pollution and all kinds of pollutions. There is a national kick on it now, it is here and in Washington, in New York, that's about all they talk about. The Secretary of Interior Udall is quite a bug on this and it is coming and I think we should get the jump and take care of our own problems as I have said before, clean our own house before they clean it for us because they won't be as careful with the furniture as we are.

In the issuing of these orders, I think also they have asked for time here. I have recognized here by listening to my telephone jingle, that there are going to be right-of-way problems if you issue an order where you are going to have

to dispose of this where there is going to be central disposal areas, say water wells or abandoned wells, we are going to need right-of-ways to get there and I know that by and far there is better cooperation now than there has been in the past. It is true there is more of an understanding between the two industries. I have worked with Mr. Merchant. We are right now in the process, we have not been before the Legislature because of a time element, but we are getting a committee together for the Ethics Code and I am sure that this will be one of the topics that will be covered. The oil and gas industry will appoint some members to this committee and the land users will appoint, they have already appointed their members, submitted the names to me and I will try to act as moderator and we will sit down and hammer this thing out and with that, I thank you.

MR. PORTER: Does anyone else have a statement to make? Mr. Anderson?

MR. ANDERSON: Thank you, Mr. Porter. In the interest of time, I will hurry along. With regard to commenting on Mr. Ramey's proposals, I feel a little bit like the cow that you mentioned earlier that hadn't had a chance to read the analysis. Sinclair is currently injecting or has committed to injection, thirteen thousand barrels of produced water a day which represents eighty-eight percent of our produced water in

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this area and on the basis of those figures I don't feel that a no-pit order is needed, however, in the event that one is entered as a result of these proceedings, Sinclair would recommend that the no-pit order contain an automatic exception for those pits or leases that are receiving ten barrels of water per day. We have thirty-eight pits in this category receiving only an average of three and a quarter barrels of water per day. This exception, we believe, is reasonable and compares closely with finding eight of the Commission's no-pit order or 1224A which has been mentioned here earlier today which provides for exception of oil wells producing a half a barrel or less of water per day due to the insignificant amount of water involved. We also recommend automatic exception for burn pits used exclusively for the burning of tank batteries, waste accumulations. We also recommend that no-pit order allow sufficient time for compliance. We believe that the January 1st, 1969 date is reasonable. Thank you.

MR. WHIGHAM: I am Carl L. Whigham representing Texaco Incorporated. Texaco welcomes the opportunity to participate with the Oil Conservation Commission, of the regular bodies, the oil and gas industry and others in the formulation of necessary regulations to provide for the conservation and the protection of fresh water.

Texaco also commends and supports the Oil Conservation

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Commission in their efficient approach to providing effective and regulations. Now the hearing today has been called by the Commission to consider an order prohibiting the use of oil surface pits for the disposal of oil field brines in this four county area. We wish to direct the attention of all concerned to three basic precepts that should be carefully considered in promulgating rules then we would like to propose and recommend the adoption of five specific provisions. Now, the first precept that we would offer for your careful consideration, is that for contamination to occur, two things must exist, a contaminant in sufficient quantity to be effective and a useable quantity of fresh water. Now throughout most of the area under discussion this afternoon, one and sometimes both of these two requirements are missing and the fresh water contamination cannot be considered a problem. Because of this rules and regulations should be applicable only to certain limited designated areas where contamination is known to be potentially possible.

Secondly, there is no question that where fresh water occurs, the proper disposal of oil field brine is essential to prevent contamination. In addition, however, it is also absolutely necessary to properly dispose of all other contaminants whether they be oil field brines, industrial wastes or others. In this regard, State regulatory authority

other than the Oil Conservation Commission, it to take action to prohibit fresh water contamination and wastes by industry in groups other than the oil and gas industry.

Thirdly, since only certain designated areas should be subject to orders, an adequate and efficient method of designating these areas, should be developed. Generally, the State Engineer and State Geologist should be responsible for designating the location of the areas where protection is required and the Oil Conservation Commission should be responsible for designating the manner and method in which protection would be accomplished. Any designation, contraction or expansion of an area should be subject to public review at a hearing if anyone objects to this designation or change in designation and wishes to call the hearing and present a case. Sufficient factual data to substantiate the designation, contraction or extension of an area should be made available to the public by the appropriate State regulatory agency.

Now, then with regard to specific rules to be adopted, we have the following five provisions that we would ask your consideration. First, I have these prepared and written as statements, all rules. The use of earthen pits for the storage and evaporation of oil field brines is prohibited in certain areas designated by appropriate authority including those areas within five miles of any continuously flowing stream

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or river and within one mile of any intermittently flowing stream or dry stream bed except as hereinafter provided.

Two, impervious collecting pits may be approved for use in conjunction with approved salt water disposal operations provided that these pits are inspected and approved by a New Mexico Oil Conservation Commission representative before they are placed in use and remain in satisfactory condition, as determined by subsequent inspection by the Conservation representatives.

Three, the areas subject to the provisions of this order should be designated, contracted or extended jointly by the New Mexico State Engineer and New Mexico State Geologist. If any individual, or group, objects to such designation or change, a public hearing may be called by the protestant in order to make available and to primarily consider all information relevant to the designation or change in an area.

Fourth, exceptions and extensions to these rules may be granted by the Secretary-Director of the Oil Conservation Commission following notice and hearing or administratively upon number one, proper application and two, waivers of objections from the State Engineer, the surface land owner and all offset operators.

Fifth and last, compliance with the provisions of these rules shall be required within two years of the effective

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thereof. Thank you, sir.

MR. PORTER: Mr. Smith, were you asking for recognition a moment ago?

MR. SMITH: Yes, I really was. I am J. J. Smith, from down Jal way and I am speaking for that old boy that Mr. Pete was talking about that looked in the canyon looking for that cow. I know that the people who have been speaking here, we have heard from almost every type and even from an educated rancher and we heard from the land people and I think they should be heard from. Now, we have problems other than just pollution problems from pits and, as Mr. Merchant said, these cows, they are not very choicy of the type of water they drink and we have, they have fenced the pits and run them out. Now, here is a situation, a pipeline situation where there is an injection station there for waterflood. Well, this pit is just a normal dirt pit out there and the water content, I have it here, I have had them tested, I called this company, if you want me to I'll call the company's name, Shell Oil Company, they're spreading down there now and the pit was running over and my son-in-law kept shoveling the dirt and kept it from running over and I called them and told them the pit was full and it was going to break and run over. Well, they said they would take care of it and I went over there and it was lowered about two or three inches, so I suppose if we get those two or

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 1120 SIMMS BLDG. • P.O. BOX 1092 • PH 243-6651 • ALBUQUERQUE, NEW MEXICO 87101
 1400 FIRST NATIONAL BANK EAST • PHONE 256-1294 • ALBUQUERQUE, NEW MEXICO 87108

three or four inch rain we have been waiting on for about eight months or a year, why I think an act of God will take care of that pit. So, we have other problems rather than just pollution problems. I say, the water pollution problem is the one problem that we are working on right here, but we have caused, damage caused from cattle out of those pits more than anything else there. They put up a fence around the pits and the old bull rubs his hair off in the spring and the lice off in the fall and watches him walk over it and they have free access to this water. So you could go on, I could go on and on and on which is not necessary at all, but we do have pollution problems even in the air and otherwise and I will say this, that, that our wildlife people, I think, are interested in these pits being closed on account of the amount of wild duck, especially and various other types of life, get in these pits and are killed and now we have the problem confronting us, I don't know what we are going to do with this we got in the ocean. I have taken some pictures here if you would like to see them on what it does to our land.

MR. PORTER: Does anyone else have a statement? Have I overlooked anyone or failed to recognize anyone who has had his hand up? That concludes the statements. The Commission will take the case under advisement. The hearing is adjourned.

(Whereupon the hearing was concluded)

EX # 13

SPECIAL RULES AND REGULATIONS GOVERNING PRODUCED
OIL FIELD WATERS IN LEA, CHAVES, ROOSEVELT, EDDY,
COUNTIES, NEW MEXICO

A. The disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any other manner which will constitute a hazard to any fresh water supplies is prohibited.

B. Exceptions to the foregoing prohibition to permit surface disposal of water may be considered by the Secretary-Director of the Commission provided

1. Water to be disposed of is potable water and contains less than 1,000 parts per million total dissolved solids; or

2. Water to be disposed of contains more than 1,000 parts per million total dissolved solids but contains less parts per million total dissolved solids than the shallow water occurring naturally within a radius of three miles to the proposed disposal site as evidenced by an analysis of the water produced by all water wells 300 feet deep or less within such three mile radius; or

3. Water to be disposed of contains more than 1,000 parts per million total dissolved solids and there are no shallow fresh water wells 300 feet deep or less within a three mile radius of the proposed disposal site; or
4. Water to be disposed of constitutes a total of not more than one barrel per day per 40-acre tract being served by the proposed disposal site but in no event shall exceed 16 barrels per day; or
5. Water is to be disposed of by evaporation in a surface pit of approved design which is equipped with an impervious lining and which provides adequate protection against overflow and accidental or intentional leakage or spillage.

C. To obtain an exception to Rule A of these rules, an operator shall first determine the section of Rule B under which he desires to qualify and shall then file two copies of the application with the Santa Fe Office of the Commission and one copy with the appropriate district office of the Commission. Each copy of the application shall be accompanied by the items specified.

To qualify under section 1 of Rule B, applications shall be accompanied by Item D-1.

To qualify under section 2 of Rule B, applications shall be accompanied by Items D-1, D-2, D-4 and D-6.

To qualify under section 3 of Rule B, applications shall be accompanied by Items D-1, D-4, and D-6

To qualify under section 4 of Rule B, applications shall be accompanied by Item D-3.

To qualify under section 5 of Rule B, applications shall be accompanied by Items D-3 and D-5.

D. Attachments to applications

1. A complete analysis of a representative sample of the produced water to be disposed of, the sample to be taken by and the analysis conducted by a governmental agency or a recognized independent water analysis laboratory. The analysis shall show total dissolved solids and shall include, but not be limited to, parts per million of sodium, calcium, magnesium, chloride, sulphates, and bicarbonates.

2. A complete analysis of a representative sample of water currently produced by every producing water well with a depth of 300 feet or less located within a three-mile radius of the proposed disposal site. Water samples shall be taken by and analyses conducted by a governmental agency or a recognized independent water analysis laboratory. Analyses shall show total dissolved solids and shall include, but not be limited to, parts per million of sodium, calcium, magnesium, chlorides, sulphates and bicarbonates.

In the event a sample of water from any well within three miles of the proposed disposal site could not be

obtained for analysis, the applicant shall state the reasons why and describe the efforts made to obtain such sample.

3. A plat of the lease which will be served by the disposal facility, indicating where the proposed disposal site is located, and showing the name and number of each producing well, the formation(s) from which it is producing, and the latest oil, gas, and water production test.
4. A plat showing the lease upon which the proposed disposal site is located, indicating thereon the disposal site, and showing the location and depth and the ownership of all producing water wells within three miles of the site.
5. A drawing, including plan and cross-section of the proposed disposal facility, together with a complete description of the construction method proposed, and including specifications of materials to be used. Description shall also be given of the methods proposed to ensure against overflow and leakage.
6. A publisher's affidavit of publication establishing that notice of intention to apply for authority to use the proposed disposal facility has been given once in a newspaper of general circulation published at Santa Fe,

New Mexico, and once in a newspaper of general circulation published in the county, or in each of the counties if there be more than one, wherein lie lands within three miles of the proposed disposal site. The notice shall advise all concerned of the quantity and quality of the water to be disposed of and shall specify under which section of Rule B the applicant intends to qualify. Guide forms for assistance in preparation of the notice may be obtained from the Santa Fe office of the Commission.

- E. Upon receipt of the application with the required attachments, the Secretary-Director may consider immediate approval for exceptions under sections 1, ^{4,} and 5 of Rule B. He may consider approval of exceptions under sections 2 ^{and} 3 ~~and 4~~ of Rule B only if no objection has been received within 15 days after date of publication of the notice of intention. In the event objection is received, the Secretary-Director shall notify the applicant of such fact, and shall set the matter for public hearing if the applicant so desires.
- F. Exceptions to Rule A of these rules shall be granted based on conditions existent at the time of approval of the exception. Any change of condition brought to the attention of the Secretary-Director which, in his opinion, justifies suspension of the

exception shall result in such suspension pending notice
and hearing of the matter and entry of an order.

~~CHIEF~~ 417

POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
1. Lovington Abo	40	91,088	87,515		25,326
Lovington Paddock	$\frac{112}{152}$	$\frac{26,738}{117,826}$	$\frac{5,296}{92,811}$	SWD	93,720
2. Midway Abo	21	38,576	2,471	Open Pit	64,047
3. Midway Bone Springs	1	881	270	Pit	---
4. Emerald Abo	1	4,468	-0-	---	---
5. Double A Upper Abo	3	3,863	-0-		---
Double A Lower Abo	$\frac{2}{5}$	$\frac{2,198}{6,061}$	$\frac{2,000}{2,000}$	Pit	118,800
6. South Double A Abo	2	1,813	-0-	---	---
7. Vacuum Abo Reef	146	490,683	37,189	Pit	---
Vacuum Blinbry	30	16,912	3,821	Pit	---
Vacuum Glorieta	173	315,443	67,855	Pit	---
North Vacuum Abo	$\frac{25}{374}$	$\frac{40,161}{863,204}$	$\frac{3,400}{112,265}$	Pit	---
8. Buckeye Abo	6	27,783	49	Pit	---
9. Corbin Abo	38	95,732	18,640	Pit	48,050
10. Maljamar Abo	6	5,606	20		---
Maljamar Paddock	$\frac{9}{15}$	$\frac{4,109}{9,715}$	$\frac{4,775}{4,795}$	Pit	117,187

	WCOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
11.	Cedar Lake Abo	15	4,263	16,598	Pit	24,708
12.	Jackson Abo	14	6,154	16,787	Pit	24,708
13.	Loco Hills Abo	6	3,481	8,525	Pit	20,164
14.	Empire Abo	252	611,868	61,323		69,793
	Empire Paddock	$\frac{1}{253}$	$\frac{166}{612,034}$	$\frac{498}{61,821}$	SWD 4,875 Pit 56,946	---
15.	Dayton Abo	7	667	111	Pit	---
16.	Young Bone Springs	1	210	-0-	---	---
17.	Querecho Plains Bone Springs	7	316	144	Pit	---
18.	Goodwin Abo	3	3,837	4,573		---
	Goodwin Drinkard	$\frac{3}{6}$	$\frac{1,775}{5,612}$	$\frac{450}{5,023}$	SWD Plan Pit	---
19.	East Hobbs Blinebry	1	395	-0-	---	---
20.	Hobbs Drinkard	1	46	32	SWD	8,070
21.	Nadine Drinkard	2	420	65	Pit	---
22.	Quail Ridge Bone Springs	3	9,365	1,111	Pit	---
23.	Big Eddy Strawn	4	39,532	8,035	Pit	59,640
24.	Teas Bone Springs	1	659	66	Pit	31,240
25.	Lea Bone Springs	7	6,823	6,237	SWD	---
26.	Scharb Bone Springs	13	46,790	228	Pit	30,601

	POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
27.	Monument Blinebry	36	20,493	36,192		---
	Monument Paddock	$\frac{34}{70}$	$\frac{32,872}{53,365}$	$\frac{71,128}{107,320}$	SWD	---
28.	Monument Tubb	38	37,033	5,565	SWD	58,400
29.	Skaggs Drinkard	19	5,095	466		---
	Skaggs Glorieta	$\frac{13}{32}$	$\frac{5,404}{10,499}$	$\frac{938}{1,404}$	SWD	26,700
30.	Weir Blinebry	12	7,089	1,453	SWD	---
31.	House Drinkard	13	2,559	1,307		47,300
	East Weir Blinebry	$\frac{9}{22}$	$\frac{4,234}{6,793}$	$\frac{148}{1,455}$	Pit	---
32.	D K Drinkard	4	1,597	308		106,855
	D K Abo	$\frac{1}{5}$	$\frac{49}{1,646}$	$\frac{36}{344}$	Pit	---
33.	Warren Abo	1	95	24		91,600
	Warren Drinkard	$\frac{2}{3}$	$\frac{1,039}{1,134}$	$\frac{359}{383}$	Pit	---
34.	Elliott Abo	3	1,053	124	Pit	55,380
35.	Terry Blinebry	114	36,410	3,043	Pit	88,956
36.	Blinebry Oil	274	141,305	11,674		
	Blinebry Gas	145	16,967	377	SWD 633 Pit 11,418	99,750
	Drinkard	$\frac{540}{939}$	$\frac{139,834}{298,106}$	$\frac{12,760}{24,811}$	SWD 219 Pit 12,541	78,825

	POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
37.	Paddock	154	52,274	19,381	SWD 4,765 Pit 14,616	54,625
38.	Arrowhead Drinkard	2	1,006	780	Pit	---
39.	Oil Center Blinebry	33	48,056	8,300	Pit	85,600
40.	West Blinebry	1	61	146	Pit	---
41.	Fowler Blinebry	18	18,543	5,343	Pit	89,667
42.	Dollarhide Drinkard	87	24,715	5,923	SWD	---
43.	Justis Blinebry	173	180,499	52,156	SWD 3,255 Pit 48,901	124,220
	Justis Tubb Drinkard	116	52,867	16,997	SWD 3,959 Pit 13,038	74,950
	Justis Paddock	6	470	716	SWD 3 Pit 713	54,315
	North Justis Abo	1	59	31	Pit	---
	North Justis Glorieta	$\frac{1}{297}$	$\frac{60}{233,955}$	$\frac{31}{69,931}$	Pit	---
44.	Cotton Draw Brushy Canyon	1	233	285	Pit	---
	TOTALS	2,801	2,734,297	238,454	381,544	619,998

EX 5-A

POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
1. East Livingston Pennsylvanian	3	3,041	3	---	---
2. Townsend Wolfcamp	76	26,074	9,229	SWD 6,051 Pit 3,178	62,631
3. North Shoe Bar Pennsylvanian	1	160	-0-	---	---
4. Shoe Bar Pennsylvanian	7	28,604	-0-	---	---
Shoe Bar Wolfcamp	$\frac{2}{9}$	$\frac{872}{29,476}$	-0-	---	---
5. Eidson Pennsylvanian	6	578	207	Pit	---
6. Kemnitz Lower Wolfcamp	43	46,880	29,162	Pit	46,172
Kemnitz Cisco	$\frac{2}{45}$	$\frac{591}{47,471}$	-0-	---	---
7. Kemnitz Upper Wolfcamp	1	325		Pit	---
8. Sombrero Pennsylvanian	2	294	-0-	---	---
9. Samml Wolfcamp	1	1,021	77	Pit	---
10. Maljamar Wolfcamp	1	1,296	-0-	---	---
11. West Kemnitz Lower Wolfcamp	4	9,152	31	Pit	---
12. Anderson Ranch Devonian	10	9,465	84,359		25,702
Anderson Ranch Wolfcamp	14	5,689	26,180		11,040
South Anderson Ranch Wolfcamp	$\frac{1}{25}$	$\frac{540}{15,694}$	$\frac{108}{110,647}$	SWD	---

	POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
13.	North Anderson Ranch Wolfcamp	15	21,636	11,397	SWD	---
14.	Henshaw Wolfcamp	13	39,943	1,812	Pit	---
15.	Daffield Pennsylvanian	1	-0-	-0-	---	---
16.	Empire Pennsylvanian	1	865	-0-	---	---
17.	Grayburg Atoka	1	2,414	-0-	---	---
18.	Anderson Pennsylvanian	1	891	-0-	---	---
19.	North Cedar Lake Morrow	1	39	-0-	---	---
20.	Fren Pennsylvanian	2	-0-	-0-	---	---
21.	North Baish Wolfcamp	1	412	-0-	---	---
22.	Baish Wolfcamp	4	4,417	69	---	---
	Maljamar Devonian	$1\frac{1}{5}$	$\frac{1,930}{6,347}$	$\frac{38,440}{38,509}$	Pit	25,418
23.	Leamex Wolfcamp	2	1,378	-0-	---	---
24.	Leamex Pennsylvanian	3	2,635	-0-	---	---
25.	North Vacuum Morrow	1	2,563	-0-	---	---
26.	Vacuum Devonian	5	3,542	2,692	---	---
	Vacuum Lower Pennsylvanian	2	132	-0-	---	---
	Vacuum Upper Pennsylvanian	14	57,928	1,247	---	---
	Vacuum Wolfcamp	32	48,413	746	---	---
	East Vacuum Wolfcamp	$1\frac{1}{34}$	$\frac{385}{110,400}$	$\frac{8,680}{13,365}$	Pit	---

	POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
27.	Spencer Pennsylvanian	1	807	101	Pit	---
28.	Knowles Devonian	7	10,252	90,224	SWD	---
29.	South Knowles Devonian	14	23,085	121,828	SWD	---
30.	Reeves Devonian	3	831	29,400		---
	Reeves Pennsylvanian	3	$\frac{1,579}{2,410}$	$\frac{2}{29,402}$	Pit	---
	South Vacuum Devonian	12	38,499	351,059		---
	South Vacuum Wolfcamp	$\frac{1}{13}$	$\frac{1,175}{39,674}$ $\frac{42,084}{42,084}$	$\frac{1,011}{352,070}$ $\frac{381,472}{381,472}$	SWD 142,445 Pit 239,027	---
31.	Mid Vacuum Devonian	7	13,184	72,421	Pit	---
32.	South Corbin Morrow	1	2,916	-0-	---	---
33.	Querecho Plains Pennsylvanian	2	1,277	173		58,575
	Young Wolfcamp	$\frac{1}{3}$	$\frac{3,242}{4,519}$	$\frac{-0-}{173}$	Pit	---
34.	Shugart Pennsylvanian	2	345	-0-		---
	Shugart Delaware	$\frac{1}{3}$	$\frac{2,119}{2,464}$	$\frac{2,119}{2,119}$	Pit	---
35.	Loco Hills Morrow	1	28	-0-	---	---
36.	Loco Hills Wolfcamp	1	377	2,014	Pit	---
37.	Red Lake Pennsylvanian	2	135	-0-	---	---
38.	Atoka Pennsylvanian	17	6,575	2,002	Pit	---

	POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
39.	Penasco Wolfcamp	1	136	-0-	---	---
40.	Canyon Wolfcamp	1	75	-0-	---	---
41.	Dagger Draw Upper Pennsylvanian	1	93	-0-	---	---
42.	North McMillan Morrow	1	2	-0-	---	---
43.	Winchester Wolfcamp	1	1,466	-0-	---	---
44.	North Burton Pennsylvanian	1	-0-	-0-	---	---
45.	Lusk Strawn	60	280,293	11,707		64,803
	Lusk Morrow	$\frac{4}{64}$	$\frac{615}{280,908}$	$\frac{94}{11,801}$	Pit	---
46.	West Tonto Pennsylvanian	1	52	270	Pit	---
47.	Buffalo Pennsylvanian	2	413	72	Pit	---
48.	East Buffalo Pennsylvanian		-0-	-0-	---	---
49.	Quail Ridge Morrow	2	116	-0-	---	---
50.	Monument McKee Ellenburger	9	2,343	10	Pit	---
51.	House Tubb	1	9	10	Pit	---
52.	North Skaggs Drinkard	2	149	-0-	---	---
53.	Warren Blinebry	2	1,245	-0-	---	---
	Warren Tubb	$\frac{4}{6}$	$\frac{2,569}{3,814}$	-0-	---	---
54.	Warren McKee	46	31,620	3,711		82,328

	ECOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
55.	Cass Pennsylvanian	5	11,563	10,933	SWD	---
56.	Osuda Wolfcamp	3	1,790	205	Pit	---
57.	Osuda Morrow	3	7,642	15	Pit	---
58.	North Osuda Morrow	2	3,919	170	Pit	---
59.	Lea Devonian	9	29,211	111,193		---
	Lea Pennsylvanian	$\frac{11}{20}$	$\frac{7,465}{36,676}$	$\frac{1,622}{112,815}$	SWD	---
60.	Teas Pennsylvanian	1	58	-0-	---	---
61.	South Salt Lake Atoka	2	249	6		---
	South Salt Lake Morrow	$\frac{2}{4}$	$\frac{217}{466}$	$\frac{54}{60}$	Pit	---
62.	Big Eddy Strawn	4	39,532	8,035	Pit	59,640
63.	Dos Hermanos Morrow	1	358	-0-	---	---
64.	Getty Morrow	1	11	-0-	---	---
65.	McMillan Morrow	3	617	-0-	---	---
66.	Dagger Draw Morrow	1	37	12	Pit	---
67.	Indian Basin Morrow	8	503	2,216		---
	Indian Basin Upper Pennsylvanian	$\frac{54}{62}$	$\frac{37,081}{37,584}$	$\frac{26,402}{28,618}$	SWD	---
68.	Golden Eagle Morrow	1	-0-	-0-	---	---
69.	Berry Morrow	1	4	396	Pit	3,100

	FOOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
70.	Wilson Pennsylvanian	1	522	-0-	---	---
71.	Gramma Ridge Morrow	5	2,997	-0-	---	---
72.	Tubb Oil	38	6,937	876		---
	Tubb Gas	$\frac{158}{196}$	$\frac{16,109}{23,046}$	$\frac{967}{1,843}$	SWD 63 Pit 1,780	---
73.	Brunson Ellenburger	43	9,237	6,260	SWD 2,805 Pit 3,455	65,797
74.	Hare Simpson	39	9,728	19,132	SWD 11,027 Pit 8,105	93,770
75.	Wantz Abo	46	25,459	1,620	Pit	125,885
76.	McCormack Silurian	2	1,409	5,648	SWD	28,684
77.	Wantz Granite Wash	2	713	9	Pit	---
78.	South Brunson Ellenburger	4	5,555	209	Pit	---
	South Brunson Granite Wash	$\frac{1}{5}$	$\frac{69}{5,624}$	$\frac{-0-}{209}$	---	---
79.	Los Medanos Atoka	1	130	-0-	---	---
80.	Remuda Wolfcamp	1	196	-0-	---	---
81.	North Bell Lake Devonian	1	784	-0-	---	37,800
82.	Bell Lake Devonian	3	-0-	-0-	---	---
	Bell Lake Pennsylvanian	2	-0-	-0-	---	---
83.	Antelope Ridge Atoka	1	4,740	11,060		---
	Antelope Ridge Devonian	3	6,833	2,928		---
	Antelope Ridge Morrow	$\frac{1}{3}$	$\frac{636}{12,239}$	$\frac{-0-}{13,928}$	Pit	---

POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
84. Teague Devonian	3	147	-0-	---	17,600
Teague Ellenburger	5	4,563	70,932	SWD 51,710 Pit 19,222	120,345
Teague Simpson	$\frac{12}{20}$	$\frac{7,531}{12,241}$	$\frac{1,517}{72,449}$	SWD	114,665
85. Stateline Ellenburger	11	84,946	205	Pit	---
86. Dollarhide Devonian	20	5,470	1,960	---	---
Dollarhide Ellenburger	5	4,982	21,489	---	---
Dollarhide Fusselman	$\frac{8}{33}$	$\frac{13,492}{23,944}$	$\frac{50,878}{74,327}$	SWD 72,367 Pit 1,960	---
87. Fowler Devonian	4	5,794	145	---	---
Fowler Ellenburger	15	53,712	4,778	---	111,500
Fowler Fusselman	1	343	3,000	---	38,900
Fowler Lower Paddock	3	954	136	---	---
Fowler Upper Paddock	$\frac{3}{26}$	$\frac{-0-}{60,803}$	$\frac{-0-}{8,059}$	Pit	---
88. Custer Ellenburger	1	138	-0-	---	---
89. Cinto Rojo Morrow	1	93	-0-	---	---
90. White City Pennsylvanian	2	429	-0-	---	---
91. Red Hills Wolfcamp	1	5,221	-0-	---	---
92. West Jal Strawn	2	990	5,077	Pit	23,600

	POOL	No. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
93.	Crosby Devonian	13	1,742	2,207	Pit	62,774
94.	Justis Glorieta	16	570	650	Pit	62,500
	North Justis Devonian	9	1,786	479	SWD 446 Pit 33	---
	North Justis Ellenburger	7	3,419	5,303	Pit	34,151
	North Justis Fusselman	15	20,136	24,797	SWD 513 Pit 24,266	41,535
	North Justis McKee	10	2,388	-0-	---	58,220
	North Justis Montoya	6	6,853	2,385	Pit	45,440
	Justis Ellenburger	14	52,305	10,680	SWD	66,030
	Justis Fusselman	28	48,365	53,201	SWD 38,400 Pit 14,801	32,989
	Justis McKee	16	1,690	6	SWD	---
	Justis Montoya	15	20,348	25,665	SWD 21,604 Pit 4,061	69,935
95.	Dublin Devonian	2	58	-0-	---	---
96.	Black River Pennsylvanian	1	313	421	Pit	---
97.	Crawford Pennsylvanian	1	-0-	-0-	---	---
98.	Cotton Draw Ellenburger	1	499	65,283	Pit	---
	TOTALS	1,211	1,333,135	845,151	637,347	1,482,498
	GRAND TOTALS	17,248	9,885,859	8,533,305	4,398,984	12,932,289

MEMORANDUM

State Engineer Office
Santa Fe, New Mexico

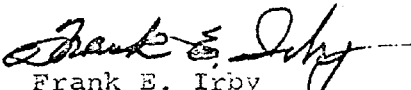
April 14, 1967

TO A. L. Porter, Jr.
FROM Frank E. Irby
SUBJECT Contamination

As a matter of precaution, we are sending an original and 7 copies of this letter to the State Records Center for filing because of the requirements of Senate Bill 277 which carried an emergency clause and was passed in the recent session of the Legislature. The signed letter attached hereto is an exact copy of the one being sent to the Records Center and I hope will suffice until such time as we can furnish a copy certified by the Records Center.

FEI/ma

Yours truly,


Frank E. Irby

OCC
EN 7/10/1
Call 3551



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

April 13, 1967

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

All underground water in the State of New Mexico containing 10,000 parts per million or less of dissolved solids is hereby designated by the State Engineer pursuant to Section 65-3-11. (15) N.M.S.A., 1953 Compilation; except that this designation shall not include any water for which there is no present or reasonably foreseeable beneficial use that would be impaired by contamination. This designation supercedes all previous designations pertaining to underground water.

For your information I am attaching a memorandum dated April 10, 1967 and the map mentioned therein which shows the areas and formations in which water of 10,000 parts per million or less commonly occurs.

The surface water designation previously made remains unchanged.

FEI/ma
encl.

Yours truly,

S. E. Reynolds
State Engineer

By: 
Frank E. Irby
Chief
Water Rights Div.

MEMORANDUM

April 10, 1967

To: Chief, Water Rights Division
(Through Chief, Technical Division)

From: Chief, Hydrology Section, Technical Division

Subject: Designation of fresh-water supplies to be protected against contamination, as authorized by Section 65-3-11(15), New Mexico Statutes Annotated, 1953 Compilation, 1965 Supplement.

Section 65-3-11(15), New Mexico Statutes Annotated, 1953 Compilation, 1965 Supplement, is concerned with prevention of contamination of fresh-water supplies resulting from disposal of water produced or used in connection with the drilling for or production of oil or gas.

Sections 65-3-11(1) and 65-3-11(2) appear to make adequate provision for the protection of ground waters from hazards incident to wildcat and oil-well drilling and in completion of production wells.

It is believed that the intent of the legislation pertinent here is to provide reasonable protection against deterioration of the chemical quality of water presently usable or being used for domestic, irrigation, or stock-water supplies and water that could be made usable for such purposes by treatment methods now generally employed by municipalities and methods commonly used in treating individual household supplies. Such water is considered to be "fresh" within the meaning of the subject legislation.

Many irrigation water supplies in the Pecos Valley and in the Tularosa area contain more than 3,000 ppm dissolved solids and some water containing as much as 5,000 ppm dissolved solids is used. Water containing more than about 3,000 ppm dissolved solids ordinarily is considered to be too highly mineralized for use as irrigation water but evidently may be used beneficially in favorable environmental situations.

Numerous stock-water supplies in the State contain between 2,000 and 3,000 ppm dissolved solids and many contain as much as 5,000 ppm dissolved solids. A number of stock wells in southeastern New Mexico are known to produce water containing between 5,000 ppm and 9,260 ppm dissolved solids and one stock well produces water containing 17,200 ppm dissolved solids. Water containing much more than 5,000 ppm dissolved solids probably could not be practically used continuously for stock-watering purposes but water containing more than 10,000 ppm dissolved solids may be used temporarily in special or emergency circumstances (see California Water Quality Control Board Publication No. 3A, "Water Quality Criteria," 1963, pp. 112-113).

It would appear, then, that waters containing 5,000 ppm or less dissolved solids should be afforded definite protection against possible deterioration of chemical quality and it is suggested that provision for protection of supplies containing 10,000 ppm dissolved solids or less be

made in those areas where water of better quality is not available and where such water is usable or is currently being used for livestock watering purposes.

Deterioration of chemical quality of existing water supplies may occur directly or indirectly in several ways as a result of disposal of oil-field wastes:

1) Oil-field wastes placed in unlined pits will seep through the bottoms and sides of the pits and enter shallow fresh-water aquifers (such as occur in the Ogallala formation and other Cenozoic formations found in widespread areas of New Mexico). The wastes, upon reaching the saturated zone, will tend to move to the lower parts of the aquifer because the density of the wastes is usually greater than that of the water in the aquifer. The wastes may then spread laterally as they move down dip or they may be primarily confined to topographic erosion channels. Obviously the degree of deterioration of fresh waters that will result will depend upon the rate at which wastes are disposed, the length of time the disposal operations are continued, the quality of the disposed wastes, the local geohydrology in each instance and the degree of pumping of fresh water in the vicinity of the pits.

2) Direct injection of wastes into the fresh-water zones of an aquifer by means of disposal wells would have much the same effect as pit disposal operations except that relatively deep as well as near-surface water supplies could be affected and the effects might spread more rapidly than in the case of pit disposal, other things being equivalent.

3) As an example of indirect deterioration of fresh-water supplies as a result of displacement of water of poor quality, consider a formation which contains water of both good and poor chemical quality in different areas or zones. If wastes are introduced into the areas or zones containing the poor quality water, or even into adjacent formations hydraulically connected, the poor quality water will migrate because of displacement into the areas or zones of good quality water. Obviously, as for 1) above, the impairment that would result in the areas or zones of good quality water will depend upon the magnitude of the disposal operation, its time of continuance, and the hydraulic and hydrologic properties of the formation under consideration.

4) Consider next a formation which discharges water of poor quality to a stream through springs or seeps, or indirectly through other formations. Introduction of wastes into such formations, even in areas of poor quality water, will increase the rate of accretion of poor quality water to the stream and could result in serious impairment to the quality of the stream water, particularly during periods of low flow.

All formations, deposits, or rocks younger than Cretaceous in age at most places in the State of New Mexico contain fresh-water supplies (if they contain water at all) which should be afforded protection.

The attached map shows on a broad formation-area basis the areas in which fresh-water supplies commonly are found in formations of Cretaceous age and older in the areas delineated. It must be realized that the facts pertinent to many of the areas shown on the map are incompletely known and that revision from time to time as information is gained will be desirable. In the meantime, however, the map should serve as a guideline to interested persons.

Although this memorandum is primarily oriented to a discussion of ground-water supplies, the effect of disposal of oil-field wastes on surface-water supplies used for domestic, stock, municipal, industrial, irrigation and recreation purposes must be considered also. In general, all surface-water supplies of the State can be considered "fresh" under the definition stated above. Some reaches of some streams may have part-time flows wherein the stream waters will contain more than 5,000 ppm dissolved solids but these conditions should not be aggravated.

P. D. Akin

PDA:mm
Attachment

EX 4-4

POOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
1. Lovington Abo	40	91,088	87,515		25,326
Lovington Paddock	$\frac{112}{152}$	$\frac{26,738}{117,826}$	$\frac{5,296}{92,811}$	SWD	93,720
2. Midway Abo	21	38,576	2,471	Open Pit	64,047
3. Midway Bone Springs	1	881	270	Pit	---
4. Emerald Abo	1	4,468	-0-	---	---
5. Double A Upper Abo	3	3,863	-0-		---
Double A Lower Abo	$\frac{2}{5}$	$\frac{2,198}{6,061}$	$\frac{2,000}{2,000}$	Pit	118,800
6. South Double A Abo	2	1,813	-0-	---	---
7. Vacuum Abo Keef	146	490,688	37,189	Pit	---
Vacuum Blinbry	30	16,912	3,821	Pit	---
Vacuum Clorieta	173	315,443	67,855	Pit	---
North Vacuum Abo	$\frac{25}{374}$	$\frac{40,161}{863,204}$	$\frac{3,400}{112,265}$	Pit	---
8. Buckeye Abo	6	27,783	49	Pit	---
9. Corbin Abo	38	95,732	18,640	Pit	48,050
10. Matjamar Abo	6	5,606	20		---
Matjamar Paddock	$\frac{9}{15}$	$\frac{4,109}{9,715}$	$\frac{4,775}{4,795}$	Pit	117,137

	NO. OF PITS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
11. Cedar Lake Abo	15	4,263	16,598	Pit	24,708
12. Jackson Abo	14	6,154	16,787	Pit	24,708
13. Loco Hills Abo	6	3,481	8,525	Pit	20,164
14. Empire Abo	252	611,868	61,323		69,793
Empire Paddock	$\frac{1}{253}$	$\frac{166}{612,034}$	$\frac{498}{61,821}$	SWD 4,875 Pit 56,946	
15. Dayton Abo	7	667	111	Pit	
16. Young Bone Springs	1	210	-0-		
17. Querecho Plains Bone Springs	7	316	144	Pit	
18. Goodwin Abo	3	3,837	4,573		
Goodwin Drinkard	$\frac{3}{6}$	$\frac{1,775}{5,612}$	$\frac{450}{5,023}$	SWD Pit	
19. East Hobbs Blinebry	1	395	-0-		
20. Hobbs Drinkard	1	46	32	SWD	8.070
21. Nadine Drinkard	2	420	65	Pit	
22. Quail Ridge Bone Springs	3	9,365	1,111	Pit	
23. Big Eddy Strawn	4	39,532	8,035	Pit	59,640
24. Teas Bone Springs	1	659	66	Pit	31,240
25. Lea Bone Springs	7	6,823	6,237	SWD	
26. Sciard Bone Springs	13	46,790	228	Pit	30,601

	FOOT	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
27.	Monument Blinebry	36	20,493	36,192		---
	Monument Paddock	$\frac{34}{70}$	$\frac{32,872}{53,365}$	$\frac{71,128}{107,320}$	SWD	---
28.	Monument Tubb	38	37,033	5,565	SWD	53,400
29.	Skaggs Drinkard	19	5,095	466		---
	Skaggs Clorieta	$\frac{13}{32}$	$\frac{5,404}{10,499}$	$\frac{938}{1,404}$	SWD	26,700
30.	Weir Blinebry	12	7,089	1,453	SWD	---
31.	House Drinkard	13	2,559	1,367		47,300
	East Weir Blinebry	$\frac{9}{22}$	$\frac{4,234}{6,793}$	$\frac{148}{1,455}$	Pit	---
32.	D K Drinkard	4	1,597	308		106,855
	D K Abo	$\frac{1}{3}$	$\frac{49}{1,646}$	$\frac{36}{344}$	Pit	---
33.	Warren Abo	1	95	24		91,600
	Warren Drinkard	$\frac{2}{3}$	$\frac{1,039}{1,134}$	$\frac{359}{383}$	Pit	---
34.	Elliott Abo	3	1,053	124	Pit	55,380
35.	Terry Blinebry	114	36,410	3,043	Pit	38,956
36.	Blinebry Oil	274	141,305	11,674		
	Blinebry Gas	145	16,967	377	SWD 633	99,750
	Drinkard	$\frac{540}{959}$	$\frac{139,834}{298,106}$	$\frac{12,760}{24,811}$	SWD 219	78,625
					Pit 12,841	
					Pit 11,418	

	FOOL	NO. OF WELLS	OIL VOLUME	WATER VOLUME	DISPOSITION	CHLORIDES
37.	Paddock	154	52,274	19,381	SWD 4,765 Pit 14,616	54,625
38.	Arrowhead Drinkard	2	1,006	780	Pit	---
39.	Oil Center Blinebry	33	48,056	8,300	Pit	85,600
40.	West Blinebry	1	61	146	Pit	---
41.	Fowler Blinebry	18	18,543	5,343	Pit	89,667
42.	Dollarhide Drinkard	87	24,715	5,923	SWD	---
43.	Justis Blinebry	173	180,499	52,156	SWD 3,255 Pit 48,901	124,220
	Justis Tubb Drinkard	116	52,867	16,997	SWD 3,959 Pit 13,038	74,950
	Justis Paddock	6	470	716	SWD 3 Pit 713	54,315
	North Justis Abo	1	59	31	Pit	---
	North Justis Glorieta	$\frac{1}{297}$	$\frac{60}{233,955}$	$\frac{31}{69,931}$	Pit	---
44.	Cotton Draw Brushy Canyon	1	233	285	Pit	---
	TOTALS	2,801	2,734,297	238,454	381,544	619,998

1966 WATER PRODUCTION

BY TOWNSHIP RANGE SECTION

DATED MARCH 23 1967

SEC TWP. RGE WATER PROD.

33	6	26	3560
34	6	26	417
4	7	26	1627
5	7	26	1384
8	7	26	1875
200	7	26	1705
207	7	26	785
209	7	26	470
22	7	26	910
33	7	27	1030
7	7	31	5283
19	7	33	1660
200	7	33	3057
204	7	33	1637
205	7	33	3574
206	7	33	710
208	7	33	85
209	7	33	488
200	7	33	919
211	7	33	919
22	7	33	1069
22	7	33	1155
22	7	33	610
22	7	33	187
22	7	33	5470
4	7	34	79
16	7	34	347
18	7	34	72
19	7	34	5230
200	7	34	247
209	7	34	461
30	7	34	1227
25	7	35	3261
25	7	35	1673
26	7	35	22172
30	7	36	631
31	7	36	1101
2	8	30	180
3	8	30	940
7	8	30	366
10	8	30	749
11	8	30	5415
11	8	30	440
13	8	30	761
14	8	30	18
15	8	30	119
17	8	30	1158
1	8	32	38402
6	8	32	4387
24	8	32	4877
25	8	32	4118
26	8	32	165
1	8	33	4672

9/8-1

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114	9	36	6533
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223	9	36	144333
226	9	36	377606
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20	10	34	131075
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15	10	36	689349
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21	10	36	115800
22	10	36	690555
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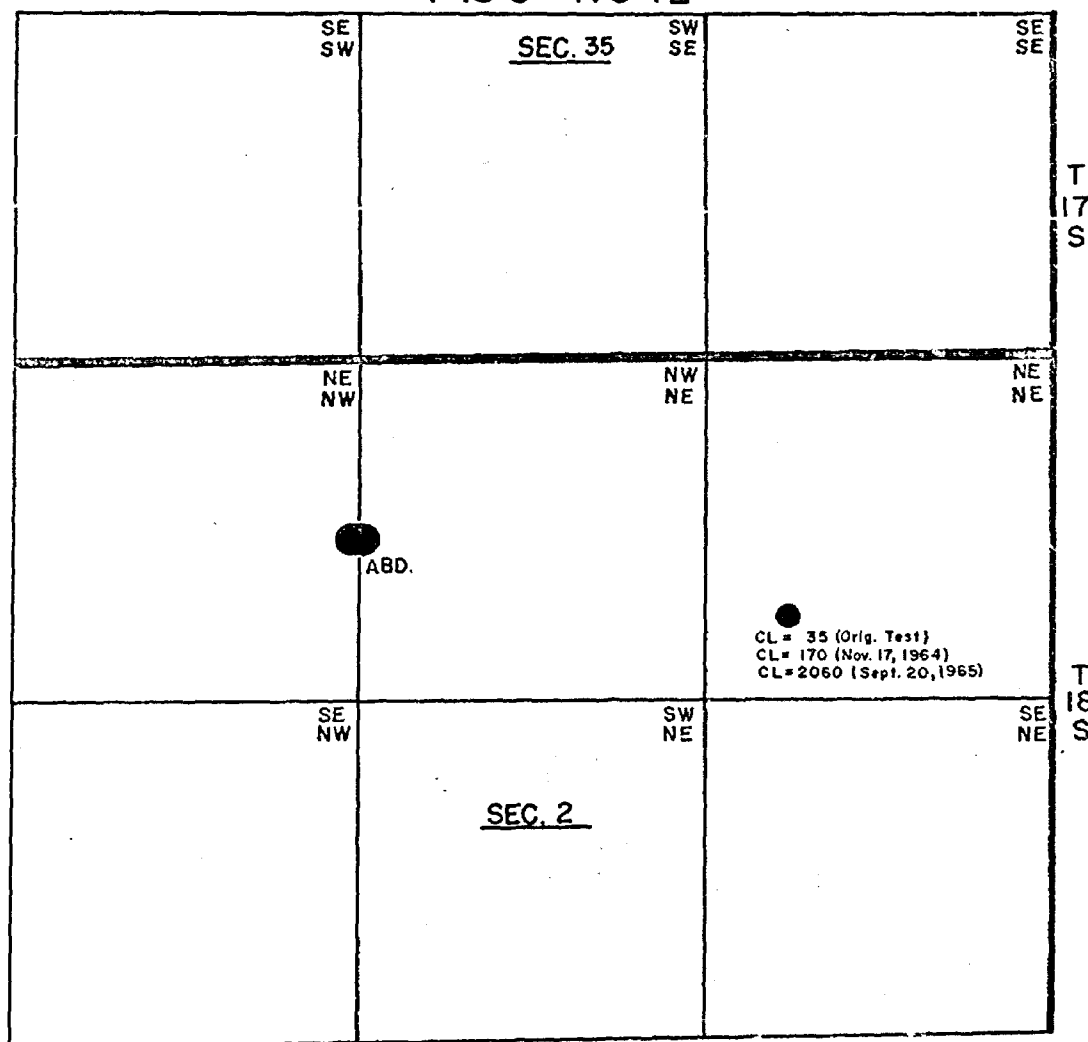
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24

SOUTHEAST WATER SUMMARY
158,194,768

~~CONTAMINATED WATER~~

T 18 S - R 34 E



N.W. O.C.C.
HOBBS, N.M.
4-10-67

EXHIBIT No. 7-A

LEGEND:

- ☐ DISPOSAL PIT
☒ WATER WELL.
☐ CONTAMINATED WELL.

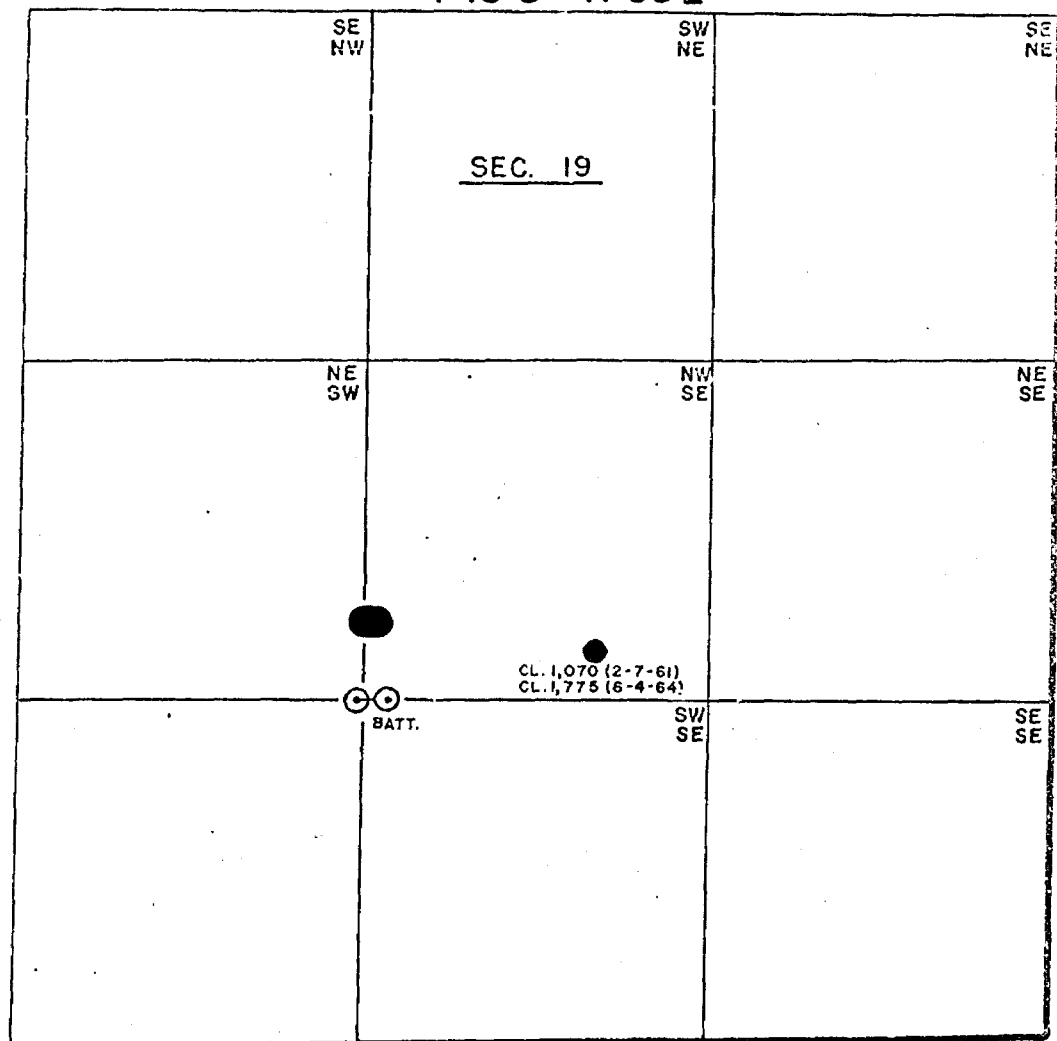
TOWNSHIP 18 SOUTH, RANGE 34 EAST

Kermac - Water Supply Well - Vacuum Pool

Chlorides	Original Test	+ 35 ppm
Chlorides	November 17, 1964	- 170 ppm
Chlorides	September 20, 1965	2060 ppm

CONTAMINATED WATER

T 18 S - R 38 E



N.M.O.C.C.
HOBBS, N.M.
4-10-67

LEGEND:

- DISPOSAL PIT
- ⊗ OIL BATTERY
- CONTAMINATED WELL

EXHIBIT No. 9-b

TOWNSHIP 18 SOUTH, RANGE 38 EAST

A contaminated well on which complaints were made to the Oil Conservation Commission lies in the NW/4 SE/4 of Section 19, T18S, R38E. First complaint was made to the Oil Conservation Commission in February of 1961 and samples collected by the Commission indicated chlorides to be 1,070 ppm. This complaint was made by Mr. Tommy Ledford who had just purchased this place (farm). He has since moved to Arkansas. Again in June 1964, the Commission received a complaint from Mr. Buck Jones, who had purchased this farm. Mr. Jones complained about the water being too salty to drink, and he also stated that it had made some of his horses ill. The water sample taken by the Commission at that time indicated that the chloride had risen to 1,775 ppm.

This well is cased with 8" casing and has two pumps in a common bore - one small one to furnish water for the house and stock and the other, a larger pump, to irrigate some farm acreage. (A Mr. Foy Davis, who lived at this place prior to Mr. Ledford, said later that during the spring through fall seasons, during irrigation time, the water always seemed to get saltier.) There has not been any more complaints of salt contamination of wells in this area.

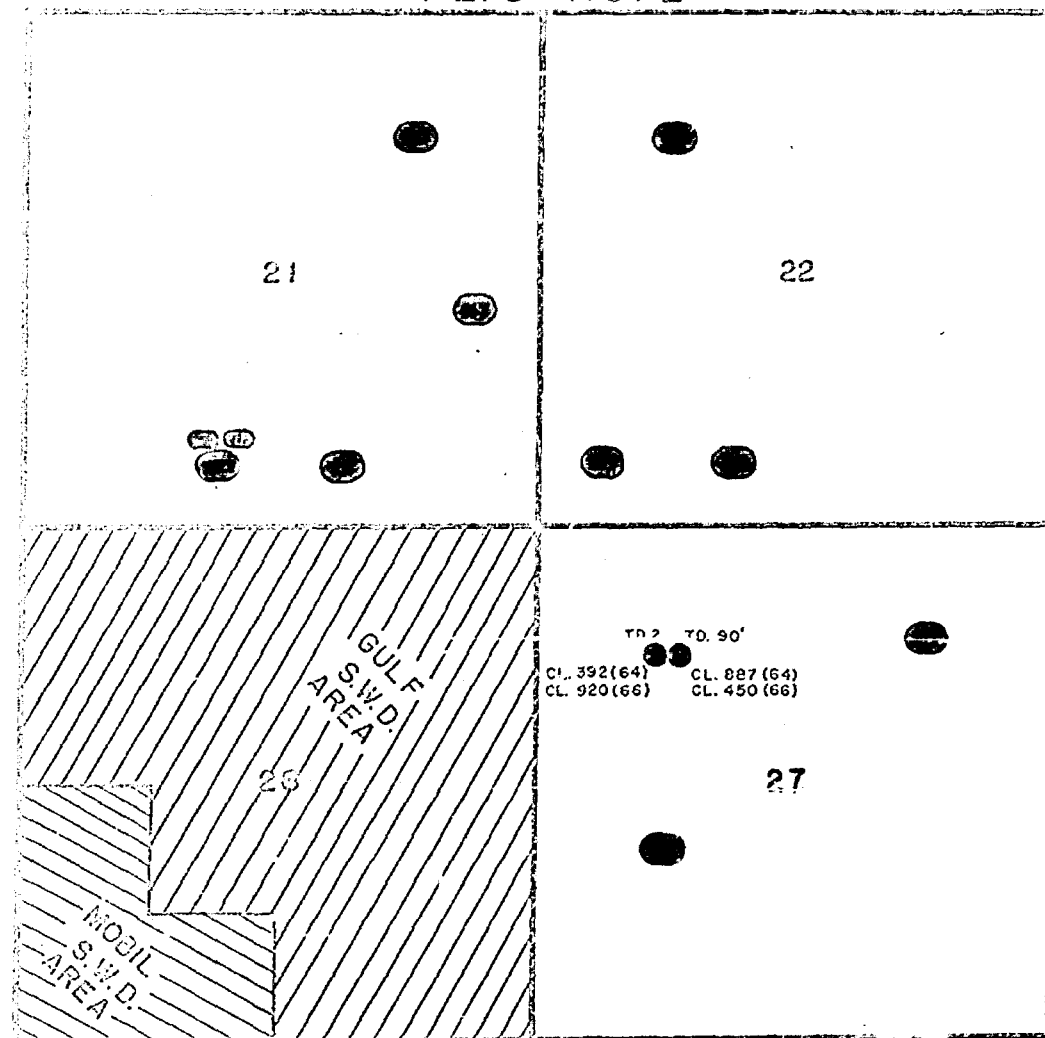
Additional Information:

Chloride content of water wells tests in this area:

SE NW	5-18-38	Cl. 78 ppm
NW NW	34-18-38	Cl. 107 ppm
Hobbs City Water	April 4, 1967	Cl. 60.35 ppm
	March, 1967	Cl. 56.72 ppm
Green Meadow Lake	Cl. 507.65 ppm	
Phillips Plant Pond	Cl. 416.00 ppm	

~~CONTAMINATED WATER~~

T 21 S - R 37 E



N.M.O.C.C.
HOBBS, NM.
4-10-67

LEGEND:

- DISPOSAL PIT
- ⊗ WATER WELL
- CONTAMINATED WELL

EXHIBIT No. 9-C

TOWNSHIP 21 SOUTH, RANGE 37 EAST

Mr. Barclay made complaint to the Oil Commission May 19, 1966. In talking to Mr. Barclay, he said that there was no shortage of water but that he noticed a change in the taste in the spring of 1964. Later in 1964 his peach trees and garden were killed out by this water. There is no gassy or oily smell or taste to this water.

The first known test on Mr. Barclay's well was October 26, 1964. The sample was collected and submitted to Halliburton's laboratory in Lovington. The results indicated chlorides to be 878 ppm and his neighbor's well (Mr. Walker)* to be 392 ppm. (Mr. Walker's well is approximately 150 feet west of Mr. Barclay's well.)

In June, 1965, a sample of water from this well was sent to Albuquerque, New Mexico, for a bacteria test which was negative.

Tests taken on May 19, 1966 by New Mexico Oil Conservation Commission Ran by Halliburton
Barclay Cl. 450 Walker Cl. 920

SW SW SW	22-21-37	Windmill	TD ? Cl.	149.1	3/67	NMOCC
NW/4 NW/4	27-21-37	Water well for House	TD 60'csd Cl.	184.1	3/67	NMOCC
	27-21-37	Warren WSW	TD ? Cl.	192	1/64	Dowell*
	27-21-37	Skelly WSW #7	TD ? Cl.	765	1/64	Dowell*
	27-21-37	Skelly WSW #8	TD ? Cl.	1200	1/64	Dowell*
	27-21-37	Skelly WSW #11	TD ? Cl.	298	1/64	Dowell*
NE SE	27-21-37	Windmill	TD ? Cl.	227	1/64	Dowell*

*These samples were collected by the Commission after a complaint was made by Warren Petroleum Corporation of salt in water wells. (A casing survey was conducted in this area in March, 1964, with negative results.)

Additional water tests in this area (Cl.) (1964) by Warren Lab Plant H₂O

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

NE SE SE	26-21-37	Warren Supply Well #5	419	363	360	-	441	-	443	-	383	-	410	-
SE SW SE	35-21-37	Warren Supply Well #2	368	363	361	-	335	-	351	-	336	-	351	-
NE SE SE	35-21-37	Warren Supply Well #17	269	269	262	-	290	-	281	-	290	-	304	-
SE SW SW	23-21-37	Warren Supply Well #19	-	538	571	-	625	-	690	-	742	-	-	Aband. Bact.

Water tests 1964 Continued

					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SW	NE	SE	35-21-37	Warren Supply Well #21	814	796	723	-	800	-	795	-	731	-	737	-
NE	NE	SE	35-21-37	Warren Supply Well #25	304	389	315	-	310	-	293	-	418	-	-	-
SE	SW	SE	26-21-37	Warren Supply Well #8	421	426	431	-	431	-	431	-	433	-	418	-

Additional water tests in this area (Cl.) 1965 by Warren Lab Plant H₂O

					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NW	SE	SE	26-21-37	Warren Supply Well #5	410	-	-	373	398	433	464	476	-	476	-	-
SE	SW	SE	26-21-37	Warren Supply Well #8	433	-	-	466	433	433	-	406	464	-	429	-
NE	SW	SE	26-21-37	Warren Supply Well #12	398	-	-	361	363	374	-	348	360	-	383	-
NE	SE	SE	35-21-37	Warren Supply Well #17	304	-	-	233	339	374	-	394	534	-	336	-
SW	NE	SE	35-21-37	Warren Supply Well #21	737	-	-	431	620	450	-	615	638	-	690	-
NE	NE	SE	35-21-37	Warren Supply Well #25	418	-	-	292	339	445	-	313	290	-	302	-
SE	SW	SE	35-21-37	Warren Supply Well #27	351	-	-	338	-	363	-	406	348	-	325	-
SW	NE	SW	26-21-37	Warren Supply Well #1	-	-	-	-	421	433	-	406	394	-	371	-

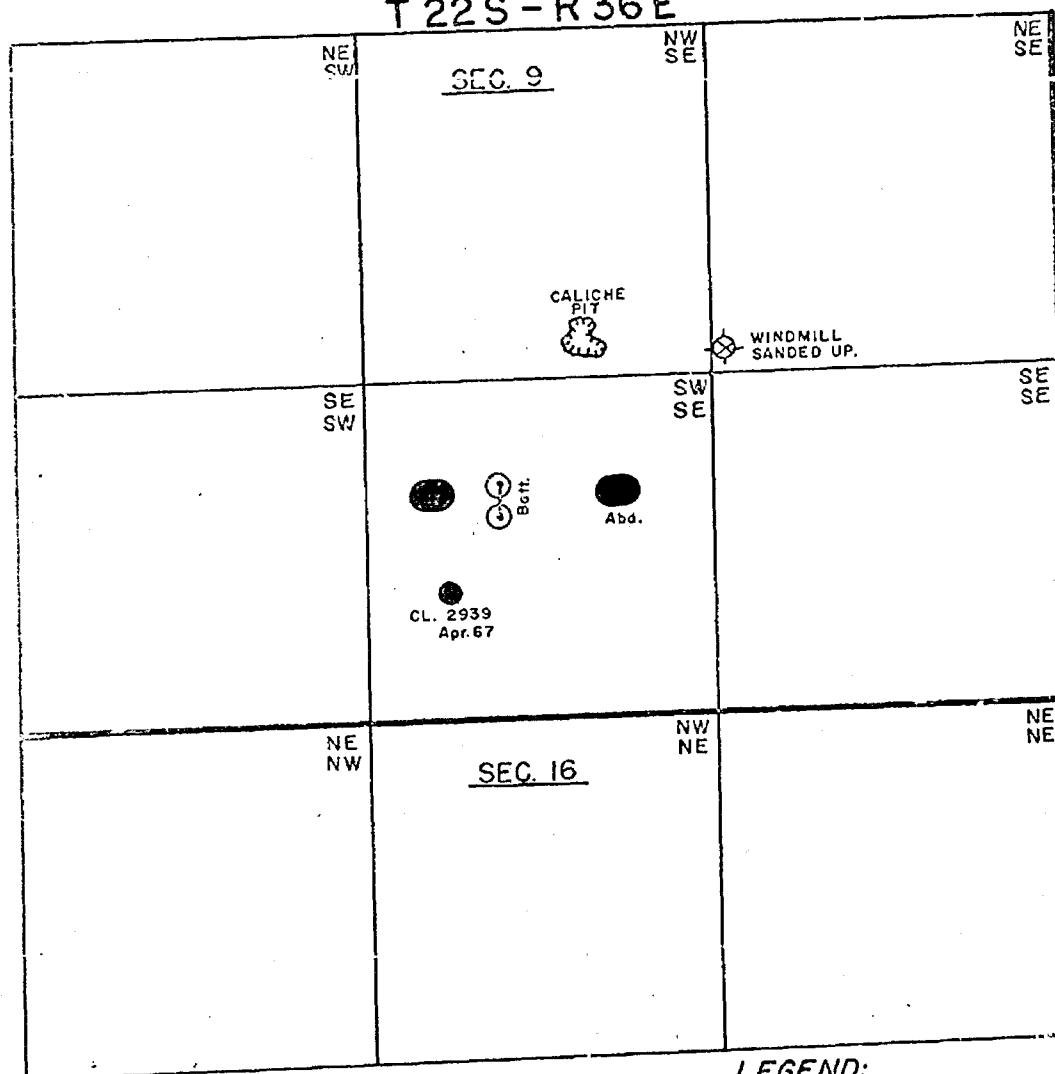
Eunice City Water April, 1965 94 ppm February, 1966 105 ppm

Chlorides content of water wells taken from map furnished by the State Engineer Office in a radius of two (2) miles of known contaminated water well(s)

17 wells with 250 ppm or above Cl
 10 wells with 100 - 250 ppm Cl
 3 wells with less than 100 ppm Cl
 49 wells do not have Cl tests reported on map
 79 wells total reported in this 2 mile area

~~CONTAMINATED WATER~~

T 22 S - R 36 E



N.M.O.C.C.
HOBBS, N.M.
4-10-67

LEGEND:

- DISPOSAL PIT
- ⊗ OIL BATTERY
- CONTAMINATED WELL.

EXHIBIT No. 9D

TOWNSHIP 22 SOUTH, RANGE 36 EAST

SW/4 SE/4 of Section 9, T22S, R36E Water well with a submergeable pump now being used to water stock in the NE/4 SE/4 of Section 9, T22S, R36E. This well was used in the past by the Texas Pacific Oil Company to furnish water for a lease house that has since been moved out. This well was sold with all equipment to the Snyder Ranch.

The chloride on this well ran 2,939 ppm. This test was run by the Oil Conservation Commission the first part of April, 1967.

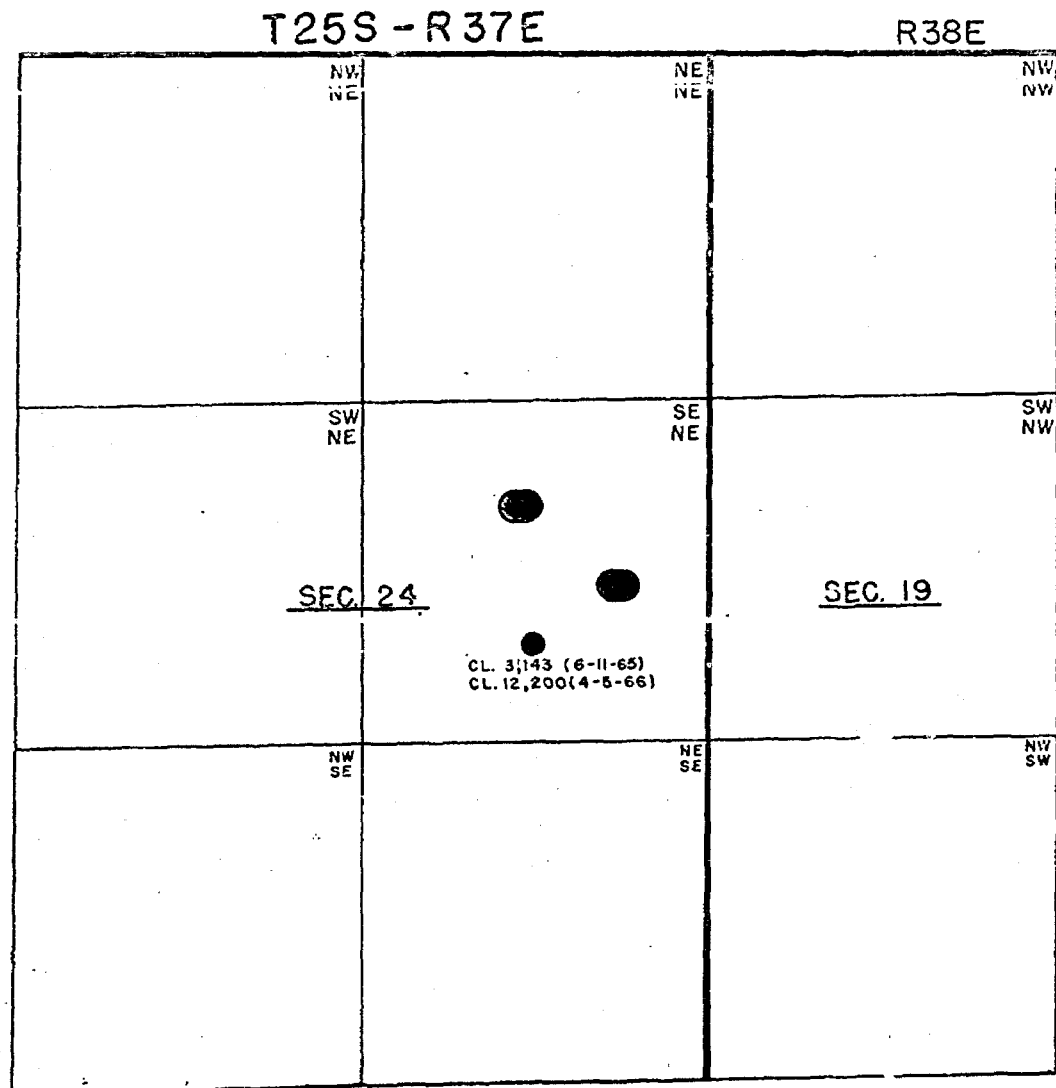
The nearest well to the above well lies in the NE/4 SE/4 of Section 9, T21S, R36E which is not in use at the present time. There is no way to get a water sample from this well.

Additional Information:

Chloride content of water wells taken from map furnished by the State Engineer Office in a radius of two (2) miles of the above contaminated well is:

1 well with 250+ ppm Cl
1 well with 100 - 250 ppm Cl
0 wells with 0 - 100 ppm Cl
4 wells with no chloride tests reported
6 wells in this two mile area

CONTAMINATED WATER



N.M. O.C.C.
HOBBS, N.M. •
4-10-67

LEGEND:

- DISPOSAL PIT
- ⊗ WATER WELL.
- CONTAMINATED WELL.

EXHIBIT No. 9-E

TOWNSHIP 25 SOUTH, RANGE 37 EAST

Mr. George Blocker of Jal, New Mexico, made a complaint to the Commission August 10, 1965 on his water well located in the SE/4 of the NE/4 of Section 24, T25S, R37E. This condition was brought to Mr. Blocker's attention by a tool pusher on a rig that was using water from this well when this water was used in the radiators of the rig's engine. The depth of this well is 105 feet with casing set at TD and a fluid level of approximately 75 feet.

Mr. Blocker had a water test taken in June of 1965 that indicated the chlorides to be 3,143 ppm.

The tests taken by the Commission in August, 1966, indicated chlorides to be 12,200 ppm. This well is not being used now.

Additional Information:

Chlorides in various wells in this area:

NW NW	25-25-37	Cl. 1,265 ppm	August 20, 1962	Same well
NW NW	25-25-37	Cl. 3,660 ppm	May 6, 1963	Same well

The above well was used for Amerada's Wimberley Lease camp water.

The following chloride tests were taken by the Commission in April, 1967:

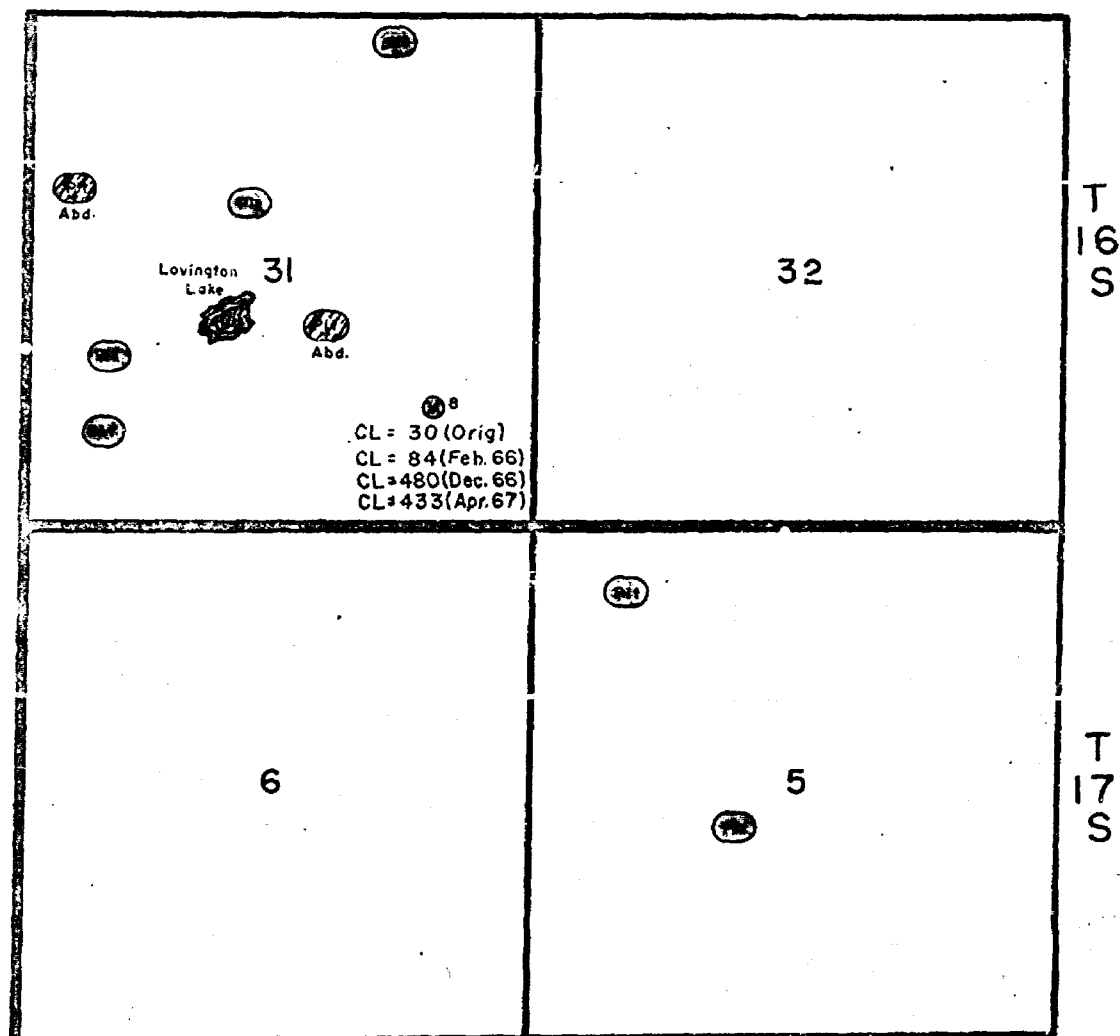
SE SE	23-25-37	Cl. 372.75 ppm	
NW NE SE	22-25-37	Cl. 940.75 ppm	
NW SW	19-25-38	Cl. 834.25 ppm	
NW SE	20-25-38	Cl. 386.95 ppm	This is a fairly new well and is east of any oil production approximately one mile.

The following summary of chlorides are taken from a map furnished by the State Engineer Office for a radius of two (2) miles of the contaminated water well.

5 wells with 250+ ppm Cl
1 well with 100 - 250 ppm Cl
1 well with 0 - 100 ppm Cl
14 wells with no chloride tests reported
21 wells in this two mile area

CONTAMINATED WATER

T16S - R37E



N.M.O.C.C. - H08BS
4-17-67

LEGEND:

- DISPOSAL PIT
- ⊗ WATER WELL
- ⊙ CONTAMINATED WELL
- CL = Chloride

EXHIBIT No. 9-F

PCA

POTASH COMPANY OF AMERICA

MINE AND REFINERY: P. O. BOX 31 • CARLSBAD, NEW MEXICO 88220 • AREA CODE 505 • TU 7-2844

6 AM 6 07
JUN 6 1967

R. H. BLACKMAN
RESIDENT COUNSEL

June 5, 1967

Mrs. Ida Rodriguez
Secretary to Director
New Mexico Oil Conservation Com.
Santa Fe, New Mexico

Dear Ida:

I want to thank you very much for sending me the transcript in Case No. 3551. I have read it with great interest and it is returned herewith.

With kindest personal regards,

Sincerely,

R. H. Blackman
R. H. Blackman
Resident Counsel

RHB:pw
Enc.



MEMBER: AMERICAN POTASH INSTITUTE



STATE OF NEW MEXICO
STATE ENGINEER OFFICE
ROSWELL

S. E. REYNOLDS
STATE ENGINEER

April 14, 1967

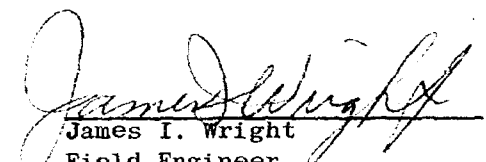
ADDRESS CORRESPONDENCE TO:
P. O. BOX 1717
ROSWELL, NEW MEXICO

New Mexico Oil Conservation Commission
Mr. Joe Ramey
1000 West Broadway
Hobbs, New Mexico

Dear Sir:

As you requested, submitted is a chemical analysis of water from the City of Lovington's Well No. 8 located in the NW $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 31, Township 16 South, Range 37 East, which city personnel collected for me on April 6, 1967. This analysis was made by E. A. Chavez of the State Engineer Office on April 7, 1967.

The City of Lovington will send you copies of the analyses that the Health Department has on this well.


James I. Wright
Field Engineer
State Engineer Office

JIW*jcj



STATE OF NEW MEXICO
STATE ENGINEER OFFICE
ROSWELL

S. E. REYNOLDS
STATE ENGINEER

April 14, 1967

ADDRESS CORRESPONDENCE TO:
P. O. BOX 1717
ROSWELL, NEW MEXICO

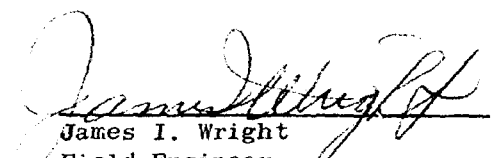
New Mexico Oil Conservation Commission
Mr. Joe Ramey
1000 West Broadway
Hobbs, New Mexico

Dear Sir:

As you requested, submitted are records from our file on well L-2723 located in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 2, Township 18 South, Range 34 East, regarding chemical quality of water pumped from this well.

According to our records a sample of water taken November 17, 1964 had a chloride content of 170 ppm and a sample taken September 20, 1965 had a chloride content of 2060 ppm. These two analyses were apparently run by the Kerr-McGee laboratory.

On September 15, 1965, E. C. Barry of this office collected a sample of water from this well, which was subsequently analysed by our office. This sample had a chloride content of 1080 ppm.


James I. Wright
Field Engineer
State Engineer Office

JIW*jcj

State Engineer Office
Roswell, New Mexico

16.37.31.4411 ANALYTICAL STATEMENT

County Lea

Lab No. RSE0-4913

Location L-5458

Date of collection 26 April 1967

Source (type of well) drilled

Owner City of Lovington

(Well No. 8)

Date dcd June 9, 1965

Depth 111 ft

Water level 0 g. 111 ft

Sampled after pumping 4 hrs.

Yield GPM (mean or est)

Pt of coll top of well head

Appearance Clear

Temp (°F) 71

Collector City personnel for J.I.W.

Chemist E.A. Chavez

Date completed 07 Apr 1967

Checked by _____

Date transmitted _____

	apm	ppm
SiO ₂		
Fe		
Ca		
Mg		
NO		
K		
Na + K		
HCO ₃		
CO ₃		
SO ₄		
Cl		<u>433</u>
F		
NO ₃		

Specific Conductance 1870 (microhm/cm at 25°C)

Joe's testimony

If the Commission please, George Hatch, appearing on behalf of the Commission and its staff.

I will have two witnesses that will present testimony.

SWEAR WITNESSES.

1. I would like to call Mr. Ramey to the stand at this time.
2. State your name and position for the record, please.
3. Mr. Ramey, in your capacity as Supervisor of District No. 1 for the New Mexico Oil Conservation Commission, is it your duty to make recommendations to the Commission concerning the disposal of produced water?
4. Are you familiar with Case 3551 and what it proposes?

5. Would you please tell the Commission what is being sought *Give the background of SWD in the SE & what is being sought in this case & the reason for bringing the case* in Case 3551, the reason for bringing the case, etc. *a short summary of the*
(Background) Number of SWD orders issued in past, complaints to the Oil Conservation Commission of contamination, etc.

6. With what geographical area are we concerned with in this case?

Lea, Eddy, Chaves and Roosevelt Counties

7. What oil and gas pools might be affected by an order issuing as a result of this hearing?

- All of the gas and oil pools of the Southeast

8. Have you prepared an exhibit that will show the names and locations of the oil and gas pools that may be affected by an order issuing as a result of this hearing?

= 1 - 4 and 1 A - 4 A

9. What exhibit is that? = 1 - 4 and 1 A - 4 A

10. Will you explain to the Commission why there are 3 exhibits covering the same geographical area (2, 3, 4)

11. What is the reason for the numbers by each pool shown in Exhibits 1 - 4?

12. Is there any oil or gas production that might be affected by an order that is not reflected in Exhibits 1 - 4 and 1 A - 4 A?

= explain there are wells other than those in the designated pools shown on the exhibits.

13. Do you have any information as to the amount of water produced by ~~the wells in~~ each of the pools shown on Exhibits 1 - 4?

- shown on 1 - 4 in color - explain

- shown on 1 A - 4 A - explain

14. Exhibit Nos 1 - 4 and the tabulation sheets 1 A - 4 A show the amount of oil field brines produced during what period of time?

December, 1966

15. What happens to these produced brines?

- pits, waterfloods, SWD

16. Where are these ^{open} pits located?

(some are near one well - but one pit may serve a number of wells?)

17. How many barrels of brines were produced during December, 1966, by the pools shown on Exhibits 1 - 4 and 1 A - 4 A.

Why was December, 1966, chosen?

18. How many barrels of brine went into surface unlined pits?

- This would be the total from the pools shown on Exhibits 1 - 4 and 1 A - 4 A for December, 1966.

19. Do the exhibits show the amount of brines produced by each pool?

Explain (1) Color shown on 1 - 4

(2) How information is also on 1 A - 4 A.

20. Do the exhibits also reflect the disposition of the brines as to each pool?

Explain (1) triangles

(2) that information is reflected on 1 A - 4 A.

(3) point out several pools as examples.

21. What percent of the total produced brines goes into surface pits?

What percent into SWD or waterflood?

Exhibit?

22. You have testified as to the production of oil field brines and the disposition of the brines, do you have any information as to the chloride content of the brines?

Refer to Exhibits 1 A - 4 A and point out how that is shown on exhibits.

Explain why only chlorides are on exhibit.

23. Explain where information as to chloride content came from.

24. What is the highest chloride content?

25. What is the lowest chloride content?

26. Explain why some pools do not have a chloride content shown.

27. Explain that the chloride content of some pools would be similar to those that are shown.

28. Would you expect the chloride content of those pools that do not show a chloride content to range from a low of _____ to a high of _____ ?

29. You have testified to the amount of brines produced by each pool during the month of December, 1966. Do Exhibits 1 - 4 and 1 A - 4 A show how much water is produced in a section?

30. Do you have any testimony or exhibits that will show how much water is produced in each section? for year of 1966

Exhibits 5 and 6

Exhibit 7 (tab sheet)

31. Is this a large amount of water?

How many sections would it cover to a depth of one foot?

32. *Refer to exhibits 5 & 6 & explain what those*
32. What does each color represent?
are

33. Explain how the exhibit shows the production of oil field brines by Section, Township, Range, and where the information came from.

34. Explain that exhibits 5, 6, 7 do not show quality of water.

35. Explain that exhibits 5, 6, 7 do not show disposition of water.

36. But show by the (5) examples that you can take the information from a combination of figures and show the disposition of water in each section and the quality of the water being disposed in each section.

37. You have testified as to the quality of water produced by oil and gas wells - have you had occasion in your duty as Supervisor of District 1 to make a study of the quality of the water in any water wells?
38. Is it a duty of your office to investigate complaints as to possible contamination of water wells by brine disposal?
39. Have you studied the quality of the water in a well (or wells) located in Section ____, Township ____ South, Range ____ East?
40. Is that well (or wells) shown on Exhibit No. 8?
41. What did the analysis show as to chloride content?
42. What was the depth of each well?
43. In your opinion, are the wells producing from the same water sand? (PERHAPS THIS SHOULD BE LEFT FOR SPIEGEL?)
44. Is there a surface unlined disposal pit in the area?
45. What is the distance and direction of each well from the pit?

INTRODUCE EXHIBITS AND CALL ZANE

CALL DR. ZANE SPIEGEL TO THE STAND

(Water Resources Engineer)

1. Please state your name, profession, and by whom you are employed? (Hydrologist)
2. Have you testified before this Commission before in that capacity?
3. Will the Commission accept the witness's qualifications?
4. Dr. Spiegel, in your position as a Hydrologist for the State Engineer's Office, is it one of your duties to make reports to the State Engineer as to the presence of water and its quality in particular areas of the State, including the Counties of Lea, Eddy, Chaves, and Roosevelt?
5. Are you familiar with Case 3551 and what it proposes?
6. In your position as Hydrologist, have you made reports to the State Engineer as to the presence of water and the quality of the water in the Counties of Lea, Eddy, Chaves, and Roosevelt?
7. Were those reports incorporated into a memorandum prepared by the State Engineer and sent to the Commission?
8. I am handing you what has been marked as Exhibit No. 9, is it a true and correct copy of the memorandum prepared

by the State Engineer's office and sent to the Commission upon the request of the Commission.

9. Does the memorandum reflect the quantity and quality of water in Lea, Eddy, Chaves, and Roosevelt Counties?

10. Would you please explain to the Commission what a fresh water supply is.

a. human b. agriculture c. industry

11. Did you make certain studies and prepare certain exhibits pertaining to the quality of the water in the four counties under consideration at this hearing as a preliminary step in the preparation of this memorandum? (Exhibit Nos. 10, 11, 12)

12. Is there a fresh water supply in close proximity to each of the oil and gas pools as shown on Exhibits 1 through 4?

13. For example, is there a fresh water supply in close proximity to:

- a) Cato-San Andres - Chaves - 8S - 30 E (Secs. 8, 9, 16, 17)
- b) Chaveroo-San Andres - Roosevelt - 7S - 33E (Secs. 19-36)
- c) Allison-~~Pennsylvania~~ Roosevelt - 8S - 37E (Secs. 19, 20, 28, 29, 30, 32, and 33)
- d) Mescalero-~~San Andres~~ - Lea - 10S - 32E (Secs. 10, 11, 14, 15, 21, 22, and 23)
- e) Paduca-Delaware - 25 S - 32 E (Secs. 9, 10, 16, 21, and 22)
- f) Grayburg-Jackson - 17 S - 29, 30, 31 E
- g) Artesia Pool - 18 S - 28 E

- h) Dos Hermanos- Villas Loma Pools - 20 S - 30 E (Sec. 33)
- i) Lynch Villas Loma Pools - 20 S - 34 E (Secs. 26, 27, 34, and 35)
- j) Lusk Lt. Lusk - 19 S - 31, 32 E

14. What is the quality of the water in the vicinity of each of the pools you have pointed out?

15. How do you know the quality of the water? (Windmills - samples Exhibits 10, 11, 12)

16. Do you have any information as to the depth of the fresh water in the various areas?

Exhibits 11 and 12

Will point out depth of particular areas.

17. Is it your testimony that fresh water supplies exist in substantially all areas where oil and gas production occurs in the four counties?

18. Did you hear Mr. Ramey testify as to the amount, type, and location of produced water in the Counties of Lea, Eddy, Chaves, and Roosevelt?

19. Did you also hear his testimony as to the chloride content of certain water wells located in _____ and the location of water wells in relation to a surface disposal pit?

20. Do you have an opinion as to whether or not those wells were contaminated by other than natural causes?

21. Would you explain your answer?

(Explain how contamination occurs)

22. Do you have any opinion as to whether or not the disposal of produced water into unlined pits in Southeast New Mexico presents any problem of contamination to the fresh water supplies in the area?

(Refer to previous explanation of how contamination occurs.)

23. Do you have any opinion as to whether or not there is any area in the Southeast where the disposal of produced water into unlined surface disposal pits will not present a hazard to the fresh water supplies of the area?

24. Dr. Spiegel, did you testify in Case 1053?

Do you recall your testimony in that case?

25. Did you testify in that case as to the presence of fresh water in certain parts of the Southeast? And as to the definition of fresh water?

26. Did you also testify as to how contamination has occurred and as to the probability of future contamination?

27. Would your testimony as to such matters be substantially the same today?

- slight diversion in the stream of the contaminant -

28. If the Commission please, I would like to move to incorporate the record in Case 1053 with the record in this hearing and would also like for the Commission to take administrative notice of Orders R-1224 and R-1224-A that issued as a result of the hearings held in that case.

29. Introduce Exhibits 9 - 12,

Outline

1. Background statement

A. General statement as to actions, both voluntary and compulsory taken in the past

B. Purpose of this hearing

II. Area under consideration at this hearing

A. Geographical area (SE)

1. Lea 2. Eddy 3. Chaves 4. Roosevelt

B. Oil and gas pools that may be affected by an order issuing as a result of this hearing

1. Maps showing names and locations of oil pools and gas pools

2. Tabulation sheets

a. Names and locations of pools

b. Number of producing wells in each pool

3. Testimony that wells in undesignated pools will also be affected.

III. Water production and disposition

A. Production of water by pools during month of December, 1966

1. Total production in S E

B. Production of water by each pool

C. Disposition of water by pools (total for S E)

1. Unlined pits (barrels)

2. SWD wells (barrels)

3. Secondary recovery (barrels)

4. Percent going into unlined pits

D. Disposition of water by each pool

1. Unlined pits

2. SWD wells

- 3. Secondary recovery
- 4. Percent going into unlined pits
- E. Water production by Section, Township, and Range during year of 1966
- IV. Chemical property of produced water
 - A. Basis of information
 - B. Range of chloride content
- V. Evidence of contamination
 - A. Complaints
 - B. Location of water wells tested
 - C. Results of tests - chloride
 - D. Location of pits in relation to water wells
 - E. Depth of wells
- VI. Evidence of fresh water supplies
 - A. Definition of fresh water
 - B. Location of fresh water
 - C. Method of location of fresh water
 - D. Location of fresh water in vicinity of particular pools
 - E. Presence of fresh water in substantially all areas
- VII. How disposal of produced brines into unlined pits presents a hazard to the fresh water supplies
- VIII. Opinion as to contamination in particular water wells
- XI. Recommendations
 - A. Area or areas where pit disposal should be barred
 - 1. Entire area
 - 2. Fields
 - 3. Pools

B. Time in which pit disposal should cease

1. Entire area
2. Fields
3. Pools

C. Exceptions

1. Pools that already have an exception based on
one barrel

D. Administrative procedure for exceptions and extensions
of time

CHLORIDE ANALYSIS OF OIL FIELD BRINES

A $\frac{1}{10}$ normal, standard volumetric solution of silver nitrate was prepared from a concentrated "Acculute" solution, by adding distilled water for a total of 1000 ml of solution.

The silver nitrate solution was placed in a 100 ml titration buret. (The buret was refilled to the 0 ml mark before each new test to prevent subtraction errors).

The measured water sample for each test was placed in a clean, distilled water washed, beaker. To the water sample was added 4 drops of Potassium Chromate indicator.

The water sample was then slowly titrated with the silver nitrate solution, until the end point was reached; at which point the potassium chromate indicator turned a pale pink - red.

The volume of ~~the~~ silver nitrate solution used was read from the buret and multiplied times the factor for $\frac{1}{10}$ normal

solution, for a given water sample, as follows:

1 ml water sample — AgNO_3 used (ml) $\times 3550$ = Chloride PPM
5 ml water sample — AgNO_3 used (ml) $\times 1775$ = Chloride PPM
10 ml water sample — AgNO_3 used (ml) $\times 355$ = Chloride PPM
100 ml water sample — AgNO_3 used (ml) $\times 35.5$ = Chloride PPM

The water samples were accurately measured from a 1 ml volumetric Buret, 10 ml graduated cylinder and a 100 ml graduated cylinder.

- A 1 ml water sample was used for samples having a 50,000 + Chloride content.
A 5 ml water sample was used for samples having a 20,000 to 50,000 Chloride content.
A 10 ml water sample was used for samples having a 5,000 to 20,000 Chloride content.
A 100 ml water sample was used for samples having from 0 to 5,000 Chloride content.

John W. Runyan

Geologist

N. M. O. C. C.

F. L. HEIDEL
A. M. SWARTHOUT
C. GENE SAMBERSON

LAW OFFICES
HEIDEL, SWARTHOUT & SAMBERSON
311 NORTH FIRST STREET
POST OFFICE BOX 1298
LOVINGTON, NEW MEXICO 88260

TELEPHONE
396-5303
AREA CODE 505

April 18, 1967

Mr. Joe D. Ramey
Oil Conservation Commission
1000 West Broadway
Hobbs, New Mexico

Dear Mr. Ramey:

In behalf of Southeastern Lea County Fee Land Owners Association, various individuals, and myself, I submit for your consideration in connection with your water pollution hearing of April 19-20, 1967, the matters herein mentioned.

1. Associated Press News story date lined Big Spring, Texas, Saturday, August 6, 1966, appearing in The El Paso Times, concerning the problem in the West Texas area. I am informed that recently the Railroad Commission of Texas has prohibited open pit disposal of polluted water. See Exhibit "A".

2. I am informed that Marathon Oil Company has a water well in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 13, Township 22 South, Range 36 East, N.M.P.M., that was originally drilled for domestic purposes for a pumper's dwelling house, and that ultimately the house was moved away because there was not sufficient water for domestic purposes. I am informed that the well is now flowing and the quality of the water is unfit for human consumption. See Exhibit "B". There are several Marathon pit locations about 1/2 mile West serving 4 or 5 oil wells producing from about 3,800 feet. See Exhibit "C". There is a Gulf pit location less than 1/2 mile South. See Exhibit "D". These pit locations are somewhat higher than the water well location and presumably draining toward the water well. It is significant that the water well is now flowing from a shallow formation. Although a rancher, Mr. Robinson, is using water from the Marathon pit for livestock purposes, you will note from the exhibits that all the water is unfit for human consumption.

Page 2
April 18, 1967
Mr. Joe D. Ramey

3. I call your attention to the McCall well, see Exhibit "B", the Barcly well, see Exhibit "E", and the Pilchier well, see Exhibit "F", all located in the North edge of Eunice, New Mexico. The exhibits show that the water in all of these wells is unfit for human consumption. I am informed that Skelly Oil Company has approximately 5 domestic wells in the area that are in similar condition. I am informed that there are many salt pits in the area of these wells, and I call your attention to an oil well located in the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 27, Township 21 South, Range 37 East, N.M.P.M., which has a faulty bradenhead. The quality test of this water is shown as Item No. 4 on Exhibit "G", and this water is being allowed to run freely upon the ground. I also call your attention to the other tests shown on Exhibit "G", and particularly the third item on Exhibit "G" which concerns a well in the NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Section 27, Township 22 South, Range 37 East, N.M.P.M., and you will note that no test was made for the reason that there was oil and gas in the water. The McCall well is located close to the oil well that has the faulty bradenhead.

4. I call your attention to the fact that Union Oil Company filed Applications No. CP-364 and CP-364-X with the State Engineer on May 23, 1966, to change location of shallow wells by abandoning existing wells and commencing the use of new existing wells in the same Section drilled to a depth of 128 feet and 140 feet for the purpose of continuing the rights of appropriation of 636 acre feet per annum for industrial use in the Dollarhide Gasoline Plant located in Andrews County, Texas. I am informed that one of the reasons for this application was because the old wells had commenced to produce so much salt that the water was not usable in the gasoline plant. It is to be noted that there are salt water disposal pits in the area.

Page 3
April 18, 1967
Mr. Joe D. Ramey

5. I am informed that the recently drilled 300 foot water well at the Burke Junior High School in Jal, New Mexico, is now developing water that is not potable for human consumption and is being used only for watering grass and perhaps more disturbing is the fact that they are flaring gas from this water well.

6. And, I am sure that you have previously heard about the George Blocker water well located in the NE $\frac{1}{4}$ of Section 24, Township 25 South, Range 37 East, N.M.P.M.

7. And, I am likewise reasonably certain that you have heard about Windmill Oil Company operations at the Northwest edge of Hobbs. I am informed that it now operates about 50 wells in the process of skimming oil off of the fresh water at a depth of about 60 feet.

8. I call your attention to the Snyder water well located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 2, Township 22 South, Range 36 East, N.M.P.M. See Exhibit "E". There is a Gulf pit nearby.

9. I call your attention to the filling station water well in the Northwest Quarter (NW $\frac{1}{4}$) in Township 21 South, Range 36 East, N.M.P.M., and the Sims water well located in the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Section 32, Township 21 South, Range 37 East, N.M.P.M. See Exhibit "E". There is a Gulf pit near the Sims well and various pits near the filling station well.

10. I am informed that in the vicinity of the Linam Ranch, 5 or 6 miles West of Hobbs, that one or more good water wells have recently become unfit for human consumption and that there are several brine pits nearby, however, I have not received detailed information. I am also informed that there are several other water wells in Lea County that are suspect, but I do not have detailed information at this time.

i.e. Well in SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 34, T23S, R36E, NMPPM

Page 4
April 18, 1967
Mr. Joe D. Ramey

11. In referring to disposal pits, I am not certain whether all of the pits are in use at this time, nevertheless, it would appear that the damage has been done and that some agency, be it the Oil Conservation Commission or otherwise, must exercise greater policing powers for the benefit of future generations, and I specifically request that you call this problem and all of your information to the Water Quality Control Commission recently established by the New Mexico Legislature.

Respectfully submitted,

HEIDEL, SWARTHOUT & SAMBERSON

By



FLH:lt

FINIS LEROY HEIDEL
LEA COUNTY
DISTRICT 1
HOME ADDRESS:
BOX 1298
LOVINGTON, NEW MEXICO



PARLIAMENTARIAN
COMMITTEES:
CHAIRMAN:
JUDICIARY
MEMBER:
TAXATION & REVENUE

State of New Mexico
House of Representatives
TWENTY-EIGHTH LEGISLATURE
Santa Fe

Saturday, August 6, 1966

THE EL PASO TIMES

More Dams Proposed

Central, West Texas Water Endangered By Oil Pollution

Big Spring, Tex. (AP) — Central and West Texas officials said Friday contamination from oil wells is endangering water supplies.

The testimony was before the House Inland Salt Water Pollution Control Committee in its second day of hearings here in a crowded courtroom.

"We're already contaminated," said Kent County Commissioner G. L. Hamilton, adding that a heavy outcropping of salt water was spoiling much of the Brazos River quality.

He proposed upstream dams to prevent pollution from infiltrating lower regions.

Aubrey Simpkins, water superintendent for Sweetwater, said many Nolan County oil brine pits were affecting municipal supply lakes. He said the polluted water was seeping underground and flowing into the city's water supply.

Ed Perkins, county judge of Fisher County, said since the oil fields developed 10 years ago, fresh water has been made "unfit for man or beast."

SHORT-HANDED

Roy D. Payne, director of field operations for the Railroad Commission, said the commission was too short-handed to properly oversee orders banning open disposal pits for salt water out of oil wells.

Payne, of Austin, said he felt the next legislature would be asked to appropriate money for 30 more field men.

He said he hoped the commission soon could see the day when all contaminated wells would be plugged, and the setting of surface pipe and cementing of wells

would be commonplace, and when injection wells were used in preference to open pits.

Payne said it was possible the commission might have to issue a statewide no-open-pit order.

Many officials brought colored slides as evidence of how salt water brine had killed grass and plants, leaving large patches of briny white.

PHASING OUT

Gerald Fugit, Ector County judge, said open pits were being phased out gradually in his territory. He supported Payne's contention that the railroad commission should have greater policing powers to stay on top of pollution control.

Thursday, Martin Cleveland told the committee the Central Texas Municipal Water District spent \$270,000 in plugging 45 oil wells. He is assistant manager of the water district.

He said water quality in the Hubbard Creek Reservoir is being threatened by about 15,000 shallow oil wells.

Ex "A"

Report date 4-13-67

Sample Location

Sample date

Sample source			Continental Oil Co. NE, SW 1/4 Sec. 33 T-22 R-36 Robinson	Marathon Oil Co. Water Well NE, NE 1/4 Sec. 13 T22 R36 Robinson	McCall Residence NW 1/4 521 SR37E JUNIOR North Edge	Water Well NE, NE 1/4 Sec. 20 522 R37 Robinson
CATIONS	Calcium (Ca)	as ppm CaCO ₃	1220	94	530	150
	Magnesium (Mg)	as ppm CaCO ₃	1380	98	440	102
	Sodium (Na)	as ppm CaCO ₃		682	438	208
TOTAL CATIONS		as ppm CaCO ₃	2600	874	1408	420
ANIONS	Bicarbonate (HCO ₃)	as ppm CaCO ₃	980	84	208	200
	Carbonate (CO ₃)	as ppm CaCO ₃				
	Hydroxide (OH)	as ppm CaCO ₃				
	Sulfate (SO ₄)	as ppm CaCO ₃	370	180	410	130
	Chloride (Cl)	as ppm CaCO ₃	*850	610	790	50
TOTAL ANIONS		as ppm CaCO ₃	*2200	874	1408	420
TOTAL HARDNESS		as ppm CaCO ₃	2600	192	970	212
ALKALINITY		as ppm CaCO ₃				
	Phenolphthalein		None	None	None	None
	Total		980	84	208	200
IRON ppm Fe						
SILICA ppm Si						
TURBIDITY						
TOTAL DISSOLVED SOLIDS (Mmhos)			15000	3200	2600	900
CAUSTICITY ppm (OH) as CaCO ₃						
pH			7.75	7.5	7.25	7.25
SULFITE (SO ₃) ppm						
PHOSPHATES (PO ₄) ppm						
	Poly					
	Ortho					
CHROMATE as ppm						

Tests By

Remarks: *Interference from H₂S in Sample.

EX "B"

Report date 4-13-67

Sample Location

Sample date

Sample source			U.S. Smelting Refining and Mining Tank Batt. Pit-NW 1/4 Sec. 1, TWP 22S R37E App. 100 Bbl./day	Sal. D. Area 1.8.088 A NCT 6 acres water soaked SE 1/4 Sec. 25 TWP 24S	Marathon Oil Co. NE, NW 1/4 Sec. 13 T22, R36 Robinson pit	Humble Oil Co. SE, SE 1/4 Sec. 18 T22 R37 Robinson
CATIONS	Calcium (Ca)	as ppm CaCO ₃	8260	481	840	720
	Magnesium (Mg)	as ppm CaCO ₃	1240	114	640	540
	Sodium (Na)	as ppm CaCO ₃	118	462	1214	3776
TOTAL CATIONS		as ppm CaCO ₃	9382	1158	2694	5036
ANIONS	Bicarbonate (HCO ₃)	as ppm CaCO ₃	316	488	154	122
	Carbonate (CO ₃)	as ppm CaCO ₃				
	Hydroxide (OH)	as ppm CaCO ₃				
	Sulfate (SO ₄)	as ppm CaCO ₃	3850	180	40	1000
	Chloride (Cl)	as ppm CaCO ₃	5216	490	2500	3914
TOTAL ANIONS		as ppm CaCO ₃	9382	1158	2694	5036
TOTAL HARDNESS		as ppm CaCO ₃	9500	1620	1480	1260
ALKALINITY		as ppm CaCO ₃				
	Phenolphthalein		None	22	None	
	Total		316	488	154	122
IRON ppm Fe						
SILICA ppm Si						
TURBIDITY						
TOTAL DISSOLVED SOLIDS (Mmhos)			50000	9500	6700	9000
CAUSTICITY ppm (OH) as CaCO ₃						
pH			7.5	7.75	7.75	7.25
SULFITE (SO ₃) ppm						
PHOSPHATES (PO ₄) ppm						
	Poly					
	Ortho					
CHROMATE as ppm						

Tests By

Remarks:

Ex "C"

2

Report date 4-13-67

Sample Location _____

Sample date _____

Sample source _____		Gulf Oil Co. SW, NW 1/4 Sec. 18 T22 R37 Robinson	Woolsworth Ranch NE 1/4 S27 T24S R36E		
CATIONS	Calcium (Ca)	as ppm CaCO_3	800	Unable to run	
	Magnesium (Mg)	as ppm CaCO_3	1030	Sample	
	Sodium (Na)	as ppm CaCO_3	565		
TOTAL CATIONS		as ppm CaCO_3	2005		
ANIONS	Bicarbonate (HCO_3)	as ppm CaCO_3	1480		
	Carbonate (CO_3)	as ppm CaCO_3			
	Hydroxide (OH)	as ppm CaCO_3			
	Sulfate (SO_4)	as ppm CaCO_3	135		
	Chloride (Cl)	as ppm CaCO_3	390		
TOTAL ANIONS		as ppm CaCO_3	2005		
TOTAL HARDNESS		as ppm CaCO_3	1440		
ALKALINITY		as ppm CaCO_3			
	Phenolphthalein		None		
	Total		1480		
IRON ppm Fe					
SILICA ppm Si					
TURBIDITY					
TOTAL DISSOLVED SOLIDS (Mmhos)			7750		
CAUSTICITY ppm (OH) as CaCO_3					
pH			7.25		
SULFITE (SO_3) ppm					
PHOSPHATES (PO_4) ppm					
	Poly				
	Ortho				
CHROMATE as ppm					

Tests By _____

Remarks: _____

EX "D"

Report date 4-12-67

Sample Location _____

Sample date SNYDER

Sample source _____		Filling Sta. at Y NW 1/4 S36 T21SR R37	Pat Sims NE 1/4 S 1/4 32 T21S R72	Barclay Residence <i>EUNICIA NORTH EDGE</i>	Stock Watering T22S R36E SE 1/4 SE 1/4 S2
CATIONS	Calcium (Ca) as ppm CaCO ₃	50	482	134	10
	Magnesium (Mg) as ppm CaCO ₃	140	350	1136	886
	Sodium (Na) as ppm CaCO ₃	498	224	355	645
TOTAL CATIONS as ppm CaCO ₃		688	1056	1625	1541
ANIONS	Bicarbonate (HCO ₃) as ppm CaCO ₃	130	160	160	236
	Carbonate (CO ₃) as ppm CaCO ₃	None	None	None	None
	Hydroxide (OH) as ppm CaCO ₃	None	None	None	None
	Sulfate (SO ₄) as ppm CaCO ₃	104	440	115	5
	Chloride (Cl) <i>15-60</i> as ppm CaCO ₃	454	456	1350	1300
TOTAL ANIONS as ppm CaCO ₃		688	1056	1625	1541
TOTAL HARDNESS <i>30-50</i> as ppm CaCO ₃		190	832	1270	806
ALKALINITY <i>90</i> as ppm CaCO ₃					
	Phenolphthalein	None	None	None	None
	Total	130	160	160	236
IRON ppm Fe					
SILICA ppm Si					
TURBIDITY					
TOTAL DISSOLVED SOLIDS (Mmhos) <i>400</i>		7500	2100	3700	3000
CAUSTICITY ppm (OH) as CaCO ₃					
pH		7.5	7.25	7.5	7.25
SULFITE (SO ₃) ppm					
PHOSPHATES (PO ₄) ppm					
	Poly				
	Ortho				
CHROMATE as ppm					

Tests By _____

Remarks: _____

EX "E"

Report date 4-12-67

Sample Location _____

Sample date _____

Sample source			Geo. W. Sims NW 1/4 SW 1/4 S24 T22S R37E	Sinclair Oil- Gas Co. B. Davis Lease S 1/2 SW 1/4 34-23-36 D/T	Linam Ranch NE 1/4 NE 1/4 G-20SR-35E	John Pilchier Residence 400 Ave I Eunice, N.M.
CATIONS	Calcium (Ca)	as ppm CaCO ₃	520	930	940	1650
	Magnesium (Mg)	as ppm CaCO ₃	430	1512	1382	1030
	Sodium (Na)	as ppm CaCO ₃	99	3323	231	272
TOTAL CATIONS		as ppm CaCO ₃	957	5765	2553	2952
ANIONS	Bicarbonate (HCO ₃)	as ppm CaCO ₃	142	190	312	224
	Carbonate (CO ₃)	as ppm CaCO ₃	None	None	30	None
	Hydroxide (OH)	as ppm CaCO ₃	None	None	None	None
	Sulfate (SO ₄)	as ppm CaCO ₃	432	125	31	300
	Chloride (Cl)	as ppm CaCO ₃	383	5450	2180	2428
TOTAL ANIONS		as ppm CaCO ₃	957	5765	2553	2952
TOTAL HARDNESS		as ppm CaCO ₃	950	2442	2322	2680
ALKALINITY		as ppm CaCO ₃				
	Phenolphthalein		None	None	30	None
	Total		142	190	344	224
IRON ppm Fe						
SILICA ppm Si			None	None	None	None
TURBIDITY						
TOTAL DISSOLVED SOLIDS (Mmhos)			1800	10000	8250	6000
CAUSTICITY ppm (OH) as CaCO ₃						
pH			8.0	7.75	8.5	7.25
SULFITE (SO ₃) ppm						
PHOSPHATES (PO ₄) ppm						
	Poly			NEARBY WATER WELL POLLUTED		
	Ortho					
CHROMATE as ppm						

Tests By _____

Remarks: _____

EX "F"

WATER SYSTEM LOG SHEET

COMPA

PLANT

LOCATION Funice, N.M.

DATE	SOURCE OF SAMPLE	CHLORIDE	CHLORIDE	Total HARDNESS	HARDNESS CONCENTRATIONS	TREATMENT RESIDUALS			ALKALINITY		PH VALUE	TDS	SULFITE
		PPM	CONCENTRATIONS			PHOSPHATE PPM	CHROMIUM PPM	P PPM	M PPM	3 PPM			
4-17-67	SW 1/4 - SE 1/4 Sec. 14, T-21, R-37	464		600				4	110				
4-17-67	SE 1/4 - SW 1/4 Sec 9, T-22, R-36	5591		1044				0	250				
	NE 1/4 - NE 1/4 Sec 27, T-23, R-37												
4-17-67	SE 1/4, NE 1/4 Sec 27, T-21, R-37	603		270				40	204				
	SE 1/4, SE 1/4 Sec 27, T-21, R-37	580		810				0	38				

Oil Well Braconhead

Ex "G"

Oil & Gas in water

EL PASO NATURAL GAS COMPANY
WATER ANALYSISNE $\frac{1}{4}$ Sec 29 25S-37ESample Location Blocker Water Well

Report date _____

Sample date _____

Sample source _____		Well #, Sample	Agwelle #2		
CATIONS	Calcium (Ca)	as ppm CaCO ₃	3654	2660	
	Magnesium (Mg)	as ppm CaCO ₃	686	680	
	Sodium (Na)	as ppm CaCO ₃	8,386	8,413	
TOTAL CATIONS		as ppm CaCO ₃	12,726	12,753	
ANIONS	Bicarbonate (HCO ₃)	as ppm CaCO ₃	126	128	
	Carbonate (CO ₃)	as ppm CaCO ₃	N0	N0	
	Hydroxide (OH)	as ppm CaCO ₃	N0	N0	
	Sulfate (SO ₄)	as ppm CaCO ₃	400	375	
	Chloride (Cl)	as ppm CaCO ₃	12,200	12,300	
TOTAL ANIONS		as ppm CaCO ₃	12,726	12,753	
TOTAL HARDNESS		as ppm CaCO ₃	4,340	4,340	
ALKALINITY		as ppm CaCO ₃			
	Phenolphthalein		N0	N0	
	Total		126	128	
IRON ppm Fe			.24	.34	
SILICA ppm Si			69	67	
TURBIDITY			6	2	
TOTAL DISSOLVED SOLIDS (Mmhos)			5,400	5,450	
CAUSTICITY ppm (OH) as CaCO ₃					
pH			7.0	6.9	
SULFITE (SO ₃) ppm					
PHOSPHATES (PO ₄) ppm					
	Poly				
	Ortho				
CHROMATE as ppm					

Tests By _____

Remarks: _____

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

October 2, 1967

C
O
P
Y

Sperry-Sun Well Surveying Company
P. O. Box 19095
Oklahoma City, Oklahoma 73119

Attention: Mr. R. D. Warden

Gentlemen:

Reference is made to your letter of September 1, 1967, inquiring as to the New Mexico Oil Conservation Commission ruling on salt water disposal in this State.

Order No. R-3221, a copy of which is enclosed, sets forth certain deadlines for the prohibition of surface disposal of salt water in any manner in certain areas in Southeast New Mexico.

No provision is made for the use of plastic lining for pits. It is assumed that should such use be authorized on an individual basis, it would have to be after notice and hearing.

Very truly yours,

DANIEL S. NUTTER
Chief Engineer

DSN/esr
Enclosure

SPERRY-SUN WELL SURVEYING COMPANY

P. O. Box 19095
Oklahoma City, Oklahoma 73119

JNO. G. PEW
PRESIDENT
C. E. HAWK
VICE PRESIDENT

JOS. T. WILSON, JR.
SECRETARY-TREASURER

September 1, 1967

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

My Company is attempting to learn what the ruling is on surface salt water disposal pits in your State.

We are chiefly interested in whether a plastic lining for the pits is acceptable providing the lining will not allow any seepage of fluids into the earth.

Your assistance in providing me with the requirements for your State would be appreciated.

Very truly yours,

SPERRY-SUN WELL SURVEYING COMPANY

R. D. Warden

R. D. Warden
Mid-Continent Division Manager

RDW:cm

MAIL ROOM

'67 SEP 5 AM 8 10

F. L. HEIDEL
A. M. SWARTHOUT
C. GENE SAMBERSON

LAW OFFICES
HEIDEL, SWARTHOUT & SAMBERSON C.
311 NORTH FIRST STREET
POST OFFICE BOX 1298
LOVINGTON, NEW MEXICO 88260

TELEPHONE
396-5303
AREA CODE 505

APR 17 11 17 AM '67
April 14, 1967

Mr. Joe D. Ramey
Oil Conservation Commission
1000 West Broadway
Hobbs, New Mexico

Dear Mr. Ramey:

The City of Lovington, Lea County, New Mexico, is experiencing contamination in at least two (2) of its water wells which supply water for public consumption. Said wells are located in Section 31, Township 16 South, Range 37 East, N.M.P.M., Lea County, New Mexico. The contamination consists for the most part of an excessive amount of chlorides in the water produced from said wells.

For your information, you will please find enclosed herewith copies of the chemical analysis reports from the New Mexico Department of Public Health for Well No. 5 dated February 14, 1966, and October 5, 1966; and for Well No. 8 dated February 14, 1966, and December 15, 1966.

According to recommended health standards, chloride should not exceed 250 mg/l, whereas on Well No. 8, the December 15, 1966, report reflects chloride content of 480 mg/l. This well has been shut-in by the City.

At the present time, some of the other City wells in this area are being similarly tested.

I direct your attention to the fact that oil production activities are being conducted in the vicinity of the City water wells and particularly to the fact that an open disposal pit is in close proximity to Well No. 8.

Page 2
April 14, 1967
Mr. Joe D. Ramey

The City of Lovington plans to attend the Oil
Conservation Commission hearing scheduled in Hobbs, New
Mexico, commencing April 19, 1967.

Very truly yours,


C. GENE SAMBERSON
Attorney for City of
Lovington, New Mexico

CGS:lt

Enclosures

NEW MEXICO DEPARTMENT OF PUBLIC HEALTH
Environmental Sanitation Services

408 Calisteo Street
Santa Fe, New Mexico 87501

Dated December 15, 1966

The following chemical analysis based upon a sample of water recently submitted from your supply has been reported to us by the chemistry department of the State Public Health Laboratory. It is herewith forwarded for your information.

TOWN Lovington COUNTY Lea DATE COLLECTED 10-5-66
OWNER OF SUPPLY Lovington LAB NO. 1938
POINT OF COLLECTION Well #8 NW 1/4, SE 1/4, SE 1/4, of Sec. 31, Twp. 16S, Rge 37E

RESULTS OF ANALYSIS

Color Units colorless pH 8.1	Total Alkalinity (as CaCO ₃) 158 mg/l	Potassium (as K) 3.0 mg/l
Odor, Nature normal Th. O.	Carbonate 0.0 mg/l	Fluorides (as F) 1.05 mg/l
Turbidity mg/l	Bicarbonate 158 mg/l	Magnesium (as Mg) 29 mg/l
Conductance 25°C 1915 Micromhos/cm	Hydroxide 0.0 mg/l	Iron (as Fe) (Total) 0.06 mg/l
Total Residue mg/l	Chlorides (as Cl) 480 mg/l	Manganese (as Mn) 0.00 mg/l
Nonfilterable Residue mg/l	Sodium (as Na) 189 mg/l	Hardness (as CaCO ₃) 510 mg/l
Filterable Residue 1290 mg/l	Calcium (as Ca) 156 mg/l	Surfactants (as ABS) < 0.05 mg/l
Nitrates (as NO ₃) 7.2 mg/l	Sulphates (as SO ₄) 110 mg/l	

Remarks: Turbidity = Supernatant = 0.1
Total = 0.3

RECOMMENDED STANDARDS

Turbidity, not to exceed 10 mg/l
Color, not to exceed 20 mg/l
No objectionable taste or odor
Iron and manganese together should not exceed 0.3 mg/l
Magnesium should not exceed 125 mg/l
Fluorides should not exceed 1.5 mg/l
Chloride should not exceed 250 mg/l
Sulphate should not exceed 250 mg/l

Total Residue not to exceed 500 mg/l for a water of good chemical quality. However, if such water is not available, a total residue of 1,000 mg/l may be permitted.

Permissible pH about 10.6 at 26°C.

NEW MEXICO DEPARTMENT OF PUBLIC HEALTH
Environmental Sanitation Services

408 Galisteo Street
Santa Fe, New Mexico

Dated February 14, 1966

The following chemical analysis based upon a sample of water recently submitted from your supply has been reported to us by the chemistry department of the State Public Health Laboratory. It is herewith forwarded for your information.

TOWN City of Lovington COUNTY Lea REcd in Lab 12-10-65
DATE COLLECTED not given
OWNER OF SUPPLY not given LAB NO. 1495
POINT OF COLLECTION Well # 3

RESULTS OF ANALYSIS

Color Units... <u>colorless</u> pH <u>7.4</u>	Total Alkalinity (as CaCO ₃) <u>162</u> mg/l	Potassium (as K) <u>1.6</u> mg/l
Odor, Nature <u>normal</u> Th. O.	Carbonate <u>0.0</u> mg/l	Fluorides (as F) <u>0.95</u> mg/l
Turbidity <u>clear</u> mg/l	Bicarbonate <u>162</u> mg/l	Magnesium (as Mg) <u>20</u> mg/l
Conductance 25°C <u>750</u> Micromhos/cm	Hydroxide <u>0.0</u> mg/l	Iron (as Fe) (Total) <u>0.10</u> mg/l
Total Residue <u>472</u> mg/l	Chlorides (as Cl) <u>84</u> mg/l	Manganese (as Mn) <u>0.00</u> mg/l
Nonfilterable Residue <u>0</u> mg/l	Sodium (as Na) <u>46</u> mg/l	Hardness (as CaCO ₃) <u>270</u> mg/l
Filterable Residue <u>472</u> mg/l	Calcium (as Ca) <u>76</u> mg/l	Surfactants (as ABS) <u><0.05</u> mg/l
Nitrates (as NO ₃) <u>5.49</u> mg/l	Sulphates (as SO ₄) <u>80</u> mg/l	

Remarks: _____

RECOMMENDED STANDARDS

Turbidity, not to exceed 10 mg/l
Color, not to exceed 20 mg/l
No objectionable taste or odor
Iron and manganese together should not exceed 0.3 mg/l
Magnesium should not exceed 125 mg/l
Fluorides should not exceed 1.5 mg/l
Chloride should not exceed 250 mg/l
Sulphate should not exceed 250 mg/l

Total Residue not to exceed 500 mg/l for a water of good chemical quality. However, if such water is not available, a total residue of 1,000 mg/l may be permitted.

Permissible pH about 10.6 at 26°C.

NEW MEXICO DEPARTMENT OF PUBLIC HEALTH
Environmental Sanitation Services

408 Galisteo Street
Santa Fe, New Mexico 87501

Dated February 14, 1966

The following chemical analysis based upon a sample of water recently submitted from your supply has been reported to us by the chemistry department of the State Public Health Laboratory. It is herewith forwarded for your information.

TOWN City of Lovington COUNTY Lea Recd in Lab: 12-10-65
OWNER OF SUPPLY not given DATE COLLECTED not given
LAB NO. 1494
POINT OF COLLECTION Well No. 5 Pt. N 1/2 of Sec. 31 Twp. 16S Range 37E

RESULTS OF ANALYSIS

Color Units <u>colorless</u> pH <u>7.9</u>	Total Alkalinity (as CaCO ₃) <u>163</u> mg/l	Potassium (as K) <u>1.6</u> mg/l
Odor, Nature <u>normal</u> Th. O. <u> </u>	Carbonate <u>0.0</u> mg/l	Fluorides (as F) <u>0.95</u> mg/l
Turbidity <u>clear</u> mg/l	Bicarbonate <u>163</u> mg/l	Magnesium (as Mg) <u>12</u> mg/l
Conductance 25°C. <u>600</u> Micromhos/cm	Hydroxide <u>0.0</u> mg/l	Iron (as Fe) (Total) <u>0.59</u> mg/l
Total Residue <u> </u> mg/l	Chlorides (as Cl) <u>36</u> mg/l	Manganese (as Mn) <u>0.00</u> mg/l
Nonfilterable Residue <u> </u> mg/l	Sodium (as Na) <u>34</u> mg/l	Hardness (as CaCO ₃) <u>230</u> mg/l
Filterable Residue <u>365</u> mg/l	Calcium (as Ca) <u>72</u> mg/l	Surfactants (as ABS) <u><0.05</u> mg/l
Nitrates (as NO ₃) <u>6.02</u> mg/l	Sulphates (as SO ₄) <u>80</u> mg/l	

Remarks: Slight brown sediment

RECOMMENDED STANDARDS

Turbidity, not to exceed 10 mg/l
Color, not to exceed 20 mg/l
No objectionable taste or odor
Iron and manganese together should not exceed 0.3 mg/l
Magnesium should not exceed 125 mg/l
Fluorides should not exceed 1.5 mg/l
Chloride should not exceed 250 mg/l
Sulphate should not exceed 250 mg/l

Total Residue not to exceed 500 mg/l for a water of good chemical quality. However, if such water is not available, a total residue of 1,000 mg/l may be permitted.

Permissible pH about 10.6 at 26°C.

NEW MEXICO DEPARTMENT OF
HEALTH AND WELFARE

LABORATORY OF WATER ANALYSIS

Location: Los Alamos County: Los Alamos Date: 10-7-66
Source of Supply: Public Report transmitted to: Health Officer
Sample collected by: Public Supply: Public ☒ Private ☐
Has supply been approved for domestic use as the result of a sanitary survey by a qualified member of the New Mexico Department of Public Health? ☐ Yes ☒ No Source of supply: Well ☒ Spring ☐ Lake ☐ River ☐
Point of Collection: Well #5
Remarks: Good

TAP NO.	DATE RECEIVED	RESULTS OF LABORATORY ANALYSIS	
<u>10-10-66</u>	<u>10-7-1966</u>		
Color Units <u>1.2</u>	pH <u>8.2</u>	Total Alkalinity (as CaCO_3) <u>100</u> mg/l	Potassium (as K) <u>0.1</u> mg/l
Odor, Nature <u>None</u> Th. O. <u>0</u>		Carbonate <u>100</u> mg/l	Fluorides (as F) <u>0.1</u> mg/l
Turbidity <u>0.5</u> mg/l		Bicarbonate <u>100</u> mg/l	Magnesium (as Mg) <u>0.1</u> mg/l
Conductance 25°C <u>200</u> Micromhos/cm		Hydroxide <u>0</u> mg/l	Iron (as Fe) (Total) <u>0.1</u> mg/l
Total Residue <u>100</u> mg/l		Chlorides (as Cl) <u>0</u> mg/l	Manganese (as Mn) <u>0.1</u> mg/l
Nonfilterable Residue <u>0</u> mg/l		Sodium (as Na) <u>0</u> mg/l	Hardness (as CaCO_3) <u>100</u> mg/l
Filterable Residue <u>0</u> mg/l		Calcium (as Ca) <u>0</u> mg/l	Surfactants (as AOS) <u>0.1</u> mg/l
Nitrates (as NO_3) <u>0</u> mg/l		Sulphates (as SO_4) <u>0</u> mg/l	

Laboratory Remarks: OK
Water is good
10-10-66
PHL-Ch-27 (Rev. 1/2/62) Date Reported: 10-10-66 By: 10-10-66

W. D. GIRAND
RAY C. COWAN
N. RANDOLPH REESE
R. E. RICHARDS

GIRAND, COWAN & REESE
LAWYERS

NEW MEXICO BANK AND TRUST COMPANY BUILDING
POST OFFICE BOX 1290
HOBBS, NEW MEXICO 88240

April 26, 1967

TELEPHONE
AREA CODE 505
EXPRESS 3-9116

67 APR 29 PM 12 13

Mr. A. L. Porter, Jr., Secretary
Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Re: Docket 11-67
Case 3551

Dear Mr. Porter:

The writer, representing Me-Tex Supply Company, attended the Oil Conservation Commission hearing of the above case held at the Holiday Inn in Hobbs, New Mexico, on April 19th. The Me-Tex Supply Company did not enter any protest; however, on behalf of the company I did make a short statement.

I was surprised, as any number of the operators were surprised, to find that the Commission staff had prepared and submitted to the Commission a recommended order at the close of the hearing. I would respectfully call your attention to a few things that should be considered by the Commission before the Commission enters an area order covering the complete four-county area of Lea, Eddy, Chaves, and Roosevelt.

1. The first item that occurred to me would be the effect of such an order on the drilling of what is commonly called wildcat wells. These are wells that are drilled at a location more than one mile from the exterior line of designated pools. An operator proposing to drill a wildcat well would encounter immediately the problem of making provision for the disposal of production water, should it be encountered with the production, either by the construction of a lined pit or the drilling of an additional well for the purpose of returning the production water to some formation which the State Engineer and the Oil Conservation Commission have

W. D. GIRAND
RAY C. COWAN
N. RANDOLPH REESE
R. E. RICHARDS

GIRAND, COWAN & REESE
LAWYERS
NEW MEXICO BANK AND TRUST COMPANY BUILDING
POST OFFICE BOX 1290
HOBBS, NEW MEXICO 88240

TELEPHONE
AREA CODE 505
EXPRESS 3-9116

April 27, 1967

APR 29 PM 12 13 '67

[Handwritten initials]

Mr. A. L. Porter, Jr.
Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Dear Pete:

The enclosed letter addressed to you has the same text of a letter I wrote the Governor and Land Commissioner Hays. We urge you not to be a party to an order which would injure our present economy any more than is required and feel that the aims of the Commission could be attained by making the no pit provision a matter of pool rule, dealing with the characteristics of each pool.

We do not endorse contamination of our fresh water and think that such practices should be stopped, but on the record before the Commission it seemed that only a few isolated areas had been checked to determine this matter.

With best personal regards, I am

Yours very truly,

[Handwritten signature]

GIRAND, COWAN & REESE

Enclosure
WDG/jw

Mr. A. L. Porter, Jr.
April 26, 1967
Page 2

to approve, without knowing at the time of the commencing of drilling whether such a formation exists to which the production can be re-turned.

2. The proposed order failed to allow temporary pits used in connection with the actual drilling or working over of an existing well.

3. The State Engineer asserted jurisdiction over all waters having a ratio of less than 5,000 parts per million underlying the four counties. The order proposed required the return or disposition of water having solids and salts of 1,000 or more parts per million. The proposed order required in order to get an exception a notice and hearing, with notice to each windmill owner within a radius of 3 miles. A radius of 3 miles would cover an area approximately comprised of one township.

4. No provision was made for the disposition of water during the period of conversion from primary to secondary recovery in the oil-field.

5. No study was made as to what would be considered marginal oil wells and whether or not these wells, presently producing and paying royalty to some State institution and paying production taxes to the State of New Mexico, would be required to be shut in since the cost of complying with the proposed rule would be prohibitive from an economical standpoint.

6. I would venture to say that no more than 20 per cent of the area incorporated in the proposed order, i.e., Lea, Eddy, Chaves, and Roosevelt counties, is presently covered by oil or gas pools. It seems that the characteristics of each producing pool would be the best background to study to determine what rules, if any, are necessary in order to eliminate the pollution of fresh waters.

7. It was testified that there were five areas checked in connection with water contamination, all located in Lea County, New Mexico, and in old designated oil pools. These areas were some 25 miles apart, being up at Crossroads, Lovington, Eunice, Jal, and the Vacuum Pool. The Vacuum Pool's problems have been corrected and the testimony was that two-thirds of the wells were properly handling the disposal of salt water. We feel that the checking on five isolated areas is hardly a fair check for an area comprising approximately 25,000 square miles.

Mr. A. L. Porter, Jr.
April 26, 1967
Page 3

8. There was testimony that there were areas within the four-county area that had no underground water above the Red Beds. Surely the discharge of production water in open pits in these areas could not contaminate any fresh water.

9. We respectfully submit that before any order of the Commission be entered that the proposed order be submitted to all of the operators for their opinions and observations as to how it will affect their particular operation, as well as for suggestions. We believe that this would give the Commission a more intelligent picture of the ills it is seeking to cure.

We want you to know that our position insofar as the contamination of the fresh waters underlying the four-county area is that we want it eliminated. We are not in favor of the continuation of practices which might damage it in any way. By the same token, we do not want the Commission to enter an order which, in our opinion, would have a marked effect on the economy of the four-county area as well as on the revenues to the different institutions of the State of New Mexico and to the State of New Mexico through its production tax revenues.

Respectfully submitted,



GIRARD, COWAN & REESE

WDG/rjp
cc: Me-Tex Supply Company
Randall F. Montgomery
Robert L. Summers

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO

June 26, 1967

C The Honorable David F. Cargo
Governor of New Mexico
State Capitol Building
Santa Fe, New Mexico

O Re: Case No. 3551 - Docket 11-67
Letter from Mr. W. D. Girand

P Dear Governor Cargo:

I received an identical letter from Mr. Girand on April 29, 1967, and have since that time been contacted by Mr. Girand in person.

Y Mr. Girand's letter was received too late for consideration at our Commission meeting of April 24th in your office, at which time the testimony was reviewed and a decision was made in Case 3551. An order was signed on May 1, 1967 containing the provisions that were agreed upon at our April 24th meeting.

I am returning Mr. Girand's letter for your files and sending Mr. Girand a copy of this letter.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

cc: Mr. W. D. Girand

W. D. GIRAND
RAY C. COWAN
N. RANDOLPH REESE
R. E. RICHARDS

GIRAND, COWAN & REESE
LAWYERS
NEW MEXICO BANK AND TRUST COMPANY BUILDING
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HOBBS, NEW MEXICO 88240

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June 29, 1967

Car file

The Honorable David F. Cargo
Governor of New Mexico
Office of the Governor
Santa Fe, New Mexico 87501

Dear Governor Cargo:

This will acknowledge receipt of your letter of June 22 in regard to my letter of April 26 as well as a copy of a letter received from Mr. A. L. Porter, Jr., Secretary-Director of the Oil Conservation Commission, dated June 26, 1967.

I have reviewed the order that was adopted by the Commission, and the majority of the objections that I expressed in my letter were met in the order as prepared. I thank you and Mr. Porter for your kindness in answering my letter and taking into consideration the matters expressed therein.

Yours very truly,

s/ W. D. GIRAND

GIRAND, COWAN & REESE

WDG/rjp
cc: Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Mr. Porter
Alab



TOM F. HILL
Manager, Southwest Division
F. G. PRUTZMAN
Superintendent Operating Department

PRODUCTION DEPARTMENT **SUN OIL COMPANY** SOUTHLAND CENTER, P. O. BOX 2880, DALLAS, TEXAS 75221
April 27, 1967

DWA

RE: Docket No. 11-67, Case 3551
No-Pit Order

State of New Mexico
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

Sun Oil Company has no objections to the provisions of the proposed order barring surface pits with the exceptions of those approved administratively. We do request that the order itself should clearly exempt drilling, burn, and emergency overflow pits without the detail supporting data being required. We also believe that the limiting volume for unlined surface pits specified by Section B4 should be increased to 4 BWPD per 40-acre developed tract, not to exceed 64 BWPD for any pit.

We would appreciate your consideration of our position in this matter in making your final order.

Very truly yours,

SUN OIL COMPANY

A. R. Ballou

By: *Granville Dutton*
Granville Dutton

GD:mo

MAIN OFFICE 000

'67 APR 28 PM 1 16

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WESTERN UNION TELEGRAM

W. P. MARSHALL, President

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(R II-54)

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NEW MEXICO OIL CONSERVATION COMMISSION=

MORGAN HALL STATE LAND OFFICE BLDG SANTA FE NEW MEX=

MARATHON URGES THAT ANY ORDER ADOPTED BY THE COMMISSION FOLLOWING THE HEARING IN CASE NO. 3551, APRIL 19, 1967, RESTRICTING THE USE OF ANY TYPE OF SURFACE PIT FOR THE DISPOSAL OF OIL FIELD BRINE BE LIMITED TO THOSE AREAS WHERE THE EVIDENCE IN THIS CASE SHOWS THAT THE USE OF SURFACE DISPOSAL PITS DOES NOT ADEQUATELY PROTECT FRESH WATER ABOVE AND BELOW THE SURFACE OF THE GROUND. IN THE EVENT THE COMMISSION SHOULD ADOPT, AS A RESULT OF THE EVIDENCE SUBMITTED AT THIS HEARING, AN ORDER PROHIBITING THE USE OF CERTAIN TYPES OF SURFACE PITS FOR THE DISPOSAL OF OIL FIELD BRINE, MARATHON URGES THE COMMISSION TO PROVIDE IN ANY SUCH ORDER

(1) THAT THE EFFECTIVE DATE OF ANY SUCH PROHIBITION SHALL BE NOT LESS THAN ONE (1) YEAR FROM THE DATE OF SUCH ORDER; AND

(2) THAT THE COMMISSION SHALL HAVE THE AUTHORITY, ON WRITTEN APPLICATION, TO GRANT EXCEPTIONS TO SUCH ORDER WITHOUT NOTICE AND HEARING UPON A SHOWING OF CIRCUMSTANCES WARRANTING SAME AND UPON A SHOWING THAT SURFACE AND SUB-SURFACE FRESH WATER WILL BE PROTECTED=

MARATHON OIL CO BY E L PULLEY ACTING DIV OPERATIONS
MANAGER==

3551 19 1967 (1) (1) (2)=SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

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CHAIRMAN OF THE BOARD

R. W. MCFALL
PRESIDENT

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NEW MEXICO OIL CONSERVATION COMMISSION, CARE HOLIDAY INN=
200 SOUTH LINAM ST HOBBS NEW MEX=

MARATHON URGES THAT ANY ORDER ADOPTED BY THE COMMISSION FOLLOWING THE HEARING IN CASE NO 3551, APRIL 12, 1967, RESTRICTING THE USE OF ANY TYPE OF SURFACE PIT FOR THE DISPOSAL OF OIL FIELD BRINE BE LIMITED TO THOSE AREAS WHERE THE EVIDENCE IN THIS CASE SHOWS THAT THE USE OF SURFACE DISPOSAL PITS DOES NOT ADEQUATELY PROTECT FRESH WATER ABOVE AND BELOW THE SURFACE OF THE GROUND. IN THE EVENT THE COMMISSION SHOULD ADOPT, AS A RESULT OF THE EVIDENCE SUBMITTED AT THIS HEARING, AN ORDER PROHIBITING

WU12011(12-65) THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

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(38).
THE USE OF CERTAIN TYPES OF SURFACE PITS FOR THE DISPOSAL OF OIL FIELD BRINE, MARATHON URGES THE COMMISSION TO PROVIDE IN ANY SUCH ORDER(1) THAT THE EFFECTIVE DATE OF ANY SUCH PROHIBITION SHALL BE NOT LESS THAN ONE (1) YEAR FROM THE DATE OF SUCH ORDER: AND (2) THAT THE COMMISSION SHALL HAVE THE AUTHORITY, ON WRITTEN APPLICATION TO GRANT EXCEPTIONS TO SUCH ORDER WITHOUT NOTICE AND HEARING UPON A SHOWING OF CIRCUMSTANCES WARRANTING SAME AND UPON A SHOWING THAT SURFACE AND SUB-SURFACE FRESH WATER WILL BE PROTECTED=
MARATHON OIL CO BY E L PULLEY ACTING
DIVISION OPERATIONS MANAGER=

WU12011(12-65)

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

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NEW MEXCO OIL CONSERVATION COMMISSION=
SANTA FE NMEX=I

1967 APR 18 AM 9 59

IN RE CASE 3551 FOR CONSIDERATION OF ORDER TO PROHIBIT
SURFACE PIT DISPOSAL OF OIL FIELD PRODUCED BRINES IN LEA,
CHAVES, ROOSEVELT, AND EDDY COUNTIES. PHILLIPS PETROLEUM
COMPANY OPERATIONS MAY BE SUMMARIZED AS FOLLOWS: BRINE
ASSOCIATED WITH 91.8 PERCENT OF PHILLIPS OIL PRODUCTION
IS CURRENTLY COMMITTED TO SUBSURFACE DISPOSAL; PRODUCED
WATER ASSOCIATED WITH 6.5 PERCENT OF COMPANY OIL PRODUCTION
IS OF INSIGNIFICANT QUANTITIES OR PRODUCTION WILL JUSTIFY
AVAILABLE DISPOSAL METHODS: DISPOSAL OF PRODUCED WATER
ASSOCIATED WITH 1.4 PERCENT OF PHILLIPS OIL PRODUCTION ON
13 LEASES LYING OUTSIDE OF CURRENTLY DELINEATED FRESH
WATER BASIS AREAS PROBABLY CANNOT BE ECONOMICALLY
JUSTIFIED: AND PRODUCED BRINE ASSOCIATED WITH 0.3 PERCENT
OF COMPANY OIL PRODUCTION IS WITHIN FRESH WATER BASIS AREAS
AND CURRENTLY AVAILABLE DISPOSAL METHODS CANNOT BE JUSTIFIED.

PHILLIPS PETROLEUM COMPANY MAKES THE FOLLOWING
RECOMMENDATIONS: ;

1. SELECTION OF NO-PIT AREAS ON A BASIS RELATING
TO AQUIFER LOCATION RATHER THAN COUNTY LINES MIGHT BE MORE
ADVANTAGEOUS TO FRESH WATER PROTECTION AND LESS BURDENSOME
TO THE INDUSTRY AND SHOULD BE CONSIDERED.

2. ISSUANCE OF ANY NO-PIT ORDER SHOULD ALLOW

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

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SUFFICIENT TIME FOR COMPLETE ECONOMIC EVALUATION OF ALL AVAILABLE DISPOSAL METHODS, INCLUDING JOINT VENTURES, TO YUELD THE LOWEST INCREASE IN LIFTING COST AND THUS PERMIT A LONGER ECONOMIC LIFE AND GREATER OIL AND GAS RECOVERY.

7 3. THE OIL AND GAS INDUSTRY SHOULD NOT BE RESTRICTED BEYOND LIMITS IMPOSED ON OTHER MINERAL RECOVERY INDUSTRIES IN THE SAME AREA=

PHILLIPS PETROLEUM CO SHOFNER SMITH
PRODUCTION DIRECTOR=



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THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

September 14, 1967

C

O

P

Y

Powers Corporation
3436 Coors, S.W.
Albuquerque, New Mexico 87105

Gentlemen:

With reference to your letter of September 7, 1967, please be advised that virtually all oil operators in Southeast New Mexico will be affected by Commission Order No. R-3221, a copy of which is enclosed.

The names and addresses of these many operators can be obtained from any of several commercially published directories of oil and gas operators.

Very truly yours,

DANIEL S. NUTTER
Chief Engineer

DSN/esr
Enclosure

DOCKET: REGULAR HEARING - WEDNESDAY - APRIL 19, 1967

OIL CONSERVATION COMMISSION - 9 A. M. - THE HOLIDAY INN, 200 SOUTH LINAM,
HOBBS, NEW MEXICO

- ALLOWABLE: (1) Consideration of the oil allowable for May, 1967;
- (2) Consideration of the allowable production of gas for May, 1967 from thirteen prorated pools in Lea, Eddy and Roosevelt Counties, New Mexico. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico for May, 1967.

CASE 3551: In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider an order prohibiting the disposal of oil field brines in surface pits in Lea, Chaves, Roosevelt, and Eddy Counties, New Mexico.

CASE 3552: Southeastern New Mexico nomenclature case calling for an order for the creation of one pool and the assignment of an oil discovery allowable therein, and the creation and extension of certain pools in Lea and Chaves Counties, New Mexico:

(a) Create a new pool in Lea County, New Mexico, classified as an oil pool for Middle Pennsylvanian production and designated the Nonombre-Middle Pennsylvanian Pool, comprising the following-described acreage:

TOWNSHIP 13 SOUTH, RANGE 34 EAST, NMPM
SECTION 32: NE/4

Further, for the assignment of approximately 52,295 barrels of oil discovery allowable to the discovery well, Midwest Oil Corporation's State "D" Well No. 3, located in Unit F of said Section 32.

(b) Create a new pool in Chaves County, New Mexico, classified as an oil pool for San Andres production and designated as the Many Gate-San Andres Pool. The discovery well is H. L. Brown, Jr., O'Brien No. 1, located in Unit D of Section 7, Township 9 South, Range 30 East, NMPM. Said pool described as:

TOWNSHIP 9 SOUTH, RANGE 30 EAST, NMPM
SECTION 7: NW/4

(c) Extend the North Anderson Ranch-Wolfcamp Pool to include therein:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
SECTION 2; Lots 3, 4, 5, and 6

April 19, 1967 Regular Hearing

Docket No. 11-67

- (d) Extend the Antelope Ridge-Morrow Gas Pool to include therein:

TOWNSHIP 23 SOUTH, RANGE 34 EAST, NMPM
SECTION 27: S/2
SECTION 33: S/2
SECTION 34: W/2

- (e) Extend the North Bagley-Lower Pennsylvanian Pool to include therein:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
SECTION 16: NW/4
SECTION 21: E/2 and NW/4

- (f) Extend the West Bagley-Pennsylvanian Pool to include therein:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
SECTION 29: W/2

- (g) Extend the Cato-San Andres Pool to include therein:

TOWNSHIP 8 SOUTH, RANGE 30 EAST, NMPM
SECTION 9: E/2
SECTION 14: S/2
SECTION 15: SW/4

- (h) Extend the South Corbin-Strawn Pool to include therein:

TOWNSHIP 18 SOUTH, RANGE 33 EAST, NMPM
SECTION 27: SW/4
SECTION 28: S/2

- (i) Extend the South Flying "M"-Pennsylvanian Pool to include therein:

TOWNSHIP 9 SOUTH, RANGE 33 EAST, NMPM
SECTION 19: SW/4

- (j) Extend the Fowler-Blinebry Pool to include therein:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM
SECTION 10: SW/4

- (k) Extend the Justis-Tubb Drinkard Pool to include therein:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
SECTION 26: W/2 NE/4

- (l) Extend the Lusk-Morrow Gas Pool to include therein:

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM
SECTION 30: All

April 19, 1967 Regular Hearing

Docket No. 11-67

- (m) Extend the Paduca-Devonian Gas Pool to include therein:

TOWNSHIP 25 SOUTH, RANGE 32 EAST, NMPM
SECTION 18: NE/4

CASE 3553: Northwestern New Mexico nomenclature case calling for an order extending certain pools in Rio Arriba, Sandoval, San Juan and McKinley Counties, New Mexico:

- (a) Extend the Ballard-Pictured Cliffs Pool to include therein:

TOWNSHIP 24 NORTH, RANGE 4 WEST, NMPM
SECTION 19: N/2
SECTION 20: NW/4

- (b) Extend the Blanco-Pictured Cliffs Pool to include therein:

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
SECTION 21: W/2

- (c) Extend the South Blanco-Pictured Cliffs Pool to include therein:

TOWNSHIP 26 NORTH, RANGE 7 WEST, NMPM
SECTION 26: E/4

- (d) Extend the Many Rocks-Gallup Oil Pool to include therein:

TOWNSHIP 32 NORTH, RANGE 17 WEST, NMPM
SECTION 26: SW/4 NW/4

- (e) Extend the Pinon-Gallup Oil Pool to include therein:

TOWNSHIP 28 NORTH, RANGE 11 WEST, NMPM
SECTION 19: NW/4 S/2

TOWNSHIP 28 NORTH, RANGE 12 WEST, NMPM
SECTION 13: W/2 SW/4
SECTION 14: E/2 SE/4
SECTION 15: NE/4 NE/4 & W/2 NE/4
SECTION 23: NE/4 NE/4
SECTION 24: N/2

- (f) Extend the South Hoshpah-Lower Sand Oil Pool to include therein:

TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM,
SECTION 1: SE/4 SE/4 & Lot 8

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Hobbs, New Mexico
April 19, 1967

REGULAR HEARING

IN THE MATTER OF:

Hearing called by the Oil
Conservation Commission upon its
own motion to consider an order
prohibiting the disposal of oil
field brines in surface pits in
Lea, Chaves, Roosevelt and Eddy
Counties, New Mexico.

Case 3551

BEFORE:

A. L. Porter, Chairman
George Hatch, Attorney for Oil Conservation Commission
Guyton Hays, Secretary-Director
David F. Cargo, Governor

TRANSCRIPT

MR. PORTER: We will take up Case 3551.

MR. HATCH: Case 3551. In the matter of the hearing called by the Oil Conservation Commission upon its own motion to consider an order prohibiting the disposal of oil field brines in surface pits in Lea, Chaves, Roosevelt and Eddy Counties, New Mexico.

If the Commission please, George Hatch appearing on behalf of the Commission Staff and I will have two witnesses.

MR. PORTER: We are going to call for appearances in the case and we are going to try to get a microphone over to the end of the table so that the witness may sit there and testify. I know that one of the Commission's witnesses has very extensive testimony and might get tired standing at the microphone, but in the meantime, I would like to call for appearances in the case of those who desire to present testimony.

Now, as all of you know, who are familiar with our procedures, after testimony has been presented, after it is concluded, we allow anyone present at the hearing to make a statement of position in the case so we will conclude the testimony before we call for statements of positions.

When the case was publicized, we emphasized the fact that the Commission would have extensive testimony in

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the case due to several months of study by the Commission Staff members, so we indicated at the time that we were not discouraging anyone else from coming in and putting on testimony, in fact, we welcome it from any source. Our Commission's witness will go on first, or witnesses, and after that, why we will have an opportunity, anyone here will have an opportunity to present whatever testimony he desires.

At this time, I would like to have an indication of those who would desire to present testimony in the case, that is, a witness, sworn testimony. I know Mr. Hatch, you have some testimony, or your witnesses. How many witnesses do you have, please?

MR. HATCH: Two witnesses.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: Jason Kellahin, appearing for Standard Oil Company of Texas. We will have one witness who is to present testimony. I would also like to enter an appearance for Continental Oil Company who will not offer any testimony.

MR. PORTER: You say you have one witness?

MR. KELLAHIN: Yes, sir, very brief.

MR. PORTER: Thank you.

MR. LOSEE: Mr. Porter.

MR. PORTER: Mr. Losee?

MR. LOSEE: A. J. Losee, Losee and Stewart, Artesia, New Mexico representing Wilson Oil Company. We may have one witness with brief testimony.

MR. PORTER: Hr. Heidel?

MR. HEIDEL: I am appearing as attorney for the City of Lovington, Southeastern Land Owner's Association, various individuals and myself, as State Representative. We do not propose to present any witnesses. We do have a letter with an exhibit attached that we would offer into evidence and make a brief statement.

MR. PORTER: Thank you, Mr. Heidel. Is there anyone else who desires to put on testimony?

MR. CARR: My name is Harvey Carr. I am with Southland Royalty Company. I have a statement to make.

MR. PORTER: I see. Well, I'll tell you what, if there is no one who desires to put on testimony, we will just take the statements as they come at the close of the testimony and that way we will save time at this point. Mr. Hatch?

MR. HATCH: I would like to call Mr. Joe Ramey to the stand at this time, please.

MR. PORTER: Would you like for me to swear the witness?

MR. HATCH: Yes.

(Witness sworn)

(Exhibits marked for
identification)

JOE RAMEY, called as a witness on behalf of the
New Mexico Oil Conservation Commission, first having been
duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HATCH:

Q Mr. Ramey, in your capacity as Supervisor of
District Number One of the New Mexico Oil Conservation
Commission, is it your duty to make recommendations to the
Commission concerning disposal of produced water?

A Yes, it is.

Q Mr. Ramey, let me back up first and have you state
your name and position, for the record, please.

A Joe D. Ramey. I am supervisor of District One
for the New Mexico Oil Conservation Commission.

Q And your answer to the question I just asked you
will still be the same?

A That's right.

Q Mr. Ramey, are you familiar with Case 3551 and
what it proposes?

A Yes, sir.

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Q Would you please give the Commission a short summary of the background of the salt water disposal in the southeast and what is being sought?

A You want me to answer that question, Mr. Hatch?

Q Yes.

A The first salt water disposal well in southeast New Mexico was approved by the Commission in 1951 as a result of an application by Gulf Oil Corporation. In April of 1956, hearings were commenced on Case 1053 which was for an order to establish rules for the disposal of salt water in certain areas in Lea County. This hearing came after a period of development of D production, particularly from the Devonian formation in northern Lea County, and in the year or two preceding this hearing, water production had increased considerably.

The hearings on this case lasted several months and in addition numerous committee meetings were held as a result of this problem. As a result of this hearing, the Commission issued Order R-1224A which prohibited disposal of oil field brines and open surface pits in ten areas in Lea County.

Since the original hearing, the Commission has heard three additional cases which have resulted in no-pit orders for a total of nineteen pools in Lea County and

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no-pit orders for several pools along the Pecos River. Now, in addition to these hearings, the Commission has held many formal and informal conferences with operators which have resulted in disposal systems. In this respect, we periodically check water production or in some instances we had a direct complaint from an interested party and we tried to determine what we term "danger areas." When we do run across one of these areas, we will talk to the operator or operators involved and suggest that they find another means of disposing of their produced water. In the majority of cases, this is all that has been necessary to obtain some surface disposal. In some cases our suggestions have met opposition where we did not feel that sufficient progress was being made toward disposal. In these instances, we have held hearings.

Now, in addition to these, many of our operators will install a disposal system strictly on a voluntary basis. As a matter of fact, it appears that some operators now seem to find salt water disposal systems as part of their development plans for a lease.

To date, the Commission has issued orders for a total of one hundred and seventeen salt water disposal wells and the latest available figures indicate that seventy-five of these are being utilized for active salt water disposal

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systems. In addition, many barrels of produced water is being injected into secondary recovery projects. For some time now, the number of complaints reaching my office have been increasing considerably. Also, evidence of fresh water contamination is present in areas in the southeast.

Therefore, the staff feels that the Commission should be advised of the situation in southeast New Mexico and let them decide if the situation warrants an order prohibiting open surface pit disposal of oil field brines.

Q Mr. Ramey, has the Commission received a letter designating fresh water supply in the State of New Mexico?

A Yes, it has.

Q Does the letter have attached to it a memorandum and a map?

A Would you re-word that question?

Q Did the letter have attached to it a memorandum and a map?

A Yes, sir, it did.

Q Would you summarize, give a brief summary of the contents of the memorandum?

A Perhaps -- Would you like me to read the letter first, Mr. Hatch?

Q Yes. Perhaps that would be better.

A This is a letter to Mr. A. L. Porter, Jr.,

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Secretary-Director, Oil Conservation Commission, Santa Fe, New Mexico. "Dear Mr. Porter: All underground waters in the State of New Mexico containing 10,000 parts per million or less of dissolved solids is hereby designated by the State Engineer pursuant to Section 65-311-15 NM SA 1953 compilation, except that this designation shall not include any water for which there is no present or reasonably foreseeable beneficial use that would be impaired by contamination. This designation supersedes all previous designations pertaining to underground water.

For your information, I am attaching a memorandum dated April 10th, 1967 and the map mentioned therein, which shows the areas and formations in which water of ten thousand parts per million or less, commonly occurs. The surface water designation previously made remains unchanged." It is signed, "Yours very truly, S. E. Reynolds, State Engineer, by Frank E. Irby, Chief of the Water Rights Division."

Q All right. Now, would you give a brief summary of the contents of the memorandum?

A This is a memorandum from the Chief of the Hydrology Section to the Chief of the Water Rights Division. The memo first explains why the designation of fresh water supplies by the State Engineers should include water

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containing up to ten thousand parts per million total solids.

Next, it briefly explains the manner by which contamination of underground water supplies could occur as a result of the disposal of oil field wastes. The hydrologist also declares that all formations, deposits or rocks younger than cretaceous in age, in most places in the State of New Mexico, contain fresh water supply if they contain water at all and these should be afforded protection.

Q Does the letter also mention a map?

A Yes, sir. This map we have placed on the board back here. This map shows the areas in which various rocks, cretaceous or older are near the surface and commonly contain fresh water. It should be noted that all of the southeast producing area is so designated as having these rocks present.

MR. HATCH: If the Commission please, I would like to introduce this into evidence at this time.

Q Mr. Ramey, has this been marked, the letter and attachment?

A Yes, sir, this has been marked Exhibit Number One.

MR. HATCH: I would like to move the introduction of Exhibit Number One including the attachment into evidence at this time.

MR. PORTER: Any objections? The Exhibit will be admitted.

(Whereupon, Oil Conservation Commission's Exhibit Number One was admitted into evidence.)

Q (By Mr. Hatch) Mr. Ramey, what geographical area are we concerned with in this case?

A This would be the southeast producing area which is the Counties of Lea, Eddy, Chaves and Roosevelt.

Q What oil and gas pools might be affected by an order issuing as a result of this hearing?

A It would be all of the pools in these Counties.

Q Have you prepared an exhibit that would show the names and locations of the oil and gas pools that might be affected by an order issued as a result of this hearing?

A Yes, sir.

Q What exhibits are those?

A Those are Exhibits Two through Five and the accompanying sheets 2a through 5a.

Q Will you explain to the Commission how that is shown on Exhibits Two through Five, please?

A Yes. Just one moment. These Exhibits which are the first four maps, briefly cover the entire southeast producing area. They don't entirely cover all of the Counties, but they do contain the area which is oil and gas productive. Now, on these maps we have outlined the pools and we have color-coded the pools as to volumes of water which

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go into pits.

Now, we have also outlined all water basins in the area which include the Lea County Water Basin, the Capitan Water Basin, Carlsbad Water Basin and the Roswell-Artesia Basin. There are two areas on the map which are not in water basins and those are the south central area, and the north area which commences here and extends to the top of the maps.

Q Is there oil and gas production or oil or gas production in all of those declared water basins?

A Yes, there is.

Q Is there any production outside of the basins?

A Yes, sir, there is also production outside of the basins.

Q Mr. Ramey, why do you have three exhibits covering the same geographical area, that would be Exhibits Three, Five and Six, is it?

A It would be Exhibits Four, Five and Six. No, wait a minute. It would be Three, Four and Five, I'm sorry. Exhibit Two covers the, that is the exhibit on my far right, Exhibit Two covers the northern half of the producing area and Exhibits Four, no, Three, Four and Five, cover the south half. It was necessary to split this up into three exhibits because of the great number of overlapping pools,

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particularly in the area here, well it would be south of the Lea County water basin, primarily.

Q What is the reason -- you have the numbers by each of those pools up there?

A Yes, sir.

Q What is the purpose of the numbers?

A The numbers are strictly for identification purpose only. The numbers on the maps correspond to the numbers on the master sheets for which all the information that we weren't able to get on the maps is posted on the master sheets.

Q Would you explain the color coding to the Commission, please?

A Yes. The color coding designates waters that are going into open surface pits only. The color coding is as follows up to five.

Q Mr. Ramey, is there any oil or gas production that might be affected by an order that is not reflected on Exhibits Two through Five?

A Mr. Hatch, I don't believe I ever answered the previous question concerning the color coding. Would you like me to answer that?

Q All right.

A We have color coded these maps on the basis of

water volumes going into open pits. The green represents volumes up to five hundred barrels a month and the dark blue is for five hundred to a thousand barrels, the light blue, a thousand to two thousand, the yellow, two thousand to four thousand, brown, four thousand to ten thousand, violet, ten thousand to twenty thousand, orange, twenty thousand to fifty thousand, light red, fifty thousand to a hundred thousand and dark red, all those above a hundred thousand.

Q All right, then, let's come back to the next question. Is there any oil or gas production that might be affected by an order that is not reflected on Exhibits Two through Five?

A Yes. Since these exhibits were prepared, why there have been, of course, new pools created in our regular nomenclature and also there are undesignated wells which lie outside of any pool boundaries. These would be affected by this order.

Q Now, you have spoken of the coloring up here and how it has represented the amount of -- Exhibits Two to Five and the tabulation sheet that you spoke of show the amount of oil field brines produced during what period of time?

A This is December 1966.

Q What happens to these brines?

A These are -- they are either put into salt water disposal systems and used for injection water in waterflood, they go in, in some cases they go into lined surface pits and then in the rest of the cases it goes into open surface pits.

Q Where are those pits located?

A That, of course, depends primarily on the size of the lease. In some cases we will have a forty-acre lease and so the pit would be near the producing well, but in other cases, why in the case of a central tank battery or a large co-mingling system, why one pit would serve many wells.

Q How many barrels of brine were produced during December 1966 by the pools shown on your Exhibits Two through Five?

A The total reported water production for this period was twelve million nine hundred thirty-two thousand, two hundred eighty-nine barrels.

Q That was for the month of December, 1966?

A Yes, sir.

Q Why did you use that month?

A When these exhibits were prepared, why that was the last available or the most recent available information.

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Q Now you gave the total production from all of those pools, how many barrels of brine went into surface unlined pits?

A Four million three hundred and ninety-eight thousand nine hundred and eighty-four barrels.

Q And again, that is only for one month, December 1966?

A Yes, sir.

Q Do the Exhibits show the amount of brines produced by each pool?

A The Exhibits 2a through 5a will reflect the total volumes produced by each pool, yes, sir.

Q Do the Exhibits also reflect the disposition of the brine to each pool?

A Yes, sir, they do.

Q Would you explain to the Commission how that is shown?

A Of course, the tabulation is on the Exhibits 2a through 5a under disposition of the water we have classified that as either salt water disposal or pits. The salt water disposal will include actual salt water disposal systems, waterflood and lined pits and then the pit explanation is strictly for surface pits. The exhibits actually show the status, or the Exhibits Two through Five, actually show the

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status of the produced water that is going into pits only. Let me explain a little further on that. If you will refer to Exhibit Two and 2a.

Q Have those Exhibits Two and 2a been marked and distributed?

A Yes, sir, I believe that the Commissioners have copies of those in front of them. If you will go to Pool 30 in Exhibit 2a which is this particular pool here, now this represents the Bouth San Andres gas and the Bough Devonian oil pool. These pools indicated no produced water during December and we have no coding whatsoever on the exhibits.

Next we will go to Pool 37. This is the Crossroads San Andres gas and South Crossroads Devonian Oil. The total water production was fifty-eight thousand eighty-nine barrels for the month, all of which is being disposed of into open surface pits. This is color-coded light red to indicate the fifty to a hundred thousand production bracket for water.

Next, we have Pool 13 which is the Noma Sand Abo and Noma Sand Penn and Noma San Andres. The total water production was forty-two thousand one hundred and eighty-four barrels of which twenty-one thousand three hundred and forty-three barrels is going into a salt water disposal system and twentythousand six hundred and sixty into open

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pits. This is color-coded light orange to represent the twenty thousand plus category. We have also designated on these maps, black triangles. These will represent water disposal of some kind. We didn't try to differentiate between salt water disposal and waterflood, but we did designate in Pool 13 the black triangle which represents a salt water disposal system. And then Pool 32 which is the Crossroads Devonian, Crossroads Mississippian and Crossroads Pennsylvanian Pools, the total water production for the month of December, was four hundred and thirty-four thousand nine hundred and eighteen barrels all of which is being disposed of into salt water disposal systems. So in this case, it is not color-coded since the water going into pits was zero, but we have designated the salt water disposal system in the pool. So from a compilation of these exhibits we can see the status of the water production, in other words zero water production, water production with no disposal, water production with partial disposal and water production with one hundred percent disposal.

Q Go ahead, did you have something else? What percent of the total produced brines from these pools goes into surface pits?

A Excuse me, Mr. Hatch. I want to go back to Exhibit Two while I am there. I wanted to call your attention to Pool

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Number 51 which is kind of an eyesore setting in among a bunch of salt water disposal systems. Anyway, this is the North Bagley area which has production from several different horizons. On February 7th of this year, a meeting of the operators was held and at this meeting they were informed that the produced water volumes were such that I considered this to be a critical area. I informed them that they should take immediate action to ward sub-surface disposal.

Also, they were informed that this hearing would be held today and were advised that I would make a definite recommendation for no further open-pit disposal in this area. The December water production for this field was a hundred and twelve thousand, five hundred and seventy-two barrels or nearly four thousand barrels per day.

Q All right. Do you have anything else to say there?

A I think that one operator has made application for a disposal well in this pool and I think there are other plans that have been made.

Q Mr. Ramey, going back to the question I asked you a moment ago, what percentage of the total produced brines goes into surface pits from all of these pools?

A It is approximately thirty-four percent.

Q The rest of it then, approximately sixty-six percent

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is going underground in some manner?

A Yes, sir. That is correct.

Q All right. You have testified as to the production of oil field brines and the disposition of the brines, do you have any information as to the chloride content of those brines?

A Yes, sir, these are listed by pools in the sixth column on Exhibits 2a through 5a.

Q That is the same exhibit we have already used?

A Yes, sir, that is correct.

Q I notice there --

A I should say, Mr. Hatch, that we didn't attempt to have these waters analyzed as to total solid content. We were able to, in our own office with our meter lab facilities, we were able to analyze chlorides, but chlorides are one of the main contaminants of fresh water and this should furnish us with a representative sample or representation of what the produced waters are like in each of the pools.

Q What is the highest chloride content shown on that exhibit?

MR. PORTER: Mr. Ramey, just a moment.

(Whereupon an off the record discussion was held)

Q (By Mr. Hatch) I will repeat the question. What

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was the highest chloride content shown on that exhibit?

A One hundred and eighty-six thousand twenty parts per million.

Q And the lowest chloride content?

A One thousand four hundred and twenty parts per million.

Q Do you have a chloride content shown by each of those wells on this exhibit?

A No, not on all of them. The pools, I should say.

Q Yes, thank you. Why not?

A First, of course, some of the pools make no water and then in some instances, we were unable to obtain a sample because of the small volumes involved or that the wells were not producing at the time that we attempted to get the sample. In other instances we made no attempt to obtain samples because we had samples from nearby pools which were producing from the same formation which we felt were representative of the quality of waters involved. Just for an example, the Carlsbad Delaware Pool, the water was analyzed at ninety-nine thousand forty-five parts per million chloride. The Dartanian-Delaware, the analysis showed slightly over a hundred thousand so we can assume that Delaware water would test around a hundred thousand barrels.

Q Mr. Ramey, where did you get the information as to

the chloride content?

A These were either by our own analysis or from sample analysis which we had on file.

Q All right, you have testified now to the amount of brines produced in each pool during the month of December 1966. Do Exhibits Two and Five, Two through Five and 2a through 5a show how much is produced in a section?

A No, sir.

MR. PORTER: Just a minute Mr. Hatch, while we are on this chloride content, approximately how many sample did you take, Mr. Ramey, that are being considered here in this exhibit?

THE WITNESS: I believe it was approximately two hundred and fifty that we ran ourselves.

MR. PORTER: And these were scattered over the four-county area?

THE WITNESS: Yes, sir.

MR. PORTER: Thank you.

Q (By Mr. Hatch) Do you have any testimony or exhibits that will show how much water is produced in each section?

A Yes, sir, I do.

Q What exhibit is that?

A Those are Exhibits Six and Seven which again, are

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the large maps on the board and Exhibit Eight which is a tabulation by section, township and range of the water production.

Q What period of time does that cover?

A These were for the year 1966.

Q Would you point out to the Commission your color scheme again?

A The color scheme -- I won't go into the whole thing, but the color scheme is very similar to what I explained on the other exhibits except that we added a few more colors. They range from, dark green and dark blue are the low volumes and then again, the light red and dark red are the high volumes.

Q Again, this Exhibit would show the total production of water through oil and gas operations during the year 1966?

A Yes, sir, on a per-section basis.

Q All right. Where did you get that information?

A This was furnished by our Santa Fe office which in turn came from information that the operator submitted on their monthly production report.

Q This is the amount of water reported by the operators?

A Yes, sir.

Q And how much is that?

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A The -- I've got it here someplace. The total water production for the southeast producing area for the year 1966 was one hundred and fifty-eight million, one hundred ninety-four thousand, seven hundred and sixty-eight barrels.

Q Well, can you give us how much water, is that a large amount of water?

A Well, it is a reasonably large amount of water. Of course, it depends on what you compare it with, but this is sufficient water to cover thirty-two sections of land to a depth of slightly over one foot.

Q Of course, it isn't all concentrated in one place like that is it?

A No, and as you can see from the exhibit, it is pretty well scattered.

Q Do Exhibits Six, Seven and Eight show the quality of the water?

A No, sir.

Q Do Exhibits Six, Seven and Eight show the disposition of the water?

A No, they do not. The combination of Exhibits Two through Eight, why you could fairly well, I think, tell the disposition of the water to a certain extent, anyway, not in all instances. For example, I'll just pick a few sections at random.

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Now, we will refer to Section 2 of 15 South, 37 East, let's see if I can locate that. It would be this particular section which is marked dark red. Now, the records indicated that this section produced two million, five hundred and seventy-eight thousand barrels during the year of 1966. Now, if you will transfer this to the other exhibits we will find that this is in the Denton Pool, so we can see in the Denton Pool all water goes into salt water disposal systems.

Another one would be Section 29, Township 8, South Range 33 East, which is in the Tobac Pool. Now, this produced two hundred and ninety-eight thousand five hundred barrels and from Exhibit 2 again we can see that all the water in this pool goes into open pits. It would be in this particular pool (indicating), and then to take another section, Section 22, Township 19, South Range 35 East. This is in the Pearl Queen Pool. This section produced two hundred and two thousand four hundred barrels. If we will transpose this section to Exhibit 3, it will be here which is one of those pools which is labeled both water and pits and salt water disposal systems.

So in this particular instance we would need additional information which we do have, but it would take a, we would have to know the ownership of the lease and we would

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have to know who has the disposal system and what wells go into the system. We do have this information on file, but we weren't able to reflect it on these exhibits.

Q Are you through?

A Yes, sir.

Q You have been testifying as to the quality of water produced by oil and gas wells. Have you had an occasion in your duties as supervisor of District One, to make a study of the quality of the water in any water wells?

A Yes, sir.

Q Is it a duty of your office to make investigations as to possible contamination of water wells by brine disposal?

A Yes, it is.

Q Are you prepared to give testimony and present exhibits concerning wells that your office has investigated?

A Yes, I am.

Q What are those exhibits?

A This will be Exhibit 9a through 9f.

Q I suggest that we change the title of those exhibits. Have those been distributed?

A I believe they are in front of the Commissioners, yes, sir.

Q The Exhibits should have "Water" at the top of

them rather than "Contaminated Water", so if you will make that correction on the exhibits, please.

A I am ready to proceed.

Q All right. If you will go to Exhibit 9a.

A Exhibit 9a, now we have labeled these or color-coded these again, about the same, the red dots indicate a water well.

Q Mr. Ramey, let me interrupt you a moment. As you go through each of these, be sure to give the Commission all the information as to where you received your information.

A All right, I will. The blue oval shapes are the disposal pits, they may be active or abandoned. The Exhibit 9a shows a water well in the northeast quarter of the northeast quarter of Section 2, Township 18, South Range 34 East. The information as to chloride content was furnished us by the State Engineer's office in Roswell. This well, the chloride content on the original test, was thirty-five parts per million. On a test taken November 17, 1964, they indicated one hundred and seventy parts per million and then on a test taken September 20th, 1965, the chloride were two thousand and sixty. Would you like to have me point out the area of each of these wells, Mr. Hatch?

Q Yes, I wish you would.

A The well in Exhibit A would be in the Vacuum Pool

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area, it would be at this location on the south edge of the Vacuum Pool.

Q Is that in one of the designated or declared water basins?

A Yes, sir, that is in the Lea County Water Basin. The Exhibit 9b -- one thing I should mention in going back to Exhibit 9a, that is, there was a pit a little over a quarter of a mile west of this well. The pit is now abandoned and all the waters in this area are going into disposal systems. As a matter of fact, this is the area covered by the Commission's most recent order on salt water disposal. It was effective March the 1st for a certain area and then the remainder of the pool will be effective on June the 1st.

I might mention going back to the Exhibit, I did show the Vacuum Pool area as under salt water disposal system but on my tabulation I showed the water going into the pits because the majority of the water at the time was going into the pits. Now back to Exhibit 9b, this shows a water well in the northwest quarter of the southeast quarter of Section 19, Township 18, South Range 38 East. This is on the northwest side of Hobbs. Now, these chloride analysis were those which were analyzed from samples which we collected from the well.

The chloride content of this well in February of

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'61, was one thousand and seventy parts per million and the chlorides tested one thousand and seven hundred and seventy-five parts per million in June of 1964. The well has a pit within a quarter of a mile to the west which is an abandoned pit which was abandoned under the first order that the Commission issued, R-1224A, that is, the Hobbs Pool was one of the ten areas that was listed in this order.

MR. PORTER: That was 1958?

THE WITNESS: Yes, sir. It seems like it was effective January 1, 1959.

The Exhibit 9c indicates two water wells located in the northwest quarter of Section 27, Township 21, South Range, 37 East. This is on the north outskirts of the town of Eunice. Chlorides for one well and in looking at these, I think we might have gotten our samples switched, but regardless this is the way we have them posted, but the chlorides on one well indicated to be three hundred and ninety-two in 1954 and nine hundred and twenty in 1966. For the other well, the chlorides indicated to be eight hundred and eighty-seven in '64 and four hundred and fifty in 1966. Now, one of these wells has been abandoned and the other one is being used and the one that we show the highest chloride content in '66 is the one that is being used, so I kind of feel like we got our samples switched on that.

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Q But you haven't run any other samples to check it?

A No, sir, not at this time. Of course, these were from analysis that we took from the well or from samples we took from the well and had analyzed. This shows several pits in the immediate area, two in the same section and then several in the sections to the north and west. Now the section directly west of these wells is under salt water disposal which is designated on the plat.

Q Are the pits shown there still active pits?

A Yes, sir, they are.

Q They are unlined?

A Unlined pits, yes, sir. Exhibit 9d shows a water well in the southwest quarter of the southeast quarter of Section 9, Township 22, South Range 36 East. It would be in this area. More of an illustration, it would be in this general area. We have no initial analysis on this well, but we took a sample on the well in April of '67 and our analysis showed that the chloride content was two thousand nine hundred and thirty-nine parts per million chloride. There is a pit directly west of this well and then a pit to the, not directly west, but directly north of the well and then a pit, an abandoned pit to the northeast.

Exhibit 9e shows a water well in the southeast quarter of the northeast quarter of Township 25, South Range

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37 East. Did I say Section 24? It would be in this area, (indicating). The chloride contents were furnished to us by the owner of the well and these came from samples which were analyzed by one of the El Paso gasoline plants in the Jal area. The chlorides on this well indicated three thousand one hundred forty-three in June of 1965, and they have increased to twelve thousand two hundred in April of 1966.

Q But you didn't take -- these were not taken by the Oil Conservation Commission?

A We took the last sample.

Q You took the last sample?

A Yes, sir. The last Exhibit which is 9f is a water well located in the southeast quarter of Section 31, Township 16, South Range 37 East. The information for the chlorides on this well were furnished us by the City of Lovington.

The chlorides, let me point out this well first in this area (indicating). The chlorides on this well indicated on the original test thirty parts per million. In February of 1966, they indicated eighty-four parts per million and the chlorides taken again in December of 1966 indicated four hundred eighty parts per million and then a sample taken this month by the State Engineer which was also furnished to us, indicated four hundred and thirty-three parts per million. The well had been shut down on this, prior to the last sample.

This shows numerous pits in the area and also some abandoned pits from what we were able to, from our inspection of these pits, we did not find any water going into the pits and our records indicate that all of the water from the Lovington Pool is going into salt water disposal system.

Q Were all of these water wells located in declared water basins?

A Yes, sir, primarily, I think part of them were located in the Lea County Water Basin and the remainder in the Capitan Water Basin.

MR. PORTER: Mr. Ramey, at this point, could you tell us approximately the depth of the water, of the water wells that you have examined here?

THE WITNESS: These wells all range in the depth from ninety feet to two hundred eighty feet. I think the first well was bottomed at around two hundred and eighty feet, I'm not completely sure of those depths, but they are --

MR. PORTER: It is in that range?

THE WITNESS: It is what we term, shallow, fresh water. This is above the Santa Rosa and it is probably in Alluvium or Ogallala.

MR. HAYES: That two hundred and eight some-odd foot well, do you happen to know where it is?

THE WITNESS: Yes, sir, it is, that was the first

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well which is in the Vacuum Pool area.

MR. HAYES: You don't know what level they're using this water from, do you?

THE WITNESS: Yes, sir, that is Ogallala, it is Ogallala water.

Q (By Mr. Hatch) Mr. Ramey, do you have anything else you would like to offer?

A Yes, I would like to discuss just in general, the two areas which are reflected on these Exhibits. The first area is that from the Maljamar Pool to the City of Artesia. This trend is one of the oldest producing areas in the southeast with some of the wells having been drilled well over thirty years ago. Now, most of these wells produced as strippers for a number of years and the water production over the life of these pools has been negligible, however, some years back secondary recovery by waterflooding was attempted.

However, with waterflooding you necessarily have large volumes of produced water so that an area which ten years ago produced less than ten thousand barrels of water in the month of December, now produces some seven hundred and thirty-eight thousand barrels of which three hundred and twenty thousand barrels go into open surface pits.

The chloride content for these waters ranges from fifty-four thousand to a hundred and fifty thousand and most

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of the operators of these waterflood projects either collect this produced water and reinject it or they intend to do so in the future.

However, some operators have stated that they do not intend to reinject the water, but will continue to dispose of it in open pits. Now, to my knowledge we have never received a complaint from this area at all but we do have a situation where the operators have created a possible problem with secondary recovery and water production in the pits which could lead to water contamination in the area. However, the operators could go in and solve their own problem by picking up this produced water and reinjecting it back into their waterfloods.

Now, the second area is that of the Capitan Reef Pools, particularly those in southern Lea County. It would be this area here (indicating). Now, here again we have another area of extremely over-production, particularly that portion of it which lies south of the Lea County Water Basin in the recently established Capitan Water Basin.

MR. PORTER: Mr. Ramey, when you refer to stripper wells, about what is the level of production in the area would you say, oil production?

A I think the proper classification is below ten barrels a day, but we have numerous wells which are lower than

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that. Ten barrels would be a lot of oil to some of these wells. But back to this area, of course, this is an area of old production, also, but unlike the others, these are active water-drive pools and the pools have produced substantial amounts of water for several years. Now, three of the pools in this area, the Jalmat, the Arrowhead and the Scarborough produced a reported nine hundred twelve thousand seven hundred barrels last December.

To dispose of these volumes of water, it has been necessary for the operators to dig large surface pits and in many cases, a series of water pits. In many areas through this trend, the operators have been unable to contain their produced waters in the pits which has resulted in surface damage to the land outside the pits.

Now, our analysis of the waters produced from the Capitan Reef Pools indicated a level of two thousand seven hundred seventy-nine parts per million and a high of some twenty-six thousand parts per million. This is chlorides, of course.

In the three pools mentioned previously, the Arrowhead, the Scarborough and the Jalmat, the chlorides tested at two thousand seven hundred seventy-nine; three thousand four hundred forty-three and four thousand three hundred eighty-two parts per million respectively which is

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really not bad water.

Now, to give you an idea of the type of water we are talking about here, I have a letter in my files from a rancher in South Lea County concerning the use of water from a disposal pit in the Arrowhead Pool. We have found a siphon line coming out of the surface pit and have requested the operator to remove the line and confine his water to the pit.

The operator informed us that the rancher had installed the siphon and was using the water for stock water. We requested a letter from the rancher to verify this and in his letter the rancher states that this is the only available water for his stock and that the water going out of the pits supports vegetation very well. However, the chloride content is much too high for human consumption.

MR. PORTER: What is the chloride content, do you know, in that particular pool?

A In this particular pool, this was in the Arrowhead Pool and the chlorides were two thousand seven hundred parts per million.

MR. PORTER: Maybe those cattle haven't read the analysis on it.

THE WITNESS: That's all I have Mr. Hatch.

Q (By Mr. Hatch) Mr. Ramey, were Exhibits Two through Nine and Exhibits 2a through 5a prepared by you or under your

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supervision?

A Yes, sir, they were.

MR. HATCH: I would like to ask the Commission to accept Exhibits Two through Nine and Exhibits 2a through 5a into evidence at this time.

MR. PORTER: Two through Nine, 2a through 5a?

MR. HATCH: Yes, sir.

MR. PORTER: If there are no objections, the Exhibits will be admitted.

(Whereupon Oil Conservation Commission's Exhibits Two through Nine and 2a through 5a were admitted into evidence)

MR. HATCH: That's all the questions I have of Mr. Ramey, but I would like permission to recall him after all other testimony is in for the purpose of possibly making recommendations.

MR. PORTER: The Counsel for the Commission has requested permission for approval to recall the witness to make some recommendations. He thinks, perhaps, it would be better to hear any other testimony that may be presented prior to making his recommendations. He will be available for cross examination, of course, at this time, on what he has testified to up to now, and the witness has requested time to get a cup of coffee, let's take a ten minute break and let's keep it to ten minutes because the Governor has some pressing

business elsewhere and he wants to stay and hear as much of this as he can.

(Whereupon, a recess was taken)

MR. PORTER: The hearing will come to order, please. Mr. Hatch, do you have any further questions on direct at this time?

MR. HATCH: No, not of Mr. Ramey, no. I have another witness to call when he is through.

MR. PORTER: The witness is available for cross examination. Are there any questions? If you want to cross examine the witness, I suggest you come forward to the front. If there are no questions, the witness may be excused and recalled later. Mr. Hatch, will you call your next witness?

MR. HATCH: I call Dr. Zane Spiegel to the stand, please.

(Witness sworn)

* * * * *

ZANE SPIEGEL, called as a witness on behalf of the New Mexico Oil Conservation Commission, first having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HATCH:

Q Dr. Spiegel, will you please state your name,

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profession and by whom you are employed?

A Zane Spiegel, Oil Reserve Engineer employed by the State Engineer's office.

Q Have you testified before this Commission before?

A Yes, I have.

Q In that capacity?

A Yes.

MR. HATCH: Will the Commission accept the witnesses qualifications?

MR. PORTER: Yes, sir.

Q (By Mr. Hatch) Dr. Spiegel, in your position as a Hydrologist for the State Engineer's office, is it one of your duties to make reports to the State Engineer as to the presence of water and its quality in particular areas of the State, including the Counties of Lea, Eddy, Chaves and Roosevelt?

A Yes.

Q Are you familiar with Case 3551 and what it proposes?

A Yes, I am.

Q Are you also familiar with the letter and the attachments prepared by the State Engineer and sent to the Commission and previously entered in this Case?

A Yes.

Q Are you familiar with the fresh water standards used in making the designation?

A Yes, I am.

Q Would you explain to the Commission the quality of water that is suitable for various uses including human use, agriculture and other animals?

A Yes. The water that is suitable for human use, under Public Health Service recommended standards for interstate carriers, is a total of five hundred parts per million with two hundred and fifty parts per million chloride or two hundred and fifty parts per million sulphate.

If water is not available of this quality, they permit the use of water twice these contents, these three values, that is up to five hundred parts per million chlorides, five hundred sulphate and one thousand total solids.

Occasionally, if water is not available they have permitted use of water somewhat greater in these constituents in certain cases for interstate carriers. These standards which are usually quoted as being Public Health standards are standards only for interstate carriers. They have not established similar standards as absolute maximum limits which can be used by people who for their own private use, and humans can drink water considerably greater in total solids, chlorides or sulphates than the interstate limits that have

been established.

I don't think that there are any definite limits, it depends upon individuals. It goes up to two to three thousand and I have heard of up to four thousand particles being consumed by individuals with no apparent illeffects after they have become accustomed to it.

However, most people cannot become accustomed to such water and suffer serious consequences if they drink water much above two thousand, fifteen to two thousand parts per million total solids.

Irrigation water can be considerably higher above five thousand parts per million depending upon total solids, depending upon individual constituents. Stock can drink water exceeding ten thousand parts per million, again like humans they must become accustomed to the water and I'm sure that individuals vary in their maximum tolerance and the tolerance depends considerably upon the amount of water that they take in in their feed, the amount of moisture in the feed.

For instance in a wet year with green feed they may be able to exist on very much higher water because they will not need to drink so much of it.

The tolerance for industry is extremely variable. It depends upon industry and the cost which they are willing

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to go to make water suitable or modify this industrial requirement. I think that they can use water up to ten thousand parts per million for certain things such as cooling. When water quality gets worse than that it becomes much more expensive, the maintenance of the cooling apparatus.

Q You have stated that you have made studies pertaining to the quality of water in the four counties under consideration at this hearing. Do you have any exhibits that you used in making your studies?

A Yes.

Q What are those exhibits?

A The first exhibit consists of four sheets, it is labeled Ten. The sheets are labeled 10a, 10b, 10c and 10d. They consist of maps of Roosevelt, Lea, Eddy and Chaves County; Chaves County being in two sheets, a total of five maps altogether prepared by the planning division of the New Mexico State Highway Department.

Q Let me interrupt you a moment. I see five county maps I think.

A There are four counties.

Q Three here and two over here.

A Yes, there are four counties. Chaves County is in two pieces. The two on the East wall are both Chaves County. I'm sorry, they are labeled 10a to 10e.

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Q 10e?

A That's right. And in addition, I have exhibits that are labeled 11a, b, c and d. These consist of County maps of the same counties prepared from sepias of the original county maps and on these maps are, on the sepia reproductions of the county maps, have been located certain wells from which samples have been taken and analysis made by the U. S. Geological Survey over a period of years from 1929 up until 1964 and '65.

In addition I have a set of maps in six sheets, labeled Exhibit 12 which covers the Capitan Water Basin in Eddy and Lea Counties.

Q Going back to Exhibit 10, that is 10a, b, c, d and e, five County maps, who prepared those maps?

A These maps were prepared by the planning division of the State Highway Department.

Q You didn't make them yourself, then?

A No, I did not.

Q What do those maps show, again, that you would like to --

A The principal purposes of introducing these maps, the highway department maps, are to show the distribution of windmills that are used for stock watering throughout these four counties. You have to look very closely at the map

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because the windmills are not, otherwise, marked in color, they are represented by a small circle with two little horns representing the windmill blades, at the top, a little "v" mark and if you will look carefully at these maps, I'm sure most of you have looked at such maps in the past, you will see that in nearly every section of these four counties, you will find one and sometimes more of these windmill symbols which represent the location of stock wells. I might add that the maps are made from aerial photographs and stock wells are visible and identifiable on the aerial photographs, quite easily.

Q Well, how do those windmills show the presence and the quality of water?

A Well, the windmills show that a well exists at the particular place, that it is used for stock and stock use is one of the uses to which fresh water is put to, in these four counties.

Q Have you used those maps on many occasions to locate windmills?

A Yes, I have used these maps for a period of eighteen years in every County of New Mexico. I have used maps identical to these, but in smaller format, quadrangle size, in much of the area of New Mexico, and I find them to be reasonably accurate. They do not represent, however, all of

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the windmills that occur in the given area, but all of the windmills that are shown on them in general with few exceptions can be found in the field. Sometimes the windmill may have been taken down since the photographs were taken, or the maps made, but you can usually identify the location of the well under which the windmill was located.

Q All right. Let's go on to Exhibit 11 just a moment. Did you prepare, that would be 11a, b, c and d and those are again the County maps, they show the counties, did you prepare those?

A No, these maps were prepared by the U. S. Geological Survey in cooperation with the State Engineer Office. However, I did not prepare the maps, but I did check the location indicated for each of the analyses and the values that are written on the map representing the analyses and I checked these data by going to the Geological Survey office in Albuquerque, and to the State Engineer office in Roswell, which has photocopies of the original analyses and I checked card by card, each of the locations against the location and the data plotted on the four maps.

Q You have found them to be accurate, then?

A Yes, they are accurate.

Q Now, you have not displayed Exhibit 12.

A I'm sorry, it is right behind you on the chair. I

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don't think we had room to put it up, perhaps at the time we introduced it.

Q Who prepared Exhibit 12?

A Exhibit 12 was prepared by or under the direction of Jim Wright, Engineer from the State Engineer office in Roswell.

Q That is by the office you work for?

A Yes.

Q All right, Dr. Spiegel, would you refer to the Exhibits 1 through -- excuse me, this will be 2 through 5 of Mr. Ramey --

A Yes.

Q -- and to your own exhibits and give the Commission your opinion as to whether or not there is a fresh water supply in close proximity to the Cato's San Andres Pool, do you have that one located?

A Yes, just one moment. I have some work maps with me upon which I have located additional data not on the geological survey maps and the location of the pools, the base maps, my work maps are the same as Exhibit 11 and I may refer to them from time to time to give you the answers to your specific questions. I also have some notes here.

Cato Pool is in Township 8, South 30 East, Chavez County, right here. It is number 17 on Exhibit 2. There is

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fresh water in this entire township, 8 south, 30 east, that is in parts of the entire township. There are several stock wells, two houses, one which is now abandoned which have windmills, water supplies which we can presume were used for domestic use, one of the houses is quite large and substantial and, we don't have any water samples from these wells, from any of the wells in this area, but there are these two domestic wells and numerous stock wells, all of them have showed up in Allevium or in triassic routes.

Q Have you seen those wells?

A Yes, I have.

Q All right, would you locate the Chaverco San Andres Pool, please?

A The Chaverco Pool is in Roosevelt County, 7 South, 33 East, the southern part of it, I believe that is number 16 on this map. I'm sorry, 6 on this map, it covers quite an extensive area in the red area here. There is ground water in the Ogallala formation in most of the Township and surrounding and all of the surrounding townships, the water is of good to fair quality and the water is used for stock and domestic use. Now, in the center of this Township 7, South, 33 East, there are some areas where the bedrock surface, that is the triassic surface, is above the general water table in the Ogallala and in these areas, the Ogallala may be

dry in small areas, however, the underlying rocks, triassic rocks, do contain fresh water.

There are some wells in the triassic rock area where the Ogallala has been reported to be dry. There have been some wells drilled in this area which have been reported to be "dry", but, dry, in reference to wells, is a relative term. I think we all know that, that a dry oil well may be one which does not have economic production at the particular time that it is drilled or one in which no petroleum of consequence was identified. We all know that such wells have been reentered at times to produce oil.

A dry well referred to, in the petroleum industry, may be one that produces large quantities of water and no oil. When we refer to a dry water well, when a water well is referred to as being dry, it means that insufficient water for the purpose at hand, in mind, was obtained at the time of drilling. For instance, a dry well that was drilled for irrigation purposes in an area where the wells are normally expected to produce three thousand gallons a minute, may produce four to five hundred gallons a minute and yet be considered a dry well by the driller or the owner. Therefore, I conclude from the data we have on the Chaveroo Pool area, that there is water in the entire Township and surrounding townships of the Chaveroo Pool.

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Q Would you next locate the Allison Pennsylvanian Pool?

A The Allison Pool is in 8 South 37 East, southern part, I believe it is number 10, the magenta-colored one on this map. If we refer to Exhibit 10, map number 8a, Roosevelt County, we will see that there are a number of stock wells shown in the area of this oil pool. In this particular township, the oil wells are also indicated, show the location of the pool. The pool name is not identified but the wells are shown. This particular area is in the heart of the high plains, the eastern part of the New Mexico high plains, where ground water is found of good quality in the Ogallala and at times in underlying rocks of cretaceous or triassic age and therefore there is fresh water in the entire area.

We also note that from water level contours that have been constructed and from the quality of water in the entire portion of Lea County and southern Roosevelt County, that fresh water is obtained, that the fresh water moves generally eastward or south-eastward or south-southeastward and this sort of information is quite different from, the interpretation of this sort of information is quite different from the interpretation of oil pool data. Oil pools occur only in certain isolated localities. The oil is static and

you must have very detailed data to determine whether or not oil is present in a particular place. But you do not need such specific data to determine whether or not water is present in an area or whether or not the quality is of a particular type, because ground water occurs everywhere at some depth.

MR. PORTER: Excuse me. Dr. Spiegel, I believe they are requesting that now you talk into the microphone.

THE WITNESS: I'm sorry.

A The ground water occurs everywhere and it moves in determinable directions and once the general direction and formation in which water is, ground water moves, is determined one can make quite positive predictions as to the depth at which water will be found and the water level which will be measured or would be measured in a well drilled in a particular location and the quality of the water which you can expect in the location.

Q (By Mr. Hatch) Dr. Spiegel, would you locate the Artesia Pool?

A The Artesia Pool is in Eddy County, 18 South, 28 East. I believe it is this one orange color, number 14 on the map. Is that right? 18 South, 28 East, no I think it is on this other map. This one in yellow, I am sorry, number 43. The ground water in this area is present in the quarternary

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alluvium and the rustler formation. The water in the quarternary alluvium in the vicinity of the pool, is excellent, very low in chlorides, from six to twenty-seven parts per million chloride. The water in the rustler in some parts of this area is on the poor side, we have one analysis in which the water is one thousand seven hundred and seventy parts per million chloride, the water is used for stock, the depth of this well is a hundred and sixty feet.

Q Dr. Spiegel, do you have any other particular pools that you want to talk about at this time?

A No, I have none, specifically, I have additional information on other pools specifically and I also have generally information on the occurrence of fresh water in the entire area.

Q Of course, there are many, many pools here and you have visited some of these as you have stated that you have. You haven't, of course, visited all of these pools, have you?

A No, I have not.

Q But using the information that you do have available and your experience and your education and without going to each pool in particular here in pointing out each pool, do you have an opinion as to whether or not there is fresh water or supplies of fresh water existing in

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substantially all areas?

A Yes.

Q In these four county areas where oil and gas production occurs?

A Yes, I think there is fresh water in substantially all of the areas of these four counties in which oil production has been obtained and in fact fresh water exists in substantially all of the four counties. There are some areas in which water is extremely high in chlorides and dissolved solids, particularly in the Salido and certain portions of the Rustler formation where the heads in the salt water from the underlying triassic formation are higher than the Rustler water heads and therefore have caused some salt water to enter by natural means into the Rustler. However, except for this particular case of the Salido formation in certain areas of the Rustler, I think there is fresh water in substantially all of the remainder of these four counties. I have no knowledge that would indicate that there is not fresh water in or in very near proximity to each and everyone of the oil fields, oil pools in these four counties.

Q Now, you are familiar with the map that was introduced as Exhibit 1, that accompanied the letter from the State Engineer's office?

A It is gone now, but, yes, I think I know which

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one you mean, yes. This is it, I think.

Q Do you agree with the statement that that map would show the existence of fresh water or formations that commonly contain fresh water existing all over the entire four county area?

A Yes.

Q Did you hear Mr. Ramey testify as to the amount, type and location of the produced water in the counties of Lea, Eddy, Chaves and Roosevelt?

A Yes.

Q And to the surface disposal of a part of that water?

A Yes.

Q Did you also hear his testimony as to the chloride content of certain water wells?

A Yes.

Q And to the location of water wells in relation to surface disposal pits?

A Yes, I did.

Q Those were exhibits 9a through 9f, do you have a copy of that exhibit handy? Do you have an opinion as to whether or not those wells are contaminated at this time and, if so, what caused the contamination?

A I think that each and every one of the wells

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referred to by Mr. Ramey this morning have been contaminated on the basis of the information which he provided, and also on the basis of information which I have obtained independently in most cases not knowing the exact data that he had to present today, and I am quite certain that each and every one of these wells has been contaminated by artificial cause. There is absolutely no reason, whatsoever, to suspect that water of such high chloride could possibly have gotten into these wells by the normal process of pumping water from these aquifers. In the areas of each of these wells, the water levels in the shallow aquifers are higher than the water levels pertaining to the deeper aquifers and much higher by several hundred feet than the water levels in the very deep aquifers which contain high chlorides.

There is no way for water from these deep aquifers to get to the shallow ones unless it is pumped out and put into the shallow aquifers, either by direct injection, by leakage from oil field tubing and casing or from the pits into which the water pumped out of the deeper saline aquifers is placed.

Since the pits into which this water is commonly placed and has been placed in the past in nearly every oil pool leak, and if they don't leak under natural conditions are made to leak, it is to be expected that this would be the

principal method of contamination.

It is possible that in certain areas contamination is artificial by such processes as leakage from a water line used to convey saline water from a well to an injection well or disposal pit or leakage from the conduits containing mixtures of petroleum and water, but I think that the conduit containing mixtures of oil and water are policed very carefully to avoid such leaks.

I'm quite sure that there are occasionally leaks in spite of efforts to avoid the loss of petroleum and the accompanying water, but since the efforts to prevent leakage from pits has been negligible in many cases, in fact just the opposite, the pits have been so constructed so that they would leak, I think it is likely that the pits in general are the most common source of contamination. Now, since the quality of the water --

Q Dr. Spiegel, is it your testimony that water in those wells should have had a lower chloride content than is shown on the exhibits and Mr. Ramey's testimony?

A If they were not contaminated, yes, because either of the earlier analyses of the same wells showed that the chloride was very low or we have other wells in the same formations in the near vicinity which show that the quality is generally low in those areas.

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Q Do you have any information as to what you would have expected the quality of the water to be in each of those wells under natural conditions?

A Yes.

Q Would you give it for each of those, please?

A I think that Exhibit 9a shows that the original quality of water of a well located in Section 2 of 18 South 34, was 35 parts per million chloride. I don't have the date of that original analysis, but I do have analyses which show that the normal chloride in that area in the Ogallala formation is between 24 and 47 parts per million of chloride. The water level in that area is normally about thirty-nine hundred and twenty-five feet and the water moves southeastward. The water level in the triassic rocks is at least twenty-five feet deeper and the quality is somewhat different in the triassic rocks, but the chloride is still low and water levels in deeper aquifers with high chlorides are a hundred to two hundred feet deeper still or more.

Q Would you go on to the next one please?

A Exhibit 9b, a well in Section 19, 18 south 38, the analysis, the first analysis reported was one thousand and seventy chloride in the vicinity of this well, data taken in 1955 from another well nearby showed two hundred and seventy chloride and in 1958 another well, two hundred chloride.

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However, both of these wells in my opinion are also contaminated since the normal chloride in the Hobbs area, northwest of Hobbs, ranges from thirty-eight to approximately fifty. There are some analyses as high as sixty-five, but these may also be contaminated.

Exhibit 9c, reported data from two wells in Section, I believe that was 27, north of Eunice. The data from one well show a large increase from three ninety to nine hundred and twenty chloride. I want to refer to my work map on this area to see what the quality -- I don't have the notes on this one, I don't think. I have two analyses in this area, short distances to the northeast in Section 24 of 22 South, 37 East, one of which has chloride of five hundred eighty parts per million. The other seven hundred and seventy. However, I think that these both represent contaminated waters. The normal chloride in this area as represented by wells a few miles to the northwest is about a hundred or less parts per million total dissolved solids. In fact, we had a difficult time in this area because there has been so much water production, salt water disposal that practically none of existing analyses are to be considered as uncontaminated.

Exhibit 9d: In a well in Section 9 of 22 South 36 East, the chloride reported two thousand nine hundred and thirty-nine in April of 1967, my data show that in the

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cretaceous or quaternary rocks overlying the triassic rocks the water is of generally good quality in this area, normally less than a hundred parts per million, again generally contaminated in local areas.

The water in deeper rocks, the triassic, is twenty-five feet lower in water level, has good quality water, an analysis made in 1965 by the State Engineer's office shows two hundred chloride in triassic rocks.

Q If on each of the others you will just give what you in your opinion would expect in its natural condition.

A All right. The Exhibit 9e, in Section 24 of 25 South 37 East, the normal quality of water in this area would be on the order of fifty parts per million chloride.

Exhibit 9f, a well in Section 31 of 16 South, 37 East and I believe that is called the Number 8 Well of Lovington. I have analyses from the Public Health Department as well as the State Engineer's office and that data reported by Mr. Ramey and an analysis of the nearby well number 5 of the Lovington Supply which corroborate the increase in chlorides in the last two years. The normal chloride in that area would be from thirty to fifty chloride, thirty to fifty parts per million chloride.

Q Dr. Spiegel, I don't think you have identified how you used Exhibit 12 and Exhibit 12 is made up of how many

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parts?

A Exhibit 12 is the Capitan Basin, I guess I didn't refer to that. That Exhibit has additional data on the quality of water in the Capitan Basin that is not shown on Exhibit 11.

Q What additional information is shown on Exhibit 12?

A These analyses are analyses made by the State Engineer's office in a routine investigation of water level and quality of the water in the Capitan Basin in 1965 and 1966.

Q Does it show all of the wells in the area?

A The Exhibit shows what is estimated to be about ninety percent of all the water wells in the area.

Q It shows the depth of the wells as well as water quality?

A It shows the depth of the well, it shows water level if the water level could be measured or has been reported by the owner, and it shows the chlorides of wells which were pumping at the time of visits and the total solids of the water from those wells at the time of visit. Wells which had produced water into a stock tank were not sampled because there can be minor changes in quality in the tank either by dilution of drain water or concentration by evaporation.

Q You say that just covers the Capitan area?

A Just the Capitan area.

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Q Dr. Spiegel, did you testify in Case 1053?

A Yes.

Q Do you recall your testimony in that Case?

A Yes, I think I do.

Q Did you testify in that case as to the presence of fresh water in certain parts of the southeast?

A Yes.

Q And as to the definition of fresh water?

A Yes.

Q Did you also testify as to how contamination has occurred and as to the probability of future contamination?

A Yes, I did.

Q Would your testimony to such matters be substantially the same today?

A My testimony with respect to the method of contamination and the actual contamination in Lea County, would be substantially the same. I would make, if I were to testify to the same questions today, I would be much more emphatic that the saline water put into disposal pits goes down into fresh water, that it goes to the base of the aquifer or aquifers in the area and that the water, I would be much more emphatic that the water moves in a general direction of the ground water movement, but I would add that the details of the movement of water at the base of the principal fresh water

aquifer would be guided very strongly by the configuration of the base of the aquifer.

That is the original valleys and possible sink-hole valleys that occur in what are called the red bed or other rocks which lie below the Ogallala and Alluvium in Lea County and that the fresh water being the salt water which goes to the bottom of this aquifer and moves very slowly, generally southeast, along these valleys does contaminate the fresh water supplies in the area. However, the contamination is identifiable principally in the vicinity of heavily pumping wells that happen to be located near these areas of accumulation of the brine.

Q Dr. Spiegel, if a well becomes contaminated, how long will it remain contaminated or is it easy to decontaminate?

A Well, the well remains contaminated until all of the brine has been pumped out of the well. Now, if the brine is pumped out and put on the surface again, of course, it will move back into the aquifer and recirculate and therefore it will remain there eternally, if there is no known natural method of purifying the brine or for the brine to become purified as it moves through the aquifer.

MR. HATCH: If the Commission please, I would like to move to incorporate the record in Case 1053 into the record of this hearing and would also like for the Commission

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to take administrative notice of Order R-1224 and 1224A that issued as a result of the hearings held in that Case.

MR. PORTER: If there are no objections these will be included in the record and incorporated into the record of this hearing.

Q (By Mr. Hatch) Dr. Spiegel, do you have anything else you would like to add to your testimony?

A No.

Q It is your testimony that fresh water exists in substantially all areas of the four counties under consideration?

A Yes.

Q And is it your testimony that disposal of produced brines into open pits or unlined pits presents a hazard to that fresh water?

A Yes.

MR. HATCH: That's all the questions I have on direct. I would like to -- just a moment.

Q Dr. Spiegel, you have already said that you did not prepare Exhibits 10a, b, c, d and e, or 11a, b, c and d, but you have used those, right?

A That's right. And I have checked the accuracy of these maps.

Q And that the State Engineer's office did prepare

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Exhibit 12?

A Yes.

MR. HATCH: I would like to move the introduction of Exhibits 10a through 10e, 11a through 11d and Exhibit 12, at this time.

MR. PORTER: Any objections? The Exhibits will be admitted.

(Whereupon Oil Conservation Commission's Exhibits 10a through 10e, 11a through 11d and Exhibit 12 were admitted into evidence.)

MR. PORTER: Dr. Spiegel will be available for Cross Examination, at 1:00 o'clock. We will recess the hearing now until 1 P.M.

(Whereupon the Hearing was recessed until 1:00 o'clock P.M.)

MR. PORTER: Mr. Hatch, have you concluded with your direct examination of the witness?

MR. HATCH: Yes, I have.

MR. PORTER: The witness now, is subject to cross examination if anyone would like to ask him a question, please come forward and use one of these microphones, please. Mr. Losee?

CROSS EXAMINATION

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BY MR. LOSEE:

Q Dr. Spiegel, is it your testimony that contamination has occurred to all of the fresh waters in all of the four counties in southeastern New Mexico?

A I believe I testified that the water that has leaked from pits, wherever there are pits, has contaminated the fresh water supply in that vicinity.

Q Now, is that all of the fresh waters, not just the Ogallala?

A The fresh waters that are contaminated include water in triassic rocks, the sandstones of the Chimber formation, and the Santa Rosa formation, and possibly in some areas where it is present in subsurface cretaceous rocks.

Q But that is all of the fresh waters that are present in southeastern New Mexico?

A Excuse me, and also in the Rustler Formation.

Q Dr. Spiegel, if I am correct, the only specific examples of contamination which you referred to on your direct examination were Exhibits 9a through f?

A Yes.

Q Is that correct?

A Those are the only ones I referred to.

Q What other sources do you have available as to why or where contamination occurred in southeastern New Mexico?

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A I have a list of a number of other wells which the evidence shows have been contaminated.

Q But those have not been introduced before the Commission at this time.

A No.

Q Dr. Spiegel, would you locate with the pointer, please, each of these wells on those two easterly maps which I think are Exhibits 2 and 3, right behind you. I will give you the Section, the Township and the Range. The first one shown on Exhibit 9a is located in Section 2, Township 18, South Range 34 East.

A Indicating.

Q The second one is located in Section 19, Township 18 South Range 38 East. There ought to be a light circle where I have drawn during the noon hour.

A Section 19?

Q Yes. Township 18, South Range 38 East.

A There is a light circle, but it is in 17. This is 19 here.

Q Exhibit 9c is Section 27, Township 21, South Range 37 East, 21, 37 Doctor. Township 21, South Range 37 East.

A 21 South?

Q 37 East.

A 37 East. There is a circle here. Section 14, did

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you say?

Q Well, it is actually Section 27, but I think that is in the colored area.

A Yes, 27 is here, just north of the town of Eunice.

Q Incidentally, while you have mentioned that Doctor, do you know if it is not a fact that these wells shown on 9a through 9f are all high withdrawal rate wells?

A I don't know that, no.

Q Does that well serve the City of Eunice that you are just now referring to?

A I don't recall whether it is or not. I may have it in my notes. No, I don't know who owns the well or for what purpose it is used.

Q Or the withdrawal rates out of any of these wells?

A No, I don't think I do.

Q Well, let me ask you this question, doctor. Isn't it true that a well with a high withdrawal rate is more likely to show an increase in chloride than one with a steady withdrawal rate?

A You mean a low? One with a high withdrawal rate is more likely to show contamination, other things being equal than one with a low rate when it is not being pumped, yes.

Q And isn't it also true Doctor, that the amount of recharge to the water-bearing formation surrounding the well,

one with a high recharge rate would show less chlorides than one with a lower recharge rate?

A If a well had near it an unusually large source of recharge of fresh quality water, of good quality water, compared to another well and in the vicinity of both these wells there were brines that could contaminate the wells, probably the one with the larger recharge rate would show less, indicate less contamination, but this is not definite.

Q Well --

A It depends upon --

Q Well, recharge is a factor in contamination, isn't it?

A No, recharge, if it is normal recharge that goes on from year to year, is the same and, is a steady condition, in other words. The contamination from brine is not a steady condition, it is something that is superimposed on the natural system and if in both of these two cases you are talking about the recharge being different values were steady, it would not affect, it would only affect what is the normal quality of water in the area anyway and if the qualities of water were the same in both, the amount of recharge would not affect the conditions. Now, if in the vicinity of one well, the recharge were increased, this would be something else. The water level would tend to rise and the quality might

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become a bit better.

Q Well, Doctor, let me ask you a simple question. Is recharge, the volume of recharge, a factor or is it not a factor in determining contamination or the increase or decrease of chloride, the recharge of fresh water?

A Not if the recharge is a steady thing. If it suddenly increases, yes.

Q Well, it is a factor then if it increases?

A If the recharge increases it would become a factor.

Q Thank you Doctor. Let's go back to the map, Exhibit 9b, Township 22 South Range 36 East, Section 9.

A In the north central part of this orange pool labeled number 88 in Section 9.

Q Refer to what is marked Exhibit 9e and that well is located in Township 25 South Range 37 East, Section 24.

A Section 24 is on the east edge of this very large red area labeled number 95, east of Jal.

Q And now Exhibit 9f locates a well in Section 31, Township 16, South Range 37 East, 16, 37.

A Well, Section 31.

Q Yes.

A Would be here near this number 1 on the map.

Q Now, Doctor, these six wells that you have just located for us on the map, are the only six wells in which you

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have offered any specific data with respect to contamination to the Commission, is that correct?

A Yes.

Q Would you take the pointer and draw a circle not larger than the area, the outermost area of those wells?

A I'm sorry, I don't understand what you want me to do.

Q If you will take the pointer and cover that particular area in southeastern New Mexico in which any of those wells are located.

A Oh.

Q Just encompass the area.

A Well, I think 16 South near Lovington is the farthest north.

Q North.

A And the farthest south is somewhere in 25 South near Jal and --

Q The furtherest easterly well, is the first one. It is located in 18, 34.

A The furtherest westerly you mean.

Q Westerly, excuse me.

A Over here, yes. Okay. It is roughly the southeast quarter of Lea County.

Q Now, that map that you have been referring to with

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the pointer covers Eddy and Lea Counties and the map above it covers Chaves and Roosevelt, does it not?

A There is part of Lea County in the upper map, part, yes, there is part, essentially this is part of Lea County in the upper map also.

Q But there has been no specific evidence of contamination offered in any wells on that northerly map or in any wells westerly on the southern map of the point you located.

A There has none been offered by Mr. Ramey, but I have evidence that there is contamination in other parts of the map.

Q But it hasn't been offered at this time?

A No.

MR. LOSEE: I think that's all.

MR. PORTER: Does anyone else have a question of the witness? You may be excused. The Commission will recognize Mr. Heidel at this time.

(Witness excused)

MR. PORTER: Take the stand at the end of the table, Mr. Heidel.

MR. HEIDEL: Gentlemen of the Commission, I appear here as I mentioned earlier, as an attorney for the City of Lovington, Lea County, New Mexico.

* * * *

PHINAS HEIDEL, first having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HATCH:

Q Would you give your name for the record, please?

A Phinas Heidel of Lovington, New Mexico and I appear here as attorney for the City of Lovington, Lea County, New Mexico and also for the Southeastern Lea County Fee Land Owners' Association which is an association of various land owners in the south part of Lea County.

I appear also on behalf of various individuals and myself, individually and as State Representative of District One, Lea County, New Mexico.

First with reference to the City of Lovington Wells, the City of Lovington about two years ago, floated a bond issue of a million three hundred thousand dollars and bought a farm ranch approximately six miles, five or six miles southeast of Lovington and that is in the vicinity, I believe, of the south Lovington oil field and there were a few irrigation wells located on part of the premises. The City of Lovington, I believe did not purport, or use any of those for Lovington municipal purposes, but the City did drill nine new wells and built a pipeline and a pumping system to pump that

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water to the City of Lovington for municipal supplies.

The nine new wells were drilled, each of them to the red bed or approximately so, averaging about two hundred and forty feet deep and were cased all the way to the bottom and developed from that point. They were developed and each of them were generally capable of a thousand gallons or more per minute. When they were equipped and put on pipeline they were equipped with six inch pumps set for a pumping rate of three hundred gallons per minute and have been on line for oh, say, a year or a year and a half, more or less, and these wells, this water field is located generally, in the area of Section 31, Township 16, South Range 37 East, NM PM, Lea County, New Mexico. There has already been testimony here with reference to Well Number 8 and the Commission, I believe, has already placed into evidence the reports on that Well.

I have also information with reference to Well Number 5 that is pumping more chloride and other solids than are more than desired. Some question has been raised as to what the area, immediate area there of the well might be producing. I might submit for consideration -- now, I believe the February 1966 report on Well Number 8 was in the record, but if not, the chlorides at that time was 84 and then you have a report, I believe of December 15th, 1966 showing chlorides, 480.

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When the City purchased this, or before they purchased these water rights in this area, and developed this field, they tested several wells in the area, one of them called the North Well in the area, it tested chlorides of 32. The south well at the south edge of the area tested chlorides 65 and some of the other wells that the City has in the area, the Booster Station Number 2, chlorides 46 and Well Number 4, chloride 54; Well Number 7, chlorides 43; Well Number 9, chlorides 40; Well number 11, chlorides 41; Well number 12, chlorides 79 and Well number 13, chlorides 85, and so forth. So I bring that to your attention, generally, to show what some of the wells in the area, the content is and then the matter of, particularly Well Number 8 and then Well Number 5. So much for the Lovington Wells.

MR. HAYES: May I ask you when you tested these wells, you didn't give the date, I don't believe. If you did, I missed it.

MR. HEIDEL: I did not give the dates on those various tests. This North Well was September 3, 1964, the South Wells, September 3, 1964, Booster Station Number 2, June 28th, 1966, Well Number 5, there was two tests on it, there was a February 14, 1966 when it showed 36 and then there was another test on it in December of this year that showed a higher content, I will have to locate it here in my notes,

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but going on here, Well Number 4 was October 5, 1966, Well Number 7, October 5, 1966, Well Number 9, October 5, 1966, Well Number 11, October 5, 1966, Well Number 12, October 5, 1966, Well Number 13, October 5, 1966, Well Number 7 I don't know whether I have given that or not, but here is another one that was tested February 14, 1966 and Well Number 9, another report on February 14, 1966.

MR. HAYES: Thank you.

MR. HEIDEL: And if the Commission desires, why these analyses by the State Health Department, will be made available on these additional wells to which I have testified.

Now with reference to other problem areas, first I would like to mention in passing, that the Texas Legislature held a hearing down at Big Springs, Texas, last Fall and there was a newspaper story, El Paso Times Associated Dateline of August 6th, 1966 and that news story showed that the West Texas area had the problem that you are considering today.

This hearing was testimony before the House, Inland Salt Water Pollution Control Commission and appearing there, according to this newspaper story, was G. L. Hamilton, the Kent County Commissioner testified, Aubrey Simpkins, Water Superintendent for Sweetwater testified, Ed Perkins, County Judge at Fisher County testified, Roy D. Payne, Director of Field Operations for the Railroad Commission of Texas,

testified; Gerald Fugit, Akron County Judge testified; Martin Cleveland who as Assistant Manager of the Water District in that area, testified; Hubbard Creek Reservoir, no, excuse me, he is the Texas Municipal Water District and no doubt, many others. But they all generally testified that their areas were being contaminated by oil wells and in particular salt water disposal.

And I have here a clipping from the Oil and Gas Journal of April 10th, 1967. There is a news story that the State of Texas and is headlined "Unlined Brine Tests Banned in Texas" by the Railroad Commission. It won't take effect until January 1, 1969 and while it prohibits the use of unlined pits for storage or evaporation of brines, they will permit some collecting pits, but must be with approved salt water disposal program. Individual exceptions may be obtained for good and sufficient cause, and so forth.

I would call the Commission's attention to some additional wells that I have information upon. I have handed the Commission a letter summarizing this problem and I will condense it as far as I can, that the Marathon Oil Company Well has a water well in the northeast quarter of the northeast quarter of Section 13, Township 22, South Range 36 East, Lea County, that was originally drilled for domestic purposes for a pumper dwelling house, but the house was

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ultimately moved away and I am informed that one of the reasons was that there was not sufficient water for domestic purposes. I am now informed that the well is now flowing and the quality of the water is unfit for human consumption. And on the, attached to my letter as Exhibit B, what I have marked as attached to my letter as Exhibit B, the analysis of the water in that well is shown and for instance, the chloride content is 610, six hundred, ten total dissolved solids, three thousand two hundred.

There are several pit locations in the area, some about a half a mile west, serving four or five producing wells, oil wells producing from about thirty-eight hundred feet and the water from those wells, from that pit is shown on Exhibit C attached to my letter. Also there is another pit located about a half mile south and it is shown on Exhibit D of the letter. So it is rather significant that this water well is now flowing from a shallow formation and I believe this is the well that was testified to earlier today, that there was a rancher using the water from the pit for livestock purposes, but I call your attention that the analysis of this water from this pit shows that it is unfit for human consumption.

Paragraph three of my letter, I call your attention to the McCall Well on Exhibit B. This well is located in the northwest quarter of Township 21, Range 37 East, Lea County,

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at the north edge of Eunice. The analysis on this well shows that the chloride content is seven hundred and ninety and total solids, two thousand six hundred. Another well on Exhibit E is the Barkley Well, no, wait a minute, it is on Exhibit E in the same general area. This, likewise is, I believe, within the townsite and at the north edge of Eunice. The Barkley resident well shows chloride content of one thousand three hundred and fifty, total solids, three thousand seven hundred.

Then on Exhibit F of my letter, the Pilcher Well, John Pilcher residence at 400 Avenue I, Eunice, New Mexico, the chloride content is, by the analysis shown to be two thousand four hundred and twenty-eight, total hardness, two thousand six hundred and eighty. I am also informed, I do not have detailed information, but I am informed that Skelly Oil Company has approximately five domestic wells in the area that are, if a test were run would probably show a similar condition.

I call the Commission's attention that there are many salt pits in the areas of these wells and I would call your attention that there is an oil well located in the southeast quarter of the northeast quarter of Section 27, Township 21, South, Range 37 East, NM PM, which has a faulty bradenhead and the water is draining out onto the surface.

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The quality test of this water is shown as item four on Exhibit G of my letter and it shows that the chloride content is six hundred and three and it shows a total hardness of two seventy, but I think that is in error, but anyway, because it doesn't jive with the chloride content. But I would call your attention to the other two tests shown on Exhibit G, particularly the third item on Exhibit G which concerns a water well in the northwest quarter of the northeast quarter of Section 27, Township 22, South, Range 37 East, Lea County, that there is oil and gas in the water and no reliable test could be made. The McCall Well, I just mentioned, is located very close to the oil well that has the faulty bradenhead.

I would go to item four of my letter. I call the attention of the Commission and ask you to take judicial notice of, that Union Oil Company filed applications No. CP-364 and CP-364-X with the State Engineer on May 23, 1966, to change location of shallow wells by abandoning existing wells and commencing the use of new existing wells in the same section and these new wells were, are already drilled to the depths of, one a hundred and twenty-eight feet, another a hundred and forty feet and for the purpose of continuing the rights of, for creating six hundred and thirty-six acre feet for industrial use located in the Dollarhyde Gasoline

Plant in Andrews, Texas.

My information is that one of the reasons for this application was because the old well had commenced to produce so much salt that the water was not usable in the gasoline plant and it is to be noted there are salt water disposal pits in the area of the old well.

The next item is paragraph five of my letter. I am informed that there is a recently drilled well, perhaps it is two or three years old now, approximately three hundred feet deep, a water well at the Burke Junior High School at Jal, New Mexico, and the water that is now being pumped from that is not potable for human consumption and is being used only for watering grass, but a more disturbing fact is that they are flaring gas from this water well. Item six, the Brock well, it has already been touched upon.

Item 7 doesn't deal with the immediate problem, but I do call attention to the State Engineer since he is here today, that the Windmill Oil Company at the northwest edge of Hobbs has about fifty wells in the process of skimming off oil off of our fresh water depths at about sixty feet, but other wells that I call to the attention of the Commission are in my letter. I call the attention to the Snyder well located in the southeast quarter of the southeast quarter of Section 22, Township 22, South, Range 36 East, NM PM, as shown on Exhibit

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E attached to my letter and it shows that this well, the analysis, chloride thirteen hundred, total solids, three thousand.

The item nine of my letter, as I call your attention to a filling station water well in the northwest quarter of Township 21, South, Range 36 East, NM PM and the Simms Water Well located in the northeast quarter of the southeast quarter of Section 32, Township 21, South, Range 37, East, NM PM. The analysis as shown on Exhibit E of my letter, the Filling Station Well has total chlorides four hundred and fifty-four, total solids seventy-five hundred. The Simms Well has total chlorided of four hundred and fifty-six and a total dissolved solids, two thousand one hundred. On these two wells you will note the date of these reports are shown on the Exhibit. This analysis report is dated April 12th, 1967.

I am informed that out on the Lynum Ranch, five or six miles west of Hobbs, that there are one or more good water wells that have recently become unfit for human consumption and that there are several brine pits nearby. I do not have analysis or detailed information. Other wells that I have just recently received information on, but no analysis, is a well in the southwest quarter of the southwest quarter of Section 34, Township 23, South, Range 36 East, NM PM, that there is complaint on.

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I would also call attention to a problem, I think that perhaps the Oil Conservation Commission might have in its files, if not, I am sure the State Engineer has in his files and that is the KerrMc Potash Wells out south and west of Hobbs. I am not sure of the exact Section number, but I think it was a problem there a year or a year and a half ago, after putting their wells for their pipeline over there to the Potash mine between Hobbs and Carlsbad, that at least one, and perhaps one of the wells became salty and of such salt content, they could not be used in the mining operation.

In the area of Section 2, Township 21, Range 33 East, NM PM, known in the area as part of the DC Berry Ranch, the well at the house supplying, used to supply house water at least, was abandoned in 1957. It became unfit for irrigation, livestock and human consumption. Previously there was a good well there. The analysis of water from that general area and the source shows chloride content of one thousand seven hundred and forty-seven. The new well was located and is being used for domestic purposes and livestock purposes and so forth and it contains 8 parts per million. And I have pictures here of some of the salt water disposal pits in the area. Here is one picture in the northwest quarter of the southeast quarter of the southeast quarter of Section 2, Township 21, South Range 33 East, another one in

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Section 2, Township 21, South, Range 33 East, another one in the southeast quarter of the southeast quarter, Section 2, Township 21, South, Range 33 East, and I might say that is to the amount of water going into these pits in this last one, there is approximately two thousand barrels of water per day going into that one. In the one before that there is four hundred and fifty barrels and that pit is only a quarter of a mile away from the present Berry Supply Well. In the first pit I mentioned, it is now receiving approximately twelve hundred barrels per day, however, it may be greater today. They think they put on some new pumps recently. There is another pit in the southeast quarter of the northwest quarter, Section 35, Township 20, Range 34 East, that is producing eight hundred barrels--that is, there is eight hundred barrels per day going into that pit, so I think that there is a real contamination problem there and these pictures I would offer to the Commission for whatever use they might like to make of them.

Leaving the--well before leaving that area, I have some letters here from land owners. Here is a letter signed by Clyde N. Cooper that calls attention to the southwest quarter of Section 1, Township 25, South, Range 37 East. This talks about the Union Oil Company of California, the two wells that became salty in 1966 and which they had to abandon.

On this Section and on Section 2, joining Section 1 on the West, there is a number of large salt water disposal pits and another letter from the same gentleman, on the southeast quarter of Section 28, Township 25, South, Range 37 East, we have a water well making considerable amount of gas. On this quarter section there are two old Queen Sand Wells which have been shut in for at least fifteen years and one deeper well which is still producing.

A letter from Fred D. Cooper, "In the fall of 1947, I bought the Madge Humphry's Ranch, south and west of Jal, New Mexico. Ralph Lowe was drilling their Lynley No. 2 in the center of the southeast quarter of the northeast quarter of Section 23, Township 25, South, Range 36 East. It was plugged as dry, but the driller told me that there was lots of water at about fifty-five feet. I soon drilled and found it as he said and although I knew the water was not entirely fresh, I set a windmill and watered my cattle. A year or so later, some pits three-quarters of a mile northeast of there belonging to the City Service dried up and so did my well."

Another letter from the same gentleman, "There is some thirty to forty acres in the southwest quarter of Section 14, Township 24, South, Range 36 East, that Continental Oil Company has destroyed the salt water pits piece by piece. This land will possibly never be reclaimed

and certainly not in my lifetime."

Now to move on to another area, to the north end of Lea County and the south edge of Roosevelt County, I have three color slides here of pictures, one relates to the Ingram State Number One, Section 32, Township 8, South, Range 38 East submitted by Mr. W. E. Bilbrey -- M. E. Bilbrey, I guess it is. And another one, Ingram State 1, Section 32, Township 8, South, Range 38 East, submitted by the same gentleman. And another one, the Ingram Number One State, Section 32, Township 8, South, Range 38 East, submitted by the same gentleman. These pictures show some of the operations up there. Mention was made earlier about the new oil field west of Tatum which I believe, is at the North Bagley, I pointed to there on the map, that in the operations there, there is instances of perhaps, of the water not staying in the pits and there is also instances of shooting the pits so the water would drain more freely, and that was called to the attention of the Oil Conservation Commission Office in Hobbs and part of the other problems there, and I believe, Mr. Clemons, of the Hobbs office made a field inspection and found that, and I will leave this up to the records of the Commission, found that perhaps there was a minimization of the problem. In other words, records showing that wells were producing, say a hundred barrels per day when in fact they were producing a

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great deal more than that. In other words, apparently an effort to show that there is no real problem in that area, so I think the Commission is well-versed in that problem. I believe that completes my initial presentation. I will try to answer any questions.

MR. HATCH: Do you have all of those exhibits marked?

A They are marked and attached to my letter except these pictures which I have just handed over to the Commission.

MR. PORTER: It is your desire to offer these exhibits into the record, Mr. Heidel?

MR. HEIDEL: I do.

MR. PORTER: Is there any objection to the admission of Mr. Heidel's exhibits? They will be admitted.

(Whereupon Phinas Heidel's Exhibits were admitted to evidence)

MR. PORTER: Is there any questions of Mr. Heidel? I never thought engineers would overlook an opportunity to cross examine a lawyer. He may be excused.

MR. HEIDEL: Thank you, Commissioner.

(Witness excused)

MR. PORTER: Does anyone else desire to present testimony? Mr. Kellahin?

MR. KELLAHIN: Jason Kellahin, appearing for Standard

Oil Company of Texas. We have one witness I would like to have sworn at this time.

(Witness sworn)

D. C. HELM, called as a witness, first having been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A D. C. Helm.

Q By whom are you employed and in what position, Mr. Helm?

A I am Production Foreman for Standard Oil Company of Texas Division of Chevron Oil Company.

Q And where are you located?

A Here, in Hobbs.

Q Do you have anything to do with the production of oil and the disposal of produced brines in the southeastern New Mexico, the four Counties covered by this hearing?

A Yes, sir.

Q Have you prepared an exhibit, Mr. Helm, that shows the disposition that is being made of water produced by Standard Oil Company of Texas?

A Yes, sir, I have.

Q Would you have that marked as Standard's Exhibit

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Number One, please?

A It has been so marked, yes, sir.

Q Now, referring to what has been marked as Exhibit Number One, on the original exhibit there was one pool omitted, is that correct?

A Yes, sir, there was. It produced so little oil and so much water, that we overlooked it.

Q Now, going through the exhibit of the pools in which you are operating, what disposition is being made of the water?

A Well, generally, this exhibit gives a tabulation of this, sir, and we are producing at this time, from a total of one hundred and thirty-five wells that Standard operates here in Lea and Eddy Counties, a total of about fifty-eight hundred barrels of water a day and at the present time all but about eight-tenths of one percent of that is being put into some type of disposal system. We are presently pitting about forty-five barrels of water a day from these total eleven fields that we operate.

Q Now, the exhibit shows as to the Bagley field, you are disposing of all of that water by sub-surface disposition, is that correct?

A Yes, sir. Basically, we have one lease that has not as yet been connected to the vacuum salt water disposal system,

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but it should be this week.

Q So that will cover all of your wells in the vacuum?

A Yes, sir.

Q Now, as to the surface disposal, would you outline which pools are affected by that?

A Yes, sir. We basically have two pools which we are not disposing of water through an underground system or have some plans to do so and that would be the Scarbones Springs Field in Lea County where we produce approximately eleven to fifteen barrels of oil a day and about thirty-seven barrels of water and that is pitted and in the State Line Ellenberger Field in Lea County, where we have three wells, we are producing approximately eight barrels of water a day from those three wells that is pitted.

Q Now, you are producing water in the Maljamar that is not being disposed of?

A We are, at this time, the Maljamar Field is under a secondary recovery project and we are using approximately ninety percent of the produced water for reinjection purposes and we do have plans to use a hundred percent of the produced water for reinjection purposes.

Q That will be in the very near future?

A Yes, sir, within the next ninety days.

Q Now, as to the Scarbones Springs Pool, what

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disposition do you propose to make of that water?

A Well, if the Commission enters an order as they are considering, we would explore the possibility of a cooperative disposal system as has been installed in other areas or look at an individual disposal system using the well that we have. If, in fact, it appears that this produced water would furnish a possible source of contamination.

Q Now, have you had any experience with entering into cooperative disposal systems?

A Yes, sir.

Q Does it take a little time to work those out, Mr. Helm?

A It certainly does.

Q On the basis of your experience, would you make any recommendations to this Commission as to the effective date of any no-pit order?

A Well, my opinion and our opinion, would be that any no-pit order should grant completely sufficient time to allow for the formation of these things. We would look on something in the order of six months or eight months delay to be something reasonable.

Q Now, as to your State Line Ellenberger Pool, you are producing approximately eight barrels of water a day. What do you propose to do as to that pool?

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A We would like to see some means provided should the Commission take the action that it is proposing here for the exception to be granted in instances where investigations showed the amount of water produced or the location of where it is produced, would not bring a great amount of potential damage on any fresh water that might be developed, to allow us means for exception in this, some reasonable means for exception in these types of instances.

Q Would you propose an administrative procedure for granting exceptions?

A We definitely would, yes, sir.

Q How would you propose to give notice to those parties who might be affected by the disposal of brines in open pits?

Q Our viewpoint would be that, say, newspaper notice might possibly be satisfactory and provide the means necessary to inform all those concerned under some type of provisions as set up by the appropriate authority or some other type of public notice that might be deemed better.

Q Then, in the event of an objection, you would propose to have a hearing on the application, is that correct?

A Yes, sir.

Q Was Exhibit Number One prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time, I would like to offer in evidence, Exhibit Number One.

MR. PORTER: If there are no objections, the Exhibit will be admitted. Does anyone have any questions of the witness?

CROSS EXAMINATION

BY MR. PORTER:

Q As I understand, you would recommend some means of administrative exception in case the Commission should enter a no-pit order and that instead of limited notices as we have for other administrative procedures, that you would recommend that the matter be advertised and that a time limit be put on it for objections?

A Yes, sir, this is our viewpoint. It would be rather hard to determine, we feel, initially, who all the interested parties might be and it is our feeling that public notice, perhaps in a newspaper, would provide this without the chance of overlooking an interested party and that at some reasonable time after such notice has been posted, that the Commission could take

such action as deemed appropriate.

MR. PORTER: Does anyone else have a question?
The witness may be excused.

THE WITNESS: Thank you, sir.

(Witness excused.)

MR. KELLAHIN: That's all we have, Mr. Porter.
Thank you.

MR. PORTER: Does anyone else desire to
present testimony? Mr. Losee?

MR. LOSEE: If the Commission please, I have
one witness to be sworn.

* * * * *

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

DIRECT EXAMINATION

BY MR. LOSEE:

- Q Would you state your name and residence, please?
- A I am Raymond Lamb from Artesia, New Mexico.
- Q What is your occupation?
- A I am a Geological Engineer.
- Q And employed by what company?
- A By Wilson Oil Company of Santa Fe.
- Q Are you an officer of that Company?

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A Yes, sir, Vice President of Production and Engineering.

Q Have you previously testified before this Commission as a Geological Engineer?

A I have, yes.

MR. LOSEE: Are Mr. Lamb's qualifications acceptable?

MR. PORTER: They are.

Q (By Mr. Losee) Mr. Lamb, did this Commission appoint you in 1958 to any water study committee?

A Yes, I was appointed Chairman of the Wilson Pool Water Study Committee.

Q Now, would you locate the Wilson Pool area on the map directly behind you?

A This area here, immediately across the Township line of 21, 34 and 21, 35.

Q Is Wilson Oil Company one of the producers of oil within that pool?

A At the present time, we are the only producer.

Q From what formation does the pool produce?

A The major part of oil production is from the Seven Rivers Reef.

Q What force drives the oil in this pool?

A Very active water drive.

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Q During the period that you have been chairman of this water study committee, have you maintained any records with respect to the quality of produced water and of the water wells in the area?

A Yes, I have.

Q Do you have before you the figures on the amount of produced water from your wells in this Wilson Field for the period from 1957 down to date?

A Yes, I have.

Q What is the total amount of water that has been produced in this Field?

A The total amount or accumulative amount of water is fifteen million, one hundred and seventy thousand, nine hundred and twenty-three barrels through January 1st, 1967.

Q All right. What was the greatest amount of water produced in any one year?

A We produced one million, two hundred and eighty-one thousand, seven hundred and eighty-three barrels in 1958.

Q All right, what is the least amount of water produced in any one year?

A The least amount was in 1965, however, it was a close race with 1966 at four hundred and thirty-eight

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thousand, six hundred barrels.

Q Now, the water production is evidently falling off, is that also true of the oil?

A That's right.

Q What is the remaining life, if you have an opinion on the subject, of the Wilson Pool?

A Approximately three years.

Q Now, would that be with the present rates or would there be any change in rates of oil production?

A Well, there will be a decreasing rate in oil production.

Q Would the same thing be true of water production?

A Yes.

Q Have you caused the produced water to be analyzed as to its chloride content?

A Yes, I have, a number of times.

Q You have the high and low chloride content being produced with the oil in that Field?

A The high chloride content is 2240 with hydrogen sulphide at 650 and, that is the low. The high is 4280 with three hundred and thirty hydrogen sulphide.

Q Those are parts per million?

A Yes, that's right.

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Q Have you, during this period from 1956 down to date, had any analysis made of any water wells in the area?

A Yes, we are the sole producer of fresh water in this area with the exception of a few windmills that belong to the rancher.

Q Please refer to the windmill that belongs to the rancher in Section 30, Township 21 South, Range 35 East, and give the chloride content of that well in '56 and then again in '67, if you have those figures.

A The chloride content in 1956 was ninety-three with a .0096 hydrogen sulphide. In 1967, it was one hundred and fifty chloride and no hydrogen sulphide.

Q Please refer to one of Wilson's water wells located in Section 13 of the same township and range and give the chloride content for that well in '56 and then again in '67.

A In 1956, it was 91.6 with no hydrogen sulphide and a hundred and fifty in 1967 with still no hydrogen sulphide.

Q Refer again to Wilson's water well in Section 6, Township 21 South, Range 35 East and give the chloride contents for the well for 1956 and the present 1967?

A In Section 7, it is 24.8 in 1956 and one

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hundred in 1967.

Q Now, were these analyses, how did you determine the chloride content of these wells?

A These were a chemical analyses by Laboratory Service Company.

Q Now, are these water wells still within Dr. Spiegel's range for human consumption after eleven years and placing over fifteen million barrels of produced water on the ground?

A Well within the range that he specified in his testimony this morning.

Q Do your field employees drink any of the water from these wells?

A This is the sole source of water for our camp which includes four houses and an office, and so forth.

MR. LOSEE: I think that's all.

MR. PORTER: Does anyone have a question of Mr. Lamb?

CROSS EXAMINATION

BY MR. COOPER:

Q Can he give us the chemical analysis of the water he produces?

A Of the water we produce with the oil, you

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want detailed?

Q Yes.

A Or do you want the chlorides or the solids?

MR. PORTER: The question was, can you give us chemical analysis of the water you produce, I assume with the oil?

A Well it may have preface what I am going to give you with the statement that in the various zones of the Seven Rivers Reef there is a wide range of percentages and solids. As a matter of fact, some of the upper reef zones will contribute fresh water usable in a house, other parts of the particular horizon will go on up to six thousand parts per million, but our normal amount that we use, the maximum is thirty-one thousand chloride -- thirty-one hundred chlorides against forty-two hundred chlorides. This is a random figure and you should know that because the chemical analysis of the water in the Seven Rivers Reef is not uniform by any means.

Q That has all been pitted?

A I beg your pardon?

Q Has this water all been pitted?

A Yes, it has.

Q Open pits?

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A Yes, that's right.

MR. PORTER: For the record here, the questioner in this case was Mr. Cooper.

MR. HEIDEL: Mr. Porter?

MR. PORTER: Mr. Heidel?

MR. HEIDEL: I have a question.

CROSS EXAMINATION

BY MR. HEIDEL:

Q How deep are your wells that you just testified as being fresh water wells, at what depth are these producing?

A For the water wells?

Q Yes.

A It will run anywhere from two hundred sixty feet to four hundred and eighty feet and down to a thousand feet.

Q In other words, they are not what we call Ogallala wells on top of the red bed?

A No, we are out of the area of the Ogallala formation.

MR. PORTER: Does anyone else have a question of Mr. Lamb? He may be excused.

(Witness excused)

MR. PORTER: Does anyone else desire to put

on a witness, put on testimony? Before we have statements, we are going to take a ten minute break.

(Whereupon, a short recess was taken.)

MR. PORTER: If no one else desires to present testimony at this time, the Commission will recall Mr. Ramey.

* * * * *

JOE RAMEY, recalled as a witness on behalf of the New Mexico Oil Conservation Commission, having previously been sworn, was examined and testified as follows:

DIRECT EXAMINATION
(Continued)

BY MR. HATCH:

Q Mr. Ramey, you have already testified in this case before?

A Yes, sir.

Q You are still under oath?

A Yes, sir.

Q Do you have any statements that you would like to make at this time?

A Yes, sir, I do have. The staff made this recommendation that the Commission write an order prohibiting the disposal of oil field brines in open surface pits in the southeast producing area.

Now, in line with this, we have worked up

proposed rules which are labeled "Special Rules and Regulations Governing Produced Oil Field Waters in Lea, Chaves, Roosevelt and Eddy Counties, New Mexico" and this is marked Exhibit Thirteen.

Q These are just proposals by some members of the staff?

A Yes, sir. This is staff proposals.

Q Would you go through that exhibit, please, thirteen, and explain it to the Commission?

A Yes, sir. Under Section A, the disposal of water produced in conjunction with the production of oil or gas or both, on the surface of the ground or in any pit, pond, lake, depression, draw, stream bed or arroyo or in any other manner which will constitute a hazard to any fresh water supply, is prohibited. Now, in line with this recommendation or in line with this order should the Commission write it, it would be our recommendation that the effective date be January 1, 1969. This would be for the area-wide disposal.

Now, it is further recommended that an effective date of July 1, 1967 be specified for the North Bagley Lower Penn, the North Bagley Middle Penn, the North Bagley Upper Penn and the North Bagley Wolfcamp and the Northeast Bagley Wolfcamp Pool. Further, in

waterflood projects, the areas known only as waterflood projects, it is recommended that the effective date be January 1, 1968.

MR. PORTER: Only in waterflood areas?

THE WITNESS: Yes, sir. Now, the staff has also worked up for us some exceptions which we are offering at this time to the Commission, under Section B, exceptions to the foregoing prohibition to permit surface disposal of water, may be considered by the Secretary-Director of the Commission provided:

ONE: Water to be disposed of is potable water and contains less than one thousand parts per million, total dissolved solids. I think that portion is self-explanatory.

TWO: Water to be disposed of contains more than one thousand parts per million, total dissolved solids, but contains less parts per million total dissolved solids than the shallow water occurring naturally within a radius of three miles to the proposed disposal site as evidenced by the analysis of the water produced by all water wells three hundred feet deep or less within such three mile radius.

THREE: Water to be disposed of contains more than one thousand parts per million, total dissolved

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solids and there are no shallow fresh water wells, three hundred feet deep or less within the three mile radius of the proposed disposal site, or

FOUR: Water to be disposed of constitutes a total of not more than one barrel per day for the forty-acre tract being served by the proposed disposal site, but in no event shall exceed sixteen barrels per day.

FIVE: Water to be disposed of by evaporation of a surface pit of approved design which is equipped with an impervious lining and which provides adequate protection against overflow and accidental or intentional leakage or spilling.

Q Those would be the five recommendations for administrative approval?

A Yes, sir.

Q Are those only the methods of applying?

A These would be the grounds for applying. Now, the method of applying, I will cover later.

Q All right. But, the Commission would not be bound by these determinations?

A No, sir.

Q Would you go on to the next part?

A In Section C, to obtain an exception to the

Rule A of these Rules, an operator shall first determine the section of Rule B under which he desires to qualify and shall then file two copies of an application with the Santa Fe office of the Commission and one copy with the appropriate district office of the Commission and each copy of the application shall be accompanied by the items specified. To qualify under Section One, Rule B, the application shall be accompanied by Item B 1.

Q Mr. Ramey, I think you can skip that part, now and go on to part D, the attachments to the application.

A All right. Part D, attachments to application. One, a complete analysis of a representative sample of the produced water to be disposed of. The sample to be taken by, and the analysis conducted by a governmental agency or a recognized independent water analysis laboratory. The analysis shall show total dissolved solids and shall include, but not be limited to, parts per million sodium, calcium, magnesium, chloride, sulphate and bicarbonates.

Q All right, now, those are attachments that will be required under, if you were applying under Section One of Rule B, would that be all that would be required for that?

A Yes, sir, as I understand.

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Q All right. Now, to qualify under Section Two of Rule B, application shall be accompanied by items D1, D2, D4 and D6. Would you explain what each of those provides for?

A Of course --

Q Section Two is the water to be disposed of contains more than a thousand parts per million?

A Yes, right. That shall be accompanied by items D1, D2, D4 and D6. Now D1, I just covered. D2 is as follows: The complete analysis of a representative sample of water currently produced by every producing water well, with a depth of three hundred feet or less located within a three mile radius of the proposed disposal site. Water samples shall be taken by and an analyzed analysis conducted by a governmental agency or a recognized independent water analysis laboratory. Analysis shall show total dissolved solids and shall include, but not be limited to parts per million of sodium, calcium, magnesium, chloride, sulphate and bicarbonates. In the event a sample of water of any well within three miles of the proposed disposal site could not be obtained for analysis, the applicant shall state the reason why and describe the efforts made to obtain such samples. That covers Section D2 for administrative exception to Section 2.

Q It would also require D4?

A It would also require D4 which is a plat showing the lease on which the proposed disposal site is located indicated there on the disposal site and showing the location, depth and ownership of all producing water wells within a three mile radius of the site.

Q All right. Then D6?

A D6, a publisher's affidavit of publication establishing that notice of intention to apply for authority to use the proposed disposal facilities has been given one, to the newspaper of general circulation published at Santa Fe, New Mexico, and one in a newspaper of general circulation published in the County or in each of the Counties, if there be more than one wherein lie lands within three miles of the proposed disposal site. The notice shall advise all concerned of the quantity and quality of the water to be disposed of and shall specify under which section of Rule B, the applicant intends to qualify. Guide forms for assistance in preparation of the notice may be obtained from the Santa Fe office of the Commission.

Q Mr. Ramey, Item 2, I mean Section 2 requires four attachments while the first, Section 1, only required one. What is the difference here?

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A Well, in the first place we are talking about potable water in Item 1 which would probably not contaminate any fresh water supplies so there would be no hazard to any underlying fresh water supplies. Item 2 allows you to put non-potable water into pits wherein there is non-potable water or else water of worse quality than what you are disposing of underlying the disposal site, so it is necessary to furnish additional information in this case.

Q To qualify under Section 3, application shall be accompanied by Item D1, D4 and D6 and you have already read those?

A Yes, sir.

Q And they would be the same as the third one. To qualify under Section 4 of Rule B, it says "Application shall be accompanied by Item D3." Have you read D3?

A No, sir, I haven't read it. I will read it.

Q Would you read that now?

A Yes, sir. Of course, D3 covers the portion of the proposed exception where water to be disposed of contains more than three -- more than a thousand parts per million total dissolved solids and there are no shallow fresh water wells within a three mile radius, so Section D3 is the plat of the lease which will be

served by disposal facility indicating where the proposed disposal site is located and showing the name and number of each producing well in the formations from which it is producing and the latest oil and gas and water production tests.

Q All right, to qualify under Section 5 of Rule D, application shall be accompanied by and it is D3 and D5. You have already read all of those, I think, except D5, haven't you?

A That is correct and D5 states that, of course, to go back to Item 5, this is water to be disposed of into a lime pit for evaporation purposes and D5, a drawing shall include -- a drawing including plan and cross section of the proposed disposal facility together with a complete description of the construction method proposed and including specifications of materials to be used. Description shall also be given of the methods proposed to insure against overflow and leakage.

Q Mr. Ramey, going back to Number 4 of the exceptions, do you think it would be necessary to set up any sort of metering device?

A Yes, sir, I would think so. I would think that the water going into the pits should be metered in this case.

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Q To insure that no more than one barrel per day --

A Yes, sir.

Q I think we have covered all of those points. Will you go on to page 5?

A Page 5 under E. Upon receipt of the application with required attachments, the Secretary-Director may consider immediate approval of the exceptions under Sections 1, 4 and 5 of Rule B. He may consider approval of exceptions under Sections 2 and 3 of Rule B only if no objection has been received within fifteen days after date of application of the notice of intention. In the event objection is received the Secretary-Director shall notify the applicant of such facts and shall set the matter for public hearing if the applicant so desires.

Under F, exception to Rule A of these Rules shall be granted based on conditions existent at the time of approval of the exception. Any change of conditions brought to the attention of the Secretary-Director which in his opinion justifies suspension of the exception, shall result in such suspension pending notice and hearing of the matter and entry of an order.

Q Do you have anything else you want to add to your testimony?

A No, sir, not at this time.

Q Was Exhibit 13 prepared by you?

A It was prepared by the staff.

MR. HATCH: I would like to move the introduction of Exhibit 13 into evidence at this time.

MR. PORTER: Exhibit 13 being the proposed rules?

THE WITNESS: Yes, sir.

MR. HATCH: Yes, sir.

MR. PORTER: If there are no objections, the Exhibit will be admitted.

(Whereupon Oil Conservation Commission's Exhibit 13 was admitted into evidence.)

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Ramey, I'm a little confused on your recommendations for deadlines. I notice you have recommended the deadline in the Bagley, the general area of the North Bagley and so forth, as July 1, 1967. Does that mean that there would be a, your recommended deadline would apply to all other areas, January 1, 1969?

A Yes, sir, with the exception of waterflood areas wherein the, I feel they should pick up their produced water and reinject it by January 1, 1968.

Q So you have recommended three dates, one being

January 1, 1968 for salt water produced in waterflood?

A Yes, sir.

MR. PORTER: Does anyone have a question of the witness?

THE WITNESS: I might clarify this North Bagley. Now as I testified earlier, we did have a meeting and I would have requested a hearing before the Commission had not this hearing been on the agenda for this area exclusively. I think the operators in that pool had ample warning back in February.

Q (By Mr. Porter) In other words, if this hearing had not been pending, there probably would have been a special hearing?

A Yes, sir, that would have been our recommendation to the Commission.

MR. PORTER: Mr. Gray, would you come forward and use the microphone, please?

MR. GRAY: Mr. Porter, I was just going to ask Mr. Ramey, to repeat one of the exceptions.

MR. PORTER: Which one is it, Mr. Gray?

MR. GRAY: Number 4.

MR. PORTER: Would you repeat Number 4, Mr. Ramey?

THE WITNESS: Number 4: Water to be disposed of constitutes a total of not more than one barrel

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per day per forty-acre tract being served by the proposed disposal site, but in no event shall exceed sixteen barrels per day, perhaps I should add, per section, so the intent of this is that this is not one barrel per well, it is one barrel per forty-acre tract and if an operator has a lease that is fully developed and contains three hundred and twenty acres, he would in this case get eight barrels a day into a pit. If his lease covered a whole section, he would get sixteen barrels a day.

Q (By Mr. Porter) Now would that apply to any area in the four counties that we have been discussing?

A Yes, sir.

MR. PORTER: Mr. Anderson?

MR. ANDERSON: Mr. Porter, I have a formal closing statement but I would like to make a comment at this time. This is the first time -- I am R. M. Anderson of Sinclair Oil and Gas Company. This is the first time that I have heard the proposals of the Commission Staff in Hobbs and I can see right quick that this is a rather complicated, intricate situation. I believe that a matter of this nature might lend itself better to a better solution if it were placed in the hands of an industry committee appointed by the Commission with

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Commission members serving on the committee, and possibly somebody from the State Engineer's Office serving on the committee in much the same manner as we worked on the deviation rule and on the co-mingling manual and I would like to suggest that you consider that as a more satisfactory way to handle this problem. I prepared Sinclair's position in this matter, but I am not prepared to analyze a complicated proposal such as I have just heard.

MR. PORTER: Mr. Anderson, you will be given an opportunity to state the position of your company later. Does anyone else have a question? Will you come forward please?

MR. MORGAN: Mr. Porter, the exception Mr. Ramey discussed is, I believe, is exception Number 4. Would that apply to any previous orders issued by the Commission such as the Vacuum Pool order?

THE WITNESS: If the Commission would see fit, why it would.

MR. MORGAN: Thank you.

THE WITNESS: However, I would say that the facility is already under disposal and there would be no reason to take it out of the disposal system and put it back into the pit.

MR. PORTER: Will each questioner please identify himself as he comes to the microphone.

CROSS EXAMINATION

BY MR. BLUM:

Q My name is Paul Blum and I am an attorney for State Engineer's Office. I would like to ask you to refer to B3 on page 2 of your recommended special rules and regulations.

A Yes, sir, I have that before me.

Q I would like for you to tell us if you can, the general extent of the area in these four counties where fresh water, the water level of the fresh water is more than three hundred feet deep.

A I think you're asking me a question that Dr. Spiegel could probably answer. I will give an answer and qualify it. It may not be correct, but where water will be more than three hundred feet deep?

Q Yes, where the water level is more than three hundred feet deep.

A We're not talking about the water level being three hundred feet deep, we are talking about the depth of the well, fresh water wells.

Q All right, where will it be more -- what percentage of this area or how much of this area where

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the wells will be more than three hundred feet deep?

A The Indian Hills or the Indian Basin, that is kind of a -- well it is a hard question, frankly, for me to answer because I don't have all of the information on water. I think Dr. Spiegel testified that fresh water can be found just about anywhere in this area, but I think his terminology of fresh water went down to and probably, including the formation directly above the salt section, but there are some areas in the southeast producing area where there are no wells and possibly no water at a depth of three hundred feet.

Q Well, how did you reach the figure of three hundred feet?

A This is what we termed, probably the overall depth of the red bed.

MR. BLUM: Thank you.

MR. PORTER: Does anyone else have a question of the witness? The witness may be excused.

(Witness excused.)

MR. PORTER: We will now hear statements from any interested party. Mr. Loe, would you come forward to the microphone?

MR. LOE: Mr. Hays, Mr. Porter, I am Jim Loe, Amerada Petroleum Corporation, Vice President and

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General Production Superintendent. I would like for you to bear with me for just a minute or two here while I reminisce, if you will. Amerada and I came to Hobbs thirty-seven years ago and have been intimately associated with the growth of the oil industry in this State since that time. I am particularly pleased to be here today and appear before this Commission in support of the regulations that are being discussed. I think we will find here that a majority of the oil industry will favor reasonable regulations that will serve to eliminate future contamination of our water supply.

To an outsider not familiar with the history of the oil and gas industry of New Mexico, this might seem strange, but to me it is simply a continuation of the cooperation between the industry and this Commission that has been going on over the years and safeguarding New Mexico's natural resources.

We have grown up together, much has happened since Amerada and I came here thirty-seven years ago. The quality of living, of course, has improved tremendously and in a large measure, oil is responsible. New Mexico's crude production in 1930 wasn't quite thirty thousand barrels a day. Today, it is ten times that amount and has a value of over a third of a billion dollars a year

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and you know what that means to the State and its people. The oil industry has a good record of helping New Mexico in its efforts to conserve its resources. Within a few months after the Humble Bowers Number One was drilled in Hobbs, the operators in the Hobbs field band together and set up an organization known as the Lea County Operators' Committee to enable them to develop the Hobbs field in an orderly manner. This was done on a voluntary basis as no statutes then existed whereby the industry could be regulated.

Early in the life of the field when it became evident that flaring gas on top of the structure was wasteful, the operators by mutual agreement, imposed a restriction on this waste. Later the Lea County Operators' Committee assisted in the promulgation of a set of rules and regulations that are today among the most progressive and efficient in the country. Meanwhile, other things have changed. New Mexico's population has more than doubled since 1930. It's use of fresh water from underground sources has more than tripled, clearly then fresh water, along with oil and gas is vital to New Mexico's future and we all have a stake in that future. Emphasizing Amerada's stake in that future, our permanent work force in the State has grown from, oh, a handful in

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1930 to well over a hundred today. Our children go to New Mexico schools, we drive on New Mexico's streets and highways, we drink New Mexico water, in fact, we are New Mexicans. What has the industry done to protect this water. It wasn't until 1961 that jurisdiction of any state agency was clearly established over oil field pollution. Nevertheless, five years earlier, the industry and this Commission cooperated to prevent what might have been a serious pollution problem in certain Lea County oil fields.

Many of you recall that first industry meeting here in Hobbs, August 1956 and field by field studies that followed. The result was construction of underground disposal facilities in critical areas such as Hobbs, Monument, Bagley and the East Caprock and many more, and at a cost of several million dollars. I am happy to say that Amerada played a major role in this effort, in fact, even earlier, and we were not the only ones, Amerada was disposing of water underground.

I would like to illustrate that the cost of salt water disposal is quite significant. Amerada produces nearly seven percent of the oil in Lea County. Unfortunately, we don't have any in the other three counties under consideration here today. I assume that

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we produce about the same amount of water percentage-wise as all of the water that is produced. At any rate, we do dispose of nearly nine million barrels of water a year underground and at a cost of about a hundred and sixty thousand dollars annually and have a capital investment of well over a million dollars in those facilities. Now, if you multiply that by, we will say fifteen, why that will be a sizeable, and I don't know if those are the figures, I am just assuming that the percentage might hold true. And in addition to disposing of salt water as waste, a lot more is used under secondary recovery projects and these are being expanded, of course.

The problem the industry faced in 1956, was relieved, but not permanently solved for since then the amount of salt water produced from the oil in the four county area, has nearly tripled. We think it is time to consider additional measures and we think the adoption of a no-pit order for the four county area is a practical answer. If the Commission should adopt such an order, we propose that it incorporate the following points. The order should exempt: (A) mud pits or reserve pits used in drilling, de-contesting, re-working and so forth; (B) Emergency pits that are used to collect pollutants

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in case of breakdown or mechanical failure; (C) Burn pits used solely for the purpose of burning waste, oil or other inflammable materials. The order should exempt existing pits. I have not put a timetable on this as Mr. Ramey did, but other than the fact, I would not care to comment on the North Bagley, I have no information. The other timetables seemed logical, but this, some time needs to be allowed for the operator to work out economical means of disposing of water and as far as possible, prevent premature abandonment of the marginal well.

The order should provide a method of obtaining an exception for unlined pits in areas where such pits would not be a pollution hazard. This to be done only after notice and hearing, administrative examiner hearing.

With these points considered, we support the proposed no-pit order and that is without here endorsing any of Mr. Ramey's suggestions in that I feel we should all have a little more time to study those, but we do endorse the idea as another cooperative step in the conservation of New Mexico's resources.

Thank you.

MR. PORTER: Mr. Kastler.

MR. KASTLER: Bill Kastler with Gulf Oil Corporation. Gulf recognizes the need for sub-surface

disposal of oil field brine in some cases and is anxious to cooperate in any way reasonable with the efforts to eliminate any pollution of fresh water. In connection herewith, we make the following recommendations: 1. Any order by the Commission should provide for exceptions on a reasonable basis to provide for the use of lined pits where water production is small. Also, if no potable water exists near an operation, an ordinary pit ought to be regarded as a reasonable protection.

Finally, we believe that there are many cases where it is necessary to run water into pits due to an emergency and in these cases, the use of pits for a period up to one hundred and eighty days ought to be provided for by administrative order.

2. In the event a blanket order should be adopted Gulf suggests that in absence of finding that an emergency exists after notice and hearing in areas within the blanketed zone, the Commission should provide a period of up to three years from July 1, 1967 in which all operators may comply. The reason for this is that the cost of total compliance is expected to be extremely high and this time would be utilized for planning, obtaining the necessary budgeted funds and completing the work without impairing ordinary operations.

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3. Finally, Gulf believes that a sufficient public benefit in prevention of waste and protection of natural resources is obtained by underground disposal of waste water to warrant legislation which would permit operators either individually or through units or through disposal systems to condemn private lands in order to obtain rights-of-way and easements for disposal lines and wells.

In line with this, we suggest that such legislation should be obtained before any no-pit order becomes absolutely effective.

Thank you.

MR. PORTER: Anyone else? Mr. Yates, would you come forward?

MR. YATES: I think, in many respects I agree with Gulf's position; however, I would like to add this. The testimony here reveals a possibility of pollution from open pits overlying the Ogallala formation. Now the testimony given here today supports pollution of any other aquifer in any other portion of this four county area. It is our belief that to apply a blanket order to the entire area is not warranted by the evidence. It would be prohibitively expensive in many cases and work undue hardships on the operators.

Thank you.

MR. PORTER: Would you come forward, please?

MR. HOLLOWAY: I am W. D. Holloway from Texas Pacific Oil Company and we would like to simply reiterate the statements made previously here in regard to our position regarding the general elimination of pits in the southeast New Mexico area, and specifically, I would like to state Texas Pacific's position in regard to a specifically cited area. Texas Pacific, an operator in the counties previously cited in southeast New Mexico and in the specifically cited North Bagley Pool in cooperation with the Oil Conservation Commission and with operators in the North Bagley Pool area has conducted a study of salt water disposal in the North Bagley area. This study concludes that disposal of produced water from wells in the system owned and operated independently by a single operator, will be virtually prohibitive from the standpoint of cost to the operator, thus a jointly owned system is apparently the most practical means of accomplishing salt water disposal to pursue elimination of unlined surface pits in the area. Operators in the area have, in general, reached this same conclusion and have indicated their desire to jointly pursue negotiation of participation in such a system as rapidly as economically

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feasible in the interest of protection of fresh water resources and hydrocarbon resources in that area.

Texas Pacific believes that it will require a minimum of six months and probably up to a year to negotiate participation, develop all of the detailed aspects of such a joint system and to physically install a system for operation in the North Bagley Pool. It is therefore respectfully requested that this minimum period from the date of issuance of a formal order be allowed the operator in the North Bagley Pool to eliminate the open unlined pit disposal in that area.

Current development activity precludes precise assessment of ultimate disposal system designed requirements. Continued oil resources development activity is expected in this area. This and the reasons stated above is the basis for the minimum time request. The Commission's favorable action in this regard will provide the operators at least minimum reasonable time in which to adequately plan a workable system and at the same time permit each operator in that area to continue to protect the interests of royalty and mineral owners as well as the invested capital that each operator has contributed to the development of this area in the rest of southeast New Mexico.

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Thank you.

MR. PORTER: Mr. Girand?

MR. GIRAND: If the Commission please, I am W. D. Girand. I am here on behalf of Metex Supply Company and several individuals. It is our suggestion to the Commission that any no-pit order be entered as by pool rather than as to the large area covered by the entire four counties. In looking at the exhibits, it occurs to me that there is far more undeveloped land than there is developed land as far as oil and gas is concerned and the no-pit project would certainly put an undue hardship on any wildcatting because of the doubt of the operator as to what he could do should he obtain any production water. I think as another suggestion we would propose that the Commission circulate its proposed order and authorize all operators a given period of time in which to file exceptions or call attention to the Commission of ideas or thoughts they had which might be more workable.

Basically, we are against the pollution of our fresh water. We will not tolerate that, we don't believe in that, but we do believe that before the Commission enters into an order based on the testimony we have had today, that each of the operators ought to

have a right to submit to the Commission their own problems and the circumstances which they think stand in the way of any such order covering all of the counties. There was nothing in the testimony that showed that one pit would influence or affect an area having a radius of three miles. We think it goes too far.

MR. BARB: I am Glen Barb with Mobil Oil Corporation. Mobil Oil Corporation commends the New Mexico Oil Commission for their great strides and advancements it has made in seeking to prevent pollution hazards to fresh water. Mobil also supports the issuance of constructive regulations designed to control possible pollution hazards.

The present practice of dealing with the field wide area in the industry seems to offer a better opportunity for operators to present evidence showing the need for local use exceptions where little or no threat to fresh water is passed. This insures the industry that the operating costs will not be unnecessarily increased or drilling operations curtailed and prevents the premature abandonment of leases producing to the benefit of the State for tax revenue and royalty income. It is our belief the opportunity to present such evidence can best be preserved under the present successful practice. If

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the Commission would issue an order abandoning the use of unlined earthen pits in southeastern New Mexico. Mobil Oil Corporation urges the Commission to: One, allow a minimum period of twenty-four months to complete installation of the compliant facilities; Two: to provide sufficient flexibility in the order so as to not preclude technological advances in the handling of brine water; Three: establish administrative procedure at the local level for the granting of exceptions from such order for the use of unlined earth pits in drilling operations and for emergency use of such pits in waterflood operation disposal systems, to clean out operations and other such reasonable exceptions as may appear.

Thank you.

MR. CARR: I am Harvey Carr with the Southland Royalty Company. This concerns the North Bagley area. We have recently received an administrative order to re-enter Cabot Carbon drilled State D well in the southeast quarter Section 31, Township 10 South, Range 33 East and if we are successful in re-entering this well, we propose to lay a line from our Emby Wells to our Graham State Number One in the North Bagley field and from there about two miles north to this well and

we will be soliciting water to help defray the cost of this re-entry.

MR. PORTER: Mr. Buell?

MR. BUELL: May it please the Commission, my name is Guy Buell. I am representing Pan American Petroleum Corporation. At the outset, I would like to express my appreciation and gratitude to the Commission for including by reference into the record of the subject case, the record in case 1053. As the record of case 1053 will reflect initially some broad and sweeping charges were made in that case that oil field brines placed in a surface pit had contaminated fresh water. The Commission very graciously gave the operators an opportunity to make a study of their own. Pan American made an exhaustive study of the fresh water supplies in the Lea County Water Basin. We presented that study to the Commission. In my opinion, our study conclusively proved that not one iota of contamination could be traced to oil field brines that had been placed in a surface pit, but regardless of the conclusion of our study, Pan American cooperated one hundred percent with the Commission, the other operators and the State Engineer in eliminating surface pits in that area. We did this even though our study showed no contamination was occurring.

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because we realized that salt water, if it does get to fresh water, is harmful and is a contaminant. We still take that position and Pan American will do everything it can to eliminate even the opportunity for salt water to reach fresh water.

We came out here today to support the Commission in the issuance of a general no-pit order. For that reason we did not cross examine either Mr. Ramey or Dr. Spiegel, although I will state quite frankly that we do not agree with all of their opinions, but I would like the record to reflect that our silence was simply because we do support the Commission in the issuance of a no-pit order because of the possible harmful results of putting salt water on the surface of the ground.

I would like to suggest to the Commission, if I may, that has already been suggested, that the order when issued, will provide for exceptions of meritorious cases and I would also recommend to the Commission the effective date of January 1, 1969.

I would like to, if I may comment briefly on the North Bagley. That pool has been singled out today as sort of a thorn among the roses. From what I know about it, it is a very unlikely candidate. In the first place, it is in an active stage of development. Drilling

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operations are going on continuously. Secondly, there are many operators in the pool. Pan American is an operator, Pan American is a minor operator. With regard to the meeting that was recently held, although Mr. Ramey mailed us a notice of that meeting, it failed to reach us so Pan American was not able to participate in the meeting through no fault of Mr. Ramey's and we only learned about it later on. The Penn in that area is a reservoir engineer's nightmare in that producing characteristics of the well change very rapidly. Because of this, it is an extremely hard area to evaluate from the standpoint of any kind of field services like a field-wide salt water disposal system or something of that nature.

I really shouldn't need to say this, but I will. I have very tremendous respect for Mr. Ramey, both personally and professionally, but in all candidness, I must say his July 1, '67 deadline for the North Bagley Pool area, in my opinion, is both unrealistic and unreasonable due to all of these very conflicting factors that we have in this pool. If the Commission issues a July 1, '67 deadline on that pool in effect, it is going to be a shut-in order, either that or the operators will have to go to the prohibitive expense of trucking their water out.

I would urge the Commission to, if they could find it possible to do so, to be more lenient to North Bagley because of our immense problems there. Thank you.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: If the Commission please, I would like to make a brief statement on behalf of Standard Oil Company of Texas in regard to the testimony that was presented here. I think we support the conclusion that there should be a reasonable time in which to comply with any order that is entered and that there should be reasonable exceptions available to the operators and we would recommend an administrative procedure for that purpose. Standard not only has no objection to a no-pit order, they see a necessity for such an order and are in general support of the Commission in that regard. We have no objections to the staff recommendations with the exception of one item. It was proposed, as I recall, that one basis for an application for administrative approval would be where the production was not more than one barrel per forty-acre tract not to exceed sixteen barrels per section. We would propose that this be increased to three barrels per forty-acre tract not to exceed forty-eight barrels per section.

I would like also, if the Commission please,

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to make a statement on behalf of Continental Oil Company. I believe that in general Mr. Ramey has already stolen all of our recommendations. It is remarkable how perceptive he is at times when he agrees with us. Continental Oil Company is well aware of the importance of fresh water resources, particularly in the arid areas in New Mexico. It is recognized that a large number of situations, the disposal of produced water in unlined pits, may constitute a threat to these fresh water resources and some action should be taken to prevent any contamination.

On the other hand I believe that the testimony presented here today shows that there are situations where the disposal of produced water does not constitute a threat to fresh water supplies and such situations would include instances, for example, where produced water has little or no validity, where there are no fresh water aquifers or where fresh water supplies are protected from pollution by impermeable barriers.

In this connection, I think the Commission should give consideration and any order or any exception that may be granted to such an order to the volume of water that is being produced, the quality of the produced water, the presence of underlying water strata, the quality of this water and the danger of pollution that actually

exists in the particular area.

It would appear then that the general prohibition against unlined pits would work a hardship on the oil industry which would be unreasonable and for this reason, Continental urges that the matter be considered on an area by area basis or a pool by pool basis. I believe that the testimony offered by the Wilson Oil Company shows that there are certainly instances where area-wide exceptions should be granted and perhaps this should be done at the outset when the order is entered. Should the Commission consider however, that the evidence presented indicates a situation requiring area-wide no-pit order as has been proposed, there should be ample provision for exceptions included in the order along the lines as suggested by Mr. Ramey.

Continental would like to point out further that in most instances the disposal of produced water, other than by surface pits, will be quite expensive and will require the cooperation of other operators and will call for negotiations for rights-of-way and other matters which will take a considerable amount of time. Mr. Ramey has proposed, in general, that it will not become effective until January the 1st, 1969, and perhaps that may be enough time to take care of the situation. In any

event, we urge not less than one year where the situation appears to be critical in order to comply with the order and two years where the danger of pollution is not so serious.

It is further recommended that provisions be made for the use of lined pits to be used in connection with waterflood operations and I believe Mr. Ramey's recommendations cover that. Exceptions are also needed, we feel, during drilling and testing operations and for emergency use. Thank you.

MR. PORTER: Does anyone else have a statement?

Mr. Losee?

MR. LOSEE: If the Commission please, Wilson Oil Company recognizes that contamination has occurred in southeastern New Mexico, that we deny that an appreciable contamination has occurred throughout the entire area. In fact the subsidy of evidence offered at this hearing indicates that it only occurs in certain areas. We recommend that the effective date of any order be delayed until the operators can take the proper steps to diligently comply with the order and we would ask that the order either cover only those pools upon which the Commission has subsidy of evidence in its files of contamination with provision for subsequent inclusion

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of new and old pools, or two, if the order is blanket-wide and covers the entire southeastern portion of New Mexico, provisions should be made for realistic exceptions in fields where no contamination has existed or no danger is present. We do not believe that all of these realistic exceptions are mentioned in the order proposed by Mr. Ramey for the Commission staff.

MR. PORTER: Mr. Reynolds?

MR. REYNOLDS: Distinguished Commissioners, I am Steve Reynolds, State Engineer. It is obvious that it is my view that it is not necessary for the State Engineer to take a formal position on the rules, orders, prescriptions and measures that may be needed for the Commission to discharge its responsibility to provide reasonable protection to fresh waters designated by the State Engineer. I am pleased to have had this opportunity to present for the Commission's consideration the results of the investigations of my office and the services of expert witnesses employed by the State Engineer office. I do want to invite the careful consideration by the Commission to some of the problems that may be related to paragraph B3 under the heading "Exceptions in the proposed order", particularly, attention should be given to the extent of the area in which the

first fresh water may be at depths greater than three hundred feet. Furthermore, the Commission should very carefully consider the possibility of contamination resulting at distances greater than three miles downstream from disposal pits and again I thank you for this opportunity.

MR. PORTER: Mr. Merchant?

MR. MERCHANT: I trust that all of the people who are experts in the petroleum business and attorneys have talked because I invite you to descend to the level of a cowboy and it may be more comfortable to some of you. I am president of the -- I am legitimately a cattle grower, livestock operator. My wife and my three daughters and I own a ranch in south Lea County, but I have some extra-curricular activities. I am head of the Southeast New Mexico Grazing Association and, along with Vince White am co-chairman of Agricultural Water Liaison Committee and I think I do less than I should in saying a word or two in explanation of our position, and as sort of a justification for our being in this picture.

As a real compliment we have been given credit for having some part in precipitating this meeting and the study that Mr. Ramey and his staff have made. It is more of a compliment than it is accurate because when we got into the water situation it seemed to me and our

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groups represented on the water committee which include the cattle growers, the wool growers, the Farm and Livestock Bureau, my grazing Association, the Southeast Lea County Land Owners, have all taken the view that there is an inner relation of interest between the petroleum industry and the livestock industry and the agricultural industry in general, because both of us are land buddies. As you probably know or most of you or maybe all of you, there is a code of ethics presently being brought up to date by Oscar Jordan and a committee of the people interested which sets out the responsibilities when an oil company has the mineral rights under the surface of land which is held on the surface by the ranchers and farmers, which sets out pretty definitely the responsibilities of each, and I think that the code of ethics in a parallel way concerns the water because we both need water, we both have to have water.

There are a few homely facts about the agriculture business, particularly cattle raising, that are not always thought of by petroleum people. For instance, you people might be able to wait six months or a year or two years to do some of the things you need to do, but when my cattle come in in the morning for that long fifteen-gallon drink, they have got to have it and

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if you don't have it the second day, you are in a crisis and if you don't have it in four days, you are out of business because we are operating with nature and animals and you people can make long range plans and probably get by with some delays, but remember the fact that when you are dealing with nature, why there is no alcoholic that has got to have a drink like that cow every morning when she comes in.

There are some other things that have been brought up here today that through personal knowledge, I want to speak about. It is true that we wrote Mr. Porter and told him that we felt that some of the requests and objections of the livestock industry were not receiving attention from the Commission. Mr. Porter wrote me a most interesting and courteous letter in which he stated the history of the efforts of the Commission to dispose of brackish water, which was information to me and which I passed on to my Association in my quarterly newsletter. So an opportunity like we have had today to learn what is going on in connection with petroleum industry is most helpful and just for a minute I would like to turn you around and have you know some of the things that occurs to the fellow that is raising cattle.

My friend Raymond Lamb pointed out the Wilson

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Field. It happens that the ranch on which I had been brought up and which I am part owner, completely surrounds the Wilson Field and it has been there, I believe, for something like thirty years and the disposal has been open pit and our shallow water wells have never been affected adversely at all. I expect to get a dinner out of Raymond for that, but it is true. There has been a statement that open pit disposal has no authentic record of contaminating wells, but the well over at Dan Berry's that has been made completely contaminated for many years, as long as thirty or fifty years ago, I drank that water, at least mixed some bourbon and it was potable, but the well has been completely ruined and it was a good well until open pit disposals surrounding it was practiced and maybe as the Pan American executive says, that there is no real evidence that it has been contaminated, but it just so happens that this well just went all to pieces when they put the contamination around it, but I will enter in complimenting Joe Ramey, your Hobbs Supervisor, who under Mr. Porter's arrangements, went all over this field with me and two other cattle growers and I never found anybody more open-minded or more anxious to do away with the contamination or pollution of water and remember we must have that water and it is

not in any particular strata, the shallow water, the head water of Merchant livestock, the water table is eleven feet under the surface. If you are going to wonder how deep your water is, that, at least, is one level. On my end of the ranch they spun me off in '62, every well I had except one is more than three hundred feet deep. I am in the Santa Rosa, so there is a first-hand fact. I have no worry about the contamination.

Now, there is an interlacing intertwined interest between the oil industry and the cattle growers and the agricultural people and it won't stop with this order, which I think is a step in the right direction, if it is put into effect. The question of use of the surface for right-of-way will come up immediately. On my ranch, all of the Antelope Field, Antelope Ridge Field of the Shell is on my ranch and at present they use an open pit disposal of about two hundred gallons per minute, but they have on their own accord arranged to inject all of their water to a level of four thousand and eighty on down to about fifty-five hundred feet. There will be a right-of-way of some eight to ten miles on the area that I either own or am purchasing or am leasing.

They asked me the other day what they had

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to do to get the right-of-way. Mr. Brown down there at the de-sulphering plant and I asked him how much I owed him to take it because it is all for my benefit. Now that would be general, but we will use whatever influence we have, gentlemen, to get the people using the surface on the ground to be reasonable in their requests and demands when it becomes necessary for you to lay the pipelines that you have to lay and we trust we can cooperate in that way, the way the oil people have cooperated with us. Thank you.

MR. PORTER: Mr. Merchant, I haven't had that kind of applause for anything I have said today. Mr. Jordan?

MR. JORDAN: I am Oscar Jordan, attorney for the New Mexico Land Office. During the break I spoke to the Commissioner about, or made a few notes before this about what I thought should be said here on our behalf and I asked the Commissioner about it, but it looks like about everything has been said by Mr. Merchant and the oil people here today. My notes just follow right down the line with a couple of exceptions. One is, there is a possibility here that there might be a conflict of interest, my appearing here before the Commission, in one of the Commissioners is my boss, but in this particular

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instance, we are interested from both angles. We are interested in the oil for the simple reason that ninety-five percent of our revenue comes from the oil. In addition, from the State's standpoint, thirty-seven percent of all the revenue from the federal ends also goes to the State, but not through our office, so we are interested in oil from that standpoint, the revenue end of it. And we are also interested on the other hand, in the surface, because after the oil has been produced or after some other fuel has replaced it, if that is possible, we are still going to need the land and we are still going to need the water. We are interested from that standpoint, so I don't see really a conflict. I think that the evidence today presented has shown that there are some areas in here that there is definite pollution. There are other areas that there is no pollution in this large area, so with that I would recommend to the Commission that they consider that there is going to have to be some kind of no-pit order issued and I would suggest either a partial order or a series of partial orders or a blanket order with exceptions, and those exceptions have been pretty well set out here today already.

There is one thing that no one has mentioned

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today in this connection, that something should be done about where there is pollution, where we know and we can see there is definite pollution, something has got to be done and this reason if for no other at all, and this is my personal feeling, is that the State has shown to its Oil Commission that it can take care of conservation of oil and we don't need any Federal intervention and I think we can show them now that we can take care of this water problem and pollution without Federal intervention and we will do it to keep them from stepping in because as you know, when the Federal Government has taken over a problem, I have yet to see one they have solved, but I have seen them spend a lot of money, but I think it is serious that we should do this where there is pollution because there is a national kick on air pollution, water pollution and all kinds of pollutions. There is a national kick on it now, it is here and in Washington, in New York, that's about all they talk about. The Secretary of Interior Udall is quite a bug on this and it is coming and I think we should get the jump and take care of our own problems, as I have said before, clean our own house before they clean it for us because they won't be as careful with the furniture as we are.

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In the issuing of these orders, I think also they have asked for time here. I have recognized here by listening to my telephone jingle, that there are going to be right-of-way problems. If you issue an order where you are going to have to dispose of this where there is going to be central disposal areas, say water wells or abandoned wells, we are going to need rights-of-way to get there and I know that by and far there is better cooperation now than there has been in the past. It is true there is more of an understanding between the two industries. I have worked with Mr. Merchant. We are right now in the process, we held it up during the Legislature because of a time element, but we are getting a committee together for the Ethics Code and I am sure that this will be one of the topics that will be covered. The oil and gas industry will appoint some members to this committee and the land users will appcint, they may have already appointed their members, submitted the names to me and I will try to act as moderator and we will sit down and hammer this thing out and with that, I thank you.

MR. PORTER: Does anyone else have a statement to make? Mr. Anderson?

MR. ANDERSON: Thank you, Mr. Porter. In the

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interest of time, I will hurry along. With regard to commenting on Mr. Ramey's proposals, I feel a little bit like the cow that you mentioned earlier that hadn't had a chance to read the analysis. Sinclair is currently injecting or has committed to injection, thirteen thousand barrels of produced water a day which represents eighty-eight percent of our produced water in this area and on the basis of those figures I don't feel that a no-pit order is needed; however, in the event that one is entered as a result of these proceedings, Sinclair would recommend that the no-pit order contain an automatic exception for those pits or leases that are receiving ten barrels of water per day. We have thirty-eight pits in this category receiving an average of only three and a quarter barrels of water per day. This exception, we believe, is reasonable and compares closely with finding eight of the Commission's no-pit order R1224A, which has been mentioned here earlier today, which provides for exception of oil wells producing a half a barrel or less of water per day due to the insignificant amount of water involved. We also recommend automatic exception for burn pits under exclusively for the burning of tank battery waste accumulations. We also recommend that any no-pit order allow sufficient time for compliance.

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We believe that the January 1st, 1969 date is reasonable.

Thank you.

MR. WHIGHAM: I am Carl L. Whigham representing Texaco Incorporated. Texaco welcomes the opportunity to participate with the Oil Conservation Commission, other regulatory bodies, the oil and gas industry and others in the formulation of necessary regulations to provide for the conservation and the protection of fresh water.

Texaco also commends and supports the Oil Conservation Commission in their efficient approach to providing effective and equitable regulation.

Now the hearing today has been called by the Commission to consider an order prohibiting the use of oil surface pits for the disposal of oil field brines in this four county area. We wish to direct the attention of all concerned to three basic precepts that should be carefully considered in promulgating rules, then we would like to propose and recommend the adoption of five specific provisions. Now, the first precept that we would offer for your careful consideration is that for contamination to occur, two things must exist: a contaminant in sufficient quantity to be effective and a useable quantity of fresh water. Now throughout most

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of the area under discussion this afternoon, one and sometimes both of these two requirements are missing and fresh water contamination cannot be considered a problem. Because of this, rules and regulations should be applicable only to certain limited designated areas where contamination is known to be potentially possible.

Secondly, there is no question that where fresh water occurs, the proper disposal of oil field brines is essential to prevent contamination. In addition, however, it is also absolutely necessary to properly dispose of all other contaminants whether they be oil field brines, industrial wastes or others. In this regard, State regulatory authority other than the Oil Conservation Commission is urged to take action to prohibit fresh water contamination and waste by industry in groups other than the oil and gas industry.

Thirdly, since only certain designated areas should be subject to no-pit orders, an adequate and efficient method of designating these areas, should be developed. Generally, the State Engineer and State Geologist should be responsible for designating the location of the areas where protection is required and the Oil Conservation Commission should be responsible for designating the manner and the method in which

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protection would be accomplished. Any designation, contraction or expansion of an area should be subject to public review at a hearing. If anyone objects to this designation or change in designation and wishes to call the hearing and present a case, sufficient factual data to substantiate the designation, contraction or extension of an area should be made available to the public by the appropriate State regulatory agency.

Now, then with regard to specific rules to be adopted, we have the following five provisions that we would ask your consideration. First, I have these prepared and written as statements, or rules. The use of earthen pits for the storage and evaporation of oil field brines is prohibited in certain areas designated by appropriate authority including those areas within five miles of any continuously flowing stream or river and within one mile of any intermittently flowing stream or dry stream bed except as hereinafter provided.

Two, impervious collecting pits may be approved for use in conjunction with approved salt water disposal operations provided that these pits are inspected and approved by a New Mexico Oil Conservation Commission representative before they are placed in use and remain in satisfactory condition, as determined by subsequent

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inspection by the Conservation representatives.

Three, the areas subject to the provisions of this order should be designated, contracted or extended jointly by the New Mexico State Engineer and the New Mexico State Geologist. If any individual, or group, objects to such designation or change, a public hearing may be called by the protestant in order to make available and to properly consider all information relevant to the designation or change in an area.

Fourth, exceptions and extensions to these rules may be granted by the Secretary-Director of the Oil Conservation Commission following notice and hearing or administratively upon number one, proper application and two, waivers of objection from the State Engineer, the surface land owner and all offset operators.

Fifth and last, compliance with the provisions of these rules shall be required within two years of the effective date thereof. Thank you, sir.

MR. PORTER: Mr. Smith, were you asking for recognition a moment ago?

MR. SMITH: Yes, I really was. I am J. J. Smith, from down Jal way and I am speaking for that old boy that Mr. Pete was talking about that looked in the canyon looking for that cow. I know that the people who

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have been speaking here, we have heard from almost every type and even from an educated rancher and we heard from the land people and I think they should be heard from. Now, we have problems other than just pollution problems from pits and, as Mr. Merchant said, these cows, they are not very choicy of the type of water they drink and we have, they have fenced the pits and run them out. Now, here is a situation, a pipeline situation where there is an injection station there for waterflood. Well, this pit is just a normal dirt pit out there and the water contents, I have them here, I have had them tested. I called this company, if you want me to call the company's name, I will. Whell Oil Company, they're flooding down there now and the pit was running over and my son-in-law kept shoveling the dirt and kept it from running over and I called them and told them the pit was full and it was going to break and run over. Well, they said they would take care of it and I went over there and it was lowered about two or three inches I suppose, so if we get that two or three or four inch rain we have been waiting on for about eight months or a year, why I think an act of God will take care of that pit.

So, we have other problems rather than just pollution problems. I say, the water pollution problem

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is the one problem that we are working on right here, but we have cost, damage cost from cattle out of those pits more than anything else there. They put up a fence around the pits and the old bull rubs his hair off in the spring and the lice off in the fall and then the full watches them walk over it and they have free access to this water. So you could go on, I could go on and on and on, which is not necessary at all, but we do have pollution problems even in the air and other water and I will say this, that our wildlife people, I think are interested in these pits being closed on account of the amount of wild duck, especially, and quail and various other types of life, get in these pits and are killed and die, and now we have the problem confronting us, I don't know what we are going to do with this oil we got in the ocean. I have taken some pictures here if you would like to see them on what it does to our land.

MR. PORTER: Does anyone else have a statement? Have I overlooked anyone or failed to recognize anyone who has had his hand up? That concludes the statements. The Commission will take the case under advisement. The hearing is adjourned.

(Whereupon, the hearing was adjourned.)

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STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

I, JERRY POTTS, an officer, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Hobbs, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

In witness whereof, I have affixed my hand and notarial seal this 26th day of May, 1967.

Jerry Potts
 Notary Public

My Commission Expires:

July 10, 1970

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE
OIL CONSERVATION COMMISSION UPON ITS OWN
MOTION TO CONSIDER AN ORDER PROHIBITING THE
DISPOSAL OF OIL FIELD BRINES IN SURFACE
PITS IN LEA, CHAVES, ROOSEVELT, AND EDDY
COUNTIES, NEW MEXICO.

CASE No. 3551
Order No. R-3221

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 19, 1967, at Hobbs, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 1st day of May, 1967, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

- (1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.
- (2) That large amounts of water produced in conjunction with the production of oil or gas, or both, are being disposed of on the surface of the ground by means of unlined disposal pits located in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.
- (3) That said produced water contains high concentrations of chlorides.
- (4) That fresh water supplies as designated by the state engineer exist in substantially all areas where there is surface pit disposal and in substantially all the area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.
- (5) That the disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of

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CASE No. 3551

Order No. R-3221

the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, constitutes a hazard to existing fresh water supplies, as designated by the state engineer, in the vicinity of such disposal.

(6) That in order to afford reasonable protection against contamination of fresh water supplies as designated by the state engineer, the disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies existing in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico, should be prohibited in said Counties.

(7) That the testimony indicates that the volume of water produced in conjunction with the production of oil or gas, or both, from the North Bagley-Upper Pennsylvanian, North Bagley-Middle Pennsylvanian, North Bagley-Lower Pennsylvanian, North Bagley-Wolfcamp, and Northeast Bagley-Wolfcamp Pools, Lea County, New Mexico, and being disposed of into unlined pits is so great as to constitute an imminent threat to fresh water supplies designated by the state engineer and the surface disposal of said water should, therefore, be prohibited after October 31, 1967, in the area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(8) That large amounts of water are produced in conjunction with the production of oil from active waterflood projects and active water pressure maintenance projects.

(9) That one or more injection wells are present in each waterflood project.

(10) That in order to afford reasonable protection against contamination of fresh water supplies designated by the state engineer, the surface disposal of water produced in conjunction with the production of oil from active waterflood projects and active water pressure maintenance projects should be prohibited after December 31, 1967, in the area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(11) That complete prohibition of surface disposal in Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico, of water produced in conjunction with the production of oil or gas, or both, should be accomplished by December 31, 1968, unless specifically exempted.

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CASE No. 3551

Order No. R-3221

(12) That the surface disposal in pits of not more than one barrel per day for each developed 40-acre tract served by said pits, but limited to a maximum of 16 barrels per day, is so insignificant as to present little hazard to fresh water supplies and should be allowed in order to prevent waste caused by the premature abandonment of wells.

(13) That in order to prevent waste caused by the drowning out of oil or gas wells or burdensome delay or expenses, the District Supervisor of the appropriate District Office of the Commission should be empowered to authorize temporary disposal in surface pits for a period not to exceed 30 days for such contingencies as injection system failures and evaluation of wildcat wells.

IT IS THEREFORE ORDERED:

(1) That effective November 1, 1967, the disposal of water produced in conjunction with the production of oil or gas, or both, from the North Bagley-Upper Pennsylvanian, North Bagley-Middle Pennsylvanian, North Bagley-Lower Pennsylvanian, North Bagley-Wolfcamp, and Northeast Bagley-Wolfcamp Pools, Lea County, New Mexico, or within one mile thereof, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies, is hereby prohibited in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(2) That effective January 1, 1968, the disposal of water produced in conjunction with the production of oil from any waterflood project or water pressure maintenance project on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies is hereby prohibited in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(3) That effective January 1, 1969, the disposal of water produced in conjunction with the production of oil or gas, or both, on the surface of the ground, or in any pit, pond, lake, depression, draw, streambed, or arroyo, or in any watercourse, or in any other place or in any manner which will constitute a hazard to any fresh water supplies and said disposal has not

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CASE No. 3551

Order No. R-3221

previously been prohibited by Orders Nos. (1) or (2) above, or by Order No. R-1224-A, or by Order No. R-2526, or by Order No. R-2788, or by Order No. R-3164, is hereby prohibited in that area encompassed by Lea, Eddy, Chaves, and Roosevelt Counties, New Mexico.

(4) That in those areas subject to the provisions of Orders Nos. (1) and (3) above, surface pits may be utilized for the disposal of a maximum of one barrel of produced water per day for each developed 40-acre tract served by said pits, provided however, that in no event shall said surface pit disposal exceed 16 barrels per day, and provided further, that this authorization shall not apply to those areas affected by Orders Nos. R-1224-A, R-2526, R-2788, or R-3164.

(5) That nothing contained in this order shall be construed as prohibiting the disposal of water produced in conjunction with the production of oil or gas, or both, in impervious lined pits presently in use, provided said pits were inspected and approved by a Commission representative prior to use, and for so long as said pits are properly maintained to ensure their continued imperviousness.

(6) That each unlined pit used for the disposal of water produced in conjunction with the production of oil or gas, or both, and not servicing a well exempt under the provisions of Order No. (4) above shall be filled, leveled, and compacted within six months after its use for the disposal of produced water is prohibited or by November 1, 1967, whichever date is later.

(7) That nothing contained in this order shall be construed as prohibiting the use and maintenance of mud pits or burn pits.

(8) That the District Supervisor of the appropriate District Office of the Commission is hereby empowered to authorize temporary disposal in surface pits for a period not to exceed 30 days for such contingencies as injection system failures and evaluation of wildcat wells. Authority for said disposal shall only be granted on an individual case basis and only after the volume and quality of the water produced and the proximity of fresh water supplies have been taken into consideration.

(9) That the provisions of this order are in addition to the provisions of Order No. R-1224-A, Order No. R-2526, Order

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CASE No. 3551

Order No. R-3221

No. R-2788, and Order No. R-3164 of the Commission and nothing herein contained shall be construed as abridging or altering in any manner the provisions of said orders.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



DAVID F. CARGO, Chairman



GUYTON B. HAYS, Member



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

S E A L

esr/

NEW MEXICO
OIL CONSERVATION COMMISSION
P. O. Box 2088
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PICTURES OFFERED IN
CASE 3551 - APRIL 19, 1967
Hearing in Hobbs



12-12-67 12:15/33



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