Case No.

1053

Application, Transcript,
Small Exhibits, Etc.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 18, 1958

IN THE MATTER OF: Case No. 1053

TRANSCRIPT OF PROCEEDINGS

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3-6691 5-9546

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 18, 1958

IN THE MATTER OF:

Application of the Oil Conservation Commission, upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the freshwater bearing horizons in Lea County, New Mexico. Case 1053

BEFORE:

Mr. A. L. Porter, Jr.
Mr. Murray Morgan
Governor Edwin L. Mechem

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: We'll take up next Case 1053, which was first brought on for hearing approximately two years ago and has been continued for periods of three to six months since that time. Each time it has reappeared on a docket, we have had progress reports from the various Pool Committee Chairmen for the ten pools in question.

MR. PAYNE: Case 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern

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the disposal of salt water in areas of Lea County, New Mexico.

MR. PORTER: At this time we would like to hear reports from the various Pool Committee Chairmen, and I would like for you to come down in front, please, to present those reports. At this time I would like to recognize Mr. Christie.

MR. CHRISTIE: If the Commission please, Mr. O. C. McBride, Amerada's Engineer in Monument, will give our reports on the different fields that we are chairman of.

MR. PORTER: Mr. McBride.

MR. McBRIDE: Yes, sir. I am O. C. McBride, Jr., representing Amerada Petroleum Corporation. We are Chairman of three of the industry committees and co-chairman of one, the Eunice-Monument-Eumont Committee. Gulf will give the report for Amerada and Gulf on the Eunice-Monument, and we concur in their report.

We operate the Bagley-Pennsylvanian-Devonian salt water disposal system. This system has been in operation since May the 29th of 1957. It has disposed of a total of 2,149,947 barrels of salt water up to May 1st, 1958. The two fields produce about 8,076 barrels per day, and all of this water is now going into the disposal well.

Amerada also operates the East Caprock-Devonian salt water disposal system. This system has been in operation since July the 25th of 1957, and has injected a total of 744,155 barrels to May 1st, 1958. Water production from the field totals about 7,055 barrels per day, of which until recently 2,680 barrels is

being disposed of at 1250 pounds pressure. This volume represented 38 percent of the produced water from the field. The disposal well has been shut in since May 19, 1958, after a mechanical failure developed in the well. We have made application to the Commission, it was heard on May 29, 1958, to permit a dual completion in our Posy A-4 for the disposal of salt water into the Devonian formation. The approval of the application will permit disposal of all salt water in the field. I might add in addition to the Dewey Lake, which has been our disposal zone since the system has been in operation, we tested the San Andres formation last year and it gave us no help at all in putting the water away. We have come to the conclusion that the only place in the East Caprock Field that we can dispose of the volume of water that we have is back into the Devonian producing formation.

Amerada also operates the Saunders salt water disposal system. We started disposing of about 90 percent of the field water yesterday. All but five of the batteries in the field are tied into the system, and they are tying those in today, and we expect to have 100 percent of the water going tomorrow.

That concludes Amerada's report.

MR. PORTER: Thank you, Mr. McBride. Does anyone have any questions concerning Mr. McBride's report?

MR. IRBY: Have you had any -- I am Frank Irby from the State Engineer's office. Have you had any indication from the Commission as to their action on your application to complete the

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dual completion for the disposal of water in this particular well that you spoke of in the East Caprock Pool?

MR. McBRIDE: We do not have the order as yet. The application is still pending.

MR. IRBY: Have you stated the percentage of water being disposed of in the Bagley Pool? I didn't get it.

MR. McBRIDE: All of the water.

MR. IRBY: All of it?

MR. McBRIDE: All of it is going.

MR. IRBY: That's all.

MR. PORTER: Mr. Nutter.

MR. NUTTER: Mr. McBride, what formation is the water being disposed through in the Bagley-Pennsylvanian, the Devonian Pools?

MR. McBRIDE: In the Bagley system, all of the water is going back into the Pennsylvanian producing formation.

MR. NUTTER: Do you anticipate that you will be able to inject water into that formation without difficulty for an indefinite period of time?

MR. McBRIDE: We think we will be able to. We have had to acidize the well occasionally to make it take water on vacuum, but it is still taking water without pressure.

MR. NUTTER: Into what formation are you disposing of water in the Saunders?

MR. McBRIDE: It is also in the State SC No. 5, about the

Pennsylvanian system. It will become the salt water disposal Well No. 1.

MR. NUTTER: You anticipate that you will be able to dispose of water into the Pennsylvanian formation without difficulty?

MR. McBRIDE: We don't have enough history to tell yet. The water is going in on vacuum at present. However, only time will tell whether it will continue to do so, and how much pressure will be needed. We do have other possible wells in that area that we could convert.

MR. PORTER: Anyone else have a question? You may be excused.

(Mr. McBride excused.)

MR. PORTER: Mr. Wade. Texas Company is Chairman of the Moore and the Echols-Devonian, is that right?

MR. WADE: No, sir, just the Moore.

MR. PORTER: Will you give us the report on the Moore?

MR. WADE: Yes, sir. H. N. Wade with the Texas Company, reporting on the Moore-Devonian Pool.

The State of New Mexico BNNC, the one salt water disposal Well No. 1, started receiving injection water into the Dewey Lake on May 21, 1958. The total injection through June 13 was 19,956 barrels. We have occasioned some difficulties with this well, in that first it required acidizing, at completion it looked as if it was going to take the water without any difficulty, and we again ran into difficulty and have re-acidized for a period of five

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days ending on June 10th. We put in 100 percent of the water, about 3100 barrels per day produced in the field. On the 10th of June, our pressure situation became unbearable for the equipment that we have, on the pumping equipment we have to put the water away, and we had to shut the system down temporarily. We intend and have on order smaller fluid ends for our pump, and we feel that the increased pressure which we can obtain with the smaller fluid ends will allow us to again return 100 percent of the water produced in the field, as soon as this change is made.

That's all I have.

MR. PORTER: Any questions of Mr. Wade?

MR. NUTTER: Yes, sir.

MR. PORTER: Mr. Nutter.

MR. NUTTER: Mr. Wade, do you anticipate that after the pump has been remodeled so you can raise the injection pressure, that you will be able to dispose of all the water?

MR. WADE: Our preliminary testing indicates to us that we should be able to, yes, sir.

MR. NUTTER: Will there be an ultimate increase in pressure and you will have to revise the pumps later on?

MR. WADE: We don't think so, no, sir. At the pressures which we anticipate during original testing, we put away water much in excess of the volume that will be required to be injected this time. We also had good test at the pressure we had on the pump at this time, and it built up, so we just can't tell, so we

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think we will be able to put it away without any trouble.

MR. NUTTER: In the event that you are not able to put in 100 percent of the water with your pump as you are remodeling it at the present time, can you change pumps or will there be other means by which you can dispose of water?

MR. WADE: Certainly we would make every effort to develop other means. I think we can supplement the pumping equipment to such an extent that we can put it away in this well. We would like to, and we have planned to utilize this well if at all possible.

MR. NUTTER: Thank you.

MR. PORTER: Mr. Irby.

MR. IRBY: Mr. Wade, you stated that the materials were on order for the remodeling of this pump?

MR. WADE: Yes, sir.

MR. IRBY: When do you anticipate that this pump will be back in operation and disposing of the 100 percent?

MR. WADE: I would just have to estimate, Mr. Irby, but I would imagine that probably within three or four weeks at the outside. It probably should be in operation within two weeks. I just don't have any way to guess. I'm not familiar with the delivery dates and so forth on equipment of that type.

MR. IRBY: At that time you would be disposing of 100 percent of the salt water?

MR. WADE: Yes, sir, at that time we anticipate that we would be disposing of 100 percent of the salt water.

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MR. IRBY: That's all.

MR. PORTER: Anyone else have a question? You may be excused.

(Mr. Wade excused.)

MR. PORTER: Mr. Bumpass, would you give us a report on the pools in which Gulf is the Chairman?

MR. BUMPASS: Yes.

MR. PORTER: I believe you represent Gulf here today?

MR. BUMPASS: Yes, sir. My name is C. M. Bumpass. I am an area engineer for Gulf Oil Corporation, Hobbs office.

Gulf is the chairman of the industry salt water disposal committee for the Eunice-Eumont area, and Amerada is the chairman of the industry salt water disposal committee for the Monument-Eumont area.

At their request we are making this statement, and also for the Monument-Eumont area. In behalf of these committees, I wish to read the following into the record of Case 1053.

It will be recalled that when the last progress report was presented to the Oil Conservation Commission, operators were meeting to draft a salt water disposal agreement. Subsequent to that hearing, a legal sub-committee was formed to eliminate objections to the proposed agreement. After these differences were resolved, a meeting of the 35 operators was held, at which time agreement was obtained from all operators on the final form of the agreement. A final agreement was then prepared and was submitted

to the operators for execution during the week of June 9, 1958. Execution by interested operators is expected within one month, and based on this, it is probable that materials can be ordered and physical work can be initiated as early as August or September of this year. Although subsurface disposal of waste water from some wells will be accomplished earlier, it is estimated that all wells will not be connected to the system for a period of approximately eighteen months. However, realizing the size of the system, it is felt this is not an unreasonable period of time. Of course, as segments of the project are completed, they will be tied into the disposal wells to permit disposal at the earliest possible time.

Now in line with that eighteen-month estimated time for completion, I would like to give an estimate on progress that we anticipate in regard to percent completion of this project. I will do that by discussing the Monument-Eumont area first, and then the Eumont-Eunice area second.

We feel that at the end of the first six months of this eighteen-month period, that we can have two disposal wells in operation and the lines to handle the water for those wells, which will approximate 12,000 barrels of water per day. That volume of water will represent approximately 50 percent of the water in the Monument-Eumont area. At the end of the next six months, or at the end of twelve months, we will have two additional disposal wells in operation with their respective lines installed. By so

doing we will pick up an additional 6,000 barrels of water a day, making the total of 18,000 barrels, which will effect the project approximately 80 percent complete. Then by the end of 18 months, why we feel that we will have all of the necessary lines in to gather all of the water in the Monument-Eumont area. That figure is based on June, '57 figures, was in the neighborhood of 22,000 barrels per day. Now in the Eunice-Eumont area --

MR. PORTER: (Interrupting) Mr. Bumpass, may I ask you something at this point?

MR. BUMPASS: Yes.

MR. PORTER: Did you say how many disposal wells you expected to have in operation at the end of the eighteen months?

MR. BUMPASS: Well, the proposition is a function of the volume of water, and we estimate that we'll have to take four wells to take care of this initial 22,000 barrels. That is in the Monument-Eumont area.

MR. PORTER: Thank you.

MR. BUMPASS: In the Eunice-Eumont area at the end of the first six months, there again we anticipate having two disposal wells with their respective gathering lines in, and the volume of water there will be approximately 9,000 barrels per day. This again is roughly approximately 50 percent of the volume of water for the Eunice-Eumont area. At the end of twelve months there will be two additional disposal wells with their lines, bringing to the total water barrels per day a 14,000, an increase of five over the

previous figure. At that point we will have the project approximately 85 percent complete, in relation to the volume of water to be disposed of. Then, of course, at the end of eighteen months we will have all the gathering lines in.

MR. IRBY: Pardon me, Mr. Bumpass. That Eunice-Eumont will go into the four wells that you have mentioned, 100 percent?

MR. BUMPASS: That's true. That's our plans at this time. We may have to have more wells, we may have to have less. The plans we have call for four. As more water developed, or as the receptivity of the wells decreased, it is just a function of how many wells we will have to have. Four wells for the Eunice-Eumont and four wells for the Monument-Eumont.

MR. IRBY: Thank you.

MR. BUMPASS: Although this may appear to be a long period of time to those not familiar with work of this type, perhaps it will be well to review the progress made to date in these three pools, and analyze the magnitude of the job the operators have faced. Subsequent to the Oil Conservation Commission Memo No. 22-56, dated July 3, 1956, operators in the various pools in Southeast New Mexico began to formulate plans for the disposal of produced waste water. Operators met to discuss the disposal possibility in Eunice, Monument, and Eumont Pools, and because of the size of the pools decided that Amerada would be the Chairman of the committee to work on the disposal of waste water in what is called the Monument-Eumont geographical area. In this area there are the

Monument Pool, the Monument-Blinebry, the Monument-Paddock, and the Eumont Pool. Likewise, for handling of the Eunice and Eumont wells in the geographical locality of the Eunice Pool, Gulf was selected a Chairman to head the Eunice-Eumont waste water disposal committee. Thus two separate committees started the study to determine what would be done with the produced water from approximately 1300 wells. The mere fact that 1300 wells of 35 operators, covering in excess of 50,000 acres, indicates the magnitude of the task of getting this job under way.

The initial work of these committees consisted of studies in laboratory analysis to determine the characteristics of the water of the various pools and their compatibility with each other, the corrosive nature and the volumes of water to be anticipated. After analyses were made, it was concluded that the best method of handling this water would be to dispose of it underground in the San Andres formation, which is known to be very porous and has ability to take large volumes of water.

The committee's work indicated water from these pools compatible, and very few corrosive problems would be anticipated. All of these problems were new to the operators, and they agreed that more progress could be made through the employment of a professional concern to perform the necessary engineering design work than could be accomplished with the work committees. Consequently, Rice Engineering and Operating, Inc., was given the task of making the preliminary survey and design of the system.

By September of '57, Rice had completed the preliminary survey and formulated conclusions in reports to the operators. In this report Rice estimated the initial expenditure would approximate two and one-half million dollars, with an ultimate cost in the neighborhood of $3,600,000.

To give an idea of the task involved in these particular pools, it took Rice four months alone to complete the preliminary report. This required the survey of each tank battery location for determination of elevation, the location of the disposal wells for handling of water, sizing of gathering lines, and various other related data necessary for preliminary design. After review of this report, there were many questions to be resolved, and these had to be settled through subsequent operators' meetings. These problems involved such things as sizing of lines, which wells were to be included, what to do with marginal wells, what to do with wells producing low volumes of water where large volume would never be anticipated, and where savings could be accomplished without sacrificing quality. These problems have now been resolved to the satisfaction of all concerned, and it is felt there is a sound engineering and legal basis for the project as now visualized by participating operators.

In view of this, it is anticipated there will be no difficulty in having the operators execute the articles of agreement since a large percentage of the operators in the Southeastern New Mexico are involved in this project and have reached a mutual

understanding on the agreement. It is felt a considerable saving in time should result from other projects to be installed in this locality. As the Commission and State Engineer's Office knows, a project of this magnitude requires a considerable amount of time and investment. The operators have attacked this problem in good faith and with diligence; it is felt that substantial progress has been shown. For this reason, it is felt that any order which might be issued affecting closing in of wells in this field would not be justified on the basis of the progress made to date.

We therefore urge the Commission to continue this case, reviewing it in the future as it deems necessary.

That concludes the statement.

MR. PORTER: Mr. Bumpass, I assume that a number of wells are available for use of the disposal wells in these plans?

MR. BUMPASS: Yes, there are some available for that purpose.

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

MR. NUTTER: Mr. Bumpass, what is the total amount of water that you expect will have to be disposed of in the Eunice-Eumont area?

MR. BUMPASS: Now, let's see, I failed to give -- I gave 22,000 for Monument-Eumont. I believe it is 16,000 for Eunice-Eumont. That is the present water, or based on '57 June figures.

MR. NUTTER: Has all engineering work been completed for this project?

MR. BUMPASS: Yes, it has. With the approval of the agreement, then we're ready to go to work. There might have to be some insignificant re-design, but that will be determined after receptivity of injection wells has been determined.

MR. NUTTER: You expect that the actual physical work will be commenced by what date?

MR. BUMPASS: I believe it was August or September. I think the actual articles of agreement allow for ninety days approval. We hope to get them in prior to that time, which will form the contract to allow this cooperative system to be in operation. At that time plans will be made to drill the disposal wells and test them, and then order materials for laying of lines and at the same time surveys could be, the final surveys could be conducted.

MR. NUTTER: You expect it will take a total of eight disposal wells for the entire area?

MR. BUMPASS: That's approximate. I believe actually the figure is seven. It just depends on receptivity, to some extent, and locality of those wells. I reported here eight. That's initially what it will be; ultimately I don't really know. There again it's a function of the amount of water and the number of wells we have at that time.

MR. NUTTER: Will water be disposed of in the San Andres in all seven or eight wells?

MR. BUMPASS: That is the understanding that I have, that

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is the plan.

MR. NUTTER: Thank you.

MR. PORTER: Anyone else have a question? Mr. Irby.

MR. IRBY: As I understood your testimony, Mr. Bumpass, the present plan is based on the present water production of the wells, is that right?

MR. BUMPASS: Yes, sir.

MR. IRBY: The number of wells in your gathering system is based --

MR. BUMPASS: (Interrupting) The number of disposal wells is based on the present water. Our lines are so designed to take care of future water, sizing of the lines; in other words, at the present time our lines would be oversized.

MR. IRBY: And then as more disposal wells were required, you would expect to apply to the Commission for those?

MR. BUMPASS: That is true.

MR. IRBY: And dispose of any increased production of water?

MR. BUMPASS: That's true.

MR. IRBY: Thank you.

MR. PORTER: Anyone else have a question of Mr. Bumpass? Mr. Bumpass, you made a move for continuance in the case. Did you request a specific length of time for continuance, or specific date?

MR. BUMPASS: No, sir, I didn't.

MR. PORTER: Anyway, the Commission will postpone action

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on your motion until after we have heard the complete progress reports. You may be excused.

(Mr. Bumpass excused.)

MR. PORTER: Does Magnolia have a representative present?

MR. EVANS: My name is C. T. Evans. I am District Petroleum Engineer for Magnolia at Hobbs. I would like to report on the Bough Field, which at the present time we are the sole operator there now. We do have an injection system in operation. We are injecting water back into the producing formation in that field. We're presently extending the system to include wells that have since that time started making water. We will pick them up in the immediate future.

MR. PORTER: But you have been disposing of 100 percent of the salt water production?

MR. EVANS: We have up until, I would say, this past month.

MR. PORTER: Up until the new development?

MR. EVANS: Yes, sir. We did not include all our wells in the initial system. Some of these wells have since that time begun making water. We are installing the rest of the system to pick them up. I would also like to report on the Crossroads Field. I checked this week, we have our final agreement out for execution by other operators, and I received word from the other operators that the agreement is executed and will be sent to us within a week. At this time we anticipate circulating AFE's and as soon as they are cleared, we will start work on the project.

MR. PORTER: That's in the Crossroads?

MR. EVANS: That's the Crossroads. I would estimate that we should be installing within two months our system there. I would also like to report on the South Denton. This is a project that Shell and ourselves are installing to include the three wells that we have. We have one and Shell has two. We have circulated final plans, also agreements, to Shell, and they indicated this week that they are presently executing this agreement and again we should be able to start within two months on this project.

I believe that's all we have.

MR. PORTER: Anyone have any questions of Mr. Evans? Mr. Nutter.

MR. NUTTER: Mr. Evans, you said that you were disposing of water in the Bough Pool and adding new wells to the system as soon as they start making water. When did you start injecting water in there?

MR. EVANS: In March.

MR. NUTTER: Of '58?

MR. EVANS: Yes, sir.

MR. NUTTER: Is that water going into the Pennsylvanian formation?

MR. EVANS: Yes, sir.

MR. NUTTER: Do you have any trouble injecting the water at all?

MR. EVANS: No, sir, it is still a vacuum system.

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MR. NUTTER: You stated that you will circulate AFE's perhaps next week, perhaps after you have the operating agreement returned in the Crossroads Pool?

MR. EVANS: Yes.

MR. NUTTER: How long do you think it will take before the AFE's are approved?

MR. EVANS: That should be minimum, the agreements and plans have been approved to date, so the AFE should not take long. I would hesitate to put a specific date, I would say two to three weeks would be the maximum.

MR. NUTTER: All the engineering work has been finished?

MR. EVANS: Yes, sir.

MR. NUTTER: And the AFE's have been prepared?

MR. EVANS: Yes, sir.

MR. NUTTER: You stated that you will probably be able to start work in two months. When do you think that you will have the project complete then?

MR. EVANS: Installation shouldn't take more than a month, I would say. Within three months we should be completed.

MR. NUTTER: In other words, you think that you would be able to handle 100 percent of the salt water within three months from today?

MR. EVANS: Yes, sir.

MR. NUTTER: Now in the South Denton, you said that you would start work in two months?

MR. EVANS: Yes, sir.

MR. NUTTER: Would that likewise take about a month to do the work?

MR. EVANS: Yes, or less. It is a small system, it shouldn't take too long.

MR. NUTTER: You anticipate that within three months from the present date, you should be able to handle 100 percent of the water there?

MR. EVANS: Yes.

MR. NUTTER: What formation will you use in the Crossroads and Denton?

MR. EVANS: San Andres in the Crossroads and Devonian, or the producing formation, in the South Denton.

MR. NUTTER: Thank you.

MR. PORTER: You say there are three wells producing at present in the South Denton Pool?

MR. EVANS: No, Shell and Magnolia has three wells.

MR. PORTER: I see.

MR. EVANS: I believe there are seven wells in the South Denton. As I understand it, the other operator is taking care of their water themselves.

MR. PORTER: Do you know the approximate total amount of daily salt water production in the Crossroads Pool?

MR. EVANS: Slightly in excess of 2,000 barrels per day.

MR. PORTER: Mr. Irby, do you have any questions?

MR. IRBY: Yes, sir, just a second. Mr. Evans, you stated that, in reply to Mr. Nutter's question, that you anticipated disposal of 100 percent of the water in both the Crossroads and the Denton Fields within three months?

MR. EVANS: Yes, sir. Now that's our water in the South Denton, Shell's and Magnolia's.

MR. IRBY: Then I take it that there is no agreement between all of the operators in those pools?

MR. EVANS: In the Crossroads there is. It will be 100 percent of the field in the Crossroads. I'm sorry I caused that confusion. 100 percent in the Crossroads, we are the Chairman there. In the South Denton there will be two systems in the field, and Shell and Magnolia's system is the one that I'm reporting on, solely, there.

MR. IRBY: Is there a Chairman here of the other system?

MR. EVANS: That would be Signal, and I do not know whether they are here or not.

MR. IRBY: There are only the three operators in the pool?

MR. EVANS: Yes, sir.

MR. IRBY: And your system will take care of everything except Signal's water production?

MR. EVANS: Yes, sir.

MR. IRBY: Thank you.

MR. PORTER: Mr. Cooley.

MR. COOLEY: Mr. Evans, do you have any knowledge whether

Signal's system is complete, 100 percent operating at the present time?

MR. EVANS: Not positive. I know that they have received permission to use their proposed injection well and my understanding was that approximately a month ago they were starting installation. I can't say for sure, however, they are on that.

MR. COOLEY: Thank you.

MR. PORTER: Anyone else have a question of Mr. Evans? Mr. Utz.

MR. UTZ: Mr. Evans, how much water are you disposing of in the Bough Pool?

MR. EVANS: Right now, approximately 500 barrels per day.

MR. UTZ: Is that 100 percent?

MR. EVANS: No, sir. We have about 250 that we have just recently began producing in the field. We are picking that up, though, or we're beginning installation of further gathering system.

MR. UTZ: And the South Denton on our system how much water do you have to dispose of?

MR. EVANS: Oh, it will be in the order of 1,000 barrels per day initially for the three wells.

MR. UTZ: That's all.

MR. PORTER: Anyone else have a question of Mr. Evans? You may be excused.

(Mr. Evans excused.)

MR. PORTER: Is there a representative of the Signal Oil

and Gas Company present? The South Denton was one of the original pools under consideration; it probably accounts for inconsistency. Is there a representative of Shell present?

MR. ELKINS: My name is R. L. Elkins. I am Division Mechanical Engineer with Shell in Roswell, New Mexico. As Chairman of the Echol and Caudill salt water disposal system, I would like to report that in Shell's statement of March 13, 1958, it was reported that construction was in progress on the Echol Field system. This system was completed and placed in operation on April 18, 1958, and is currently disposing of all water from leases connected to the system, a total of 37,500 barrels of salt water has been disposed of as of June 1st, 1958. Although the Caudill Devonian Pool was not listed in the ten critical or the thirteen less critical water areas in the Commission's letter of June 3rd, 1956, the need for disposal was recognized by the companies and a disposal system is being installed.

It was reported at the March 13th hearing that injectivity tests were being made in our No. 1, a dry hole in the Caudill Field. After an expenditure of $36,000, the attempt to complete the well for subsurface disposal in the San Andres and Glorietta formations was a failure. A new design has been completed, using the Devonian in Humble's Daugherty, et al. The AFE for $5000 has been prepared and is currently being circulated to the participating companies. It appears that the cost will be $245,000, or about $14,000 per producing well, if the completion of the Daugherty well is

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successful. In view of recent statements that have appeared in the Statehouse Reporter, Shell feels it would be timely to make statements about our activities in the other ten critical fields listed. With your permission, I would like to report on those activities.

MR. PORTER: Be glad to hear it.

MR. ELKINS: In Hobbs Field, all of Shell's wells have been committed to the system which will be built by Rice Engineering, and the AFE in the matter of $120,000 has been approved for Shell's share of the system. In the Denton Field all the Shell's well have been committed to the Atlantic Refining Company system. Shell has executed the operating agreement and approved the AFE in the amount of $50,000.

Eunice-Monument, all of Shell's wells have been committed to the system, which Rice Engineering will build, and AFE in the amount of $60,000 has been approved.

In the East Caprock Field, all of Shell's produced water is being disposed of through the Amerada system, and the Saunders Field, all of Shell's wells have been committed to the Amerada system, and Shell has executed the operating agreement and AFE in the amount of $27,000; and as Amerada reported this morning, these wells are being tied in right now so we will be disposing of water in that field in the next few days.

In the remaining ten critical fields, we do not operate.

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

Mr. Irby.

MR. IRBY: Mr. Elkins, will these plans that you have dispose of 100 percent of the produced water in both the Echol and the Caudill Devonian Pool?

MR. ELKINS: No, these are two separate -- the plans we have for Caudill, it will dispose of all the water for Caudill, and there's a possibility it might handle Dean Field, too. We haven't finalized that, but if it will, we will invite them into the system too.

MR. IRBY: This 37,500 barrels you have disposed of to date in the Echol Pool, does that constitute 100 percent of the produced water in the Echol Pool?

MR. ELKINS: I believe it constitutes practically all of the water. I believe that the case is that the Texas Company hasn't tied in because they are not producing any appreciable water, any measurable water to date in that field. All the rest of the water is being disposed of in the field.

MR. IRBY: And it is anticipated that the system will take care of all the water that will be produced?

MR. ELKINS: Yes, it is. They have all agreed to come in and paid their share of the system, too; so it will include all the water in the field.

MR. IRBY: Back to the Caudill Field, did you state that the engineering plan had been accepted?

MR. ELKINS: No, sir. We are circulating our plans with

an AFE to the companies now for approval. We had to change our plans there. We tried the San Andres and Glorietta in the well, and spent $36,000 and were unable to make a disposal well, so it required picking a new well where we could go in to the Devonian at 14,000, which will cost us $105,000 more, and we are circulating those plans with AFE's for approval now.

MR. IRBY: How many operators are there in that pool?

MR. ELKINS: In the Caudill, I believe there are five.

MR. IRBY: Do you anticipate any trouble in organizing these operators under this plan?

MR. ELKINS: We had a meeting and discussed it, and they were all in agreement at the meeting . We held the meeting before we circulated the AFE, the supplemental AFE's.

MR. IRBY: Could you give me an estimate as to when this agreement might be signed, when the construction would start, and when the disposal would start?

MR. ELKINS: Without any difficulty, I would estimate that we might have an agreement signed in two to three months, and construction completed by the end of the year. The construction would start immediately after the agreement is signed up. If we can get the AFE approval, we will start it before we get our agreement signed.

MR. IRBY: Does two to three months seem like a rather long period to you after having had your agreement in an open meeting of the operators?

MR. ELKINS: No, sir, it doesn't. Those agreements have to be sent to different offices, they have to be transmitted to at least two offices and maybe three and reviewed by lawyers, and if there are any changes to be made, they come back down the line and we iron out the changes, so I don't think it is. As we give more and more of the agreements, this time for execution would be cut quite a bit. The agreements are all new to the operators in this area. Once we know what these other people want in the agreement, I think we can prepare one the first time that will be acceptable.

MR. IRBY: We will have our job done, then, won't we?

MR. ELKINS: It will be a lot easier.

MR. PORTER: Mr. Nutter.

MR. NUTTER: Did you state that the Texas Company is a party to the agreement in the Echol Pool?

MR. ELKINS: Yes, sir.

MR. NUTTER: So when their wells start making water, their water will be disposed of in that system?

MR. ELKINS: Yes, sir.

MR. NUTTER: Thank you.

MR. PORTER: Anyone else have a question? Mr. Cooley.

MR. COOLEY: Mr. Elkins, you said that you believed that construction would be completed around the first of the year in the Caudill Devonian Pool, in the absence of any unforeseeable difficulties. You meant that you would have 100 percent disposal

at that time?

MR. ELKINS: Yes, sir.

MR. COOLEY: Thank you.

MR. PORTER: Mr. Utz.

MR. UTZ: What is your disposal formation in the Echol Pool?

MR. ELKINS: It's the San Andres formation.

MR. UTZ: Is that one well?

MR. ELKINS: One well, that's right.

MR. UTZ: How much water will you have to dispose of in the Caudill?

MR. ELKINS: Around 2,000 or 2,500 barrels per day. That injection pressure has continued to increase. The pressure right now is around 1,200 pounds.

MR. UTZ: That's all I have.

MR. PORTER: Any further questions of this witness? You may be excused.

(Mr. Elkins excused.)

MR. PORTER: Who is Chairman in the Denton? Mr. Tomlinson.

MR. TOMLINSON: I am W. P. Tomlinson, representing the Atlantic Refining Company.

The Atlantic Refining Company is the operator of a field-wide salt water disposal system in the Denton Field. This statement concerns our progress toward completion of the system.

All working-interest owners in the field have executed the operating agreement. Right-of-way for the gathering system

and treating plant has been procured. Some of the pipe to be used has been received and cement lined. As of the date of preparation of this report, we are awaiting shipment of the remainder of the pipe. The contract for construction of the system has been awarded. The Atlantic Refining Company's Dickinson A-13 No. 1 has been recompleted and is ready for salt water disposal. A lost-circulation zone in the Pennsylvanian was perforated and treated with 11,000 gallons of acid. Following this work the well took water on vacuum at a rate of 10,800 barrels per day.

I think we did not get a higher test because we didn't have any more water available at the time. I think it would take a lot more.

That's all I have to report at this time.

MR. PORTER: Mr. Tomlinson, when do you estimate that you will be disposing of 100 percent of the salt water production in this pool?

MR. TOMLINSON: We're hoping to complete the system and have it in operation during the month of August, if we obtain the pipe as we're expecting, in the near future. We may already have it at this time.

MR. PORTER: But you would anticipate a completion date of somewhere in August?

MR. TOMLINSON: Yes, sir, if we have no delay in receiving the materials.

MR. PORTER: Anyone have any questions? Mr. Irby.

MR. IRBY: Will this system take care of all the water produced in the Denton Field?

MR. TOMLINSON: Yes, sir.

MR. IRBY: That's all.

MR. PORTER: Mr. Utz.

MR. UTZ: How much water is being produced in the Denton?

MR. TOMLINSON: How much has been or is being?

MR. UTZ: Is being today.

MR. TOMLINSON: I think it's in the neighborhood of 12,000 barrels per day. It will be in the immediate future in the range of 12 to 13,000, I believe, with the allowables, probably more than anybody else.

MR. UTZ: The disposal zone is the Pennsylvanian?

MR. TOMLINSON: Yes, sir.

MR. PORTER: Mr. Cooley.

MR. COOLEY: When you said that you believed the system will be completed sometime in August, you also mean it will be 100 percent effective?

MR. TOMLINSON: That is my understanding from our construction crew.

MR. PORTER: Any further questions? Anyone else have any questions of the witness? You may be excused.

(Mr. Tomlinson excused.)

MR. PORTER: At this time we will hear from Pan American.

MR. KELLEY: I'm C. L. Kelley, District Superintendent,

Pan American Petroleum Corporation, Roswell, New Mexico, with a report on the progress of salt water disposal in the Hobbs Pool.

In the progress report presented during the March, 1958 Regular Hearing, it was stated that the basic design for the Hobbs Field Salt Water Disposal System had been accepted and that a revised draft of the Operating Agreement had been mailed to the operators. This revised draft of the agreement was accepted by the operators at a meeting held in Hobbs on April 11, 1958. A complete final draft was then prepared and submitted to the operators on May 26, 1958, for execution. In order to expedite the execution of the agreement, June 25, 1958, was set as the deadline. The majority of the operators indicated verbally that the 30-day execution period was satisfactory.

The operating agreement will be in effect and preparations for construction will begin when operators, committing 225 wells, have signed the agreement. I firmly believe that the agreement will be executed by the required number of operators prior to the June 25 deadline. At such time as the agreement becomes effective, the duties of Pan American as chairman of the Hobbs Field Operators, will cease and a representative of Rice Engineering and Operating, Inc. will become the new chairman as operator of the system.

Inasmuch as this will probably be the last report presented by Pan American, we are including a brief history on the progress of salt water disposal in the Hobbs Field up to the present time.

On August 14, 1956, a meeting of all operators in South-

eastern New Mexico was held to discuss Case 1053 concerning disposal of salt water in New Mexico. In this meeting a temporary chairman was selected for each of the 10 pools considered as critical areas by the State Engineer and Commission. Pan American was selected as temporary chairman for the Hobbs Field.

An organizational meeting for the Hobbs Field Operators was held on August 24, 1956, to discuss the course of action to be taken in disposing of produced water in the Hobbs Field Area. Pan American was elected chairman of the Hobbs Field Operators and sub-committees were set up to study individual problems of designing a permanent disposal system. The sub-committees consisted of a map committee for the preparation of a base map of the field and a reservoir committee to develop realistic forecasts regarding future water production.

Operators' meetings were held on September 6 and October 9, 1956, to evaluate progress made by the two sub-committees. By the October 9th meeting the reservoir committee had completed their study of future water production for the field and a tabulation showing their estimated future maximum water production from each lease was accepted by the Operators for use in designing a disposal system. The map committee was in the process of completing the map to show the location of each tank battery and a contour of the surface. A design committee was appointed at this meeting and given the assignment of preparing the preliminary design of the disposal system.

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It was agreed that an important factor in the design would be the ability of a usable disposal formation to take the volume of water estimated to be produced in the future. Humble's and Pan American's representatives stated that they were investigating the possibility of deepening a well to the lower San Andres for disposal purposes.

By March 1957, Humble had recompleted their State A-2 as a disposal well in the lower San Andres formation. Injection tests indicated that the well would take four barrels per minute on vacuum through 2 ½" tubing.

Pan American had made application for hearing before the Commission to convert State A Tract 9,.No. 13 to a salt water disposal well and to transfer the allowable of this well to other wells in the vicinity on the same basic lease. Plans were to commence work immediately upon favorable action by the Commission. A 96-hour production test witnessed by the Commission on the proposed disposal well indicated that the well would produce an average of 19.5 barrels of oil per day. In view of the unexpected large volume of oil produced, Pan American obtained dismissal of the two cases on conversion.

At the March 11, 1957, Operators' Meeting, an operating agreement for the disposal system was presented for discussion. It was agreed that a meeting would be called at a later date to discuss various features of the agreement.

In June, 1957, Rice Engineering and Operating, Inc.,

presented a proposal to conduct a complete preliminary study and design a salt water disposal system for the Hobbs Field. This proposal was accepted by ballot from the operators on August 7, 1957, and Rice was notified to proceed with the study. By August, 1957, Pan American had drilled and completed the State A Tract 9 Salt Water Disposal Well No. 1 located in the SW/4 NW/4 of Section 15, Township 19 South, Range 36 East. During injection tests conducted on August 10, 1957, the well was indicated to have a maximum disposal capacity of 1152 barrels per hour, or 27,648 barrels per day, by gravity flow down 7-inch casing. The well was also indicated to have a capacity of 15,840 barrels per day by gravity through 3-inch tubing.

With the completion of Humble's and Pan American's disposal well, sufficient data were available to complete the basic design of a salt water disposal system. In addition, it became possible to begin disposal of produced salt water in the two disposal wells. On August 26, 1957, six Pan American Hobbs Field wells were connected to the State "A" Tract 9 SWD No. 1 for injection of salt water produced. In October, 1957, Humble commenced disposing of salt water produced from eleven of their thirteen Hobbs Field wells into their State A-2 disposal well. As of June 1, 1958, the total number of wells connected to the two disposal systems increased to 37 wells with an average injection rate of approximately 1041 barrels per day.

Rice Engineering and Operating, Inc., completed the pre-

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liminary study of salt water disposal in the Hobbs Field and submitted their design for a gathering system on November 14, 1957. There was some disagreement with the design factors used by Rice and subsequently the fieldwide system was redesigned using revised factors. This redesign was completed and presented to the Operators at a meeting held on February 14, 1958. At a meeting held on February 28, 1958, the redesigned fieldwide cooperative system was accepted by the Operators. On March 21, 1958, an Operators' Meeting was held to discuss provisions of a revised draft of the Articles of Agreement. The details of the revised provisions were satisfactorily resolved and it was agreed that a draft incorporating the accepted revisions would be distributed as soon as possible. Provisions of the revised draft were accepted by the Operators at a meeting held on April 11, 1958. A complete final draft was then prepared and submitted to the Operators on May 26, 1958, for execution. It was agreed that 30 days would be satisfactory for processing the agreement through the parties for execution. The deadline for reply is therefore June 25, 1958.

Rice's representative stated that they expect to have the trunk lines and main lateral lines installed and connected within six months after the agreement becomes effective. This would handle the major part of the water now being produced.

I was told this morning that they considered that they could complete that in six months.

MR. PORTER: Instead of the seven shown on the printed copy?

MR. KELLEY: Instead of the seven.

MR. PORTER: Anyone have any questions of Mr. Kelley? Mr. Irby.

MR. IRBY: Mr. Kelley, are all the operators in this pool expected to enter into this agreement?

MR. KELLEY: No, not all of the operators. We don't know about some of the operators. They haven't submitted their wells. We have 278 wells of the, I believe 300 is the total in the field. Some of those are not water producers, and some are light water producers, and I have information that several of the operators plan to put in evaporating systems.

MR. IRBY: This proposed system will take care of all those major producers of water?

MR. KELLEY: Of the 278 wells that were in the consideration for the contract.

MR. IRBY: I presume that the 22 remaining wells are small independents that propose to use this evaporation system?

MR. KELLEY: It is people with a small number of wells, one or two wells. As I say, several of those wells don't produce measurable water.

MR. IRBY: I would like during the noon recess to consider Mr. Kelley's paper here a little further and have the privilege of asking any questions that might come to mind after the luncheon recess, if that is agreeable with the Commission and Mr. Kelley.

MR. KELLEY: If I can answer them, I would be glad to.

MR. PORTER: Does anyone have any questions at this time? Mr. Nutter.

MR. NUTTER: Mr. Kelley, would you elaborate on that last sentence there and state what you mean in percentage by the "major part of the water being produced?"

MR. KELLEY: That would be, now, this has been planned to connect to the biggest water producing batteries first, and the system, of course, will not be completed, it's open-ended, as far as additional batteries going to be connected to it, there are some batteries that won't be committed because they are not producing water. I would say that would be all of the appreciable water production of these 278 wells.

MR. NUTTER: How many batteries are in the Hobbs Pool, do you know?

MR. KELLEY: I don't remember.

MR. NUTTER: But this would be the water from all of the batteries that are producing large volumes?

MR. KELLEY: Yes, sir. The reason I didn't say all the wells would be connected, because some of them are not producing water and it is not intended to connect them at the present time.

MR. NUTTER: Would you have any idea what the volume of water would be?

MR. KELLEY: That would not be connected?

MR. NUTTER: That would handle the major part of the water produced?

MR. KELLEY: I have been trying to recall for the last few minutes what the total water in the field is. I can't do it. I haven't used the number lately, and I can't recall it. I don't know that I understand your question. Do you mean the total volume of water that will be connected or will not?

MR. NUTTER: I was wonderning the total amount of water that you will be able to inject when this system is connected, say at the end of six months?

MR. KELLEY: All of it. All of it that the operators desire to commit to the system. The two wells now have a capacity to take more than the present production.

MR. NUTTER: When you say that Rice expects to have the trunk lines and the main lateral lines installed and connected within six months after the agreement becomes effective, you mean lateral lines to all of the batteries?

MR. KELLEY: All the batteries that are desired to connect to this.

MR. NUTTER: Which represents the 278 wells?

MR. KELLEY: That are making water, yes. I am sorry I didn't make that clear.

MR. NUTTER: Thank you.

MR. PORTER: Does anyone else have a question? At this time the hearing will recess until 1:00 P.M.

(Recess.)

AFTERNOON SESSION

MR. PORTER: The meeting will come to order, please. Are there any other reports to be given at this time in Case 1053? Mr. Irby, did you want to recall Mr. Kelley at this time?

MR. IRBY: Not at this time, and I'm not sure that I will recall Mr. Kelley. There might be one other witness that I would like to call, and that would be Mr. Bumpass of the Gulf, who reported on the Monument Eunice area.

MR. PORTER: Mr. Bumpass, would you take the stand, please?

MR. IRBY: Mr. Bumpass, it appears to me that there has been less progress made in your area than in those reported this morning. I realize that you have a large field with a great number of wells in that field. I would like very much, if you will, for you to make the comparison in the areal extent and the number of wells in the Monument area, as compared to the other fields in Lea County.

MR. BUMPASS: I will certainly try to do so, Mr. Irby. I would like to say that the number of wells that I'm going to use for comparison in the other pools, I can only make an approximation at this time, but I think it will accomplish what you desire. I may even, I might even consider some of the pools, the number of wells in the other pools, but let's just pick out one some place and we'll get started on this thing.

Well, let's just take the Hobbs, for example. I think there was around 300 wells, the terrain is relatively flat with a

gentle slope from the northwest to the southeast, and that contrasts with the Eunice-Monument area which has, I believe I used the figure of approximately 1300 wells; there was actually, I think, 1262 in Rice's report that was finalized in September of '57, and I'm certainly sure that there has been some wells completed since then. I think we would agree that 1300 is a pretty representative figure there. We have a little more than four times the wells here in this pool than we have in the Hobbs Pool. The terrain in the Eunice-Eumont-Monument Pool is quite a contrast to that in the Hobbs Pool in that it is rolling country, although the slope might be generally to the southeast, although there is a difference in the elevations over the pool. That requires somewhat of a different problem there than in one where you have a general slope in one direction. I don't offhand know how many operators are in the Hobbs Pool. If I was to guess, it would be just a guess, I would say maybe twenty, I don't know what it is. In the area that we're talking about here, for comparison, I believe the figure is somewhere in the neighborhood of thirty-five. Now that may not be all of them, but I would say that's within the top 90 some odd percent of the number of operators. There was in the planning of it, there is wide difference in variations in the amounts of water that could be produced there. You have, I believe there's five pools, Eunice-Monument, I mean the Eunice, the Monument, the Blinebry, the Monument-Paddock, and the Eumont -- I believe that's correct, five pools. It's true that the Eunice, I mean the Monument,-Blinebry and Monument-Paddock

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are very small in areal extent, whereas this whole area that we're talking about here is approximately twenty miles long, with widths ranging up to nine miles; of course, it narrows down to maybe three to four miles at the smallest extent, and let's see, I believe your question was to give a comparison with the size of this pool with the size of some other pool?

MR. IRBY: Yes, sir.

MR. BUMPASS: I have endeavored to do so. I would appreciate more direct questions, if I have not answered your question.

MR. IRBY: Well, I believe you stated previously that in your area you had approximately 50,000 acres?

MR. BUMPASS: That's true. How close that is I don't know, but I think that twenty miles by three to nine miles wide is pretty close. I checked that from the report that Rice prepared, just the areal extent.

MR. IRBY: And approximately what would be the areal extent of the Hobbs Pool which you have been discussing?

MR. BUMPASS: I might say this in answering that question, you notice I quoted 1300 and 40-acre wells comes out around 52,000 acres, but there are some wells that are twins on the same 40 acres. If we use that same line of reasoning in the Hobbs, some 300 wells and divide that by 40 acres, what is it -- about 12,000.

MR. IRBY: You mean multiply, I hope.

MR. BUMPASS: Well, I don't know. I could figure it out for you. I don't know if I can right here, but I would hazard a

guess Hobbs is about three or four miles long. I'm embarrassed, I should know, I live right there, and maybe four miles wide, but I haven't been thinking about that.

MR. IRBY: Your method of estimation is satisfactory for the information. Now is the Hobbs Pool the second largest in Lea County?

MR. BUMPASS: What do you mean, from areal extent?

MR. IRBY: Areal extent.

MR. BUMPASS: Well, sir, I wouldn't hazard a guess, or if I did say, it would just be a guess here.

MR. IRBY: Then would you say that Hobbs is second in number of wells?

MR. BUMPASS: No, I don't believe I would. I believe the Vacuum and probably the Caprock has more wells, far more wells.

MR. IRBY: What I'm trying to get at, Mr. Bumpass, is that your testimony indicates that you have accomplished about four months work in the past two years, which is shown in your Rice Engineering report. Now there's very little testimony as to what had transpired in this remaining twenty months of the two-year period.

MR. BUMPASS: Yes.

MR. IRBY: Now, I'm at a loss to understand why you have accomplished four months work and you want eighteen months more to finish, as compared to some of these other pools. I'm trying to determine if there is a comparison between another large pool

and your pool that would indicate that you need such time?

MR. BUMPASS: Well, I've tried to point out here, I'm sure I haven't done it amply and I'll try to do it again, I would like to rephrase it. When you have a small number of wells , or around 200 or 300, and your terrain is relatively flat or sloping in one direction, if you knew just exactly how much water you were going to produce now and how much later, and you could get everybody together all at one time and just make these decisions on operating agreement, engineering design, and such as that, you could get things accomplished a lot quicker than in an area -- let's say you could do it three times quicker in an area that was three times larger. When we first started out in this project here, we sent off water samples -- I'm getting into some details, but I'm trying to give you your answer. As I recall, the Commission's first mention of this matter was at an informal meeting or it was mentioned informally at a meeting on October 25, 1955. They stated in the near future the Commission would be considering salt water disposal. I think it came on the docket April, '56, and then it was continued with Mr. Spiegel's testimony, April and also May, at which time he related that he would publish a list of pools that the State Engineer felt would be critical. That list was received by the operators on, I believe June the 3rd, Commission Memo 22-56; 1956, in the month of June water samples -- we were anticipating something along this line so we sent in water samples from the various pools from the Hobbs down through the Eumont.

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That included six pools, five previously mentioned plus the Hobbs Pool. Our purpose there was to determine if these waters would be compatible, if we would have any serious corrosion from it, all of this was preliminary work. Skip along here a little bit more. I think it was in, we had the meeting of all operators and we decided which operator would be responsible for that particular project. The committee work that was done after that, in my opinion, wasn't progressing as well as it should be. Everybody was trying to do their share on each pool, there was some duplication there, some of us had to work in several pools all at one time. What I'm trying to say here is that it could possibly look like we was a long time on this, but yet if we hadn't taken the initiative to ~~x~~send off these analysis earlier than we had -- we sent them off in June and received replies from them in September, that along with bringing a professional concern in here to handle them because we wanted to speed up the operation; the fact that it took them four months there, being professional people, to make the studies and determine the amount of water that was supposed to be disposed of and predict water volumes, and there being agreement and disagreement on the volumes and further meetings by the operators to resolve the differences, and finally come up with something that was acceptable to everyone.

MR. IRBY: Let me interrupt. Rice Engineering took five months for the report and it was submitted in September of '57?

MR. BUMPASS: That is true.

MR. IRBY: Evidently you turned the work over to them in May of '57?

MR. BUMPASS: May the 13th is, I believe, when we gave them a go-ahead, after the meeting of the operators.

MR. IRBY: Prior to that date, which was more than a year after the first hearing, there was no coordinated effort at all?

MR. BUMPASS: Yes, sir, there was. We had our operating meetings and we proceeded to gather the information as best we could as to the amount of water that would be produced, the location of the tank batteries, the wells that would be usable and that the operators would have that we could use for salt water disposal. What I meant to say, there was that progress was not being made as rapidly with those meetings made up of the various operators' representatives on those committees as it could be done by a professional concern. I think you can see the advantage there in that. We might -- for example, had one or two men working on the Denton Pool at the same time, we had the same people working on the Hobbs Pool; they also worked on the Eunice-Monument Pool. They also helped in the Saunders Pool. This was with a cooperative affair, some of these others that were smaller in number, the various representatives, that is, representatives of each company that were on these committees had a part in every one of these pools. I just might use an example. We had a man that was working on the Eunice-Monument, same time he was working on the Hobbs, same time he was working on the Denton, same time he was aiding

in the Saunders, and some of the others, I don't remember them offhand, but when everyone's efforts were concentrated toward the same goal in getting this job done and to say -- if I may say this -- to say that one pool was not progressing as it should, I don't think one would say that if he knew just what I related, in that the efforts of all were progressing along at the same time. We might take for example in the Hobbs Pool; after the thorns had been, so to speak, removed from the operating agreement in the Hobbs Pool, that was readily adoptable and adaptable to the Eunice-Eumont-Monument Pool. The reason it was was because there were several operators in both pools common one to the other. When you accomplished something like that, that would be an aid in one pool, that would serve in the other. That certainly was helping toward the progress of the finalization of this matter.

MR. IRBY: Let me move on to the future now. You estimate that you will have your operating agreement in one month?

MR. BUMPASS: That's an estimate.

MR. IRBY: I don't remember your exact words, but as I took them, the plant is still in the planning stage, is that correct?

MR. BUMPASS: No, I didn't mean to leave that impression. If we can drill the disposal wells at the point we have picked, and the well will receive the water that we estimate, then the lines are ready to be laid; assuming, of course, that we had the material on hand. It's just a matter of whether or not if we drill a well

just like when we go out to drill an oil well, if we drill a dry hole our plans are changed. We think they are more or less set, sir.

MR. IRBY: Your previous statement was that you anticipated no trouble as far as the wells are concerned, that the principal problem was the gathering system and the injection system, is that correct?

MR. BUMPASS: Well, I would like to qualify that problem just a little bit. The wells, I don't think we will have any problem because there's history in Southeast New Mexico of the San Andres being very receptible to large volumes of water; as to the disposal lines being a problem, the only problem that exists there, if you want to call it a problem, if you want to call it a problem, is the time of getting them installed after we have made the disposal wells available and determined injectivity, then it is a matter of laying the lines, which is a function of time as to how much pipe can be laid.

MR. IRBY: Do you recall from Mr. Rice's report approximately the number of miles of pipe line that would be necessary for this system?

MR. BUMPASS: No, I don't. I have that report that I can refer to. I think it may be in my office. As I recall the breakdown, I am more familiar with the feet of certain size pipe.

MR. IRBY: I'd be glad to hear the feet.

MR. BUMPASS: It has been modified, I would be glad to give

you the initial. His report called for eleven disposal wells initially, with 21 ultimately, and after re-design of that system, I believe the number of disposal wells were reduced from eleven to eight. There were certain modifications of the line. I will be happy to read what the original disposal length of the lines were.

MR. IRBY: I don't want to burden this record or take up a lot of time of the Commission, but if you can get that figure quickly, I would like very much to have it.

MR. BUMPASS: Mr. Irby, shall I just read off the size and footage, would that be ample?

MR. IRBY: I would like the total number of pipe lines you are going to have to lay.

MR. BUMPASS: Well, I have here a figure of 866,050 feet. That is a total arrived at by manual addition. I would like for the record to show that, so that if I have made an error in that we can add it up by machine.

MR. IRBY: Now, is the construction of the pipe line the principal reason for requesting or estimating six months before you can inject 50 percent of the water, 12 months before you can inject 85 percent, and eighteen months before you can inject 100 percent? Is that the principal factor that is controlling your time?

MR. BUMPASS: Yes, sir, I think so. The pipe hasn't even been ordered, so the main thing is getting the pipe here and getting

it into the ground.

MR. IRBY: That is the main thing. I presume by that you mean that getting the pipe on the ground will take a major portion of the eighteen months, is that a correct assumption?

MR. BUMPASS: For the whole system, yes, sir. I think we can complete our disposal wells, I would judge this figure may be very rough, but we should be able to complete our disposal wells a month or less time, so the other factor or bottleneck is obtaining the pipe and actually putting it in, the physical work of putting it in.

MR. IRBY: Are there appreciable delays in pipe deliveries?

MR. BUMPASS: I wouldn't be qualified to answer that, Mr. Irby. I do know that I had occasion to talk with one or the cement asbestos manufacturers of pipe and they related that if that much pipe is ordered at one time, they couldn't possibly deliver it for -- I forget the length of time, but they just don't stock that much.

MR. IRBY: Most of your report this morning you gave from a paper. Did you submit a paper for the record here?

MR. BUMPASS: No, I didn't, Mr. Irby. I will be happy to do so. The reason I didn't have one prepared was that there was some slight additions to it from the time it was really prepared until the time it was given. I'll be very happy to do that.

MR. IRBY: I would appreciate receiving a copy.

MR. BUMPASS: All right.

MR. IRBY: I have no further questions of this witness.

MR. PORTER: Anyone else have a question of Mr. Bumpass? You may be excused.

(Mr. Bumpass excused.)

MR. PORTER: I believe that completes the reports by individual pools. Does anyone have a statement to make in this case?

MR. IRBY: At the March session on this case, I made the statement that I would prepare figures of an analysis, or an analysis on the figures, and I find that the figures that I desired aren't necessarily an accurate picture of the situation, due to the fact that some of the operators have been leaving blank the column "Water" on form C-115, required under Rule 1114. We have found in our field observations that some of these wells which are not reporting water are producing water. Therefore, these figures are not as significant as I had hoped they would be.

Nevertheless, they indicate a tremendous water production and show an increase in nearly all of the pools in Lea County which we have listed, they being the ten most critical, the thirteen needing attention in the very near future, and on the third sheet, several others which are producing approximately 100,000 barrels per annum or more. Now, at the bottom of each sheet, each of the first two sheets, we have entered some totals, and on the third sheet we have entered the grand total for these,

showing this definite increase.

On the fourth sheet we show the salt water production in Lea County by months for the year 1957 in these same pools mentioned before.

On the fifth sheet we show the salt water disposal by injection into disposal wells. These basic figures in this compilation are all taken from two sources, the monthly and annual reports of the New Mexico Oil and Gas Engineering Committee, and the progress reports in this case. For identification, I would like to have that marked State Engineer's Exhibit 1. I have plenty of copies here for all of the Commission to have copies and those operators who might be interested in them.

(State Engineer's Exhibit No. 1 marked for identification.)

I would call the Commission's attention to the fact that in the beginning the State Engineer's request that the Commission promulgate rules and regulations for the disposal of salt water covered all of Lea County.

MR. PORTER: Mr. Irby, just a minute, are those available for all the committee chairmen, at least?

MR. IRBY: Yes. I would like to call the Commission's attention to the fact that at the beginning of this case, the State Engineer requested that the Commission look into brine or salt water disposal in all of Lea County, and listed, I believe, some 153 pools in Lea County. The exhibits that were submitted in the original

hearing in May of 1956 included one showing the water production summary of Lea County, New Mexico. Immediately following this meeting, a member of the State Engineer's staff submitted to the Commission the names of the twenty-five pools considered most critical. These were broken down and ten were named as very critical, needing immediate attention. Twenty-three were listed as needing attention in the very near future.

Now we have today received reports on the ten most critical. Some of these have made very good progress, and we of the State Engineer's office are fully satisfied in certain instances. There are others we feel have exerted a limited, if not a minimum, effort in disposing of this problem. There have been no reports from any of the thirteen which needed attention in the very near future; and I don't think that anyone will define the very near future as two years or more. In fact, it is my opinion, and I think it might well be that of the Commission, that there should be reports on all of the 153 pools listed in this exhibit in the original hearing as producing water, which might through surface disposal contaminate the fresh water supplies of Lea County.

I would like to read into the record a very short statement from a report on an examination of the problem of surface disposal of relatively fresh water from oil producing areas. This report is prepared by the Salt Water Disposal Working Committee, Inter-Provincial Petroleum and Natural Gas Association, a Canadian organization. There are two short excerpts from this, the first is

on page 8 under Evaporation. "Most so-called evaporation ponds are too small in surface area to have much value for purposes of evaporation. Solar evaporation depends on several unstable factors, such as air temperature, temperature of water, surface wind movement, and humidity. Except in certain special regions, evaporation and condensation nearly compensate for each other in summer months. In winter months the depletion of water from ponds by evaporation is negligible. There are not many times during the year when solar evaporation factors are conducive to high evaporation rates. In any case, solar evaporation is ineffective, as only pure water is drawn off as a vapor and more concentrated brine is left behind. In evaporation ponds, water loss is far greater through downward seepage than by surface evaporation."

We realize fully there are different climatological conditions existing in the country in which this report was written. I want to stress, and I want to impress on your minds the one thought here, and that is that the evaporation of water does not help the situation unless the pit is impervious. The salt remains there to be carried down by any future water that is deposited in that pond.

The other brief excerpt is on page 10 of this report. This is not for my case particularly, but I think it's a thought that should be before the Commission. "Regulatory authorities should consider each field as a separate problem and do all they can within reason to keep the small fields producing so that the

reserves can be removed and recovered."

Now we have this same problem of these small wells, I believe you normally call them strippers, and this disposal problem is quite a problem for those people operating those wells. I have recently had two operators who have very few wells call on me to discuss some means of disposing of this water, other than this method of injections into the earth, which they consider quite expensive for their small operations.

It is not the intention of the State Engineer, in spite of all of the reports that we have read, to preclude disposal by evaporation. I have in mind a statement made in another report. It was made by Arve H. Dohl, who is with the U. S. Department of Health, Education, and Welfare. He presented a paper to the conference on Water Quality Control for Subsurface Injection in December, 1956, at the University of Oklahoma, in which he stated: "Subsurface injection for disposal of brine and waste water is the only acceptable method that has been developed."

As I have previously stated, our office is not in full agreement with that statement. We believe that there is a line that can be drawn between the heavy producers and the lighter producers, which will permit the lighter producers to dispose of their brines by evaporative methods.

I want to go back now to the reports, briefly, by Mr. Bumpass. I think the Commission should take special note that this was first brought to the attention of the operators in October,

1955; that it was actually pitched in their lap in April of 1956; that on this particular report no definite progress was shown until September of 1957, at which time Rice Engineering submitted their report to the operators in the Monument area; that it has now been many months since this report was submitted. To date, the cooperative agreement has not been signed, although they expect it within thirty days; that they expect no more than 50 percent of the salt water in this field to be disposed of in six months, no more than 85 percent in one year, and they expect it to take eighteen months before they will be able to dispose of 100 percent.

I am using this, not to single out Mr. Bumpass or his company or his area, but because it appears on the face of it that the least progress has been made here. I don't know what the Commission will rule, but it is my personal opinion that the problem in the Eunice-Monument-Eumont area has not been diligently pursued. I feel that there are others which have not been diligently pursued, and it is evident on the face of the reports that very little, if any, diligence has been shown in those pools other than the ten most critical.

As I stated at the last session of this hearing, there are several who have made some progress which we are aware of only by their submission of applications for disposal wells. We have no reports whatever on them. We have no reports on the thirteen second critical list. I think it behooves the Commission to demand reports of all of these operators, and to demand reports of those

who are not in the cooperative agreements in instances such as Mr. Kelley related in the Hobbs pool. There is an excellent probability that these people are doing some planning and possibly even some work, but there is nothing before me or before this Commission to indicate that anything whatsoever has been done in the more than two years that they have had the problem before them.

For the various reasons that I have stated, I move that the Commission enter an order at this time prohibiting the production from any well whose operator has not shown diligence in the planning or construction of means by which he may dispose of the brines which are contaminating the fresh waters of Lea County.

Thank you, gentlemen.

MR. PORTER: Mr. Buell.

MR. BUELL: If it please the Commission, Guy Buell for Pan American Petroleum Corporation.

In my opinion, listening to those reports here today, we have either seen, one, complete success of a project, or, two, substantial progress. I realize that Mr. Irby is sincere in his request, but I'm afraid that he doesn't completely understand the tremendous complexities that we have been faced with in some of these pools in Lea County. Frankly, in my opinion, any type of a shut-in order at this time in any pool where a cooperative program is almost complete will completely scuttle the cooperative program, because each individual operator will immediately start on a crash program, a frantic program to get his water in the ground so that

he can produce his oil and make money on his wells.

I urge, based on these reports here today, that the Commission continue this case for six months.

MR. PORTER: Mr. Irby.

MR. IRBY: In reply to the statement, I would like to say, or to reiterate, that my motion goes to diligence in planning or construction.

MR. PORTER: Anyone else have anything to say concerning the motion before the Commission?

MR. COOLEY: Mr. Irby, on the record, as has been presented thus far in the case today, I don't believe that it will reveal that there is any company that has failed to exhibit diligence in either planning, constructing, or operating any of the various projects that were reported on here today. Could you elucidate somewhat on what you mean by having shown diligence?

MR. IRBY: I think possibly my line of questioning to Mr. Bumpass would indicate my thinking on diligence. For example, they have spent some two years on four months' effort -- not four months' effort, but four months'accomplishment. It is my personal opinion that if a person takes two years to accomplish what should have been, or what may have been done in four months, that he definitely isn't showing diligence.

MR. COOLEY: What I'm getting at is pointing to a particular operator. I don't believe that simply because one company happens to be selected as chairman that they should be responsible for the

laxness, possibly, or the failure of the other operators in the pool.

MR. IRBY: Certainly not.

MR. MORGAN: I think the counsel is supposed to ask questions and not express the opinion of this Commission.

MR. COOLEY: I'm trying to determine if there is anything in the record that would point to a single operator or anything that could be put in the record.

MR. MORGAN: Ask him, don't express your opinion on it.

MR. IRBY: In the case of the Monument area, I'm talking about the people in the cooperative pool, and I believe that it was stated that all companies are included, all operators in the pool are included or expected to be included in the agreement when it is signed. The fact that the agreement isn't signed even after two years indicates that there has been very little coordinated effort between -- now, it's impossible for me, not having attended their meetings, to say who is dragging his feet and who is trying to push the thing along. I don't feel that it is one of my duties or even my prerogative to inquire into such a thing. I think that is a function of the Commission.

MR. COOLEY: Thank you.

MR. PORTER: Mr. Irby, we had the last progress report three months ago, at which time we had several reports to what we had today. Do you think that the various reports today have indicated that there has been a lack of diligence since the last progress

report?

MR. IRBY: On the part of those reporting today, and that includes each operator within the scope of each report, it is my opinion that there has been more diligence shown in the last ninety days than there has been in any like previous period.

MR. PORTER: Thank you. We'll have a very short recess.

(Recess.)

MR. PORTER: The Commission will overrule the motions for continuance in this case; if anyone has any further testimony to present, they can do so at this time.

MR. BUELL: Guy Buell, for Pan American Petroleum. We have some brief factual data and testimony we would like to present. I estimate it would take us about thirty minutes, if we could have a minute or two recess to get our exhibits up.

MR. COOLEY: What will be the nature of the testimony?

MR. BUELL: The testimony will summarize factual data available to us which, frankly, in my opinion, conclusively shows that there is no contamination of fresh water by salt water in the area of our data in the Hobbs Pool and the Wilson Pool, which are two of the ten heaviest water producers on the State Engineer's list.

MR. PORTER: We will have a five-minute recess.

(Recess.)

MR. PORTER: The Commission has decided on its own to continue this case until the regular September hearing, and in the

meantime a formal order of continuance will be issued as soon as possible.

MR. BUELL: May we have a two or three minute recess to take our exhibits down?

(Recess.)

* * * * * * * * *

C E R T I F I C A T E

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 1st day of July, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1959.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 14, 1957

TRANSCRIPT OF HEARING

Case No. 1053

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE - SANTE FE
3-6691 2-2211

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 14, 1957

IN THE MATTER OF:

Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

Case No. 1053

BEFORE:

Honorable Edwin L. Mechem
Mr. A. L. Porter
Mr. Murray Morgan

TRANSCRIPT OF HEARING

MR. PORTER: The Commission will consider the next case, No. 1053.

MR. BUSHNELL: H. D. Bushnell, attorney with Amerada. Amerada is prepared to make a statement concerning the disposal system in progress in the four fields. I understand there may be some other operators who are ready to give reports. If you will like, I would like the Amerada engineer to give his report and then the other operators can give their reports at the end of which I would like to make a further statement, or make a motion.

MR. PORTER: Just one moment, Mr. Bushnell. Mr. Christie, were you named as General Chairman of this?

MR. CHRISTIE: Actually, Mr. Porter, the Committee was never organized as such. We just acted as temporary chairman and no permanent chairman was ever appointed so far as I know. We more or less just took the lead in order to get the thing started.

MR. PORTER: Mr. Bushnell, you may proceed with your roll call.

MR. BUSHNELL: I will ask Bill Abbott to make his report on that.

MR. ABBOTT: W. G. Abbott with Amerada at Monument.

The first pool we are operating a salt water disposal system, is the Bagley. In that pool the operating agreement has been signed, all materials are on location, that is (a) six and eight inch Asbestos/cement pipe, (b) three and four inch steel pipe, and we have had that steel pipe cement lined, and at the present time they're wrapping that steel pipe. Our precipitator is on location. We have permission, granted by the Commission Order R-942, to convert our Amerada State BT"D" No. 4 to salt water disposal in the Bagley Pennsylvanian from 9045 to 9230. The contract on the disposal system has been let and the construction will start, the actual digging of the ditch and laying the pipe, within ten days.

The next system that we will operate will be the East Caprock Salt Water Disposal System. The operating agreement on East Caprock

has been circulated but it has not been signed by all the operators. We have all the materials on location, six and eight inch asbestos cement pipe, the three and four inch steel pipe which we have had the cement lined, and we also have on location a Triplex pump and gas engine. Permission has been granted by the Commission Order R-886 to convert the Amerada Posey "A" No. 2 to a salt water disposal system, or disposal well in the Dewey Lake zone from 1300' to 1450'. Actual work on that system will start as soon as this agreement has been signed.

The next system that we want to operate will be the Saunders Salt Water Disposal System. No operating agreement or AFE has been circulated yet on Saunders. We are waiting to submit our operating agreement on Saunders pending the discussion on similar agreements from the other operators that we have submitted on this Bagley and East Caprock Salt Water Disposal System. We have at Saunders all the materials on location. Permission has been granted by Commission Order R-951 to convert our State S"C" No. 5 to salt water disposal well in the Pennsylvanian zone from 9820' to 10,065'. We have also had a hearing to obtain permission to convert the State S"G" No. 1 to a salt water disposal well in the San Andres zone, but we haven't gotten the order on that yet.

The fourth system that we are working on is the Monument Salt Water Disposal System. That is in the committee stage. We have organized two work committees and we are gathering information

on this system. The two committees are the Map Committee and the Design Committee. We held our last meeting in Hobbs, February 12, 1957. There was suggested at this meeting by Amerada that as this disposal area is so large, there is 660 wells in this system, that various independent segments might be more practical than one common disposal system. But as yet we are still working on it. Thank you.

MR. PORTER: Thank you, Mr. Abbott. Do we have other pool chairmen?

MR.LEACH: W. H.Leach with Magnolia in Tatum.
We would like to report on progress in the Bough and Crossroads Field. In the Bough Magnolia requested permission to dispose of salt water into T. Betenbough Well #2 (temporarily abandoned well in Section 12, Township 9-South, Range 35-East) Lea County, in a hearing held before the New Mexico Oil Conservation Commission on January 17, 1957 (case 1194). As there were no protests to this request, commission approval was granted on February 14, 1957. Previous injection tests on this well indicated it was capable of handling 4,300 barrels of water per day at zero surface pressure. This is approximately equal to two and one half times the anticipated water production rate for the subject field.

Regarding progress on the proposed disposal system, plans for this system have been formulated and are now in the hands of Magnolia's Civil Engineering Department for final design and checking. It is therefore anticipated that installation of the proposed

system can be initiated in the near future.

Mr. J. R. Sharp, the only other operator in the Bough Field has been contacted in regard to his participation in the proposed system. He indicated his willingness to work out an equitable agreement with Magnolia for disposing of his produced water. Mr. Sharp will therefore be contacted and an agreement made with him, prior to injecting any water.

Crossroads Field: In a letter dated January 24, 1957, Magnolia made application to the New Mexico Oil Conservation Commission for permission to dispose of salt water into Santa Fe Pacific "C" Well #2 (temporarily abandoned well located in Section 26, Township 9-South, Range 36-East) Lea County. The proposed injection zone, the San Andres formation, is not productive of oil and/or gas within a radius of 2 miles of the proposed salt water disposal well. The proposed use of said well was agreed to by the landowner, Mr. U. D. Sawyer, in a letter dated January 29, 1957, to Magnolia's Land Department, Roswell, New Mexico. As no protests to Magnolia's petition have been heard, as of this date, it is presumed that approval of the request will be received shortly.

Injectivity tests have been conducted recently on the Santa Fe Pacific "C" No. 2, to ascertain more definitely exactly what volume of water the well can handle. Because these tests revealed the well could handle only moderate volumes in its former condition, the well was cleaned out and sand pumped to increase its

capacity. As the clean out operation has only recently been concluded, the actual effectiveness of it has not been determined as of this date. During these testing and clean out operations, Magnolia's Santa Fe Pacific "C" No. 1 Well, a sizeable (950 barrels per day) water producing well, has been produced only at those times when the facilities were available to dispose of the produced salt well.

As to the proposed disposal system, detailed designes of the gathering system and injection plant facilities have been drawn up and submitted to Magnolia's Lea District Office for approval. When approval has been received, the other Crossroads Field Operators will be contacted in order that a plan for participating in the proposed system may be formulated.

MR. MALONE: If it please the Commission, Ross Malone for Gulf. Gulf was for the Eunice-Eumont Pool. W. R. Eddington of Gulf, Hobbs Office, is Chairman and will report.

MR. EDDINGTON: W. R. Eddington, Gulf Oil. The Eunice-Eumont area with its great number of wells, many operators and its relatively rugged terrain, presents an enormous problem of salt water disposal. However, work has progressed satisfactorily and is on schedule. The two work committees formed by the committees have been active. The Training Committee has completed its work and is preparing its final report. The Design Committee has met weekly for the past five or six weeks and has layed on the base map

to serve 75 percent of the Eunice Field after consideration has been given to the use. No operating agreement has as yet been circulated to the operators, due to the fact that the Committee has been giving consideration to a suggestion to divide the Eunice Field into several separate disposal systems, each with a different operator, and consequently each having a different operating agreement. A meeting of the operators will be held in the near future to handle this problem.

MR. KELLEY: I am C. L. Kelley, Pan American Petroleum Corporation, reporting for the Hobbs Field Operators the progress of salt water disposal in the Hobbs Field.

The last report was made on December 13, 1956 in which it was stated that assignments to the Map Committee and the Reservoir Engineering Committee had been completed. The Design Committee had been temporarily suspended pending collection of data on zones suitable for disposal, quantity of water the zones would take and pressures required.

At the time of the December 13 hearing Humble had announced plans to immediately begin work on deepening their State "A" Well No. 2 in the SE/4, Township 18 South, Range 38 East and to convert to salt water disposal. Also on December 13, Pan American's management had approved abandoning a low productivity oil well and converting it to a disposal well. At that time we were negotiating for right of way. Since the December hearing, Humble's well has been deepened from 4250 to 4753 and 5" casing was set at total

depth and cemented with 1200 sacks. After perforating two intervals between 4565 and 4735 and acidizing with 1,000 gallons, Humble's well took water under vacuum at a rate of 4 barrels per minute. Pan American has completed negotiations with surface owners for rights-of-way to serve salt water gathering systems for its State "A" Tract 9 Well No. 13. In addition, Pan American has two cases on today's docket for conversion of its State "A" Tract 9 Well No. 13 to salt water disposal well and transfer of its present allowable to other wells.

Subsequent to the application it was found that the productivity of the well is such that continued operation would be so highly profitable that abandonment of the well and transfer of the allowable could not be justified. We plan to ask that the two cases be dismissed, but Pan American plans to immediately select another well for conversion or to drill a new well for salt water disposal. Work on the selection of the substitute well should be completed today (March 14, 1957) and our management asked to authorize the necessary funds in case a new well is necessary. We anticipate no delay on this authorization because funds have been budgeted for the project and the main thing now is to show that the course we select is the best in the long run.

As to right of way work that was done relative to State "A" Tract 9 Well No. 13, we are of the opinion that the time spent in securing the rights-of-way will not be wasted and that the work will not have to be re-done because routes to the substitute well will be generally over the lands of the same surface owners regardless of where the well is located. The agreements so far have left the exact routing of the lines open.

In addition to the above work, Pan American has circulated for approval of the various companies an operating agreement which will apply to a fieldwide salt water disposal system.

A meeting of the Operating Committee was held on March 11. At that time the operating agreement was reviewed, that agreement was circulated March 1st, 1957.

MR. PORTER: Thank you, Mr. Kelley.

MR. MONTGOMERY: J. W. Montgomery, Shell Oil Company, Hobbs, reporting on the Echol Devonian Pool.

At a meeting of the operators in the Echol Devonian Pool in August 1956, Shell Oil Company was chosen to assume the responsibility of directing salt water disposal efforts and to design a system to be presented to the other three operators.

In January 1957, a plan for semi-gravity, semi-pressured gathering system disposing by gravity into the open hole Pennsylvanian formation in the dry and abandoned Texas Company's State AW-1 well was presented through the mail to the operators in the Echol Devonian Pool. This proposal and a Texas Company proposal, calling for disposal into the Dewey Lake formation in Shell's junked and abandoned State A-2 well, were discussed at a second operators meeting on February 21, 1957. At this meeting, an engineering committee was formed to investigate again all disposal possibilities in the Echols Devonian Pool.

The engineering committee met on March 6, 1957, and recommended that The Texas Company's State AW-1 well be cleaned out and tested for disposal into the San Andres formation. A proposed operating agreement, which had been presented at the previous meeting, was discussed and minor changes recommended.

Shell Oil Company, as chairman of the engineering committee, agreed to prepare and circulate the revised operating agreement and the cost estimates for testing the San Andres formation and for

installing a complete system for disposal into the San Andres formation in State AW-1.

MR. PORTER: Thank you, Mr. Montgomery.

MR. TOMLINSON: W. P. Tomlinson for Atlantic.

Atlantic is chairman of the group of operators planning to initiate salt water disposal in the Denton Field. In connection with this, the following has been accomplished: A zone in the permanent Poe Pennsylvanian has been selected for salt water disposal. A gathering system has been designed, a disposal well has been tentatively selected. The operators have reviewed a draft of a proposed operating agreement. Discussions concerning salt water disposal are being conducted with the royalty owners for the tentatively selected disposal well. The last item is, at present, holding up the other. When we are through talking to the royalty owners in that area, I feel we'll be able to go ahead.

MR. PORTER: Thank you, Mr. Tomlinson.

MR. WADE: H. N. Wade with The Texas Company reporting on Moor Devonian Field. Three operators to Moor Devonian have discussed the proposed salt water disposal system for the field on several occasions since the last report to the Commission. These discussions included an operator's meeting February 13, 1957. It was initially planned to dispose of the salt water for a well previously drilled for oil production on one of The Texas Company's leases. It developed this would not be feasible. Tentative agreement

has been reached by parties to drill a salt water disposal on The Texas Company State of New Mexico NN lease located in the southwest quarter of Section 25, Township 11 south, Range 32 east. This well will be so located as to permit the installation of a gravity disposal system with injection into the Dewey Lake. An operating agreement is being prepared by The Texas Company for submission to the other interested operators in this field.

MR. PORTER: Thank you. Do we have other reports? Mr. Mankin.

MR. MANKIN: I'd like to add to the reports that have been given, Incidently of all the ten fields, this is the complete report we had requested previously. I would like to state in connection with Amerada's report, that an order has just been ordered, Order R-955 for Amerada State S"G" No. 1, which will supplement the report that Mr. Abbott just gave for the Saunders Pool. That is a supplemental well. I would like to supplement that in the Magnolia report for the Bough Pool, that Order R-950 was issued for that Betenbough Well No. 2, Magnolia's.

I would like also to state in the Crossroads Pools that the first administrative order issued as amendment to Rule 701 was issued to the particular well which was a salt water disposal Order No. 1 for the Santa Fe Pacific No. 1.

In addition to these ten fields we have likewise issued an administrative order for salt water disposal well in a pool which

was not in these ten pools which was the North Gradolia Devonian Pool for Ralph Lowe, a recent development likewise. It would be, appear these projects are favorably proceeding and should be given proper consideration.

MR. PORTER: Thank you, Mr. Mankin.

MR. MANKIN: I believe Mr. Yates is also here from State Engineer's Office.

MR. PORTER: Mr. Bushnell, did you have something further?

MR. BUSHNELL: Since it would appear that some of these systems will be in operation within the next six months, I would like to move that we continue this case for six months, at which time the operators will again be asked to give reports of the status of their systems.

MR. PORTER: Mr. Bushnell, before we rule on your motion I would like to hear from Mr. Yates, who is a representative of the State Engineer's Office.

MR. YATES: The State Engineer has no objection to the continuance for six months.

MR. PORTER: Thank you, Mr. Yates.

MR. BARINEAU: I am L. R. Barineau with Sun Oil Company. I had a specific statement in connection with our company which had to do with Cases 1217, 1218, which I understand that Mr. Kelley has planned to drop now, is that correct?

MR. KELLEY: That is correct.

MR. BARNEAU: In connection with the continuance, it is a feeling that no weight should be given to transfer of a well that is converted for salt water disposal. We feel that such transfers would lead to abuses and inequities in the manner of proper handling of the salt water in the various fields.

MR. PORTER: Is there any objection to Mr. Bushnell's motion for a six months' continuance of this case?

As most of you know, this case was first called for April 18 of 1956, and continued to May 16, when we received extensive testimony from the representatives of the State Engineer's Office as to the danger of fresh water contamination and salt water disposal. Again the case was continued to September the 13th when we heard some very satisfactory progress reports, and continued the case again to December 13 when we received more progress reports.

It is the decision of the commission that the case will be continued for a six months' period. It will be heard again at the regular hearing six months from this month.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, 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 day of 1957.

Notary Public-Court Reporter

My commission expires:

June 19, 1959.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 13, 1956

IN THE MATTER OF:

Case No. 1053

TRANSCRIPT OF PROCEEDINGS

DEARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6691
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 13, 1956

IN THE MATTER OF:

Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh water bearing horizons in Lea County New Mexico.

Case No.1053
(Continued)

BEFORE:

Mr. E. S. (Johnny) Walker
Mr. A. L. Porter

TRANSCRIPT OF HEARING

MR. PORTER: The meeting will come to order, please. The case to be considered at this time is Number 1053.

MR. COOLEY: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

MR. PORTER: You remember this case came on May 16th, at which time we heard testimony from the State Engineer's Office, and had requests for continuation from some of the operators. We continued the case to this date, September 13th, and at that time instructed the operators that we would entertain progress reports at this hearing. I understand that there have been many meetings held, conferences, and we have Mr. R. S. Christie of Amerada to make a statement at this time.

MR. CHRISTIE. This statement, if the Commission please, is made primarily for two reasons. First, to initiate proceedings in this case, and, secondly, perhaps in the interest of saving some time, the statement is as follows:

The New Mexico Oil Conservation Commission, on May 16, 1956, under Case Number 1053, heard evidence by representative from the office of the State Water Engineer, concerning the possibility of pollution of fresh water by surface disposal water produced with oil. Subsequent to the hearing, the Oil Conservation Commission sent out a list of producing fields, where, according to the State Water Engineer, sub-surface disposal of oil field water should be considered; ten of which were classified by him as requiring immediate action.

In order to formulate definite plans and further reduce as much duplication of planning as possible, a meeting of all operators was held in Hobbs on August 14th, to discuss the following phases of the overall problem:

1. The necessity, or urgency of disposing of water produced in the fields listed, particularly, the ten designated by the State

Water Engineer as requiring immediate action.

2. Procedure which will lead to plans for disposal of water from each field that will avoid duplication facilities.

3. Plans for gathering information and report progress to the Oil Conservation Commission when Case Number 1053 is called on September 13th.

4. Any other phase of the disposal problem.

The interest in the problem was evidenced by the fact that 41 companies were represented at this meeting. The majority of the operators agreed that the sub-surface disposal of produced oil field water should be done where necessary, practical and feasible, in the light of all conditions. As a direct result of the meeting, chairmen of Committees for the ten fields designated as requiring immediate action were appointed. The meetings have been held on all fields and studies are in progress toward a solution of the problem in as expedient a manner as it is practical to do so. A meeting of the chairmen was held on September 7th to review the progress made to date. The chairmen, or their representatives are here today to make their reports to this Commission.

In connection with the overall problem there are certain pertinent facts that are herein presented for the Oil Conservation Commission's consideration. First, sufficient time should be allowed for a thorough study, and after the study, permit a reasonable time for the installation of the system. For example, in some of the larger fields, the expenditures would be of sufficient magnitude to require budgeting on the part of some of the companies. Then, too, if orders for all the pipe necessary for all projects

were placed, immediate delivery may be slower than we can anticipate. In a report on one of our fields, you will find that pipe is not available immediately. It is pointed out that an estimated cost of disposing of water in these first ten fields will be between 3½ to 5 million dollars. Added to this, of course, is an operating cost which will vary from a few mills to several cents per barrel depending on the amount of water to be disposed of and the type of system necessary.

The Commission should not exclude entirely the possibility of disposal in the Triassic beds. There are places where this might be done without damaging effect, therefore the Commission should keep an open mind in the matter.

And finally, the State Water Engineer and the Oil Conservation Commission should be patient and not expect too much to be accomplished in a short time to the detriment of the most efficient and economical disposal system for each pool. The operators are working diligently and are serious in their attempts to comply with the requests of the State Water Engineer and the Oil Conservation Commission.. It is the opinion of the operators that this program can be carried out without the necessity of additional rules and regulations.

That is the end of the statement. Amerada has assumed the chairmanship of four of the ten fields that were designated by the Commission. Those are the Bagley Field, the East Caprock, and the Monument portion of the Eunice-Monument Field, and the Saunders. Mr. W. G. Abbott is the chairman of the committees for those pools, but he was unable to be here today, and Mr. Blackwood will substi-

tute in his place. I will introduce Mr. Blackwood to you now.

MR. PORTER: Thank you, Mr. Christie. Mr. Blackwood?

J. C. B L A C K W O O D ,

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

DIRECT EXAMINATION

MR. BLACKWOOD: The Monument portion of the Eunice-Monument area, the operators for this area met in Hobbs, August 16, 1956, to initiate the discussion of salt water disposal. The area includes the Monument Pool, that portion of the Eumont Pool overlying Monument; the Monument Blinebry and Monument Paddock Pools. In this area there is approximately 20,000 barrels per day of water being produced. The representatives of 13 of the larger operators in their meeting agreed that there was some danger of contamination of fresh water by the produced oil field brine, and that there was need for immediate action, and that plans should be made for the proper disposal of the salt water.

Provisions were made for the gathering of information required to include a topographic map of the area, information on wells available for use as disposal wells, cost estimates of the construction and disposal, and information as to the amount of water being produced and expected to be produced.

The Committee will meet again to assimilate that data within about two weeks.

For East Caprock-Devonian Pool, all operators met on August 17th to discuss salt water disposal in that pool. The pool has a total of 24 wells producing a reported 4,725 barrels per day of salt water.

The representatives of the operators agreed that there was some danger of pollution of fresh water in the area and that sub-surface disposal should be considered.

Since that time Amerada Petroleum Corporation has prepared a disposal well and tested the possibility of injecting water into the Dewey Lake Formation and since that time has made application and the hearing has been held by the Oil Conservation Commission on September 6th, where permission to use the well for disposal purposes was asked. It is planned that a cooperative salt water gathering and disposal system will be constructed in the field to handle all of the water produced from all wells in the pool. The pipe required for the disposal system has now been ordered. The pipe is expected to be delivered during the months of October and November, so that it should all be on hand by about the first of December, this year. We are now preparing orders for a pump, engine and other equipment needed for the disposal system.

For the Bagley Field, it covers two pools, the Bagley-Siluro-Devonian and the Bagley Pennsylvanian. There are a total of 37 wells producing a reported 5,945 barrels of salt water per day. There are only two operators concerned in the field at present. Discussions have been held between these two operators and the plans for a cooperative disposal system to handle water from all wells in both pools have been drawn. The pipe required for such a system is on order and is expected to be delivered during October and November of this year.

For the Saunders Pool, there are 54 wells producing a reported 2,304 barrels of water per day. Representatives of the operators

met on August 23rd, and in discussion of the disposal problem, they agreed that there was some danger of fresh water pollution by salt water, and that sub-surface disposal should be considered and planned on. Since that time a test has been made on water injection into the San Andres Formation. It appears that this formation is suitable for disposal and can be used with not too much expense. The pipe for a disposal system for the Saunders Pool has been ordered, and it, too is expected to be delivered during the months of October and November of this year. I believe that's all I have.

MR. PORTER: Thank you, Mr. Blackwood. Unless someone has a question of Mr. Blackwood he may be excused.

MR. MANKIN: Yes, I have a question of Mr. Blackwood.

CROSS EXAMINATION

By MR. MANKIN:

Q You indicated in the Bagley Pool the pipe has been ordered. Has there been a definite well selected for disposal?

A We have one in mind. It hasn't been agreed on by the other operators.

Q That will be the subject possibly, of a future hearing?

A Yes.

Q The same way in the Saunders?

A Yes, that is right.

Q Did you consider the same thing in the Caprock-Devonian of a possible disposal well, has a well been selected there?

A Yes, it has. That was the one in which we had the hearing before the Commission for permission to use the well.

Q The only other question is, in the Monument Pool there has

been one approval of the salt water disposal well on the Matthew. Will that be considered in the disposal problem?

A Yes.

Q It will be a portion of the problem?

A Yes, No agreement has been worked out with Gulf as to whether that will be used as a portion of the cooperative system, or whether they will use it for their own disposal. That hasn't definitely been agreed upon.

MR. MANKIN: That is right.

MR. PORTER: Mr. Irby?

By MR. IRBY:

Q What formation would the brines be injected into in the Bagley Pool? I didn't get that.

A Well, I didn't say. Actually at present we have considered several possibilities, both the producing formation, a Pennsylvanian formation and the Dewey Lake formation. It appears at the present time that the Pennsylvanian formation is the number one choice.

Q The Caprock was the Dewey Lake?

A Dewey Lake, yes.

Q Saunders was the San Andres?

A Yes.

Q The Monument, did you state which formation that would go into?

A I didn't state that. The well tnat Gulf has applied for approval on was to be, tne water was to be injected into the lower portion of tne San Andres formation, below the oil-water contact.

MR. IRBY: Thank you.

MR. PORTER: Anyone else have a question of Mr. Blackwood? You may be excused.

(Witness excused.)

MR. PORTER: Could we have a report at this time from the chairman of the Hobbs Pool?

MR. SMITH: J. K. Smith. Mr. Kelley is chairman of that Committee, and he has a statement to make. However, at this time I would like to inquire of the Commission if they intend to, or would consider an application to continue the hearing for another three months to see what further progress has been made? I would like to state that I think considerable progress has been made. The problem is a serious one from the standpoint of the size of the disposal, particularly in the Hobbs Field. I would like to ask the Commission if they are going to consider continuing it to a further date, that Stanolind at this time will not put in certain evidence we desire to put in in the event that the Commission should see fit to give an order requiring the injection of salt water. Our investigation has led us to the conclusion that our operations may have shown some possibility of contamination. We don't want to leave the impression that we sound so acquiescence, or that we do admit contamination. With that statement I would like to complete my statement and would like to know if the Commission will continue the case for three months?

MR. PORTER: We will withhold a decision on your request at this time.

C. L. KELLEY,

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

MR. KELLEY: C. I. Kelley, Stanolind Gas Company. On August 24th, the meeting of the oil producers in the oil field was held at the Commission office in Hobbs, with 19 of the operators present, representing 264 of the 287 wells in the field. At that meeting Stanolind was elected chairman of the group and it was agreed that studies would be made to determine the feasibility of a cooperative salt water injection system for the Hobbs Field.

The first work done at that meeting was the appointment of two committees, one was a map committee which was assigned the job of checking, revising the base map from which all the work will be done; second, to prepare a topographic map of the field. Also there was a reservoir committee appointed and their assignment -- They had four assignments. One was to accumulate and screen the reports of the operators as to their predicted water production. Second, was to prepare rate versus time water production predictions for those operators that didn't have a staff to do that work themselves. Third, was to furnish the water production figures to the Hobbs Field operators, and further to select a suitable disposal zone or zones.

The operators met again on the 6th, and at that time the reservoir committee -- Well, the map committee reported that they had finished the base map and it is now in the hands of a draftsman, being prepared for reproduction for use in preparing topographic maps. The reservoir committee reported that on that date, approximately, 25 percent of the predictions had been made as to the water to be produced. Since then other predictions have been made to the point that that part of it we estimate approximately 50 percent complete.

The reservoir committee is to meet again on the 21st of this month, at which time it is believed that all of the predictions of water production will be in, and at which time they will go over all those predictions and put them in form to furnish to the operators who will meet immediately after that meeting, within the next very few days. As soon as that committee reports, then a design committee will be appointed to design a system to conform with the recommendations as to a disposal zone, and with the topographic maps and the map of the city, there, it is going to be quite a problem of laying out any problem in the city.

MR. GURLEY: What was the date your committee was to report?

A The 21st of this month. There is one thing we feel should be recognized, that is, the people working on these committees almost all of them are working on the other nine committees that are making the studies. We are going to expedite it all we possibly can, but there is going to be some delay, due to people having so many committees to work on. That concludes the report for the Hobbs Field.

MR. PORTER: Any questions of Mr. Kelley?

By MR. GURLEY:

Q What is the time element desire there, Mr. Kelley, for completion of the planning?

A Completion of the planning?

Q Yes.

A That's going to depend on how much trouble this design committee runs into in right-of-ways, and so forth, in town. Other than that, I think a period of three months should cover most of the planning work. That's my own estimate.

MR. GURLEY: That is all.

MR. PORTER: Anyone else have a question? Mr. Mankin?

By MR. MANKIN:

Q Mr. Kelley, at the present time there has been one application by an operator for disposal in the Hobbs Field?

A I believe the water is going to be moved to another field for disposal.

Q Speaking now of the application on the docket, were you aware of that?

A Yes, I did see that on the docket.

Q There is no further plans, other than that well at the present time that well at the present time, that you know of?

A That is the only definite plans that I know of.

MR. MANKIN: That is all.

MR. PORTER: Anyone else have a question? You may be excused, Mr. Kelley.

(Witness excused.)

MR. PORTER: I would like to hear now from the chairman of the Denton and Denton Wolfcamp Pool.

W. P. TOMLINSON

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

MR. TOMLINSON: W. P. Tomlinson for the Atlantic Refining Company. I have a statement that is short, but will indicate the progress that we have made. The Atlantic Refining Company as chairman of a group of operators studying cooperative salt water disposal problems in the Denton Field.

There have been three meetings of operators and an engineering committee with the following accomplishments.

1. A zone in the Permo-Pennsylvanian has been selected for salt water disposal.

2. A gathering system has been designed.

3. A cost estimate has been obtained for a gathering system.

4. A disposal well has been tentatively selected.

None of the results of this work has been presented to the operators. The operators did attend an initial meeting on August 9, and since that time the work has been in the hands of the engineering committee.

MR. PORTER: That is the Denton Pool engineer committee?

A This is a special committee, I believe, set up for the studying of the problems of salt water disposal. It may be some of the people who worked last spring on the other hearing and the other problem, but this has a different objective.

MR. PORTER: Do you have plans for a meeting in the near future?

A There will be an additional meeting before the end of this month. Some of the work groups will report on different additional assignments that they have worked on. There are other assignments for us to work out such as method of participation and things like that.

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

CROSS EXAMINATION

By MR. IRBY:

Q I would like to ask what formation?

A Permo-Pennsylvanian. It is a zone near the base of the Wolfcamp, or top of the Pennsylvanian. Somewhere there is a lost circulation zone that gave quite a bit of trouble to several operators when they were drilling in the field.

MR. IRBY: Thank you.

MR. PORTER: Mr. Mankin?

By MR. MANKIN:

Q Mr. Tomlinson, the zone which is now being presently considered, Permo-Penn, is that below the producing interval of the Wolfcamp?

A It is.

Q Below the oil-water contact?

A Yes, I am sure of that.

Q Within the field, or the edge of the field?

A Well, the particular well that we had tentatively selected is on the edge of the field. I believe you will find that zone though occurring probably across the field in some places.

MR. MANKIN: Thank you.

MR. PORTER: Anyone else have a question of Mr. Tomlinson? You may be excused.

(Witness excused.)

MR. PORTER: I would like to hear next from the chairman on the Eunice Pool, and that portion of the Eumont which overlies it, I guess.

MR. MALONE: Ross Malone, if it please the Commission, Ross Malone, Roswell, for Gulf. Mr. Eddington who is the chairman of the Committee is here and has a report to present.

If it meets with the Commission's approval, I would like to preface it with a brief statement of Gulf's position and progress, individually. The statement which was made by Amerada we feel is a fair statement of the situation, and Gulf would like to generally subscribe to it. Gulf would like to underline the fact that the instrument suggested by Amerada, of three and five million dollars, indicates the magnitude of the undertaking at hand. We feel it is important that it be undertaken in an efficient and economical basis, and that we should not sacrifice either efficiency of economy to speed.

The reports from the industry of the activity since the matter was originally considered by the Commission, indicate we feel that the industry is moving to take all necessary action to meet this situation. We feel sure that the Commission will cooperate with the industry in accomplishing those ends. Reference was made to Gulf's application in Case Number 1121, which was heard before the Examiner on August 7th. That was an application initiated by Gulf prior to any industry action to convert its G. C. Matthews Well Number 6 to a salt water disposal well. It's contemplated that salt water from the Hobbs, Monument and Eunice Pools will be disposed of through that well in quantities of approximately 5,200 barrels of salt water per day. This will represent approximately 72 percent of the total water produced by Gulf in these three fields.

Mr. Eddington of Gulf's Hobbs Office is the chairman of the Eunice-Monument Committee and will report for that committee.

MR. PORTER: Thank you, Mr. Malone.

W. R. EDDINGTON

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

MR. EDDINGTON: The intiial meeting of the operators of the Eunice and that portion of the Eumont Pool within the geographic limits of the Eunice Pool, was held August 20th of this year in Hobbs. The progress to date is as follows:

1. A base map is being prepared for the purpose of constructing a contour map, plotting of a battery location, and planning of a gathering system.

A request has been made of the operators for the location of their, location of their respective tank batteries, their current water production and the estimate of the future water production by well and value; and data on a possible disposal well. A response to this request from the operators has been active. A meeting is going to be held to assimilate this data and to do further planning.

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

By MR. GURLEY:

Q What, in your opinion, is the time element desired or needed for completion of the planning and perhaps, presentation of the solution in your particular field?

A That is a very complicated area. It is going to require a great deal of planning. It is my opinion that probably in getting the approval, or some form of agreement in that area, that it will probably take, six months will be required to do the planning to draw a complete system down there.

Q Is that a generous estimate, or a conservative one?

A I would say that is not too generous, but nevertheless not

too conservative, either.

By MR. MANKIN:

Q Mr. Eddington, has Gulf assumed the chairmanship of this area instead of Continental?

A Gulf was elected chairman at the initial meeting.

Q Continental was going to be.

A They were selected as temporary chairman.

MR. PORTER: Anyone else? Mr. Irby?

By MR. IRBY:

Q Mr. Eddington, this six months estimate you gave, that is the end of the planning I presume, and the program would not be initiated until the end of the six months, is that correct?

A That is correct, I don't believe it would.

Q At the end of this six months, would you be ready then to initiate the program of disposal?

A I believe we would be ready to initiate field work.

MR. IRBY: Thank you.

MR. PORTER: Thank you, Mr. Eddington.

(Witness excused.)

MR. PORTER: Next is the chairman of the Moore-Devonian Pool.

H. N. WADE

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

MR. WADE: H. N. Wade, The Texas Company. I would like to preface our report by stating that the Texas Company in general agrees with Amerada's statement, and would like to further suggest that continuation of the hearing be given by the Commission, or

continuation of this case.

On August 17, 1956, the Moore-Devonian Pool Field Committee, consisting of representatives of Amerada Petroleum Company, Samdan Oil Corporation, and the Texas Company, the three companies operating in the field, met in Hobbs, New Mexico, to consider the disposal of salt water. The Committee agreed that the possibility of contamination of fresh water sands with oil field brines did exist, if continued use of surface disposal pits was employed.

The Committee further agreed there was need for immediate action because of the ever increasing salt water production in the field, and thus, plans were initiated for a cooperative field salt water disposal system. It was agreed that the Texas Company, the major operator in the field, would furnish the Committee chairman, and would undertake to design and supervise the installation and the operation of a cooperative system, subject to managerial approval of all companies concerned. The tentative call for a gravity gathering system with disposal to be in either the Dewey Lake, or the San Andres Formation of Permian age, at the Texas Company, State of New Mexico BO Well Number 5, located in the northwest quarter of the southwest quarter , Section 13, Township 11 South, Range 32 East. Currently, battery location and elevations are being obtained and estimates are being made of the maximum daily water volume anticipated during the life of the field. With these data, a salt water disposal system for the Moore-Devonian Pool would be designed.

MR. PORTER: One question, Mr. Wade. You mentioned that you were considering using the State of New Mexico State BO Number

5, which is the Texas Company well for disposal?

A Yes, sir, that is tentative.

MR. PORTER: What is the status of the well at the present time?

A I believe that is a dry hole.

MR. PORTER: Dry hole?

A Yes, sir.

MR. PORTER: Anyone else have a question of Mr. Wade?

CROSS EXAMINATION

By MR. GURLEY:

Q How long do you think it will take to come to the solution in your particular pool?

A I would estimate a minimum of three months to get approval from the participating companies.

Q At the end of that time, you think you will be ready to put your plan into action?

A Yes, sir, I think the initial work could then be started.

MR. GURLEY: That is all.

MR. PORTER: Anyone else? You may be excused, Mr. Wade.

(Witness excused.)

MR. PORTER: We will hear now from the chairman of the Crossroads Pool.

V. M. LEONARD

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

MR. LEONARD: V. M. Leonard, Magnolia. I would like to state that Magnolia agrees in general with Amerada's statement.

The operators in the Crossroad Field met and they agreed and proposed to dispose of their water into the San Andres Formation of Magnolia Petroleum Company, Santa Fe Pacific Well Number 2, which is a dry hole located in the southwest quarter of the northwest quarter Section 26, Township 9 South, Range 36 East. Also available in this field, is Magnolia dry hole, Santa Fe Number 1, located in the southwest quarter of the northwest quarter of Section 26, Townsnip 9, South, Range 36 East. Present water produced in the field is approximately 1,850 barrels of water per day. We propose to inject it into the San Andres Formation from approximately 4,706 feet to 5,500 feet.

MR. PORTER: Does your report cover all of the pays in the Crossroad area, the Devonian and Pennsylvanian?

A There is only about 30 barrels, as I recollect,of water production over on the Pennsylvanian. I believe Magnolia's well only makes about 30 barrels, so the total field production there is only about 1,850, 1900 barrels a day.

MR. PORTER: Thank you. Any questions?

CROSS EXAMINATION

By MR. GURLEY:

Q How soon will you be ready to put your plan into operation?

A Magnolia Engineering Department there has recommended our company, that we use this well and as soon as we get approval from our management, we already have approval from the Engineering Department, I would say that we should be ready in a couple of months, be ready to test to see if the San Andres Formation would take the water in the Santa Fe Pacific Well Number 2. It may be

we might have to use a second well, or find an additional well. That is our proposed plan at the present time.

MR. PORTER: Any more questions? Are you chairman of the Bough Committee? Proceed with the Bough.

A Operators in the Bough Field propose to dispose of their produced water in the Bough C. Lime in the Magnolia T. Betenbough Well 2A located in the southwest quarter of Section 12, Township 9 South, Range 35 East. This is a producing formation; it is watered out at a depth of about 9,617 to 35 feet. We expect to inject about 1,450 barrels a day into this formation. We called Halliburton out and pumped in to this well to check it's injection rate, and it took three barrels a minute on vacuum, so we don't anticipate having any trouble disposing of water here.

MR.PORTER: Any questions on this pool? Mr. Mankin?

By MR. MANKIN:

Q Mr. Leonard, is this proposed injection below the oil-water contact in the Pennsylvanian zone?

A It's very irregular up in the Bough Field there. As every one will know, this well, in addition to the west offset, has gone to 100 percent water, and I would say that it was below the water-oil contact.

MR. PORTER: About how thick is your pay section in the Bough Pool?

A In this well it was 9,617 to 35. T. Betenbough Well 2A, located in the Southwest quarter of Section 12, Township 9 South, Range 35 East.

Q I believe Magnolia operates all the wells in the pool with

the exception of one?

A That is right, yes, sir. Southwest quarter of Section 12.

MR. PORTER: Anymore questions? Do you have anymore pools? You may be excused.

(Witness excused.)

MR. PORTER: We will hear next from the chairman of the Echols-Devonian.

MR. McCAGUE: Mr. Jack Ward will present the report on the Echols Pool, but in behalf of Shell, I would like to say that we in general concur with Amerada's statement, and with the statements of the Stanolind and Gulf representatives. We realize from the questions that have been asked here, that the Commission is very anxious to see maximum progress made on this thing, but we would like also to point out that there are very many problems and very many headaches involved in this thing, as long experience has shown us. That it is very difficult always to give accurate estimates as to length of time which it is going to take to do these things. Some of these men have given such estimates, but I am sure it was with a little fear and trepidation they have done so. The reports indicate to us that progress is being made, and we hope that the Commission will bear with us.

J A C K L. W A R D ,

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

MR. WARD: Jack L. Ward, with Shell. A meeting of representatives of the operators in the Echols-Devonian Pool was held at 1:00 P. M., August 14, 1956, in Hobbs, New Mexico, to discuss the

possibility of the community salt water disposal system for the Echols-Devonian Pool. This meeting was attended by ten persons representing the four operators in the pool; Shell Oil Company being one of the larger operators in the pool was chosen to assume the responsibility of directing the salt water disposal effort. All the operators were of a mind that underground disposal of salt water is desired in this pool, and plans should be pursued diligently to bring this about. Preliminary indications are that none of the dry holes or the abandoned wells in the vicinity of the pool is in condition to be economicably adaptable to salt water sub-surface disposal.

The detailed study for the use of a marginal producer is now conducted by Shell. Considering the limited size of the Echols Pool, consisting of six producing wells, that faster progress could be made if one operator were made responsible for the design of the system. Shell Oil Company was selected to do this, and has undertaken design of a salt water gathering, water treating and disposal facilities, and intend to make a cost estimate when design work is completed, and prepare an operating agreement, all to be submitted to the other operators for their review.

On the basis of the work done to date, including labor and field chemical analysis of the produced water elevation, surveys in the field and estimates of future water production, it appears that a closed gravity gathering system will be practical. We plan to pursue this work assiduously to completion. That is the end of my statement, Mr. Porter.

MR. PORTER: Thank you, Mr. Ward. Any questions of Mr. Ward?

CROSS EXAMINATION

By MR. GURLEY:

Q How long do you think it will take to have your design work completed and ready for operation?

A I think we can complete design work within a three month period and be ready to start work in the field.

MR. PORTER: Mr. Mankin?

By MR. MANKIN:

Q Mr. Ward, has a particular well been selected as yet?

A No, there has not.

Q It was indicated that you might use a marginal well rather than a dry hole. Was there any thought given to what would happen to the oil production from that well, or the allowable that may have been with the well?

A That possibility is being studied now. As of the moment we haven't decided whether that is the best course for us to take, both from the point of view from being operators and from the point of view of economical disposal; until such time as the study we are making now is completed, I hesitate to make any definite statement.

Q Then you have not been able to determine if it should go below the oil-water contact or whether it should be in an upper zone in the area as yet?

A That is right.

MR. PORTER: Mr. Irby?

By MR. IRBY:

Q Mr. Ward, do you have any particular formation in mind to dis-

pose of this brine in?

A No, sir, not at the moment. There are several possibilities and we have not yet definitely selected any of them.

Q What age would they be, could you tell me that?

A They would be in accordance with the suggestion made by your office, below the Permian.

MR. IRBY: Thank you.

MR. PORTER: Anyone else have a question of Mr. Ward? You may be excused.

(Witness excused.)

MR. PORTER: Do we have reports from anyone else on this case?

MR. GREGG: I am D. H. Gregg, representing Humble. Humble is aware of the salt water problem. However, we are the operator in only three of the fields on the Commission's critical list. We have expressed our willingness and desire to the operators in the fields to cooperate in the installation of facilities for disposition of salt water. We have every expectation and hope that will be accomplished within a reasonable time. However, if that is not accomplished, Humble is prepared to initiate an independent action on its own to dispose of its own salt water. With respect to the Hobbs application, we have no objection to the postponement of that application until such time as a Committee of the operators can report on its activities. On the other hand, we are willing also to let that work be worked into the cooperative facilities and become a part of them, if that is part of the plan worked out. On the other, if nothing is accomplished, we are also prepared to

proceed with that well to dispose of our own salt water at Hobbs.

MR. PORTER: Judge Foster?

MR. FOSTER: E. H. Foster, with Phillips. We have production in only two of the ten fields that have been reported on there this morning. I want to say that we are in general agreement with the statement made by Amerada, and the statement made by the chairman of the committee in the two fields in which we are interested. We are also aware of the salt water problem and we are willing to cooperate with the other producers in those fields in which we are producing, for the purpose of working out some cooperative system for the purpose of disposing of that water. That statement is not to be taken, however, to mean that in the event no agreement can be reached that we will not proceed on our own initiative to correct the situation wherever it is required.

MR. SUTHERLAND: I am John Sutherland of Sunray Mid-Continent. I would like to state that Sunray is in favor of underground disposal of salt water wherever it contaminates the fresh water. We will cooperate with the other operators and the New Mexico Oil Conservation Commission in working out a solution to work out a suggestion in each field we operate. We also concur in Amerada's statement. We are operators in three of the fields which have been mentioned this morning.

MR. PORTER: Mr. Lyon?

MR. LYON: V. T. Lyon with Continental Oil Company. Continental Oil Company is generally in agreement with the attitude and the facts stated by Amerada in their statement. We are cooperating to the best of our ability with those committees in the pools in which

we operate.

MR. PORTER: Thank you, Mr. Lyon. Anyone else have a statement? Mr. Smith?

MR. SMITH: May it please the Commission, coming back to the motion I made awhile ago, I would like to supplement the statement I made at that time. Stanolind subscribes generally to the statement made by Christie and the other operators. I want to assure the Commission that we plan to carry forward with all diligence certain plans that we have in mind for the disposal of the salt water where it is necessary, and where there is a possibility that there may be some contamination at some future date, or now. I would like to ask the Commission to be patient. I don't think that there ever will be a necessity for the Commission to enter an order. I think that the operators in the State of New Mexico are aware of the danger of the situation and are prepared to go forward to take care of it without the necessity of any order being entered. I would like the Commission to be patient with us for another three months.

MR. PORTER: Thank you, Mr. Smith. I notice here one of the statements in Mr. Christie's statement, or recommendation was that the Commission should not exclude entirely the possibility of disposal at the Triassiac beds. We have Mr. Frank Irby of the State Engineer's Office with us. I would like for him to make some kind of a statement on this at the present time.

MR. IRBY: Gentlemen, I have noted in most of the reports that all of them expect to dispose of the brines in formations well below the Triassiac, or below the Triassiac, I should say. We have

evidence that there is quite a bit of water being used, Mr. Caldwell wouldn't profit probably for the Health Department, but it is being used from the Santa Rosa Formation. We are worried about the probability of migration of brines that might be placed in the Santa Rosa, into areas where this is being used. Also, below the shallow Ogalala Formation, the next best water in Lea County is in the Santa Rosa. Now, there are places where this water is not considered potable, however a deselinization process will make this water potable. If we dispose in that, then we have the problem of trying to purify water that has been contaminated with brines.

I would like to insist that the Santa Rosa not be considered as a place of disposal for those brines.

Our office wants to adopt a policy of keeping an open mind on this, and we are highly gratified at the progress that the operators have made. In fact, I am just a little bit amazed that they have gone as far as they have, as quickly as they have. We are very much pleased with the action you have taken. I will go back to this Santa Rosa, out in the field itself, the major portion of the field along the Caprock, or what is commonly called the High Plains, we have a limited amount of information on the Santa Rosa formation now. But, in the fringe, area they are using this water and the day may come they will need it within the field itself, and more particularly if we are not able to solve our contamination problem in this shallow water in real short order, and I am sure that most of you realize that that problem is being worked on right now.

We assume that this problem can and will be handled in an orderly manner by the operators and as you have stated, everything will be

done to expedite it. We realize that the solution to this problem is going to involve a certain amount of time, and a great amount of energy. It can't be accomplished overnight. We would like to reiterate however, that the safe disposal of the salt water will best be accomplished by injection into pre-Triassiac rocks, or of formation of Permian age.

MR. CHRISTIE: Mr. Irby, in the defense of that one particular statement, we feel there are some places that this might be possible. There are some places, the higher elevations where the Santa Rosa Formation might be dry, and there are some waters that are not much worse than the Santa Rosa water. In those instances we don't think it would be too bad to mix them, or put them in dry sands. Later on we may want to use the water for pressure maintenance, or water flooding, or something like that. Somewhere down the road we may want to use some of the Santa Rosa water not considered potable for water flooding. I don't know that is being done now, but it is being considered. We don't want to use these upper sands just indiscriminantly. Of course, it will be after a hearing, or so forth. We want the Commission not to exclude them entirely until after such hearing.

MR. IRBY: I might add that I have already made the statement that we are not sure, we don't have adequate information to be sure about the Santa Rosa in the Caprock Area. I am not speaking of the Caprock Field, but the Plains area. Certainly we wouldn't stand here today and say no without adequate information to back it up.

MR. PORTER: Mr. Smith of Stanolind has made a motion the

hearing be continued for three months, which would be until the December hearing, I believe. Is there any objection to his motion? The case will be continued to the regular December hearing.

I would like to join with Mr. Irby in expressing my appreciation to the industry and also Mr. Walker's for the progress you have made, the way you have taken hold of this matter which was called to your attention last spring. We feel that it has been well planned and organized, and that progress is being made. I, least of all, don't want to rush into some Commission order which would cause inadequate disposal systems to be created, or inefficient systems. We feel that the operators can handle this thing themselves. We feel it would be much better if the operators did handle it themselves. We know there is a tremendous expenditure involved. It's going to take some time. I certainly am opposed to any more rules and regulations than are absolutely necessary for conservation, and protection of our fresh water. It is my sincere hope that it can be worked out on a cooperative basis by the operators themselves. We realize that the oil industry in this state has a tremendous stand. You know that you can't produce your oil wells if you don't have someone there to produce them, and you are not going to have anyone there to produce them if you don't have any fresh water to drink.

We will continue the case until the regular December hearing. At that time we would like to entertain more progress reports, Mr. Christie.

STATE OF NEW MEXICO)
: SS.
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my hand and seal, this, the 22nd day of September, 1956.

Ada Dearnley
Notary Public-Court Reporter

My Commission Expires:
June 19, 1959

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

IN THE MATTER OF:

Case No. 1053

December 13, 1956.

DEARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6691
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
December 13, 1956

IN THE MATTER OF:

Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico. Case 1053

BEFORE:

Mr. A. L. Porter
Mr. E. S. (Johnny) Walker

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: We will take up next Case 1053.

MR. GURLEY: Case 1053. Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico.

MR. PORTER: In Case 1053, do we have further progress reports at this time, Mr. Christie?

MR. BUSHNELL: H. D. Bushnell, attorney with Amerada. I have a statement to make on behalf of the company. As the Commission knows, Amerada is an operator in the East Caprock, Bagley and Monument and Saunders fields. We are prepared to make statements of the progress of proposed salt water disposal systems

in the Bagley, East Caprock, Saunders and Monument pools. We are also prepared to put testimony on, if the Commission desires, to support these statements. As far as the Bagley and East Caprock pools are concerned, we have evidence that those fields will be under operation of salt water disposal definitely within ninety days, of course, in the absence of any unforeseen shortages of equipment.

As for the Saunders pool, we are pretty certain that that will be in operation within ninety days, but we do not include it with the other two fields because we don't want to be completely bound by the statement.

As to the Monument pool, progress is being made. It will require a longer period of time before the study is completed, and naturally before any system is put into operation.

We therefore ask for a continuance of this cause and perhaps another progress report within the next ninety or one hundred twenty days. If the Commission desires, I will put our witness on the stand to support these statements.

MR. PORTER: Is there any other interested party here who desires to hear this testimony at this time?

MR. WALKER: Mr. Spiegel, I see you just walked in. We are on Case 1053. I wanted to call it to your attention. If you want to put the testimony on, we will, but the Commission feels it isn't necessary.

MR. PORTER: The Commission feels it isn't necessary to hear the testimony at this time, Mr. Bushnell. Mr. Christie, do you know whether any other pool chairmen are here who would like

to report?

MR. CHRISTIE: I assume there are representatives from all the Pools. I don't know for sure.

MR. PORTER: Mr. Smith.

MR. SMITH: Mr. Kelley, who is chairman of the Hobbs Pool, was unable to attend. However, he has a statement which I can make to the Commission on his behalf. Mr. Brown, our District Engineer, who is fully familiar with the situation down there, is here today, in the event that the Commission should see fit to make further inquiry as to the progress being made in the Hobbs Pool.

At the September hearing, it was reported that the Hobbs operators had appointed a Reservoir Engineering Committee and a Map Committee, and that both of these committees had begun work on their assignments. At that time, the Reservoir Committee work was about fifty percent complete and the Map Committee had completed the base map and the map had been assigned to a draftsman for final preparation. The Reservoir Engineering Committee has now completed its assignment of predicting water production rates and selecting possible disposal zones. The Map Committee has the base map in final form and it has been approved by the operators and released for reproduction. A topographic map contoured on a ten foot interval has been located and found to be suitable for study. These contours will be posted onto the base map for distribution to the operators. At meeting of operators on October 9th, a Design Committee was appointed; however, that work is essentially completed. I think the design is pretty well agreed

upon. At present, why, the companies themselves are engaged in doing that work which is necessary for the individual companies in order to cooperate in the disposal system. The work is progressing satisfactorily, as I understand that Humble is very soon to begin the deepening of their State "A" No. 2 in the Southeast quarter Section of 25, Township 18 South, Range 37 East, to Lower San Andres for recompletion as a disposal well. Stanolind also plans to deepen a well to test the Lower San Andres as a disposal zone. Stanolind's tentative plans are complete, and at present we are negotiating with the surface owners in the area around Hobbs for rights of way for our lines to be laid out for the disposal well. We plan to take the salt water out of the City of Hobbs and dispose of it outside the City limits. It necessitates getting rights of way from various land owners adjacent to the City of Hobbs. As soon as we can get our rights of way negotiated, why, we plan to come to the Commission and ask for a conversion of the well we select for disposal.

I should like to make a request, join in the request of Amerada that another ninety days will see the Hobbs Pool pretty well on its way. At that time we will be able to say when the project will be completed, and there is a possibility we may be near completion at that time.

MR. PORTER: Thank you, Mr. Smith. Any other Pool chairman?

MR. WADE: Yes, sir. I am Mr. Wade with the Texas Company. The Texas Company is serving as chairman for the Moore Devonian Field. I have a statement concerning that Committee.

A gravity gathering system with pressure injection into

the Dewey Lake formation of Permian Age has been designed for the purpose of disposing of the salt water produced in the Moore Devonian Field. Application will be made shortly to the Commission for the conversion of the Texas Company's State of New Mexico "BO" Well No. 5, presently plugged and abandoned and located in the northwest quarter of the southwest quarter of Section 13, Township 11 South, Range 32 East, to a salt water disposal well. Currently cost data are being assembled and the design of the system along with the cost data will be presented for approval to the operato"s of the field early in January of 1957.

We would concur with the recommendation of the chairman from Amerada that the case be continued for additional progress reports in ninety days.

MR. PORTER: Thank you.

MR. WARD: Jack Ward with Shell. I have a report on the Echols Devonian Pool. As previously reported to the Commission, Shell Oil Company was selected to undertake design of salt water disposal facilities for the Echols Devonian Pool. We have completed design work on this system. As designed by Shell, it includes the following items:

1. Tentative plans are to dispose of water into the Pennsylvanian formation in the Texas Company State AW No. 1 Well, a dry and abandoned hole, in which intermediate casing was set at a depth of 4251 feet and cemented to the surface. This well is to be cleaned out to a depth of approximately 10,200 feet, a 5 1/2-inch liner is to be cemented into the top of the Pennsylvanian, the open hole section from 9500 feet to 10,200 feet is to be

acidized, and the well is to be equipped with plastic coated tubing.

2. Water is to be treated by settling and skimming off oil in a closed vessel.

3. Water is to be collected using a closed, corrosion resistant gathering system.

We are planning to submit results to the other operators in the Pool immediately, and are planning to call a meeting of operators early in January, 1957, to review our design. When approval of design is obtained, we are planning to prepare an operating agreement, to obtain necessary authorities for expenditure and to proceed with construction of the system as soon as possible.

MR. PORTER: Thank you. Do we have another report?

MR. EDDINGTON: W. R. Eddington, Gulf Oil Corporation, representing the Eunice-Eumont operators Salt Water Disposal Committee. At a recent meeting of this group, water predictions and other data were received from those operators who had not previously submitted the information to the committee chairman. It was also reported at this meeting that a base map had been constructed and a topographic contour map had been obtained and that, to date, seven wells have been offered for possible disposal wells. All of these wells, or nearly all of them, will require deepending for injection into the Lower San Andres.

Two sub-committees were organized at this meeting to study treating problems and to design a basic system. A treating committee was formed for the purpose of determining the type of system that will be required, considering such factors as water characteristics and the type of oil treating equipment in use in

the area. The treating committee has met once and is now collecting water samples from the area. Upon receipt of a report from this committee, the map committee will begin its work, which shall consist of applying the water production figures, battery locations, and possible disposal wells to the design of a basic system that can be submitted to the operators for their consideration and approval.

We would like to say that we concur with Mr. Christie in the request for a continuance of this case.

MR. PORTER: Thank you, Mr. Eddington. Are there other reports?

MR. CAMMACK: Van Cammack with Atlantic Refining Company. The Atlantic Refining Company is chairman of a group of operators studying cooperative salt water disposal problems in the Denton Field. In connection with salt water disposal, the following has been accomplished:

1. A zone in the Permo-Pennsylvanian has been selected for salt water disposal.

2. A gathering system has been designed.

3. A cost estimate has been prepared for a gathering system.

4. A disposal well has been tentatively selected.

5. The operators have reviewed the initial draft of the operating agreement and plans are being made for another meeting to consider a revised draft during the month of December, of this year.

6. Discussions have begun with the royalty owners of the tentatively selected disposal well.

An operator has not yet been selected for the system; however, it is expected that this will be done at the next meeting.

MR. PORTER: Thank you. Any more reports?

MR. RAMSAY: Jim Ramsay of Magnolia. I have statements concerning the Bough Field and the Crossroads.

The operators in the Bough Field have agreed to cooperatively dispose of produced salt water into Magnolia's T. Betenbough No. 2, a temporarily abandoned well in Section 12, Township 9S, Range 35E. It is proposed to inject water into the Bough limestone, the producing formation in the Bough Field. The T. Betenbough No. 2 was producing from the Bough limestone until March, 1956 at which time it watered out. The well was drilled to a total depth of 9,639 feet and has 7-inch casing set from the surface to 9,606 feet, leaving 33 feet of open hole in the Bough formation. The estimated original oil-water contact for the field was at -5620 feet subsea and the estimated present oil-water contact is from -5470 to -5500 feet subsea.

Injectivity tests were conducted on the well and indicate that it will take 4,300 barrels of water per day at zero surface pressure. This rate is two and one-half times the maximum anticipated rate of water production from the Bough Field.

Application has been made with the New Mexico Oil Conservation Commission for permission to use the T. Betenbough No. 2 as a salt water disposal well for the entire Bough Field. Detailed plans for a salt water disposal system for the field are being drawn up. Upon completion of the plans and permission of the Conservation Commission to use the T. Betenbough No. 2 as a disposal

well, construction on the disposal system will be initiated.

The operators in the Crossroads Field have agreed to cooperatively dispose of produced salt water. It is proposed to dispose of the water in either Magnolia's Santa Fe Pacific "C" No. 2, a dry hole located in Section 26, Township 9S, Range 36E, or Magnolia's Santa Fe "B" No. 1, a temporarily abandoned well in Section 28, Township 9S, Range 36E. The Santa Fe Pacific "C" No. 2 well was originally drilled to a total depth of 12,368 feet and has 8-5/8-inch casing set from the surface to 4,706 feet. The well was recently worked over and a cement plug was set at 5,615 feet, leaving 909 feet of open hole in the San Andres formation. Injectivity tests were conducted after acidizing and water fracturing the San Andres formation. It was found that the well would take 2,800 barrels of water per day at 200 psi surface pressure.

The Santa Fe "B" No. 1 well is also being considered for conversion into a salt water disposal well. Application will be made with the Oil Conservation Commission for use of one of the wells for salt water disposal. Detailed plans are being drawn up for a disposal system to dispose of all the produced salt water in the Crossroads area.

MR. PORTER: Thank you. Does anyone else have a report at this time? Does anybody have a statement to make in this case? Mr. Spiegel, did you have anything to say as a representative of the State Engineer's Office?

MR. SPIEGEL: No. I don't have anything to say.

MR. PORTER: Is Mr. Irby present?

MR. SPIEGEL: He will be down here in a few minutes. I

don't think he wanted to say anything.

MR. PORTER: Mr. Mankin.

MR. MANKIN: Warren Mankin, with the Oil Conservation Commission. I would just like to cover a little further -- go a little further with some of the statements that have been made. We have two applications from Amerada Petroleum in the Saunders Pool for salt water disposal, at a hearing that will be held here before an Examiner in Santa Fe on January 9th. One is to go into the pay formation on the edge of the pool below the oil-water contact. The other is a Bradenhead disposal well opposite the San Andres formation. Apparently they will attempt to utilize first going into the pay formation; if that isn't successful they will revert to the Bradenhead disposal.

As was indicated by the Magnolia representative, we have an application for salt water disposal in the Bough Pool. That will likewise be held on January 9th, at the same time as the other two Amerada cases, in Santa Fe. There will be three salt water disposal wells heard at that time. We have approved the salt water disposal in the Hobbs Pool, as was requested by Humble. A hearing has been held, and an order has not yet been written for the Bagley-Penn Pool for the Amerada's disposal well. Previously, a hearing was held for Gulf for disposal well, I believe it was in the Monument Pool, for a very large system. I just want to mention these particular ones we have had and ones we are going to have, so we can bring you up to date as to the hearings that we have held on the disposal wells.

The order is presently in process of being written to allow for disposal into a non-productive zone; that's the hearing

held to allow administrative approval. It is not out yet, but will soon be out to allow disposal into a non-producing horizon not within two miles of the injected well. It will still be required for a hearing, to go below where it is into the same formation or below the oil-water contact of the producing horizon in the pool.

That is all I have this morning. I believe this covers our ten most important pools, the progress reports.

MR. PORTER: I wanted to ask Mr. Mankin when you anticipate that order will be written or issued concerning the administrative approval of non-productive disposal?

MR. MANKIN: I would hope that we would have it out within a week.

MR. PORTER: Do any of you who made the statements have a copy of the statements that you could leave with the reporter? If you do, bring them by.

MR. CHRISTIE: Mr. Christie with Amerada. I want to mention, I believe you left out one well, the well in the East Caprock Pool. The Commission has already issued an order on that.

MR. MANKIN: Yes, I did leave that out, and such an order has been approved.

MR. PORTER: Does anyone else have a statement?

The Commission has before it a motion for continuance, I believe, for ninety days -- is that right, Mr. Bushnell?

MR. BUSHNELL: That is right.

MR. PORTER: Before acting on your motion, I want to commend the various committee chairmen this morning for their reports and certainly for the attitude of the entire industry toward this

matter since it was brought up several months ago.

Is there any objection to continuance of this case to the regular March hearing, which I believe is on the 14th of March? The case will be continued.

* * * * * *

C E R T I F I C A T E

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 31st day of December, 1956, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
Notary Public

My commission expires:
June 19, 1959.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 14, 1957

TRANSCRIPT OF HEARING

Case No. 1053

DEARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6691
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 14, 1957

IN THE MATTER OF: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.	Case No. 1053

BEFORE:

Honorable Edwin L. Mechem
Mr. A. L. Porter
Mr. Murray Morgan

TRANSCRIPT OF HEARING

MR. PORTER: The Commission will consider the next case, No. 1053.

MR. BUSHNELL: H. D. Bushnell, attorney with Amerada. Amerada is prepared to make a statement concerning the disposal system in progress in the four fields. I understand there may be some other operators who are ready to give reports. If you will like, I would like the Amerada engineer to give his report and then the other operators can give their reports at the end of which I would like to make a further statement, or make a motion.

MR. PORTER: Just one moment, Mr. Bushnell. Mr. Christie, were you named as General Chairman of this?

MR. CHRISTIE: Actually, Mr. Porter, the Committee was never organized as such. We just acted as temporary chairman and no permanent chairman was ever appointed so far as I know. We more or less just took the lead in order to get the thing started.

MR. PORTER: Mr. Bushnell, you may proceed with your roll call.

MR. BUSHNELL: I will ask Bill Abbott to make his report on that.

MR. ABBOTT: W. G. Abbott with Amerada at Monument.

The first pool we are operating a salt water disposal system, is the Bagley. In that pool the operating agreement has been signed, all materials are on location, that is (a) six and eight inch Asbestos/cement pipe, (b) three and four inch steel pipe, and we have had that steel pipe cement lined, and at the present time they're wrapping that steel pipe. Our precipitator is on location. We have permission, granted by the Commission Order R-942, to convert our Amerada State BT"D" No. 4 to salt water disposal in the Bagley Pennsylvanian from 9045 to 9230. The contract on the disposal system has been let and the construction will start, the actual digging of the ditch and laying the pipe, within ten days.

The next system that we will operate will be the East Caprock Salt Water Disposal System. The operating agreement on East Caprock

~~has been circulated but it has not been signed by all the operators.~~ We have all the materials on location, six and eight inch asbestos cement pipe, the three and four inch steel pipe which we have had the cement lined, and we also have on location a Triplex pump and gas engine. Permission has been granted by the Commission Order R-886 to convert the Amerada Posey "A" No. 2 to a salt water disposal system, or disposal well in the Dewey Lake zone from 1300' to 1450'. Actual work on that system will start as soon as this agreement has been signed.

The next system that we want to operate will be the Saunders Salt Water Disposal System. No operating agreement or AFE has been circulated yet on Saunders. We are waiting to submit our operating agreement on Saunders pending the discussion on similar agreements from the other operators that we have submitted on this Bagley and East Caprock Salt Water Disposal System. We have at Saunders all the materials on location. Permission has been granted by Commission Order R-951 to convert our State S"C" No. 5 to salt water disposal well in the Pennsylvanian zone from 9820' to 10,065'. We have also had a hearing to obtain permission to convert the State S"G" No. 1 to a salt water disposal well in the San Andres zone, but we haven't gotten the order on that yet.

The fourth system that we are working on is the Monument Salt Water Disposal System. That is in the committee stage. We have organized two work committees and we are gathering information

on this system. The two committees are the Map Committee and the Design Committee. We held our last meeting in Hobbs, February 12, 1957. There was suggested at this meeting by Amerada that as this disposal area is so large, there is 660 wells in this system, that various independent segments might be more practical than one common disposal system. But as yet we are still working on it. Thank you.

MR. PORTER: Thank you, Mr. Abbott. Do we have other pool chairmen?

MR. LEACH: W. H. Leach with Magnolia in Tatum.
We would like to report on progress in the Bough and Crossroads Field. In the Bough Magnolia requested permission to dispose of salt water into T. Betenbough Well #2 (temporarily abandoned well in Section 12, Township 9-South, Range 35-East) Lea County, in a hearing held before the New Mexico Oil Conservation Commission on January 17, 1957 (case 1194). As there were no protests to this request, commission approval was granted on February 14, 1957. Previous injection tests on this well indicated it was capable of handling 4,300 barrels of water per day at zero surface pressure. This is approximately equal to two and one half times the anticipated water production rate for the subject field.

Regarding progress on the proposed disposal system, plans for this system have been formulated and are now in the hands of Magnolia's Civil Engineering Department for final design and checking. It is therefore anticipated that installation of the proposed

~~system can be initiated in the near future.~~

Mr. J. R. Sharp, the only other operator in the Bough Field has been contacted in regard to his participation in the proposed system. He indicated his willingness to work out an equitable agreement with Magnolia for disposing of his produced water. Mr. Sharp will therefore be contacted and an agreement made with him, prior to injecting any water.

Crossroads Field: In a letter dated January 24, 1957, Magnolia made application to the New Mexico Oil Conservation Commission for permission to dispose of salt water into Santa Fe Pacific "C" Well #2 (temporarily abandoned well located in Section 26, Township 9-South, Range 36-East) Lea County. The proposed injection zone, the San Andres formation, is not productive of oil and/or gas within a radius of 2 miles of the proposed salt water disposal well. The proposed use of said well was agreed to by the landowner, Mr. U. D. Sawyer, in a letter dated January 29, 1957, to Magnolia's Land Department, Roswell, New Mexico. As no protests to Magnolia's petition have been heard, as of this date, it is presumed that approval of the request will be received shortly.

Injectivity tests have been conducted recently on the Santa Fe Pacific "C" No. 2, to ascertain more definitely exactly what volume of water the well can handle. Because these tests revealed the well could handle only moderate volumes in its former condition, the well was cleaned out and sand pumped to increase its

capacity. As the clean out operation has only recently been concluded, the actual effectiveness of it has not been determined as of this date. During these testing and clean out operations, Magnolia's Santa Fe Pacific "C" No. 1 Well, a sizeable (950 barrels per day) water producing well, has been produced only at those times when the facilities were available to dispose of the produced salt well.

As to the proposed disposal system, detailed designes of the gathering system and injection plant facilities have been drawn up and submitted to Magnolia's Lea District Office for approval. When approval has been received, the other Crossroads Field Operators will be contacted in order that a plan for participating in the proposed system may be formulated.

MR. MALONE: If it please the Commission, Ross Malone for Gulf. Gulf was for the Eunice-Eumont Pool. W. R. Eddington of Gulf, Hobbs Office, is Chairman and will report.

MR. EDDINGTON: W. R. Eddington, Gulf Oil. The Eunice-Eumont area with its great number of wells, many operators and its relatively rugged terrain, presents an enormous problem of salt water disposal. However, work has progressed satisfactorily and is on schedule. The two work committees formed by the committees have been active. The Training Committee has completed its work and is preparing its final report. The Design Committee has met weekly for the past five or six weeks and has layed on the base map

to serve 75 percent of the Eunice Field after consideration has been given to the use. No operating agreement has as yet been circulated to the operators, due to the fact that the Committee has been giving consideration to a suggestion to divide the Eunice Field into several separate disposal systems, each with a different operator, and consequently each having a different operating agreement. A meeting of the operators will be held in the near future to handle this problem.

MR. KELLEY: I am C. L. Kelley, Pan American Petroleum Corporation, reporting for the Hobbs Field Operators the progress of salt water disposal in the Hobbs Field.

The last report was made on December 13, 1956 in which it was stated that assignments to the Map Committee and the Reservoir Engineering Committee had been completed. The Design Committee had been temporarily suspended pending collection of data on zones suitable for disposal, quantity of water the zones would take and pressures required.

At the time of the December 13 hearing Humble had announced plans to immediately begin work on deepening their State "A" Well No. 2 in the SE/4, Township 18 South, Range 38 East and to convert to salt water disposal. Also on December 13, Pan American's management had approved abandoning a low productivity oil well and converting it to a disposal well. At that time we were negotiating for right of way. Since the December hearing, Humble's well has been deepened from 4250 to 4753 and 5" casing was set at total

depth and cemented with 1200 sacks. After perforating two intervals between 4565 and 4735 and acidizing with 1,000 gallons, Humble's well took water under vacuum at a rate of 4 barrels per minute. Pan American has completed negotiations with surface owners for rights-of-way to serve salt water gathering systems for its State "A" Tract 9 Well No. 13. In addition, Pan American has two cases on today's docket for conversion of its State "A" Tract 9 Well No. 13 to salt water disposal well and transfer of its present allowable to other wells.

Subsequent to the application it was found that the productivity of the well is such that continued operation would be so highly profitable that abandonment of the well and transfer of the allowable could not be justified. We plan to ask that the two cases be dismissed, but Pan American plans to immediately select another well for conversion or to drill a new well for salt water disposal. Work on the selection of the substitute well should be completed today (March 14, 1957) and our management asked to authorize the necessary funds in case a new well is necessary. We anticipate no delay on this authorization because funds have been budgeted for the project and the main thing now is to show that the course we select is the best in the long run.

As to right of way work that was done relative to State "A" Tract 9 Well No. 13, we are of the opinion that the time spent in securing the rights-of-way will not be wasted and that the work will not have to be re-done because routes to the substitute well will be generally over the lands of the same surface owners regardless of where the well is located. The agreements so far have left the exact routing of the lines open.

In addition to the above work, Pan American has circulated for approval of the various companies an operating agreement which will apply to a fieldwide salt water disposal system.

A meeting of the Operating Committee was held on March 11. At that time the operating agreement was reviewed, that agreement was circulated March 1st, 1957.

MR. PORTER: Thank you, Mr. Kelley.

MR. MONTGOMERY: J. W. Montgomery, Shell Oil Company, Hobbs, reporting on the Echol Devonian Pool.

At a meeting of the operators in the Echol Devonian Pool in August 1956, Shell Oil Company was chosen to assume the responsibility of directing salt water disposal efforts and to design a system to be presented to the other three operators.

In January 1957, a plan for semi-gravity, semi-pressured gathering system disposing by gravity into the open hole Pennsylvanian formation in the dry and abandoned Texas Company's State AW-1 well was presented through the mail to the operators in the Echol Devonian Pool. This proposal and a Texas Company proposal, calling for disposal into the Dewey Lake formation in Shell's junked and abandoned State A-2 well, were discussed at a second operators meeting on February 21, 1957. At this meeting, an engineering committee was formed to investigate again all disposal possibilities in the Echols Devonian Pool.

The engineering committee met on March 6, 1957, and recommended that The Texas Company's State AW-1 well be cleaned out and tested for disposal into the San Andres formation. A proposed operating agreement, which had been presented at the previous meeting, was discussed and minor changes recommended.

Shell Oil Company, as chairman of the engineering committee, agreed to prepare and circulate the revised operating agreement and the cost estimates for testing the San Andres formation and for

installing a complete system for disposal into the San Andres formation in State AW-1.

MR. PORTER: Thank you, Mr. Montgomery.

MR. TOMLINSON: W. P. Tomlinson for Atlantic.

Atlantic is chairman of the group of operators planning to initiate salt water disposal in the Denton Field. In connection with this, the following has been accomplished: A zone in the permanent Poe Pennsylvanian has been selected for salt water disposal. A gathering system has been designed, a disposal well has been tentatively selected. The operators have reviewed a draft of a proposed operating agreement. Discussions concerning salt water disposal are being conducted with the royalty owners for the tentatively selected disposal well. The last item is, at present, holding up the other. When we are through talking to the royalty owners in that area, I feel we'll be able to go ahead.

MR. PORTER: Thank you, Mr. Tomlinson.

MR. WADE: H. N. Wade with The Texas Company reporting on Moor Devonian Field. Three operators to Moor Devonian have discussed the proposed salt water disposal system for the field on several occasions since the last report to the Commission. These discussions included an operator's meeting February 13, 1957. It was initially planned to dispose of the salt water for a well previously drilled for oil production on one of The Texas Company's leases. It developed this would not be feasible. Tentative agreement

has been reached by parties to drill a salt water disposal on The Texas Company State of New Mexico NN lease located in the southwest quarter of Section 25, Township 11 south, Range 32 east. This well will be so located as to permit the installation of a gravity disposal system with injection into the Dewey Lake. An operating agreement is being prepared by The Texas Company for submission to the other interested operators in this field.

MR. PORTER: Thank you. Do we have other reports? Mr. Mankin.

MR. MANKIN: I'd like to add to the reports that have been given. Incidently of all the ten fields, this is the complete report we had requested previously. I would like to state in connection with Amerada's report, that an order has just been ordered, Order R-955 for Amerada State S"G" No. 1, which will supplement the report that Mr. Abbott just gave for the Saunders Pool. That is a supplemental well. I would like to supplement that in the Magnolia report for the Bough Pool, that Order R-950 was issued for that Betenbough Well No. 2, Magnolia's.

I would like also to state in the Crossroads Pools that the first administrative order issued as amendment to Rule 701 was issued to the particular well which was a salt water disposal Order No. 1 for the Santa Fe Pacific No. 1.

In addition to these ten fields we have likewise issued an administrative order for salt water disposal well in a pool which

was not in these ten pools which was the North Gradolia Devonian Pool for Ralph Lowe, a recent development likewise. It would be, appear these projects are favorably proceeding and should be given proper consideration.

MR. PORTER: Thank you, Mr. Mankin.

MR. MANKIN: I believe Mr. Yates is also here from State Engineer's Office.

MR. PORTER: Mr. Bushnell, did you have something further?

MR. BUSHNELL: Since it would appear that some of these systems will be in operation within the next six months, I would like to move that we continue this case for six months, at which time the operators will again be asked to give reports of the status of their systems.

MR. PORTER: Mr. Bushnell, before we rule on your motion I would like to hear from Mr. Yates, who is a representative of the State Engineer's Office.

MR. YATES: The State Engineer has no objection to the continuance for six months.

MR. PORTER: Thank you, Mr. Yates.

MR. BARINEAU: I am L. R. Barineau with Sun Oil Company. I had a specific statement in connection with our company which had to do with Cases 1217, 1218, which I understand that Mr. Kelley has planned to drop now, is that correct?

MR. KELLEY: That is correct.

MR. BARINEAU: In connection with the continuance, it is a feeling that no weight should be given to transfer of a well that is converted for salt water disposal. We feel that such transfers would lead to abuses and inequities in the manner of proper handling of the salt water in the various fields.

MR. PORTER: Is there any objection to Mr. Bushnell's motion for a six months' continuance of this case?

As most of you know, this case was first called for April 18 of 1956, and continued to May 16, when we received extensive testimony from the representatives of the State Engineer's Office as to the danger of fresh water contamination and salt water disposal. Again the case was continued to September the 13th when we heard some very satisfactory progress reports, and continued the case again to December 13 when we received more progress reports.

It is the decision of the commission that the case will be continued for a six months' period. It will be heard again at the regular hearing six months from this month.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, 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 day of 1957.

Notary Public-Court Reporter

My commission expires:

June 19, 1959.

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
Santa Fe, New Mexico

September 18, 1957

TRANSCRIPT OF HEARING

Case 1053

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
3-6691 5-9545

BEFORE THE
OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO
Santa Fe, New Mexico

September 18, 1957

IN THE MATTER OF: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.	Case 1053

BEFORE:

Mr. A. L. Porter
Mr. Murray Morgan
Honorable Edwin L. Mechem

TRANSCRIPT OF HEARING

MR. PORTER: The Commission will consider next Case 1053.

MR. COOLEY: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico.

MR. PORTER: Mr. Bumpass.

MR. BUMPASS: For the record I would like to read into the record this statement --

MR. PORTER: Can you furnish a copy of the statement? I would like to make an announcement, that these various progress reports which we will probably get this morning, if you have it written, we would like to have it for the record so that the reporter wouldn't have to take it down.

MR. BUMPASS: My name is C. M. Bumpass. I am an Engineer for Gulf Oil Corporation in the Hobbs Office. Gulf is Chairman of the Industry Salt Water Disposal Committee for the Eunice-Monument area. As spokesman for this Committee, I wish to report on the progress in this matter.

Subsequent to the Commission Hearing in March, 1957, the last progress reporting date, a professional water disposal firm offered its services to operators in southeastern New Mexico. It was the opinion of several operators that professional handling would expedite operations. After several meetings, operators representing in excess of ninety percent of the wells in the Eunice-Eumont area had approved of the employment of this professional firm for the purpose of making a preliminary survey. This firm was given authority to start work on May 13, 1957. Their work was to be finalized, in a formal report, which would present the operators with a preliminary design of the disposal system.

Following their initiation of this work in the Eunice-Eumont area, they were also authorized by operators to make a similar study and report for the Monument-Eumont area. Later these two ares were

combined for the purpose of this report. This report, which includes the Eunice-Monument and Eumont area, is very comprehensive and required approximately four months for its preparation. This report was recently received by the operators, I believe it was on Wednesday of last week, September 10; after a sufficient length of time has elapsed to allow the operators to study the report, an operator's meeting will be called, probably in October, to review and discuss this report for the purpose of determining what future action should be taken. That completes our progress report.

MR. PORTER: Thank you, Mr. Bumpass. We have another Pool Chairman.

MR. BLACKWOOD: I am J. C. Blackwood, Engineer with Amerada Petroleum Corporation in Midland, Texas. I would like to report progress toward salt water disposals in those fields in which the Conservation Commission has indicated that immediate attention should be given to underground disposal.

In the Bagley-Pennsylvanian and Bagley-Siluro-Devonian fields in Lea County, disposal of all produced salt water by injection underground was started May 29, 1957. Injection is by gravity into the Pennsylvanian formation. All wells and all leases are connected, both Ameradas and other operators, in the pool.

During August there was a total of 207,696 barrels produced and disposed of underground. This is an average daily volume of 6700 barrels. Cumulative water disposed of until the end of

August is 605,529 barrels. All produced water is being disposed of and we anticipate that all future production will be disposed of underground in that pool.

In the East Caprock-Devonian Pool, the salt water gathering system was completed and disposal by injection into the Dewey Lake formation was started on July 25, 1957. Injection into the Dewey Lake is between the depths of 1300 to 1450 feet and is by pumps with pressures of 900 pounds per square inch. The injection rate at the start of injection was 4500 barrels per day. This has declined to 3000 barrels per day at present. The total water production in the field is about 8500 barrels per day.

The gathering system is sufficiently large to handle all the produced water, but it's apparent now that the injection well isn't capable of handling the present production. We propose to deepen the injection well to open additional injection zones probably into the San Andres formation. In the Saunders Pool the salt water gathering system has been designed, most materials for that are on hand, permission has been received from the Conservation Commission to use the disposal wells, and agreement has been drawn up between the operators to operate, to install and operate the gathering system and disposal wells, and this agreement is being circulated among the operators for signature at the present time. But we anticipate that construction will start on this system in the near future.

The only other field in which Amerada has taken the lead was

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in the Monument Field area and a report by Mr. Bumpass of Gulf on the activities of the operators in that area I believe covers that. We propose to cooperate with Gulf and anticipate that the operators of both Eunice, Monument and Eumont Pools will meet some time in October to discuss installation and operation of a water disposal system for those pools.

MR. PORTER: Mr. Blackwood, my attention was veered for a moment. What other pool were you reporting on beside the Saunders?

MR. BLACKWOOD: East Caprock and Bagley; Bagley-Siluro and Pennsylvanian.

MR. PORTER: Anyone have any questions on Mr. Blackwood's report? That will be all, Mr. Blackwood. We have another Pool Chairman.

MR. WADE: I am H. N. Wade with The Texas Company. The Texas Company is Chairman of the salt water disposal committee for the Moore-Devonian Pool, and has diligently proceeded, with the cooperation of the other operators in the field, with efforts to dispose of produced salt water in the Moore-Devonian Pool. A Form C-101 is in process of being submitted whereby a request for a permit to drill a salt water disposal well is being sought. This well will be located in Unit L, 143 feet from the south line, 897 feet from the west line, Section 25, Township 11 South, Range 32 East, Lea County, New Mexico.

Present plans are to dispose of all the produced salt water

from the Moore-Devonian Reservoir in the Dewey Lake formation, which is anticipated to occur within the interval from 1210 to 1430 feet. Rights of way have been obtained for the surface location of the proposed well as well as for the gathering system. Much of the tubular goods required for the gathering system is on order. All of the interested operators are in complete agreement on this project, and it is anticipated that water will be disposed of into the proposed well within six weeks after drilling operations commence. That's all.

MR. PORTER: Thank you, Mr. Wade. Any questions of Mr. Wade? You may be excused.

MR. LEACH: W. H. Leach with Magnolia Petroleum Company. Magnolia is Chairman of the disposal projects in the Bough and Crossroads Field.

Bough Field: Installation of a field-wide salt water disposal system is now under way in the Bough Field. Produced water will be disposed of into the Bough "C" (Penn) lime section of T. Betenbough well #2 (SE/4, SW/4, section 12, township 9-south, range 35-east, Lea County, New Mexico). Commission approval for the use of this well for salt water disposal was granted on February 14, 1957 (case #1174). Installation of the system will include 4 1/2" cement lined lines to the tank batteries of all presently water productive leases, with facilities available at the station manifold system to tie in the remaining leases when water production from those

leases dictates such a connection. In this regard, a manifold connection will also be made available for the use of Mr. J. R. Sharp, the only operator other than Magnolia now producing in the Bough Field.

Crossroads Field: On February 16, 1957, Commission approval was granted to Magnolia to use its Santa Fe Pacific "C" #2 (NW/4, SW/4, section 26, township 9-south, range 36-east, Lea County) for salt water disposal in the San Andres formation (Order # SWD-1). Since the date of approval, final plans for the disposal system have been formulated and tentatively approved by all operators in the field. An operating agreement for a unitized system is presently being processed and should be submitted to all operators in the Crossroads Field in the near future.

Produced water from Magnolia's Santa Fe Pacific "C" Lease (approximately 320 barrles per day) is being injected into the San Andres formation of the salt water disposal well. A temporary pump and gathering system have been installed for this purpose pending the completion of the complete salt water disposal system.

Installation of the field wide system will be commenced as soon as an operating agreement is negotiated with the other operators in the field.

MR. PORTER: Thank you. Does anyone have a question on this report? You may be excused. Mr. Tomlinson.

MR. TOMLINSON: W. P. Tomlinson, Engineer with the

Atlantic Refining Company. Atlantic is Chairman of the Group of operators working towards disposal of salt water in the Denton Field. Our last report was submitted in March, 1957, on this project. Since that time we have virtually completed preparation of an operating agreement which should be submitted to the operators within the next one to two weeks. The New Mexico Oil Conservation Commission has approved use of a well in the southeast corner of the field for salt water disposal. I know of no large obstacles beyond this point that will slow down field construction of the system. That's all I have.

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

MR. KELLEY: I am C. L. Kelley with Pan American Petroleum Corporation reporting on the activities of the Hobbs Pool.

At the time of the March 14, 1957, Regular Hearing of the New Mexico Oil Conservation Commission, progress toward solution of the salt water disposal problem in the Hobbs Field was primarily in the planning stage. A salt water disposal well had been completed, however, injection had been limited to that necessary to obtain injectivity tests and comparable data. Activity was primarily confined to data collection, securing of rights-of-way and tentative steps toward a field wide disposal system. Since that time we feel that material progress has been made.

Humble Oil and Refining Company is making final arrangements

to commence disposing of produced salt water from 11 of their 13 Hobbs Field wells. Humble reports that all material for their disposal system has been received and that construction is expected to commence within 30 days; completion is expected within the next 15 days. The 125 barrels of water per day produced from Humble's 11 wells will be injected in their State "A" No. 2 completed as a salt water disposal well during February, 1957. This volume of water represents 85% of total water produced from Humble's Hobbs Field wells.

Pan American Petroleum Corporation has drilled and completed the State "A" Tract 9 Salt Water Disposal Well No. 1 located in SW/4 NW/4 Section 15, T-19-S, R-38-E, which is at the southern end of the Hobbs Field. During tests conducted on August 10, 1957, the well was indicated to have a maximum disposal capacity of 1152 barrels of salt water per hour or 27,648 barrels per day by gravity flow down 7" casing. It is equipped with three inch tubing. Through 3" tubing the well had a capacity of 15,840 barrels per day. The well was drilled to a depth of 4872'; 7" casing was run to this depth and cemented in two stages with a total of 1205 sacks of cement. Water is being injected into the San Andres through 476 casing perforations located over the depth interval 4634' to 4826'. The perforated interval is approximately 400' below the lowest oil productive interval in the San Andres. Drill stem tests were run to locate the lowest oil productive interval

and to determine that only salt water and no oil could be produced from the disposal interval.

Since August 26, 1957, all of the produced salt water from 6 Pan American Hobbs Field wells has been injected in the State "A" Tract 9 SWD No. 1. These 6 wells produce approximately 700 barrels of water per day and are served by temporary disposal lines. This temporary system is to be expanded within the next 90 days to include an additional 32 wells and handle an additional 700 barrels of water per day. The present 700 barrels per day being injected represent 47% of water produced from Pan American operated wells. After the proposed expansion of the temporary system this will be increased to 93%.

Within the next 90 days, the Humble and Pan American disposal systems should have a total of 49 wells connected and will be injecting about 1525 barrels water per day. Wells connected and barrels disposed of will represent about 17% of the total Hobbs Field wells and 18% of total water production.

With the completion of Humble's and Pan American's disposal wells, sufficient data is available to make a complete design of a possible field wide salt water disposal system. Operators of 97% of the Hobbs Field wells accounting for essentially all of the present water production have agreed to share the cost of a preliminary salt water disposal study including proposed design and estimated costs of a cooperative field wide system. Rice

Engineering and Operating, Inc. has been employed to make this study. Mr. Ivan M. Rice has advised that the study is now 60% completed and he anticipates that the completed report will be in the hands of the Hobbs Field Operators before the 1st of November. When this report has been evaluated by the operators, they should then be in a position to make the final decision as to the type of disposal system to be used in the Hobbs Field.

MR. PORTER: Thank you, Mr. Kelley. Does anyone have a question of Mr. Kelley? You may be excused.

MR. MONTGOMERY: J. W. Montgomery of Shell Oil Company in Hobbs.

In Shell's statement at the March 14, 1957 hearing, it was reported the Echol Pool Engineering Committee recommended that The Texas Company's State AW-1 be cleaned out and tested for receptivity in the San Andres formation. During the neogitations to obtain The Texas Company well for the test, the 5 1/2-inch casing in Shell's State A-1 well parted at approximately 8000 feet. To expedite the installation of the disposal system, injectivity tests were initiated in Shell's well instead of The Texas Company well. These tests are currently being made and as soon as they are finished, a meeting of the operators will be held to complete the design and begin construction of a disposal system. An operating agreement has been circulated, comments have been received from the other operators, and a revised agreement is now being prepared.

Shell was also selected as chairman of the Engineering Committee to design a community disposal system in the Caudill Devonian Pool. Although no mention of this Pool was made in the Commission's letter of July 3, 1956 to the operators, the need for subsurface disposal was recognized by the companies operating in the Pool. Shell, acting as agent for the other operators, is currently negotiating for an abandoned dry hole to use as a disposal well. A proposed operating agreement has been circulated and a meeting to discuss this agreement will be held in the near future.

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

MR. BLACKWOOD: If there are no further reports, I would like to make a statement. Blackwood with Amerada. In view of the progress that has been reported toward salt water disposal in the fields, we feel like it would be well to continue this case for another six months until the regular March hearing of 1958.

MR. PORTER: Before we act on your motion, Mr. Blackwood, is Mr. Spiegel here from the State Engineer's Office? Do you have any comments to make, Mr. Spiegel?

MR. SPIEGEL: No, I don't.

MR. PORTER: Is there anyone else from the State Engineer's Office that would like to offer anything in this case?

I might say that the Commission has been very well pleased with the progress reports which we have received from time to time

since this case first came on the docket. I know that a lot of work has been done on these projects, particularly in the Eunice-Monument area, and the Hobbs area, involve the expenditures of a lot of money. It takes a lot of planning on how to best spend that money, there are a lot of people involved, and we recognize that all of those things take time. However, we would like to urge you to, as Pool Committee Chairmen and as Pool Committees, to continue your diligent efforts so that we may dispose of this matter as promptly as possible.

Of course, we expect to hear more favorable progress reports when the case comes on again. The Commission has decided to continue the case until March, the March regular hearing.

The hearing will recess until one-fifteen.

(Recess.)

C E R T I F I C A T E

STATE OF NEW MEXICO)
: SS
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, 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 1st day of October, 1957.

Ada Dearnley
Notary Public-Court Reporter

My commission expires:

June 19, 1959.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 13, 1958

IN THE MATTER OF: Case No. 1053

TRANSCRIPT OF PROCEEDINGS

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
3-6691 5-9546

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 13,1958

IN THE MATTER OF:

Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico. Case 1053

BEFORE:

Mr. A. L. Porter, Jr.
Mr. Murray Morgan
Governor Edwin L. Mechem

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: We will take up next Case 1053.

MR. COOLEY: Case 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico.

MR. PORTER: Mr. Christie.

MR. CHRISTIE: R. S. Christie, Amerada Petroleum Corporation. I have a short statement to make in reference to the Pools in which Amerada is interested as the operator.

In the Bagley salt water disposal system for the Bagley Field, which is operated by Amerada Petroleum Corporation, this fieldwas reported on at the last hearing on September 17th as having been in operation. It has been in continuous operation since May the 29th, 1957, except for some short periods when the well was acidized to increase injectivity. All the produced water in the Pennsylvanian and Devonian Pools is now being injected into the Pennsylvanian producing zone through Amerada State BTD No. 4. The well takes water on a 21 inch vacuum, a total of 1,616,599 barrels has been injected to the 1st of February of this year. The average injection rate during January was 7428 barrels per day. So this particular system is working as we had expected and very satisfactorily.

In the East Caprock Field, which is operated by Amerada, the system has been in operation since July 25, 1957, and has injected 452,000 barrels to the 1st of February of this year. An average of 2322 barrels per day was injected during January of 1958. We haven't been so successful in this project because our pressures are extremely high; they run about 1200 pounds, and we are only injecting about 25 percent of produced water. We have under consideration now a study to determine the feasibility of injecting in the Devonian in an edge well. So I think within a very short time we will probably file an application with the Commission to substitute another well for injecting of salt water.

MR. PORTER: At the present time it is all being disposed

of through the present well?

MR. CHRISTIE: No, sir, only about 25 percent of it.

MR. PORTER: 25 percent?

MR. CHRISTIE: Yes, sir.

MR. PORTER: Go ahead.

MR. CHRISTIE: The Saunders Field has not commenced operation as yet. The articles of agreement have been executed by all the operators in the field, the system has been completely surveyed and construction has started. All pipe for gathering lines is on hand, and all other equipment has been requisitioned. We expect construction to proceed rapidly and should be in a position to inject water in several months.

Heretofore the Eunice-Monument area was divided as far as reporting was concerned into two areas; the Eunice-Eumont area which Gulf Oil Corporation reported on formally, and the Monument-Eumont Area which Amerada reported on. These two areas have been combined for the purpose of a study by an outside consulting firm, and I will report on the total area at this time for both companies.

Since the Commission hearing of September 17th, 1957, the last progress reporting date, an operators' meeting was held November 19, 1957, in which operators having sixty-nine and one-half percent of the wells in the Eunice-Monument-Eumont Area favored unit operation of the Eunice-Monument salt water disposal system. At this meeting the articles of agreement were reviewed and recommended changes were made. A meeting was also held February 20,

1958, for final consideration of the estimated maximum water production for the final design of the salt water disposal system. To expedite the physical work of installing this system, it was voted that a deadline of March 15, 1958, be set for the operators to commit wells to the system, in order that design may be finalized. With the number of wells to be included in this system on hand by March 15th, the following schedule outlining estimated future progress in this matter is considered realistic. This schedule was arrived at after discussing the matter with the Rice Engineering & Operating Inc. company, who it is expected will be the operator of this unit. By April 15th the final design of the system should be completed and the final draft of the operating agreement will be mailed to all interested parties. It is the feeling that by July 15, 1958, all operators will have approved and returned the articles of agreement. By this date, July 15, 1958, orders for materials for some of the lines will be placed and work will be started on the initial salt water disposal wells. Subsequent to the completion of the disposal wells, final surveys for some of the gathering lines will be initiated.

With the above schedule and no undue delays, it is believed that actual physical work on the construction of some of the gathering system can be started by August 15th of this year. The initial work in installing this cooperative salt water disposal system will be in the areas of the larger water production, to start off with, at least.

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As a matter of information, as of this date approximately 925 wells have been committed to this system at this time.

MR. IRBY: How many?

MR. CHRISTIE: 925.

MR. PORTER: Out of a total of how many?

MR. CHRISTIE: Initially the total wells for both fields was approximately 1262 wells. Of course, there are a number of wells in the field that are still not making water, and it is presumed that this 925 are the ones that are making water, or they are expected to make water in the near future; and as time goes on, it may be necessary to extend the gathering system to take in the other wells that are not committed at this time. Of course, I think the Commission realizes that this field being as large and having so many different operators, that it is a little more complicated to get everybody in agreement than it is in the smaller fields where we have few operators.

MR. PORTER: Do you know how many operators in this pool are involved?

MR. CHRISTIE: Just offhand, I do not. I imagine that Mr. Abbott, if he is here, he may be able to tell you.

MR. ABBOTT: I believe there are 37 operators.

MR. CHRISTIE: In the two areas?

MR. ABBOTT: Yes, sir.

MR. PORTER: Owning from one well up to around 240 wells?

MR. CHRISTIE: Well, I'll assume those figures are correct.

MR. PORTER: Anyone have a question of Mr. Christie while he's on the stand?

MR. COOLEY: I have a question. Mr. Christie, have you ever projected completion date for that Eunice-Monument-Eumont Area where 100 percent of the water would be disposed of?

MR. CHRISTIE: Well, if all this target is met that I read out by July 15th when the work would start, I would judge possibly ninety days, four months. It might be the end of the year. I think we can start injecting water before that, but to complete the system and have the wells tied into it and be injecting water from all wells, it might take four to six months.

MR. COOLEY: Somewhere around the 1st of '59?

MR. CHRISTIE: Yes, sir.

MR. COOLEY: What is your projected completion date on the Saunders?

MR. CHRISTIE: On the what?

MR. COOLEY: Saunders.

MR. CHRISTIE: Saunders Pool, I would estimate about sixty days.

MR. COOLEY: That one hundred percent of the water would be disposed of in that sixty days?

MR. CHRISTIE: Yes.

MR. COOLEY: From this date?

MR. CHRISTIE: Well, yes, from this date.

MR. COOLEY: What is your projected completion or projected

point to where one hundred percent of the water would be disposed of in the East Caprock?

MR. CHRISTIE: Well, that depends on the number of factors; in the first place, we have to get a permit from the Commission to inject water into the Devonian which is what we contemplate, and this is a matter of timing, I assume, and take a month or more to get that, and it wouldn't take long after that because our system is in, so I would say from two to three months.

MR. COOLEY: Thank you very much.

MR. PORTER: Anyone else like to ask Mr. Christie a question on this progress report? Thank you, Mr. Christie.

Do we have representatives from other committees to report on other pools?

MR. WADE: Mr. Wade, Texas Company. I am reporting on the Devonian Pool. We have received the Commission's approval to use our salt water disposal well by Order No. SWD-7. We have all the equipment on hand. We hope that we will be putting one hundred percent of the water in the ground during next month, by May the 1st. That's all I have.

MR. PORTER: Does anyone have a question concerning Mr. Wade's progress report? Thank you.

MR. CHRISTENSEN: Mr. Christensen with Shell Oil.

MR. PORTER: Would you come forward, please, each of you who are giving progress reports?

MR. CHRISTENSEN: Mr. Christensen with Shell. I would like

to report on the progress of the Echol and the Caudill Fields.

Echol Field injectivity tests have been made in the State A-1 well. These tests were successful and we have Commission's approval to use the well. The equipment for the system has been ordered and construction is in progress. It is anticipated that this system will be completed and in operation by the middle of April.

The Caudill Field, although no mention was made of the Caudill Devonian Pool in the Commission's letter of July 3rd, 1956 to the operators, the need for subsurface disposal was recognized by the companies operating in the pool. In Shell's statement of September 18, 1957, it was reported that negotiations for an abandoned dry hole for use as the disposal well in the Caudill Field were under way. We have now obtained Humble's dry and abandoned Ault Heirs No. 1 well. Injectivity tests are currently being made. A gathering system has been designed and a portion of the rights-of-way obtained. An operating agreement and AFE for the installation of the system are currently being circulated to the participating companies for approval.

MR. PORTER: Anyone else have a question on this pool? Thank you.

MR. COOLEY: What is the projected completion date?

MR. CHRISTENSEN: April 15th for the Echol Field.

MR. COOLEY: You say in operation by then, does that mean one hundred percent?

MR. CHRISTENSEN: One hundred percent. The Caudill, three to four months, I would say as an estimate.

MR. COOLEY: Thank you.

MR. PORTER: Does anyone else have a report at this time? Mr. Tomlinson.

MR. TOMLINSON: This is continuation of the progress report for the Denton salt water disposal system. Atlantic expects to be operator of the Denton salt water disposal system. Two days ago we obtained additional operator approval of the operating agreement for the system, and this increases the total percentage of approval to a little over eighty percent. That is sufficient to start ordering materials, purchase rights-of-way, and start field survey work. We expect that to go forward immediately. We have previously obtained the Commission's approval to convert a depleted Wolfcamp producer to an injection well in the Pennsylvanian. At this time we are pleased with the progress that we're making toward underground salt water disposal in the Denton. We expect to be injecting water in the Denton by July the 1st, if we do not have any further delays than we see right now.

MR. COOLEY: One hundred percent?

MR. TOMLINSON: That's one hundred percent assuming that the remainder of the operators sign the operating agreement. If they didn't, of course, we wouldn't be authorized to speak for them.

MR. COOLEY: But the facilities would be large enough to handle one hundred percent?

MR. TOMLINSON: Yes, sir.

MR. COOLEY: -- of the water by July 1, you feel?

MR. TOMLINSON: Yes, sir, that is our intention, that is our target date.

MR. PORTER: Does anyone have a question concerning this report? Thank you, Mr. Tomlinson. Mr. Buell.

MR. BUELL: Guy Buell.

MR. KELLEY: I am C. L. Kelley with Pan American Petroleum Corporation to report on the Hobbs salt water disposal work.

The previous progress report on the Hobbs Field Salt Water Disposal System presented at the September, 1957 Regular Hearing pertained primarily to the completion of the two disposal wells to be included in the cooperative system and progress on the installation of a temporary disposal system. It was also stated in the report that Rice Engineering and Operating, Inc. had been employed to make a preliminary study of the Hobbs Field and design a system to dispose of the produced water. This design was received by the Operators on November 14, 1957. There was some disagreement with the design factors used and subsequently the fieldwide system was redesigned, using different factors. This redesign was completed and presented to the Operators at a meeting held in Hobbs, New Mexico, on February 14, 1958. At another Operators' meeting held on February 28, 1958, the redesigned fieldwide cooperative system was accepted by the Operators. The estimated cost to install the redesigned system is approximately $1,100,000. It will initially

employ only the two existing disposal wells, and therefore will not require drilling any additional disposal wells to place the entire system into operation.

A revised operating agreement, incorporating revisions previously requested, was mailed to all the operators on March 4, 1958. An operators' meeting has been called for March 21, 1958, to review the revised draft and discuss any additional changes to the agreement. By the date of this meeting, it has been requested that all operators submit a final list of leases and wells to be included in the initial installation of the cooperative system. Only wells submitted by this date will be included in the final design.

Now that the design of the system has been agreed to by the operators and the proposed operating agreement is in final stages of consideration, it is anticipated that construction of the permanent system can begin within three or four months. Most of the operators have informed us that the expenditure for this system has been budgeted and their management would like to spend the money within this calendar year.

In addition to the progress that has been made on the permanent fieldwide system, the number of Hobbs Field wells that are currently disposing of water underground through the temporary systems has increased from six in September, 1957, to thirty-seven as of March 1, 1958. Cumulative water injected in the two existing disposal wells as of March 1, 1958, is approximately 158,000 barrels.

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MR. PORTER: Does anyone have a question of Mr. Kelley concerning his report?

MR. COOLEY: Yes, sir.

MR. PORTER: Mr. Cooley.

MR. COOLEY: Do you have a projected completion date by which one hundred percent of the water in the Hobbs Pool can be disposed of?

MR. KELLEY: No, we do not at this time. There are several reasons for it, one of them is that the operating agreements haven't been executed by the operators, and another is that even after that it will be difficult to estimate how long before all the wells can be brought in because there's a lot of townsite work to be done and some of that may be slow. A lot of streets to cross and alleys to go through.

MR. COOLEY: You wouldn't have an estimated earliest possible date?

MR. KELLEY: If we get started in three or four months, and we predicted here, I think, by the end of the year, it possibly could be in without undue delays, but as I say there is going to be a lot of trouble there in town.

MR. COOLEY: Thank you, Mr. Kelley.

MR. NUTTER: Have you ironed out the right-of-way problem, Mr. Kelley?

MR. KELLEY: Not all of them. We have quite a few of the right-of-ways already arranged for, but not all of them.

MR. NUTTER: You still have some right-of-ways to obtain, then?

MR. KELLEY: Yes. The biggest part of it will be on permit rather than right-of-way in the townsite, I believe that will be mostly permits because these lines will probably go down parkways and alleys.

MR. PORTER: Does anyone else have a question of Mr. Kelley? Thank you, Mr. Kelley. Does that conclude our list?

MR. CHRISTIE: I don't know if you think it is going to be necessary to have another progress report or not, but if you do, our company would recommend that we have another progress report not any sooner than six months at least.

MR. PORTER: We have a motion for the continuance of this case for a period of six months. Would anyone like to comment on that? Mr. Irby.

MR. IRBY: Yes, sir, I would.

MR. JOYNER: Sir, we have another statement to be read here of Magnolia.

MR. PORTER: Does this concern another pool?

MR. JOYNER: Yes, sir. Hagan D. Joyner, Magnolia; statement concerning the Bough and Crossroads Fields.

On March 3, 1958, a fieldwide salt water disposal system was put into operation by Magnolia in the Bough Field, Lea County, New Mexico. The system is currently disposing of produced water in the field, using Magnolia's T. Betenbough Well No. 2, SE/4, SW/4,

Section 12, Township 9 South, Range 35 East, as the disposal well. Permission to use this well for salt water disposal was obtained from the New Mexico Oil Conservation Commission on February 14, 1957, Case 1174.

The Bough system is entirely closed and utilizes 4-1/2 inch cement lined pipe throughout. Injection is accomplished by means of gravity head at the station provided by two low 500 barrel plastic lined storage tanks.

There is, therefore, no further need for surface salt water disposal in the Bough Field.

Crossroads Field: Magnolia has circulated an Operator's Agreement for the installation of a fieldwide salt water disposal system in the Crossroads Field. Upon receipt of all operator's approval of that agreement, Magnolia will install the proposed system to handle produced water in this area.

The New Mexico Oil Conservation Commission granted approval to Magnolia, Order SWD-1, February 16, 1957, to use its Santa Fe Pacific "C" No. 2, dry hole, as a salt water disposal well. The injection formation is the San Andres dolomite. This well has been tested and found adequate as a disposal well. At present, a temporary injection pump has been set at the well in order that the produced water from Magnolia's Santa Fe Pacific "C" No. 1, approximately 600 barrels per day, can be disposed of without surface contamination.

The proposed system will be closed throughout and will consist

of cement lined pipe and plastic lined storage tanks.

MR. PORTER: Mr. Joyner, would you give an approximate completion date on this Crossroads system, or would you venture one?

MR. JOYNER: Well, the Operator's Agreement hasn't been signed and construction of the system wouldn't be started until such time.

MR. PORTER: How many operators in the pool, three?

MR. JOYNER: Just a minute. No, sir, there are four.

MR. PORTER: Four. Mr. Cooley.

MR. COOLEY: Has there been any progress made since the last report in this pool?

MR. JOYNER: No, sir, no progress on the signing of the agreement; all operators signed on the Crossroads.

MR. COOLEY: All operators in the Crossroads have signed the agreement?

MR. JOYNER: No, sir, they have not.

MR. COOLEY: And there has been no progress since September, no additional ones?

MR. JOYNER: Not to my knowledge, no, sir.

MR. COOLEY: Do you have any knowledge of why this hasn't progressed?

MR. JOYNER: No, sir, I don't.

MR. COOLEY: What companies have failed to sign?

MR. JOYNER: I believe, I am not sure on this, I think Sunray and Warren. I can't be sure on that statement.

MR. COOLEY: Can you check that?

MR. JOYNER: Yes, sir, I can. I can get it for you.

MR. COOLEY: I mean with someone here at the present time.

MR. JOYNER: Can anybody verify that, a representative of Sunray?

MR. KASTLER: I can verify that Gulf now operates properties of Warren. The agreement will be executed next week. The agreement was misplaced in the transfer of files from one company to another.

MR. PORTER: Is there a representative of Sunray present?

MR. ERREBO: Burns Errebo.

MR. COOLEY: Has Sunray signed the agreement for water disposal in the Crossroads Pool?

MR. ERREBO: Yes.

MR. JOYNER: It is our information that it has not been received. It could be received in the Tulsa office. It hasn't been received in the Midland office. The operator's agreement has been sent out.

MR. COOLEY: It has been circulated?

MR. JOYNER: Yes.

MR. COOLEY: Do you know when?

MR. JOYNER: Yes, sir. It was circulated last July, approximately. I can check the exact date for you. It has been in circulation for almost six or eight months.

MR. ERREBO: I think I can find out about that; I have no information on it.

MR. COOLEY: Would you determine what your company's policy is with regard to this agreement and advise the Commission at your earliest convenience?

MR. ERREBO: Yes.

MR. COOLEY: To your knowledge, I believe you said Sunray and Warren are the only two that have not signed up?

MR. JOYNER: Yes, sir.

MR. COOLEY: Warren, now operated by Gulf, states they will sign up shortly, and Sunray is going to advise?

MR. JOYNER: Yes.

MR. COOLEY: I believe that takes care of it.

MR. PORTER: Thank you, Mr. Joyner. Mr. Irby. There has been a motion by Mr. Christie, if another progress report is deemed necessary, that the case be continued for at least six months. Is that the substance of your motion?

MR. CHRISTIE: Yes, sir.

MR. PORTER: Mr. Irby.

MR. IRBY: I am not sure whether the progress report is necessary if the Commission expects to enter an order today, but with the thought in mind of six months continuance, I would like to say that it's been about two years since the operators attacked this problem; and we must admit, of course, that in some of these pools,why they have diligently attempted to solve this problem, and in other pools the converse is true. Out of the ten pools which required immediate attention, and the letter was sent out by

the Commission two years ago, there have been fourteen applications from ten different operators to dispose of salt water underground. Now these applications, according to the reports that we have, do not purport to represent anywhere near the total brine production in these pools. No operator has indicated an intent to construct evaporation pools with impervious lining in them. This is no surprise, when you consider the feasibility of those products. Now in the thirteen pools which required attention in the very near future, in this same letter I spoke of previously, there have been no applications to the Commission to dispose of this water in underground pools, nor have there been any applications or any indications that they desire to dispose of water in impervious evaporation pits. However, there is an interesting thing here to note, and that is that several pools which were not listed on either of these critical lists have submitted applications and started construction and injection of water underground to take care of their brines.

Now the State Engineer's office staff is now compiling data and information from several sources including the progress reports that have been submitted here at the previous meetings, and this compilation when finished will include the reports that have been submitted here today. We expect to have this compilation completed in a maximum of six weeks. An analysis of this data will follow immediately, and is included in the six weeks estimate. Now at that time we will be prepared to ask the Commission to enter an

order in this case. For the reasons I have stated, the State Engineer urgently moves that this Commission not grant a continuance beyond sixty days. Now at the expiration of the sixty days, if the continuance is for sixty days, when it's called we will be prepared to present our compilation and the analysis of it, and it is our present intention to ask that an order be entered shutting in all brine producing wells in Lea County operated by persons or companies who have not diligently demonstrated in their planning and construction the means for the disposal of their waste.

Again I urge that the continuance not exceed sixty days.

MR. PORTER: Anyone else have a comment on the motion? Mr. Christie, the Commission will deny the motion for continuance for six months. The Commission will continue the case for ninety days or three months, to be heard at the regular hearing three months from now, the June regular hearing.

MR. JOYNER: I have a statement to make in Case 1053. This statement is on behalf of all operators in the field, to clarify a statement made, this is for the benefit of the operators. I would like to make a statement that if any of the operators want to drop by the office and inspect this data, it is available.

MR. PORTER: Mr. Joyner, you may proceed with your statement.

MR. JOYNER: Magnolia Petroleum has received the signed approval and the operating agreement from all operators in the field. Work on the completion of the gathering system will start in the near future, and it is estimated that the one hundred percent

injection of all produced water can be started by September 15, 1958.

* * * * * * * * * *

C E R T I F I C A T E

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 31st day of March, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1959.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico

IN THE MATTER OF:

Case No. 1053

TRANSCRIPT OF PROCEEDINGS

September 17, 1958

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BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
SEPTEMBER 17, 1958

IN THE MATTER OF:

Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

CASE NO. 1053

BEFORE:

Edwin L. Mechem
Murray Morgan
A. L. Porter

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: As you came into the hearing room this morning, you were handed a statement prepared by the Commission, concerning Case Number 1053, which I will take up at this time.

Statement begins, "It has come to our attention that there is some question concerning the Commission's jurisdiction over the subject of salt water disposal. In order to resolve any doubts in this regard, it is our position that the Oil Conservation

Commission has general jurisdiction over the subject of salt water disposal by virtue of its implied power to supervise the production of oil and gas in the State of New Mexico. Such jurisdiction is also expressly conferred upon this Commission by subsections (2) and (7) of Section 65-3-11 of the New Mexico Statutes Annotated."

The balance of the statement has to do with what has transpired in this case since it came on in April of 1956, more of a resume, and with the procedure to be followed in the case this morning. The procedure set out at the bottom of page 2 will be strictly adhered to and conducted in the case, and we will certainly appreciate your cooperation in that regard. At this time we will hear testimony from the State Engineer's Office.

MR. PAYNE: Case 1053. Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico.

MR. HARRIS: May it please the Commission, I am Charles Harris, attorney for the State Engineer. I have reviewed the testimony on the possibility or hazards of contamination on the ten fields in question, and it seems that to me that there has been a prima facie case made up. There may be some additional questions that may need to be raised about the water condition in those fields. Mr. Don Akin with the office of the State Engineer,

and our previous witness Mr. Sam Spiegel is out of the State now, Mr. Akin can testify generally about the water conditions in these ten fields,and therefore, I would like to have him sworn at this time.

MR. PORTER: Mr. Akin, stand and be sworn, please.

(Witness sworn.)

P. D. AKIN

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

DIRECT EXAMINATION

By MR. HARRIS:

Q State your name, please.

A P. D. Akin.

Q And you are employed by the Office of the State Engineer?

A Yes, sir.

Q In what capacity?

A Chief of the Water Resources and Development Section of the Technical Division.

MR. COOLEY: Mr. Akin, I do not think they can hear you.

MR. PORTER: We have a good many people in the back of the room this morning.

Q (By Mr. Harris) Would you briefly give the Commission an outline of your educational background, Mr. Akin?

A I was graduated from the University of New Mexico as a Civil Engineer in 1940, and I was employed by the United States Geological Survey in 1941, in the ground water branch, and in that capacity why I did work in Lea County and other ground water basins in the eastern part of the State. Is that sufficient?

Q No.

A In 1944, I was transferred to North Dakota and stayed there to become District Engineer of the North Dakota office of the Geological Survey, and in 1954, I left there and returned to New Mexico, and in the spring of 1955, I was employed by the State Engineer's office and was District Engineer in Roswell for about two months, and then I was transferred to Santa Fe as chief of their Reports and Engineering Data Section of the Technical Division; and about, in the spring of 1958, I was transferred to Chief of the Water Resources and Development Section.

Q And have you done any post-graduate work after you received your bachelors degree, Mr. Akin? A No, sir.

Q And have you had an occasion to go over the transcript of record before the Oil and Gas Commission concerning Lea County?

A Yes, sir, on Mr. Spiegel's Case 1053.

Q And have you gone over the exhibits and the material and the text of the treatise that were involved in this case?

A I do not know how -- I might say partly to that question.

I have not examined all the texts and technical literature that was referred to by Mr. Spiegel in his testimony.

Q But you have gone all over his work, and have you gone over his computations?

A I have gone -- read his testimony and examined the exhibits.

Q And do you agree with the conclusions that he has presented to the Oil and Gas Commission?

A Yes, sir, I believe so.

Q I would like to have this map marked for identification.

(Applicant's Exhibit No. 19 marked for identification.)

Q Referring to what has been marked as Exhibit 19, and referring to the red circles --

MR. PORTER: Let's mark this Exhibit 19-A.

Q (By Mr. Harris) Referring to the circles with the "A", with the capital "A" in the center of the circles, Mr. Akin, are those the ten well fields in question?

A Yes, sir, I believe so. I have not had a chance to examine this map before, but it -- yes.

Q Now, then, comparing this map with the previous map that was introduced, entitled "Approximate Thickness of Saturated Settlements in the Ogallala Formation and Part in Lea County", and introduced as Exhibit 13, would you compare Exhibit 13 with what has been identified as Exhibit 19-A? Mr. Akin, Exhibit 13 shows

the depth of the saturated water bearing sand in the Ogallala Formation, is that correct?

A Yes, sir, in the principal area of the Ogallala Formation in northern Lea County.

Q Now, then, referring to Exhibit 19-A, to the circle entitled "Eunice-Monument Field", could you tell the Commission whether or not under the Eunice-Monument Field there is fresh water that is now being appropriated in Lea County?

A The township is not given on this map.

Q Well, are you acquainted with the map?

A Well, I need to get the location of the Eunice-Monument Field with regard to something on this map.

Q Do you have any other exhibits that you could compare it with so that you can orientate yourself with, Mr. Akin?

A I can get it pretty well here, I think, if you will just allow me a moment. This map has none of the details on it.

Q Well, have you studied, Mr. Akin, have you studied the field that they call Eunice-Monument Field that the State Engineer has suggested as a critical area?

A Yes, we have information that I do not have with me right now, that there are fresh water supplies in the Eunice-Monument area.

Q Now, referring to Hobbs area, in the Hobbs Field, --

A Definitely, there will be fresh water in the Hobbs Field. Hobbs is considerable distance from the southern boundary of the main Ogallala area.

Q And is there a distinct hazard that the brine disposal in the Hobbs Field would contaminate the fresh water in the Hobbs vicinity?

A I believe that surface disposal into unlined pits would be a potential hazard to the water in that area.

Q Now, referring to the two circles that are marked "Denton Field", is there fresh water underlying the location of those fields?

A Yes, definitely.

Q And is there a hazard that they may become contaminated from brine disposal?

A Yes, sir, that would be the case in that area; it might be more hazardous to Texas than there, than to New Mexico, but in the area of the field itself, there would be danger of contamination there.

Q Now, referring to the Sanders Field --

A Yes, sir.

Q -- is there a hazard from brine disposal in that field?

A Yes, sir.

Q And how about the East Caprock Field, is that still within

the declared boundary of the Lea County Basin?

A Yes, it is.

Q And is there fresh water being pumped and used in that area?

A Yes, sir, for stock and domestic supplies, there would be.

Q And would the disposal of brine in unlined pits cause a hazard to the fresh water supply in that area --

A Yes, sir.

Q -- if it continues over a long period of time?

A Yes.

Q How about in the Bagley Field?

A Yes, Bagley would be, yes, sir.

Q And in the Moore Field?

A Yes, sir.

Q Now, then, going up to the three fields that are on the north, outside the declared basin, the Eohol, Bough and Crossroads Fields, which are north of the declared basin, would you tell the Commission whether or not brine disposal in unlined pits would constitute a hazard to fresh water supply in those areas.

A Well, we have very little information on the ground water conditions in those areas there, and the only thing that we can go on is that there are domestic water, domestic and stock water supplies in that area. I do not believe that there are any large irrigation supplies, but it would appear that simply the presence

of stock and domestic wells in that area would indicate that there are fresh water supplies, and if this is the case, disposal of brine from these fields would create a hazard.

Q Has investigation of the State Engineer's office shown that brine has been disposed in surface pits in all ten of the fields mentioned?

A That, I can't answer right now unless this information is in Mr. Spiegel's testimony; I think that we can assume that it is the case though. I have not personally examined all these fields, and unless the information is in Mr. Spiegel's --

Q Have you reviewed Mr. Spiegel's testimony?

A Yes, but I wouldn't know if he gave data on all these ten fields; I think perhaps Mr. Irby might be able to say about that.

Q Now, then, Mr. Akin, is there any way that the salt brine that is being disposed in these ten fields in open pits, is there any way it can be prevented from going down to the fresh water aquifer by natural conditions?

A You mean if the water is disposed of in pits --

Q Yes.

A -- in unlined pits --

Q Yes.

A If the water is disposed of in unlined pits, it is almost bound to get into the fresh water aquifers.

Q Is there any barrier under these ten fields, any natural barrier which would prevent the fresh water from going into -- the brine from going into the fresh water aquifer?

A The only thing we can say is that there are fresh water supplies in this area, and that -- in these areas, and the fresh water in these areas is supplied by rainfall in the area, so that the water percolates down to the aquifers. Now, if the fresh water percolates down to the aquifers, so will the brine.

Q And therefore it is your opinion that in each of the areas that the brine that is disposed on the surface will eventually percolate down into the fresh water zone?

A Yes, sir.

MR. HARRIS: May it please the Commission, that is all the questions I have.

MR. PORTER: Do you wish to offer your exhibits at this time?

MR. HARRIS: Yes, we will offer the exhibit which I understand has been prepared by Pan-American, and which shows the location of the ten fields in question.

MR. PORTER: Any objection to the admission of this exhibit?

MR. BUELL: Probably for the record, instead of giving Pan-American the blame for that drafting work that is on there, I think I will have to confess that I did it.

MR. PORTER: The exhibit will be admitted.

Does anyone have a question of Mr. Akin?

MR. ADAMS: Mr. Porter, is it needless to say that the rebuttal testimony will be later on,do I assume that now is the time to ask questions, or per schedule?

MR. PORTER: There may be rebuttal testimony, so, Mr. Adams, if you haveany questions of this witness, you askthem at the present time.

CROSS-EXAMINATION

By MR. ADAMS:

MR. ADAMS: My name is John Adams. I am from Hobbs, representing Mapensa Oil Company and Fresoil Company, and myself as operator.

Q (By Mr. Adams) I would like to ask, Mr. Akin, if you have anything of what you consider positive evidence that there has to this point been contamination of the underground aquefir under any of these ten pools?

A Well, we have water samples which show the increase in chloride under some of the pools.

Q Could you tell me -- excuse me.

A No, sir, offhand, I can't tell you which ones. We have the information in the office, and I didn't bring it down this morning because I didn't think we would use it.

Q Then if you do not have this evidence here, and this evidence has not been offered before the Commission, are we to go upon your basis of the statement that was made that you assume that contamination occurs?

A I believe that on the basis of Mr. Spiegel's testimony, in the previous hearings, that it is pretty well established that disposal in pits will definitely be a hazard to fresh water supplies in these areas.

Q This, I take it --

A In other words, the water cannot be contained in the pits, so it has to go down into the fresh water.

Q This, I take it then, you mentioned a moment ago, would be a potential hazard?

A Yes, sir.

Q Do you have any estimate of when this potential hazard might occur?

A Well, I think that the hazard, that the contamination is already occurring, but the magnitude of assurance at the present time, I do not know.

MR. PAUL JOHNSTON: Mr. Porter, would I be out of line to ask for a short recess to discuss this questioning with Mr. Adams?

MR. PORTER: We will have a five minute recess.

(Recess.)

MR. PORTER: The hearing will come to order, please. Mr. Adams, did you have any further questions of the witness?

MR. ADAMS: I didn't have any further questions, Mr. Porter. All I wanted was to find the extent of the evidence the State Engineer has found as to possible contamination.

MR. PORTER: Anyone else have a question of Mr. Akin? The witness may be excused.

Does that conclude all the testimony by the State Engineer's office?

MR. HARRIS: Yes, sir.

MR. PORTER: At this time we will hear testimony from any interested operators concerning the subject we are discussing.

MR. BUELL: May it please the Commission, Pan-American has some testimony to put on. It will take us approximately 15 minutes to get our exhibits up; I didn't realize we were so near through here, or I would have put them up during that short recess, but it will take us at least 15 minutes. One of them is very large and hard to handle.

MR. PORTER: The hearing will recess until 1:00 o'clock.

(Recess.)

1:00 P.M. SESSION
SEPTEMBER 17, 1958

MR. PORTER: The meeting will come to order, please.

MR. HARRIS: May it please the Commission, we would like

to have permission to introduce one more exhibit from this witness and ask him questions about it.

MR. PORTER: Would you like to recall your witness?

MR. HARRIS: Yes, we would like to recall our witness, Mr. Akin, for the purpose of introducing one exhibit.

MR. PORTER: Go ahead.

P. D. AKIN

recalled as a witness, having been previously sworn, testified as follows:

DIRECT EXAMINATION

By MR. HARRIS:

Q Mr. Akin, you are the same Mr. Akin that testified this morning?

A Yes, sir.

Q I hand you what has been identified as Exhibit 20-A, Mr. Akin, and would you tell the Commission what this map purports to show?

A This map shows the locations of the ten fields in question. It also shows the boundaries of the Lea County underground water basin; it shows the general geology --

Q Go ahead.

A -- shows the general geology --

Q Go ahead, Mr. Akin.

A -- and in the southern part of the County, near the Eunice-Monument fields, it shows the locations of the water wells on which we have schedules, and their depths and the producing formations.

Q That's principally in the area of the Eunice-Monument Pool, is that correct?

A Yes, sir.

Q And that only the wells below the declared basin are shown, is that correct?

A There are a few wells, I believe, shown in the southern part of the declared basin.

Q Now, there is a jagged line that extends from the middle part of Range 38 East, Township 21 South, Range 38 East, and goes in a northwesterly direction. Is that the boundary of the Ogallala Formation?

A Yes, sir, that's the southeastern boundary of the main body of the Ogallala Formation in Lea County.

Q And you have only shown the well locations below, south of that Ogallala boundary?

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

Q And your testimony in reference to Exhibit 19-A would be the same as it would be for 20-A, is that correct?

A Yes, sir.

Q And the only addition is showing the extent of the Ogallala Formation and the water wells in the Eunice area, is that correct?

A Yes, sir.

MR. HARRIS: We offer Exhibit 20-A.

MR. PORTER: Is there objection to the admission of the exhibit? It will be admitted.

MR. HARRIS: No further questions.

MR. PORTER: Does anyone have a question of Mr. Akin concerning this Exhibit 20-A? The witness may be excused.

Does that conclude your testimony at this time, Mr. Harris?

MR. HARRIS: That concludes our testimony.

MR. PORTER: At this time I recognize Mr. Buell.

MR. BUELL: May it please the Commission, Pan-American is ready at this time to present our testimony. We will have one witness, Mr. Currens, who has not been sworn.

(Witness sworn.)

MR. BUELL: I would like to state at the outset that the fact that we are presenting testimony should not be construed to the effect that Pan-American is not interested in protecting fresh sub-surface waters; actually, it is due to that interest that we are presenting testimony. We have two major objectives. One is to place in this record and give the record the benefit of data which we have tabulated; our second major objective is to show the

Commission that contamination has not occurred in Lea County due to disposal of produced brine in surface pits.

DANIEL R. CURRENS

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

DIRECT EXAMINATION

By MR. BUELL:

Q State your full name, Mr. Currens.

A Daniel R. Currens.

Q By whom are you employed, and in what capacity, please, sir?

A Pan-American Petroleum Corporation as a Reservoir Engineer.

Q Where are you located?

A Roswell, New Mexico.

Q Mr. Currens, you have testified at prior Commission hearings, have you not?

A Yes, sir, I have.

Q Are your qualifications as a petroleum engineer a matter of public record?

A Yes, sir, they are.

Q In that connection, Mr. Currens, with particular reference to the subject matter of this hearing, have you had any specialized experience in analyzing fresh water samples?

A Yes, sir, I have.

Q Briefly relate that experience.

A Well, sir, at one time I was employed by Sun Oil Company at their Dallas Production Laboratories. My duties there were to run water analyses; analyses of both fresh waters and oil field produced brines. In addition to that, I was employed by the Texas Engineering Research Foundation at Texas A. & M. College; the project we were working on there was water purification systems. I set up a laboratory for chemical analyses of waters in connection with this work, and ran analyses of those waters. All in all, I would say I've spent something over a year in the work of chemical analyses of fresh waters.

Q All right, Mr. Currens, now with reference to the subject matter of this hearing, do you feel the study you have made of this overall matter has been a comprehensive study?

A Certainly. I certainly made the most comprehensive study I could make with the amount of time that I had available to work on the problem. I might state that I have worked something over 1100 man hours myself in the study of this particular problem.

Q Have other Pan-American personnel been involved in assisting you in making this study?

A Yes, sir, they certainly have. I will make an estimate that probably half as much or as much time has been spent by others on this subject, of Pan-American employees, as I have spent myself.

Q Have you had any conferences and discussions with other independent agencies that are interested and have knowledge of this problem?

A Yes, sir, I have.

Q Briefly relate the extent and scope of those conferences.

A Well, I've had several discussions with the United States Geological Survey ground water people, both in Albuquerque and in Roswell, in general talking about the problem, the physical factors involved, and building background information myself in relation to ground water. Also talked to people with the Soil Conservation Service of the United States Department of Agriculture.

Q In connection with this study, Mr. Currens, have you made any field trips to Lea County?

A Yes, sir, I have. You may recall that prior to the time I went to Roswell, I worked out of our Hobbs office -- been several years, however, I went down there on two occasions to in general refresh my memory of the lay of the land, you might say, and the location of pits and just gathering some information on the ground. On those trips I also talked with employees of our company who had some thoughts about the occurrence and location of fresh water in the area, as well as with other companies.

Q At your request, Pan-American personnel contacted drillers of water wells in order to get the information that they might

have that wouldn't be on file or on record anywhere?

A Yes, sir, there have been such contacts made; there had been --

Q And you had the benefit of the firsthand knowledge that they gained from drilling and completing --

A Yes, they were made at my request, and reported back to me.

Q Generally speaking, Mr. Currens, what has been the aerial scope of your study?

A Well, sir, possibly I could best refer to a map here of Lea County. Generally, my study has been confined to an East-West line along around say through Tatum down south to the Texas border. Of course, the points I was primarily interested in were those areas of oil production, and of course that is where most data was available to me.

Q All right, sir. Were you present at the May 1956 portion of this case?

A No, sir, I was not.

Q Have you read the transcript of that portion of this case, and are you generally familiar with the testimony and data that were presented at that time?

A Yes, sir, I've read that transcript, and I am generally familiar with that information.

Q Mr. Currens, I direct your attention now to what has been

marked as Pan-American's Exhibit 1, and Exhibit 1-A. What are those exhibits?

A Exhibit 1, the one here on the left, is Exhibit 1. This is 1-A. Exhibit 1 and 1-A are actually two portions of a map that get pretty tall if we put them together. They show generally Lea County and portions of Chavez and Eddy Counties and Roosevelt County too.

Q What information have you had plotted on Exhibits 1 and 1-A, Mr. Currens?

A Well, sir, we see a heavy red line around much of both exhibits. This represents the boundaries of the Lea County ground water basin as defined by the State Engineer. In addition, we see a number of smaller areas that are outlined in different colors. These represent the fields, pools, that have been previously discussed and there has been some discussion on in this case. The ten pools, the ten most critical pools from the standpoint that produce the most salt water are shown here, as well as the next thirteen that are deemed most critical. Actually, there are 23 pools here. Taking the Lovington area, this side, it is the Lovington Oil Field, and four zones are shown over there.

Q All right, sir, speaking generally, Mr. Currens, does the accumulation of fresh sub-surface waters in Lea County generally divide itself into two areas?

A Yes, sir, I believe so.

Q What are those two areas now, very generally?

A Well, generally the shallow fresh waters that we find in the Ogallala which generally are in the defined Lea County Ground Water Basin; other than that, we find occasional shallow waters out of that Basin. We find waters that are rather deep, and generally waters that we find in the redbeds.

MR. BUELL: I wanted to bring that out at this time, may it please the Commission, because by your instructions you have separated this hearing into two phases. It is unfortunate that the separation of the hearing and the separation of the fresh waters in Lea County do not correspond. We want to follow your instructions, and we are going to be extremely careful to do that in that this phase of our testimony we will attempt to confine our testimony and exhibits to that area generally within the defined Basin which contains 7 of the first 10 pools.

Q (By Mr. Buell) Mr. Currens, did your study include any of the area north of the northern boundary of the Basin?

A No, sir, it didn't.

Q Why didn't you include that area?

A Well, I was rather limited in the amount of time I had, although I have spent a considerable amount of time on this, it is an awfully large area that we are looking at. Since I had that

more or less time limitation on me, I tried to restrict the bulk of my study to those areas where I had the most information. The areas that I had the most information in were those areas that Pan-American has operations in.

Q Do we operate in any pool north of the northern boundary of the Basin?

A No, sir.

Q All right.

A That pretty well covers the scope of my study here.

Q All right, sir, based on your study, what in your opinion is the major source of fresh water, sub-surface water, in Lea County?

A I would say that the major source of fresh water, ground water, in Lea County is that water that is contained in the Ogallala, where the Ogallala is saturated and has significant thickness.

Q Is that generally within the limits of the Basin, as defined?

A Generally so, yes, sir.

Q I direct your attention now, Mr. Currens, to what has been marked as Pan-American's Exhibit Number 2. What is that exhibit?

A Exhibit Number 2 is a map that was prepared, dated 1953, was prepared by the United States Geological Survey in cooperation with the State Engineer of New Mexico. It's title: Approximate Altitude and Configuration of the Base of the Ogallala Formation in part of Lea County, New Mexico.

Q All right, sir, I direct your attention now to what has been marked as Pan-American's Exhibit 2-A. What is that exhibit?

A Exhibit 2-A is another map that, from the same source, prepared by the United States Geological Survey, in cooperation with the State Engineer, dated February 1953, and is titled: Approximate Thickness of Saturated Sediments in Ogallala Formation in Parts of Lea County, New Mexico.

Q All right, sir --

A We --

Q Could you move that board around just a little, Mr. Currens, so that the Commission may see it? What does Exhibit 2 reflect, Mr. Currens?

A Well, Exhibit 2 we might call a structure map on the base of the Ogallala. We see the structure contours going on over here.

Q What is the significance of the red line around the western and southwestern periphery of that exhibit?

A That is, well, the red line simply is pointing out a line that was already on the map. It is rather difficult to see, since there are a number of lines on this map, but generally we could call this the Caprock, the definition of the Caprock as it was reflected on that United States Geological Survey plat; it is simply drawn in so that it could be seen, it was already there.

Q All right, sir. As I understand, that is not your individual

work, Mr. Currens, but is the work of another agency. Let me ask you whether or not you are in general agreement with the structure as reflected by that exhibit?

A Generally, yes. Certainly there are some areas where the data seems to be interpretative. Of course, that was recognized when the map was prepared; the dashed lines were shown on that area, generally they are around the periphery of this map in the southern portion and some over here on the western side. Certainly, as I say, it was indicated when the map was drawn that it was interpretative in those areas by dashed line. In addition to that, there is a note on the legend that makes a similar sort of statement about locally sandy beds that may actually be above these contour surfaces.

Q Go over to Exhibit 2-A and state what that reflects.

A Exhibit 2-A we might call an Isopach of the Ogallala in this portion of Lea County. These maps both reflect a dashed line around the edge which is similar to those lines; again we show the definition of the Caprock simply pointing out what is on it, and as I say, it is more or less what we might call an Isopach.

Q What is the significance of the caprock line in one respect?

A Well, it seems to be more or less the limit of water saturated in the Ogallala area. Certainly there are spotted sand lenses in the Ogallala that do contain water. Talking about the southern portion,

south of that, but it seems to more or less define the limit of a major and significant source of water in the Ogallala.

Q All right, sir, thank you. A major phase of your study related to whether or not contamination had occurred in this area through the disposing of produced oil field brines in surface pits, is that right?

A Yes, sir, I was very interested in that.

Q Let me ask you then, generally, and we'll go into specific detail later, but generally did you find any evidence that indicated to you that contamination had occurred from this source?

A I've seen nothing in any of the data that I have had available to me, and that I have analyzed, that would indicate to me that there has been any contamination of the shallow fresh water sands in -- as a result of the surface disposal of produced salt waters.

Q All right. Let's go into details of that, Mr. Currens. Approximately how many analyses of fresh water have you reviewed in the Ogallala area, generally?

A Oh, about a hundred and fifty.

Q By Ogallala area generally, I meant generally that area within the defined limits of Lea County Ground Water Basin; would your answer be the same?

A Yes, sir, I am talking about that area where the Ogallala

is present as a major water source.

Q What are the red dots that you have placed on Exhibit 1, Mr. Currens?

A Well, we see a number of red dots up there; these represent places where data from water analysis samples -- analysis of water samples was available. Certainly these are not all; these are the later ones I have access to.

Q Mr. Currens, I notice that generally speaking, the major portion of your red dots are in areas either in or adjacent to oil production. Do you feel from a geographical standpoint that the spread of your data were limited?

A Well, certainly the area that we are most interested in, are those areas around the oil producing pool where salt water is produced. I think that I have a fairly good spread here in that respect, because that is our major point of interest.

Q Actually, if you could choose the place where you would rather have your data, that is where you would rather have it?

A Yes, sir.

Q Mr. Currens, let me ask you to make this assumption: Let's assume that produced brine placed in a surface pit percolates down and enters a fresh water aquifer. Assuming that that occurs, in your opinion will that salt water mix and diffuse with the fresh water, or will it, due to gravity segregation, circulate down

to the fresh water sand and remain there?

A Well, I believe that if produced salt water were to seep down through the bottom of these pits, and through the surface sands and leaching and so forth, and get down into the water saturated section of an aquifer, such as this Ogallala is in places, that that salt water would diffuse and mix throughout the area.

Q Now, that's your own opinion, is it not, Mr. Currens?

A Yes, sir, it is.

Q Are you familiar with the testimony placed in the record by a witness for the State Engineer in May of 1956, where he related that with regard to the question of whether salt water would mix and diffuse or not mix, that very little work had been done on that, are you in agreement with that statement?

A Well, as I recall, the statement in there was that probably most hydrologists had not given much thought to the question.

Q Yes, sir. Well, do you agree with that statement?

A Yes, sir, I agree with that statement that probably most hydrologists have not; I have read a good bit of literature in conjunction with this study, and I have never seen any information on the subject.

Q Mr. Currens, again directing your attention back to May of 1956, the portion of this case that was held at that time, do you recall where this same witness related a beaker experiment

that he had made?

A Yes, sir, I recall the test that you are talking about; might be called a beaker experiment.

Q What was that experiment?

A Well, sir, generally it was along this line, that he took a beaker of fresh water and, partially full of fresh water, mixed up a salt solution and dyed that salt solution and dropped it into the fresh water to see what would happen to it.

Q What did happen?

A According to the information he presented, he said that it went to the bottom and separated.

Q Have you made a similar test that, a test that might be analogous to a beaker test?

A Yes, sir, I have.

Q What happened when you did that?

A Well, let me just describe my test to you briefly. I took a drinking glass and partially filled it with fresh water from tap at home, mixed up a salt water solution, one that was on the order of ten thousand parts per million, and tried it another time with one that was about twenty thousand parts per million, added a vegetable dye to that water. Actually, I just used my wife's cake coloring for that, but I dropped some of that salt water mixture into the fresh water to see what would happen to it.

Q What did happen?

A It went to the bottom.

Q All right. Let me ask you this, Mr. Currens: An open beaker or a glass of water, would that ever approach reservoir conditions that exist in the Ogallala Formation?

A No, sir, I do not believe so.

Q Well, Mr. Currens, was your scientific curiosity aroused, and did you perform another experiment in which you tried to incorporate some of the factors that you might find in fresh water reservoirs?

A Yes, sir, I did try a further experiment that I thought might more closely resemble the conditions that we might find in a reservoir.

Q Relate what that experiment was.

A Well, I took a jar and filled it with sand and saturated that sand with water, and then put salt water in on that, this same dyesolution, and, well, just to see what would happen with more nearly reservoir conditions where we had sand and a saturated water sand.

Q What did happen?

A I saw that the salt water diffused throughout that sand body.

Q Did it take very long for this mixing or complete diffusion

to occur, Mr. Currens?

A Took quite a while, yes, sir.

Q Did you continue to observe this experiment vessel over a period of time to see if gravity segregation would occur?

A Yes, sir, I did. I saved that particular sample, it sat around for a number of days, and I observed it during that period of time.

Q Did it continue to remain mixed and diffused?

A Certainly did. The dyed solution was all throughout that jar of sand and water.

Q Are you prepared to make those same experiments today?

A I can make similar tests here today.

Q All right, sir, what materials do you have with you?

A I have some fresh water that I got from the drinking fountain right outside here, have a jar, have some sand, and I have a blue dye solution of barium bromide.

Q Would that be your contaminating fluid?

A Yes, sir.

Q Why do you want to use that as your contaminating fluid, when we are concerned here with produced salt water?

A Well, the general theory that would be behind any idea of salt water falling out to the bottom would be that salt water had a greater specific gravity or density than the fresh water. Now,

I said that the experiments that I ran with salt water took some time. The salt water that I used was on the order of the gravity of 1.02. This berium bromide solution that I have has a gravity of 1.7, two-thirds as heavy as fresh water.

Q So, actually, using this solution will enhance the opportunity for gravity segregation to occur?

A Yes, it certainly should.

Q Also, since it is heavier, work faster so that we may perform this experiment within the time of the hearing?

A It takes a lot less time.

Q Will you get your materials out? Do you have all your materials gathered, Mr. Currens?

A I believe so.

Q First, Mr. Currens, I want you to demonstrate the open beaker test, and I am going to ask you to kindly talk along as you go along there so the record will reflect the steps that you are going through.

A All right, sir. I have here some fresh water, which as I stated, I got from the fountain outside, poured that into one of these small jars about like an olive jar. I have my contaminating fluid here. I will pour some of that in the cap, take it to the fresh water and drop a little in, and it readily goes to the bottom. Bounced even when it got there.

Q All right, sir. It has all gone to the bottom, has it not?

A Yes, sir, you can see a pretty good line there.

Q We have seen gravity segregation occur, have we not?

A Yes, sir, we certainly have.

Q All right. We will ask you to perform experiment number two and relate for the record the various steps you are going through, Mr. Currens.

A Well, I will take the jar and my sand, pour some sand in this jar; take again my contaminating fluid, pour that in so that I saturate this small amount of sand in the jar.

Q About how much sand do you have in your jar now, Mr. Currens?

A Oh, on the order of half an inch or so.

Q All right, sir.

A The jar is about probably four inches high, a little less, or more, and I have poured the contaminating fluid in the jar with the sand; I then filled this on up with sand, the rest of the jar with sand, so now we have the jar almost full of sand, the bottom portion of it is saturated with the contaminating fluid. I'll saturate the remainder of the sand by pouring in the fresh water.

Q Takes it rather slowly, does it not?

A Not too rapidly. All right, the remainder of the sand is now saturated with fresh water; go ahead and put a lid on this

jar, screwed it down, and we will see --

Q Excuse me for interrupting, I notice that this time you have a pretty distinct -- there has been little mixing or co-mingling at this time.

A That's right, you see little capillary phases, distinct phases.

Q Why is that?

A We got this very heavy fluid on the bottom; there has not been any mixing taking place.

Q All right, sir, go ahead.

A I will take this jar and turn it over and we can observe the action of the contaminating fluid.

Q Mr. Currens, why did you put the contaminating fluid on the bottom, and then turn the jar over?

A Well, sir, I think this would more nearly simulate what would be going on beneath one of these pits, if water were seeping there; you can see that seeping is not going through here, it is in lines. You recall when I dropped the contaminating fluid in the jar of fresh water here, just the plain water?

Q Yes, sir.

A I was above the surface of that, I had an extra head, plus the head that the difference in weight would show, would cause there; if this water were seeping down through the bottom of these

pits, it would be seeping slowly and in a more or less uniform manner down very tortuous paths, through flow channels. There wouldn't be additional head or anything on that, so by putting this on the bottom and turning it over, I think that we have more simulated reservoir conditions.

Q What happened in the jar, now, Mr. Currens?

A Well, we see that it is falling down and mixing throughout, it is coming down a little heavier on one side than the other; it hit the bottom, it started back up. We have a general picture of diffusion throughout that jar now.

Q Do you want to go back to your seat, and we will sit here and watch it as we go along? Mr. Currens, are there still some conditions that exist in a fresh water reservoir that we have not simulated or approximated in experiment number two?

A Oh, yes, sir, there certainly would be.

Q What would some of those conditions or factors be?

A Well, we certainly do not have the thickness of the reservoir body here; the jar is not nearly so tall as the thickness of the water saturated sands would be; we have a pretty uniform sand body in there, in the reservoir you would have, oh, probably a number of inhomogenuities, little shales, large rocks, caliche, and so on. Certainly here we do not have any horizontal movement or water through this body. Now, I believe it is generally

recognized that in the Ogallala Basin, or this Lea County Water Basin where the Ogallala is present and a significant source of water, that there is a general flow, oh, from more or less to the southeast at rates say on the order of one to three feet per day. Now, we certainly do not have any horizontal flow through here.

Q All right, sir. Would all of these factors, movement of the water, the fact that a reservoir actually is seldom if ever homogenous such as your jar is, and tremendous difference in size of the two, would those factors aid in mixing and diffusion, or would they be a deterrent in mixing and diffusion?

A Each of those things I think would cause a greater tendency toward mixing of the fresh and salt waters; certainly the flow would be a major factor, and any homogenuities would certainly do; greater thickness of the actual sand bed would also tend in that direction. I think all of those things would cause a greater tendency for mixing and diffusion.

Q What has happened to experiment number two by now, Mr. Currens?

A Well, I will have to look. We see that we have generally had the contaminating fluid settle through it, through the sand body. We can see that some of the liquid up here on top is colored blue, so it looks to me like there is pretty complete diffusion through here. The blue through this, and if you will look, you

will see the blue layer on top there, so I think we've had plenty of mixing there.

Q In your opinion, then, I'll ask you to state again, that should salt water reach the Ogallala fresh water reservior, that mixing and diffusion will occur?

A Yes, sir, I certainly believe so.

Q All right. Now, since that is your opinion, I am going to have to ask you to make another assumption, for the purpose of this we -- that assumption is this: Should salt water percolate down from a surface pit into the Ogallala, I want you to assume that mixing and diffusion would not occur, but that on the contrary this migratory salt water would percolate on to the bottom of the sand and remain there because of the gravity segregation. That is the assumption. The question is if that assumption were the truth and the fact, how would you check, or what method would you use to ascertain whether or not contamination had occurred?

A Well, sir, if we are to assume that salt water were to seep down from these surface pits, through the underlying sand and caliche on down to the water saturated Ogallala, and go all the way through that and lie along the bottom, if we are to make those assumptions and I wanted to look for evidence of contamination, I would look for wells that were completed in the bottom of the Otallala, that penetrated the full section, and were completed

at the bottom.

Q Mr. Currens, do you know of any wells that are completed open in the bottom of the Ogallala sand?

A According to information that I received from a member of the Hobbs City Water Board, their normal practice is to drill their municipal wells to the bottom and open up that bottom section, perforate or have the open interval at the bottom.

Q What does a review of the analysis of samples from these wells reflect with respect to whether or not contamination has occurred?

A I've looked at the results of a number of analyses from these wells, and in no case have I seen any contamination of these wells as a result of surface disposal of produced oil field brines.

Q All right, sir, so even if mixing and diffusion does not occur, but you firmly believe it does, even though it does not, you still have seen no evidence in Lea County to indicate to you that contamination has occurred due to the placing in surface pits produced brine?

A I have seen no such evidence that would lead me to a conclusion of that sort. I have seen no contamination in any analysis that I have seen.

Q Mr. Currens, what type data do you need to trace the history of water from a certain well, and to ascertain if it contains

elements of contamination, if any, what type of data do you need?

A Well, by use of the word "history", that's what you need. You need a history for comparison; the data from sample analysis over some period of time.

Q What about one analysis, would that help you?

A Well, one analysis will certainly give you an indication, show you the quality of a particular water at a particular time.

Q Does it give you any information as to any change in its constituent components?

A You need more than one thing to compare for change. You have to have at least two things for comparison to see a change.

Q Do you have any wells from the area with which we are dealing, from which you have a history of complete analysis?

A Yes, sir.

Q I direct your attention now to what has been marked as Pan-American's Exhibit Number 3, and I'll ask you, Mr. Currens, to tell us what Exhibit Number 3 is.

A Exhibit Number 3 is a, shows a series of what we call Palmer modifications of Tickell's diagram over a series of years for fresh water wells that we have serving our camp, or our office now in the Hobbs area, the Hobbs field, just south of the town of Hobbs. These are shown in yellow. The pictures of fresh water analyses shown in red is the picture of an analyses of produced

salt water from one of our locations in the Hobbs field; shown in green is a picture of what an analysis would look like if fresh and salt water had been mixed.

Q I direct your attention now to what has been marked as Pan-American's Exhibit number 3-A, what is that exhibit?

A Exhibit 3-A is, it is a tabulation of supporting data that Exhibit 3 was prepared from; it shows the year in which the samples were taken, the constituents that were analyzed, in what amounts they were present, as well as the percent reacting values of each of these contituents.

Q Do you have several more exhibits similar to Exhibit 3?

A Yes, sir.

Q Well, a portion of each one of those is simply the tabulation supporting data for the major exhibit?

A Yes, sir.

Q All right, sir, I want you to go back to Exhibit 3 and -- well, first I am going to ask you, Mr. Currens, for me and the benefit of other laymen, what is a "Tickell" diagram? What is it?

A It is a, something commonly used throughout the industry as a means of providing a sight analysis of any particular water sample; a sample of water is taken, it's analyzed, the parts per million of each of the various constituents are calculated from

that analysis, and then from those components is calculated the reacting value of all of each of those components which simply puts them all on a common footing as far as how they would react. The percentage of each of those reacting values are calculated, then they are plotted on a spider-like diagram here; the diagram has six legs. The Mg is Magnesium; the NA is Sodium; the CA is Calcium; the HCO_3 is bicarbonate; SO_4 is Sulphate; CL is Chloride. I said percentages, what was plotted here, each of the particular parts on each of the legs represents ten percent.

Q Mr. Currens, what is the subject matter of this case, what elements are we going to be primarily interested in?

A Well, in looking at salt water, the thing we are primarily interested in is salt and sodium.

Q Which of the legs reflect these elements?

A The leg going up to your right and to your left is sodium, the one marked NA; the one going down to your east is chloride, marked CL; those are the two major components. Well, looking down at this produced water sample from one of our leases in Hobbs, you see that sodium and chloride are extremely heavy in comparison to the others.

Q I notice with respect to your Tickell diagram colored in yellow, immediately above the diagram there are some numbers, and below, what are they?

A Above the diagram are numbers showing the year in which this sample was taken; in this yellow diagram we have 1927 and 1950, and so on, 1958. Beneath the diagrams the number, oh, for instance on the 1958 here, we see 575 PPM. This is 575 parts per million total solids analyzed in that fresh water.

Q Oh, I see. That bottom number is not parts per million Chloride, but parts per million total solids?

A Yes, sir, total solids, the summation of these six elements that are detected on the graph.

Q All right, sir, will you go ahead with your explanation of Exhibit 3, what it reflects.

A Well, we had a series here of diagrams in yellow on this particular exhibit; there are seven of them, they are all at the top. The samples shown from 1950 up to 1958 were samples taken from water tap at our Hobbs office. These were served by domestic wells that we have at camp there. The 1927 sample is not from that same source.

Q What was the source of the 1927 sample?

A Well, sir, as you will recall, Midwest Refining Company which was the predecessor company to us, drilled the discovery well in Hobbs Field; operations were started on that well in 1927, it was completed in 1929. When they were at a total depth of 62 feet in drilling that well, they were in a fresh water sand, caught

a sample of that water, had it analyzed, and these are the results of that analysis.

Q Was this well we are speaking of, was it the first well in that area to produce oil?

A To the best of my knowledge, it was. This was in 1927. Actually, this well, as I said, was only 62 feet deep at the time, it was not completed until 1929.

Q Well, then, could we say with respect to that sample, Mr. Currens, certainly insofar as any effect that produced brine could have on it, produced oil field brine, that this is a virgin sample?

A I certainly would say so. There was not any oil production in that area that I know of prior to that.

Q All right, sir. What do the diagrams, the yellow diagrams on Exhibit 3 reflect from the standpoint of whether or not contamination has occurred from surface pits?

A Well, they certainly are similar in appearance; certainly we see minor variations throughout these diagrams, however, that is to be expected. From the standpoint of contamination, we see that they are, oh, essentially unchanged over this, what, 31 years period here, with respect to the chloride; there is a little change in the sodium, but certainly not in chloride, which would be the, one of the major things we would see if salt

water had gotten into our fresh water wells.

Q All right,sir, go on down to the two diagrams on the bottom, one colored in red, and one colored in green, and go into a little more detail as to what takes place.

A I mentioned the diagram on the lower left which is colored in red and marked "Hobbs Field Water", was the data from sample water produced in one of our ~~leases~~ in Hobbs Field. The total solid content of this particular sample was 1,703 parts per million. Looking at it, we see, as I said before, it's major ~~constituents~~ relatively are sodium and chloride. Moving over to the sample on the left, or the picture on the lower right of this Exhibit, we have one here shown in green on this larger exhibit, which depicts what a mixture of 95% of the fresh water and 5% of the red sample here, we might call it the produced Hobbs Field water, what an analysis of that mixture would look like. Now, actually here I have used the 1927 sample and calculated the contamination here that we might see with five percent salt water.

Q Why did you use the 1927 sample, why not a later sample, Mr. Currens?

A Well, the earliest one in the area offers the best means of comparison. We mixed the original with the produced and look at what we have now, that should be, I think, the tracks we are going to follow to see that contamination had taken place.

Q When you mixed five percent produced brine with your fresh water, what kind of a picture do you get,does it look anything like your fresh water picture?

A No, sir, it more nearly approaches the picture we see from the Hobbs produced field water. Looking up here at this '58 sample of the fresh water, we see that it's major contents are calcium and bicarbonates. The general picture here, the contamination, the picture that would show contamination, show a picture of fresh and salt waters in no way resembles these pictures that are drawn from the analyses on the fresh water wells.

Q All right. Off the record.

(Discussion off the record.)

Q Mr. Currens, I now direct your attention to what has been marked Exhibit 4, and Exhibit 4-A. What is Exhibit 4? While we are getting that exhibit passed out, Mr. Currens, let me ask you this: Have you prepared a Tickell diagram exhibit on each well in this area, where you had a history of complete analysis available?

A Yes, sir, I have.

Q All right, sir. What is Exhibit 4?

A Exhibit 4 is a comparison of the Tickell diagram, showing the comparison of a water taken from a fresh water well in the Northwest Quarter of the Northwest Quarter of Section 36, Township 17 South, Range 37 East; one of the samples was taken in 1942, the

other in 1956.

Q '56 or '58?

A '58, pardon me, 1958.

Q All right, sir, that covers a period, history and the life of that well of some 16 years, is that correct?

A Yes,sir.

Q From the standpoint of the constituent elements that we are interested in here today, has there been any significant change?

A No significant change, no, sir.

Q What would these data reflect from the standpoint of whether or not contamination had occurred due to disposal into surface pits of produced oil field brine?

A Well, in examining the pictures we see here, I do not see that we have any evidence in this case of contamination of fresh water in this well by, as a result of the surface disposal of produced oil field brines.

Q I direct your attention now, Mr. Currens, to what has been marked as Exhibit 6 and Exhibit 6-A.

A I believe we are on 5.

Q 5, you are right, I am sorry. Mr. Currens, I wish you would do this: I intended to have you do it and I overlooked it. Will you take a red pencil and on Exhibit 2, place a small "X" in the

approximate location of the wells that we are concerned with on Exhibit 3, and as well as the wells concerned with on Exhibit 4.

A I will just put it in the Section.

Q That's probably as close as you can come on this map.

A The first one was on Exhibit 4.

Q Exhibit 5 is a similar comparison of the Tickell diagrams on a well in Section 8, 15, 36. Would you similarly place a small "X" in the approximate location of that well on your Exhibit 2?

A This is comparison of samples from 1951 and 1952 from a well located in the Northwest Quarter of the Northeast Quarter of the Northwest Quarter of that Section.

Q All right, sir. With reference to the two constituent elements that we are interested in here today, what do these data reflect from the standpoint of whether or not contamination from surface pits had occurred?

A I see in looking at these two diagrams, I do not see any indication that there has been any contamination of this well as a result of disposed salt water from surface pits, or salt water disposed into surface pits.

Q All right, sir. I direct your attention to what has been marked as Pan-American's Exhibit 6 and 6-A. What is Exhibit Number 6?

A Exhibit 6 is a comparison of Tickell diagrams on a well

located in the Southeast Quarter of the Southwest Quarter of Section 21, 17 South, 37 East. One sample was taken in 1942, the other in 1958.

Q Would you place a small "X" on Exhibit 2 at the approximate location?

A I already have, sir.

Q What period in the life of this well do we see reflected between these two samples?

A Well, there is 16 years here from the first to the second.

Q What do these diagrams reflect with respect to the two elements we are interested in here today in regard to whether or not we've had contamination from surface pits in this well?

A I do not see any particular change in the two major constituents on what we would be looking at here, the diagrams are similar, not exactly alike but similar. I do not see any evidence or anything in these diagrams that would indicate to me that there has been any contamination of this well as a result of disposal of produced oil field brines in surface pits.

Q All right, sir. I direct your attention to what has been marked as Exhibits 7 and 7-A. What is Exhibit 7? While copies of that exhibit are being passed out, Mr. Currens, will you place a small "X" on Exhibit 2 at the approximate location of that well?

A Yes, sir.

Q What is reflected on Exhibit 7?

A Exhibit 7 is a series of these Tickell diagrams on actually some four different wells that are in the Hobbs city supply, Hobbs city wells, municipal supply. Four of those are different wells that were sampled in 1942, Well Number 4, Number 3, Number 1, Number 5, four samples in 1942 there, one in ~~1958~~ 1953, and one in 1958.

Q What do these data reflect from the standpoint of whether or not contamination has occurred in any of these wells, contamination from surface pits, Mr. Currens?

A Well, sir, these series of several wells here that are all in the same Section, as I recall they are all in the same Quarter Section, they are all in the same Quarter, Quarter Section, and we have a period here from '42 to '58. We see minor variations in these constituents; there is nothing here though that would lead one to believe that there has been any contamination of these wells as a result of surface disposal of produced oil field brines.

Q All right, sir. I direct your attention to what has been marked as Exhibit 8 and Exhibit 8-A. What is Exhibit 8? Mr. Currens, will you place a small "X" on Exhibit 2 in the approximate location of the wells reflected on this exhibit?

A Actually, on Exhibit 2 I have drawn a circle in the general area, a pretty big circle, larger than was necessary, I am afraid, but these are not all the same wells. They are not all located

in the same Section, however, they are in adjacent sections; these are other wells that are in the Hobbs city water supply, Hobbs municipal supply. One of them is well Number 8, one is well Number 6, one is well Number 9; there is another that is simply identified in Section 35, Township 18 South, Range 38 East; the last one is identified as Section 36, Township 18 South, Range 38 East. I might point out that most of these data came from United States Geological Survey Water Analysis files, and those were the locations on these particular wells, I didn't know what number they were, but they were marked as being in the Hobbs city supply.

Q Mr. Currens, what do the data on Exhibit 8 reflect from the standpoint of whether or not contamination has occurred from the disposal of produced brine in a surface pit?

A Well, we see minor variations throughout the period. There were three of these samples in '53, two in '56. I do not see any particular or significant changes in these samples, but generally they had the same configuration. I would say that looking at those, there isn't anything there that would make you believe that there had been any contamination of any of these wells as a result of surface disposal of produced oil field brines.

Q I direct your attention now to what has been marked as Pan-American's Exhibit Number 9. What is Exhibit Number 9? Exhibit Number 9-A is attached to that exhibit, is it not?

A Yes, sir.

Q While this exhibit is being passed out, will you mark on Exhibit 2 the approximate location of the well or wells reflected on this exhibit?

A Actually, I believe I note an error on this exhibit. I think it says Range 36 East, I believe that should be Range 37 East. Let me check, if you will. I know that one -- That should be Range 37 East.

Q Would you change the official exhibit, and I would like every one to do so, if they would be kind enough to change the Range on there. Range 37 East, is that correct, Mr. Currens?

A Yes, sir. This is an analysis, or a series of analyses, in 1950, '52, and '53, from a domestic well that we had at the lease house in Section 33, Township 20 South, Range 37 East.

Q Mr. Currens, I notice the attitude of the diagrams on this exhibit are radically different from any that we have seen so far; why is that?

A Well, sir, this is not water from the Ogallala.

Q Is it from a deeper --

A Yes, sir, it is a deeper water. This particular well is no longer in use. It is about 300 feet deep, as I recall. It looks like what is generally referred to as Santa Rosa water.

Q Was this well located in an area where you would generally

expect to encounter Ogallala water?

A Well, in this particular area, it's a little more erratic than any other place.

Q Is this well in the fringe area that we discussed back on Exhibit 2 and 2-A, where you stated you might be in disagreement with them?

A Yes, it is in this area where the data is shown to be interpretative, certainly there are shallow waters in there; there weren't at this particular location.

Q All right, sir, go ahead and review what this exhibit reflects.

A Well, simply a picture of those water analyses taken at three different times from this well, 1950, '52 and '53. Essentially, they all look the same.

Q Mr. Currens, is the zone from which that water that we are looking at here is produced, would it be susceptible to contamination from the surface?

A I do not believe so.

Q Why?

A Well, sir, this is very likely buried in a massive shale body that is essentially impervious to any percolation of water through it.

Q Will we discuss that more thoroughly in the other phases

of our testimony in accordance with the Commission's instructions?

A I plan to.

Q Do you have any comments on Exhibit 9?

A No, sir.

Q I want to ask you about contamination. In your opinion, water from the surface could never get through this zone?

A No, sir.

Q I direct your attention to what has been marked as Exhibits 10 and 10-A. Now, I will ask you, Mr. Currens, to place a small "X" on Exhibit 2 at the approximate location of the well reflected on Exhibit 10.

A I've done so on this map.

Q All right, sir. What is Exhibit 10?

A Exhibit 10 is again a series of these diagrams on another fresh water well that we had at a lease house in Section 25, Township 20 South, Range 36 East. They start in 1950 and the last one is 1956.

Q Is the location of this well within the defined limits of Lea County Ground Water Basin?

A Yes, sir, it is.

Q Is this another example of where we find around the periphery of the Ogallala structure in that area, places where the Ogallala is not productive of fresh water?

A Yes, sir, it certainly is an indication of this particular area.

Q All right, sir. Go ahead and discuss what is reflected on Exhibit 10.

A Exhibit 10 here shows a similarity of these analyses through this period of time, '50 to '56. It's again on what is quite often referred to as Santa Rosa water, a little more highly mineralized than your Ogallala water. You see a striking similarity in all of these.

Q Do these last two exhibits, Mr. Currens, when you compare them with prior exhibits on Ogallala water, do they furnish a striking illustration of benefit in the advantage of the use of these Tickell diagrams?

A Yes, sir, you can make a sight analysis of the data that you have. That way -- all these diagrams more or less "fingerprint water", would be an adequate way to describe them. As I say, they are commonly used in the industry for identification of water sources, what waters come from what sources.

Q Would the zone from which this well produces, be a zone that in your opinion would be susceptible to contamination by the placing of produced brines in surface pits?

A No, sir, I do not believe so.

Q Is it, in your opinion, sealed from the surface?

A Again, that water is buried within a massive shale, which generally is impervious to any downward percolation of water through it.

Q Mr. Currens, are you generally familiar with Exhibit 12 that was introduced by the witness for the State Engineer at the May '56 portion of this hearing?

A Yes, sir, I am.

Q What did that exhibit reflect? What was on it?

A It was a tabulation of some nine wells -- yes, some nine fresh water wells, showing a history of the chloride content of analyses from those wells as early as 1942, and as late as 1956. It didn't have every year, but --

Q Would you name those wells, those nine wells, for the record, please?

A Yes, sir. One of them was, designated the owner as Staley in Section 15, Township 18 South, Range 38 East. Another one was, designated the owner as Goings, G. W. Goings, or Gaines, in Section 30, Township 18 South, Range 38 East. Another was the Hobbs city well Number 3, in Section 34, Township 18 South, Range 38 East. Another one was listed as a Mr. Goings, and location simply as Hobbs. Another, Cooper in Section 4, Township 20 South, Range 37 East. Another, Record in Section 15, Township 20 South, Range 36 East. Another as Berry, in Section 2, Township 21 South, Range

33 East. Another as Gulf, simply Township 22, Range 36. Sims in Section 24, Township 22 South, Range 37 East.

Q Mr. Currens, as I recall, I believe those were the nine wells, the data of which were the bases for that witness' conclusion that contamination might have occurred from the disposal of produced brine in surface pits, is my memory correct?

A That's the impression I got from the transcript, yes, sir.

Q Of course, all he had available to him at that time were data that had been accumulated at that time, is that not right?

A Certainly.

Q Have we had the benefit and the advantage of an interim period since that May 1956 period of a little over two years?

A Yes, sir.

Q I wonder, Mr. Currens, have you made a study of subsequently acquired data on some of those wells?

A Of some of them, yes, sir.

Q Not all of them?

A Not all of them.

Q What wells have you not been able to make a further study of?

A Well, sir, the well listed as belonging to Berry, I have not been able to make any further study of.

Q Why didn't you, Mr. Currens?

A Well, in the transcript, the witness said it was his under-

standing that that well had cleaned up and the water was now potable from that well. This was in response to some questioning about having an abandoned well plugged in that area.

Q All right, sir. What other well have you made no further study of?

A I made no study of the Gulf since in the transcript it was stated that that well since then had been abandoned.

Q That well was abandoned in the May 1956 hearings?

A Yes, sir, that was my understanding.

Q What other well?

A Well, I have no further information about the Goings well, which was simply carried with the location of wells on that exhibit.

Q Could you locate it?

A Not with just that information, no, sir.

Q All right, sir. Any others?

A A well by Gaines or Goings in Section 30, 18, 38, I couldn't locate that well.

Q Did you study the remainder of wells that were on that list?

A Yes, sir, I had subsequent information on each of those wells.

Q If my arithmetic is correct, there would be five remaining?

A Yes, sir, that is correct.

Q Have you prepared an exhibit which reflects data which have been acquired subsequent to May of 1956?

A Yes, sir, I have.

Q I direct your attention to what has been marked as Pan-American's Exhibit Number 11. What is Exhibit 11, Mr. Currens?

A Exhibit 11 is a bargraph that is constructed showing the information on the Staley well. We show here in brown the information presented on Exhibit 12 in the May 16th, 1956 hearing; in yellow, we show data obtained from the United States Geological Survey Water Analysis files, which, well, might not have been available to the witness at that time, and in green we show other data that we have obtained subsequent to that May 1956 hearing.

Q All right, sir. Would you briefly discuss the data that are reflected by Exhibit 11?

A Well, we show the years along the bottom; the axis on the left is the parts per million chloride. We see here that in 1951, a sample from the well analyzed 75 parts per million chloride; in '54 it was 152 parts per million; in '55 it was 206 parts per million chloride; in '58, the analysis shows 184 parts per million chloride.

Q Do these data indicate to you, Mr. Currens, that contamination of this well has occurred due to the disposal of produced

brine in surface pits?

A No, sir, I see no such indication of that from this exhibit.

Q I direct your attention now to what has been marked as Pan-American's Exhibit Number 12. What is Exhibit 12, Mr. Currens?

A Exhibit 12 is a similar bargraph on the, as that we presented in Exhibit 11, on the City of Hobbs well Number 3, and simply showing an analysis in 1942, '51, '53, 1956, and 1958. 1956 showed 80 parts per million chloride; 1958 shows 68 parts per million chloride.

Q Mr. Currens, do these data indicate to you that contamination has occurred in this well due to the disposal of produced oil field brine in surface pits?

A I see no data reflected on this exhibit that would lead me to believe there had been any contamination of this well from that source.

Q All right. I direct your attention to what has been marked as Pan-American's Exhibit Number 13. Mr. Currens, what is reflected on Exhibit Number 12?

A Exhibit -- this is Exhibit 13, isn't it?

Q You are right, 13.

A Exhibit 13 is a similar diagram for the Cooper well, showing the chloride content of the sample analysis in 1954 at which time it was 450 parts per million chloride; another sample in 1958

analyzed 298 parts per million chloride. Additional data shown on here says that the well was potable before 1952.

Q That was on Exhibit --

A That was on Exhibit 12 that we were talking about.

Q All right, sir. Mr. Currens, do these data indicate to you that contamination has occurred in this well due to the disposal of oil field brine in surface pits?

A I see no indication of contamination of this well from that source.

Q I direct your attention now to what has been marked as Pan-American's Exhibit 14. What is reflected on this exhibit?

A Exhibit Number 14 is a bargraph on the Record well, showing 1954 analysis when the analysis was 1,080 parts per million chloride; 1958 analysis which indicated 789 parts per million chloride.

Q Do these data indicate to you, Mr. Currens, that this well has been contaminated due to disposal of oil field brine in surface pits?

A I cannot see that this well is contaminated as a result of any disposal of oil field brines in surface pits.

Q I direct your attention now to what has been marked as Pan-American's Exhibit Number 15. What is reflected on this exhibit?

A Exhibit 15 is a bargraph on the Sims well, showing analysis in 1953, '54, 1955, and 1958. In 1955 the well showed 770 parts per million chloride; 1958 it shows 590 parts per million chloride.

Q Does this well indicate to you, Mr. Currens, that any contamination has occurred due to the disposal of oil field brines in surface pits?

A I see nothing on here that would indicate to me that this well has been contaminated from that source.

Q Mr. Currens, in the last five exhibits, I have noticed in each instance that the parts per million chloride on each well has declined since the time of the May 1956 hearing. Is that observation a correct one?

A Well, the 1958 sample has analyzed a smaller chloride than the last previous sample did on all of these exhibits.

Q Was that your bases for your conclusion that no contamination had occurred from surface pits?

A Yes, sir, it is.

Q In the area of these wells, has there been any cessation of pit disposal in the interim period over which these samples were obtained?

A For most of the time between the next to the last sample and the 1958 sample in each of these areas, all produced salt water that I know of has been disposed of in surface pits. Up in

the Hobbs area, we have recently got a disposal well in there, and have been putting some away, but the bulk of the time involved in each of these would show that there would be salt water disposal in surface pits.

Q Certainly then if contamination had been occurring from pits, you wouldn't expect to observe the decline in parts per million chloride?

A No, sir, you would expect to see an increase here, I believe, if that were the source, because there would be further and further contamination if this were contaminated in that manner.

Q Mr. Currens, by way of summary, let me ask you this: Have you seen any data which indicates to you that contamination in the general area we are dealing with here now, the Ogallala area, that any contamination has occurred due to the placing in surface pits produced oil field brine?

A No, sir, I've seen no data here that would lead me to believe that we as yet had contamination of fresh water wells as a result of the disposal of produced salt water in surface pits.

MR. BUELL: May it please the Commission, that concludes our direct presentation on this phase of the hearing here today, and I would like at this time to offer Exhibits 1 through 15.

MR. PORTER: Without objection, Exhibits 1 through 15 will be admitted. We will take a 10-minute recess.

MR. PORTER: The hearing will come to order, please.

Does anyone have any questions of Mr. Currens?

MR. HARRIS: Yes, sir.

MR. PORTER: Mr. Harris?

CROSS EXAMINATION

BY MR. HARRIS:

Q Mr. Currens, on your experiment with the dye, you stated that in your opinion from your experiment, that the brine water mixes evenly through the aquifer, is that your opinion?

A I would say there was a large amount of profusion and mixing in there, yes sir.

Q Well, is that dilution merely in the locality of the brine disposal plant or did you mean to infer that it mixes throughout the entire basin?

A Well, certainly there wouldn't be any in areas where there wouldn't be any salt water entering the places. I mean, in much of this area there isn't any oil production, so there wouldn't be any salt water, possibly in those at all. Naturally, my experiment was limited to a rather small scope and I decided that the fact that it was rather small in scope --

Q Well, I want to ask you, in this brine that is going into the aquifer, does it difuse locally or how far does the difusion take place?

A Well sir, I think if brine disposal in surface pits were to enter this fresh water sand, that the difusion in that general

area would be pretty wide-spread.

Q However, there is a great difference between the sodium and chloride in different analyses in different wells throughout the basin, is that not correct?

A In produced salt water or in fresh water?

Q I am talking about the Ogallala formation.

A There seem to be variations through there, yes sir.

Q And therefore, you will assume that there is not any salt solution that hasn't difused over the entire basin?

A I don't quite understand that, sir.

Q Well, going back to the earliest analysis that was taken in 1927, the earliest analysis that you know of, before there were any oil wells there, there was a considerable amount of difference in the chemical analysis of the water in different parts of the Lea County Basin, is that correct?

A Well, I only had that one 1927 analysis, I don't know about any other portions of that particular water --

Q Is it your opinion that before there were any oil wells drilled in Lea County, that all of the water had the same chemical analysis in the Ogallala formation?

A No sir, I wouldn't say that. There were probably minor variations all over the place.

Q And there could be major variations, couldn't there?

A Of the water at that time?

Q At the time the water was analyzed?

A At that time, yes sir, there probably were some pretty significant differences throughout.

Q The reason I ask is because I grew up on a ranch over there and the water at our place was so hard we could hardly drink it and half a mile away they had good water and that condition existed for at least twenty years.

A Well, I don't know the specific area which you are speaking of, of course, and I don't know about the water source in those two particular instances.

Q But there is a great deal of local variations between the salt content?

A In the fresh water, yes sir, there seems to be.

Q Now, referring to this exhibit with your wife's vegetable dyes, you said something about the gravity center. What I want to know is, has the supreme court passed upon that type of segregation?

A I don't know that its come up yet.

MR. BUELL: They will.

Q (By Mr. Harris) Mr. Currens, do you think it is possible that there would be a possibility that the dyes that you used in that bottle would have a tendency to stick more to those grains of sand than the brine itself?

A No sir, I don't believe so. I have washed all that out. Well, this is probably a sample that has been used before and the sand was all washed out without any trouble.

Q You don't know whether or not there would be more capillary attraction to the dye than there would be to the salt?

A No sir, I don't.

Q If there were any difference, it would make a great deal of difference in your experiment?

A I believe that the dye was very discriminately picked in that solution as to contaminated liquids that I have had.

Q But you haven't run experiments on the dye itself, have you?

A Not on the dye itself, no.

Q Mr. Currens, in your opinion, what happens to the salt at the bottom of these brine disposal, unlined brine disposal pits?

A The salt?

Q Yes, sodium and chloride and other salts.

A I don't think I quite see --

Q I understand that there is a vast amount--from reading the transcript--that there is a vast amount of brine that is put in unlined disposal pits in Lea County?

A Yes sir, there is a large amount of salt water put in those --

Q What happens to the salt water?

A Well, that's a pretty good question, it is rather difficult to answer. Certainly part of the produced salt water that's put in the surface pits, part of it evaporates.

Q The salt evaporates?

A Part of the salt water, sir.

MR. BUELL: Let him finish his answer, Mr. Morgan.

A Surely some of that salt water seeps down into the surface sand that underlies the pits in many areas of Lea County and there's a pretty good caleche bed under the surface and caleche, of course, well, it really has quite--it is quite able to soak up water so I am sure that an awful lot of it is soaked up there. As to what happens to all of that water, I don't know. It is the same possibilities that I mentioned there, but --

Q It is possible that some of that goes down into the aquifer?

A Yes sir, that might be possible.

Q And that caleche which you are talking about, it becomes saturated with water?

A It might be.

Q And if the caleche bed becomes saturated, is it possible for some of that water to go through the caleche bed?

A Well, if you soak caleche well, you know, it gets pretty impervious. It takes up so much water and then seems to more or less form a kind of impermiable barrier. The caleche takes up an awful lot of water.

Q Do you know whether or not in Lea County that caleche forms such a barrier that the water cannct go on down through it?

A All over Lea County?

Q Yes.

A No sir, I don't know.

Q You don't know whether or not --

A I don't know if it forms a barrier all over Lea County, no sir.

Q Now then, you said a while ago that some of this salt water evaporates. Did you mean to say by that that some of the salt evaporates?

A Well, the water evaporates, the salt water.

Q But the salt remains there, doesn't it?

A Well, we take out the liquid and then if we add liquid it will increase the concentration of the remaining liquid somewhere.

Q But if you have sand like in your bottle there and you put water in there, it will be a solution and will sink down through the sand, won't it?

A Well sure, any minerals that are contained, such as sodium chloride, in a sand body would certainly be subject to a certain amount of ~~caliche~~ leaching by the additional introduction of water.

Q And if there's enough water put there, it will have to go down, will it not, unless there is a barrier between there that stops it?

A Well, as I said, I am sure some of it evaporates.

Q I am talking about the salt solution, the salt itself?

A Well, your salt solution would be made of primarily

salt water and some of the water, of course, would have to evaporate but if there was no barrier whatsoever between the surface, if there were no barrier whatsoever, certainly some of that water would have to percolate down.

Q Without that caleche barrier then, the water disposal of brine in unlined surface pits would constitute a hazard tothe fresh water supply assuming that there is no barrier between the unlined surface pits and the water?

A It might possibly constitute some hazard.

Q What would keep it from constituting a hazard except for the impermiaole barrier?

A There are a number of things to take into account there, the volumes and so on, I believe.

Q Regardless, even if you would--eventually, if there, was enough water placed in the surface pits and there was no barrier underneath that surface pit oetween the brine solution and the fresh water, assuming that, and you continue to put water in there, eventually insome period of time, it would constitute a hazard, would it not?

A Yes sir, it might constitute a hazard if enough water were disposed of in that manner, salt water.

Q And you have recognized that possibility in your study, is that correct?

A Yes, sir.

Q And have you made any recommendations as to the use of

unlined surface pits to your company?

A Well sir, speaking generally, in the area of the Lea County ground water basin, it has been our policy to investigate the subsurface disposal of brines.

Q And have you recommended that they attempt to discontinue the use of unlined surface pits?

A That depends, of course, on certain factors but where I think the physical factors might be such that there is the possibility of some future contamination of fresh water might occur, where it is practical and feasible, generally we plan to dispose of our produced salt water by methods other than unlined surface pits.

Q In other words, I am just asking if you called your company's attention to the possibility of a contamination there?

A Well, I don't recall who called it to who's attention on this.

Q It has been called to the attention of your company that that is a possibility?

A We are aware that in this area there might be that possibility, yes sir.

MR. HARRIS: No further questions.

MR. PORTER: Anyone else have a question of Mr. Currens?

MR. COOLEY: Yes, sir.

MR. PORTER: Mr. Cooley?

CROSS EXAMINATION

BY MR. COOLEY:

Q Mr. Currens, from your answers to Mr. Harris' questions, did I gather that it is your opinion that the continued disposal of oil field brines in unlined earthen pits in these ten most critical areas which we have been discussing today in this case and which we discussed here before, would constitute a threat and a hazard to the fresh water in the area with respect to the future?

A I think I would have to qualify my answer there to a certain extent. As I pointed out initially, I didn't have a sufficient amount of time to make a complete study of Lea County and of course my study was more on a regional bases. In many areas, certainly, as I said, up north of the northern boundary of the defined basin, I made no investigation up in that area whatsoever. Primarily, my efforts have been directed to those areas in which Pan American has operations and we are a significant factor in those areas where our operations have some scope. Generally, I would say that--well, just generally talking, that the entire defined ground water basin, in a general way, that it would probably be advisable that the significantly large amounts of salt water that is produced with oil not be disposed of in surface pits. As I say, I don't have full information on all of these--we don't operate in all of these pools and many of the companies that do operate in those pools certainly have more

information than I have had time to study. In these ten pools, generally, as I recall from the June hearing, there have been pretty significant progress reports indicating that the majority of operators working in there do use subsurface disposal systems.

MR. COOLEY: Nothing further.

MR. PORTER: Anyone else have a question of Mr. Currens?

MR. McPETERS: Yes, sir.

CROSS EXAMINATION

BY MR. McPETERS:

Q I notice on your map there in the Eumont-Monument area, the Lea County water basin is more or less--more or less bisects that field, is that correct?

A The southern limit of the ground water basin in Lea County is along the line between Township 20 and 21, yes sir.

Q In your study, did you find that the conditions were different south of that line than they were north of the line?

A Well, I couldn't exactly say that that line was a real division. Certainly in this area in the lower portion of the Lea County ground water basin immediately south of it, there are sand lenses that have relatively shallow pits that don't contain fresh water. Now, as far as a specific area goes, it might be necessary to make a more localized study than I have been able to make. As I have said, I made a pretty general study here just from lack of time.

Q And I recall from your testimony that most of the wells

south of that line, let's say, were producing in the red section, is that true?

A I don't know quite how I would break that down, whether it is most or not. Certainly, there was a number of wells out there that water was being produced from.

Q And you have more or less now given a recommendation, but your idea now would be that there certainly should be more study made in that area?

A I would think that certain areas here certainly might deserve more study than I could give them in that amount of time.

MR. McPETERS: Thank you.

MR. PORTER: Anyone else have a question of Mr. Currens?

MR. NUTTER: Yes, sir.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Currens, on your Exhibits 11 through 15, in each case the analysis of water in 1958 shows less parts per million chloride than the analysis in 1955, is this correct?

A Yes, sir. Well, I don't know if there was a '55 analysis on all of these, but --

Q In the '55 or more recent one?

A The last one previous to it, yes sir. The analysis of the particular water sample from that well showed in each of those five cases that that analysis contained a smaller, or that the sample contained a smaller amount of chloride than the last --

previous one.

Q To what do you attribute this?

A I don't know, sir, I really don't. Certainly we have had variations in the quality of water over a period of time.

Q Does the sand charged by fresh water percolated down the surface the result of rainfall?

A I am sure that there is some recharge of it in this general area of the Lea County ground water basin. It presents a significance on water and sand. I am sure that in areas, there certainly must be some recharge from rainfall.

Q Has there been any more moisture, precipitation or whatever you want to call it, in Lea County in the last couple of years than there has been on the last seven or eight years on an average?

A I don't recall any numbers right offhand, sir. I don't believe I could answer that question.

Q Did you make any comparison of rainfall in the last several years?

A Oh, I think that--I believe that data was available to me but I don't recall what it showed right offhand.

Q Do you think if there had been more than the usual amount of rainfall and that this water, fresh water, percolated down, that it might result in the dilution of the existing water in there and cause the count of solids to be lowered?

A That's a pretty hard question to answer in that this is

a pretty good water basin and it has an awful lot of water and I don't know the rainfall figures offhand. I just don't think I could answer that right now, sir, I would have to have some further study along that line.

MR. NUTTER: I believe that is all, thank you.

MR. PORTER: Anyone else have a question of the witness?

MR. FISCHER: Yes, sir.

MR. PORTER: Mr. Fischer?

CROSS EXAMINATION

BY MR. FISCHER:

Q Mr. Currens, I think it is implied on your exhibits, is this true, that the scale on your tickell diagrams is in units of ten?

A Each one of those divisions is a ten per cent division on each of those legs, yes sir.

Q Does that hold true for all exhibits, all of the exhibits are on scale?

A On everyone of these diagrams that I made as is showed on the diagram, each of those hash marks are division lines, ten per cent lines, yes sir.

Q In your Exhibit 9 on that Dailey water well, I think it is 1838?

A Exhibit Nine?

Q Yes, I believe that's the one.

A I have Exhibit 9 as a well in 3320 37.

Q That is Exhibit 11.

A On the bar graphs?

Q Right. A Yes, sir.

Q Is it true that there are no oil wells in the immediate vicinity of this well, no producing oil wells at the present time?

A I don't recall right offhand on that particular questio. Let me see, there doesn't appear to be any in that immediate area, though.

Q On your other diagram, Exhibits 11 to 15, are any of the wells shown located in the vicinity of water producing oil wells or surface pits?

A I haven't fully checked these out in that respect. I was just trying to give you the benefit of some additional data which I gained. I would imagine that the Hobbs Number 3 is in the City of Hobbs and probably pretty close to production there.

Q We have a map here, I just wanted to --

A That's what I was checking here. This seems to be in an area where there is oil production, that's Exhibit 13; 14 seems to be an area of oil production, that general area, and 15, yes sir, that's in a general area of oil production, too.

MR. FISCHER: Thank you, that is all.

MR. BUELL: You understand, do you not, that we didn't pick these, that these wells were used in prior exhibits?

MR. FISCHER: That is right.

MR. PORTER: Does anyone else have a question of the

witness?

MR. UTZ: Yes, sir.

MR. PORTER: Mr. Utz?

CROSS EXAMINATION

BY MR. UTZ:

Q On the field scale, that was ten per cent of the total solids?

A No sir, those are per cent reacting values. You take and total the individual solid for that particular component per million. That is the analysis and then they are converted into a common scale of reacting--in other words, how would the sodium combined with the chlorine and sulphate and everything that is taken into account and is available and then these are the acting portions or the reacting values of those things. Then these are simply added up and you take the percentage of each of those reacting values to plot this, so it is not looking at a percentage. You can't say that it was so much of that particular component of what this tabulation shows. It shows both the results of it and the analysis, that is what is plotted on this thing, but you get a picture of the water to see whether there's been any relative change in it. Did I answer your question, sir?

Q Yes, you did.

A Thank you.

MR. UTS: That is all.

MR. PORTER: Anyone else have a question of the witness?

MR. LAMB: Yes, sir.

MR. PORTER: Mr. Lamb?

CROSS EXAMINATION

BY MR. LAMB:

Q From the line of questioning and physical findings, did I understand that caleche was the only barrier that might exist between the bottom of the pit and the water?

A I didn't intend it to be so, sir.

Q There are other formations or deposits that are normal barriers, is that correct?

A Certainly there is impervious shale that might overlie water.

MR. LAMB: That is all.

MR. PORTER: Does anyone else have a question?

(No response).

MR. PORTER: The witness may be excused.

(Witness excused).

MR. PORTER: Does this complete your testimony on this phase of the case?

MR. BUL. . Yes sir, it does.

MR. PORTER: Does anyone have any testimony to present concerning the ten areas that have been under discussion here?

(No response).

MR. PORTER: Does the State Engineer's Office have any rebuttal testimony that they would like to present at this time?

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MR. HARRIS: No, we do not.

MR. PORTER: The next phase of our case has to do with the reports as required by the section of Order R-1224. This order required all operators in the ten areas to file written reports or to appear at the hearing and make a report. Now, we are assuming that those who have not filed reports will make an oral report here or be represented by someone who will. These brine reports, of which we have a good many, will be made a part of the record.

Starting with the Bagley pool, I would like to hear reports at this time.

On these reports which we are about to receive, I would like for each person giving the report to identify the operators for whom he is reporting if he doesn't have a list, which he can submit to the reporter for the record.

Mr. McBride, you may proceed.

MR. McBRIDE: I have three reports, Bagley, Saunders and East Caprock. Should I give all three of them?

MR. PORTER: I believe we can dispense with Bagley first because there might be some other operators who have something to add. However, the East Caprock and the Saunders will be next in order.

MR. McBRIDE: All right, sir. I am O. C. McBride, engineer for Amerada Petroleum Corporation in Midland, Texas. We are operators of the Bagley Devonian and Bagley Pennysylvania

salt water disposal system. Other operators in this system besides Amerada are Texas Pacific Coal and Oil and Gulf. This system has been in operation since May 29 of 1957 or for a period of about sixteen months. We are now disposing all of the produced water in the system.

MR. COOLEY: Does that conclude your report?

MR. McBRIDE: That's it for Bagley unless there are questions.

MR. COOLEY: Which is your next report?

MR. McBRIDE: East Caprock or Saunders, either one.

MR. IRBY: Does this one hundred per cent represent your disposal system for the entire salt water production of this pool?

MR. McBRIDE: This represents all of the water produced by wells that are connected to the system.

MR. IRBY: Are there salt water producing wells which are not connected to the system?

MR. McBRIDE: To my knowledge, there are none. There might be one or two wells that are not connected that might maybe have a trace of water or something.

MR. IRBY: Thank you.

MR. PORTER: Mr. McBride, Amerada, TP and Gulf are the only three operators in the Bagley area?

MR. McBRIDE: Yes, sir.

MR. PORTER: Anyone else have a question pertaining to Bagley?

(No response).

MR. PORTER: Proceed with the East Caprock pool.

MR. McBRIDE: Amerada is also operator of the East Caprock Devonian salt water disposal system. Other operators in addition to Amerada are Shell, Skelly, Texas Company, Texas Pacific Coal and Oil and the Union Oil Company of California.

MR. COOLEY: Mr. Fischer is trying to write these down.

MR. FISCHER: The Texas Company, was it mentioned?

MR. McBRIDE: Amerada, Shell, Skelley, Texas Company, Texas Pacific Coal and Oil and Union of California.

MR. FISCHER: I got them, thank you.

MR. McBRIDE: All right, sir. This system was first placed in operation on July 25, 1957 or about fourteen months ago. We started injection into our salt water disposal well number one, which was completed in the Dewey formation. The well initially took approximately 2,800 barrels of water per day at about 950 pounds. As we have reported before, this volume that it was able to take decreased and the pressure increased. In an attempt to get additional disposal capacity, we attempted the San Andres zone in this same well in October of 1957 with no increase in disposal capacity from tnat operation.

We continued our disposal into the Dewey Lake formation until May 19th of this year. At that time, we had injected a total of 820,978 barrels of salt water and the well failed us on that date.

We applied for permission to inject into the Devonian formation on our order A-4 and this was granted on June 20 of this year and immediately after that date, we started negotiating with the surface land owners for a right to use this well as a disposal well. On September 4 of this year, we finally managed to sign an option with him and in the meantime, we had deepened the well to prepare it for disposal.

After signing this option, we started signing royalty owners since we were putting the water back into the Devonian and they were signed, enough were signed up by September 15 and on that date, we exercised the option by signing the lease and we hope to have some water going into the well by tonight and we don't know yet how much pressure will be required to put that water away. So we should know within a few days and we could buy extra pumps and install them if they are necessary. We would estimate that within thirty days we will have a hundred per cent disposal system in East Caprock.

That concludes my report on East Caprock.

MR. NUTTER: Will all of the water in this pool be disposed in that well?

MR. McBRIDE: That would be rather difficult to answer today, Mr. Nutter. We have never been able to gather all of the water with our present gathering system. We really don't know if we have a disposal capacity at the central gathering plant, whether we could gather all the water. We think we can, but we are

not sure yet.

MR. NUTTER: What is the problem in gathering all the water in the pool?

MR. McBRIDE: Well, we designed our lines on a certain volume of water and we think that volume will go through those lines in that load capacity when we do get our disposal well into operation.

MR. NUTTER: And in the event that the lines don't have sufficient capacity to handle the produced salt water, will the size of the lines be increased?

MR. McBRIDE: We can't increase the size of the lines.

MR. NUTTER: Will you replace the lines with larger lines?

MR. McBRIDE: We will probably loop them. We will take water up to the capacity of the gathering system as it now exists and if we see the necessity of it, we will take whatever action is necessary to increase that capacity of the gathering system.

MR. NUTTER: That's the answer I was looking for.

MR. McBRIDE: Yes, sir. We have had experience, we have experienced difficulties in other systems and we hope we don't have them here, but we might. I can't really answer your question.

MR. NUTTER: Thank you.

MR. McBRIDE: On a specific answer.

MR. PORTER: Anyone else have anything to report concerning the East Caprock pool?

MR. IRBY: Are all of the operators in this pool in the

cooperative agreement?

MR. McBRIDE: To my knowledge they are, Mr. Irby.

MR. IRBY: Thank you.

MR. McBRIDE: I can't think of any wells that are not connected.

MR. PORTER: Mr. McBride, will you proceed with the Saunders pool, please?

MR. McBRIDE: Amerada Corporation is also operator of the Saunders salt water disposal system. In addition to Amerada, other companies connected to the system are Atlantic, Cities Service, Gulf, Magnolia, Shell, Fish Northwest Construction and the Texas Company.

This system was placed in operation on June 18 of this year or approximately three months ago. To August 1st of '58, we had disposed of a total of 39,956 barrels of water. We reported at the last hearing that the well was taking water on backing. I think that we placed the system into operation on the date of the hearing. After approximately 4,000 barrels had gone into the well, the well started pressuring up. We acidized the well again with no significant change in its capacity. This pressure continued to increase until now the well is capable of taking approximately 1,100 barrels of water per day at about 2,500 pounds pressure.

It was obvious that we didn't have enough disposal capacity in this well to handle all of the produced water connected to the system. We applied for permission to use our State 36 Number One

as an injection well. This was denied so we have applied now for administrative approval to use our State SD Number Five as a disposal well using the San Andres as a disposal zone and we are also in the process now of converting this well to a disposal status.

As soon as the necessary approval is obtained, we estimate that we will have a hundred per cent system in about thirty days.

That concludes my report on Saunders.

MR. FISCHER: Mr. McBride, were you reporting for Shell?

MR. McBRIDE: Yes, I thought I mentioned them.

MR. FISCHER: I'm sorry, I didn't get it, thank you.

MR. McBRIDE: That's all right.

MR. PORTER: As I have it, Mr. McBride, you were reporting for Atlantic, Cities Service, Gulf, Magnolia, Shell, Fish Northwest, Texas Company and Amerada?

MR. McBRIDE: Yes, sir.

MR. PORTER: According to my information, Colorado Oil and Gas has a well in this pool?

MR. McBRIDE: I didn't hear you, Mr. Porter.

MR. PORTER: According to my information, Colorado Oil and Gas Company has one well in the pool and we have a written report on file, and I can also show one well for TP Coal and Oil Company and they have filed a written report.

That concludes the pools on which you were to report, Mr. McBride?

MR. McBRIDE: Yes, Sir. I might add that we were to report for Gulf in Eunice-Monument.

MR. PORTER: That will come later. Rice Engineering will report on that. We will proceed with the Eunice-Monument unit Eumont area, Eunice-Monument-Eumont.

MR. ABBOTT: My name is W. G. Abbott, I am division manager for Rice Engineering and Operating, Incorporated in Hobbs. This is a progress report on salt water disposal for the Eunice-Monument-Eumont fields, Lea County, New Mexico:

"In the Progress Report presented during the June 18, 1958 Regular Hearing, Mr. C. M. Bumpass, Gulf Oil Corporation, Area Engineer, Hobbs, New Mexico, discussed plans for handling water produced in the Eunice-Eumont and Monument-Eunice areas. These areas are now combined into the Eunice-Monument-Eumont Salt Water Disposal System. The Articles of Agreement became effective August 1, 1958; however, signature sheets were not received until August 8, 1958. The Agreement was executed by twenty-five companies and 982 producing wells have been committed to the system. Pending approval of the Operating Committee, four more operators will commit fifteen additional producing wells. Rice Engineering and Operating, Incorporated was designated as operator of the System and became chairman of the Operating Committee.

The first meeting of the Eunice-Monument-Eumont (hereafter known as the E-M-E) Operators Committee was held in Hobbs August 25, 1958. Committee approval was obtained to purchase the

Amerada Adkins Number Two well located in the northwest quarter, southwest quarter, southwest quarter of Section 5, Township 20 South, Range 37 East and recomplete it as a disposal well. A surface lease has been procured and physical work will be started as soon as a permit to inject water is issued by the New Mexico Oil Conservation Commission. Application for a hearing was submitted to the Commission on September 11, 1958.

The Amerada Adkins Number Two was selected for a disposal well because it was originally completed as a Monument Blinebry well and offers a possibility of testing the receptivity of the lower San Andres in the minumum length of time merely by setting a plug in the casing and perforating opposite zones of indicated porosity. It is also located in an area of large water production and if receptivity is mainly limited by injection tubing capacity, the well should provide substantial relief for the area.

Committee approval was obtained to drill a disposal well 2,340 feet from the north line and 500 feet from the west line of Section 21, Township 20 South, Range 37 East on the Sinclair Roach Lease.

Committee approval was also received to drill a disposal well 1,320 feet from the north line and 1,320 feet from the east line of Section 32, Township 21 South, Range 36 East. The location has been staked, an application has been made to the State Land Office for a business lease and application for a permit to inject water was submitted to the New Mexico Oil Conservation Commission

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on September 12, 1958.

There have been no injectivity tests taken in the lower San Andres formation in the E-M-E fields. However, available data indicates the formation may be as receptive to water in the E-M-E fields as it is in the Hobbs field. If this proves to be true, completion of these three disposal wells should result in handling approximately fifty per cent of the reported water production.

It was originally planned to request approval for one more disposal well in the Monument-Eumont area. However, the operator decided to defer further action until an actual injection test could be made. Upon obtaining approval to purchase the Amerada Adkins Number Two, it appeared that more specific plans could be made sooner with reliable information.

Right-of-way options have been obtained on approximately twenty-three per cent of the fee land in the system. Survey crews are working in the Monument-Eumont area and the final design is being made.

The E-M-E System will cover a large geographic area and the operator has divided the field into segments. Every effort will be made to show progress by the volume of water handled rather than the quantity of line installed or the amount of money spent."

I have a list of the twenty-five members of this Eunice-Monument salt water disposal system, plus two other operators that have been approved by the Committee to join the system and

I will turn this in for the record.

MR. FISCHER: I have one question.

MR. ABBOTT: Yes, sir.

MR. FISCHER: Mr. Abbott, you mentioned the Eunice-Monument-Eumont. Does this also include wells that are producing water completed in the Monument Bline and the Monument Paddock?

MR. ABBOTT: Yes, sir.

MR. FISCHER: They do?

MR. ABBOTT: Yes, sir.

MR. FISCHER: Thank you.

MR. PORTER: Mr. Nutter?

MR. NUTTER: You mentioned that you had twenty-five companies committed to the cooperative agreement at the present time and they are on that list, is that correct?

MR. ABBOTT: Yes, sir.

MR. NUTTER: And you have two that have been accepted by the committee as applicants?

MR. ABBOTT: Yes sir, they haven't actually signed the operating agreement, but they have been --

MR. NUTTER: Their names are on the list?

MR. ABBOTT: Yes, sir.

MR. NUTTER: And a while ago you mentioned that you had a possibility of four additional companies becoming parties to the agreement?

MR. ABBOTT: Yes, we have had one other operator write us

a letter, but we haven't had an operating committee meeting and that hasn't been brought up.

MR. NUTTER: Are you in a position so that you can divulge these two operators' names that are potential applicants so that we can check them off here or shall we get a written report from them?

MR. ABBOTT: I would rather you got a written report from them.

MR. NUTTER: Now, of the 982 wells that you have committed, they belong to the twenty-five operators who are presently members, correct?

MR. ABBOTT: Yes, sir.

MR. NUTTER: Does this represent one hundred per cent of the water-producing wells that these twenty-five operators own?

MR. ABBOTT: I don't know if that's right or not. They may have other wells or leases that they haven't committed, but I don't know about that.

MR. PORTER: Mr. Abbott, I would like to know the date at which time we might expect a hundred per cent disposal from the 982 wells committed to this system?

MR. ABBOTT: Well, according to our schedule, we will try to do that in one year. We hope to have this fifty per cent disposal fairly soon and within a year, we should--or slightly over a year--have a hundred per cent disposal.

MR. PORTER: Anyone else have a question of Mr. Abbott?

MR. COOLEY: I have a question regarding this report. As you know, Mr. Abbott, Order 1224 required that each operator in these ten critical areas report to the Commission. I would like to get it clear whether you are reporting for the two additional operators whose names you have written on the sheet that you just passed to Mr. Nutter?

MR. ABBOTT: Well, I don't know if I am or not. I don't know if they have submitted reports to you or not. They asked for permission to join the system and were voted in in the last committee meeting. They are not officially signed up yet, but since they have been accepted by the operating committee, I imagine they will become a party to it.

MR. COOLEY: The Commission will consider that your report covers these two operators and if they wish to offer anything additional, they may do so.

MR. ABBOTT: All right.

MR. PORTER: Mr. Irby?

MR. IRBY: Mr. Abbott, these fifteen wells over and above the 982 represent these other two operators, is that correct?

MR. ABBOTT: They represent the two operators plus another operator that has written us a letter asking to become a member of the system, but we have not brought that up at a committee meeting yet and there's one other operator that is a member of this agreement and they have two additional wells to bring in and that should account for all fifteen.

MR. IRBY: And we have a rough total of a thousand wells committed to this system?

MR. ABBOTT: Yes, sir.

MR. IRBY: And are there not approximately fourteen hundred wells in this area?

MR. ABBOTT: I imagine that's fairly close, yes sir.

MR. IRBY: Could you tell me anything about these other four hundred wells with respect to their salt water production and their intent?

MR. ABBOTT: No, I don't know what their intent is and I am just reporting on the progress of this Eunice-Monument-Eumont salt water disposal system, so I don't know what the other operators plan on doing.

MR. IRBY: Thank you.

MR. PORTER: Anyone else have a question of Mr. Abbott?

MR. COUCH: Mr. Abbott, do you know if the report of the committee reflects the identity of the wells that are included in this list that are committed to the system?

MR. ABBOTT: Yes, I understand that list --

MR. COUCH: A list of the wells actually identifying the wells?

MR. ABBOTT: No, I don't think there's any identification of the wells.

MR. COUCH: That's all.

MR. COOLEY: Could you submit such a list to the Commission

in order that we might have that for our files?

MR. ABBOTT: Yes, if the Commission requires that, I can.

MR. COOLEY: Mr. Nutter says he would like to have one. Would you please submit it?

MR. ABBOTT: Yes, sir.

MR. PORTER: Anyone else have a question of Mr. Abbott?

(No response).

MR. PORTER: Anyone else in the Eunice-Monument-Eumont area wish to report at this time?

MR. HAMPTON: Yes, sir.

MR. PORTER: Would you identify yourself, please?

MR. HAMPTON: John Hampton representing Great Western Drilling Company. We have one well in Eumont. The Great Western Drilling Company has four wells which don't make any water at all so we have no water disposal plant here. We have one well in the Eunice-Monument, the Great Western Drilling Company has one well that produces five barrels of oil a month; consequently, we do not feel that for such a small amount of water, we can justify joining the system of Rice Engineering on their disposal well. As an alternate, we propose to build an asphalt-lined disposal pit, which we have found emminently satisfactory in other parts of the country. We can have one completed in about thirty days.

MR. PORTER: Thank you, sir.

MR. NUTTER: Was that five barrels of oil or five barrels of water a month?

MR. HAMPTON: I'm sorry, five barrels of water a month.

MR. PORTER: Mr. Irby, did you have a question?

MR. IRBY: Mr. Hutter asked my question.

MR. ADAMS: I am representing Magnolia and I would like to report on our four wells in the Eumont Field. We have a State lease and they are making no water and we have made no plans. We haven't entered the system or anything.

MR. BROWN: D. C. Brown representing Sun Oil Company. Sun is a member of the E-M-E Salt Water Committee. However, we have one lease on the field and we have one oil well. It produces roughly four barrels of oil a day with a slight trace of water. We cannot see the economics of joining the system at this time but we will comply with the reports and requirements as set forth by the Commission.

MR. PORTER: Mr. Hinkle?

MR. HINKLE: Mr. Kelly was here this afternoon and asked me to make a brief report for him, and Elliott, Incorporated, they have one well which is located in the Eumont oil pool in the northeast northeast quarter of Section 34, Township 20 South, Range 36 East. Present production is five barrels of oil per day and about twenty barrels of water. Elliott, Incorporated is in contact with the other operators in the area and they are trying to work something out, some sort of system for disposal of this water economically if it is possible for this type of production, but so far has been unable to do so.

MR. PORTER: Anyone else in this area?

MR. McBROWN: Yes, sir.

MR. PORTER: Mr. McBrown?

MR. McBROWN: I would like to report on the Monument area. We have several leases down there that make some water and we are either going to employ evaporative pits or prove to the Commissions satisfaction that the water we produce does not percolate to fresh water sand. We have built one pit and we have another one on the drawing board.

MR. COOLEY: When you refer to the pit that you built, are these lined pits of some sort?

MR. McBROWN: Lined pit, yes sir; as a matter of fact, the State has inspected one up in the Hobbs pool and has not as yet given us an okay or turndown on it. However, according to Mr. Irby, a pit of that type is acceptable.

MR. PORTER: Anyone else desire to make a report?

MR. ADAMS: Yes, sir.

MR. PORTER: Mr. Adams?

MR. ADAMS: John Adams representing Trace Oil Company. We have two wells recently made in the Monument pool that do produce salt water. I do wish to identify myself as a friend of the Commission and the State Engineer, even if it did not appear so previously and as a result, I wish to say that the findings of the Commission on Order Number 1224 and we do not believe that --

MR. PORTER: Mr. Adams, at this time I believe we should

confine ourselves merely to a progress report.

MR. ADAMS: We have made no plans whatsoever for the disposal of these produced waters other than open earthen pits unlying.

MR. COOLEY: What is the approximate quantity of water from the well you have just mentioned?

MR. ADAMS: Somewhere in the vicinity of a hundred barrels per day.

MR. COOLEY: Thank you.

MR. PORTER: Mr. Couch?

MR. COUCH: I am representing the Ohio Oil Company. We have some wells in the area covered b the Eunice-Monument-Eumont system that are not producing any water. All wells which produce water are committed to the system.

MR. FOSTER: Mr. Cickowicz?

MR. Cickowicz: Continental Oil Company has some oil wells, I believe, in the Eunice-Monument area which do not produce any water and are not committed to the system, Rice's system. However, wells that do produce water are connected to the Rice system. Morgan with Phillips has a few leases that do not produce water and are not anticipated to produce water and are not connected to the system; all wells that are water producers or anticipated water producers are connected.

MR. SETH: I am representing Tidewater. Tidewater is a member of the Rice system but we have a few leases that are not

committed to the system. We would like to present to the Commission production data on the wells that are not connected. I believe an examination of this data shows that in most instances no water is produced from these wells and in the few where there is water production, some water below the pipeline, we have no present plans for any disposal system some seventeen of these wells produce a total of some three barrels per day and we believe that this is a minimum consideration.

MR. PORTER: Mr. McBride?

MR. McBRIDE: Amerada has three wells in the Eunice-Monument pool that do not make any water and we have not committed those to the system. In the Eumont pool, we have seventeen wells that make a very small quantity of water which are not connected to the system. We plan to use the sealed pits on these where necessary to handle the water.

MR. COOLEY: Mr. McBride, what quantity of water is produced from the wells which have not been committed to the cooperative project?

MR. McBRIDE: You want them well by well?

MR. COOLEY: The whole works, the total.

MR. McBRIDE: I don't have that added up, I'm sorry.

MR. COOLEY: Well, approximately.

MR. McBRIDE: On the order of fifty barrels a day.

MR. COOLEY: And you are going to dispose of all fifty barrels per day in unlying pits?

MR. McBRIDE: Some of these wells don't make a tenth of a barrel per day and some maybe two barrels. The largest one is about fifteen barrels, in that order, and we will probably have to do something.

MR. COGLEY: Thank you, Mr. McBride.

MR. PORTER: Anyone else have a progress report on this area?

MR. COOPER: My name is Cooper and I am here as a representative of Kodie Rojo Corporation and also representative of Ben Hogan. Kodie Rojo Corporation operates eight wells in the Eumont area and the maximum water production of any one of the eight wells is a barrel a day and the production is so little, the oil that comes out is in a very small quantity and we have made no plans to dispose of that water or anything other than pits and if necessary we will line the pits, but we hope that won't be necessary.

Ben Hogan has two wells in the same area that produce a third of a barrel of water a day and we have made no plans to dispose of that.

MR. KELLAHIN: J. C. Kellahin reporting for Continental Oil Company. Continental has committed all of its water-producing wells and those in which water production may be anticipated to the system which is operated by Rice Engineers.

MR. PORTER: Any more reports on the Eunice-Monument-Eumont area?

(No response).

MR. PORTER: Mr. Abbott --

MR. ABBOTT: Yes, sir?

MR. PORTER: Is it your intention to report on the Hobbs pool?

MR. ABBOTT: Yes, sir.

MR. PORTER: Off the record.

(Discussion off the record).

MR. NUTTER: According to our records, we have received no written report nor have oral reports been presented yet for the following companies. I would like to know if there is a representative here from the following:

Cactus Drilling Company, Gillian Drilling and Exploration Company --

MR. PORTER: There is, I know there is a report from the Gillian Drilling and Exploration Company.

MR. NUTTER: Is that a written report?

MR. PORTER: Yes.

MR. NUTTER: There is a possibility it didn't cover this pool. There is a written report from Gillian Exploration.

First Chicago Oil Corporation, Harris and Mills, T. F. Hodge, R. P. Honeman, Coke Oil Corporation, J. F. Lane, H. S. Moss, Nolan and Bryron, Nolan and Lane --

MR. McBROWN: Just a minute, I reported for Nolan and Bryron.

MR. NUTTER: For Nolan and Bryron?

MR. McBROWN: Nolan and Bryron, yes.

MR. PORTER: What about Mr. Lane?

MR. NUTTER: Was that presented by your report?

MR. McBROWN: That will be the same, yes sir.

MR. NUTTER: Thank you.

C. C. Pollard, E. G. Rodman, Bill Shelton, Two-States Oil Company, Vem Oil Company, and --

MR. PORTER: Is that V-E-M?

MR. NUTTER: V-E-M, yes sir.

Wilson Oil Company, Guy Zachery --

MR. LAMB: For Wilson Oil Company, I think you will find a written report in your file.

MR. PORTER: There is a report.

MR. NUTTER: That's all.

MR. COOLEY: Is that all, Mr. Nutter?

MR. NUTTER: Yes.

MR. PORTER: A check will be made of the Commission's records, a thorough check. These written reports will be checked and corrections will be made. We are bound to be in error, so we will check.

Proceed next to the Hobbs pool.

MR. ABBOTT: This is a progress report on Salt Water Disposal, Hobbs pool, Lea County, New Mexico.

In the Progress Report presented during the June 18, 1958 Regular Hearing, it was stated that at such time as an Operating Agreement became effective, the duties of Pan American as chairman

of the Hobbs Field Operators would cease and a representative of Rice Engineering and Operating, Incorporated would become chairman.

The Hobbs Salt Water Disposal System Agreement became effective June 25, 1958. Twenty-one operators have committed a total of 279 producing wells to the system. Arrangements have been made for all right-of-way options. Two disposal wells have been purchased by the system. One is Pan American's State "A" Tract 9 Salt Water Disposal Number One hereafter designated as Rice Engineering and Operating, Incorporated, Hobbs Salt Water Disposal Well E-15. The other is Humble's State A-2 Salt Water Disposal Well hereafter designated as Rice Engineering and Operating, Incorporated, Hobbs Salt Water Disposal Well P-25. Material is on hand and construction contracts have been awarded for approximately sixty per cent of the system. Design work is one hundred per cent complete, the balance of the material is on order and contract proposals have been submitted to contractors for the remainder of the system. As of September 15, 1958, the accumulation tanks have been installed and two construction spreads are currently ditching and laying line.

It is estimated that the System should be completed in March 1959.

I have a list of the operators here.

MR. PORTER: In March 15, 1959 --

MR. ABBOTT: Yes, sir.

MR. PORTER: You hope to be disposing a hundred per cent of

the water?

MR. ABBOTT: From these two hundred and seventy-nine wells?

MR. PORTER: From the two hundred and seventy-nine wells.

MR. ABBOTT: Yes, sir.

MR. PORTER: Mr. Abbott, are all of these wells in the pool represented by you?

MR. ABBOTT: Those are all of the Hobbs pool wells. Let me correct that, I believe Par American has one Hobbs Drinkard well.

MR. PORTER: But none of them are Bough?

MR. ABBOTT: No, sir.

MR. PORTER: Anybody have a question of Mr. Abbott concerning this report?

(No response).

MR. PORTER: Anyone else have a progress report concerning the Hobbs pool?

MR. JOHNSTON: Yes, sir.

MR. PORTER: Mr. Johnston?

MR. JOHNSTON: Paul Johnston, all of our wells in the Hobbs pool produce pipeline oil and therefore we have no plans at the present for any disposal of water.

MR. IRBY: Mr. Johnston, by production of pipeline oil, you mean there is no water production?

MR. JOHNSTON: The water is collared to below the pipeline. The amount of water is below the pipeline collar.

MR. IRBY: Thank you.

MR. PORTER: Mr. McBride?

MR. McBRIDE: Amarada has two wells in the Hobbs pool that are not committed to the disposal system. Neither of these wells makes any water and we don't anticipate that they will make any.

MR. PORTER: Mr. Adams, did you have a question?

MR. ADAMS: We have one well in the Hobbs pool producing about thirty barrels per day of salt water and at the present time this is disposed of in open earthen pits unlined. We have no plans at the present time for any changes.

MR. PORTER: Mr. Adams, I don't know whether we could make the term progress broad enough to include that as a progress report or not.

Does anyone else in the Hobbs pool--Mr. McBrown?

MR. McBROWN: We have eight wells in the Hobbs pool. One of them is committed to the unit for the disposal system and we have a lined pit for the other ones. The other six do not make water and are not in the system.

MR. PORTER: Any other reports in the Hobbs pool?

MR. KELLAHIN: Continental Oil Company's wells in the Hobbs pool are committed to the disposal system.

MR. COUCH: For Ohio, the same situation with regard to our well.

MR. PORTER: Anyone else have a report on Hobbs?

MR. SETH: Tidewater has two wells that are not connected to the system. They produce one barrel or less per day. Does this

include the Bowers?

MR. PORTER: Yes.

MR. SETH: Tidewater has two Bowers and Kelly has one. Well, I think Tidewater has one and there is no water produced.

MR. COUCH: Do you include the Bowers on this pool?

MR. PORTER: It is the Hobbs area.

MR. COUCH: Then we have wells in the Bowers pool which are not committed to the Hobbs salt water disposal system, none of which produce water.

MR. CARTER: Mr. Carter of Cities Service. We have a well in the Hobbs pool that we have committed but we have four Bowers wells not committed to the Rice system. These four wells are apparently producing about three barrels a day and we disposed of this water in a sealed pit whenever necessary.

MR. CHRISTENSON: Mr. Christenson for Shell Oil. We have wells in the Bowers pool that are not committed that are not producing any water. One is not committed to the Rice system, it produces an insignificant amount of water.

MR. IRBY: Define insignificant.

MR. CHRISTENSON: The percentage, sir, is somewhere--first, the well produces two or three barrels of oil a day in volume and the volume of water would be in the range of four or five quarts of water a day.

MR. IRBY: Thank you.

MR. PORTER: Mr. McBrown?

MR. McBROWN: Pan American Corporation operates seven wells in the Bowers pool which produce eight barrels a day. We are investigating the possibility of disposing the water in sealed pits.

MR. PORTER: Mr. McBride?

MR. McBRIDE: I didn't get to report on Bowers. Amarada operates five wells in Bowers that are not committed to the system. These five wells make a total of about one barrel of water a day. We have no present plans about handling that water.

MR. BROWN: Sunray and Midcontinental have wells in the Hobbs pool which are committed to the Rice system and wells in the Bowers pool which are not committed. They make an insignificant amount of water and by insignificant I mean approximately a barrel or two a month.

MR. PORTER: Mr. Brown, do you have knowledge as to approximately how much water is produced by the Bowers pool per day?

MR. BROWN: Well, I would guess in the order of about thirty barrels per day for all the Bowers pool wells and I think they are approximately fifty Bowers pool wells.

MR. PORTER: Thank you.

Anyone else have a report on this area?

MR. BUMPASS: Yes, sir.

MR. PORTER: Mr. Bumpass?

MR. BUMPASS: Sam Bumpass, Gulf Oil. We have five wells in the Bowers pool. I don't recall the water, it is very small, maybe one to three barrels per day per well. We plan to dispose of the

water by using lined pits.

MR. PORTER: Any other reports on this area?

(No response).

MR. PORTER: Mr. Nutter, do you have a check on the number of operators who have not reported either orally or by written report?

MR. NUTTER: Yes, sir. First I would like to find if there is a proration schedule on one Gulf Oil Corporation well. I wonder if the representative of Mr. Bryron has reported for that well in the Hobbs pool?

MR. McBROWN: Yes, sir.

MR. NUTTER: Is there a representative of John A. Yates here to make a report?

(No response).

MR. NUTTER: That completes the report, sir.

MR. PORTER: Next the Bough pool.

MR. EVANS: I am C. T. Evans with Magnolia. We are at present the only operator in the Bough pool and we now have a hundred per cent salt water disposal system in operation. We do not have all of our tank batteries connected and the water-producing wells are disposing into the Bough formation. It is a water-drive field and we anticipate no troubles.

MR. PORTER: Any questions?

(No response).

MR. PORTER: You may be excused and we will proceed to the

Crossroads. Were you going to report on the Crossroads or did you have any other report?

MR. EVANS: No, just those two.

MR. WADE: There is a unit agreement in the Crossroads now covering the oil development for the Company of Texas, Gulf, Tidewater, Sunray Midcontinental and Magnolia. In the Crossroads, we have agreements signed by the operators I have listed here and if these are approved, we have ordered all the material for installation of the system and bids have been taken for installation and the date of November 15, installation date, when we will be putting a hundred per cent water in the ground. I believe that the salt water disposal well has already been approved as the San Andres.

MR. PORTER: Mr. Irby?

MR. IRBY: Did I gather from your testimony that all of the operators are committed, is that correct?

MR. WADE: I'd better say that the operators here that I named are committed.

MR. IRBY: Are there other operators in the pool?

MR. WADE: I think there is one other that I know of right offhand now that I can think of and I believe that's the only other operator.

MR. IRBY: There is no other operator?

MR. WADE: Texas Company, and I think that is one that produces no water.

MR. NUTTER: Who did you say were members of the cooperative agreement?

MR. EVANS: Oil Development Company of Texas, Gulf --

MR. NUTTER: Just a minute, please.

MR. WADE: Actually, Tidewater won't show up and Sunray Midcontinental are the only other ones and I don't think you have a report of these joint interests.

MR. NUTTER: Is the Lonestar Production a member of that cooperative agreement?

MR. WADE: No, are they in the Crossroads field?

MR. NUTTER: Yes, we show them in the Crossroads. In the Bough pool, we have J. R. Sharpe.

MR. WADE: He has plugged his well.

MR. PORTER: Mr. Nutter, if Lonestar is in the Crossroads, there may be some error there.

MR. NUTTER: Possibly.

MR. WADE: I think that's true.

MR. NUTTER: And the Sharpe well is not making any water then?

MR. WADE: No sir, it is no longer producing.

MR. PORTER: Anyone else have anything to report on the Crossroads?

MR. BROWN: Mr. Brown for Sunray and Midcontinental. All of the wells that Sunray and Midcontinental operate are committed to the system.

MR. PORTER: Thank you, sir.

I believe the only other pool left of these ten is the Echol.

MR. CHRISTENSON: Christenson with Shell Oil Company. The Echol disposal system was placed in --

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

MR. CHRISTENSON: Mr. Christenson with Shell. The Echol field disposal system was placed in operation April 16, 1958. The plant is currently disposing of all water from the field, a total of 149, 211 barrels of salt water has been disposed as of September 1st. The member operators in the system are Shell Oil, Sinclair Oil and Gas and the Texas Company.

MR. PORTER: Any question on this report?

(No response).

MR. PORTER: Anyone have anything further to report in the Echol pool?

(No response).

MR. PORTER: Sorry, I missed one pool. We will take the Denton pool next.

MR. CAMMACK: Van Cammack with Atlantic Refining Company. As you know, Atlantic is the operator of the disposal system in the Denton field right now and other members of the cooperative system are Gulf, Magnolia, McAllister --

MR. NUTTER: One minute, please. That covers the Wolfcamp and the Devonian both?

MR. CAMMACK: Yes, sir.

MR. NUTTER: Thank you.

MR. CAMMACK: Ohio, Pan American, Phillips, Shell, Sinclair and Skelly. Installation of the cooperative salt water disposal system in the Denton field has been completed. Injection of salt water commenced on September 9, 1958 with Atlantic Dickenson A-13 Number One well as a disposal well. Salt water was going into the premises within the entire well at 9950 to 10,010 feet.At the present, about seven hundred barrels of water per day are being disposed of by the system and that amounts to about sixty per cent of the water produced in the Denton, Wolfcamp and Devonian combined. We are experiencing some mechanical difficulties with the skimming system and as soon as this is eliminated, we expect to dispose of a hundred per cent salt water produced by the operators participating in the cooperative salt water disposal system.

The injection well is capable of taking approximately seven thousand barrels of water per day with the wellhead equivelant to twenty-five inches of parkway. Judging from this, we believe that the well will take all of the produced water in the field as soon as we get our other difficulties worked out.

As of September 14, 1958, approximately thirty-two thousand barrels of water had been injected into the disposal zone.

That concludes my report.

MR. PORTER: Did you mention a date on which you might be taking a hundred per cent?

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MR. CAMMACK: We feel that it will certainly be within thirty days. It is just minor mechanical difficulties right now.

MR. PORTER: Anyone have a question?

MR. IRBY: Yes, sir.

MR. PORTER: Mr. Irby?

MR. IRBY: Does this thirty days take care of a hundred per cent of the produced water in the field?

MR. CAMMACK: Well, one hundred per cent of the produced water by operators who are members of this cooperative disposal system. To my knowledge, there is one operator who is not a member and the production report shows that he is not making any water. He has one Wolfcamp well.

MR. IRBY: Thank you.

MR. PORTER: Mr. Nutter?

MR. NUTTER: Did you report on Magnolia in that pool?

MR. CAMMACK: Yes sir, would you like me to read them now?

MR. NUTTER: No, I have them all except Magnolia.

MR. CAMMACK: Okay.

MR. NUTTER: Our records indicate that there is a well in the Denton Devonian pool and this may be an error, in the south Denton pool operated by Nolan and Bryron. I will check that and the Eunice-Monument.

MR. PORTER: Any other operators who want to report on the Denton area?

(No response).

MR. PORTER: Have you made a check of the operators who have reported, Mr. Nutter?

MR. NUTTER: Yes sir, the reports are complete.

MR. PORTER: Mr. Wade, we overlooked the Moore pool, too. The Moore pool is next.

MR. WADE: H. N. Wade with the Texas Company. I am reporting on the Moore-Devonian pool. I am reporting for three operators, the Texas Company, Samidam and Amarada. All of the water produced in this field is going to be assigned to this system. Therefore, when we finally get this thing going, one hundred per cent of the water in the field will be disposed of through the system. I reported at the last--in the June hearing, that we had experienced some difficulty with our pumping equipment. We altered the pumps to a certain extent and were successful in increasing our injection volume to cover one hundred per cent of the produced water and until recently, we again experienced difficulty in getting the water into the well, into our disposal well.

We have recommended and had approved by the other members of the cooperative system the installation of an additional pump. We anticipate that with this installation, we will finally have our problem solved and will again be able to resume one hundred per cent injection of all produced salt water in the pool. We hope to have this done sometimes during the month of October. The equipment is being ordered today.

MR. PORTER: You would expect to make a hundred per cent

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disposal by the end of October?

MR. WADE: Certainly by the end of October.

MR. PORTER: Anyone have anything to add concerning the Moore Devonian, any other reports?

(No response).

MR. PORTER: Thank you, Mr. Wade.

Mr. Abbott?

MR. ABBOTT: I believe I stated in answer to a question on the E-M-E salt water disposal system that we would have a hundred per cent disposal in a year. I would like to change that to eighteen months.

MR. PORTER: Eighteen months?

MR. ABBOTT: Yes, sir.

MR. PORTER: That brings us down to Step Five in our procedure here, Statements or Recommendations. I believe the State Engineer's Office has a statement to make at this time?

MR. HARRIS: If it please the Commission, the State Engineer's Office recommends that this Commission enter an order prohibiting surface disposal of oil field brines in unlined earthen pits in the ten most critical areas at the earliest possible date with administrative exceptions on applications by the operators to extend the completion date of a hundred per cent disposal or to grant exceptions to the order in cases where surface disposal would not constitute a threat to fresh water either because of the absence of fresh water in a localized area or because of the low

amount of salt water production.

MR. PORTER: Anyone else have a statement to make concerning these ten areas?

MR. JOHNSTON: Will you permit my statement at this time?

MR. PORTER: Yes, sir.

MR. JOHNSTON: Paul Johnston, Gackle Oil Company. As all of you here know, a statement of position was prepared and signed by myself. This statement was a result of the combined thinking of the several operators in the Hobbs pool.

In the interests of time before the Commission, I would request that the statement be entered for the record, and I would like to state the following in conjunction with that statement for the purpose of the contents of the statement is to make clear that we feel that there is a need for cooperative study groups in each oil and/or gas field to determine whether or not there is a need to conduct mechanical operations that would physically handle well leavings other than gas or oil. And if such need is determined, then that study group would report to the New Mexico Oil Conservation Commission as to the need and would recommend a procedure to be followed that would be equitable to all, would protect correlative rights and would be in the interests of conservation in the State of New Mexico.

We feel that such study groups should be composed of representatives of industry, the State Engineer's Office and the New Mexico Oil Conservation Commission. These study groups should

53 be appointed by the Commission.

There is one portion of the statement that I do wish to read, and I refer to SJ 135, which is a part of the written statement.

I would like to go off the record for a moment.

MR. PORTER: Off the record.

(Discussion off the record).

MR. PORTER: Back on the record, please.

MR. JOHNSTON: I am reading that portion that I referred to on Page Eight of the statement:

"Further I respectfully call your attention to the United States Senate Joint Resolution #135, a measure that was sponsored by Senator Clinton P. Anderson and was signed by the President on September 2, 1958.

In brief, this resolution establishes a saline water conversion program to demonstrate the economics and feasibility of various processes in converting large quantities of "off-color" water into potable and useful liquid.

The resolution calls for the establishment of five demonstration plants of different types for the conversion of sea water and the treatment of brackish water. One of these plants may be located in the Southwest.

It is quite possible that a plant could be located in Southeast New Mexico and we urge that the State Engineer's Office take full advantage of the possible use that such plant would afford

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the people of the State of New Mexico."

That concludes my statement.

MR. PORTER: Mr. Irby?

MR. IRBY: In response to Mr. Johnston's statement--first, on the appointment of committees for the various pools other than the ten --

MR. JOHNSTON: I didn't hear you, Mr. Irby.

MR. IRBY: Didn't you suggest that committees be appointed to study the situation in the pools other than the first ten?

MR. PORTER: I don't believe he said that a study be made.

MR. JOHNSTON: I did not state that. It would be the intention to study this pool and if the need should arise in the ten that we are talking about, then we could be working on that.

MR. IRBY: On the first ten, and you suggested that the State Engineer be a member of the committee?

MR. JOHNSTON: Yes, sir.

MR. IRBY: What position will the State Engineer occupy in this committee, just one of the working members or review or what?

MR. JOHNSTON: I would have in mind that certainly he would be one of the working members. Now, as to who would be the chairman, it would be my thought that that should be left to the Commission if they so appoint such a study group since it would be appointed by the Commission. It might be a member of the State Engineer's Office. The chairman of the group would be at the

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discretion of the appointing body.

MR. IRBY: May I look at your statement?

MR. JOHNSTON: Yes, sir.

MR. IRBY: I have no further questions or statements.

MR. PORTER: Mr. Adams did you have a statement to make at this time? Excuse me, Mr. Johnston?

MR. JOHNSTON: I made a request that the statement be entered in the record. May it be amended to refer to the ten pools now in question?

MR. PORTER: The statement to refer to the ten pools now in question?

MR. JOHNSTON: Since that is the only thing we are taking up, yes sir.

MR. PORTER: It will be so entered, Mr. Johnston. Give a copy to the reporter.

Mr. Adams?

MR. ADAMS: Yes, I believe that statement to operate is pretty well covered by Mr. Harris. We recommend that the Commission, in an order, provide for relief in individual cases. That would certainly agree with my contentions in disagreeing with the pool-wide regulations that the Commission can't consider at least separately and under its own conditions.

MR. PORTER: Mr. McPeters?

MR. McPETERS: McPeters, John M. Kelly. We are in favor of salt water disposal in areas where there are shallow surface

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fresh water sands endangered by large volumes of oil field brines. Such factors as agriculture, irrigation and mineral pockets should be considered. However, we are opposed to a blanket order of the Commission covering thousands of acres which would include some areas where salt water disposal is not necessary. We do not feel that the Commission has heard sufficient testimony to warrant one hundred per cent disposal in the fields listed in Order 1224. I will amend that to the ten pools in question.

In fact, we believe that the testimony presented today indicates there has been no contamination in large areas such as Monument which contains some 2,820 acres, Eunice, 14,840 acres and Eumont, 24,920 acres. A blanket order cannot be written without including some areas where salt water disposals are not necessary.

We feel that each lease or area should stand on its own in considering one hundred per cent water disposal.

MR. PORTER: Anyone else have a statement?

MR. KELLAHIN: J. C. Kellahin for Continental Oil Company. As previously reported, Continental Oil Company has committed to a disposal system all of the wells which it operates that are producing water or which may reasonably be anticipated to produce water.

We are in favor of an order of the Commission with a reasonable basis for requiring disposal of water and that all the companies have an obligation to take care of these problems.

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However, we strongly urge the adoption of the recommendations made by the State Engineer in regard to an administrative procedure for exceptions in hardship cases.

Certainly in an area as large as is taken into consideration in these ten pools, there are going to be numerous instances where underground disposal of water will not be necessary or where to require an unreasonable disposal system will result in premature abandonment and we do urge some system for administrative exceptions.

MR. PORTER: Anyone else have a statement to make?

Mr. Harris?

MR. HARRIS: My collegue, Mr. Irby, is a little bit worried about my recommendations and I would like to point out that I presume that in any administrative setup that the Gas and Oil Commission will surely take the proper steps to consult with the State Engineer where it is necessary and that should be included in my recommendation.

MR. PORTER: It would be your recommendation that the State Engineer's Office be consulted on all applications for administrative exceptions?

MR. HARRIS: I think that that could be worked out between the Oil and Gas Commission and the State Engineer considering their budget and time and so forth but I think that the State Engineer should be referred to by the Oil and Gas Commission wherever possible.

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MR. NUTTER: Mr. Harris, would it be a procedure similar to the one we follow now, for administrative approval of salt water disposal systems, where an operator is making an application, notifies the State Engineer and the Oil Conservation Commission processes the application if within fifteen days the State Engineer has not objected to it?

MR. HARRIS: Something could be worked out and we can determine exactly what procedure is best and it may have to be changed from time to time. I think, or I presume that the Oil and Gas Commission will use the facilities of the State Engineer's Office whenever they feel it is necessary.

MR. IRBY: Mr. Nutter, in a few rare cases, in spite of the order that is issued on the salt water disposal, we fail to receive their application for this; therefore, we have no opportunity to object within fifteen days and I would prefer something in the nature of a waiver from the State Engineer before administrative consideration is taken.

MR. COOLEY: With this waiver, this would be available to any operator to request a hearing for the exception?

MR. IRBY: Yes, sir.

MR. PORTER: Anything further concerning the procedure here on the first ten most critical areas which have been under discussion?

MR. JOHNSTON: I would like to point out that this statement was prepared, printed, prior to the time that we were aware

of the procedure to be followed; therefore, I request that it be confined to the ten pools in question.

MR. PORTER: We will proceed now to the second phase of our hearing and at this time hear testimony concerning any or all of the thirteen areas listed in the second phase.

MR. BUELL: For Pan American Petroleum Corporation, we have additional testimony under this phase of the hearing.

MR. PORTER: You have additional testimony on this phase. Anyone else have testimony on the thirteen areas mentioned here?

(No response).

MR. PORTER: You may proceed, Mr. Buell.

(Short recess).

MR. PORTER: The meeting will come to order, please.

I would like to announce at this time that Mr. Irby has a few copies of the publication on the calculated evaporation of saline water from sealed pits in the vicinity of Hobbs, which he said he would be glad to supply as long as the supply lasts. You may secure those from Mr. Irby.

Mr. Buell?

DAN CURRENS

a witness, having previously testified, further testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Mr. Currens, earlier in your testimony you said that

from a geological standpoint and from an accumulation standpoint, fresh subsurface waters in Lea County are divided up between two areas?

A Yes sir, generally.

Q And in phase one of your testimony, we covered the area that is defined as the limits of the Lea County ground water basin?

A Yes, sir.

Q Would you define this other area?

A Well, it more or less lies south of that area we previously discussed, in the southern part of Lea County.

Q In this area that you just described, did your study reveal that there was any major source of shallow fresh subsurface water?

A No, the major source was rather spotty, rather limited shallow, fresh waters.

Q Did you attempt to locate and evaluate each and every one of these rather shallow fresh water zones in southern Lea County?

A No sir, I certainly didn't. I made a rather large scope study here and I just didn't have time to make those individual evaluations.

Q In your opinion, would the only way that they could be accurately evaluated be on a highly localized study basis?

A Yes sir, I think you would need to limit yourself in

areal extent a great deal and make a very localized study.

Q Did you find that even an independent agency conducting a regional study more or less ignored these erradic, spotty zones we are discussing and didn't include them with the scope of your study?

A Yes sir, that's generally been the case.

Q Directing your attention now to what has been marked as Exhibit Eighteen, what is Exhibit Eighteen?

A Exhibit Eighteen is a map of the United States that was taken from a United States geological survey circular, Circular Number 114. That paper was titled, "The Water Situation in the United States," with special reference to ground water, written by C. L. McGuinness, and it was dated June, 1951.

This circular was adapted for a report prepared for the President's Water Resources Policy Commission.

Q All right, sir. Directing your attention to the Lea County portion of this United States map, what does it reflect with respect to shallow fresh subsurface waters?

A Generally, it shows a portion in the central part of Lea County that seems to be unlying by significant fresh water outlets.

Q What portion of Lea County would that be, more particularly?

A Generally, it falls within the confines of the defined Lea County ground water basin.

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Q Does it reflect in any way on this map the erradic, shallow sands that we encounter south of the basin area?

A No sir, it doesn't.

Q All right. Mr. Currens, since there is no major source of fresh water from shallow sands, what, in your opinion, is the major source of fresh water in southern Lea County?

A Generally, this water is found at depths much greater than we presently are discussing here, water that is found embedded in massive shale, which commonly is known as Santa Rosa water and in sand beds that seem to be rather limited in extent and buried pretty deeply.

Q I wonder, Mr. Currens, if in the interests of simplicity, we can simply refer to those massive shales as red bed shale?

A Well, recognizing the fact that this is the massive shale we are talking about here, certainly there are other things above that are commonly called red beds, but it would be a lot simpler to talk about it that way.

Q When you use the term Santa Rosa water, you don't mean to imply that it is from the Santa Rosa formation?

A That's just a sort of general, common useage for that name, for that water. It may or may not be in certain specific instances.

Q All right, sir. With respect to Santa Rosa water, in your opinion, in the southern area of Lea County, will the disposing of brines in subsurface pits have the opportunity to contaminate

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Santa Rosa water?

A No sir, I don't believe they would.

Q What would prevent that, Mr. Currens?

A Well, as I said, this water that we are referring to as the Santa Rosa is buried within the red beds. The shale on top of it is of a very impermiable nature, it is protected by nature itself. It is closed from any effect that the surface disposal might have.

Q All right, sir. Let me direct your attention now to what has been marked as Pan American Exhibit Nineteen. What is that exhibit?

A Exhibit Nineteen is a structure map for the top of the red beds generally extending from, oh, about the southern boundary of Township 19 on south to the Texas border.

Q For the purposes of orientation, would the other exhibit here, have you shown the southern boundary on the Lea County ground water basin by that red line?

A That red line here on this map, yes sir.

Q How many logs did you examine, Mr. Currens, in preparing this exhibit?

A Well, I did the bulk of this work myself. I didn't do quite all of the identifying in here, but we looked at something over fifteen hundred radio-active --

Q Did you look at sample logs?

A Yes, we correlated those with a number of sample logs,

the sample logs we had available.

Q In fact, in your study, Mr. Currens, why did you prepare this map?

A I wanted it for my own information. I wanted to see where this water in the southern part of Lea County might exist, find out where that water might be protected by nature and it might not really be necessary for us to do anything for it ourselves.

Q Did this reveal to you that this massive shale was a continuous and effective barrier between the Santa Rosa water and the surface?

A I think this structure map reflects that, yes sir.

Q In this southern area, Mr. Currens, about how many analyses of fresh water samples have you reviewed?

A Oh, probably four or more.

Q I want to direct your attention now back to Exhibit One and One-A and a part that we overlooked in phase one of your testimony. What is the significance of the red dots on that map?

A The red dots on Exhibit One and One-A show where we had data available from the analysis of a water sample from the fresh water well.

There is some information shown on those dots, two figures. The upper one reflects the year in which the sample was taken, the lower one represents the chloride content of that particular sample.

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Q Would you mark the Lovington Tickell diagram?

A Lovington or West Lovington?

Q Whichever one you want.

A We are going to talk about West Lovington.

MR. BUELL: May it please the Commission, we have two Tickell diagrams to offer, one is of Lovington and one is of West Lovington. Actually, that is up in the basin, but under your instructions, we held them until now to place them here in evidence.

MR. PORTER: You identified it as Exhibit Nineteen?

A The map already was Nineteen. That's Number Twenty, sir, and the tabulation will be Twenty-A.

Q (By Mr. Buell) I direct your attention now, Mr. Currens, to what has been marked as Exhibit Twenty and Twenty-A and Exhibit Twenty-one and Twenty-one-A and ask you what they are?

A Well, we haven't had an opportunity to pass out Number Twenty-one yet, sir. Exhibit Twenty is a series of diagrams, Tickell diagrams, constructed from a water sample analysis that we had from a domestic well and that was in the West Lovington field and ranged from 1950 to 1958. Those are shown on the upper portion of the diagram, of the exhibit.

In the lower portion, we see a Tickell diagram of the West Lovington field water from our lease in that field and that's on the lower left, or lower right. We again show a structure of five per cent of the West Lovington field water and ninety-five per cent, which is what the earliest fresh water sample would look

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like.

Q In the interests of saving time, Mr. Currens, let me ask you, do either of these exhibits indicate any contamination?

A No sir, I don't see anything that would indicate to me that this fresh water had been contaminated by surface disposal of produced oil field brines on Exhibit Twenty.

On Exhibit Twenty-one, I could make the same statement for the diagram that we have in the Lovington area.

MR. BUELL: I fell in the trap I thought I would. We rearranged some of our exhibits and all that we have presented in this phase are erroneously numbered. The first exhibit, the map of the United States, should have been Exhibit Seventeen, the red bed structure should have been Eighteen and these last two Tickell diagrams should be Nineteen.

A Couldn't we just leave those alone and have a gap?

MR. BUELL: I want them re-numbered.

A All right.

MR. BUELL: I apologize for taking up this time, but I knew I was going to get into it.

A Is this Seventeen or Sixteen?

Q (By Mr. Buell) That will be Sixteen.

A The map that we previously referred to as Exhibit Eighteen should be Exhibit Sixteen, the map that was previously referred to as Exhibit Nineteen should be Eighteen.

Q Wait, I will go through it once more. The map of the

United States should have been Exhibit Sixteen.

A Right.

Q The structure map on the red beds should have been Seventeen.

A I didn't --

Q Eighteen, and Nineteen will be the Tickell diagrams. I might have caused more confusion by trying to straighten it up.

A Eighteen is the West Lovington and Nineteen is the Lovington.

Q All right, sir. Now, I direct your attention to what has been marked as Pan American Exhibits Twenty and Twenty-A, Twenty-three and Twenty-three-A, Twenty-four and--Twenty and Twenty-A, Twenty-one and Twenty-one-A, Twenty-two and Twenty-two-A, Twenty-three and Twenty-three-A, and Twenty-four and Twenty-four-A --

A That's Twenty--that's Twenty-one.

Q Mr. Currens, for the record, will you briefly locate the well from which the information was obtained in preparing each one of these five exhibits we just referred to?

A All right, sir. On Exhibit Twenty, the well was located in Section 7, Township 26 South, Range 37 East. In Exhibit Twenty-one--of course, there is an "A" with each of these, too--the well is located in Section 15, Township 25 South, Range 37 East. In Exhibit Twenty-two, the wells are located in Section 19, Township 25 South, Range 37 East. In Exhibit Twenty-three, the wells are located in Section 33, Township 21 South, Range 37

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East. In Exhibit Twenty-four, the wells are located in Section 24, Township 21 South, Range 34 East.

Q All right, sir. What information, generally, is on each one of these five exhibits, Mr. Currens?

A Generally, it is a comparison shown in the Tickell diagram which was constructed from the data obtained from the water analyses on one or more wells that were in very--either one well or possibly two wells--that were in very close proximity to each other. The difference is shown on each one. Generally, it just gives a picture of the water for that period of time.

Q Three of these exhibits cover what we have been referring to as the Santa Rosa water, do they not?

A Yes, sir.

Q Why did you prepare the Tickell diagrams of the analysis from a well producing Santa Rosa water when you testified that it was sealed from the surface?

A Well sir, I was curious as to what the water looked like. The picture we get there from the analysis gives you a different quality of water and it further points up that all water, even though it is fully protected by an impermiable barrier, does have minor changes over a period of time and in the picture you get they might appear insignificant, but there are minor variations in analysis.

Q In other words, Santa Rosa water, if sealed from salt water, also is sealed from any recharge due to rain?

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A Yes, sir.

Q And yet, even though it is a completely closed and sealed reservoir, such as this isolated Santa Rosa, the constituent elements of the water still change through a period of time?

A Yes, sir.

Q Do two of those exhibits cover samples from a well completed in a shallow sand pit?

A Yes sir, the last two. These were both shallow wells.

Q So that is an example of these isolated, erradic lenses that you have spoken of in the southern area?

A Yes sir, in these particular instances, the shallow sand is not a large, wide-spread shallow water supply.

Q Do either of these exhibits reflect any data which would indicate to you that contamination had occurred due to the disposal of salt water in the surface pits?

A No sir, neither of these would reflect contamination from that source.

Q Now, Exhibit Twenty-three covers the City of Eunice municipal supply well, does it not?

A Actually, these two separate wells were not in there, in the half of the section that was shown here, they were in the City of Eunice system.

Q Is there an indication of erradic, spotty shallow sand there? Didn't the City of Eunice need to supplement their supply and to drill more wells and to go about ten or eleven miles north

70 in order to find additional water?

A It is my understanding that they did go about ten or more miles north of the City of Eunice to find additional water for their needs.

Q What did they run into from the standpoint of quantity?

A Apparently it wasn't too good up in that northern portion. It is my understanding that--I wasn't sure I was looking at the right notes--in that northern portion, it is my understanding that actually their yield was about a thousand gallons per day and that declined to somewhere on the order of three hundred gallons so the water was not too good in that area.

Q Would that indicate to you, Mr. Currens, that they probably completed those wells in sand of limited water?

A It would surely appear that way if their water supply was being depleted.

Q In this southern area, we have erradic shallow fresh water sand. Did you find any evidence that would indicate any contamination that had occurred in the shallow sand?

A No, sir.

Q That source of supply in that area is Santa Rosa?

A Yes sir, I believe so.

Q Which in your opinion is sealed effectively from the surface by an impermiable barrier?

A That's my opinion, yes sir.

Q Is it your opinion, based on the experience gained

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in your study, Mr. Currens, that in this area particularly, a highly intensified localized study is necessary to properly evaluate the spotty, shallow sand?

A Yes sir, I certainly believe that.

MR. BUELL: May it please the Commission, that terminates our testimony. I would like to make one observation, if I may. I don't remember the procedure that you set up, but it seems to me that we have reached the stage of development in handling this problem where it would probably be more expeditious, more effective and more efficient if a final order were entered terminating Case 1053, and within that final order, set up the mechanics for either the Commission on its own motion or at the request of the State Engineer, for that highly localized area, appoint a committee composed of operators, the State Engineer, as well as a representative of the Commission, and let them make a study, first, to ascertain whether or not there is any shallow fresh water present and secondly, whether or not it is practical and feasible to protect it and I believe if we can do that, we will eliminate a lot of hearings if the matter is handled by committees and it will obviate the necessity of a hearing before the Commission.

I would certainly like to make that recommendation at this time.

MR. IRBY: Mr. Porter --

MR. PORTER: Mr. Irby?

MR. JOHNSTON: Obviously, the statement that was made

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previously concerning the other ten pools would have a more immediate application to the remaining pools within the county. It is our opinion, or our recommendation, that the Commission go along with the recommendation made by Counsel for Pan American.

MR. HARRIS: Mr. Porter, I notice next on the agenda is testimony from the State Engineer regarding the same thirteen areas. I will notify the State Engineer that we would be willing to have a committee appointed. We would recommend that the final order be entered on the first ten areas and that a committee be appointed on the thirteen second most critical areas, and therefore I move that the final order be entered prohibiting surface disposal of oil field brines in unlying sealed earthen pits in the ten most critical areas at the earliest possible date with administrative exceptions under proper safeguards, as we earlier recommended, and further, the remaining areas be referred to a committee made up of the State Engineer, Oil and Gas Commission and industry and that they report back and hold such further hearings as may be necessary.

MR. COUCH: I would like to request the attorney for the State Engineer to consider the possibility of amending the motion to the effect that the recommended order would terminate this case entirely with the provision in that order that a committee could be set up by the Commission for each of the thirteen fields or any other area that became critical and that each committee could work on that particular localized area.

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Can you accept such an amendment to your motion?

MR. HARRIS: I will accept that amendment.

MR. PORTER: Anyone else have anything concerning the motion which is before the house?

MR. WADE: H. N. Wade, Texas Company. We would like to concur with the motion that has been made that there will be a final order written on this case as such, and the thirteen pools, if the Commission finds necessary, will be referred to committees.

MR. PORTER: Any other discussion or statements?

MR. BUSHNELL: H. D. Bushnell, Amerada. Amerada is one of the major operators in New Mexico and has had a great desirability to see the subsurface disposal of waters especially in those fields where there is an underlying area of relatively unprotected fresh water sources.

As determined by hydrographic studies, Amerada has made great effort, spent much time and money in carrying out such a program or policy. We do not believe, however, that this same procedure should be necessarily placed on the operators in those areas where it is not known, or there is no evidence that there are unprotected waters. I am referring to these thirteen defined areas and I also would like to mention a portion of the Eunice-Monument field in that respect. It is our belief that there may not be any disposal problem.

We also urge the Commission to recognize that in these areas, there are numerous wells making a small percentage of water

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and if the operator is required to go to much cost or expense there in a method of disposing of these small, insignificant amounts, or in obtaining the evidence to establish proof--whatever method or procedure that may be--to establish proof that there is no contamination where there has been no evidence presented that these particular areas are underlain by unprotected waters, it has to be recognized that wells have to be shut in because of the economics involved.

We would like to state for the record that as for these thirteen pools, and I would like to mention again specifically the Eunice-Monument pool, that we support Mr. Buell's recommendation made on behalf of Pan American.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: Continental Oil Company feels that the evidence which has been presented by Pan American clearly shows the necessity for a controlled study of the situation, particularly in the southern part of Lea County, and we are going with the recommendation which has been made by Counsel for Pan American.

MR. PORTER: Any further discussion of the motion?

Mr. Buell?

MR. BUELL: I formally offer Exhibits Sixteen through Twenty-four inclusive.

MR. PORTER: Including the A's?

MR. BUELL: Including the A's.

MR. PORTER: Without objection, they will be admitted.

MR. COOLEY: Mr. Harris, Mr. Couch, it has been the policy of the Commission, recent policy of the Commission, I might add, that on a committee such as this, the Commissions feels that it couldn't sit in judgment over that trust, that we would prefer not to have the Commission represented on these committees.

I now ask you if you would have any objection to amending the motion to omit the inclusion of a New Mexico Oil Conservation Commission staff member on it?

MR. COUCH: It is perfectly agreeable to me, Mr. Cooley.

MR. HARRIS: We have no objection as long as the committee consults with staff members of the Oil and Gas Commission.

MR. COOLEY: That's our understanding then.

MR. PORTER: The Commission will take this case under advisement and will enter an appropriate order concerning the ten areas and will grant that portion of the motion which has to do with the appointment of committees concerning areas other than the ten.

The witness may be excused.

(Witness excused).

MR. PORTER: The hearing will recess until nine o'clock tomorrow morning.

MORNING SESSION
September 18, 1958

MR. PORTER: The meeting will come to order, please. Mr. Paul Johnston with Gackle Oil Company asked that he be recognized at this time.

MR. JOHNSTON: At the conclusion of Case No. 1053, there was one statement left unsaid, and I would like to present it to the Commission and for the record at this time.

On behalf of the industry, I want to thank the Commission for their kind indulgence and consideration shown in the matter of Case No. 1053. I also want to thank and commend Pan American Petroleum Corporation for the most excellent presentation of factual data in Case No. 1053. They have performed a very valuable service to us all in making such a comprehensive study of the fresh water situation in Lea County. Further, I want to express to the State Engineer's Office, and particularly to Mr. Frank Irby, our deep appreciation of his willingness to cooperate with us, and the understanding he has shown in relationship to his duties in this matter and the tremendous task that confronts us.

Thank you.

MR. PORTER: Thank you, Mr. Johnston.

EUNICE - MONUMENT - EUMONT

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Amerada Petroleum Corporation, Drawer D., Monument, N. M.
Anderson-Prichard Oil Corp., Box 1859, Midland, Texas
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Continental Oil Company, Box 427, Hobbs, N. M.
General Crude Oil Co., Route 2, Hamlin, Texas
Getty Oil Company, Box 547, Hobbs, New Mexico
Gulf Oil Corporation, Box 2167, Hobbs, N. M.
Hudson & Hudson, Inc., 1810 Electric Bldg., Fort Worth, Texas
Humble Oil & Refining Co., Box 2347, Hobbs, N. M.
Hunt, Stuart, Trustee, 1507 Mercantile Nat'l. Bank Bldg., Dallas, Texas
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Shell Oil Company, Box 845, Roswell, N. M.
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Skelly Oil Company, Box 38, Hobbs, N. M.
Standard Oil Company of Texas, Box 397, Hobbs, N. M.
Sun Oil Company, Box 2792, Odessa, Texas
Sunray Mid-Continent Oil Co., 1101 Wilco Bldg., Midland, Texas
Superior Oil Company, The, Box 510, Midland, Texas
Texas Company, The, Box 1270, Midland, Texas
Tidewater Oil Company, Box 547, Hobbs, New Mexico
Byrom, W. K., 1000 N. Dal Paso, Hobbs, N. M.)Approved by
Southern Petroleum Exploration, Inc.)Committee to join system

HOBBS POOL

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Magnolia Petroleum Co., Box 2406, Hobbs, N. M.
Ohio Oil Company, The. Box 2107, Hobbs, N. M.
Pan American Pet. Corp. Box 899, Roswell, N. M.
Amerada Oil Corp., Box 2137, Hobbs, N. M.
Shell Oil Company, Box 845, Roswell, N. M.
Sinclair Oil & Gas Co., 520 E. Broadway, Hobbs, N. M.
Skelly Oil Company, Box 38, Hobbs, N. M.
Southern Petroleum Exp., Inc., Box 176, Eunice, N. M.
Standard Oil Company of Texas, Box 397, Hobbs, N. M.
Sun Oil Company, Box 1861, Midland, Texas
Sunray Mid-Continent Oil Co., 1101 Wilco Bldg., Midland, Texas
C. H. Sweet, Box 1115, Hobbs, N. M.
The Texas Company, Box 458, Hobbs, N. M.
Tidewater Oil Co., Box 547, Hobbs, N. M.

Report by Mr. Paul S. Johnston

Gentlemen:

I am appearing before you to make a statement of position and resolutions in the matter of New Mexico Oil Conservation Commission Order #R-1224.

We recognize that it is the duty of the New Mexico Oil Conservation Commission to cooperate with the State Engineer Office in matters of joint interest and we are mindful that a very serious problem of obtaining and protecting fresh water confronts us all.

Combining all factors, domestic water requirements for the United States by 1980 are estimated at 880,952,380 obls. per day. This compares with 268,571,427 bbls. per day for 1955, an increase of approximately 327%.

Fresh water demand by 1980 for industrial use is expected to be about 400% of the 1955 demand.

It is highly improbable that the average precipitation over North America will be increased in any significant way in time to relieve the impending shortage. Certainly in much of New Mexico even with an increase in precipitation there is no way to greatly supplement our growing need for water since in most arid area the moisture would be taken up by the dry surface sands only to eventually evaporate. Thus we must live within our water income. How?

There are the obvious courses: reduce consumption, end waste, develop more fully the use of available supply, or provide means to convert to beneficial uses vast and virtually untapped supplies of sea and brackish water, and in our case in the main, conversion of, off color underground water since the vast majority of our state is arid land.

There is little doubt that in the future, in New Mexico, private enterprises will turn in some areas to drilling exclusively for water sources for market.

These startling facts although they deal with the future do have a very direct bearing on the present Commission Order #R-1224 which is before us today.

In particular we refer to paragraph (2) of the findings which states:

> "That it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico.

Also we refer to paragraph (2) of the order which states:

> "That all operators in the above-named areas shall report to the Commission at the Regular Hearing on September 17, 1958, on the progress made thus far and the estimated completion date of a 100 percent disposal system. Operators who are

members of a cooperative group may report through the committee chairman, who shall be prepared to name all operators who are members of such group. All operators who are not members of a cooperative group shall furnish a written progress report to the Commission prior to September 10, 1958, or shall appear at the Regular Hearing on September 17, 1958, to report the progress made thus far and the estimated completion date of a 100-percent disposal system for each well which they operate in the above-named areas."

At the outset let me assure you that we will not permit fresh water to become contaminated from any source as a result of our own actions.

We do feel however that certain considerations should be made in determining just exactly what must be done in disposing of waters that are produced coincidentally with oil and gas.

I wish to point out the economics of many operations could not afford the expense of returning produced waters below the surface. All operators have geared their operations to meet the presently known requirements. To force a premature cessation of operations without first determining that actual damage will or has occurred to fresh water sands, if they are in place, from the disposal of produced fluids into surface pits, would not protect correlative rights and would constitute a gross negligence and waste of a valuable resource.

We do not have any quarrel whatsoever with the duties or perogatives of the State Engineer, as outlined in the booklet entitled "Functions and Activities of the State Engineer Office" by C. B. Thompson, Chief, Technical Division and F. E. Irby, Chief, Water Rights Division,and dated Santa Fe, New Mexico, November, 1957.

Reference is made to #s 5 & 6 of the purpose of the agency, i.e.,

#5 To Conduct hydrographic surveys.
#6 To coordinate the work of various Federal Agencies as regards water resource programs.

It is in these two provisions that we request help from the State Engineer Office and the New Mexico Oil Conservation Commission.

Referring to #5 of the purpose of the agency, I wish to point out that the only testimony on record in this case concerning the need for fresh water protection and disposal of produced waters in Lea County has been only a comparison of "They do it someplace else and Lea County is like someplace else".

How about getting specific and actually making a study of Lea County and the problem in Lea County. At least then we would have something with a New Mexico name tag on it in the record. To intelligently solve the problem it will be necessary to get down to at least section lines.

We feel that in order to better understand the problem of water polution and how we can effectively protect fresh water from our

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own acts we must know more about the exact locations of the water sands; that is to aerial extent as well as vertical limits, also the source of supply for these fresh water beds and the movement of the water within the confines of the beds.

In line with this thinking we respectfully request the New Mexico Oil Conservation Commission help the oil and gas operators within the state to secure, with the aid of the State Engineer Office as complete information as is possible from a comprehensive hydrographic survey of all areas where oil and/or gas and other well effulents are produced. We fully realize that this would be a project of considerable magnitude and would require complete cooperation on the part of the oil and gas operators. And also it would be incumbent upon the operators to take whatever steps that would be necessary to discharge their part of the resulting responsibilities.

Such a study should not be confined however to only those areas where we are now producing. We are constantly searching for new areas of oil and gas production so that we may continue, as in the past and present, to add to the growing economic resources of the state.

Also in line with such hydrographic surveys and studies should be extended to include the practical as well as theoretical possibilities of contaminating fresh water sands from well effulents, however they

may be disposed of. These studies should be pertinent only to those water bearing sands that are of sufficient magnitude that tney would bear a reasonable economic and useful value to the people of the state.

Further this study should include the actual physical and chemical composition of waters that are produced coincidentally with oil and gas, and a determination should be made as to the feasibility of utilizing these waters for economic and useful purposes. All produced water from oil and gas wells do not carry high concentration of salt. Further the lifting cost of getting the water to the surface where it is available to do with as may be decided upon is already behind us.

With particular reference to that portions of paragraph (2) of the order that states "100-percent disposal system for each well." I respectfully point back to a statement made by the State Engineer at the May 16, 1956 hearing of case #1053 in which he stated in answer to the following question: "Is it your recommendation that water be disposed of by injection wells, or just the wells producing the excessive amounts of salt water?" "I would like to answer that a little fully. I think some further investigation is warranted, investigation toward this end. That is, to determine where the brine disposal pits might not overlie fresh water and therefore might not endanger fresh water."

Agreeing with the above quote I submit that the provision of paragraph (2) of order #1224 should not apply to all wells.

We submit that without such a study as I have discussedno one would have sufficient information upon which to base an order which would regulate the protection of fresh water and the disposal of waters that are produced from oil and/or gas wells.

In line with protecting fresh water I want to point out that it has long been the practice of oil and gas operators to run casing in wells to among other things protect known fresh water supplies. In line with this policy on the part of the operators we strongly urge the adoption of Rules and Regulations Governing the Drilling and Completion, and Abandonment of water wells within the state that would effectively protect the water sands. Such regulations quite conceivaoly would include the following:

1. Casing would be set at a depth to at least the top of the water sand.
2. Such casing would be cemented with sufficient volume of cement to protect the fresh water sand from contamination from any source. In most instances this would mean circulating cement.

In thinking of brines there is one very important concept that I feel needs some clarification. In particular I refer to a statement made at the May 16, 1956 hearing. In answer to a question "Is

it your opinion that salt is filtered out or removed in any way in this path which it takes from the pits to the aquifer?" The witness representing the State Engineer office answered in part "No, it is impossible to remove the sodium chloride and almost any other constituent in the orines in any way.

In reply to this statement let me say it's no secret that several methods including use of nuclear power for separating salt from water are actively under experimentation.

The approaches are numerous - vapor compression; flash evaporation, freezing salt water; using solar energy; using solvents and chemical precipitation; and electro-filtration among others.

The Flour Corp., of Whittier, Calif., is studying the combination of a nuclear reactor with distillation of saline water, under a contract from the office of Saline Water.

One of the more unusual processes under research is termed "electrodialysis." Unlike distillation, which removes water from salt, electrodialysis removes salt from water.

Another possibility is the use of chemicals to separate the salt from water. Texas A. & M. College is engaged in such a project, using hexadecanol. This chemical apparently comcines with the purer part of the water, and the salty orine separates to another level.

Further I respectifully call your attention to the United States Senate Joint Resolution #135 a measure that was sponsored by Senator Clinton P. Anderson and was signed by the President on September 2, 1958.

In orief this resolution estaolishes a saline water conversion program to demonstrate the economics and feasiolility of various processes in converting large quantities of "off-color" water into potable and useful liquid.

The resolution calls for the establishment of five demonstration plants of different types for the conversion of sea water and the treatment of orackish water. One of these plants may be located in the Southwest.

It is quite possible that a plant could oe located in S. E. New Mexico and we urge that the State Engineer Office take full advantage of the posible use that such a plant would afford the people of the State of New Mexico.

We submit that there is need for specific studies and time in which to solve this very important problem. Also the problem is not the same in all parts of the state. Further that there are some areas that could not oe contaminated because there simply are no fresh water sands in place.

We men of the petroleum industry may have oil in our blood, out we

can no more survive without fresh water to drink than the men with manure on his boots or the soil under his fingernails. We are most anxious that a just and satisfactory conclusion be reached in order that the best interest of the state may be served.

GACKLE OIL COMPANY

Paul S. Johnston
Superintendent of Production

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

WE, J. A. TRUJILLO and JERRY MARTINEZ, Notaries Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings, pages numbered 1 through 152, were reported by us in Stenotype at the time and place aforesaid; that the same was reduced to typewritten transcript by us and contains a true and correct record of said proceedings, to the best of our knowledge, skill and ability.

WE FURTHER CERTIFY that we are not employed by or related to any attorney or party of interest in this matter; and, further, that we have no financial interest in the outcome thereof.

DATED this 4th day of October, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

J. A. Trujillo
Notary Public

My Commission Expires:
October 5, 1960

Jerry A. Martinez
Notary Public

My Commission Expires:
January 24, 1962

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
Phone CHapel 3-6691

BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

May 16, 1956

IN THE MATTER OF:

CASE NO. 1053

TRANSCRIPT OF PROCEEDINGS

DEARNLEY-MEIER AND ASSOCIATES
COURT REPORTERS
605 SIMMS BUILDING
TELEPHONE 3-6691
ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
May 16, 1956

IN THE MATTER OF:

CASE NO. 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

BEFORE:

Honorable John F. Simms, Jr.,
Mr. E. S. (Johnny) Walker,
Mr. A. L. Porter, Jr.

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: The next case on the Docket will be Case No. 1053.

MR. GURLEY: Case No. 1053, the application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico.

GOVERNOR SIMMS: I think a lot of you have not met our State Engineer. I don't know whether he plans to testify. I would like Steve Reynolds to stand up, and his Deputy, Mr. Frank Irby. They would be available for questions whether they are on the stand or off.

MR. GURLEY: I would like to call one witness, Mr. Spiegel of the State Engineer's Office.

(Witness sworn.)

ZANE SPIEGEL

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

DIRECT EXAMINATION

BY MR. GURLEY:

Q Will you state your name, please?

A Zane Spiegel.

Q What is your position?

A I am Geologist with the State Engineer's Office.

Q Have you testified before this Commission before, Mr. Spiegel?

A Yes, sir, I have.

MR. GURLEY: Will the Commission accept the witness' qualifications?

MR. PORTER: Yes.

Q Mr. Spiegel, in your capacity in the State Engineer's Office have you had opportunity to study the problem involved in Case No. 1053?

A Yes, I have. I have studied it for, oh, lately about two or three weeks.

Q Are you prepared to answer questions regarding this problem?

A Yes.

Q Mr. Spiegel, I would like to ask first how much salt water is produced from oil wells in Lea County, New Mexico?

A We have prepared some tabulations of total production of water in Lea County, by pools. The total is forty million four hundred ninety-seven thousand and thirty-one barrels in 1955.

The total production accumulative to the first of January, 1956,

677,627,135 barrels, salt water.

Q Do you have those figures as an exhibit to enter here?

A Yes, I have a table of six pages, one hundred forty-two pools in Lea County.

MR. GURLEY: Would you mark that as Exhibit No. 2?

(Marked Oil Conservation Commission Exhibit No. 2.)

Q What is the probable future trend of salt water production in Lea County, in your opinion?

A In my opinion, the water production in Lea County will continue to increase as it has over a period of years. I have a few graphs which show the increase in some pools, and a general stable trend in other pools.

I have selected Cooper-Jal, Hobbs, Arrowhead, Saunders, Monument Blinebry, Drinkard, and Lovington pools at random from the many that are reproduced every year by the Oil and Gas Engineering Committee. I would like to show these graphs.

The Lovington Pool, the red is the water production. The Drinkard Pool, again the red is water production. The Monument Blinebry --

MR. DEWEY: Are the scales comparable between oil and water?

A The scales on some of these are comparable, on others they are not. They are marked on the exhibits, I am afraid you can't see them.

MR. DEWEY: What are the other lines on the exhibits?

A Oh, this one, this line here is oil production. This is the water production. They are on the same scale on this exhibit.

MR. DEWEY: What are the lines --

A Gas-oil ratio. I am not concerned with those. This is the Saunders Pool. Here again the scale for oil and water are the same. This line here is the oil, this is the water.

Arrowhead Pool, there are three changes of scale on the water because of the large production of water, so this little bit over here is really way up here some place. The scales here for oil and water are different, however. The oil line is this one here, now declining.

The Hobbs Pool, water and oil is this one, that comes down and has leveled off.

The Cooper-Jal Pool, now in the Jalmat, oil is this one, water is this one, on two different scales as shown here.

Q Do you wish to introduce those as exhibits, Mr. Spiegel?

A Yes, I do.

MR. GURLEY: I would like to have those marked Exhibits Nos. 3 through 9.

A Could we mark them 3A,-B,-C,-D, et cetera, to 3H?

Q How do you propose to do that?

A Could we mark them 3A,-B,-C, --

MR. GURLEY: I suppose there is no objection?

MR. PORTER: No objection.

(Marked Oil Conservation Commission Exhibits Nos. 3A through 3H inclusive.)

A In my opinion the water production will continue to increase as long as oil production increases, and will probably increase even if the oil production doesn't increase.

Q Is that all the exhibits you have to introduce in connection with that?

A I think I can introduce one more. It is a statement extracted from "Physical Principles of Oil Production" by Muskat, published in 1949. It is a standard textbook in petroleum engineering.

He states, and I will read the first two sentences; "There are commercially productive oil fields that are effectively sealed, throughout their producing life, from contact or interaction with water-bearing strata. However, the majority thus far discovered are bounded by and in fluid intercommunication with water-bearing reservoirs."

MR. GURLEY: I would like to have that marked as Exhibit No. 4.

(Marked Oil Conservation Commission Exhibit No. 4.)

A That is all I have.

Q You testified at the last meeting and introduced an exhibit marked as Exhibit No. 1 in this case?

A Yes, I did.

Q What is the concentration of salt water produced in Lea County?

A The average chloride content of two hundred fifty-two reported, values reported by the operators in the past two weeks in response to a form that was sent out to them, is 33,500 parts per million of chloride. The actual range of the two hundred fifty-two values reported was from 2,000 parts per million of chloride to about two hundred million thousand parts per million chloride.

Exhibit No. 1 of last month's hearing, I made a statement that I would like to correct at this time. That statement was that the chloride content of one hundred nine samples taken from resistivety values was computed as from 4,500 to more than 300,000 parts per

million. That statement should have read that the total solids computed as chloride, sodium chloride, ranged from 4,500 to 300,000 parts per million. I have no exhibits.

Q How is brine presently disposed of in Lea County?

A Brine produced from oil wells in Lea County is almost universally disposed of by discharging it into open lined pits which have been bulldozed out of the natural surface ground. This water then leaks downward from the bottoms of the pits through unsaturated materials, sand and gravel principally in most of Lea County, and enters fresh water strata which are shallow depths of a few feet to two or three hundred feet. It moves through these shallow water bodies in a way which I will describe later.

The only known exceptions to the open pit method after discharge in Lea County, are two injection wells. One by Amerada and one by Gulf. The Amerada is in the South-Knowles-Devonian, the Gulf is in the Brunson Pool. These wells both dispose of the salt water into deep brine water bearing rocks, which I will call aquifers in later discussion. An aquifer being any formation which contains water that will move toward a well or away from a well.

Q How much water evaporates from brine disposal pits in Lea County, to your knowledge?

A Some simple calculations show that in most pools it is physically impossible to evaporate a significant portion of the total salt water disposed through the open pits, at least in the size currently used in Lea County.

If the water in these pits which are used does evaporate to significant extent, one would expect that the concentration of the water in the pit would be very large compared to the water which is

placed into the pit, and in fact to accomplish disposal of the salt in the water, the water would have to be at concentration which is about 350,000 parts per million or more most of the time, at least throughout the entire summer or warm season.

I have a table here which shows seven comparisons between water discharge into pit and the water actually in the pit. The comparison was made by taking samples of the two waters, and determining the conductivity which is an index to the total solids. I would like to submit this as an exhibit.

MR. GURLEY: I would like to have that marked as Exhibit No. 5.

(Marked Oil Conservation Commission Exhibit No. 5.)

A It shows there is no appreciable increase in the total solids or conductivity of the water in the pit as compared with the water that is discharged into the pit. A further tabulation of water which is actually disposed into the pits as compared to the first table, Exhibit No. 2 which I prepared, which was water produced by pools, has been prepared. This shows how much water is actually put into a pit in the Bagley-Pennsylvanian, Bagley-Silurian-Dev., Caprock, Denton, Denton-Wolfcamp. Eunice, Hobbs and Saunders Pools.

There are a number of selected pits taken to cover the range of very large quantities of water placed in the pits, and very small quantities of water. I would like to submit that as an exhibit.

MR. GURLEY: I would like to have it marked as Exhibit No. 6.

(Marked Oil Conservation Commission Exhibit No. 6.)

A I have taken the same pools and from the reports submitted by the operators, have computed the area of the pits in each case on Exhibit No. 6; and entered these opposite the name of the pit,

the name and location of the pit on Exhibit No. 7. I have also entered on this table the total amount of brine that was discharged into that pit in 1954. I have computed, or have had computed, the potential evaporation from these pits that would occur.

It has turned out in all but four of the pits that the evaporation will not take care of very much of the water. I would like to submit this as an exhibit.

MR. GURLEY: I would like to have that marked as Exhibit No. 7.

(Marked Oil Conservation Commission Exhibit No. 7.)

Q What is the distribution of fresh water in Lea County?

A I think first, perhaps, we had better explain what we mean by fresh water. In my discussion I would like to define fresh water as being any water that can be obtained from wells or otherwise in Lea County, that can be used consumptively in industry such as stock, irrigation, or other industries.

Normally, such waters will contain less than two or three thousand parts per million chloride. The tolerance of certain industries and certain plants varies quite a bit, however, this is a very general statement, waters up to several thousand parts per million chloride will be considered as fresh. They might be called brackish by some people.

The limit by the way for drinking, drinking water, as set by the Public Health Service, two hundred fifty parts per million chloride.

The fresh water occurs in almost every part of Lea County. Some parts of Lea County do not contain very much fresh water in storage, and some parts do not contain water of very good quality

compared to the other parts. However, water of the quality that I define as fresh water can be obtained in nearly every part of Lea County, the yields may be very small, perhaps only one or two gallons a minute. But even this small yield of water is sometimes very valuable for ranching operations.

I have a map here that shows the distribution of the fresh water in the part of the high plains portion of Lea County. This map shows by blue lines which are labeled with red numbers, to indicate the altitude of the water table on fresh water on high plains, on a portion of the high plains of Lea County from approximately six miles, eight miles south of Hobbs to perhaps eight miles north of Tatum. The red figures are the altitude of the water level contour, and the contour interval is twenty-five feet.

The dashed blue line which goes around this area in general limits the contours, is the boundary of the underground water basin of Lea County, which has been declared and administered by the State Engineer's Office.

The Lea County extends some several townships north of the map and several townships south of the map. The area administered by the State Engineer's Office doesn't limit the fresh water,or water at all in Lea County. It is an area that is administered by the State Engineer, but there is fresh water and a great deal of it in many places in the rest of the county, as well. Especially to the north, to the south, and west, the local formation is not generally present and the conditions are much more difficult and less uniform than they are in this area, and this is presented merely to show that fresh water does occur over at least this very large area, and certainly does occur over a great deal larger area in Lea County.

MR. GURLEY: Can we have that exhibit marked No. 8?

(Marked Oil Conservation Commission Exhibit No. 8.)

Q What happens, Mr. Spiegel, to the disposed, the brine disposed into --

A Brine that is disposed into unlined pits, leaks vertically downward until it reaches the water table. If there are nonuniformities in the near surface materials that will prevent vertical movement of the brine downward, it may move laterally along the top of such zones until it reaches the end of them, or perhaps a leakier place or a more permeable part of it, and then it will continue on its way downward until it eventually reaches the water table.

In most cases the water leaking downward from the bottom of the pit probably reaches the water table in the very near vicinity of the pit. A diagrammatic representation of the leakage from an unlined pit has been drawn. This has been taken from a published report, also a standard textbook by Muskat. I would like to submit this as an exhibit, showing movement nearly vertically downward.

(Marked Oil Conservation Commission Exhibit No. 9.)

A I have another cross section I have prepared which shows very roughly what happens to the brine after it gets into the water table. That last Exhibit No. 9 shows what happens to it as it makes its way down to the water table. This little figure shows brine in the pit, the same movement downward to the water table, this is the water table here. We have fresh water in this area and a bedrock base which is present all over Lea County. The water moves nearly straight downward from where it first enters the water

table until it reaches the bottom of the fresh water zone or the bottom of the principal aquifer or aquifers in Lea County. It then moves along the bottom, has a very thin narrow tongue of brine distinct from the fresh water.

There is very little mixing, the water is moving in laminar flow, non-turbulent and their interfusion is very small, density difference of the brine causes it to sink to the bottom of the fresh water.

MR. SMITH: Could I inquire if that is your work or did it come from some textbook?

A This is my work. I would like to submit this as an exhibit.

MR. GURLEY: I would like to have it marked Exhibit No. 10.

(Marked Oil Conservation Commission Exhibit No. 10.)

A I have another diagram which is a plain view of a similar situation. This situation is taken from a published or open file report by the Geological Survey. It shows an injection well injecting into, let's say a shallow fresh water zone. Normal ground water flow in this fresh water zone is in this direction to the left as you face this diagram.

In Lea County it would be toward the southeast, and the direction of the decline of the water table in the area shown on Exhibit No. 8.

The cylindrical brine column is comparable to an injection well which would fully penetrate the fresh water aquifer. So there the diagram shows roughly what happens to water that is injected into the well or cylindrical column of brine coming from a pit. The water moves as shown by the arrows, naturally away from the well and up gradient toward the well here, and elsewhere. And a cone

of recharge is caused by this injection well or brine pit which causes the natural ground water flow lines to diverge somewhat.

However, the natural flow causes the water that moves radially from the well, initially to reverse itself and move again back down gradient, as shown by these arrows going in this direction.

The shaded area is the area that would be occupied by the water being injected. Thus the water moves essentially as a relatively narrow band, down gradient with very little movement into adjacent fresh water; either up gradient, or to one side or the other side of the well.

This is a very large scale thing. If a pit were a very tiny point on this map in which one of these squares is a square mile on Exhibit No. 8, a pit would be a point and therefore the brine streamer would also be just a single line moving down gradient.

MR. GURLEY: Mark Exhibit No. 11.

(Marked Oil Conservation Commission Exhibit No. 11.)

Q What evidence is there that contamination has actually occurred in Lea County?

A I have a table here which shows by actual analysis, the chloride content of water in eight wells in Lea County. The table shows definitely in five of these wells in which two analyses have been made at two different years, that there is a very definite and in some cases quite a large increase in chloride content.

We have three of these wells in which we have only one analysis, but in those three it was reported by the owners that up until a certain year, 1951 or 1952, the water was definitely potable, and the analyses show that at the time that the analyses were made several years later, that the water is no longer drinkable.

Q Do you wish to offer that as an exhibit?

A Yes, I do.

MR. GURLEY: Mark Exhibit No. 12.

(Marked Oil Conservation Commission Exhibit No. 12.)

A I have plotted these wells on a map, same scale as Exhibit No. 8. It is a somewhat different map, just to show where they are in relation to some of the oil fields.

This map covers the same area as Exhibit No. 8. The contours or the lines on this show the thickness of the saturation of the fresh water, shown to be moving southeast in that area. The red figures at the bottom show the chloride concentration that is given in the table on Exhibit No. 12.

The owner of the well is above each well, Staley, Gains, town of Hobbs, so on. The chloride concentrations are 75 to, increased to 152, 270, 385, increase from 59 to 80. Increase from potable which would probably be under 200 to 450, from potable, this one is actually seven and a half miles off the map, to 1,750 and from 675 to 770, and from two analyses in one report one is potable, therefore less than two or two-fifty, to one thousand and twenty, and the next analysis one thousand one hundred seventy. I would like to submit this as an exhibit.

(Marked Oil Conservation Commission Exhibit No. 13.)

A The definite proof of contamination has not been obtained in many places other than these, for several reasons. One is, there have not been many wells that have been sampled more than once, and although chloride content in many wells are known to be somewhat high, and are thought to be abnormally high, we don't have the investigations behind us or the current collection program to further

prove this.

However, I would like to present some diagrams which show, perhaps, why more contamination has not yet been noticed or reported or brought to someone's attention. This involves the theory of how water gets from a dense layer at the base of a fresh water aquifer up into a well which may not go clear to the bottom of the aquifer, where the brine has no back as shown by a previous exhibit.

This diagram shows the generalized flow lines toward a well which does not penetrate completely into an aquifer. This is the well here. The top of the aquifer is here, and the bottom is here. This is fifty per cent penetration. These streamlines show that water moves toward the well up here, and as you approach the bottom of the aquifer the streamlines curve upward and enter the well, in a uniform aquifer, or even in an aquifer which is not completely uniform but which has some vertical permeability. If the permeability is great enough to let the brine settle to the bottom, it will also come back up to a partially penetrating well.

MR. SMITH: Is that your work or is that from a textbook?

A This is taken from an unpublished report by the United States Geological Survey. Also, open file data.

MR. PORTER: Were you through with that diagram?

A Yes.

MR. PORTER: May I interrupt just a minute? I believe we might as well recess until one-fifteen.

(Recess.)

AFTERNOON SESSION - OIL CONSERVATION COMMISSION

MR. PORTER: The meeting will come to order and we will proceed with Case No. 1053, Mr. Spiegel.

MR. GURLEY: I would like to have the diagram marked as Exhibit No. 14.

(Marked Oil Conservation Commission Exhibit No. 14.)

Q Will you continue, Mr. Spiegel?

A I have another diagram here, which in this case is taken from Muskat, 1949, Principals of Petroleum Production, which shows again, the coning of a dense liquid, in this case brine, upward into a partially penetrating well, and a lighter liquid in this case water. I would like to submit this diagram as an exhibit.

MR. GURLEY: I would like to have that exhibit marked as Exhibit No. 15.

(Marked Oil Conservation Commission Exhibit No. 15.)

Q Will you continue?

A I have another diagram from the same publication. This diagram shows, by a series of curves, the actual maximum yield at which such a well as just shown in Exhibit No. 15 could produce water at given thicknesses of fresh water and at given -- which are these various curves, and at given penetration in per cent of total thickness, which is read off this scale here from zero to one hundred. The lower scale is, there are two scales in barrels per day ranging from one on logarithmic scale to ten thousand. Gallons per minute, less than one ten, to two hundred ninety-two gallons per minute.

By reading thickness eight off, and well penetrating at fifty feet, you find that about two thousand barrels per day, or about

seventy-five gallons per minute could be pumped from this well without drawing the denser liquid upward into the well.

However, any pumpage in excess of the seventy-five gallons per minute would draw the dense liquid, or the brine up into the well, even though the well did not go more than fifty per cent of the thickness of the aquifer down toward the brine. I would like to submit this as an exhibit.

MR. GURLEY: I would like to have that marked as Exhibit No. 16.

(Marked Oil Conservation Commission Exhibit No. 16.)

Q What other investigations have been made of contamination of fresh water aquifers by oil field disposal brines.

A Investigations in New Mexico have been limited to studies into a general current study of ground water in Lea County by Alex Nicholson of the United States Geological Survey. This study is in cooperation with the State Engineer's Office and the New Mexico Bureau of Mines, I believe.

Detailed test drilling and water sampling to delineate the exact water contamination in the specific areas, in the vicinity of brine disposal pits, have not been done in New Mexico to my knowledge.

However, a great many intensive studies of the same problems we have in Lea County in oil field brine disposal, have been made in most of the oil producing states, Texas, California, Oklahoma, Kansas, Illinois and Michigan are some that I think of right now. And these studies, some of them were started back in the 1920's.

A partial list of technical reports that have been written on such investigations has been prepared. There are three categories on this list. One is General References and General Theory. There

are fourteen references here. Then the second category is Brine Disposal; forty references on that. And a third one, third category of Water Flooding, and there are twenty-one references on that. These references have been annotated, or at least a good many of them.

Some of them I have annotated myself, and some of them have been annotated in a general work by Steinberger, and others in 1954 by the Arkansas Department of Agriculture. I would like to submit this list as an exhibit.

MR. SMITH: I would like to examine the exhibit, if it please the Commission. I don't know if he is offering it in evidence.

MR. GURLEY: He isn't offering it in evidence yet.

Let the counsel examine the exhibit.

MR. SMITH: May it please the Commission, I understand it is not being offered. I would like to advise the Commission I intend to object to its acceptance when it is offered.

MR. WALKER: Let the record so show.

Q Would you continue with your testimony on that? Is that all you have on that question?

A I believe that is all I have. So I would like to offer this as an exhibit at this time.

MR. GURLEY: I would like to have it marked as Exhibit No. 17.

(Marked Oil Conservation Commission Exhibit No. 17.)

MR. SMITH: I would like --

MR. GURLEY: I am not offering it, I am asking to have it marked.

Q Mr. Spiegel, what are the conclusions and recommendations resulting from the investigations that you have carried out?

A The conclusions from my own investigation of this problem in Lea County, from an analysis of all the data that has been made available to me and has been, that there is a very serious problem of brine, of contamination of fresh water by the brine disposal in unlined pits.

I have studied very carefully a great many reports in other states that have been in areas, in my opinion, very similar to the geology and hydrology of Lea County. Some of these are as nearly as identical in hydrology and geology as can be expected to be found in nature.

In every case that I have investigated the same conclusions have been, and these conclusions have been that disposal of brine into unlined pits is a very definite threat to the fresh water, both surface water and ground water, in any area in which this is done.

Q Do you have an exhibit to offer in that particular --

A I have one summary from probably the best detailed investigation that I could find. This is called, it is an extract about three pages long, of Geology and Ground Water Resources with special reference to the Wichita, Kansas, municipal water supply.

It is a University of Kansas Bulletin No. 79, July, 1949. And in this study, the introduction of oil field brines into fresh water was considered in great detail. Detailed test drilling and samplings were done to test the movement of the salt water, and their work has shown conclusively that salt water in that area has been migrated, along paths such as I have described in the exhibits presented this morning and earlier this afternoon. I would like to

submit this excerpt from their report as an exhibit, because it summarizes the entire problem and its solutions more concisely than I have.

MR. GURLEY: Do you want to examine that exhibit, Mr. Smith?

MR. SMITH: Yes. I would like to offer an objection when it is offered.

MR. GURLEY: I would like to mark that Exhibit No. 18.

(Marked Oil Conservation Commission Exhibit No. 18.)

MR. GURLEY: I would like to move the introduction of the Exhibits Nos. 1 through 18.

MR. SMITH: May it please the Commission, preliminary to making my objection I think I should advise the Commission that, first, Stanolind Oil and Gas Company is just as concerned with the contamination of the underground water supply as any other residents of the State of New Mexico.

Our purpose in interrogating and objecting to the introduction of these various exhibits is directed to the entry by the Commission of an appropriate order.

We do not agree with the conclusions of the witness here that in every instance there has been an infiltration of salt water from the pits and is contaminating the water where ever it exists.

There are certain situations, perhaps, where contamination does exist. In those instances the Commission should issue an appropriate order. As far as my company is concerned, we are not going to wait for an order, we are going to do it anyway.

Our purpose in going into the thing is not to try and exclude it completely, but to try and get the correct situation before us. My primary objection to Exhibits Nos. 17 and 18, is the fact that

they are extracts, and extracts only from work done by a person other than the witness. It is fundamental law that in cases of that sort there must be a tie-in with work that he has done, so he can definitely establish the physical conditions in the area that he is testifying about are similar to the extent that he can say this work is analogous. There is no such testimony as that in the record.

For that reason we would be determining what the physical conditions are in Lea County, based on a study made in Kansas where the condition may be entirely separate and apart and may be misleading to the Commission.

I think that extracts from the report of some other person, something listed out of context, is inadmissible as a matter of law.

MR. GURLEY: May I have the courtesy to ask one other question? I had it down and slipped. I withdraw my motion that this be entered as exhibits at this time. I would like to ask the witness one further question.

Q Were exhibits, were the exhibits that we have shown here prepared by you or under your direction?

A Yes, all of them were prepared by me personally, I believe, or at least under my direction.

Q Except Exhibits Nos. 17 and 18, which as you stated, were work of other people?

A No. I am sorry, I misunderstood, these exhibits were prepared by me or under my direction. However, they were traced or projected with modifications from published works, some of them.

Q But the exhibits were prepared by you?

A Yes, most of them by me.

Q Or under your direction?

A Yes, sir.

MR. GURLEY: I would like at this time to again move the introduction of Exhibits Nos. 1 through 18 into the record.

MR. SMITH: I would like to renew my objection.

A I would like to make a statement about Exhibit 18, particularly, Exhibit 18, as you remember is the extract from this rather large volume, it is the section almost in entirety which deals with the introduction of oil field brines in that report. It is also a very large part of the special reference to the Wichita municipal water supply, which is in that report. It covers a part of south central Kansas, something like ten or twenty counties.

MR. SMITH: Did you participate in the preparation of the report?

A I have not. I have visited the area, it is my personal knowledge that the geology and hydrology is quite similar to that in Lea County.

MR. SMITH: Is it based on statements made to you?

A Personal observation.

MR. SMITH: Personal observation of what nature?

A Field work.

MR. GURLEY: I object to this line of questioning. He has an objection to the admittance of these exhibits. Let him state his objection and the Commission rule. And he can cross examine him at the proper time.

MR. SMITH: May I state that I believe my questions are appropriate and proper on voir dire to determine the admissibility of the documents.

MR. GURLEY: Your objection is to the last two exhibits.

MR. SMITH: I will state it again, it is that this witness has not testified to anything but naked conclusions on his part that there is a similarity between the work that was done in Kansas and the conditions that exist in Lea County.

His testimony in addition, not having familiarity except personal observation, whatever that means, is also personal observation so far as Lea County is concerned. He hasn't testified that he has run any test or made any tests under his supervision. He testified only that these exhibits were prepared under his supervision, they were prepared from the work of other people's textbooks.

MR. GURLEY: I agree, we withdraw Exhibits Nos. 17 and 18, and would like to move the admittance of Exhibits Nos. 1 through 16, please.

A I might add off the record, that the exhibit was prepared in part to aid the operators in examining the literature.

MR. SMITH: We would be glad to receive it.

MR. PORTER: Is there objection to introduction of the Exhibits Nos. 1 through 16? They will be received.

Do you have any further comments?

A Yes, I have a conclusion and recommendation. In part, one is that ground water usable for stock, domestic irrigation, or many industrial purposes, was present nearly everywhere in Lea County in sandstone, shallow and underlying, in concealed settlements under natural conditions before any brine was disposed in Lea County.

This is still true in most areas. However, a somewhat small

yield of poor quality water is present in many small scattered areas, especially west and south of the Caprock Scarda.

However, water from nearly every unlined brine disposal pit in use has leaked downward into fresh water strata. Even if such brine has not yet been detected in wells, as it has been in the sight that I have described in another exhibit, the brine can and does move down gradient toward wells, and eventually can and does enter these wells and make waters unfit for their usual use, or possible even unfit for consumptive use.

I don't see how anyone can say otherwise, because there has to be some place for that water to go. We know that in many areas it does, and we know the specific areas, in Lea County there is conclusive proof that it has. It would be unreasonable to assume that because we don't have specific proof at every pit, that the salt water at a particular pit does not contaminate the fresh water that we know exists in that area.

I think I've shown conclusively by the exhibits, that existing brine disposal pits are too small to evaporate to dryness, the brine discharged to them even if they were lined to prevent leakage, and I therefore conclude that the only way of disposal of large quantities of brine is by injection into a deep water bearing zone, which already contains brine of an unusable quality, and from which the injected brine or brine already in the formation cannot be forced to migrate into an overlying fresh water strata.

I conclude that in Lea County the only rocks, or aquifers or horizons which fit this requirement have permian and older rocks.

Q Do you have any further comments to offer?

A No.

MR. MADOLE: May we ask a question as to how deep the rocks are, the permian that you are talking about?

A Well, it is quite variable, in general it is over a thousand feet.

MR. MADOLE: How much over?

A It may be as much as two thousand.

Q How deep was that again?

A A thousand or two thousand, base of the triasic or top of the permian. Perhaps, many of you people know the depth better than I do on that.

MR. CHRISTIE: I would like to ask one question.

MR. PORTER: Mr. Christie.

MR. CHRISTIE: R. S. Christie, Amerada.

What field did you say that the Amerada disposal record was located?

A I believe I said it was in the South Knowles-Devonian.

MR. CHRISTIE: It is in the Knowles field, not the South Knowles.

MR. PORTER: Mr. Mankin.

MR. MANKIN: Mr. Spiegel, I don't believe you have covered this particular point, but in the water that filters down through the pits to the fresh water zone, is it your opinion that salt is filtered out or removed in any way in this path which it takes from the pits to the aquifer?

A No, it is impossible to remove the sodium chloride and almost any other constituent in the brines in any way, any natural means in moving through the sand and gravel.

MR. MANKIN: So the brine that comes from the pits going to the aquifer, the salt content remains almost the same from the time it leaves the pits until the time it arrives at the aquifer?

A Yes.

MR. MADOLE: Is the witness subject to cross examination?

MR. PORTER: Mr. Montgomery.

MR. MONTGOMERY: I wanted to cross examine him.

MR. PORTER: Yes, he is available. Go ahead Mr. Montgomery.

CROSS EXAMINATION

BY: MR. MONTGOMERY:

Q Mr. Spiegel, perhaps we as the Commission Staff are going to have to make recommendations as to what to do in these different areas. There are several things I would like to clear up in my mind. I may be sitting there myself shortly. There were a few things that I wanted to ask you about, more particularly about where the brine moves to the bottom of the aquifer. I believe you stated that was your work.

Is that general theory of most hydrolygists, that the brines do move to the bottom of the aquifer?

A Yes. Not of most hydrolygists, because I think most hydrolygists haven't even thought of the problem. However, those who have worked with the problem will agree that it moves to the bottom of the aquifer, or at least to the bottom of the first permeable bed and migrates along that, and eventually works its way toward the bottom.

Q There is no possible way that this brine solution will become mixed with the fresh water in parts per million, be distributed between a fairly wide area?

A There undoubtedly is some diffusion and there is undoubtedly some mixing as the water moves down, but it is relatively small.

Q So it is possible that throughout the entire Lea County water

basin that we would have a layer of this concentrated brine at the bottom of our fresh water resources in this area?

A Eventually, yes, over a very large part of Lea County.

Q Would you give any estimate as to how thick that layer is, using the accumulative figures as of today taking the area you have outlined that, what thickness would that be of our water bearing reservoir?

A I can't give you a definite figure. The only figure I might by able to give you is one that compares, offhand a comparison of the actual brine production as shown in Exhibit No. 2 with the natural recharge to fresh water in Lea County.

My figures are obtained this way, that there were a little over five thousand acre feet of brine produced in 1955. The thickness of brine if it were spread out over the entire county, would be on the order of about two thousandths of one foot thick. This is not very thick.

However, the annual recharge, average annual recharge has been calculated by several investigators to be on the order of about two hundredths of a foot each year. If we will assume that this five thousand acre feet will be contributed each year from now on, and that natural recharge will continue from now on, we find that we have ten per cent of the natural recharge being contributed by brine averaging thirty-three thousand parts per million, and this quantity will contaminate between one hundred fifty and two hundred barrels, one barrel will contaminate one hundred fifty to two hundred barrels of fresh water. So you can see that eventually we are going to replace a large amount of our fresh water with brine.

Q Well, now, how many years will that take, Mr. Spiegel?

A I haven't made an estimate of how long it would take to completely replace the water.

Q Would you care to make an estimate as to how long it might take to where it would not be suitable for the two hundred fifty parts per million?

A No, because of the character of the migration of the water. It does move in definite paths rather than spread out everywhere, and it is only going to contaminate the area near the well, the natural movement of the water is on the order of a few feet per day, perhaps one to three or four.

As such, it may take thirty or forty years before it spreads three or four miles. Once it has done so, it contaminates all the water above the tongue, by virtue of the fact that if you pump a well even if it is partially penetrating, it will draw the lower layer of brine up into the well.

Q The brine will be raised in the aquifer and actually the parts per million chloride will be far less, because there is more water to mix?

A It depends on the rate of pumping, the degree of penetration of the well, and so on. In some cases, as I have already shown in an exhibit, the concentration is over a thousand parts per million chloride.

Q Where?

A This well here.

Q Would you identify it?

A The Berry well, just a mile south of Lea #2, analysis one, one thousand and twenty, and the other, one thousand one hundred seventy parts per million chloride.

Q Pardon me, do you have the dates on the Berry well, when they were taken?

A Yes, they are in Exhibit No. 12.

Q Would you give me those dates, I want to bring out the fact there was a well in the area which was apparently contaminating Mr. Berry's water well. The Commission had a well in the area, the casing pulled and the well properly plugged, and it was my last understanding that the well was freshening up, at this time.

A D. C. Berry reported potable before 1952, the second was 1954, the second was 1955, one thousand one hundred seventy parts per million chloride.

Q Was that in early 1955 or late?

A I don't have the date here.

Q I believe if you would possibly check that well today you might obtain a different figure.

A I understand that water is now sweet water and is potable. I could be mistaken on that. I don't know, I don't remember the date offhand.

Q The other well that you were referring to over a thousand?

A The Gulf well which is in Township 22 South, 36 East, seven and a half miles south of this dot at the bottom edge of this map, one thousand seven hundred fifty.

Q Is there any very large industrial or commercial water in that area that you were speaking of?

A This well was used for domestic use. I think it was Gulf's lease house at the time it was reported potable. It has been abandoned since that time because it is no longer potable.

Q Generally, in that particular area there is no irrigation

going on and the domestic water is very scattered, is that correct, and difficult to find?

A I don't know. I do know that this well was used for domestic use at the Gulf lease house.

Q Even domestic water is very difficult to find and they are far removed from one another?

A I feel this doesn't change my opinion. I think in places where the zone of saturation is very thin where good water is very hard to find, that it is more important that this good water be protected.

Q Then referring to the wells in the Hobbs Pool, the water wells which are located in the general area of the Hobbs field, were these analyses taken since the Commission conducted the casing leak survey in that area in 1955?

A We have an analysis on Hobbs #3 well, which shows the chloride to be eighty parts per million in 1956 at this well. The first analysis on that well that I have a record of was in 1942, the chloride was fifty-nine at that time. A second analysis was made in 1953, and the chloride was sixty-seven parts per million at that time.

Q But it is possible that we did discover casing leaks in the area, and there was a certain amount of contamination. If we properly fixed the casing leaks it may be that we have stopped that particular situation in the area?

A It is possible that you have stopped it, that particular situation, however, because of the large concentration of wells northwest of this well and on this map, the water table gradients through Hobbs trend from northeast southwest. This indicates that

the water is moving approximately southeast, so that all of Hobbs and the entire Hobbs city well field is in the path of the movement of any brine that enters the fresh water in this area.

As I mentioned before, the gradient of movement of the water is on the order of one, two, three feet per day, so that it would actually take many years before the full effect of the disposal of the water in this area would reach out.

Perhaps, only the nearest pit is causing the particular increase in chloride that I have shown in this well. Perhaps, as you say, it is casing leaks. Eventually, there is only one thing we can conclude and that is that eventually brine will move into that area.

Q In referring to the well you have indicated as the Staley well, I understand you to say that the water moves at right angles to the gradient you have on the exhibit on the left hand side?

A Approximately, insofar as these water level contours are correct. These contours, by the way, are mostly from winter measurements when irrigation wells are not pumping. Irrigation wells, especially when there is a concentration of many wells, modify these contours very much and they would do what has happened here. They will tend to bend them back so that water begins to move toward a heavy pumping center from all directions.

It is possible that a well, even up gradient from a large area of brine disposal pits, the ground water movement can be reversed by a large number of irrigation wells so that water will move up gradient, that is, up the normal gradient but actually down a gradient toward the well, and contaminate a well even on the wrong side of the pits.

Q Even the Staley well, it is a good ways from any near pits and the topography of the region, there is an arrow that runs in a northwest direction from the Staley well, would you assume that the nearest pits being in the Hobbs field, that possibly you were being contaminated by the Hobbs salt pits?

A It is possible, depending upon his pumpage.

Q You were using some figures showing the water production for some various fields and you mentioned the Cooper-Jal, do you have any idea how many water wells there are in the area of the Cooper-Jal salt water disposal pits?

A No, offhand I don't. I believe we have data from Mr. Nicholson's investigation. I don't, offhand, remember how many wells are in that area.

Q Maybe five or ten, a distance of some -- distances, you are speaking of some thirty miles long and four or five miles wide, would that sound like too few wells to you possibly?

A I can't answer that question.

Q I am probably being very boring, and I realize that the water resources are very important, but the point I want to make is that the oil industry is also important in that they contribute somewhere near fifty per cent of our income to the State of New Mexico, and there are definite areas as Mr. Spiegel has pointed out that salt water should certainly be disposed of, but there are probably other areas where no harm is being done and possibly the many millions of dollars that would be involved we may not be protecting anything, we might be fighting a ghost. That is the questions I was trying to bring out.

We had an exhibit on the Drinkard field that happens to be

in an area where there is very little domestic water production. Also, the Arrowhead which was one that produced a lot of water, it is an area where there is very little domestic and no commercial water.

A I don't believe I am qualified to testify on the economic effect of one action or another action.

Q Well, we would certainly want to consider those items, would that be your recommendation?

A Well, I am not even qualified to make a recommendation in that respect.

Q Would it be desirable to put the brine water in the sandstone formation that is not permian age?

A I don't believe in general it would be, because the Santa Rosa formation, even in a particular area where it contains salt water, does crop out in part of Lea County, or it occurs beneath sand and gravel of younger age which contains fresh water and it is, there is a great possibility that when you dispose of water into a formation which crops out somewhere, that that water will migrate, updip, when the new pressure is imposed and come out and contaminate a fresh water stratem somewhere else, or a leak across the bed go into shallow beds even where that bed does not outcrop any more.

Q Although the Santa Rosa is separated by the fresh water by several hundred feet of redbed?

A In some places.

Q That is not always true then?

A There are places where the Santa Rosa actually crops out, if not below the ogallala below the sand and gravel that is present

between, below the caprock.

That is the area where we have the poorest water supplies actually, in quality and quantity, but that is also the area where it is, perhaps, most important that we don't make it any worse.

Q Then one further question, the reserves in the Lea County water basin, I understand that you all do have a reserve figure on that in number of years, which we might expect commercial water production?

A Yes, it has been estimated that the water will be pumped by irrigation in approximately forty years, so as to, if present pumpage will continue for the entire forty years that it would effectively de-water the Ogallala formation in which the pumping is occurring.

The actual practice, of course, some of the people will go out of business before the entire aquifer is de-watered. In actual practice, as the basin approaches de-watering, there is less fresh water there to dilute these brines which will lie below the fresh water in many areas, and therefore, the problems of contamination will become more serious than they are now.

Actually, I feel that our problems will be multiplied a hundredfold or a thousandfold, and our complaints from people who had wells contaminated in Lea County will be multiplied greatly, if it weren't for the fact that we had such a great thickness of saturation in Lea County to dilute the brine as it is pumped through the aquifer.

Exhibit No. 13, as I mentioned, has lines on it that indicate the thickness of the fresh water in the Lea County underground water basin. These figures, you probably can't see, range up to

two hundred twenty-five feet in thickness. This is the two hundred line, this small one is two hundred twenty-five, this is a one hundred, this is a two hundred. It is only when you get out to the very fringes that you get less than one hundred, a hundred goes around here like this. Everything east is more than a hundred feet of fresh water, it is only in the fringe area that we have fifty, fifty, twenty-five, twenty-five and seventy-five.

Q Yet the salt water that has been disposed of so far is only equivalent to a two thousandths of one foot if put over the entire area?

A Yes.

MR. PORTER: Mr. Madole.

MR. MADOLE: On behalf of Magnolia Petroleum Company, I wish to join Stanolind in the statement that we are certainly sympathetic to the water problem, being a former resident of New Mexico I can appreciate the water value.

BY: MR. MADOLE:

Q What I gathered from your testimony is that this water contamination all appears southeast, take it over and put it close to Texas, we will get it over there and wouldn't have any problem over here. I was sitting here trying to figure out, Mr. Spiegel, exactly what you proved against me. It is kind of confusing me just to figure what you have proved or what you have lacked proving me.

In your Exhibit No. 5, Mr. Spiegel, you have testified that your tests of the brine or salt water, is it, goes into the pits, and the concentration that exists in the pit are almost identical in every instance that you tested, is that correct?

A That is right. Within one or two per cent. I can give you the figures.

Q What is the rate of evaporation in New Mexico and Lea County?

A The evaporation rate calculated for a pan in Lea County is approximately one hundred inches a year. However, to get down to brine evaporation we have to add a few correction factors. One is, that in a pond it is estimated that the evaporation rate is only about seventy per cent of evaporation in a small pan from which the measurements were made. That brings us down to seventy inches. Much concentrated brine evaporates at a rate of ninety per cent of the fresh water, which brings us down to say sixty-three inches. There's roughly sixteen inches of rainfall which falls into the pit, which has to be evaporated, so we have to take off that.

Q Leave me with a little.

A Leaves you with not very much, and then besides, you have a little oil on top of some of the water.

Q How much would you say did evaporate off my salt water?

A It has been estimated by the Geological Survey and by my own, well, my own are probably just guesses, but the Geological Survey made some tests with oil film, that the appropriate rate would be maybe seven inches a year.

Q Seven? That sure is a guess. Let's name that expert that figured on that. I think that figure is way off, could you tell me who figured that?

A I think Mr. Nicholson could probably explain the procedure.

Q Who is he?

A He works for the Geological Survey.

Q Would you put his initials on the record?

A I have already.

Q You say that there is only seven inches effective evaporation in a disposal pit in Lea County, New Mexico?

A If there is any oil whatsoever on the pit.

Q Well, now, let's get all the factors, because I may want to use this later. Let's get all the factors in there, all the ifs, and see where we are going to stand.

We started off with one hundred inches and we are going to take off seventy per cent because we haven't got a pan, and then we are going to take and add to that thirteen inches --

A Sixteen.

Q (Continuing) -- thirteen for rainfall?

A It varies, but the average for a county might be sixteen, it would vary from, perhaps, twelve, ten to eighteen.

Q That leaves me with something like fifty-six inches. Tell me what happened to my other fifty-six inches?

A That was reduced by the oil film.

Q How did that occur?

A Oil doesn't evaporate very fast and it doesn't allow the transfer of water from the pit to the air.

Q Do you find oil on each one of the salt water pits?

A No.

Q That affects our calculation then?

A Yes, it affects it a great deal. If there is very much oil I am positive that it would drop the evaporation down to zero, and if there were no oil whatsoever, we might leave you with forty-six.

Q I am going to owe you some water?

A As a matter of fact, one of those pits, the water in the pit

actually was fresher than the water that was being put into the pit at the time.

Q Then we are recharging your fresh water zone, aren't we?

A Well, it increased the quality from, I have forgotten the figure, maybe we had better look at that one. Yes, from seventeen thousand six hundred sixty-six discharge pipe, sixteen thousand seven hundred sixty in the pit.

Now, there are possibly two ways of explaining this. One way is that you might have had enough rain to dilute the water.

Q That is the thirteen inches you are talking about?

A Thirteen inches. The other is, there is possible errors in computation, that would explain it.

Q Wouldn't there be another possibility that the water got a little saltier down where you are producing oil?

A This is a third possibility.

Q Are you telling this Commission that a salt water pit sitting out there with salt water in it, that there is no evaporation in Lea County, New Mexico?

A No. I am saying that a very, very small part of the total brine that is being disposed into the pits, for practical purposes, practically all the water is going down into the aquifer, and for practical purposes even a larger percentage of the salt is going into the aquifer. This is what we are worried about actually, --

Q I am not trying to argue with you, I am trying to get your figures. You say there was six hundred million gallons of water produced in Lea County accumulative to 1956. You are telling this Commission that six hundred million and the fraction of the thousand and hundreds and so many, that they went into your fresh water zones?

A No, but I am saying that nearly all of it did, and even a larger percentage of the salt in the water went into the water, went into the fresh water zone.

Q We are talking about just volume right now.

A We are really worried about the salt. We would like to have the water, going into the fresh water aquifer.

Q What has happened to your water table, has it dropped?

A It has dropped where there has been pumping.

Q In other words, if six hundred million gallons had gone in there since 1956 it shouldn't have dropped along with the thirteen inches?

A Thirteen inches of rainfall doesn't get into the aquifer.

Let me stop answering your questions and answer another question that nobody has asked me yet. If we evaporate a little bit of water from this salt, what have we done, have we taken any of the salt out of the water?

Q You asking me a question?

A Yes, I am asking you a question.

Q I am the lawyer that Montgomery is talking about.

A Well, I will have to answer it, myself. When water in the disposal pits is so far below concentration as this Exhibit No. 5 shows, you aren't going to precipitate very much salt in the bottoms or the sides of the pit. You have to reach essential concentration of one of the constituents in the water before you start precipitating the salt out.

We hope to get rid of the salt. We would like to have the fresh water, but with -- if we could add it without the salt we would be happy. Even if we do have, say, fifty per cent of the

water that you disposed into the pit evaporated, this doesn't take any of the salt out. The salt goes down and still joins the fresh water and contaminates it even worse than if you had that water.

Q Let's get to that assumption. What proof have you put in this record that that salt went down to fresh water? Now, I have been out and saw some salt water pits when they dried, there is a lot of salt, it looks white. I know it all didn't go down.

A Have you ever tried to compute how much salt is in a barrel of salt water, or in six hundred million barrels of salt water or even in, say, fifty thousand or one hundred thousand barrels, that is disposed into a particular pit, and try to visualize how high that salt would be piled on the ground?

Q No, but I am asking you, have you computed it? It doesn't look like you did yet.

A Yes, I have. I didn't bring any figures with me because I thought such a computation would be stretching a point, that I think we can all visualize ourselves. I really don't think that point is necessary to be made, it is so obvious.

Q If it all went down it would have covered your water sand up, too, wouldn't it; if these piles that you are talking about is just one hundred feet it would have all covered it up by now?

A No, it is in solution.

Q Oh, it is solution. I thought it was on the bottom.

A That is just it, it isn't on the bottom.

Q Who is on first base, I thought you told me the salt was on the bottom of the fresh water formation?

A The brine, which is a brine of the salt solution is on the bottom of the fresh water aquifer. It's still in solution, just

as it was when it was in the pit. It still has all the salt in it except the little bit that is left around the edges of the pit, maybe on the bottom once in awhile.

Q If it stays there nobody is hurt, is that right?

A I have already shown by a rather lengthy discussion that even though it is on the bottom at a particular place, if you put a well in there it draws it into the well anyway.

Q If he pumps at a certain rate. There are a lot of ifs. I beg to differ with your conclusion that you have shown all this conclusively, there are a lot of ifs in your testimony.

A I know, but I think I presented sufficient evidence to show that the quantities of the water which would be pumped would probably be exceeded.

It doesn't take a very big irrigation well or big domestic well to pump fifty gallon a minute. That's a very liberal estimate, I could have used the other end of the chart and got you down to one gallon a minute, which is about the third of this yield of a windmill.

Q You would concede that your testimony is pretty conjectural in a lot of the exhibits?

A No, I will not concede that.

Q You think they are proof positive?

A I think so.

Q Let me ask you this, you say that we shouldn't put the salt water in the Santa Rosa formation, but we should put it in the permian, is that right, permian rock?

A I think it would be desirable to do so.

Q What pressure would it take to put it in there?

A I can't answer that because I don't know what the pressures are. I believe that the Amerada well is now putting water into the San Andres without any pressure.

Q Does that have this permian rock?

A Yes.

Q Going in without pressure?

A Yes.

Q How does that happen?

A I think I know but I think we might better ask the Amerada people how it happens.

Q Well, I mean if you know I'd be glad to find out.

A Well, the water level in the San Andres at that time was below the land surface, and water is allowed to run down into the well. It goes down into the formation and raises the water level somewhat. I don't know the figures on the vacuum or the water level. I believe the Geological Survey tried to obtain such figures but couldn't, so I can't give them to you.

Q These examples that you have given of contamination of these eight wells, Mr. Montgomery brought out possible explanations of them, and then you turned to a well that went from fifty up to sixty and then to eighty-nine, as your second well. If your water table isn't true that the -- assuming that there has been no oil field water, if there is just a drop in your water table wouldn't you find a higher concentration of salt with your drop in the water table?

A It is possible, I don't know that, it is necessary to know just what happened.

Q If you reduce your dilution, your concentration is going to

become stronger, isn't it?

A No, the water would have to come from some other aquifer moving into it. The water level in itself doesn't have anything to do with the concentration.

Q There is some chloride content in all fresh water?

A Yes, but so far as we know, it is uniformly distributed through the Ogallala formation.

Q Just oil field salt water goes to the bottom, the fresh water salt water doesn't go to the bottom?

A No, once you have something mixed it doesn't separate. When you have a slug of brine from the bottom of the pit going into the fresh water, it will sink. If you take the brine, then mix it up with a lot of water and make it the same density as the fresh water, then it wouldn't, the chloride iron don't drop to the bottom of the aquifer.

Q They don't?

A No. Only the water itself.

Q Then going back to this slug business. You say that this water drops out of the salt water pit in slugs, we have got some kind of bottom, it doesn't drop in a slug. I am going to --

A I am speaking rather figuratively.

Q I am thinking so, too. You say -- Let's turn to that Exhibit No. 10 there, you say, you draw a column where the water just pours down into the fresh water strata?

A Effectively.

Q How did you ascertain that?

A I took a beaker of fresh water for one thing, and I mixed up some salt in some water to concentration around two hundred fifty,

or three hundred fifty parts per million, I presume, and added vegetable dye to it and poured it into the water, just poured it in and it went to the bottom.

Q What is that sand doing out there in Lea County in your beaker?

A I did the same thing with some sand in the beaker, and the vegetable dye went down, a thin streamer, much slower.

Q How much slower?

A Well, it took a couple of hours.

Q How much sand did you have in your beaker?

A Oh, about six inches.

Q If you add the depth of the dirt to the fresh water -- the fresh water over there is how far?

A Oh, it begins, fifty to one hundred fifty.

Q If you had that much dirt in there it wouldn't have sunk that fast?

A If I had four feet of water above my beaker, it probably would have gone down through the six inches of sand pretty fast.

Q If you had one hundred feet of sand it wouldn't have gone very fast?

A Not at first but after it saturated the section it would go pretty fast.

Q The trouble of the matter is, that the water in the salt water pits doesn't go down in solution in your fresh water system?

A Once it has reached the bottom it starts going down continuously, rather than in slugs. I use the term slug, it is used frequently by hydrologists and ground water to mean a sort of a wave.

Q Just down to the final thing, what conclusion, what recommen-

dation are you making; you used this paper, Exhibit No. 17 or 18, there, where they studied it up in Kansas. I happened to be unfortunate enough to be in that problem, too; you don't advocate a filter system like the man wants me to build for the municipality?

A I have already said there is no natural means by which chloride can be removed from the water.

Q Are you aware of the fact he wanted a filter system put in all over Kansas?

A I wouldn't pay much attention to something like that if I were familiar with it.

Q Will you appear as a witness for me up in Kansas?

A If someone will pay me to do so.

Q If you will testify that way I will be willing to concede you are an expert.

MR. PORTER: Mr. Smith, did you have some questions?

MR. SMITH: I have a few questions.

BY: MR. SMITH:

Q You testified, I believe, that the Public Health Service had set as a standard of potable water, two hundred fifty parts of sodium chloride as a maximum?

A Of chloride.

Q Do you know of any instances in the state where there are more parts than two hundred fifty per million, where the water is being used for domestic purposes?

A I don't know any offhand. I suppose there are.

Q Your testimony implied that anything above that was unsafe?

A It is undesirable.

Q It is undesirable, that is what it really means?

A That is right.

Q Getting back to this proposition of water going down vertically, which you have been examined rather thoroughly by Mr. Madole. I am wondering whether or not you had given any thought to the capillary attraction lateral movement of water instead of it all going straight down?

A There is some water retained by capillary attraction through the sand grains, but not very much.

Q Doesn't it have a tendency to spread?

A No, it has a tendency to go straight down, almost straight down. My exhibits showed a slight bulging of the lines of water movement, too, beyond the limits of the pump, as you remember, my first exhibit on that.

Q I remember. Are you familiar with the experiments made in Sprayberg field in Texas on the water bearing of moving oil?

A No.

Q You don't know the result of that? That is they found that water will travel laterally, go through sand that way?

A No.

Q You are not familiar with that at all?

A I am not familiar with that investigation.

Q If such were brought to your attention would it effect your testimony?

A No.

Q You would still be of the same opinion?

A That is right. I have already qualified myself that minor homogenies in the aquifer will tendto let the salt water move along the top and move outward and go back down. However, all this

does is make that cylindrical thing a little bit bigger, maybe a little elongated to the downdip side of it, it doesn't effect in the net result, the net result is that the water eventually gets down to the water table not too far from the pit.

Q Your chart that you used there, I think that you got from Muskat, is that right? Do you have that exhibit available?

A The chart in which I computed --

Q The vertical movement with the slight bulge.

A Yes, that was taken from Muskat, which in turn was reprinted from another scientific investigation. Muskat uses it in developing his theory.

Q Isn't it true that Muskat's studies and analyses were always of oil and water in conjunction with one of the other, or gas and oil?

A No, not always, --

Q Not just simply water?

A No, he is in that particular publication, he did quite a very intensive study of movement of water under dams, out of canals, and so on, where he was talking about water and water only.

Q What is the full title of that?

A One is called "The Flow of Homogeneous Fluids and Isotropic Media", and the other is called the "Physical Principles of Oil Production."

Q It does relate primarily to oil?

A It is primarily to oil but there are at least one hundred pages out of the eight or nine, dealing with water movement alone. In fact he has a chapter entitled "Ground Water."

Q How far below the surface of the pit were your water samples

tabled, were they right on the top or did they go down two or three feet?

A I'll have to ask the man who actually took the samples, that is Mr. Borden of our office.

Q Is he here?

A I think he is here.

Q Do you want to ask him now? A I have asked.

MR. BORDEN: In cases where the discharge pipe went over the surface of the pipe, I got as far out into the pit as I could and scooped it out from below the surface. Otherwise, I merely went to the edge of the pit and took out a bottle of the salt water.

Q How far down did you scoop?

MR. BORDEN: Well, along the edges of the pit, of course the bottoms are slanting, as far as a man could reach, at least a man my size; I would say that water surface in most instances was about six or eight inches from the bottom.

MR. SMITH: Back to the witness. Thank you very much.

Q Getting back to another phase of your testimony where you arrived at an average of thirty-five thousand parts to the million sodium chloride in the water that is being produced with the oil, I would like to ask you, in arriving at that average figure, I believe your testimony -- I am trying to refresh your recollection a little bit -- was to the effect that samples were taken of two hundred fifty, three hundred thousand parts, and some as little as six thousand parts to the million.

Did you just take an arithmetical average or did you give proper weight to the estimated volumes of water that would be produced, say three hundred thousand, and say six thousand?

A It was an arithmetic, it was not a weighted average.

Q Are you familiar with the fact that the largest volumes of water that are produced in that area are on the order of around six thousand parts to the million, as contrasted with the, say the, the high, three hundred thousand?

A Yes, but I don't believe that the actual averages are ever used, and perhaps, I should have qualified it at the time. A weighted average in my opinion as a rather loose guess, would probably be quite a bit less than thirty-two thousand, but I am of the opinion it would be in the neighborhood of twenty or twenty-five thousand.

Q That is just a guess on your part?

A Just a guess, and it is still pretty salty water.

Q Of course the local problem would be pretty much contingent on the number of parts into the million produced in that particular area?

A That is right.

Q So that there would be a definite possibility that certain areas in the county, that the salt water infiltration is much less severe than it would be in others?

A That is true, there are some areas where the problem is less severe than others in part, because of a smaller quality, I mean a lower content of salt than others, it is reversed because it is a larger quantity of water in these areas you are speaking of where the water may be only six or ten thousand parts per million, you remember these are the areas where most of the water is produced. These are the areas where most of the salt is produced. The salt is what we are most concerned with.

Q The volume of salt wouldn't be as great per barrel as it would in the three hundred thousand?

A No, but much more per pool or square mile or per pit.

Q Isn't that just a guess on your part?

A No.

Q There may be a sufficient volume of water produced at three hundred thousand parts to the million to produce as much salt as, say ten times, or how many times would it be that a volume produced the same amount?

A With a simple arithmetical calculation I could do it in my head, I think you could, I come up with a larger total volume of salt produced in the areas where the most water is produced.

Q You do have to know the volume of water at each area?

A I have a table by pools which shows the volumes of water by pools per year, and I think I said in Exhibit No. 1 at last month's hearing, that twenty-five of the pools which produced most of the water, now even if they are only five thousand, six thousand parts per million chloride, they produced ninety per cent of the water which way over balances a small factor in your chloride concentration variation.

Q What is the total estimated volume of fresh water in the Lea County reservoir there?

A I don't know that figure offhand.

Q Is it recharged annually?

A There is a large amount of water in storage and there is a very small amount of that recharged annually, not every year but on the average, a small amount recharged.

Q What are the withdrawals per year of fresh water?

A I can't give you any exact figures, but it is on the order of one hundred thousand acres irrigated at a use of water per acre, from two and a half to three acre feet, which gives us somewhere around in the order of three hundred thousand acre feet of water.

Q There are approximately five thousand acre feet of salt water disposed each year?

A That is right.

Q That means that your aquifer, I think you estimated the life would be about thirty or forty years?

A That would be at full development for that period, and where the economic life for irrigation,-- only there would still be some water left because of economics at the end of forty years, or even sixty or eighty years, because not that much water will actually be pumped and the water that would be left would be used for industrial purposes, the few remaining irrigators, and domestic, and municipal use, and lease house use, and things like that.

Q Applying your estimated life and assuming that is all the available water, that would be on the order of a million acre feet, or would it be ten million, my mathematics are very poor?

A I expect it would be on the order of ten or more million acre feet.

Q So, you have a reservoir of approximately ten million acre feet in there, with a deposit annually of say five thousand acre feet of salt water. What is the average, you say it is probably not thirty-five thousand, probably nearer twenty thousand, and I am wondering if you can calculate for us what the percentage of replacement of the salt water would be in that reservoir, some ten or twelve million?

A Well, I am not sure I can do what you ask. I can make some calculations that will confuse us all. I am already confused. The figures as I remember I gave, say the total water already produced, eighty-seven thousand five hundred acre feet of brine produced, and let's lower my parts per million chloride to twenty thousand. Let us use as a standard the Public Health Service requirements for drinking water.

Q Let's assume something a little higher because I believe you conceded that water could be higher than that and still could be used for domestic purposes?

A I am fairly certain that there is no community in New Mexico that is using water exceeding two hundred fifty parts of chloride. The highest I remember is one hundred seventy.

Q There are other constituent elements of water that make it undesirable besides chloride?

A Yes, but chloride is the highest single constituent, and the most critical of the normal constituents.

Q Let's continue.

A Let's assume that the normal ground water is fifty, it is reasonable it might run from thirty to eighty, or ten or fifteen to eighty. This gives us a differential of two hundred parts per million, as compared to two thousand parts per million.

That makes it possible for one barrel of twenty thousand parts per million chloride water to contaminate, to the Public Health Service limit, one hundred barrels of fresh water.

Q You testified awhile ago, with one hundred fifty barrels with thirty-five thousand --

A That is right. Approximately.

Q Well, — A Very well.

Q You are going the wrong direction, aren't you?

A No. The less chloride in the water the less water it will contaminate to a certain figure.

Q I see.

A We have, for every barrel of salt water produced we will have to assume if we mix it uniformly with the fresh water, we will contaminate one hundred barrels of fresh water. If we have produced eighty-seven thousand five hundred barrels of fresh water -- of salt water, I am sorry, and we multiply that by one hundred, we get eight million seven hundred fifty thousand acre feet.

Q You say that contamination means that it has brought it past the two hundred fifty that you are talking about?

A That is right.

Q Does that mean if you started with zero instead of two hundred fifty parts and put this twenty thousand in there, that you would contaminate a hundred barrels or wouldn't it be a figure less—

A It would be a little less.

Q Give me an idea how much less.

A Divide twenty thousand by two hundred and fifty, instead of by two hundred and -- I don't have my slide rule. It is roughly, perhaps eighty barrels instead of one hundred.

Q Of course, we still haven't come to the question I asked you which is, the percentage of the salt water injected out there or dripped down,you might say, has gone into it as contrasted with some eight or ten million acre feet in the reservoir, wouldn't the total be less than one per cent?

A Probably, but I have just shown that we get a one hundred-

fold contamination. So if it is one per cent and we contaminate one hundredfold, why, we contaminated all of it, haven't we?

Q I don't believe we have. I can't follow your line of reasoning.

A You lead me into this.

Q I think we might straighten it out by using simple arithmetic. You say six hundred forty thousand barrels of water has twenty thousand to the million parts in there; now, that doesn't mean that the whole six hundred some odd million water that was put there is all one hundred per cent salt does it? You have to take a factor to reduce the amount of salt going into the aquifer?

A That is already taken care of in -- Assume it is twenty-five thousand parts per million. This enters into the arithmetic you have already done.

Q Trying to get back to the problem of having the brine laying at the bottom of the aquifer, just how serious a problem it is. I am trying to establish as large an aquifer as you have out there, with the relatively insignificant amount of water, some of which is bound to have evaporated, disposed during that period of time.

A Yes, but the salt has not evaporated.

Q I still think I would like to have you tell me just how important the volume of salt is, in other words in your opinion, down to the bottom of the aquifer. Is it a serious problem?

A Yes, I have already stated it is a serious problem.

Q I want you to apply the figures, the calculation I am trying to get you to make, to see if you come to the same conclusion.

A I just have -- We have just come,by using your method that you have lead me along to, to contaminate eight million acre feet

of water.

Q I think that if you will take those figures back to your office and examine them, you won't find it is eight million acre feet that has been contaminated at all. It is a slighter figure than that.

A You have asked me to assume uniform mixing, and I have.

Q If there should be testimony put into the record, establishing as a hypothetical case, that a water well was drilled at a location where there were no salt water disposal pits in the area, and that it had some six thousand parts to the million upon its being drilled, and that subsequent to that time in order to get water for domestic purposes a location south of there was drilled, south of it, that the water at that point had some eight to nine hundred parts to the million, and that the salt water disposal pit lay south of the second well; would you consider that those facts cast any doubt upon the testimony that you made over here as shown on your map on the board there?

A Not in itself, no. Those facts by themselves don't alter --

Q Assuming in the Lea County water basin, wouldn't those facts lead you to the conclusion that there is salt in solution in various places in that reservoir, which have nothing to do with production of oil and gas at all?

A This is true. I have already said that, that there are areas in Lea County where the natural ground water is not usable for any consumptive use, or for most normal consumptive uses.

Q So taking the actual data you have, aside from the theoretical studies which are reflected in certain of your exhibits, do not support your conclusions at all, because it is just as reasonable

to assume that the salty condition is,in the tested well is due to a natural cause, or perhaps to a leak in the casing as Mr. Montgomery suggested, as they are to the disposal pits?

A No.

Q You don't think that is a reasonable assumption?

A No.

Q If, assuming another hypothetical question, testimony should be put on which would reflect that over a period of five years tests were made of wells at verious locations in Lea County which are close, ranging from seven hundred feet to some little distance farther but reasonably close to the disposal pit, and that those tests showed no significant change in the solids over a period of five years, would such tests as that, cast any reflection upon your testimony, or would it change your conclusions in any respect?

A No, I have already testified to the effect that a well outside a particular band of movement, if it didn't pump too much water, might not be affected at any time. But if large quantities were pumped from the well, sufficiently large quantities such as might be pumped from an irrigation well or group of irrigation wells, that the case you cite would not any longer be true.

Q A well that pumps for irrigation purposes doesn't have to be two hundred fifty parts, it can be higher than that, can't it?

A For irrigation, yes, but frequently the water from an irrigation well is used for domestic use by the -- after all, people live on these farms and operate the farms, just as people live in lease houses and company headquarters and operate oil fields.

These people have to drink water which the Public Health Service recommends not to exceed two hundred fifty parts per million

chloride.

Q I think you testified that the volume of water produced with oil would increase, and I believe you had certain charts to show an increase in the volume of production of water. You have no other basis for your statement than the fact it has increased up until now and therefore it will increase in the future, that is the only basis for your conclusion?

A No, my second basis was a statement by Muskat, which I have a reproduction of, to the effect that almost all known oil field, oil pools are bounded by water reservoirs, and they are a hydraulic connection, and when you remove the oil, the water migrates toward the oil pool and replaces the oil and moves into the wells.

Q You are aware of course, of the fact that eventually if you have enough salt water produced with the oil, it is necessary that you plug the well and abandon it, and stop producing both the oil and water?

A Yes, I am aware of this. I am also aware of the fact that before this point happens a very large quantity of water is produced.

Q But it stopped producing when they plugged the well?

A Yes.

Q That is right? A Yes.

Q So that --

A But until that time a very large quantity of water is produced, and until that time that the well is plugged or decreased in production, the water generally increases. I would like to have the Oil Conservation Commission make further statements on this particular subject. I think they are much more qualified on it

than I am.

Q You testified about it already. Mr. Spiegel, you do have to have a necessary assumption about that continued production, that is, that the wells that are presently producing large volumes of salt water must of necessity continue in the future to produce the same volumes, and that existing well, that might be solution type reservoirs instead of a water drive, would have to be water drive and would have to start producing water.

In order for you to come to that conclusion, don't you believe that the mere circumstance, that Muskat says that water comes across, that he essentially would mean just a theory and not a volume; and we are talking about volumes here, and the only reason for your saying that the volumes of water will increase is the past history?

A That is the principal evidence.

Q Yes?

A But I am certain that, now not all, I will admit there are some pools in, perhaps the water production will decrease, and I have even shown some in which it did decrease after an initial rise. The decrease was very slight and I will repeat that a tremendous quantity of water can be produced before the decrease becomes significant.

MR. SMITH: I have no further questions.

MR. PORTER: Mr. Mankin.

BY: MR. MANKIN:

Q Mr. Spiegel, following the question which Mr. Smith asked you about awhile ago in regard to travel of down water, downward from the pit, which he asked you a question about the

experiments made in the Spraybery Field with the water inhibition test.

Isn't it true that the inhibition test of Caprock above and below and are therefore confined by impervious barriers, and is entirely a different situation from the gravity situation that you spoke of underneath these pits?

A This is true.

Q Also, another question, you indicated that there had been reports received from the operators from their pits in regard to contents, salt content of the water produced from these, of which the Commission asked for such a report based upon a request of the State Engineer's Office, and that such reports were received by the Commission from all operators except two major operators, of which Stanolind was one; and which you attempted to make an arithmetic average of the content of these waters produced?

A Yes.

Q Then, your information of ccurse had to be taken from that which was received, of which two large operators, of course, did not send their reports in --

A That is correct.

Q (Continuing) -- that therefore you had to make the best of the reports you had?

A I have not personally checked to see what their returns have been.

Q That is true, I have made that check.

MR. MANKIN: That is all.

MR. WALKER: Maybe we can help a little bit here. I assume that the reason that this case is before the Commission is because the State Engineer's Office, as well as the Commission, has received

complaints from water users in Lea County, is that correct?

A I think that is correct.

MR. WALKER: Through your tests have you found that the people who are making these complaints, do you think that that is the reason the condition is there, is due to the testimony you have put on today, or through natural causes?

A You mean the increase in chloride?

MR. WALKER: Yes.

A I think in almost all the cases due to disposal of brines by unlined pits, that these increases have occurred.

MR. WALKER: I would like to say at this time, and I am speaking strictly for myself and not in behalf of the Commission, that this being the situation and from the statements that have been made by the various operators, and as a matter of fact the operators that I have talked to individually; I know it's only natural that they are concerned and they have said that they were concerned, and it is apparently a serious situation.

How serious, I don't know, but I can't believe that any operator wouldn't be sincere in what they are saying, and I know they are.

If that is the situation, perhaps this thing does require more study and sufficient time should be allowed the operators to give further evidence, as well as the State Engineer's Office, and as far as that is concerned the Commission, itself. If the study is sufficient that the evidence that you have put on justifies it, why, something certainly should be done, and I know that the operators would want to do something. I am offering that as more of a conjecture on my part to help this thing along more than anything else.

MR. SMITH: May it please the Commission, and in line with what Mr. Walker said, I would like that more time be given to the operators to study the problem. Actually, I think you have had one complaint to my knowledge, of too much salt water in a well. We went into the well itself and found a leaking casing, which I think Mr. Eaton will be able to bring forward at some future meeting. After repairing the casing the well freshened up again. So we are not too sure in our minds that the salt water disposal pits are the cause or the source of this trouble.

We would like to be sure of it before it went into a rather expensive program of disposal. I got the impression from your testimony that you are more concerned over a period of years than you are over doing something today. I recognize that if damage is being done, it should be remedied as quickly as possible. I am curious as to whether or not some period of time might not elapse to run some tests on a number of water wells and see if the increase is there, and before we move in on a large scale program.

A No, I am personally firmly convinced and everyone, I believe I can speak for the office, that further investigation is not necessary to decide that something should be done. Further investigation might be needed to decide what and how something should be done.

We are convinced that the problem is serious, that there is contamination and that something should be done, and that it is really not necessary except for academic reasons to find out exactly how water transfers from one particular pit or group of wells, from a particular well or group of wells. It might be academically interesting to conduct such further investigations, but we personally

don't have the money or the personnel to do it. We don't feel that it is desirable.

MR. PORTER: Mr. Grenier.

BY: MR. GRENIER:

Q I was a little puzzled by some of the mathematical computations Mr. Smith and Mr. Spiegel were doing. I am trying to get some figures to see if I understood him correctly.

Mr. Spiegel, what was your estimate as to the total volume of water in the reservoir, now? Did I understand you to say it was something in the neighborhood of ten million acre feet? I am pretty far back, I could have missed.

A I believe I said it was on that order of magnitude.

Q About ten million?

A Yes.

Q Give or take two or three?

A Give or take ten or twenty.

Q Well, if it was less than ten million, I guess it wouldn't be any at all, would it? Then I understood you, as I recall it, that one per cent of brine water of the solution of twenty thousand parts of sodium chloride to a million, which is about the average of what we were talking about, it would take one per cent of brine water to contaminate it past the point of potability, is that correct?

A No, the main figure that I think I juggled here was that if eighty-seven thousand acre feet were produced in history, which is our figures --

Q I mean you were going through this business, there was an average of fifty thousand, and two hundred fifty parts was the

maximum Health Standard as good water; and that figuring, the concentration and the average of the brine water that was going on down there, it would take about, that one barrel of average content brine water would contaminate about one hundred of fresh water, is that correct?

A That is correct.

Q So then, with this ten million acre feet in the reservoir, it would take about one hundred million, which was I figure would be one per cent -- one hundred thousand which I figured would be one per cent of that to contaminate it, is that correct?

A One hundred thousand barrels to completely contaminate if it were mixed up.

Q Acre feet?

A I am sorry, acre feet.

Q It would stay in acre feet, one hundred thousand acre feet?

A That is right.

Q You said the aggregate input of brine water to the turn of the year had been about six hundred million barrels?

A Yes, or eighty-seven thousand five hundred acre feet.

Q Eighty-seven thousand acre feet. That is where I got lost, right there. I thought you said eight thousand seven hundred, I couldn't follow that one out.

Let me ask you one other thing very briefly, does the water stay in this reservoir or does it flow on out?

A Ground water, under natural conditions, moves if it is fresh water and in this case the brine that is put into it moves along with it. Under all conditions fresh water is always in motion.

Q Is it going on out of Lea County then?

A It is gradually moving in the southeast direction through Lea County, yes, and out of it at a very slow rate of the order of one foot per day.

Q So that would you have any estimate as to how much, if any, of the brine content of the six hundred million barrels has already left Lea County?

A I would say that none of it beyond a marginal area of two or three miles from the state line. That none of the brine produced and disposed in any place more than three miles from the state line has left the state.

MR. GRENIER: Thank you.

MR. PORTER: Mr. Reynolds.

MR. REYNOLDS: S. E. Reynolds, I am the State Engineer for New Mexico.

It is my opinion that our reconnaissance study makes the end result of the present disposal technique obvious where ever these brine pits overlie the fresh water. I think this opinion is supported by the experience that has been suffered in other similar situations. I think that any further extensive studies are not warranted.

There's apparently salt water production of the order of forty million barrels per year, and time is of the essence in this matter. Inasmuch as these present practices have been engaged in for a number of years, I think it would be unreasonable to ask for an immediate end to it. I do think they should be ended in a comparatively short time.

MR. MADOLE: Could I ask Mr. Reynolds a question?

MR. WALKER: If he cares to answer it.

MR. MADOLE: Is it your recommendation that water be disposed of by injection wells, or just the wells producing the excessive amounts of salt water?

MR. REYNOLDS: I would like to answer that a little fully.

I think some further investigation is warranted, investigation toward this end. That is, to determine where the brine disposal pits might not overlie fresh water and therefore might not endanger fresh water.

MR. MADOLE: You wouldn't indicate, where you had a few barrels of salt water a day, that an injection well be drilled to dispose of the water?

MR. REYNOLDS: Not if you had a few barrels and made proper provision to fully evaporate and not let it mix with the fresh water I would agree it could be disposed of without the injection well.

MR. MADOLE: I would like to make the motion that the case be continued to see if the industry, I believe we are all working for the same thing, we are not antagonists, we want to cooperate; I can't say for anybody else but I can say for Magnolia that where our wells are producing excessive amounts of water, that we fully expect to dispose of it with injection wells.

In other cases where wells are producing excessively, it is not economically feasible to dispose of that water by injection wells. Now those, there are going to be those cases, and it is going to be a question of whether to abandon that lease and forever not recover that oil that is being produced there, or still produce it in salt water pits.

There is another alternative that there is a possibility if

that situation exists in a pool, that you could put down some co-operative injection wells, but those things will take time. I have been through Oklahoma and I have been through Kansas, and to my knowledge these things can't be solved over night. I think that if Mr. Reynolds or any of them have been in touch with Oklahoma and Kansas, they know that the matter is being worked out without any compulsory order.

I think that eventually if the matter is not brought to a conclusion satisfactory to the State Water Engineer and the Oil Conservation Commission, that it might be necessary for some compulsory order as to a few instances, but I don't think that we should at this time put in a compulsory order,and give industry a chance and see if we can cooperate with Mr. Reynolds. And if it becomes necessary that we become antagonistic, we can become that when it comes to it. I would like to remain friends as long as we can.

Would you be receptive to postponing any entry of any order for six months, and let industry see what they can do? There have to be studies made. We are making a lot of salt water in the Denton Pool. There is a possibility of water flooding into the Wolfcamp, then there has to be a study of where you can put the water if you do put it into a water flooding project.

There is, right now there is an injection well at the Denton Plant of Atlantic into the Santa Rosa, which has been permitted. So I was flabbergasted when Mr. Spiegel told me it wasn't good for me to put that water in there. We had already studied the record in there with the possible inject in the Santa Rosa, but according to Mr. Spiegel that would not be satisfactory to him.

We have no information on the pressures, on the expense

involved in putting it into the permian. It certainly would take time, it can't be done over night.

With permission of the Commission I would like to move that the matter be postponed for say six months, and give industry an opportunity to see what it can do in the way of solving this water problem. I don't speak for anyone else.

MR. SMITH: For Stanolind Oil and Gas Company I would like to join substantially in what Mr. Madole has said on behalf of Magnolia.

We are contending if there is contamination going on we want to eliminate it and take whatever steps are necessary. I think the entry of an order requiring all water to be reinjected into the permian is,perhaps, unrealistic. I think that a little time to study the problem and find out what is happening or as close as we can come to it, would be very helpful.

I would like to join in his motion that the matter be put forward for six months or whatever time that the Commission may feel is reasonable in the circumstances.

MR. WALKER: Mr. Reynolds, would you care to elaborate on that?

MR. REYNOLDS: Yes, I think the question was addressed to me awhile ago. I didn't have the opportunity to answer it.

I would like to make our position clear. We feel that the administration of the problem is most properly handled by the Oil Conservation Commission, that is, what disposal techniques should be used, and when adopted it is a matter for them to decide. We have brought the problem to them and we feel they will do everything reasonable to solve this problem.

It does seem to me that six months is a rather long time to think about this. I think, perhaps, we should have some definite

plan of action before that time.

MR. GURLEY: If it please the Commission, would four months be sufficient in a case like that as far as your company is concerned, Mr. Madole?

MR. MADOLE: I can only speak for Magnolia, and we have discussed this matter very fully and the engineers said that they can not come up with the economics, the data, and dispose of the ones, they thought in less than six months, and that they wanted six months time if possible.

He said, thinking about it. We are going to do something more than thinking about it. We are going to do some disposing, then after the end of the six months we will probably have some water still, and these are the things that ought to be discussed before the Commission at that time.

I think you will find that most companies will try to dispose of their excessive water wells, the wells that might be casing. It might be that they will take a look into economics of plugging that well, so as to cut off that excessive flow, and they may look into the possibility of taking a low producing well and making an injection well out of it.

It is a matter which has to be studied, they are in the business to make money, too. The millennium would be to dispose of all this water, but they have got to be considered, too. I don't think six months is an unreasonable time, not to think about it but to do something.

MR. PORTER: Judge Foster.

MR. FOSTER: E.F. Foster, representing Phillips Petroleum Company. We made some study of this water problem in New Mexico. We'd like

to suggest that we proceed in a rather orderly fashion about this matter, perhaps taking up the question field by field.

We know that in some areas that there is a rather serious condition that does exist today. We know that in other areas the situation is not so critical,and we know that in other areas we think that no action is needed now.

Even in those areas where there is now some, maybe immediate relief to be had, that that wouldn't apply to all of that area. You could even zone that area to some extent. We'd like to suggest that the Commission set this matter down on a field by field basis, so that you can get the actual facts that exist in each one of these fields, the history of the field, and then what ought to be done. I think that would be an orderly way to go about it.

We are not asking that you delay the matter any at all, but you could set it down for these field hearings on a show cause order and we would be ready on that basis, most any time, to discuss and present what we think ought to be done.

MR. PORTER: Are there any further statements in this case?

MR. SMITH: I should like to ask the Commission if they plan to give us the motion and make the motion that I will not make Mr. Eaton to testify this afternoon. If you plan to close or conclude the Hearing at this time I might want to put him on.

MR. WALKER: What Mr. Porter really meant,is,there any more discussion on the motion, because the motion is before the Commission. What we really wanted is did anyone have any further discussion on the motion. And we wish to recess for a few minutes to give you our decision on the motion.

MR. PORTER: We will take a short recess.

(Recess.)

MR. PORTER: Mr. Madole, the Commission will deny your motion for continuation for six months. We have decided to continue the case for four months which will be until the regular hearing on September 13th, this year.

In the meantime we think that within the next thirty days the State Engineer's Office will supply us with information as to the most critical areas, that is, where the brine pits overlie the fresh water supply, and we in turn will pass that on to the operators.

At the September Hearing we are going to expect to hear some progress reports from the operators in the industry, and on the basis of those reports we will determine whether or not we should enter an order.

MR. WALKER: I would like to call it to your attention that on the basis that this decision was made, that the Commission and State Engineer's Office is cognizant of the circumstances and the economy that the industry plays as far as the state is concerned, as far as it plays in the operators part. And we certainly do want to be cooperative and although not to the six months, doesn't mean that if you come in here at four months time that is when we are going to take a look at it; if you do have a progress report showing that you are trying to cope with this situation, then we can take another look at it.

Speaking for myself, and Mr. Porter, and the rest of the Commission, I know that no one wants to issue an order, compulsory order of any kind. I think this thing can be worked out. I would like to say, as far as the Commission is concerned, I want to

commend Mr. Spiegel for the manner in which he has put on his testimony, and also, the way that you gentlemen have interrogated him. I think the whole thing has been very helpful.

C E R T I F I C A T E

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the Oil Conservation Commission for the State of New Mexico was reported by me in stenotype and reduced to typewritten transcript by me and/or under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal, this, the 28th day of May, 1956, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My Commission expires:

June 19, 1959.

BEFORE THE

Oil Conservation Commission

SANTA FE, NEW MEXICO

April 18, 1956

IN THE MATTER OF:

CASE NO. 1053

TRANSCRIPT OF PROCEEDINGS

ADA DEARNLEY AND ASSOCIATES

COURT REPORTERS

605 SIMMS BUILDING

TELEPHONE 3-6691

ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
April 18, 1956

IN THE MATTER OF:

CASE NO. 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

BEFORE:

Honorable John F. Simms, Jr.,
Mr. E. S. (Johnny) Walker,
Mr. A. L. Porter, Jr.

TRANSCRIPT OF PROCEEDINGS

MR. PORTER: We will move on to Case No. 1053.

MR. GURLEY: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico.

I think we have some testimony at this time.

MR. PORTER: Mr. Mankin?

MR. MANKIN: At this time, as indicated in the application, this request for hearing was originally instituted by the State Engineer for the proper disposal of salt water in Lea County.

At this time, I wish to introduce Mr. Steve Reynolds, who is the State Engineer of New Mexico, who is incharged with the control of fresh water supplies of New Mexico. Mr. Reynolds, would you

stand? Mr. Frank Berry, in charge of the water resources, and also I would like one witness sworn to give a statement indicating what the problem is at this time. Mr. Zane Spiegel, geologist with the State Engineer's Office. He has prepared a statement which he would like to give, which we would like to have him sworn in to present this into the record at this time to indicate what the problem is.

Would you come forward, Mr. Spiegel?

(Witness sworn.)

ZANE SPIEGEL,

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

DIRECT EXAMINATION,

BY MR. GURLEY:

Q State your name and position, please.

A Zane Spiegel, Geologist for the State Engineer's Office.

Q You have a statement to make into the record at this time?

A Yes, I do.

Q Would you make that statement, please?

A I will read in part from a statement which was submitted as an Exhibit, and this will be submitted. I will make a few comments about this exhibit which are not written on the paper. From the standpoint of the conservation of our fresh ground-water supplies, the best way of disposing of salt water produced from oil wells appears to be by injection into salt water-bearing formations, preferably into those from which appreciable quantities of fluids have been or are being withdrawn.

However, the large amounts of salt water that already have been recharged to the freshwater aquifers in Lea County, as well as else-

where, and the rapidly increasing annual production of salt water from most pools make the present disposal methods a serious threat to the entire economy of the areas in which contamination is occurring. Of the 142 oil pools in Lea County, all but 16 of them have reported some water production, which is salt water, of course.

Our recent study of the disposal of salt water from oil wells in Lea County has resulted in several important conclusions, as follows:

1. The cumulative production of salt water reported in Lea County to January 1, 1956, is 677,627,135 barrels, and this is equivalent to 28,476-million gallons, or 87,500 acre feet; an acre foot being the unit of volume commonly used in ground water studies which represents the volume of water which would cover an acre of land one foot deep.
2. The total salt water production in Lea County for 1955 was 40,497,031 barrels, or 1,700-million gallons or about 5,240 acre feet. This figure was computed from figures of the Oil Conservation Commission Committee in Hobbs. The figure for the cumulative total was also from their records.
3. As a basis of comparison, the total annual pumpage of fresh ground water for irrigation is on the order of 300-thousand acre feet annually.
4. The chloride content of the disposed waters range from about 4,500 to more than 300,000 parts per million, averaging about 75,000 parts per million. The average for 109 samples is approximately 75,000 parts per million chloride. The approx-- imate amount of water that can be contaminated from the normal ground water content of chloride in that area, to the maximum

which is required by the Public Health Service of 250 parts per million chloride is the ratio of about one barrel of salt water to 200 barrels fresh water. Using an average of about 50,000 parts per million chloride, it can be easily seen that much more would be contaminated to this extent, if the average of 75,000 parts per million were used.

5. Calculations of the potential evaporation indicates that the areas of the pits used to dispose of the waters are entirely too small to evaporate even a very small part of all water disposed. Definite field evidence of actual contamination has been collected. Field evidence further substantiates that the disposal water actually is not being evaporated to an appreciable extent, and that the salt water must therefore percolate downward from the disposal pits into the underlying aquifers. The lack of data and the characteristics of the movement of salt water in an aquifer containing fresh water make it difficult to prove contamination near every disposal pit at the present time. Generally, changes in quality at a particular well are likely to be gradual and perhaps unnoticed at first, especially for those in the immediate vicinity, say, a few hundred feet from the disposal pit. The partial evaporation that might occur from water in present disposal pits results in a slight concentration of the dissolved solids; however, the amount of salt carried downward from leaking pits is virtually the same whether partial evaporation occurs or does not occur.

In other words, the water becomes more concentrated, and it leaks the more concentrated solution downward, carrying the same

amount of salt, but a little less water. If it is, therefore, necessary to use pits the size of the present pits used for disposal, it is not adequate to evaporate the disposed water in approximately two thirds of the oil pools. We don't have detailed data from the operators, which would allow us to determine exactly what quantity of water is disposed into a particular pit, we only have data by pools, at the present time, and by wells, but not by pits.

When this data is collected, we will be able to make a more adequate estimate of the individual pits which, if they were tightly sealed would be adequate to evaporate all of the water and precipitate out all of the salt in the pit.

It has been estimated that pits many acres in extent would be required to completely evaporate the water from most of the water producing wells, those that produce most of the water.

Here are some rough estimates that I can give you: About 90 per cent of the total water produced is produced from 25 out of the 142 pools.

That is all I have from this initial statement.

Q Do you wish to introduce the Exhibit as Exhibit 1 in this case?

A Yes, sir.

MR. GURLEY: If it please the Commission, I would like to move admittance of the exhibit.

MR. PORTER: Without objection it will be received.

Q Do you have anything further to offer in this case?

A No, that is all.

MR. PORTER: Are there any questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Mankin, will you make your statement, please?

MR. MANKIN: Yes, sir. As will be noted from the statement presented by the State Engineer's Office, there is a very definite problem in Lea County. It has been first suggested that an Operators' Committee should be formed to further study this problem. We gave that considerable consideration, but we feel time is very important and we can not further delay this problem. So that was decided not to take place, or not to suggest that particular action.

Therefore, we are going right ahead and recommend that the hearing be continued to the May 16 hearing, and be consumated at that time. At that time, if the operators do not see fit to recommend some type of action, and some type of disposal wells, then we will make very definite recommendations ourselves for an order referring disposals, where there is a problem, underground, because pits are not adequate.

We have asked the State Engineer's Office to determine in each individual area of Lea County what zones would be best for disposal, what underground zones, what water bearing zones, and at that time, at the May hearing, we expect that they will be able to give us that information so that the operator would be aware of what zones might be considered adequate for existing well locations, abandoned wells, wells to be drilled for disposal and to eliminate the contamination problem.

I therefore recommend that the case be continued and consumated and an order written at the May 16th hearing.

MR. PORTER: Are there any objections to the continuance of this case to the May 16th hearing?

MR. SETH: Will the records be made available by the Commis-

sion for study by the various interested parties, and also will the State Engineer's technical people be available on the May hearing for questioning?

MR. PORTER: I believe that is right, but let's clear it up.

MR. MANKIN: I might say that the State Engineer's Office has another gentleman in the field, and we have had the request from several operators for a continuance of this case, and that is the reason we are asking for continuance, primarily verbal requests from other operators.

MR. SETH: Will the information be available to the operators?

MR. PORTER: Yes, and it was my understanding that they would possibly have other information to offer at the May hearing.

MR. SETH: I see.

MR. WALKER: I think what Mr. Seth wants to know is will the State Engineer's Office furnish the operators that so desire some information between now and the May hearing.

MR. MANKIN: That may be possible.

MR. SPIEGEL: I think that certain information can be furnished. We have tabulated the water produced; and there is important information, amount of water being disposed at a particular point, we have not received that yet.

MR. MANKIN: That is the particular thing we are asking every operator to submit.

MR. WALKER: I might suggest that if anyone wants this information, any operator, that he contact the Oil Conservation Commission and we will endeavor to furnish you with what information we can get.

MR. PORTER: The case will be continued to the May 16th hear-

ing. We will take a five-minute recess.

(Recess.)

C E R T I F I C A T E

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, THURMAN J. MOODY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the Oil Conservation Commission for the State of New Mexico was reported by me in stenotype and reduced to typewritten transcript by me and/or under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal, this, the 27th day of April, 1956, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Thurman J. Moody
Notary Public.

My Commission Expires:
April 3, 1960.

[redacted]

[redacted]

[redacted]

September 2, 1958

New Mexico Salt Water Disposal Program Report

Eunice Pennsylvanian Pool

State "C" A/C-1 Lease - Two producing wells and one well shut-in. Average daily water production: 30 bbls. In cooperative plan with Amerada that is presently in operation.

Eunice Silurian-Devonian Pool

State "C" A/C-1 Lease - Two producing wells that average 140 bbls. of water per day.

State "C" A/C-1 Lease - Three producing wells that average 150 bbls. of water per day.

All water being disposed of in the pool cooperative plan operated by Amerada.

East Jalmat Permian Pool

State "C" A/C-1 Lease - One producing well that averages 5.0 bbls. of water per day. In cooperative plan that is operated by Amerada.

Jalmat Pool

State "C" Lease - Four producing wells that average 2 bbls. of water per day and produce from the San Andres.

State "C" A/C-1 Lease - Two producing wells that were completed in January and March of 1958 and average 2 bbls. of water per day. Producing formation: Grayburg.

With approval of Oil Conservation Commission, it is planned to install a 100' x 100' x 5' gunnite-lined pit at the State "C" Lease and a 70' x 80' x 5' gunnite-lined pit at the State "C" A/C-1 Lease. The former has an estimated evaporation rate of 25 BPD while the rate for the latter is 14 BPD, and it is believed this will serve TP needs for several years. When these gunnite-lined pits cannot handle the water production, the necessary steps will be taken to devise other means of salt water disposal.

Saxonburg Area

Butler Co. Joint - This recently completed well was potentialized on August 5, 1958, and is not producing water. However, when water production does appear, applications will be filed with Amerada for entry in the presently operating cooperative salt water disposal system.

...RE THE OIL CONSERVATION COMMISSION
...OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL
CONSERVATION COMMISSION OF NEW MEXICO FOR THE
PURPOSE OF CONSIDERING:
APPLICATION OF THE OIL CONSERVATION COMMISSION
OF ITS OWN MOTION AT THE REQUEST OF THE
STATE ENGINEER, FOR AN ORDER PRESCRIBING RULES
AND REGULATIONS TO GOVERN THE DISPOSAL OF SALT
WATER IN LEA COUNTY, NEW MEXICO.

...ATLANTIC AND EXPLORATION COMPANY ...
...DATED ...
...ORDER ...
...ORDER ...
...AUTHORIZING ...
...DISPOSAL OF WATER ...
...WELL LOCATED IN ...
...SECTION ... TOWNSHIP 21 SOUTH, RANGE 35 EAST,
...DESIGNATED AS DRILLING AND EXPLORATION ...
...STATE 'F' LEASE AND FROM THE SE¼ OF
...SECTION ... TOWNSHIP 21 SOUTH, RANGE 35 EAST, N.M.
...DESIGNATED AS DRILLING AND EXPLORATION COMPANY
...WELL LOCATED OTHER THAN THE PRESENTLY
...AUTHORIZED WATER DISPOSAL

...Atlantic and Exploration Company, Inc. ...
...Application for Amendment of Application to Commission ...
...Commission Order No. ...
...and Completion Order No. ...
...and would respectfully show:

...Applicant is the operator of nine wells located
...Eumont Field in Lea County, New Mexico, said wells ...
...wells 1, 2, 3, 4 and 5, located in the NW ...
...SW¼ ... Section ... Township 21 South, ...

[illegible] Section 2, and 4, [illegible] the SE¼ of Section 12 [illegible] Range 37 East, N.M.P.M. Lea County, New Mexico designated as Drilling and Exploration Company, Inc. State Endura Lease

2. That the five wells located on the State F Lease produce an average of ten barrels of water per day

3. That the four wells located on the State Endura Lease produce an average of one barrel of water per day

4. That the water produced from both leases is now being disposed of in open pits located on the Leases.

5. That a well for water was drilled on the State Endura Lease to a depth of 315 feet and was abandoned as a dry hole. That there are no water wells located within a radius of one mile of the State Endura Lease.

6. That on the State F Lease there are no production water wells. There is one producing water well approximately 1100 feet West of this Lease. The production from this water wells is insufficient at times to furnish water for livestock. That attached hereto and made a part hereof is a Laboratory Report, marked Exhibit "A", showing the properties of the wa[illegible]

...from this well. That in this connection [illegible]
...water has been produced on the State F Lease since the [illegible]
...[illegible] and has been disposed of in an earthen evaporation
...tank located thereon.

7 Respondent would show that in view of the fact that there are no water wells on, or under lease under the State Endura Lease, located in Section 12, Township 21 South, Range 35 East, and in view of the fact that the nearest water well to the State F Lease, located in Section 19 Township 21 South, Range 36 East, is approximately [illegible] and since the disposal of produced water from the State F Lease has been cared for by earthen evaporation [illegible] since October 15, 1939 without any apparent [illegible] to the said water wells, respondent claims that its method of disposal of produced water has resulted in no contamination of fresh water streams and, therefore, is in full compliance with the requirements of Commission's Memorandum No. 22-56 dated July 3, 1956 and any Orders that may be issued thereon.

Any representations placed on this respondent to limit the geographical extents of the disposal of its produced water from the Leases in question would be unwarranted and would be [illegible] to [illegible] social load to respondent.

WHEREFORE, applicant prays that having fully complied with the Commission's Memorandum No. 22-56, dated July [illegible]

...mission Order No. R-1224, dated July 28, 19...
...the Commission continue said Order R-1224, to apply
...Eumont Pool and should the Commission enter an
...order requiring any disposition of production water within
...Pool other than the disposition presented used and
...treatment that then was in that event the
...interpretation Exception and delete ...
...and the SW4 of Section 19 ...
...and the SE4 of Section ...
...Range 38 East, N.M.P.M., Lea County, ...
...and for such other and further relief as the ...

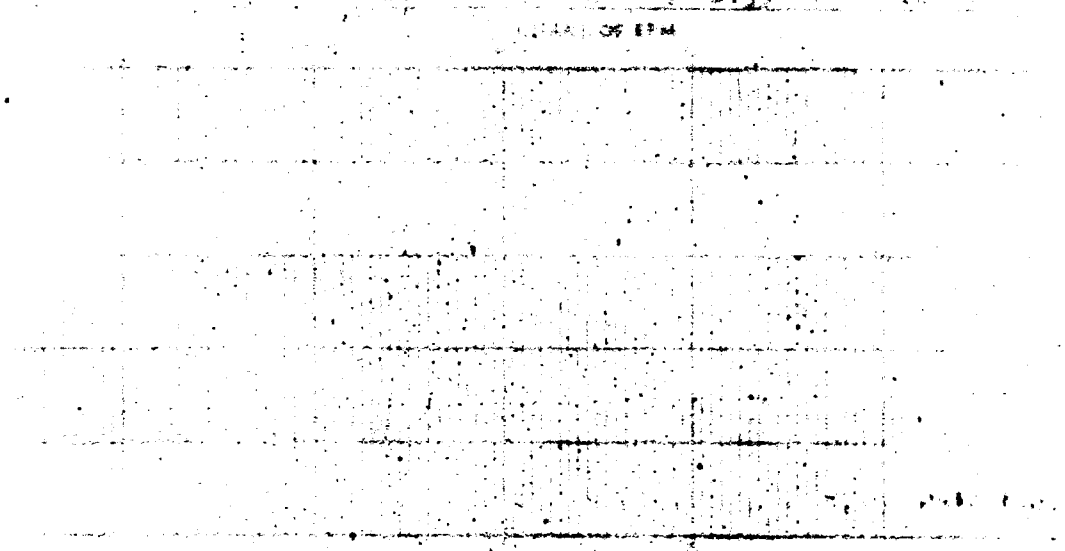
...entitled ...

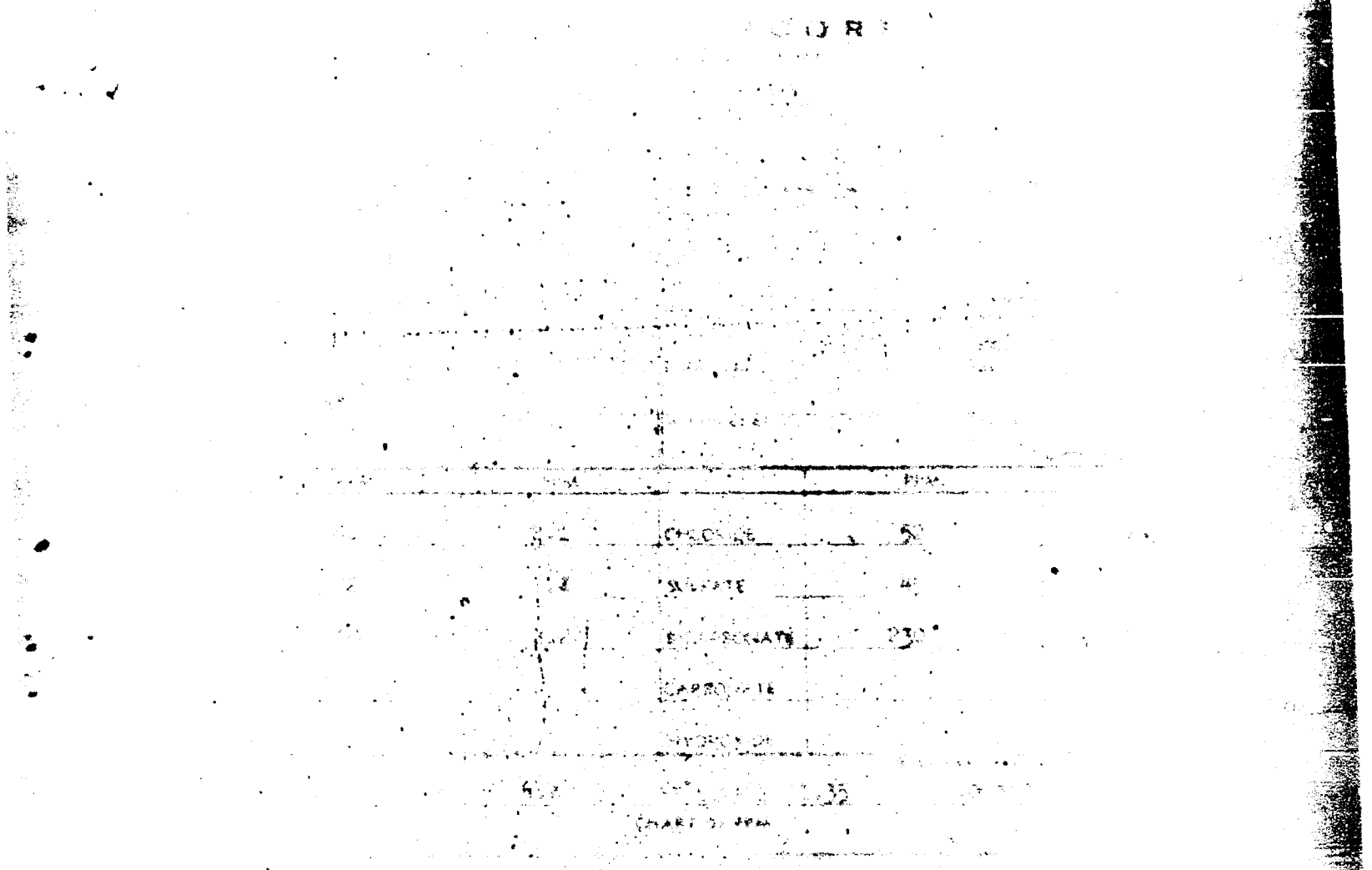
DRILLING AND ...
INC.

BY: ...

ATTORNEYS FOR ...

Exhibit "A"





SOUTHERN PETROLEUM EXPLORATION

ROSWELL NEW MEXICO

[illegible] Case No. [illegible], Order No. [illegible]

[illegible] the matter of making our wells in Texas [illegible] one-half (1 or 1/2) barrels of water, it appears [illegible] cutting off its nose to spite its face because a great number [illegible] wells on State land and the revenue, therefore, would cease [illegible] New Mexico. We also wonder if the Commission recognizes [illegible] shut in for considerable time that it cannot be brought back [illegible] that the production is gone forever. We sometimes wonder if New Mexico [illegible] a part of the United States that comes under provisions to the Constitution [illegible] the United States of America.

However that may be, we are doing the best we can to get all of our wells subscribed to any salt water disposal system that has been approved by your Commission. We recognize the fact that the Oil Conservation Commission is all powerful and can demand and regulate all things with reference to the production of oil and we, therefore, have no choice in the matter.

Yours very truly,

J. B. Hen[illegible]

JBH:sw

1 Encl. - Receipt

cc - Southern Petroleum Exploration, Inc.
Sistersville, West Virginia

Neville G. Penrose, Inc.
Fort Worth, Texas
September 4, 1958

New Mexico Oil Conservation Commission
[illegible]
[illegible], New Mexico

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

Gentlemen:

Reference is made to Order No. R-1274, dated July 26, 1958 relating to disposal of salt water produced from certain fields in Southeast New Mexico. Although we [illegible] the desire of the Oil Conservation Commission to prevent contamination of fresh water bearing horizons in Lea County, New Mexico, we do not feel that water production from our wells in the fields mentioned in your order is of sufficient magnitude as to be a source of concern.

In Paragraph 1, Page 2 of the above order, operators are told to "proceed with due diligence to complete efficient disposal systems for all salt water produced" in several fields which were enumerated. The only field listed in which Neville G. Penrose, Inc. has production is the Eumont Field and we have joined the Eumont - Monument Salt Water Disposal System. Although our water production is negligible, we are willing to join with other operators in this first disposal system in order to ascertain the practicality of this manner of handling excessive amounts of water.

In Paragraph 3, Page 3 of the above order, operators in certain named areas were to "proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas". Among those fields listed Neville G. Penrose, Inc. has production in the following fields with the daily water production and number of wells shown opposite each field.

Langlie - Mattix	1 well	0 bbls. water per day
Arrowhead	2 wells	3.2 bbls. water per day
Brunson	4 "	1.5 " "
Vacuum	9 "	1.2 " "

At the present time this small amount of water is being produced into disposal pits and evaporated. We will continue to observe the attempts of [illegible] operators to prevent seepage into the soil by lining pits with cement, plastic, etc. Our observations of similar attempts in other areas [illegible] lead us to believe that this method is not too practical. We are willing to cooperate with other operators, in fields where we have production, in studying the feasibility of group disposal systems. However, because we are minority operators in each field listed and because our water production is at a bare minimum, we do not feel justified in instituting such a proposal. Our experience with the Eumont-Monument Disposal System has indicated that it may cost several thousand dollars a well to build a system and in fields where our oil production is marginal

[illegible] water production, normal, such as experience might meet the difference between [illegible] can be the issue in question. If our present means of handling produced water [illegible] impossible, we can and will produce these small amounts of water into tanks from which water can be hauled to disposal facilities.

Very truly yours,

John F. McNaughton

JFM:jp

cc: Oil Conservation Commission
Hobbs, New Mexico
Attention: Mr. Randall Montgomery

Mr. Henry Bright
Eunice, New Mexico

R M MORAN

Box 1716

HOBBS, NEW MEXICO

August 12,1958

New Mexico Oil Conservation Commission
Santa Fe,
New Mexico

Re: Hobbs Pool Salt Water Disposal
Regular Sept.17,1958 Hearing

Gentlemen:

R.M.Moran is the operator of one (1) well in the Hobbs Pool. Namely the Hardin "B" No.1, located in the SE¼ NW¼ of Section 18, Township 18 South, Range 38 East, NMPM.

This well is not at present producing any water whatsoever and I firmly believe that it will never produce an appreciable amount of water.

This well was completed in the Grayburg formation and in the drilling and completion never penetrated the San Andres formation which in most peoples opinion is the water producing formation.

This lease is a marginal lease and if I am compelled to make arrangements to dispose of water I must produce, it will mean premature abandonment of this lease.

Very truly yours,

R.M.Moran

TEXAS PACIFIC COAL AND OIL COMPANY

FORT WORTH
TEXAS

MIDLAND, TEXAS

Re: Warlow Salt Water Disposal Progress Report

Arrowhead Pool
[illegible] in pool cooperative system.

Cowden Pool
Attended Penrose Area Operator's meeting on August 24, 1956, which was called by Shell. Shell and Cabot are already operating salt water disposal systems in the area, and with Shell's anticipated system, it was believed other pools in the area could also be included. TP has wells in three of these additional pools: the Drinkard, the Penrose-Skelly and the Paddock.

Eunice Pool
Interested in pool cooperative system.

Eunice Kallik
Interested in pool cooperative system.

South Eunice
Interested in pool cooperative system.

TEXAS PACIFIC COAL AND OIL COMPANY

GENERAL OFFICES
FORT WORTH 1
TEXAS

September 8, 1958

Re: Haskins Salt Water Disposal Program Upton

Ackerly Unit
Interested in pool cooperative system.

Kennedy Unit
Attended Dawson Area Operator's Meeting on August 12, 1958, which was called by Shell. Gulf and Magnolia are already operating salt water disposal systems in the area, and with Shell's anticipated system, it was believed other pools in the area could also be included. TP has wells in three of these additional pools: the Strickland, the Donovan-Emily and the Fuhrman.

Adams Unit
Interested in pool cooperative system.

Lassiter Unit
Interested in pool cooperative system.

Jones Ranch
Interested in pool cooperative system.

TEXAS PACIFIC COAL AND OIL COMPANY

GENERAL OFFICES
FORT WORTH
TEXAS

Secretary Director
New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Dear Sir:

Article [illegible] properties operated by Texas [illegible] Company [illegible] would have been the subject [illegible] cluster or oil separating unit with [illegible]

The first part of the report covered [illegible] by the Commission as having been late attempts [illegible] type oil. It should be pointed out that in the [illegible] the small amount [illegible] before proved to be [illegible] to have pending [illegible] of the gunnite evaporat[illegible]

The second part [illegible] the report covered [illegible] the pollution [illegible] with oil and [illegible] to the Santa Fe [illegible] operative [illegible]

Yours very truly,

TEXAS PACIFIC COAL AND OIL COMPANY
By

[illegible]

[illegible] COAL AND OIL COMPANY

[illegible]
Fort Worth
Texas

[illegible]
Fort Worth Club Bldg.
Midland, Texas

[illegible] Re: Salt Water Disposal Progress Report

[illegible] Pool
[illegible] State "A" [illegible] Lease - Two producing wells are now w[illegible]
[illegible] Ivester Lake, water production 40 BWPD. T[illegible]
[illegible] positive fear with Amerada that is presently in operat[illegible]

[illegible] Pool
[illegible] State "B" [illegible] Lease - Two producing wells that average [illegible]
[illegible] of water per day.

[illegible] water being disposed of in the pool cooperative plan [illegible]
[illegible] by Amerada.

[illegible] Regular Pool
[illegible] State "A" [illegible] Lease - Two producing wells that average [illegible]
[illegible] of water per day. The cooperative plan will be operated [illegible]
by Amerada.

[illegible] Pool
State "A" Lease - Four producing wells that average 2 bbls. [illegible]
water per day and produce from the San Andres.

State "A" [illegible] Lease - Two producing wells that were drilled [illegible]
February and March of 1958 and average 2 bbls. of water per [illegible]
from producing formations [illegible]

[illegible] approval of Oil Conservation Commission, it is planned to [illegible] a 150' x 150' x 5' gunnite-lined pit at the State "A" [illegible] Lease and a 75' x 90' x 5' gunnite-lined pit at the State "A" [illegible] Lease. The former has an estimated evaporation rate of [illegible] while the rate for the latter is 14 BPD, and it is [illegible] will serve adequately for several years. When [illegible] gunnite lined pits cannot handle the water production, [illegible] arrangements will be taken to devise other means of [illegible]

[illegible] - [illegible] recently completed well was [illegible] on [illegible], 1958, and is not producing water. However, when water disposition does appear, application will be filed with Amerada for entry in the presently operating [illegible] water disposal system.

HUMBLE OIL & REFINING COMPANY

AGENCIES DIVISION

MIDLAND, TEXAS

August [illegible], 19[illegible]

[illegible]
[illegible]
[illegible]

[illegible] of New Mexico
[illegible] Conservation Commission
[illegible]
Santa Fe, New Mexico

Gentlemen:

This letter is a report on the progress made thus far by Humble Oil & Refining Company toward effecting efficient subsurface disposal of its produced salt water in Lea County, New Mexico, in compliance with Oil Conservation Commission Order No. R-1124.

Of the fields classed as requiring due diligence in the completion of effective salt water disposal systems, Humble has water production in only the Hobbs and Eumont areas. Humble has joined with the other operators in these areas in forming jointly-owned salt water disposal systems, into which 14 wells in the Hobbs system and 51 wells in the Eumont-Monument-Fowler system. Disposal facilities in the Hobbs field, which are currently employed in disposing of salt water produced from two leases, are to become a part of the jointly-owned Hobbs system.

With the exception of four leases in the Eumont Field, all Humble-operated properties which produced salt water during July 1958 in the Hobbs and Eumont-Monument-Fowler areas, have been committed to the jointly-owned systems. The Humble leases which produce water and are not committed to the Eumont-Fowler system include the New Mexico State "AC", New Mexico State "AT", New Mexico State "G", and New Mexico State "M", on which there are a number of wells, five of which are producing salt water. The five wells produced a total of 12 barrels of water per day, or slightly more than 2 barrels per well during July 1958. The [illegible] to connect these wells at this time was based on the fact that the cost of water disposal is small, and in addition, in the case of the New Mexico State "AC" lease, it is not in the proximity of the proposed system. Disposal facilities for these wells, either [illegible] committed to the jointly-owned system or by installing [illegible], will be made when the produced water volume becomes significant.

It is our understanding that representatives of your [illegible] will be on hand for the September 1 hearing to [illegible] the progress made toward installing [illegible] salt waters.

[illegible] area [illegible] requiring due diligence in formulation of [illegible] water disposal, Humble has water production in the Langlie Mattix, [illegible] Saad, Brunson, and West Lovington Fields. The volume of Humble water production in the Langlie Mattix Field (5 bbls/day) is considered [illegible] small to warrant disposal facilities at this time. With a letter of August [illegible], Humble contacted the major producer in the Arrowhead and Brunson areas inquired as to possible plans for calling an operators meeting, and advised that Humble would like to work with the other operators in investigating various approaches to effecting salt water disposal in the area. On August 12, 1958 there was a meeting of operators in the Brunson area called by Shell to discuss salt water disposal. Preliminary data are to be compiled for all reservoirs in the Brunson area and it is anticipated that an engineering committee will be appointed to study salt water disposal in the Brunson area, at the next operators meeting. Humble is currently participating in a joint engineering study of the West Lovington Field, and with a letter of August 7, 1958, Humble recommended to the chairman of the study committee that the problem of salt water disposal be considered concurrently with other phases of the study.

Although the field is not listed in Commission Order No. R-1224, operators in the Saddill Devonian Field are proceeding with initiation of a jointly-owned salt water disposal system. Humble has executed the joint operating agreement and has approved an AFE covering installation of the system.

Yours very truly,

HUMBLE OIL & REFINING COMPANY

R. E. Mowatt

[illegible]

[illegible]
August 1, 1958

[illegible] Conservation Commission
[illegible] the State of New Mexico

Re: Order [illegible]-1221
Salt Water Disposal [illegible] Denton-W[illegible]
Field, R. H. S[illegible], N. Mex. [illegible]

Gentlemen:

PROGRESS REPORT

This letter will serve as a report as specified in the above order concerning our lease in the Denton-Wolfcamp Field.

This well produces no water, therefore discussion concerning the disposal of salt water does not enter into our operation.

Yours very truly,

L. Mayfield
Production Manager

cc: Mr.
Oil Conservation Commission
Box [illegible]
Santa Fe, New Mexico

Oil Conservation Commission
Box 2045
Hobbs, New Mexico

[illegible] PILLARD
[illegible] SUPERINTENDENT

VERNON TURNER
[illegible]

McALESTER FUEL COMPANY

PRODUCTION DEPARTMENT

McALESTER BUILDING

MAGNOLIA, ARKANSAS

MORAN OIL PRODUCING & DRILLING CORPORATION

Box 1718
HOBBS, NEW MEXICO

GENERAL OFFICES
903 WEST MARLAND
HOBBS, NEW MEXICO

PHONE
EXPRESS 3-2571
EXPRESS 3-2417

August 12,1958

New Mexico Oil Conservation Commission
Santa Fe,
New Mexico

Re: Hobbs Pool Salt Water Disposal
Regular Sept.17,1958 Hearing

Gentlemen:

Moran Oil Producing & Drilling Corporation is the operator of four (4) Hobbs Pool wells. Namely the Rice 1, 2, 3 and 4, located in the NE¼ of Section 13, Township 18 South, Range 37-East, NMPM.

These wells are not at present producing any water whatsoever and we firmly believe that they will never produce an appreciable amount of water.

These wells are completed in the Grayburg formation and in the drilling and completion never penetrated the San Andres formation which in most peoples opinion is the water producing formation.

This lease is a marginal lease and if we are compelled to make arrangements to dispose of water we dont produce, it will mean premature abandonment of this lease.

Very truly yours,

RVM/ig

R. V. Moran

GIRAND & STOUT
LAWYERS
[illegible] NEW MEXICO

ada
Dearnley

[illegible] 12, 1958

[illegible]

Attention: Mr. A. L. Porter, Secretary

[illegible] you will find original and [illegible]
[illegible] Petroleum Exploration Company [illegible]
[illegible] Memorandum No. 22-56 and Order No. [illegible]

[illegible] appreciate the Commission considering this Application in connection with the hearing on September 17, 1958.

Very truly yours

GIRAND & STOUT

BY:

[illegible] Conservation Commission
New Mexico (w/one copy)
Mr. Randall Montgomery)

PHILLIPS PETROLEUM COMPANY

P. O. Box 2105
Hobbs, New Mexico

August 19, 1958

In re: Salt Water Disposal - Hunins-Monument-Penrose Pools

Rice Engineering and Operating, Inc.
Box 1142
Hobbs, New Mexico

Attention: Mr. W. G. Abbott

Gentlemen:

In reviewing Commission Order No. R-1274, we note that it will be necessary to report on the progress and the estimated completion date of the subject salt water disposal system at the regular Commission hearing scheduled for September 17, 1958.

It is requested that, as operator, you plan to report such information on behalf of Phillips Petroleum Company at this hearing.

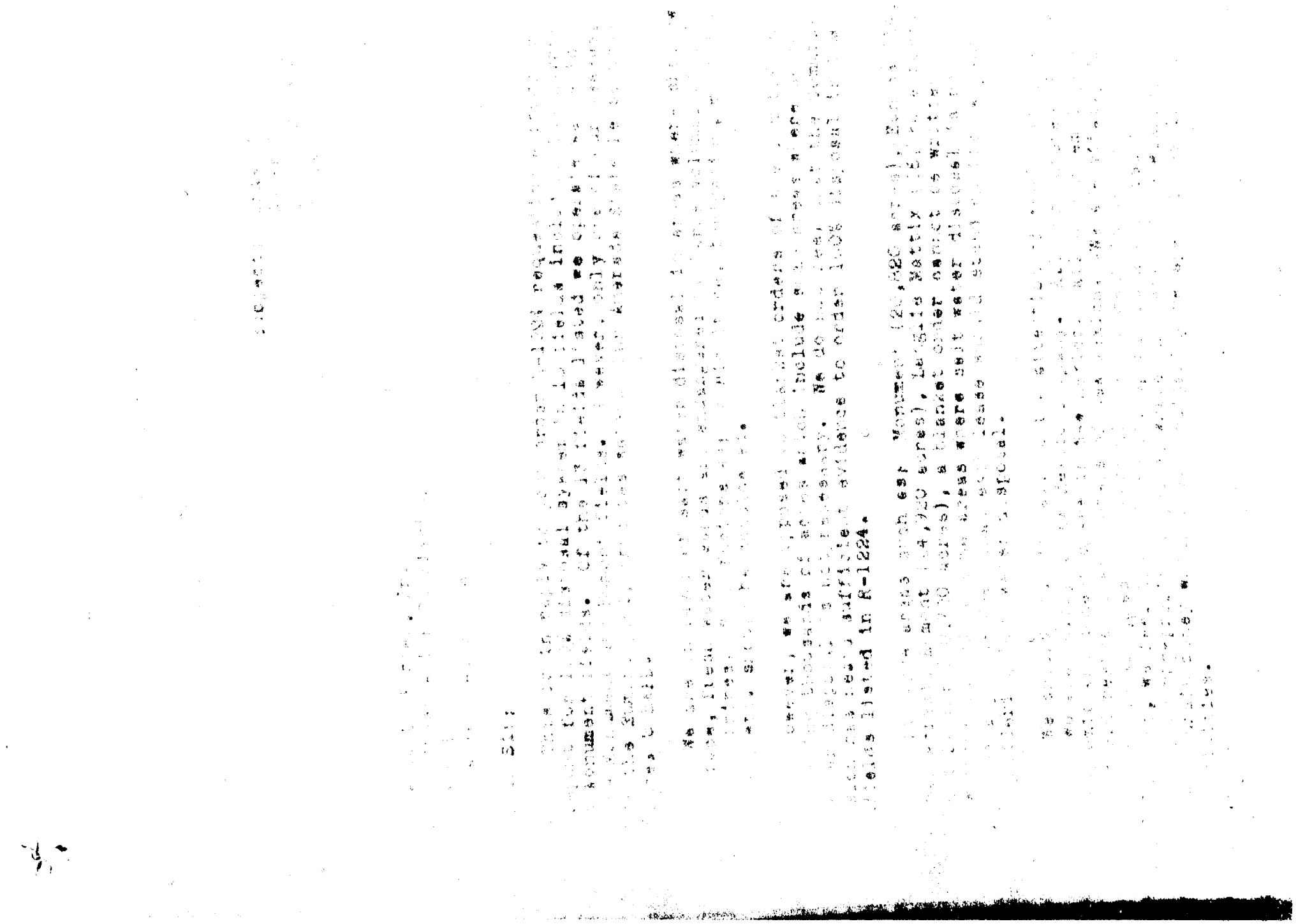
Very truly yours,

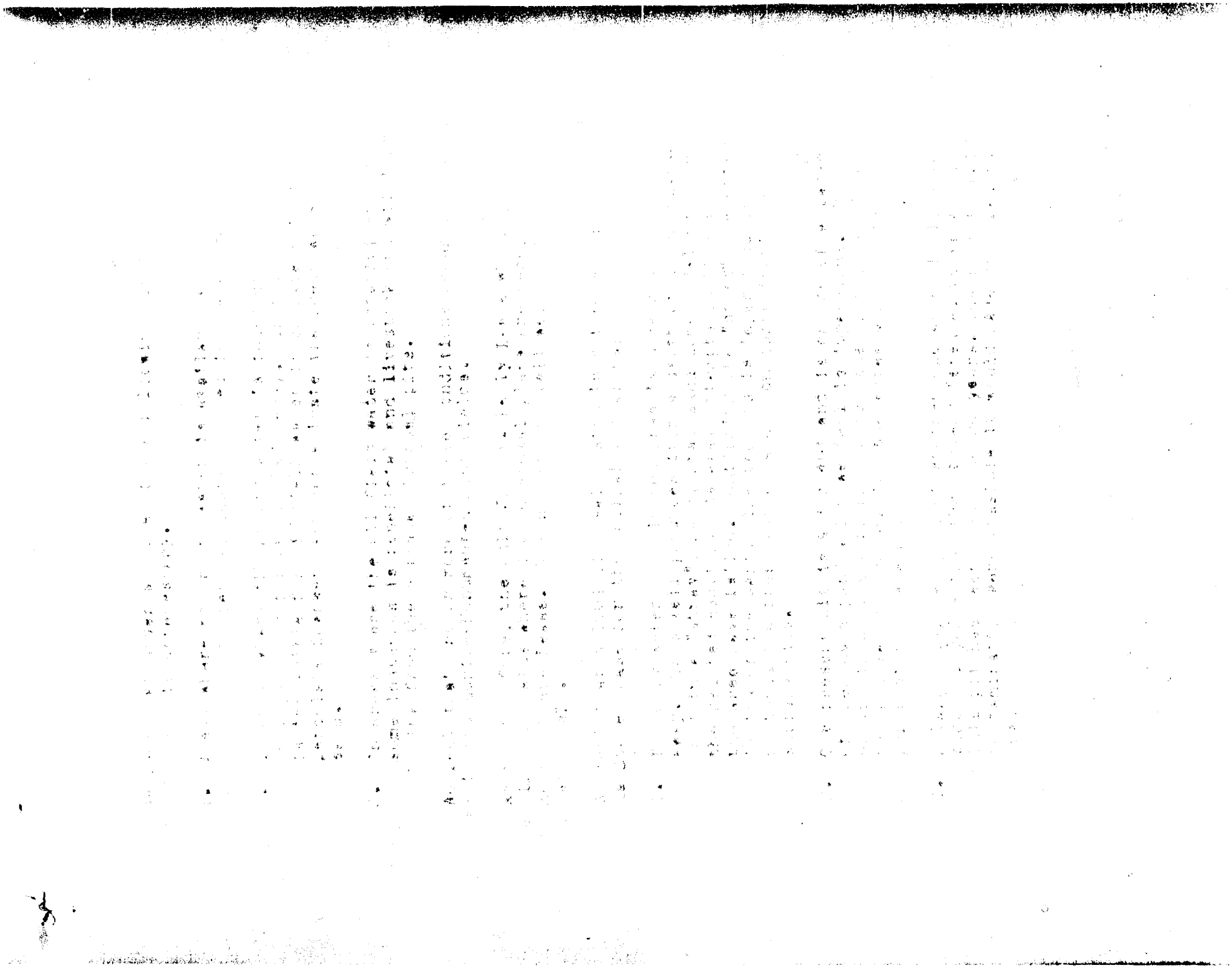
PHILLIPS PETROLEUM COMPANY

W. G. Rodgers
District Superintendent
Production Department

WGR:js
cc: New Mexico Oil Conservation Commission - 2
Hobbs, New Mexico

BERT FIELDS
SUITE 820 FOURTEEN HUNDRED LAND BUILDING
DALLAS, TEXAS





[illegible] access [illegible] disposal of salt [illegible]
[illegible] Agency to [illegible] salty disposal [illegible]
[illegible] which would meet [illegible] requirements.

We [illegible] that Commission should give the [illegible]
[illegible] which has [illegible] a blanket order for this [illegible]
[illegible] use [illegible] present evaporative pit on the Ames [illegible]
[illegible] Lease to dispose of the [illegible] PWD. As stated above [illegible]
[illegible] of this system is adequate for this lease and area.

Yours very truly,

Kenneth D. McPeters
Production Superintendent

NEIL E. SALSICH, JR.
Old In Offices
404 CENTRAL BUILDING
MIDLAND, TEXAS

[illegible]

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

[illegible]
[illegible]
Neil E. Salsich, Jr. et al, Re: Lease
Salsich, McGregor & Smith Unit Project

Gentlemen:

In reference to the above order number and [illegible] I wish to request that these leases [illegible] contain [illegible] water. Therefore we have not included in the water disposal groups, nor do we deem it necessary to set up a disposal system for our wells.

I trust this will meet with your approval.

Sincerely yours,

Neil E. Salsich

NESably

[redacted]

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

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

Re: Case No. [redacted]
Order No. [redacted]

Gentlemen:

This letter is to report progress of water [redacted] under above Commission Order.

This company operates twelve oil wells in the [redacted] pool. None of these wells make any appreciable amount of water at the present time. At such time when these wells commence producing water, necessary steps will be taken to satisfactorily dispose of the water.

This company does not operate any wells in the [redacted] pools named in Item No. 3 on page 1 and 2 of the above captioned order.

Yours very truly,

SCHERMERHORN OIL CORPORATION

By _____
John Moore
District Superintendent

[illegible], [illegible], 1958

[illegible] Corporation Commission,
[illegible], New Mexico

[illegible] - Mr. A. L. Porter, Jr.

Reference: [illegible] Order No. [illegible],
Salt Water [illegible]
Lea County, New Mexico

Gentlemen:

Morris R. Antweil is the operator of [illegible] in the Hobbs pool and ten wells in the Eumont pool, [illegible] in Lea County, New Mexico.

The two wells in the Hobbs pool are marginal oil producers and produce approximately 200 barrels of water per day. It was not economically feasible for us to participate in the Hobbs pool disposal program. There are other operators in the Hobbs pool who are of the same opinion and share our concern in this situation. We are presently disposing of our water production by the open pit method. We are studying and are awaiting the approval of a pilot project from the State Engineer's Office for a proposed cement lined evaporative type pit.

Our wells in the Eumont pool do not make an appreciable amount of water. From the ten wells that Morris R. Antweil operates, the Amerada State [illegible], [illegible] produces four barrels of water per day. The Warren State Lease, containing one well, [illegible] barrels of water per day. At this [illegible] [illegible] in an overall [illegible] [illegible] of [illegible]

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

September 4, 1958

Oil Well Drilling Company
614-617 Adolphus Tower
Dallas, Texas

Attention: Mrs. Mary Gordon

Re: Case 1053 - Order No. R-1224
Salt Water Disposal

Gentlemen:

This is in partial reply to your letter of September 2, 1958 to this office.

Memorandum No. 32-57 (enclosed) states the stand of the Oil Commission on the matter of salt water disposal into earthen pits.

It is my suggestion that you plan to have a representative at the September 17, 1958 hearing. Your letter can count as a progress report and may actually serve as a fulfillment, to date, of the conditions of Order R-1224. However, the Commission will present a statement by the Secretary-Director that should help to clarify the stand of the Commission on this very important matter.

If your representative cannot be present please notify us and I will send you a copy of any Commission statements for your guidance.

Very truly yours,

E. J. FISCHER,
District Engineer

EJF/ir

enclosure

OIL WELL DRILLING COMPANY

DALLAS, TEXAS

GULF

GULF OIL CORPORATION

P. O. DRAWER 670 ROSWELL, NEW MEXICO

[illegible]

[illegible]

[illegible] have [illegible] wells in the Fusco[illegible], Eumont and Monument [illegible] not included in any cooperative project, however, plans are under wa[illegible] system of our own referred to as the **Ramsey Block** Salt Water Disposa[illegible] agreement has been executed with **Rice Engineering & Operating**, Inc[illegible] and install this system. This project will gather the salt water produce[illegible] of our wells within the area as shown on the attached plat and dispos[illegible] a well to be drilled in Unit "C" of Section 3, T-22-S, R-36-E, Lea County, New Mexico. The disposal well is to be completed in the Yates formation and the Land Commissioner for the State of New Mexico has given his approval for disposing of salt water in this manner on State land by letter dated [illegible], 1956. The drilling of the well will be started after approval has been [illegible] by forms by the Oil Conservation Commission. It is anticipated that the well should be completed and all salt water produced within the project [illegible] disposed of underground by the end of the second quarter of 1956.

The following tabulation lists the 59 wells by pools to be connected to the Ramsey Block Salt Water Disposal System.

Lease and Wells	Location Sec.Twsp Range	Pool	No. of [illegible]
Arnott-Ramsey "C" 1, 3, 6	21-21-36	Eumont	
Arnott-Ramsey "D" 2, 3, 4, 5, [illegible]	[illegible]-21-36	Eumont	
[illegible] "A" 1, 2	20-21-36	Eumont	
[illegible] "B" 1, 3, 4, 5	29-21-36	Eumont	
[illegible]	32-21-36	Eumont	

[illegible] Ramsay "A" 10, 12, 14, [illegible] 17, 18, 20, 21, [illegible] 24, 26, 28, 29, 30, [illegible] 31, 32, 33, 35, 37,	[illegible]		
	27-21-36		
	34-21-36		
	35-21-36	Bumont	40
[illegible]-Ramsay "C" 2, 3, 4, 6, [illegible] 9, 10, 11, 12, 13, 14	21-21-36	Eumont	11
[illegible] Leonard "A" 1, 2, 4	22-21-36	Eumont	4
	TOTAL RAMSAY BLOCK		54.

For your information, the area covered by this Ramsay Block Salt Water [illegible] System as shown on the attached plat includes 5,160.76 acres of [illegible] and 160 acre Fee Lease. No water is being produced on the Fee Lease at present, and will not be connected at this time; however, if, and when [illegible] would be disposed of in this system.

The following is a tabulation of the 49 wells not connected to the disposal system with remarks as to the method of salt water disposal.

Lease and Well	Location Sec.Twsp Range	Pool	Lease Water Production Daily-Bbls.	Remarks
[illegible]-Ramsay "A" 1 (1 well)	35-20-37	Eumont	0	No disposal [illegible]
[illegible] Well "A" 1,2 (2 wells)	34-20-36	Eumont	1	Use lined pit.
[illegible]-Ramsay "B" 1 (1 well)	25-20-37	Eumont	0	[illegible]
[illegible]	[illegible]-37	Eumont	1	[illegible]
[illegible]	[illegible]	Eumont	[illegible]	
[illegible]	[illegible]-37	Eumont	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Lease or Well	Location Sec./Twp. Range	Pool	Lease Water Production Daily-Bbls.	Remarks
[illegible] State "A" 1 (1 well)	31-16-37	Eumont	0	No disposal [illegible]
[illegible] State "A" 1, [illegible] 4, 5, 6, 7, [illegible] (5 wells)	18-19-36 11-19-36	Eumont	0	No disposal [illegible]
[illegible] State [illegible] "A" 1 (1 well)	23-19-36	Eumont	0	No disposal [illegible]
[illegible] State [illegible] "B" [illegible] 2 (2 wells)	23-19-36	Eumont	0	No disposal [illegible]
[illegible], Hewett "F" [illegible] (1 well)	2 -20-37	Eumont	0	No disposal [illegible]
[illegible]. H. Bell "B" 1,2 (2 wells)	11-21-36	Eunice	2	Use lease [illegible].
[illegible] Collins 1, 2 (2 wells)	14-21-36	Eunice	2	Use lease [illegible].
[illegible]asley State [illegible] 1, 6 (2 wells)	5 -21-36	Eunice	4	Use lease [illegible].
[illegible]. Tack, [illegible] 1 (1 well)	15-21-36	Eunice	0	No disposal [illegible]
[illegible] (1 well)	[illegible]-20-37	Eunice	0	No disposal [illegible]
[illegible] (1 well)	[illegible]-21-36	Eunice	4	Use lease [illegible].
[illegible] (1 well)	[illegible]-19-36	Eumont	2.4	Use lease [illegible].
[illegible] (1 well)	[illegible]-19-37	Hardyman	0	No disposal [illegible]

	8-19-77	Abandoned	0	No [illegible]
	4-19-78	Abandoned	0.0	Well is [illegible] Well [illegible]
	10-19-30	[illegible]	-	[illegible]

[illegible] wells.

Yours very truly,

By _____

JOHN J. EISENZ
PRODUCING AND RESERVOIR ENGINEERING
ABILENE, TEXAS

P.O. Box 1159
TELEPHONE [illegible]

August 18, 1953

State of New Mexico
Conservation Commission
Santa Fe, New Mexico

Re: Case No. 1053
Order No. R-1124

Gentlemen:

As operator of two wells in the Dumont Field, we are not a member of a cooperative water disposal, but we are presently making 100 per cent disposal of the very small amounts of water produced each day by evaporative mud pit.

Very truly yours,

Sealdean Ward
Production Superintendent

SW:f

TENNESSEE GAS TRANSMISSION COMPANY
Post Office Box 307
Eunice, New Mexico
August 26, 1958

State of New Mexico
Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Salt Water Disposal
Lea County, New Mexico
Case No. 1053, Order No. R-[illegible]

Gentlemen:

In compliance with Order No. R-[illegible] dated July 28, 1958, covering salt water disposal in certain areas of Lea County, New Mexico, the following information is submitted.

Tennessee Gas Transmission Company is not a member of a cooperative salt water disposal group. Tennessee operates only four wells in the area mentioned, all on the [illegible] U.S. lease located in Section [illegible], Township [illegible] South, Range [illegible] East, Summit Field. Water production from this lease is negligible. Frequent well tests indicate only one well, the [illegible] No. 7, has ever produced water and this is about a ratio between a trace and one-half barrel per day.

Should these wells ever produce an appreciable volume of water, disposal facilities will be provided.

Yours very truly,

[illegible]
District Engineer

cc: New Mexico Oil Conservation Commission
Hobbs, New Mexico

COATS DRILLING COMPANY, Inc.

R. P. COATS
PRES. DENT

FIRMER FO 6-7244 – FO 2-6004
300 GREAT PLAINS LIFE BUILDING
LUBBOCK, TEXAS

August 6, 1958

State of New Mexico
Oil Conservation Commission
Box 871
Santa Fe, New Mexico.

Re: Gibson No. 1294

Gentlemen:

I am returning you herewith signed acknowledgement of the case hearing No. 1053, Order Number R-1224. This notice was received as of this date.

I respectfully call your attention to the property which I am a joint owner of and the designated operator of property. Said property described as follows:

J.A. Foster Land. Eumont Field. Lea County, New Mexico.
SE ¼ of Section 33, Twp. 19S, Rge 36 E.
Three (3) wells, Numbered 1,3 and 4.
Producing Zone Queen Sand.
Wells identified as to location in Sections, 1-F, 3-I, and 4-J.

Please be advised that these wells are free of salt water, brine or other elements that might cause the contamination of fresh water bands. We are continously checking this production and at this time the wells have not produced water either fresh or salt. We shall continue to watch this very carefully as we are aware of the seriousness of pollution of fresh waters.

Be assured that you have my full cooperation in any matters of salt water or other conservation matters.

Yours very truly,

R.P. Coats

fresh sub[illegible] water.

such water contaminates the sub-surface fresh water. [illegible] may be injured cases where the brine water produced from wells may be of such a saturation that it would demand protective measures, however, I firmly believe that few cases can be found that any of the brine water produced from [illegible] the Permian formations is defecting sub-surface fresh water.

I have personally attended several of the hearings [illegible] concerning the waters of the Pecos Valley disposal systems, and it seems that the [illegible] mainly with the mechanics and the operation of the system.

One certainly would not be rewarding a plan when an estimates that before such a program is completed in the an investment of at least fifty million dollars will have to be. Before such an investment is demanded by any of State Departments, absolute and unassailable evidence must be established. There is no doubt in my mind that [illegible] probably all of these expenditures could be justified in the economical development of our state, and still preserve our fresh water.

would also like to mention that the economic [illegible] of waste water produced from marginal [illegible] encouragement of many of the [illegible] in the State.

The New Mexico Oil Conservation Commission has built a reputation which has been established by an excellent [illegible] and I am sure that they do not desire to impose any order [illegible] the Oil Industry which is not supported by unimpeachable evidence.

I request that this information be included in the record of the hearing set for September 17, 1958.

Yours very truly,

R. G. McPherson

AZTEC OIL & GAS COMPANY

P. O. BOX 409
HOBBS, NEW MEXICO
September 5, 1958

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Case 1053, Order R-1224
Pertaining to Salt Water
Disposal in Lea County,
New Mexico

Gentlemen:

In accordance with provisions of the Oil Conservation Commission Order R-1224, Aztec Oil & Gas Company wishes to report the following:

1. That Aztec Oil & Gas Company is operator of oil and gas wells in the Eumont Pool, this being the only pool of the ten listed in Paragraph (3) of Order R-1224 wherein Aztec operates.

2. That Aztec Oil & Gas Company is a member of the Eunice-Monument-Eumont Salt Water Disposal System and all of Aztec's leases in the Eumont Pool that produce large volumes of oil field brines will be connected to the cooperative disposal system. Progress toward completion of this cooperative system will be made by a member of the Disposal Committee at the regular hearing of the Oil Conservation Commission on September 17, 1958.

3. That Aztec Oil & Gas Company will construct impervious evaporation pits to collect salt water produced in small quantities that may endanger fresh water supplies. These evaporation pits will be completed prior to the completion of the cooperative salt water disposal system.

4. That Aztec Oil & Gas Company will exercise observed care in the disposal of salt water that may endanger fresh water supplies and will take steps toward proper disposal of their future salt water production in areas specified by the Oil Conservation Commission.

Very truly yours,

AZTEC OIL & GAS COMPANY

Prentice R. Watts, Jr.
District Superintendent

PRW:mps

GROVER, MACCURDY & KNOX
SUITE A PATIO BUILDING
MIDLAND, TEXAS

SEPTEMBER 3, 1950

NEW MEXICO CONSERVATION COMMISSION
BOX 871
SANTA FE, NEW MEXICO

RE: CASE NO. 1053
ORDER NO. R-1224

GENTLEMEN:

IN COMPLIANCE WITH THE ABOVE MENTIONED CASE AND ORDER, WE WISH TO ADVISE THAT THE WELLS WHICH WE HAVE IN THE EUMONT POOL ARE MAKING NO WATER AT ALL. WHEN AND IF SUCH WELLS DO MAKE WATER, WE WILL TAKE THE NECESSARY STEPS TO DISPOSE OF THIS WATER IN AN EFFECIENT MANNER.

YOURS VERY TRULY,

GROVER, MACCURDY & KNOX

R. O. COURTRIGHT, JR.
ENGINEER

ROC:EM

Mr. A.L. Porter, Jr., Secretary
Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. [illegible]
Order No. [illegible]

J.V. [illegible]
Well No. [illegible]
Twp 21, [illegible]
State Lease, [illegible]
Field, [illegible]

Gentlemen:

In compliance with the captioned order we wish to advise that we have not joined with any cooperative group for salt water disposal on the above lease.

The oil producing well is pumping two to four barrels of oil per day and is not producing any salt water to use in the problem of salt water disposal.

Very truly yours,

[illegible]

[illegible]
Secretary

[illegible]/ks

cc: Harold Montgomery
Oil Conservation Commission
Hobbs, New Mexico

Mr. A. L. Porter, Jr., Secretary
Oil Conservation Commission
[illegible], New Mexico

Dear Mr. Porter:

This letter is in response to Order No. R-[illegible] of July 1958 wherein we are required to report prior to September 1, 1958 concerning the progress we have made toward the disposal of salt water.

It has not been established that Sealer & Sheldon does produce large volumes of oil field brines which may contaminate the fresh water bearing horizons of Lea County, New Mexico. We are of the opinion that our present surface disposal system [illegible] factory and do not jeopardize the fresh water of Lea County, New Mexico.

Yours very truly,

SEALER & SHELDON

By _____

/PS:dsb

Case No.

1053

Application, Transcript,
Small Exhibits, Etc.

Case No.

1053

Application, Transcript,
Small Exhibits, Etc.

NEW MEXICO
OIL CONSERVATION COMMISSION
P. O. BOX 871
Santa Fe, New Mexico

No. 32-57

MEMORANDUM:

TO: All Operators in the following-named Pools:

Hobbs
Denton (Dev.) and Wolfcamp
Eunice-Monument Area
A. Eunice-Monument
B. Eumont
C. Monument Blinebry
Moore Devonian
Caprock, East Devonian
Bagley, Sil/Dev. & Penn.
Saunders
Crossroads
Bough
Echol Devonian

FROM: A. L. Porter, Jr., Secretary-Director

SUBJECT: Salt Water Disposal

The Oil Conservation Commission has received several inquiries from operators in the above-named pools concerning the Commission's position on the matter of salt water disposal in earthen pits in these areas. In turn, the Commission requested that the State Engineer make his position clear in this matter.

The Commission received the following reply from the State Engineer's Office:

"Dear Mr. Porter:

In reply to verbal questions put forth by your legal advisor, Mr. Cooley, please be advised that it is the considered opinion of the State Engineer that any disposal of oil field brines in earthen pits in the following fields is detrimental to the fresh water supplies in those areas:

1. Hobbs
2. Denton- (Dev.) & Wolfcamp
3. Eunice-Monument Area
   A. Eunice-Monument

B. Eumont
C. Monument Blinebry

4. Moore Devonian
5. Caprock, East Devonian
6. Bagley Sil/Dev. & Penn.
7. Saunders
8. Crossroads
9. Bough
10. Echol Devonian"

It is, therefore, the opinion of the Commission that no oil field brines should be disposed of in earthen pits after the completion of the salt water disposal systems in the above-named pools.

November 6, 1957

ga

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August _____, 1958.

_____
COMPANY

_____
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

OIL CONSERVATION COMMISSION

MAIN OFFICE OCC NEW MEXICO

1958 SEP 29 AM 8:32

September 26, 1958

Mr. Jack L. Brown
DeKalb Agricultural Assoc., Inc.
Room 306 Lubbock National Bank Bldg.
Lubbock, Texas

Dear Mr. Brown:

Your letter of September 17, 1958 requested certain information in regard to the injection of salt water into the Santa Rosa and Grayburg formations, in the area of the Skaggs Pool, Lea County New Mexico.

This is to advise that the State Engineer's office has recommended to the Oil Conservation Commission that the Santa Rosa formation not be used as a salt water injection horizon due to the fact that in some areas of Lea County this formation contains potable water.

Under separate cover we have sent you a supply of Salt Water Disposal Applications which I think are self explanatory.

If we can be of further service, please do not hesitate to advise.

Yours very truly,

OIL CONSERVATION COMMISSION

R. F. Montgomery
Proration Manager

RFM/mc

cc-OCC, Santa Fe

Mark

DALLAS OFFICE RECD
1958 DEC 10 AM 9:45

AMERADA PETROLEUM CORPORATION
Box 312
Midland, Texas

December 8, 1958

Lovington Area Salt Water Committee Members:

Gentlemen:

Attached for your information are the minutes of the first committee meeting held on November 25, 1958.

At this meeting the following action was taken by the members: (1) Two committees were formed, one for Lovington Field and one for West Lovington; (2) Texas Company named Chairman of the West Lovington Salt Water Committee; and (3) Skelly Oil Company was elected permanent Chairman of Lovington Pools.

Yours very truly,

Ray E. Seifert

Ray E. Seifert
Temporary Chairman

SMH/JH

Minutes
of
Lovington Area Salt Water
Committee Meeting
December 8, 1958

The first meeting of the Lovington Area Salt Water Committee was held in the New Mexico Oil Conservation Commission Office in Hobbs on November 25, 1958. Representatives of 12 companies and the State Engineers Office were present as shown on the attached Attendance List. Mr. R. E. Seifert of Amerada Petroleum Corporation acted as Temporary Chairman.

After some discussion it was moved by Pan American and seconded by Humble that two separate committees be formed - one for the Lovington Field and one for West Lovington. This was passed unanimously. A study is under way to determine the feasibility of secondary recovery operations in West Lovington Pool and it would not be necessary to install a separate salt water disposal system now if waterflooding operations are started in the near future. It was decided that since The Texas Company is chairman of the West Lovington Engineering Committee, they should act as chairman of the West Lovington Salt Water Committee. They are to keep the Commission posted on the work of that committee. All operators who are members of the West Lovington Engineering Committee are to be members of the West Lovington Salt Water Committee.

It was decided that Amerada as Temporary Chairman would notify the Commission that the group had split into two separate committees.

Election of a permanent Chairman for the Lovington Pools was discussed. It was moved by Amerada and seconded by Pan American that Skelly, as largest operator in the Lovington Pools, be elected permanent chairman of this group. This motion passed unanimously. The members of this committee will be Skelly, Amerada, Tidewater, Pan American, Cities Service and the State Engineer.

There was some discussion of the possibilities of secondary recovery in the Lovington San Andres and Paddock Pools with respect to the work of this committee. The Skelly representative stated that they will probably call a meeting of the Lovington Salt Water Committee in the near future.

ATTENDANCE LIST

Lovington Area Salt Water Committee Meeting

NAME	COMPANY	ADDRESS
R. E. Broschat	Amerada	Monument, N. M.
P. J. Padilla	Amerada	Monument, N. M.
P. D. Lundy	Tennessee Gas Transmission	Hobbs, N. M.
R. E. Christensen	Shell Oil Company	Roswell N. M.
J. E. Hall	Oil Development Co. of Texas	Amarillo, Texas
Howard Mauk	Cabot Carbon Company	Tokio, Texas
Percy C. O'Quinn	Cabot Carbon Company	Midland, Texas
R. L. Borton	St. Engr. Office	Roswell, N. M.
J. W. Brown	Pan American Petroleum Corp.	Roswell, N. M.
Ray E. Seifert	Amerada	Midland, Texas
R. W. Miller	Tidewater	Hobbs, N. M.
Sam F. Harrill	Humble	Hobbs, N. M.
James M. McGee	Magnolia	Hobbs, N. M.
John B. Ross	Texaco	Midland, Texas
Joe D. Raney	Skelly	Hobbs, N. M.
Wendell B. Cook	Western Natural Gas	Midland, Texas

MAILING LIST
Lovington Area Salt Water Committee Meeting

Cities Service Oil Company	Box 97, Hobbs, New Mexico
Humble Oil & Refining Company	Box 2347, Hobbs, New Mexico
Kewanee Oil Company	Box 3786, Odessa, Texas
Late Oil Company	Box 670, San Angelo, Texas
Leonard Oil Company	Box 708, Roswell, New Mexico
Lee Drilling Company	Box 1109, Midland, Texas
Magnolia Petroleum Company	Box 2406, Hobbs, New Mexico
W. D. McBee	210 N. Big Spring, Midland, Texas
The Ohio Oil Company	Box 2107, Hobbs, New Mexico
Pan American Petroleum Corporation	Box 899, Roswell, New Mexico
Phillips Petroleum Company	Box 2105, Hobbs, New Mexico
Rodman-Noel Oil Corporation	Box 3826, Odessa, Texas
Shell Oil Company	Box 845, Roswell, New Mexico
Sinclair Oil & Gas Company	Craig Electric Co. Bldg. 520 East Broadway, Hobbs, New Mexico
Skelly Oil Company	Box 38, Hobbs, New Mexico
Sunray-Mid Continent Oil Co.	1101 Wilco Bldg., Midland, Texas
The Texas Company	Box 352, Midland, Texas
Tidewater Oil Company	Box 547, Hobbs, New Mexico
Fred Turner, Jr.	Box 910, Midland, Texas
United Producing Co., Inc.	Box 1783, Monroe, Louisiana
Velma Petroleum Corporation	Box 1 55, Hobbs, New Mexico
Tennessee Gas Transmission Company	410 W. Taylor, Hobbs, New Mexico
Oil Development Co. of Texas	900 Polk St., Amarillo, Texas
Cabot Carbon Company	Box 4395, Midland, Texas
Western Natural Gas	823 Midland Tower Bldg., Midland, Texas

New Mexico Oil Conservation Commission
State Engineers Office
Attention: R. L. Borton
Box 810
Roswell, New Mexico

New Mexico Oil Conservation Commission
Attention: A. L. Porter, Jr.
Box 871
Santa Fe, New Mexico

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

June 6, 1956

COPY

South Chester Tube Company
420 Niels Esperson Building
Houston 2, Texas

Attention: Mr. E. L. Moseley

Gentlemen:

Reference is made to your letter dated June 1, 1956, requesting information on salt water disposal in New Mexico.

Please be advised that there is no new law or regulation in New Mexico requiring mandatory underground disposal of salt water produced from the oil fields.

The Oil Conservation Commission of New Mexico has broad powers to require proper disposal of oil field brines. However, this Commission is conducting at the present time public hearings to require more adequate disposal of oil field brines in Lea County, New Mexico. There will be another hearing in this matter at Santa Fe on September 13, 1956 at which time the operators are to give progress reports on voluntary oil field water disposal in Lea County.

Yours very truly,

WARREN W. MANKIN
District Engineer

WWM:ds

CABLE ADDRESS:
CHESTUBE

SOUTH CHESTER TUBE COMPANY
MILL AND GENERAL OFFICE
CHESTER, PENNSYLVANIA

MAIN OFFICE OCC
1956 JUN 4 PM 1:11

E. L. MOSELEY
DISTRICT REPRESENTATIVE

420 NIELS ESPERSON BUILDING
HOUSTON 2, TEXAS

June 1, 1956

Oil, Gas & Water Conservation Commission
of New Mexico
Santa Fe, New Mexico

Gentlemen:

I have been given to understand that either a new law or a regulation of the commission now makes it mandatory that all salt water produced in the oil fields be reinjected back into the earth and that it is no longer lawful to evaporate salt water from a salt water pit.

If this is a rule of the Commission would you please be good enough to let us have a copy of it.

If this is a law passed by some recent act of the Legislature, will you kindly refer me to that.

Thanking you in advance for your kindness, we are

Yours very truly,
SOUTH CHESTER TUBE COMPANY

ELM:mo

E. L. Moseley, Representative

No. 25-58

DOCKET: REGULAR HEARING SEPTEMBER 17, 1958

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

ALLOWABLE: (1) Consideration of the oil allowable for October, 1958.

(2) Consideration of the allowable production of gas for October, 1958, from six prorated pools in Lea County, New Mexico; also consideration of the allowable production of gas from seven prorated pools in San Juan and Rio Arriba Counties, New Mexico, for October, 1958.

NEW CASES

CASE 1508: Application of El Paso Natural Gas Company for the establishment of 320-acre spacing units for the Dakota formation in San Juan and Rio Arriba Counties, New Mexico. Applicant, in the above-styled cause, seeks an order establishing 320-acre spacing units for all gas wells drilled to or completed in the Dakota formation in San Juan and Rio Arriba Counties, New Mexico, including the fifteen presently designated Dakota gas pools in said counties; and for the promulgation of special rules and regulations for said pools.

CASE 1509: Southeastern New Mexico nomenclature case calling for an order for the creation of new pools and extension of existing pools in Lea, Eddy and Roosevelt Counties, New Mexico.

(a) Create a new oil pool for Blinebry production, designated as the Justis-Blinebry Pool, and described as:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 13: SE/4

(b) Create a new oil pool for Montoya production, designated as the Justis-Montoya Pool, and described as:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 13: SW/4
Section 24: N/2

(c) Create a new oil pool for San Andres production, designated as the Milnesand-San Andres Pool, and described as:

TOWNSHIP 8 SOUTH, RANGE 34 EAST, NMPM
Section 24: NW/4

(d) Create a new oil pool for Glorieta production, designated as the Skaggs-Glorieta Pool, and described as:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM
Section 11: NE/4

(e) Extend the vertical limits of the Bagley-Pennsylvanian Oil Pool to include the following area only:

TOWNSHIP 11 SOUTH, RANGE 33 EAST, NMPM
Section 34: SW/4 SE/4

and redefine the vertical limits of this area to be -4500 feet to -5200 feet subsea.

(f) Extend the Crosby-Devonian Gas Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 33: SE/4

(g) Extend the Eumont Gas Pool to include:

TOWNSHIP 21 SOUTH, RANGE 35 EAST, NMPM
Section 3: Lots 3, 4, 5, & 6

(h) Extend the Grayburg-Jackson Pool to include:

TOWNSHIP 17 SOUTH, RANGE 31 EAST, NMPM
Section 10: E/2 NW/4 & W/2 NE/4

(i) Extend the Justis-Drinkard Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 24: SW/4

(j) Extend the Justis-Fusselman Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 13: SW/4

(k) Extend the Maljamar Pool to include:

TOWNSHIP 17 SOUTH, RANGE 33 EAST, NMPM
Section 18: SE/4

(l) Extend the East Millman-Queen Pool to include:

TOWNSHIP 19 SOUTH, RANGE 28 EAST, NMPM
Section 14: SW/4

(m) Extend the Townsend-Wolfcamp Pool to include:

TOWNSHIP 16 SOUTH, RANGE 36 EAST, NMPM
Section 6: Lots 3, 4, 5, & 6

(n) Extend the South Vacuum-Devonian Pool to include:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 21: NE/4
Section 22: W/2

(o) Extend the Vacuum-Yates Pool to include:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 34: NE/4

CASE 1510: Northwestern New Mexico nomenclature case calling for an order for the extension of existing pools in Rio Arriba and San Juan Counties, New Mexico.

(a) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 30 NORTH, RANGE 11 WEST, NMPM
Section 12: W/2 & SE/4

(b) Extend the Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
Section 10: S/2 & NE/4
Section 11: All
Section 12: NW/4

(c) Extend the Otero-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 9: SE/4
Section 21: NE/4

(d) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 2 WEST, NMPM
Section 25: SE/4

TOWNSHIP 24 NORTH, RANGE 3 WEST, NMPM
Section 10: E/2
Section 11: All

TOWNSHIP 26 NORTH, RANGE 4 WEST, NMPM
Section 19: SW/4

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM
Section 24: SE/4

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 30: SW/4

TOWNSHIP 27 NORTH, RANGE 6 WEST, NMPM
Section 14: All
Section 15: All
Section 24: E/2
Section 25: E/2

(e) Extend the Tapacito-Pictured Cliffs Pool to include:

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 26: NE/4

(f) Extend the Blanco-Mesaverde Pool to include:

TOWNSHIP 27 NORTH, RANGE 8 WEST, NMPM
Section 19: E/2
Section 33: E/2

(g) Extend the East Companero-Dakota Pool to include:

TOWNSHIP 27 NORTH, RANGE 4 WEST, NMPM
Section 17: W/2

(h) Extend the Gallegos-Gallup Oil Pool to include:

TOWNSHIP 27 NORTH, RANGE 13 WEST, NMPM
Section 36: SW/4

(i) Extend the Horseshoe-Gallup Oil Pool to include:

TOWNSHIP 31 NORTH, RANGE 16 WEST, NMPM
Section 34: NW/4 SW/4

(j) Extend the Otero-Gallup Oil Pool to include:

TOWNSHIP 24 NORTH, RANGE 5 WEST, NMPM
Section 5: NW/4 NE/4

(k) Extend the Verde-Gallup Oil Pool to include:

TOWNSHIP 31 NORTH, RANGE 15 WEST, NMPM
Section 26: NW/4
Section 27: N/2

CONTINUED CASE

CASE 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

ir/

Memo

From

To

OIL CONSERVATION COMMISSION
EXHIBIT NO. 1
CASE 1052

Sept. 1958

LEA COUNTY OIL FIELDS NEEDING IMMEDIATE ATTENTION

Pool Name	Total Water 1956	Total Water 1957	Water Jan., 1958	Water Feb., 1958
1. Hobbs	2,512,476	2,934,199	241,388	225,457
Hobbs, Drinkard	3,821	2,414	177	55
Hobbs, East Blinebry	510	none	none	none
Hobbs, East San Andres	211,653	481,060	41,441	35,484
Hobbs, East / Rivers	none	none	none	none
2. Denton, Devonian	1,717,279	2,395,776	192,956	203,621
Denton, Devonian South	24,573	399,752	48,731	57,039
Denton, Wolfcamp	1,071,844	1,083,500	91,732	89,383
3. Eunice - Monument Area				
Eumont	2,602,031	2,946,369	208,452	225,807
Eunice	3,234,222	2,937,004	230,246	214,655
Monument	6,181,224	7,366,804	746,363	504,478
Monument, Blinebry	278,295	343,470	26,221	30,330
Monument, Paddock	94,677	123,022	13,646	11,711
Eunice, South	710,412	514,619	29,527	24,701
4. Moore, Devonian	450,217	750,688	95,389	70,178
5. Caprock, East Devonian	2,173,388	2,800,060	186,453	209,973
6. Bagley, Penn.	671,429	766,814	48,421	55,284
Bagley, Siluro-Devonian	1,404,235	1,895,247	201,880	175,974
7. Saunders	848,070	796,038	71,601	62,595
8. Crossroads	645,160	651,659	33,267	31,380
Crossroads, Penn.	11,713	43,670	1,871	1,550
9. Bough	650,344	559,445	45,500	45,962
10. Echol, Devonian	508,614	380,634	30,168	27,371
Echol, Devonian North	135,036	243,757	24,707	16,692

Subtotal 26,141,223 30,416,001

LEA COUNTY OIL FIELDS NEEDING ATTENTION

IN NEAR FUTURE

(In order of possible danger)

Pool Name	Total Water 1956	Total Water 1957	Water Jan., 1958	Water Feb., 1958
1. Jalmat	4,826,973	5,173,480	401,825	392,422
2. Langlie - Mattix	2,968,694	2,729,851	235,666	115,277
3. Arrowhead	1,236,325	1,270,855	105,092	118,736
4. Brunson	1,035,291	939,503	93,625	41,221
5. South Eunice	(listed in first grouping)			
6. Cass	801,496	890,279	105,685	59,300
7. Dollarhide, Devonian		1,469	103	87
Dollarhide, Drinkard	57,835	57,596	5,405	5,354
Dollarhide, Ellenburger	124,187	107,094	7,379	2,202
Dollarhide, Fusselman	269,222	443,813	44,532	40,394
Dollarhide, Queen	28,129	97,736	9,494	9,756
8. Lovington	96,580	101,941	8,119	7,560
Lovington, Abo	186,229	418,148	38,112	34,573
Lovington, Paddock	42,280	40,963	2,631	2,466
Lovington, East Penn	2,175	598	62	none
Lovington, West	47,389	40,813	2,526	2,313
Lovington, Wolf Camp	7,125	11,417	835	402
9. Teague, Ellenburger	279,555	363,187	23,897	27,305
10. S. R. R., Devonian	353,491	332,938	40,427	32,651
11. Vacuum	175,947	181,817	17,949	16,107
12. Wilson	1,025,836	1,006,320	83,158	77,462
13. Lynch	816,868	733,081	22,039	14,185

Subtotal 14,381,637 14,942,899

ADDITIONAL LEA COUNTY OIL FIELDS

NOT MENTIONED IN O.C.C. MEMO 32-57

BUT PRODUCING CONSIDERABLE* WATER

Pool Name	Total Water 1956	Total Water 1957
Anderson Ranch, Devonian	73,204	145,779
Bronco Siluro, Devonian	137,146	204,842
Caprock Qn.-Lea & Chaves Counties	68,852	105,061
Caudill, Devonian	281,284	580,113
Corbin, South Qn.	not listed	99,706
Dean, Devonian	35,775	182,770
Drinkard (Vivian Zone)	122,201	132,377
Eidson, Penn.	181,749	140,090
Four Lakes, Devonian	no water	124,197
Fowler, Fusselman	71,063	133,132
Gem Yates	92,200	140,000
Gladiola, Wolfcamp	200,510	193,559
Hare	146,930	272,297
Knowles	495,595	427,283
Maljamar, Devonian	245,153	309,554
Paddock	136,618	169,987
Penrose Skelly	68,899	111,066
Skaggs	93,111	86,799
Subtotal	2,450,290	3,558,612

* Considerable meaning over 100,000 bbl. yearly, an arbitrary figure.

26,141,223	30,416,001
14,381,637	14,942,899
2,450,290	3,558,612
Total 42,973,150	48,917,512

SALT WATER PRODUCTION
(IN BARRELS)
Lea County, New Mexico

1957

Pool	Jan. No.Prod. Wells Tot.-Wtr.		Jan.	Feb.	Mar.	Apr.	May	June	June No.Prod. Wells Tot.-Wtr.		July	Aug.	Sept.	Oct.	Nov.	Dec.	Dec. No.Prod. Wells Tot.-Wtr.		Total
Hobbs	287	170	251,108	222,096	233,686	251,202	262,223	261,165	295	170	249,749	254,967	232,823	205,849	248,341	260,990	304	175	2,934,199
Hobbs, Drnkd.	1	1	390	329	365	150	129	153	1	1	129	105	175	183	148	158	1	1	2,714
Hobbs, E. San Andres	25	12	31,198	23,761	34,663	43,146	35,723	37,969	25	14	42,989	39,223	39,653	48,984	48,425	49,326	24	14	481,060
Denton, Dev.	109	71	204,427	178,675	201,948	199,823	206,339	173,395	108	74	205,237	192,660	206,713	221,102	202,023	209,434	108	66	2,395,771
Denton, Dev. So.	7	4	7,594	4,068	18,791	25,692	36,146	31,496	7	6	58,654	51,533	47,065	35,006	46,517	40,280	7	5	399,753
Denton, Wolf Camp	96	50	97,348	94,464	105,631	83,043	96,285	89,262	94	46	95,649	87,320	69,277	87,163	87,866	90,192	94	46	1,083,500
Eunice-Monument Area																			
Eumont	423	234	228,462	219,985	221,205	219,752	260,481	252,576	531	243	253,455	276,256	267,116	283,838	227,275	235,968	567	257	2,946,339
Eunice	303	240	253,716	256,242	274,688	255,783	258,479	247,543	301	142	267,928	210,421	227,720	240,084	219,753	224,647	299	243	2,937,000
Monument	451	301	538,014	509,048	706,111	940,410	370,710	480,470	451	298	591,691	670,042	571,606	710,044	642,825	635,833	440	300	7,366,804
Mon., Blinebry	37	20	35,461	30,457	34,440	28,426	30,834	28,535	36	27	27,144	28,807	24,172	22,568	27,293	25,333	36	25	343,470
Mon., Paddock	31	16	10,464	8,681	10,885	9,079	9,855	8,834	30	19	8,840	8,500	8,695	12,574	11,801	14,814	30	19	123,022
Eunice, South	114	63	53,714	42,344	46,737	59,115	50,476	55,034	135	78	55,272	33,936	25,886	27,165	26,468	38,472	160	91	514,609
Moore, Devonian	19	6	50,480	46,768	56,121	52,126	58,624	64,476	19	8	63,928	69,053	70,551	71,814	65,193	81,554	19	8	750,688
Caprock, East Dev.	24	18	254,579	230,777	245,516	232,221	239,666	214,732	24	18	187,867	226,222	237,431	228,631	220,589	281,829	24	17	2,800,060
Bagley, Penn.	14	11	58,738	49,491	46,918	59,821	65,671	94,396	13	10	105,026	59,830	62,187	59,451	54,940	50,275	12	10	766,814
Bagley, Siluro Dev.	21	16	133,777	126,480	126,449	139,523	149,171	177,889	21	17	173,810	157,486	160,669	154,333	164,388	231,272	21	18	1,895,247
Saunders	54	50	72,520	65,656	69,021	63,112	63,100	64,561	54	52	62,767	67,386	68,007	70,984	61,864	67,060	58	55	796,038
Crossroads	13	3	59,475	53,160	57,970	59,720	32,090	65,330	15	3	59,170	58,050	33,360	57,940	56,374	59,020	18	3	651,659
Crossroads, Penn.	9	2	1,022	945	1,037	953	912	6,303	8	3	9,955	9,984	8,755	987	920	897	5	2	43,670
Bough	9	3	26,288	26,096	30,318	31,500	46,810	59,700	10	5	68,704	60,550	76,053	45,138	43,629	44,659	10	6	559,445
Echol, Dev.	6	3	52,238	36,016	52,864	30,356	31,721	32,024	6	3	32,402	31,357	6,184	5,766	33,977	35,729	5	2	380,634
Echol, Dev. North	4	4	12,513	12,797	22,637	28,847	26,716	25,138	4	4	25,193	24,717	17,540	15,730	14,357	17,572	3	3	243,751
Jalmat	327	123	405,284	363,608	419,145	434,996	435,258	467,541	338	123	475,783	433,688	458,630	438,134	406,451	434,962	349	128	5,173,480
Langlie - Mattix	690	177	267,729	248,227	261,667	257,179	264,455	200,467	714	193	204,636	204,531	201,391	200,786	206,283	212,500	711	194	2,729,853
Arrowhead	106	83	106,163	100,519	111,564	111,516	121,997	105,897	105	85	116,940	115,368	90,349	98,500	94,436	97,103	104	89	1,270,855
Brunson	115	48	83,132	93,749	99,096	76,084	57,442	72,063	111	49	99,265	61,167	92,549	64,547	57,741	82,668	106	50	939,503
Cass	4	3	50,778	45,136	58,001	51,930	51,491	74,910	5	4	71,409	86,397	91,260	107,477	104,180	97,310	6	5	890,279
Dollarhide, Dev.					247	198	202	127	15	1	122	119	116	116	112	110	16	1	1,469
Dollarhide, Drnkd.	77	27	4,349	3,542	4,625	5,082	5,618	5,142	79	32	4,656	5,228	4,144	5,062	5,309	4,839	86	30	57,596
Dollarhide, Ell.	7	1	10,395	18,810	6,390	17,571	8,509	7,900	7	4	8,189	7,036	5,192	5,441	4,375	7,286	6	4	107,094
Dollarhide, Fuss.	7	4	22,125	21,356	23,516	39,121	40,153	37,430	8	4	38,236	37,419	45,112	46,577	48,624	44,144	10	5	443,813
Dollarhide, Queen	63	27	2,416	2,011	9,637	9,790	10,034	9,483	62	38	9,363	9,356	9,192	9,295	8,689	8,470	62	37	97,736
Lovington	49	23	8,617	15,387	7,742	7,299	6,996	6,547	49	25	7,848	8,443	8,621	8,370	7,906	8,165	49	28	101,941
Lovington, Abo	41	26	29,211	27,182	31,499	29,803	29,944	27,734	42	25	44,080	42,443	40,243	42,885	35,201	37,923	42	27	418,148
Lovington, Paddock	91	34	3,646	8,915	3,080	2,874	2,839	2,779	93	30	3,229	2,905	2,594	2,750	2,646	2,706	91	31	40,963
Lovington, East Penn.	3	1	69	42	42	61	70	65	3	1	60	46	30	31	20	62	3	1	598
Lovington, West	56	35	3,888	3,190	3,572	3,613	3,592	4,601	54	25	3,820	3,273	2,924	2,870	2,765	2,705	55	19	40,813
Lovington, Wolf Camp	1	1	722	627	655	984	1,530	581	5	1	1,732	1,199	928	801	597	1,061	1	1	11,417
Teague, Ell.	8	8	41,228	26,021	35,417	39,464	37,257	23,833	9	7	29,982	32,927	26,420	25,598	36,587	8,453	5	4	363,187
S.R.R., Dev.	2	1	39,246	1,895	23,958	41,469	39,495	24,489	2	1	23,144	27,779	16,326	33,757	31,652	29,728	2	2	332,938
Vacuum	441	98	15,229	12,788	12,102	13,117	10,978	15,487	473	76	16,152	17,749	16,641	17,340	17,013	17,221	475	76	181,817
Wilson	46	38	71,483	76,910	90,458	84,122	90,905	88,093	45	38	105,104	83,299	74,558	81,026	73,336	87,026	45	38	1,006,320
Lynch	28	20	16,696	71,410	77,905	72,517	66,720	66,639	30	17	69,007	65,983	63,445	70,875	45,930	45,954	33	18	733,081

SALT WATER DISPOSAL BY INJECTION INTO DISPOSAL WELLS

IN OIL FIELDS OF LEA COUNTY, NEW MEXICO

Pool*	Company & Lease	Well Unit	Location S. T. R.	Barrels Water Injected								Average Injection Pressure (psi)			
				Sept. 1957	Oct. 1957	Nov. 1957	Dec. 1957	Cumulative to 1/1/58	Jan. 1958	Feb. 1958	Cumulative to 3/1/58	Nov. 1957	Dec. 1957	Jan. 1958	Feb. 1958
1. Hobbs	Humble Oil & Ref. Co. N. M. St. A	2P	25-18-37	none rept.	none rept.	none rept.	2,937	2,937	3,381	3,106	9,424	none rept.	Vacuum	Vacuum	Vacuum
Hobbs	Pan Amer. Pet. Corp. St. A, Tr. 9	1E	15-19-38	none rept.	none rept.	none rept.	27,088	89,091	21,408	26,147	136,646	none rept.	Gravity	Gravity	Gravity
2. Denton, Dev.	Atlantic Ref. Co., Denton Gas Pl. SWD	1	11-15-37	none rept.	none rept.	none rept.	none rept.	none rept.	1,668	5,887	1,016,148	none rept.	none rept.	1,300	1,400
5. Caprock, E. Dev.	Amerada Pet. Corp. E. Caprock SWD	1I	11-12-32	none rept.	none rept.	none rept.	66,439	380,152	71,968	88,241	540,361	none rept.	0	0	1,225
6. Bagley, Sil.-Dev.	Amerada Pet. Corp. Bagley SWD	1N	2-12-33	none rept.	none rept.	none rept.	221,340	1,386,333	230,266	184,963	1,801,562	none rept.	0	Vacuum	Vacuum
8. Cross-roads	Magnolia Pet. Co. SPF C	2K	26-9-36	none rept.	none rept.	none rept.	6,000	98,500	3,500	2,000	104,000	none rept.	1,100	800	1,100
2. Langlie-Mattix	Gulf Coast West. Oil Co. Humble St. H.	1J	34-22-37	none rept.	none rept.	none rept.	none rept.	154,196	none rept.	6,130	173,136	none rept.	none rept.	1,900	1,900
Langlie-Mattix	May, T. O.	1B	34-22-37	none rept.	none rept.	none rept.	none rept.	142,137	none rept.	6,893	170,391	none rept.	none rept.	1,900	1,900
Langlie-Mattix	May, T. O.	4H	34-22-37	none rept.	none rept.	none rept.	none rept.	131,730	none rept.	7,348	159,405	none rept.	none rept.	1,900	1,900
Langlie-Mattix	Humble Oil & Ref. Co. State H	7F	34-22-37	none rept.	none rept.	1,585	3,965	178,267	3,247	2,189	183,703	349	652	none rept.	none rept.
Langlie-Mattix	Skelly Oil Co. Sims, H. O.	8N	34-22-37	none rept.	none rept.	9,345	none rept.	280,855	none rept.	none rept.	none rept.	675	none rept.	none rept.	none rept.
Langlie-Mattix	Sims, H. O.	9L	34-22-37	none rept.	none rept.	9,290	none rept.	218,665	none rept.	none rept.	none rept.	1,625	none rept.	none rept.	none rept.

* Numbers refer to fields as listed in Oil Conservation Commission Memo 22-56, July 3, 1956.

LEA COUNTY OIL FIELDS NEEDING

IMMEDIATE ATTENTION

Pool Name	Total Water 1956	Total Water 1957	Water Jan., 1958	Water Feb., 1958
1. Hobbs	2,512,476	2,934,199	241,388	225,457
Hobbs, Drinkard	3,821	2,414	177	55
Hobbs, East Blinebry	510	none	none	none
Hobbs, East San Andres	211,653	481,060	41,441	35,484
Hobbs, East 7 Rivers	none	none	none	none
2. Denton, Devonian	1,717,279	2,395,776	192,956	203,621
Denton, Devonian South	24,573	399,752	48,731	57,639
Denton, Wolfcamp	1,071,844	1,083,500	91,732	89,383
3. Eunice - Monument Area				
Eumont	2,602,031	2,946,369	208,452	225,807
Eunice	3,234,222	2,937,004	230,246	214,655
Monument	6,181,224	7,366,804	746,363	504,478
Monument, Blinebry	278,295	343,470	26,221	30,330
Monument, Paddock	94,677	123,022	13,646	11,711
Eunice, South	710,412	514,619	29,527	24,701
4. Moore, Devonian	450,217	750,688	95,389	70,173
5. Caprock, East Devonian	2,173,388	2,800,060	186,453	209,973
6. Bagley, Penn.	671,429	766,814	48,421	55,284
Bagley, Siluro-Devonian	1,404,235	1,895,247	201,880	175,974
7. Saunders	848,070	796,038	71,601	62,595
8. Crossroads	645,160	651,659	33,267	31,380
Crossroads, Penn.	11,713	43,670	1,871	1,550
9. Bough	650,344	559,445	45,500	45,962
10. Echol, Devonian	508,614	380,634	30,168	27,371
Echol, Devonian North	135,036	243,757	24,707	16,692

Subtotal 26,141,223 30,416,001

LEA COUNTY OIL FIELDS NEEDING ATTENTION

IN NEAR FUTURE

(In order of possible danger)

Pool Name	Total Water 1956	Total Water 1957	Water Jan., 1958	Water Feb., 1958
1. Jalmat	4,826,973	5,173,480	401,825	392,422
2. Langlie - Mattix	2,968,694	2,729,851	235,666	115,277
3. Arrowhead	1,236,325	1,270,855	105,092	118,736
4. Brunson	1,035,291	939,503	93,625	41,221
5. South Eunice	(listed in first grouping)			
6. Cass	801,496	890,279	105,685	59,300
7. Dollarhide, Devonian		1,469	103	87
Dollarhide, Drinkard	57,835	57,596	5,405	5,354
Dollarhide, Ellenburger	124,187	107,094	7,379	2,262
Dollarhide, Fusselman	269,222	443,813	44,532	40,394
Dollarhide, Queen	28,129	97,736	9,494	9,756
8. Lovington	96,580	101,941	8,119	7,560
Lovington, Abo	186,229	418,148	38,112	34,573
Lovington, Paddock	42,280	40,963	2,631	2,466
Lovington, East Penn	2,175	598	62	none
Lovington, West	47,399	40,813	2,526	2,313
Lovington, Wolf Camp	7,125	11,417	835	402
9. Teague, Ellenburger	279,555	363,187	23,897	27,305
10. S. R. R., Devonian	353,491	332,938	40,427	32,651
11. Vacuum	175,947	181,817	17,949	16,107
12. Wilson	1,025,836	1,006,320	83,158	77,462
13. Lynch	816,868	733,081	22,039	14,185

Subtotal 14,381,637 14,942,899

ADDITIONAL LEA COUNTY OIL FIELDS

NOT MENTIONED IN O.C.C. MEMO 32-57

BUT PRODUCING CONSIDERABLE* WATER

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	2,450,290	3,558,612
Total	42,973,150	48,917,512

SALT WATER PRODUCTION
(IN BARRELS)
Lea County, New Mexico

1957

Pool	Jan. No.Prod. Wells		Jan.	Feb.	Mar.	Apr.	May	June	June No.Prod. Wells		July	Aug.	Sept.	Oct.	Nov.	Dec.	Dec. No.Prod. Wells		Total
	Tot.	Wtr.							Tot.	Wtr.							Tot.	Wtr.	
Hobbs	287	170	251,108	222,096	233,686	251,202	262,223	261,165	295	170	249,749	254,967	232,823	205,849	248,341	260,990	304	175	2,934,199
Hobbs, Drnkd.	1	1	390	329	365	150	129	153	1	1	129	105	175	183	148	158	1	1	2,414
Hobbs, E. San Andres	25	12	31,198	29,761	34,663	43,145	35,723	37,969	25	14	42,989	39,223	39,653	48,984	48,425	49,326	24	14	481,060
Denton, Dev.	109	71	204,427	178,675	201,948	199,823	209,339	173,395	108	74	205,237	192,660	206,713	221,102	202,023	209,434	108	66	2,395,776
Denton, Dev. So.	7	4	7,504	4,068	18,791	25,692	36,146	31,496	7	6	56,654	51,533	47,065	35,006	46,517	40,280	7	5	399,752
Denton, Wolf Camp	96	50	97,348	94,464	105,631	83,043	96,285	89,262	94	46	95,649	87,320	69,277	87,163	87,866	90,192	94	46	1,083,500
Eunice-Monument Area																			
Bomont	423	234	228,462	219,985	221,205	219,752	260,481	252,576	531	243	253,455	276,256	267,116	283,838	227,275	235,968	567	257	2,946,369
Eunice	303	240	253,716	256,242	274,688	255,783	258,479	247,543	301	142	267,928	210,421	227,720	240,084	219,753	224,647	299	245	2,937,004
Monument	451	301	538,014	509,048	706,111	940,410	370,710	480,470	451	298	591,691	670,042	571,606	710,044	642,825	635,833	440	300	7,366,801
Mon., Blinebry	37	20	35,461	30,457	34,440	28,426	30,834	28,535	36	27	27,144	28,807	24,172	22,568	27,293	25,333	36	25	343,470
Mon., Paddock	31	16	10,464	8,681	10,885	9,079	9,855	8,834	30	19	8,840	8,500	8,695	12,574	11,801	14,814	30	19	123,022
Eunice, South	114	63	53,714	42,344	46,737	59,115	50,476	55,034	135	78	55,272	33,936	25,886	27,165	26,468	38,472	160	91	514,619
Moore, Devonian	19	6	50,480	46,768	56,121	52,126	58,624	64,476	19	8	63,928	69,053	70,551	71,814	65,193	81,554	19	8	750,686
Caprock, East Dev.	24	18	254,579	230,777	245,516	232,221	239,666	214,732	24	18	187,867	226,222	237,431	228,631	220,589	281,829	24	17	2,800,060
Bagley, Penn.	14	11	58,738	49,491	46,918	59,821	65,671	94,396	13	10	105,096	59,830	62,187	59,451	54,940	50,275	12	10	766,814
Bagley, Siluro Dev.	21	16	133,777	126,480	126,449	139,523	149,171	177,889	21	17	173,810	157,486	160,669	154,333	164,388	231,272	21	18	1,895,247
Saunders	54	50	72,520	65,656	69,021	63,112	63,100	64,561	54	52	62,767	67,386	68,007	70,984	61,864	67,060	58	55	796,038
Crossroads	13	3	59,475	53,160	57,970	59,720	32,090	65,330	15	3	59,170	58,050	33,360	57,940	56,374	59,020	18	3	651,659
Crossroads, Penn.	9	2	1,022	945	1,037	953	912	6,303	8	3	9,955	9,984	9,755	987	920	897	5	2	43,670
Bough	9	3	26,288	26,096	30,318	31,500	46,810	59,700	10	5	68,704	60,550	76,053	45,138	43,629	44,659	10	6	559,445
Echol, Dev.	6	3	52,238	36,016	52,864	30,356	31,721	32,024	8	3	32,402	31,357	6,184	5,766	33,977	35,729	5	2	380,634
Echol, Dev. North	4	4	12,513	12,797	22,637	28,847	26,716	25,138	4	4	25,193	24,717	17,540	15,730	14,357	17,572	3	3	243,757
Jalmat	327	123	405,284	363,608	419,145	434,996	435,258	467,541	338	123	475,783	433,688	458,630	438,134	406,451	434,962	349	128	5,173,480
Langlie - Mattix	690	177	267,729	248,227	261,667	257,179	264,455	200,467	714	193	204,636	204,531	201,391	200,786	206,283	212,500	711	194	2,729,851
Arrowhead	106	83	106,163	100,519	111,564	111,516	121,997	105,897	105	85	116,940	115,368	90,849	98,500	94,436	97,106	104	89	1,270,855
Brunson	115	48	83,132	93,749	99,096	76,084	57,442	72,063	111	49	99,265	61,167	92,549	64,547	57,741	82,668	106	50	939,503
Cass	4	3	50,778	45,136	58,001	51,930	51,491	74,910	5	4	71,409	86,397	91,260	107,477	104,180	97,310	8	5	890,279
Dollarhide, Dev.					247	198	202	127	15	1	122	119	116	116	112	110	16	1	1,469
Dollarhide, Drnkd.	77	27	4,349	3,542	4,625	5,082	5,618	5,142	79	32	4,656	5,228	4,144	5,062	5,309	4,839	86	30	57,596
Dollarhide, Ell.	7	1	10,395	18,810	6,390	17,571	8,509	7,800	7	4	8,189	7,036	5,192	5,441	4,375	7,286	6	4	107,094
Dollarhide, Fuss.	7	4	22,125	21,356	23,516	39,121	40,153	37,430	8	4	38,236	37,419	45,112	46,577	48,624	44,144	10	5	443,813
Dollarhide, Queen	63	27	2,416	2,011	9,637	9,790	10,034	9,483	62	38	9,363	9,356	9,192	9,295	8,689	8,470	62	37	97,736
Lovington	49	23	8,617	15,387	7,742	7,299	6,996	6,547	49	25	7,848	8,443	8,621	8,370	7,906	8,165	49	28	101,941
Lovington, Abo	41	26	29,211	27,182	31,499	29,803	29,944	27,734	42	25	44,080	42,443	40,243	42,885	35,201	37,923	42	27	418,148
Lovington, Paddock	91	34	3,646	8,915	3,080	2,874	2,839	2,779	93	30	3,229	2,905	2,594	2,750	2,646	2,706	91	31	40,963
Lovington, East Penn.	3	1	69	42	42	61	70	65	3	1	60	46	30	31	20	62	3	1	598
Lovington, West	56	35	3,888	3,190	3,572	3,613	3,592	4,601	54	25	3,820	3,273	2,924	2,870	2,765	2,705	55	19	40,813
Lovington, Wolf Camp	1	1	722	627	655	984	1,530	581	5	1	1,732	1,199	928	801	597	1,061	1	1	11,417
Teague, Ell.	8	8	41,228	26,021	35,417	39,464	37,257	23,833	9	7	29,982	32,927	26,420	25,598	36,587	8,453	5	4	363,187
S.R.R., Dev.	2	1	39,246	1,895	23,958	41,469	39,495	24,489	2	1	23,144	27,779	16,326	33,757	31,652	29,728	2	2	332,938
Vacuum	441	98	15,229	12,788	12,102	13,117	10,978	15,487	473	76	16,152	17,749	16,641	17,340	17,013	17,221	475	76	181,817
Wilson	46	38	71,483	76,910	90,458	84,122	90,905	88,093	45	38	105,104	83,299	74,558	81,026	73,336	87,026	45	38	1,006,320
Lynch	28	20	16,696	71,410	77,905	72,517	66,720	66,639	30	17	69,007	65,983	63,445	70,875	45,930	45,954	33	18	733,081

SALT WATER DISPOSAL BY INJECTION INTO DISPOSAL WELLS

IN OIL FIELDS OF LEA COUNTY, NEW MEXICO

Pool*	Company & Lease	Well Unit	Location S. T. R.	Barrels Water Injected: Sept. 1957	Oct. 1957	Nov. 1957	Dec. 1957	Cumulative to 1/1/58	Jan. 1958	Feb. 1958	Cumulative to 3/1/58	Average Injection Pressure (psi): Nov. 1957	Dec. 1957	Jan. 1958	Feb. 1958
1. Hobbs	Humble Oil & Ref. Co. N. M. St. A	2P	25-18-37	none rept.	none rept.	none rept.	2,937	2,937	3,381	3,106	9,424	none rept.	Vacuum	Vacuum	Vacuum
Hobbs	Pan Amer. Pet. Corp. St. A, Tr. 9	1E	15-19-38	none rept.	none rept.	none rept.	27,088	89,091	21,408	26,147	136,646	none rept.	Gravity	Gravity	Gravity
2. Denton, Dev.	Atlantic Ref. Co., Denton Gas Pl. SWD	1	11-15-37	none rept.	none rept.	none rept.	none rept.	none rept.	1,668	5,687	1,016,148	none rept.	none rept.	1,300	1,400
5. Caprock, E. Dev.	Amerada Pet. Corp. E. Caprock SWD	1I	11-12-32	none rept.	none rept.	none rept.	66,439	380,152	71,968	88,241	540,361	none rept.	0	0	1,225
6. Bagley, Sil-Dev.	Amerada Pet. Corp. Bagley SWD	1N	2-12-33	none rept.	none rept.	none rept.	221,340	1,386,333	230,266	184,963	1,801,562	none rept.	0	Vacuum	Vacuum
8. Cross-roads	Magnolia Pet. Co. SPF C	2K	26-9-36	none rept.	none rept.	none rept.	8,000	98,500	3,500	2,000	104,000	none rept.	1,100	800	1,100
2. Langlie-Mattix	Gulf Coast West. Oil Co. Humble St. H.	1J	34-22-37	none rept.	none rept.	none rept.	none rept.	154,196	none rept.	6,130	173,136	none rept.	none rept.	1,900	1,900
Langlie-Mattix	May, T. O.	1B	34-22-37	none rept.	none rept.	none rept.	none rept.	142,137	none rept.	6,893	170,391	none rept.	none rept.	1,900	1,900
Langlie-Mattix	May, T. O.	4H	34-22-37	none rept.	none rept.	none rept.	none rept.	131,730	none rept.	7,348	159,405	none rept.	none rept.	1,900	1,900
Langlie-Mattix	Humble Oil & Ref. Co. State H	7F	34-22-37	none rept.	none rept.	1,585	3,965	178,267	3,247	2,189	183,703	349	652	none rept.	none rept.
Langlie-Mattix	Skelly Oil Co. Sims, H. O.	8N	34-22-37	none rept.	none rept.	9,345	none rept.	280,855	none rept.	none rept.	none rept.	675	none rept.	none rept.	none rept.
Langlie-Mattix	Sims, H. O.	9L	34-22-37	none rept.	none rept.	9,290	none rept.	218,665	none rept.	none rept.	none rept.	1,625	none rept.	none rept.	none rept.

* Numbers refer to fields as listed in Oil Conservation Commission Memo 22-58, July 3, 1958.

PROPOSED OUTLINE OF TESTIMONY
CASE 1063
OIL CONSERVATION COMMISSION
MAY 16, 1956

Q1 Brine Production in Lea County

Q2 Future trends of water production

Q3 Concentration of brines produced in Lea County

Q4 Present methods of brine disposal in Lea County

Q5 Evaporation of water from brine disposal pits in Lea County

Q6 Migration of brine from disposal pits in Lea County

Q7 Distribution of fresh water in Lea County

Q8 Evidence of contamination of fresh water by oil field disposal brines in Lea County

Q9 Investigations of contamination of fresh-water aquifers

Q10 Conclusions and recommendations of other investigations

Q11 Conclusions and recommendations

HUMBLE OIL & REFINING COMPANY

MAIN OFFICE OCC MIDLAND, TEXAS

1956 AUG 17 AM 8:04

August 15, 1956

File: 6-1 New Mexico
Re: Hobbs Pool, Salt Water Disposal

Mr. A. L. Porter
New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Sir:

At an operators' meeting held in Hobbs, New Mexico, August 14, 1956, Stanolind Oil & Gas Company was designated as temporary chairman for the Hobbs Pool Operators Committee.

The Hobbs Pool Operators Committee will hold a meeting on Friday, August 24, 1956, to consider the salt water disposal problem in that pool. Due to this meeting, Humble Oil & Refining Company requests that the hearing set for August 22, 1956, on Case 1137, be postponed to a later date.

Subsequent to the above meeting, Humble Oil & Refining Company will advise the New Mexico Oil Conservation Commission relative to resetting of the hearing on Case 1137.

Yours very truly,

HUMBLE OIL & REFINING COMPANY

J. W. HOUSE

BY: R. S. DEWEY

APPROVED:

RSD/rs
cc: Offset Operators,
(See attached list)

Case 1053

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

MAIN OFFICE OCC
1957 SEP 25 AM 7:53

P. O. Box 2167
Hobbs, New Mexico

FORT WORTH
PRODUCTION DIVISION

September 23, 1957

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

Dear Mr. Porter:

Attached hereto is a copy of the statement made before the Commission September 17, 1957 pertaining to the Eunice-Eumont SWD Committee's progress report - Case 1053.

Sincerely yours,

C. M. Bumpass

C. M. Bumpass
Gulf Oil Corporation,
Committee Chairman

CMB:bm
Att'd.

Eunice-Eumont SWD Committee's
Progress Report - Case 1053

The following statement was made before the New Mexico Oil Conservation Commission in Santa Fe on September 17, 1957.

"My name is C. M. Bumpass; I am an engineer for Gulf Oil Corporation, Hobbs Office. Gulf is Chairman of the Industry Salt Water Disposal Committee for the Eunice-Eumont Area. As spokesman for the Committee, I wish to report on the progress in this matter.

"Subsequent to the Commission's hearing in March, 1957 (the last progress reporting date) a professional water disposal firm offered its services to operators in Southeast New Mexico. It was the opinion of several operators that professional handling would expedite operations. After several meetings, operators representing in excess of 90% of the wells in the Eunice-Eumont Area had approved of the employment of the professional firm to make a preliminary survey. This firm was given authority to start work on May 13, 1957. Their work was to be finalized in a formal report which would present the operators with a preliminary design of the disposal system. Following their initiation of work in the Eunice-Eumont Area they were also authorized by operators to make a similar study and report for the Monument-Eumont Area. Later the two areas were combined for the purpose of the report. This report which includes the Eunice-Eumont-Monument Area is very comprehensive and required four months in preparation.

"This report was received by the operators last Wednesday, September 10. After a sufficient length of time to allow the operators to study the report, an operators meeting will be called, probably in October, to review and discuss the report for the purpose of determining what future action should be taken."

No. 7-58

DOCKET: REGULAR HEARING MARCH 13, 1958

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

ALLOWABLE: (1) Consideration of the oil allowable for April, 1958.

(2) Consideration of the allowable production of gas for April, 1958, for six prorated pools in Lea County, New Mexico; also consideration of the allowable production of gas from six prorated pools in San Juan and Rio Arriba Counties, New Mexico, for March, 1958.

NEW CASES

CASE 1308: (Rehearing)
In the matter of the rehearing requested by Shell Oil Company for reconsideration by the Commission of certain portions of Case 1308 - application of Sunray Mid-Continent Oil Company for the temporary establishment of a uniform 80-acre well spacing and Special Rules and Regulations in the Bisti-Lower Gallup Oil Pool.

CASE 1390: In the matter of the case called by the Oil Conservation Commission upon its own motion to permit the operators in the South Blanco-Tocito Oil Pool to appear and show cause why the provisions of Rule 506 of the Commission Rules and Regulations should not be imposed in the South Blanco-Tocito Oil Pool.

CASE 1391: Southeastern New Mexico nomenclature case calling for an order for the creation of new pools and the extension of existing pools in Lea and Eddy Counties, New Mexico.

(a) Create a new gas pool for Pennsylvanian production, designated as the Crawford-Pennsylvanian Gas Pool, and described as:

TOWNSHIP 24 SOUTH, RANGE 26 EAST, NMPM
Section 26: SE/4

(b) Create a new gas pool for Pennsylvanian production, designated as the Harkey-Pennsylvanian Gas Pool, and described as:

TOWNSHIP 24 SOUTH, RANGE 27 EAST, NMPM
Section 34: NW/4

(c) Create a new oil pool for Fusselman production, designated as the Justis-Fusselman Pool, and described as:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 24: NW/4

(d) Create a new oil pool for Glorieta production, designated as the South Paddock Pool, and described as:

TOWNSHIP 22 SOUTH, RANGE 38 EAST, NMPM
Section 32: SE/4

(e) Create a new oil pool for San Andres production, designated as the South Sawyer-San Andres Pool, and described as:

TOWNSHIP 9 SOUTH, RANGE 38 EAST, NMPM
Section 33: Lots 3 & 4 and W/2 SW/4

(f) Create a new oil pool for Devonian production, designated as the South Vacuum-Devonian Pool, and described as:

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 35: NE/4

(g) Delete portions of the Atoka-Grayburg Pool, described as:

TOWNSHIP 18 SOUTH, RANGE 27 EAST, NMPM
Section 7: SW/4

(h) Extend the Red Lake Pool to include:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM
Section 1: NE/4 SE/4

TOWNSHIP 18 SOUTH, RANGE 27 EAST, NMPM
Section 7: SW/4

(i) Delete a portion of the South Eunice Pool, described as:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPM
Section 31: NE/4

(j) Extend the Anderson Ranch-Devonian Pool, to include:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM
Section 2: Lots 1 & 2

(k) Extend the Atoka Pool to include:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM
Section 12: W/2 SE/4, SE/4 NW/4, & SW/4 NE/4

(l) Extend the Eumont Gas Pool to include:

TOWNSHIP 20 SOUTH, RANGE 36 EAST, NMPM
Section 32: SE/4

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 8: NW/4

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 20: SW/4

(m) Extend the Jalmat Gas Pool to include:

TOWNSHIP 22 SOUTH, RANGE 35 EAST, NMPM
Section 14: SW/4

TOWNSHIP 23 SOUTH, RANGE 36 EAST, NMPM
Section 20: NW/4 & W/2 NE/4

(n) Extend the Justis-Ellenburger Pool to include:

TOWNSHIP 25 SOUTH, RANGE 37 EAST, NMPM
Section 24: SE/4

(o) Extend the Maljamar Pool to include:

TOWNSHIP 17 SOUTH, RANGE 33 EAST, NMPM
Section 28: E/2

(p) Extend the Pearl-Queen Pool to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
Section 21: SE/4 SE/4
Section 22: S/2 SW/4

(q) Extend the Penrose-Skelly Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 31: SW/4

(r) Extend the Townsend-Wolfcamp Pool to include:

TOWNSHIP 16 SOUTH, RANGE 36 EAST, NMPM
Section 6: Lots 9, 10, 11, 14, 15, & 16

(s) Extend the Turkey Track Pool to include:

TOWNSHIP 28 SOUTH, RANGE 29 EAST, NMPM
Section 33: E/2 NE/4

(t) Delete a portion of the Arrowhead Pool described as:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPM
Section 36: NE/4 NE/4

CASE 1392: Northwestern New Mexico nomenclature case calling for an order for the creation of a new pool and the extension of existing pools in San Juan and Rio Arriba Counties, New Mexico.

(a) Create a new gas pool for Fruitland production, designated as the Kutz-Fruitland Pool, and described as:

TOWNSHIP 28 NORTH, RANGE 11 WEST, NMPM
All of Sections 23, 26 & 27

(b) Extend the Kutz-Farmington Pool to include:

TOWNSHIP 28 NORTH, RANGE 11 WEST, NMPM
Section 22: SW/4

(c) Extend the Aztec-Fruitland Pool to include:

TOWNSHIP 29 NORTH, RANGE 11 WEST, NMPM
Section 25: NW/4

(d) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM
Section 35: W/2

(e) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 28 NORTH, RANGE 8 WEST, NMPM
All of Sections 30, 32 & 33
Section 34: W/2

(f) Extend the Gavilan-Pictured Cliffs Pool to include:

TOWNSHIP 25 NORTH, RANGE 1 WEST, NMPM
Section 30: S/2

(g) Extend the Tapacito-Pictured Cliffs Pool to include:

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM
Section 1: E/2

(h) Extend the Blanco Mesaverde Pool to include:

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM
Section 30: All

(i) Extend the Bisti-Lower Gallup Oil Pool to include:

TOWNSHIP 25 NORTH, RANGE 10 WEST, NMPM
Section 28: S/2

TOWNSHIP 25 NORTH, RANGE 11 WEST, NMPM
Section 15: SW/4
Section 24: N/2

TOWNSHIP 25 NORTH, RANGE 12 WEST, NMPM
Section 21: NE/4

TOWNSHIP 26 NORTH, RANGE 12 WEST, NMPM
Section 32: SW/4

TOWNSHIP 26 NORTH, RANGE 13 WEST, NMPM
Section 20: N/2

(j) Extend the Horseshoe-Gallup Oil Pool to include:

TOWNSHIP 30 NORTH, RANGE 16 WEST, NMPM
Section 3: E/2 SW/4

(k) Extend the Verde-Gallup Oil Pool to include:

TOWNSHIP 30 NORTH, RANGE 15 WEST, NMPM
Section 5: NE/4

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 17: NW/4

CONTINUED CASES

CASE 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the fresh-water bearing horizons in Lea County, New Mexico.

CASE 1377. In the matter of the hearing called by the Oil Conservation Commission of New Mexico on its own motion to consider the establishment of minimum allowables for gas wells in San Juan, Rio Arriba, Sandoval, and McKinley Counties, New Mexico.

ir/

PROGRESS REPORT
SALT WATER DISPOSAL
HOBBS FIELD
LEA COUNTY, NEW MEXICO

The previous progress report on the Hobbs Field Salt Water Disposal System presented at the September, 1957 Regular Hearing pertained primarily to the completion of the two disposal wells to be included in the cooperative system and progress on the installation of a temporary disposal system. It was also stated in the report that Rice Engineering and Operating, Inc. had been employed to make a preliminary study of the Hobbs Field and design a system to dispose of the produced water. This design was received by the Operators on November 14, 1957. There was some disagreement with the design factors used and subsequently the fieldwide system was redesigned, using different factors. This redesign was completed and presented to the Operators at a meeting held in Hobbs, New Mexico, on February 14, 1958. At another Operators' meeting held on February 28, 1958, the redesigned fieldwide cooperative system was accepted by the Operators. The estimated cost to install the redesigned system is approximately $1,100,000. It will initially employ only the two existing disposal wells, and therefore will not require drilling any additional disposal wells to place the entire system into operation.

A revised Operating Agreement, incorporating revisions previously requested, was mailed to all the operators on March 4, 1958. An Operators' meeting has been called for March 21, 1958, to review the revised draft and discuss any additional changes to the agreement. By the date of this meeting, it has been requested that all Operators submit a final list of leases and wells to be included in the initial installation of the cooperative system. Only wells submitted by this date will be included in the final design.

Now that the design of the system has been agreed to by the Operators and the proposed Operating Agreement is in final stages of consideration, it is anticipated that construction of the permanent system can begin within 3 or 4 months. Most of the Operators have informed us that the expenditure for this system has been budgeted and their management would like to spend the money within this calendar year.

In addition to the progress that has been made on the permanent fieldwide system, the number of Hobbs Field wells that are currently disposing of water underground through the temporary systems has increased from 6 in September, 1957, to 37 as of March 1, 1958. Cumulative water injected in the two existing disposal wells as of March 1, 1958, is approximately 158,000 barrels. The current injection rate is approximately 800 barrels per day. It was anticipated that a larger number of wells would be included by this time, but further expansion of the two temporary gathering systems has been deferred because of the present accelerated progress on the cooperative system.

No. 18-58

DOCKET: REGULAR HEARING JUNE 18, 1958

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

ALLOWABLE:

(1) Consideration of the oil allowable for July, 1958.

(2) Consideration of the allowable production of gas for July, 1958, for six prorated pools in Lea County, New Mexico; consideration of the allowable production of gas from six prorated pools in San Juan and Rio Arriba Counties, New Mexico, for July, 1958, and also presentation of purchaser's nominations for the six-month period beginning August 1, 1958, for seven prorated pools in San Juan and Rio Arriba Counties, New Mexico.

NEW CASES

CASE 1451: Application of Amerada Petroleum Corporation for a non-standard gas proration unit. Applicant, in the above-styled cause, seeks an order establishing a 280-acre non-standard gas proration unit in the Justis Gas Pool consisting of the W/2 SW/4 Section 24, NW/4 and SW/4 NE/4 of Section 25, all in Township 25 South, Range 37 East, Lea County, New Mexico, said unit to be dedicated to the applicant's proposed well to be drilled in the NE/4 NW/4 of said Section 25.

CASE 1473: Southeastern New Mexico Nomenclature case calling for an order for the extension of existing pools in Lea and Eddy Counties, New Mexico.

(a) Extend the Atoka Pool to include:

TOWNSHIP 18 SOUTH, RANGE 26 EAST NMPM
Section 23: N/2 NW/4

(b) Extend the Blinebry Gas Pool to include:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM
Section 29: W/2

(c) Extend the Eumont Gas Pool to include:

TOWNSHIP 19 SOUTH, RANGE 36 EAST, NMPM
Section 1: E/2

(d) Extend the Gladiola Pool to include:

TOWNSHIP 11 SOUTH, RANGE 38 EAST, NMPM
Section 29: SE/4
Section 32: NE/4

(e) Extend the Grayburg Jackson Pool to include:

TOWNSHIP 17 SOUTH, RANGE 29 EAST, NMPM
Section 19: SE/4

(f) Extend the Hare Pool to include:

TOWNSHIP 22 SOUTH, RANGE 37 EAST, NMPM
Section 4: NW/4

(g) Extend the West Henshaw-Grayburg Pool to include:

TOWNSHIP 16 SOUTH, RANGE 30 EAST, NMPM
Section 17: SW/4

(h) Extend the Kemnitz-Wolfcamp Pool to include:

TOWNSHIP 16 SOUTH, RANGE 33 EAST, NMPM
Section 26: NE/4

(i) Extend the South Leo-Grayburg Pool to include:

TOWNSHIP 18 SOUTH, RANGE 29 EAST, NMPM
Section 36: NE/4

(j) Extend the Pearl-Queen Pool to include:

TOWNSHIP 19 SOUTH, RANGE 35 EAST, NMPM
Section 21: SW/4
Section 28: NW/4

(k) Extend the San Simon Pool to include:

TOWNSHIP 21 SOUTH, RANGE 35 EAST, NMPM
Section 28: SW/4
Section 33: NW/4

(l) To reconsider the designation and limits of the South Sawyer-San Andres Pool.

CASE 1474: Northwestern New Mexico Nomenclature case calling for an order creating a new pool, extending existing pools and changing the designation of certain pools in Rio Arriba, San Juan and McKinley Counties, New Mexico.

(a) Create a new gas pool for Paradox production, designated as the Blue Hill-Paradox Pool, and described as:

TOWNSHIP 31 NORTH, RANGE 18 WEST, NMPM
Section 1: NW/4
Section 2: NE/4

TOWNSHIP 32 NORTH, RANGE 18 WEST, NMPM
Section 35: SE/4
Section 36: SW/4

(b) Extend the Aztec-Pictured Cliffs Pool to include:

TOWNSHIP 30 NORTH, RANGE 12 WEST, NMPM
Section 1: S/2
Section 12: NE/4

(c) Extend the Fulcher Kutz-Pictured Cliffs Pool to include:

TOWNSHIP 29 NORTH, RANGE 12 WEST, NMPM
Section 6: SW/4

(d) Extend the Gavilan-Pictured Cliffs Pool to include:

TOWNSHIP 25 NORTH, RANGE 2 WEST, NMPM
Section 23: SW/4
Section 26: NW/4

(e) Extend the South Blanco-Pictured Cliffs Pool to include:

TOWNSHIP 24 NORTH, RANGE 4 WEST, NMPM
Section 7: NE/4
Section 8: SW/4

(f) Extend the Blanco Mesaverde Pool to include:

TOWNSHIP 27 NORTH, RANGE 8 WEST, NMPM
Section 6: All

TOWNSHIP 29 NORTH, RANGE 10 WEST, NMPM
Section 5: All

(g) Extend the Angels Peak-Dakota Pool to include:

TOWNSHIP 27 NORTH, RANGE 10 WEST, NMPM
Section 27: S/2
Section 34: All

(h) Extend the East Companero-Dakota Pool to include:

TOWNSHIP 27 NORTH, RANGE 4 WEST, NMPM
Section 18: All

(i) Extend the North Los Pinos-Dakota Pool to include:

TOWNSHIP 32 NORTH, RANGE 6 WEST, NMPM
Section 20: N/2

TOWNSHIP 32 NORTH, RANGE 7 WEST, NMPM
Section 23: NE/4

(j) Extend the Bisti-Lower Gallup Oil Pool to include:

TOWNSHIP 25 NORTH, RANGE 11 WEST, NMPM
Section 15: SE/4

TOWNSHIP 26 NORTH, RANGE 13 WEST, NMPM
Section 19: SE/4
Section 30: N/2

(k) Extend the Verde-Gallup Oil Pool to include:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 8: SW/4
Section 30: NW/4

(l) Change the official designation of the following described pools:

PRESENT DESIGNATION	PROPOSED REVISION
Angels Peak Pool	Angels Peak-Dakota Pool
Bloomfield Oil Pool	Bloomfield-Farmington Oil Pool
Fulcher-Kutz (Pictured Cliffs) Pool	Fulcher Kutz-Pictured Cliffs Pool
Gavilan Pool	Gavilan-Pictured Cliffs Pool
Lindrith Oil Pool	Lindrith-Dakota Oil Pool
North Los-Pinos-Dakota Pool	North Los Pinos-Dakota Pool
South Los-Pinos-Dakota Pool	South Los Pinos-Dakota Pool
Oswell Oil Pool	Oswell-Farmington Oil Pool
Red Mountain Oil Pool	Red Mountain-Mesaverde Oil Pool
Stoney Butte (Dakota) Oil Pool	Stoney Butte-Dakota Oil Pool
Table Mesa Oil Pool	Table Mesa-Dakota Oil Pool
Wyper Oil Pool	Wyper-Farmington Oil Pool
Otero Graneros-Dakota Pool	Otero-Graneros Dakota Pool

CONTINUED CASES

CASE 1053: Application of the Oil Conservation Commission upon its own motion, at the request of the State Engineer, for an order prescribing rules and regulations to govern the disposal of salt water in areas of Lea County, New Mexico. The Commission desires to formulate rules and procedures which will result in the efficient disposal of salt water and which will eliminate the practice of surface disposal of large volumes of oil field brines in order to prevent the contamination of the freshwater bearing horizons in Lea County, New Mexico.

CASE 1440: Application of Skelly Oil Company for an order promulgating temporary special rules and regulations for the Otero-Gallup Oil Pool in Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order promulgating temporary special rules and regulations for the Otero-Gallup Oil Pool in Rio Arriba County, New Mexico, to provide for 80-acre proration units, well spacing, and such other provisions as the Commission may deem necessary and proper.

June 2, 1958

ga

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

May 17, 1956

COPY

Mr. Fred Parkey
Wichita County Water Improvement District
Memorial Auditorium
Wichita Falls, Texas

Dear Sir:

Your letter of May 9th concerning a report on salt water conditions has been referred to this office for handling.

Please be advised that a hearing was first called on this matter in April and continued to the regular May hearing of the Commission and on both occasions testimony was received from the State Engineer's Office. At the May hearing the matter was continued to September 13th in order to allow us more time to get information from the State Engineer's Office and to give the oil producers an opportunity to study the matter and report to the September hearing with progress reports. No publications have been made by either the State Engineer's Office or the Oil Commission up to now.

Yours very truly,

A. L. Porter, Jr.
Acting Secretary - Director

ALP:brp

MAIN OFFICE OCC
1956 MAY 16 PM 1:18

New Mexico
OIL CONSERVATION COMMISSION

GOVERNOR JOHN F. SIMMS
CHAIRMAN
LAND COMMISSIONER E. S. WALKER
MEMBER
STATE GEOLOGIST W. B. MACEY
SECRETARY & DIRECTOR

Box 2045
HOBBS, NEW MEXICO

May 14, 1956

Mr. A. L. Porter, Jr.
Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Mr. Porter:

I am forwarding to you a letter received by Mr. Staley's group regarding our recent investigation and hearing relative to salt water pollution in Lea County, and feel that insamuch as the work regarding this problem is being handled by our Santa Fe office, as well as the State Engineer's Santa Fe office, that this request for information made by the Wichita County Water Improvement Districts could be handled more efficiently by you.

Yours very truly,

OIL CONSERVATION COMMISSION

C. M. Rieder

C. M. Rieder
Engineer

CMR/hs
encl.
cc-Mr. Fred Parkey, Wichita Falls, Texas

OIL CONSERVATION COMMISSION
MAIN OFFICE OCC HOBBS, NEW MEXICO

1956 MAY 16 PM 1:18

May 14, 1956

COPY

Mr. Fred Parkey, General Manager
Wichita County Water Improvement Districts
Memorial Auditorium
Wichita Falls, Texas

Dear Mr. Parkey:

Reference is made to your letter of May 9, 1956, which was directed to the Lea County Engineering Committee and which has been referred to me. I am, in turn, referring it to the Santa Fe office of the Oil Conservation Commission, who at the present time, are conducting the study of salt water pollution in Lea County, New Mexico. Matters dealing with potable waters in the State of New Mexico are normally handled by the State Engineer, and should you have need for more specific information regarding underground potable waters in the state, you may direct your correspondence to the State Engineer, Santa Fe, New Mexico.

The current study of salt water pollution in Lea County, due to its complexities and its direct association with the oil and gas business, is being jointly handled by both the office of State Engineer and the Oil Conservation Commission, however, the Oil Commission, for the moment, is conducting the project, and any future correspondence regarding this particular problem should be directed to Mr. A. L. Porter, Jr., Secretary-Director, P. O. Box 871, Santa Fe.

Yours very truly,

OIL CONSERVATION COMMISSION

C. M. Rieder
Engineer

CMR/hs
cc: A. L. Porter, Jr., Santa Fe
File

FLOW OFFICE OCC
SECRETARY '56 MAY 1 1 12

DIRECTORS
DISTRICT NO. 1
ORAL JONES, PRESIDENT
A. N. NORWOOD V-PRESIDENT
RHEA HOWARD, SECRETARY
JOHN HUMPHREY
C. M. CROWELL

DIRECTORS
DISTRICT NO. 2
C. E. BIRK, PRESIDENT
CARL WILLIAMSON, V-PRES.
A. RUFUS KING, SECRETARY
WILL SPRUIELL
KINDEL PAULK

FRED PARKEY, GENERAL MANAGER

WICHITA COUNTY WATER IMPROVEMENT DISTRICTS

J. R. DRUMMOND, AUDITOR

JACK CONNELL, ATTORNEY

MEMORIAL AUDITORIUM
Wichita Falls, Texas

May 9, 1956

Lee County Engineering Committee
Salt Water Pollution
Hobbs, New Mexico

Dear Sir:

I understand that your committee has prepared a report on salt water conditions resulting from oil fields in your area.

It will be appreciated if you would send me a copy of this report.

Thanking you in advance, I remain,

Yours truly,

Fred Parkey

Fred Parkey, General Manager
Wichita County Water Improvement
District Nos. 1 & 2

FP:sd

PROGRESS REPORT ON SALT WATER DISPOSAL
HOBBS FIELD, LEA COUNTY, NEW MEXICO
JUNE 18, 1958

In the Progress Report presented during the March 1958 Regular Hearing, it was stated that the basic design for the Hobbs Field Salt Water Disposal System had been accepted and that a revised draft of the Operating Agreement had been mailed to the Operators. This revised draft of the agreement was accepted by the Operators at a meeting held in Hobbs on April 11, 1958. A complete final draft was then prepared and submitted to the Operators on May 26, 1958, for execution. In order to expedite the execution of the agreement, June 25, 1958, was set as the deadline. The majority of the Operators indicated verbally that the 30 day execution period was satisfactory.

The Operating Agreement will be in effect and preparations for construction will begin when Operators, committing 225 wells, have signed the agreement. We firmly believe that the agreement will be executed by the required number of Operators prior to the June 25 deadline. At such time as the agreement becomes effective, the duties of Pan American as chairman of the Hobbs Field Operators, will cease and a representative of Rice Engineering and Operating, Inc. will become the new chairman.

Inasmuch as this will probably be the last report presented by Pan American, we are including a brief history on the progress of salt water disposal in the Hobbs Field up to the present time.

On August 14, 1956, a meeting of all Operators in Southeastern New Mexico was held to discuss Case 1053 concerning disposal of salt water in New Mexico. In this meeting a temporary chairman was selected for each of the 10 pools considered as critical areas by the State Engineer and Commission. Pan American was selected as temporary chairman for the Hobbs Field.

An organizational meeting for the Hobbs Field Operators was held on August 24, 1956, to discuss the course of action to be taken in disposing of produced water in the Hobbs Field Area. Pan American was elected chairman of the Hobbs Field Operators and subcommittees were set up to study individual problems of designing a

permanent disposal system. The sub-committees consisted of a map committee for the preparation of a base map of the field and a reservoir committee to develop realistic forecasts regarding future water production.

Operators' meetings were held on September 6 and October 9, 1956, to evaluate progress made by the two sub-committees. By the October 9th meeting the reservoir committee had completed their study of future water production for the field and a tabulation showing their estimated future maximum water production from each lease was accepted by the Operators for use in designing a disposal system. The map committee was in the process of completing the map to show the location of each tank battery and a contour of the surface. A design committee was appointed at this meeting and given the assignment of preparing the preliminary design of the disposal system.

It was agreed that an important factor in the design would be the ability of a usable disposal formation to take the volume of water estimated to be produced in the future. Humble's and Pan American's representatives stated that they were investigating the possibility of deepening a well to the lower San Andres for disposal purposes.

By March 1957, Humble had recompleted their State A-2 as a disposal well in the lower San Andres formation. Injection tests indicated that the well would take 4 barrels per minute on vacuum through 2 1/2" tubing.

Pan American had made application for hearing before the Commission to convert State A Tract 9 No. 13 to a salt water disposal well and to transfer the allowable of this well to other wells in the vicinity on the same basic lease. Plans were to commence work immediately upon favorable action by the Commission. A 96 hour production test witnessed by the Commission on the proposed disposal well indicated that the well would produce an average of 19.5 barrels of oil per day. In view of the unexpected large volume of oil produced, Pan American obtained dismissal of the two cases on conversion.

At the March 11, 1957, Operators' Meeting, an operating agreement for the disposal system was presented for discussion. It was agreed that a meeting would be called at a later date to discuss various features of the agreement.

In June 1957, Rice Engineering and Operating, Inc., presented a proposal to conduct a complete preliminary study and design a salt water disposal system for the Hobbs Field. This proposal was accepted by ballot from the Operators on August 7, 1957, and Rice was notified to proceed with the study. By August, 1957, Pan American had drilled and completed the State A Tract 9 Salt Water Disposal Well No. 1 located in the SW/4 NW/4 of Section 15, T-19-S, R-36-E. During injection tests conducted on August 10, 1957, the well was indicated to have a maximum disposal capacity of 1152 barrels per hour, or 27,648 barrels per day, by gravity flow down 7" casing. The well was also indicated to have a capacity of 15,840 barrels per day by gravity through 3" tubing.

With the completion of Humble's and Pan American's disposal well, sufficient data were available to complete the basic design of a salt water disposal system. In addition, it became possible to begin disposal of produced salt water into the 2 disposal wells. On August 26, 1957, six Pan American Hobbs Field wells were connected to the State "A" Tract 9 SWD No. 1 for injection of salt water produced. In October 1957, Humble commenced disposing of salt water produced from 11 of their 13 Hobbs Field wells into their State A-2 disposal well. As of June 1, 1958, the total number of wells connected to the two disposal systems increased to 37 wells with an average injection rating of approximately 1041 barrels per day.

Rice Engineering and Operating, Inc., completed the preliminary study of salt water disposal in the Hobbs Field and submitted their design for a gathering system on November 14, 1957. There was some disagreement with the design factors used by Rice and subsequently the fieldwide system was redesigned using revised factors. This redesign was completed and presented to the Operators at a meeting held on February 14, 1958. At a meeting held on February 28, 1958, the redesigned fieldwide cooperative system was accepted by the

Operators. On March 21, 1958, an Operators' Meeting was held to discuss provisions of a revised draft of the Articles of Agreement. The details of the revised provisions were satisfactorily resolved and it was agreed that a draft incorporating the accepted revisions would be distributed as soon as possible. Provisions of the revised draft were accepted by the Operators at a meeting held on April 11, 1958. A complete final draft was then prepared and submitted to the Operators on May 26, 1958, for execution. It was agreed that 30 days would be satisfactory for processing the agreement through the parties for execution. The deadline for reply is therefore June 25, 1958.

Rice's representative stated that they expect to have the trunk lines and main lateral lines installed and connected within ~~seven~~ six months after the agreement becomes effective. This would handle the major part of the water now being produced.

MAIN OFFICE OCC

1958 AUG 4 AM 8:40

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, B. H. Nolen, **hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.**

John F. Lane
COMPANY

Agent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:40

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, B H Nolen, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Nolen & Lane
COMPANY

D H Nolen Owner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. A. Canavan, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Skelly Oil Company
COMPANY

Dist. Supt.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Henry Yeager, hereby acknowledge receipt of Order No. R-1224, on August 1st, 1958.

OIL WELL DRILLING COMPANY
COMPANY

Henry Yeager

President
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

E-1

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

JUL 31 1958

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Arden R. Grover, hereby acknowledge receipt of Order No. R-1224, on August _____, 1958.

Grover, MacCurdy & Knox
COMPANY

Partner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

A.L.P.G.
A.P.H.
G.S.K.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, W. T. Johnson, hereby acknowledge receipt of Order No. R-1224, on August 1st., 1958.

E. G. Rodman
COMPANY

Petroleum Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:37

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, A. L. Nelson, hereby acknowledge receipt of Order No. R-1224, on August 1st, 1958.

Cactus Drilling Company
COMPANY

Office Manager
POSITION

Referred to Box 1826 Hobbs N.M. for handling. 8/5/58
Mr. George Buchan.

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, E. Kirne, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Sunray Mid-Cont. Oil Co.
COMPANY

Dist. Engr.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

-1

MAIN OFFICE OCC
1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Neslen & Shell, hereby acknowledge receipt of Order No. R-1224, on ~~August~~ July 31, 1958.

Neslen & Shell
COMPANY

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Vilas R Theis hereby acknowledge receipt of Order No. R-1224, on ~~August~~ July 31, 1958.

Shamrock Oil Co.
COMPANY

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Jet E Salsich, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Salsich McCord & Smith
COMPANY

Operator
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

RECEIVED
PAN AMERICAN
PETROLEUM CORP.
JUL 31 1958
HOBBS, N. M.

FS	1	
FC	✓	
FE	3	
PF		
FB		
AFC		
FILE		

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Ralph L. Hendrickson, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Ralph L Hendrickson

Pan American Petroleum Corporation
COMPANY

Field Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Tennessee Gas Transmission Company
COMPANY

District Production Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Guy R. Zachry, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Guy R. Zachry
COMPANY

Operator

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

RECEIVED
AUG 1 1958
PRODUCTION DEPARTMENT
HOBBS

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August 1st, 1958.

THE OHIO OIL COMPANY
COMPANY

Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

Bodie

EL

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R. L. Bates, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

CITIES SERVICE OIL COMPANY
COMPANY

Division Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

C-1

MAIN OFFICE OCC

1958 AUG 4 AM 8:38

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August _____, 1958.

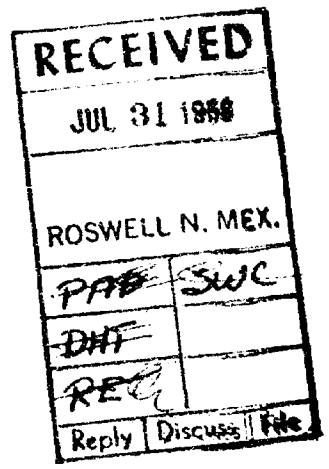
C. H. Sweet Oil Company
COMPANY

Owner & Operator
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:35



EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Parnell C. Dennis, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Shell Oil Company
COMPANY

Division Production Manager
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:35

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R. W. Manry, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Anderson-Prichard Oil Corp.
COMPANY

District Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, W. K. Byrom, hereby acknowledge receipt of Order No. R-1224, on August 2nd, 1958.

W. K. Byrom
COMPANY

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, W. K. Byrom, hereby acknowledge receipt of Order No. R-1224, on August 2nd, 1958.

B. H. Nolen
&
W. K. Byrom
COMPANY

Partner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, F. A. Hunter, hereby acknowledge receipt of Order No. R-1224, on August 2, 1958.

F. A. Hunter

General Crude Oil Company
COMPANY

Production Superintendent, W. Texas Area
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Alfred Short, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

R. B. Honeyman, Jr.
COMPANY

Agent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:32

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, John E. McLaughlin, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

NEVILLE G. PENROSE, INC.
COMPANY

Vice President
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:32

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Martin Jackson, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Bert Fields
COMPANY

Chief Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

RECD. 8/4/58
PROD. DEPT.

MAIN OFFICE OCC

1958 AUG 4 AM 8:32

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, C.A. Lambrecht, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

SIGNAL OIL AND GAS COMPANY
COMPANY

DIVISION SUPERINTENDENT
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, T. C. Capps, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Amerada Petroleum Corporation
COMPANY

District Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Frank O. Elliott, hereby acknowledge receipt of Order No. R-1224, on August 31, 1958.

Elliott Inc
COMPANY

Vice - President
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, D. E. Smith, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Drilling & Exploration Company, Inc.
COMPANY

Division Production Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

67

MAIN OFFICE OCC

1958 AUG 4 AM 8:31

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, M. T. Johnson, hereby acknowledge receipt of Order No. R-1224, on August 7-31, 1958.

Coleman-Moe Oil Corp.
COMPANY

Petroleum Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, A. P. Shackelford, hereby acknowledge receipt of Order No. R-1224, on ~~August~~ July 31, 1958.

Tidewater Oil Company
COMPANY

Area Supt.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, G. M. Putnam, hereby acknowledge receipt of Order No. R-1224, on ~~August~~ July 31, 1958.

Samedan Oil Corporation
COMPANY

District Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

F1

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, G L Young, Jr, **hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.**

Magnolia Petroleum Company
COMPANY

District Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. E. Barkley, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

THE SUPERIOR OIL COMPANY
COMPANY

General Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 5 PM 1:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. B. Clower, hereby acknowledge receipt of Order No. R-1224, on August _____, 1958.

J. B. Clower
COMPANY

Owner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Jay B. Wasson, hereby acknowledge receipt of Order No. R-1224, on August 5, 1958.

Bill G. Shelton
COMPANY

Agent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 7 AM 8:26

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. D. Cooper, hereby acknowledge receipt of Order No. R-1224, on August 5, 1958.

REAHO CORPORATION
COMPANY

Production Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 SEP 29 AM 8:21

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, BEN HOGAN, hereby acknowledge receipt of Order No. R-1224, on August 30th, 1958.

Ben Hogan
BEN HOGAN
COMPANY

Owner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:30

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, John C. Major, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Oil Development Company of Texas
COMPANY

General Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

TOBE FOSTER ESTATE

LIVESTOCK AND OIL

203-204 Hotel Lubbock Telephone PO 2-3261

MAIN OFFICE OCC
1959 AUG 6 AM 8:28

Lubbock, Texas

August 4th, 1958

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen: Re: Order No. R-1224

Enclosed herewith is acknowledgement of receipt of the captioned order, insofar as it effects the following lease in the Eumont Field, Lea County, New Mexico, to-wit:

H. S. Record Lease - 15 - 20 - 36

The J. A. Foster Lease in 33 - 19 - 36, Eumont Field, Lea County, New Mexico is operated by R. P. Coats, whose address is 505 Great Plains Life Building, Lubbock, Texas and notice of this order affecting this lease should be forwarded to him.

Thanking you, I am

Very truly yours,

W. A. Clark

(for) Tobe Foster Estate -
Coats & Foster Drilling Co.

2

MAIN OFFICE OCC

1958 SEP 2 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, M. B. Wilson, hereby acknowledge receipt of Order No. R-1224, on August 22, 1958.

FIRST CHICAGO OIL CORPORATION
COMPANY

AGENT
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

RECEIVED
AUG 28 1953
RECEIVED

2

MAIN OFFICE OCC

1958 AUG 27 AM 9:12

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, **hereby acknowledge receipt of Order No. R-1224, on August** 6 **, 1958,**

_____
COMPANY

_____
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC

1958 AUG 27 AM 9:11

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, H.K. Zinn, **hereby acknowledge receipt of Order No. R-1224, on August** 25, **1958.**

J R Shaw, Inc
COMPANY

By H.K. Zinn
Treasurer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC

1953 AUG 27 AM 9:12

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I Ernest Sneed hereby acknowledge receipt of Order No. R-1224, on August 23, 1953,

Lone Star Producing Co.
COMPANY

Dist. Supt. Production
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC
1958 AUG 27 AM 9:11

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, John M. Little, Jr., hereby acknowledge receipt of Order No. R-1224, on August 25th, 1958.

by John M. Little ?
COMPANY

Supt.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC
1958 AUG 25 AM 8:45

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, C. A. LAMBRECHT, hereby acknowledge receipt of Order No. R-1224, on August 22, 1958.

NOTE: ALL SALT WATER PRODUCED IN THE SOUTH DENTON (DEVONIAN) FIELD FROM SIGNAL LEASES IS DISPOSED OF IN A SALT WATER DISPOSAL WELL.

SIGNAL OIL AND GAS COMPANY
COMPANY

BY C. A. Lambrecht

DIVISION SUPERINTENDENT
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC

1958 AUG 25 AM 8:44

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, John McKelly, hereby acknowledge receipt of Order No. R-1224, on August 22, 1958,

John McKelly
COMPANY

Executor
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC

1958 AUG 25 AM 8:43

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R. W. Haines, hereby acknowledge receipt of Order No. R-1224, on August 22nd, 1958.

TEXAS PACIFIC COAL AND OIL COMPANY

COMPANY

Manager of Production

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC

1958 AUG 25 AM 8:48

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, A. J. Newby, hereby acknowledge receipt of Order No. R-1224, on August 22, 1958,

Koch Oil Corporation, Inc.
COMPANY

Representative
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

2

MAIN OFFICE OCC
1958 AUG 25 AM 8:48

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, W. T. Tomlinson, hereby acknowledge receipt of Order No. R-1224, on August 22, 1958,

The Atlantic Refining Co.
COMPANY

Area Prod. Engr.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

E.7

MAIN OFFICE OCC
1958 AUG 8:39

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, E. Kaseey, hereby acknowledge receipt of Order No. R-1224, on August 18, 1958.

PAN AMERICAN PETROLEUM CORPORATION
COMPANY

District Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

Order No. 1224 not received in regular distribution but obtained by company representative in Santa Fe on August 13, 1958.

MAIN OFFICE OCC
HOBBS OFFICE OCC
1958 AUG 11 AM 9:08
1958 AUG 5 AM 10:06

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Stewart Hunt, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Stewart Hunt, Trustee
COMPANY

Owner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

#1

MAIN OFFICE OCC

1958 AUG 7 AM 8:25

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (~~BOX 871~~, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Arthur Withers, hereby acknowledge receipt of Order No. R-1224, on August 4th, 1958.

Withers Drl Co.
COMPANY

President
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC
1958 AUG 7 AM 8:26

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. D. Cooper, hereby acknowledge receipt of Order No. R-1224, on August 5, 1958.

THREE STATES NATURAL GAS COMPANY
COMPANY

Production Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

E-1

MAIN OFFICE OCC

1958 AUG 14 PM 1:37

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Sheldon Hand, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

John L. Eisner
COMPANY

Production Supt.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

E7

MAIN OFFICE OCC
1958 AUG 13 AM 8:35

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, F. W. Heiser, hereby acknowledge receipt of Order No. R-1224, on August 4, 1958.

Colorado Oil & Gas Corp.
COMPANY

Asst. Mgr. Drlg. & Prod.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

RECEIVED
AUG 4 1958
PRODUCTION DEPT.
DENVER

EF

MAIN OFFICE OCC

1958 AUG 8 AM 8:22

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Paul S Johnston, hereby acknowledge receipt of Order No. R-1224, on August 6, 1958.

Albert Gackle, Operator
COMPANY

Superintendent of Production
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

AUG 1 AM 8:22

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, [signature], hereby acknowledge receipt of Order No. R-1224, on August 5, 1958.

McALESTER FUEL COMPANY
COMPANY

General Production Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MIAMI OFFICE DOCC
1958 AUG 11 AM 8 58

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August 8, 1958.

Humble Oil & Refining Company
COMPANY

Ass't. Division Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

EF

HOBBS OFFICE OCC MAIN OFFICE OCC

1958 AUG 4 AM 7:55 1958 AUG 11 AM 9:04

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, William E. Walker, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Walker Oil Corp.
COMPANY

President
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

EJ

MAIN OFFICE OCC

1958 AUG 11 AM 8:35

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, [signature], hereby acknowledge receipt of Order No. R-1224, on August 9th, 1958.

Morris R. Antweil
COMPANY

Manager
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 11 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R. D. Gunn, hereby acknowledge receipt of Order No. R-1224, on August 8th, 1958.

Fred Turner Jr.
COMPANY

By: R. D. Gunn
Office Manager
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 11 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R.P. Coats, hereby acknowledge receipt of Order No. R-1224, on August 8th, 1958.

Coats and Foster
COMPANY

R.P. Coats
OPERATOR

Partner and Operator.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

Ef

MAIN OFFICE OCC

1958 AUG 11 AM 8:38

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, E. J. Coel, hereby acknowledge receipt of Order No. R-1224, on August 6th, 1958.

Fish-Northwest Coast, Inc
COMPANY

Mgr. Oil & Gas Division
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

Hamilton, 2

Ef

MAIN OFFICE OCC

1958 AUG 11 AM 8:40

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. D. Hamilton, hereby acknowledge receipt of Order No. R-1224, on August 7, 1958.

Standard Oil Co. of Texas
COMPANY

Prod. Foreman
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

E7

Received July 31-1958

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. D. Bradley, hereby acknowledge receipt of Order No. R-1224, on July 31, 1958.

SOUTHERN PETROLEUM EXPLORATION, INC.
BOX 1012 - ROSWELL, NEW MEXICO

COMPANY

J. D. Bradley Dist Mgr.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

For Sale of Shoe-nite

MAIN OFFICE OCC

1958 AUG 6 AM 8:27

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R. L. Adams, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Continental Oil Company
COMPANY

Division Superintendent of Production
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 6 AM 8:27

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, O. K. Gilbreth, Jr., by E. Demmler, hereby acknowledge receipt of Order No. R-1224, on August 4, 1958.

GULF OIL CORPORATION
COMPANY

DISTRICT PETROLEUM ENGINEER
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August 4th, 1958.

GREAT WESTERN DRILLING COMPANY
COMPANY

General Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. B. Craig hereby acknowledge receipt of Order No. R-1224, on August 4, 1958.

Twin States Oil Co.
COMPANY

Pres.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

Aug 1 1958

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Murray et al
COMPANY

_____
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

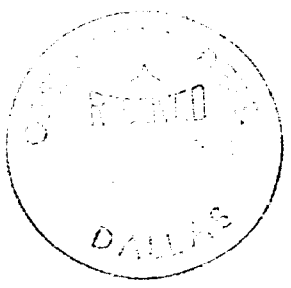
EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I _____, hereby acknowledge receipt of Order No. R-1224, on August 4, 1958.

Sun Oil Company
COMPANY

Chief Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.



MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, R L Mcpherson, hereby acknowledge receipt of Order No. R-1224, on August 2nd, 1958.

R L Mcpherson
COMPANY

Operator
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

MOP&D Corp

E.F.

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, M. A. Hinchfeld, Jr., hereby acknowledge receipt of Order No. R-1224, on August 2, 1958.

Marathon Oil Producing & Drilling Corp
COMPANY

Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 5 AM 8:28

E-1

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, H. F. Defenbaugh **, hereby acknowledge receipt of Order No. R-1224, on August** 4th **, 1958.**

SINCLAIR OIL & GAS COMPANY

COMPANY

Division Superintendent
Production Department

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

R.M. Moran
#7

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, N. A. Hirschfeld, Jr., hereby acknowledge receipt of Order No. R-1224, on August 2, 1958.

R M Moran
COMPANY

Engineer
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

7

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Leroy Gideon, hereby acknowledge receipt of Order No. R-1224, on August 4, 1958.

T. F. Hodges
COMPANY

Prod. Supt.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 6 AM 8:28

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, W. A. Chalk (W.A.Chalk), hereby acknowledge receipt of Order No. R-1224, on August 4th., 1958.

Insofar as it affects H. S. Record Lease in 15-20-36, Eumont Field

Coats & Foster Drilling Co.
COMPANY

Authorized Agent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:42

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, W. C. Rodgers, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Phillips Petr. Co.
COMPANY

W. C. Rodgers
Dist. Supt.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 PM 1:27

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, F. L. Wilson, hereby acknowledge receipt of Order No. R-1224, on August 2, 1958.

VEM Oil Company

COMPANY

F. L. Wilson

By F. L. Wilson, Partner

POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:38

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, J. Frank Pollard **, hereby acknowledge receipt of Order No. R-1224, on August** 1, **, 1958.**

C. C. Pollard and Son
COMPANY

J. Frank Pollard Partner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:37

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Neil E Salsich, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Neil E Salsich
COMPANY

Owner
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:37

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Edward H. Hudson, hereby acknowledge receipt of Order No. R-1224, on August 1st, 1958.

Hudson & Hudson, Inc.
COMPANY

Sec.-Treas.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:37

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

THE TEXAS COMPANY
COMPANY

DIVISION PRORATION ENGINEER
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:37

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, L. O. McNulty, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

UNION OIL COMPANY OF CALIFORNIA
COMPANY

DIVISION SUPERINTENDENT
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:36

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, John Moore, hereby acknowledge receipt of Order No. R-1224, on August 1, 1958.

Schermerhorn Oil Corp
COMPANY

Production Superintendent.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 AUG 4 AM 8:33

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, John A. Yates, hereby acknowledge receipt of Order No. R-1224, on August 1st, 1958.

John A. Yates
COMPANY

Operator
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC

1958 SEP 5 AM 8:21

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, [signature], hereby acknowledge receipt of Order No. R-1224, on August _____, 1958.

REAHO CORP
COMPANY

SEC. & TREAS.
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

MAIN OFFICE OCC
1958 AUG 4 AM 8:33

Hobbs

Artesia, New Mexico
August 1, 1958.

Oil Conservation Commission,
Santa Fe, New Mexico.

Gentlemen:

With reference to your Order No. B-1224, I am Operator of three wells in the Hobbs Pool, producing out of the Grayburg formation.

Two of my wells do not make any water and the third one makes a negligible quantity of connate water. In the past two and one-half years I have accumulated one small truck load of water, which was hauled off to a disposal area.

If and when, in the future, there is enough water to accumulate, I will dispose of same by trucking to an acceptable disposal area.

We are anxious to co-operate with the Oil Conservation Commission and trust this arrangement will be satisfactory. If there is anything further in this connection, please let me know.

Yours very truly,

John A. Yates

John A. Yates
Box 1267,
Artesia, New Mexico.

2

MAIN OFFICE OCC
1958 AUG 13 AM 8:47

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, Bill Johnston, hereby acknowledge receipt of Order No. R-1224, on August 12, 1958.

Wood River Oil and Ref Co. Inc.
COMPANY

Superintendent
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1053
Order No. R-1224

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION, AT
THE REQUEST OF THE STATE ENGINEER,
FOR AN ORDER PRESCRIBING RULES AND
REGULATIONS TO GOVERN THE DISPOSAL
OF SALT WATER IN AREAS OF LEA COUNTY,
NEW MEXICO.

ORDER OF CONTINUANCE

BY THE COMMISSION:

This cause originally came on for hearing at 9 o'clock a.m. on May 16, 1956, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and was continued from time to time, last being heard on June 18, 1958.

NOW, on this 28th. day of July, 1958, the Commission, a quorum being present, having considered the evidence adduced 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 it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico.

(3) That by Commission Memorandum No. 22-56, dated July 3, 1956, all operators in the following-named areas were advised to give immediate attention to formulating procedures for the efficient disposal of salt water produced in such areas:

Hobbs
Denton (Devonian) and Denton-Wolfcamp
Eunice Monument Area:
Eunice-Monument
Eumont
Monument-Blinebry
Monument-Paddock
Moore-Devonian
Caprock, East Devonian

Bagley Siluro-Devonian and Bagley-Pennsylvanian
Saunders
Crossroads
Bough
Echol-Devonian

(4) That testimony adduced at the June Regular Hearing indicates that progress is being made in most of the above-mentioned areas, but that 100-percent disposal has been achieved in only a few of such areas.

(5) That all operators in the above-mentioned areas should proceed with due diligence to complete efficient salt water disposal systems.

(6) That all operators in said areas should report to the Commission on or before September 17, 1958, on the progress made thus far and the estimated completion date of a 100-percent disposal system.

(7) That all operators in the following-named areas should proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas - such areas having been listed as the second most critical in Commission Memorandum No. 22-56, dated July 3, 1956:

Jalmat
Langlie-Mattix
Arrowhead
Brunson
South Eunice
Cass
Dollarhide (All Pools)
Lovington (All Pools)
Teague-Ellenburger
SRR-Devonian
Vacuum
Wilson
Lynch

(8) That Case No. 1053 should be continued until the Regular Hearing on September 17, 1958.

IT IS THEREFORE ORDERED:

(1) That all operators in the following-named areas shall proceed with due diligence to complete efficient disposal systems for all salt water produced in such areas:

Hobbs
Denton (Devonian) and Denton-Wolfcamp
Eunice Monument Area:
Eunice-Monument
Esmont
Monument-Blinebry
Monument-Paddock
Moore-Devonian
Caprock, East Devonian
Bagley Siluro-Devonian and Bagley-Pennsylvanian
Saunders
Crossroads
Bough
Echol-Devonian

(2) That all operators in the above-named areas shall report to the Commission at the Regular Hearing on September 17, 1958, on the progress made thus far and the estimated completion date of a 100-percent disposal system. Operators who are members of a cooperative group may report through the committee chairman, who shall be prepared to name all operators who are members of such group. All operators who are not members of a cooperative group shall furnish a written progress report to the Commission prior to September 10, 1958, or shall appear at the Regular Hearing on September 17, 1958, to report the progress made thus far and the estimated completion date of a 100-percent disposal system for each well which they operate in the above-named areas.

(3) That all operators in the following-named areas shall proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas:

Jalmat
Langlie-Mattix
Arrowhead
Brunson
South Eunice
Cass
Dollarhide (All Pools)
Lovington (All Pools)
Teague-Ellenburger
SRR-Devonian
Vacuum
Wilson
Lynch

(4) That Case No. 1053 be and the same is hereby continued until September 17, 1958.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

S E A L

ir/

R. H. SIEGFRIED, INC.
OIL PRODUCERS
THIRD FLOOR NATIONAL BANK OF TULSA BUILDING
TULSA, OKLAHOMA

August 25, 1958

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Gentlemen:

I am returning a copy of your order #R-1224 and the attached letter mailed to Keating Drilling Company which was mailed in conjunction with our Buckley lease located in the Denton-Wolfcamp Field.

I have previously filled out the receipt requested and it should now be in your possession.

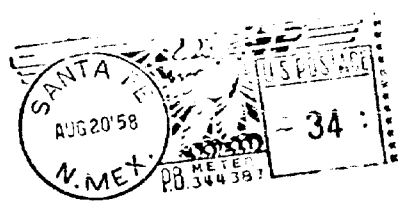
Yours very truly,

R. H. SIEGFRIED, INC.

T. Mayfield
Production Manager

TM:mc

OIL CONSERVATION COMMISSION
Box 871,
SANTA FE, NEW MEXICO.



CERTIFIED MAIL
No. 97857

Keating Drilling Company
Box 838
Tulsa, Oklahoma

RETURN RECEIPT REQUESTED

AUG 22 1958

MAIN OFFICE OCC
1953 AUG 27 AM 9:11

EXECUTE AND RETURN TO OIL CONSERVATION COMMISSION (BOX 871, SANTA FE, NEW MEXICO) WITHIN 5 DAYS AFTER RECEIPT.

I, _____, hereby acknowledge receipt of Order No. R-1224, on August _____, 1953.

_____
COMPANY

_____
POSITION

NOTE: FAILURE TO COMPLY WITH THE PROVISIONS OF ORDER NO. R-1224, WILL SUBJECT WELLS TO SHUT-IN.

RICE *Engineering & Operating, Inc.*

Post Office Box 1142 Telephone EXpress 3-9174

HOBBS. NEW MEXICO

November 9, 1959

New Mexico Oil Conservation Commission
P.O. Box 2045
Hobbs, New Mexico

Attention: Joe D. Ramey

Gentlemen:

Attached is a tabulation showing the salt water disposed by the Hobbs Salt Water Disposal System for the month of October, 1959. This listing shows the operators and water disposed by leases for those operators connected to the system.

Yours very truly,

RICE ENGINEERING & OPERATING, INC.

W. G. Abbott
Division Manager

WGA/lo

Attachment

COMPANY	LEASE	BBLS/MTH OCT. 1959
Amerada	Hardin	2,005
"	McKinley	1,598
"	St. A	224
"	St. B	11,879
"	St. C	524
"	St. E	3,956
Atlantic	Bradley	2,420
"	Grimes	366
Byrom	Bradley	561
Cities Service	Fowler	511
"	Hardin	401
Continental	Grimes	0
"	St. A-5	142
"	St. A-29	0
"	St. A-33	1,046
"	St. B-13	5,746
"	St. B-25	3,929
Getty	McKinley	32
Gulf	Graham St.-A	2,503
"	Grimes St.-A	7,030
"	Grimes St.-B	0
"	Grimes St.-C	56,438
"	Hardin	15,940
"	Holt	328
"	Lea St. "FO"	384
Humble	Bowers "A"	2,929
"	Bowers "B"	721
"	Grimes	150
"	N.M. St.-A	401
Magnolia	Berry	1,191
Ohio	St. 30	6,093
"	St. 32	97
Pan American	Buyers NW/3	3,267
"	Buyers NE/4	596
"	Capps	10,835
"	Leach	5,286
"	McKinley NW/5	1,035
"	St. A Tr. 1	1,908
"	St. A Tr. 2	2,227
"	St. A. Tr. 3	541
"	St. A Tr. 4	2,678
"	St. A Tr. 5	7,337
"	St. A Tr. 6	9,128
"	St. A Tr. 7	0
"	St. A Tr. 8	5,757
"	St. A Tr. 9	5,502
"	St. A Tr. 10	0
"	St. G	262
"	St. H	170
"	Terry 8	125
"	Terry 1	6,055
"	Terry 2	2,788
"	Thorpe	688
"	Turner Tr. 1	0
"	Turner Tr. 2	149
"	St. A Tr. 1 (Drinkard)	412

COMPANY	LEASE	BBLS/MTH OCT. 1959
Samedan	Buyers	4,319
"	Moon A	0
"	Moon B	0
"	St. B	161
"	St. C	114
"	Turner A	181
"	Turner B	185
Shell	Berry	1,117
"	Grimes	133
"	McKinley A	27,031
"	McKinley B	9,536
"	Rice	5,052
"	Sanger	158
"	St. A	96
"	St. B	0
"	St. D	1,292
"	St. F	1,334
"	Thorpe	98
"	Turner	97
Sinclair	Crump	1,638
"	Grimes	1,376
"	Selman	3,942
Skelly	McKinley	9,406
"	Fowler	33
"	Mexico "U"	427
"	Turner	0
Southern Pet. Expl.	Morris A	138
"	Morris B	94
Standard of Texas	McKinley	48,103
"	St. 1-17	131
"	St. 1-29	0
Sun	McKinley	885
Sunray	Fowler	416
Sweet	State F	3,421
"	Fed. Bowers 2A	468
"	Grimes 3	1,664
"	McKinley B-2	702
Texaco, Inc.	McKinley	8,517
"	Selman	128
"	St. N.M. "C"	1,774
Tidewater	Grimes	0
"	Hardin	1,526

SAN ANGELO, TEXAS
P. O. BOX 788
PHONE 24568

HOBBS, NEW MEXICO
P. O. BOX 1626
PHONE EXPRESS 3-2146

MAIN OFFICE
CACTUS DRILLING COMPANY
905 SOUTH CECIL
HOBBS, NEW MEXICO

RECEIVED SEP 17 AM

September 12, 1958

New Mexico Oil
Conservation Commission
107 Mabry,Hall, Capitol Bldg.
Santa Fe, New Mexico

Re: Case No. 1053
Order No. R-1224
Progress Report
on Saltwater Disposal System:

Gentlemen:

Cactus Drilling Company concurs with the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County.

In compliance with Commission Memorandum No. 22-56, dated July 3, 1956, we have made a study of the saltwater disposal situation of our only lease affected by said Memorandum, the Cactus Drilling Company "Catron" lease, located in the North half of the Northwest Quarter of Section Thirty Four, Township Twenty South, Range Thirty Six East (N½NW¼, 34-20S-36E), Eumont Field, Lea County, New Mexico.

This lease is at present making approximately five (5) barrels of saltwater per month and is being disposed of in a saltwater disposal pit once a month, said water disappearing by seepage and evaporation in approximately four hours.

To our knowledge, this lease is underlain by no shallow fresh water zones.

It is our belief, in light of the above facts, that this disposition of saltwater is not violating the above stated policy of the Commission in that "large volumes" of oil field brines are not being produced. Further, since there are no known shallow fresh water bearing horizons in the vicinity of the lease, we feel the policy of the Commission has not been violated.

This lease is marginal, producing approximately 337 barrels of oil per month from two wells. We feel that premature abandonment and economic waste would result from an order requiring 100% saltwater disposal on this lease.

Very truly yours,

CACTUS DRILLING COMPANY

George Baker

George Baker, Vice-President

MAIN OFFICE OCC
1958 SEP 12 AM 8:19

JOHN M. KELLY
BOX 5671
ROSWELL, NEW MEXICO

September 10, 1958

Subject: Order R-1224-Salt Water Disposal in Eumont-Monument Pools

Mr. A. L. Porter, Jr.
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Sir:

This is in reply to your order R-1224 requesting a progress report for 100% disposal system in 13 fields including the Eumont & Monument fields. Of the 13 fields listed we operate wells in the Monument and Eumont fields. However, only one of our leases, in the Eumont pool, produces water. Our Amerada State Lease produces 2 BWPD.

We are in favor of salt water disposal in areas where shallow surface, fresh water sands are endangered by large volumes of oil field brines. Such factors as: agriculture, irrigation, municipal uses, etc. should be considered.

However, we are opposed to blanket orders of the Commission covering thousands of acres which include some areas where salt water disposal is not necessary. We do not feel that the Commission has heard sufficient evidence to order 100% disposal in the fields listed in R-1224.

In large areas such as: Monument (20,820 acres), Eunice (14, 840 acres), Eumont (24,920 acres), Langlie Mattix (36,760 acres), and Jalmat (20,720 acres), a blanket order cannot be written without including some areas where salt water disposal is not necessary. We feel that each lease should stand on its own when considering 100% water disposal.

We should like to call to the attention of the Commission that we are solely a New Mexico Company. All our interests, both economic and domestic are in New Mexico. All of our employees are old residents and voters of New Mexico. We are vitally interested in all phases of economic development in New Mexico, however, we feel that if the oil operators are forced to spend money on non-profit projects, where they are not necessary, it will drain money which would ordinarily be spent in exploration activities.

We feel that under any one of the following conditions salt water disposal is unnecessary.

1. Areas where no ground water is available and has been proven so by several tests drilled in the area.

2. In areas where the ground water is found deep below an impervious formation (Red Beds). In this case it is impossible for oil field water in surface pits to percolate downward and contaminate the fresh water sand.

3. In areas where the oil field water is potable, and in some instances is beneficial and livestock and wildlife drink from the surface disposal pits.

We feel that one or more of these conditions occur in several places in the Eunice-Monument-Eumont fields.

As noted before, the only John M. Kelly Lease which produces water in the fields where 100% disposal plans are requested is our Amerada State Lease. The number one (#1) well on this lease produces 2 BWPD.

We feel that a 100% disposal system is not necessary on the Amerada State Lease for the following reasons:

1. The only water well in the area is some 3/4 of a mile away. This well produces from a depth of approximately 250' in a "stray", hard, gray sand some 80'-100' into the red bed section. Several attempts to find water in the area have failed, confirming the "stray" characteristics of the sand. The red bed is impervious and protects the fresh water sand from contamination by surface pits.

2. Our present pit is 40' x 40' and is on top of a layer of "red hard pan" which we feel is impervious. By noting this pits performance for the past 3 years we believe we are evaporating the water and none is percolating downward.

3. A large disposal pit, of another operator, is located some 100 yards from the above referenced water well. This pit has been used some 20 years. We feel that if contamination were possible it would have occurred by now.

When it is not necessary to dispose of salt water it would be an economic waste to install costly disposal systems and in the case of small oil wells could mean premature abandonment with physical waste occurring.

We feel that the Commission should give the above facts consideration before issuing a blanket order for this area. We plan to use the present evaporative pit on the Amerada State Lease to dispose of the 2 BWPD. As stated above we feel that this system is adequate for this lease and area.

Yours very truly,

Kenneth D. McPeters
Production Superintendent

E7

JOHN J. PENROD
FARMERS AND MERCHANTS BANK BUILDING
ABILENE, TEXAS

MAIN OFFICE OCC
1958 AUG 20 PM 1:33

P. O. BOX 1158
TELEPHONE ORCHARD 3-6406

August 18, 1958

State of New Mexico
Conservation Commission
Santa Fe, New Mexico

Re: Case No. 1053
Order No. R-1224

Gentlemen:

As operator of two wells in the Eumont Field, we are not a member of a cooperative water disposal, but we are presently making 100 per cent disposal of the very small amount of water produced each day by evaporation into pit.

Very truly yours,

Sheldon Ward
Production Superintendent

SW:f

COLEMAN PETROLEUM ENGINEERING COMPANY
PHONE EXpress 3-3813 611 GRIMES P. O. BOX 1825 HOBBS, NEW MEXICO

MAIN OFFICE OCC
1958 SEP 8 AM 8:54

SEPTEMBER 3, 1958

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

RE: CASE No. 1053
ORDER No. R-1224
COATES & FOSTER DRILLING CO.
H. S. RECORD, WELL No 2
EUMONT POOL
LEA COUNTY, NEW MEXICO

GENTLEMEN:

IN COMPLIANCE WITH THE REFERRED TO ORDER PLEASE ACCEPT THIS LETTER AS OUR WRITTEN PROGRESS REPORT CONCERNING SALT WATER DISPOSAL IN THE EUMONT POOL.

AT THE PRESENT TIME COATES & FOSTER DRILLING COMPANY'S H. S. RECORD, WELL NO. 2 PRODUCES APPROXIMATELY 15 BARRELS OF OIL AND 15 BARRELS OF WATER PER DAY. THE WATER PRODUCTION IS DISPOSED OF BY THE OPEN PIT METHOD. THIS PARTICULAR PIT HAS NEVER BEEN SHOT AND WITH THE SMALL QUANTITY OF WATER ENVOLVED THE PROCESS OF EVAPORATION IS ELIMINATING MOST OF THE WATER.

AS OF THIS DATE NO PROGRESS HAS BEEN MADE ON A 100 PERCENT DISPOSAL SYSTEM BECAUSE OF THE LOCATION OF THE WELL, AMOUNT OF WATER PRODUCTION, AND LACK OF INFORMATION ON ANY UNITIZED EFFORTS IN THE GENERAL AREA. NO THOUGHT OF AN ESTIMATED COMPLETION DATE IS ENTERTAINED AT THIS TIME; HOWEVER, THE H. S. RECORD, WELL No. 2 IS OPERATED BY THE TOBE FOSTER ESTATE OF LUBBOCK, TEXAS AND ANY METHOD OF WATER DISPOSAL THAT IS ECONOMICALLY FEASIBLE WILL CERTAINLY BE PURSUED TO THE SATISFACTION OF THE NEW MEXICO OIL CONSERVATION COMMISSION.

RESPECTFULLY SUBMITTED,
TOBE FOSTER ESTATE
Joe A. Coleman
JOE A. COLEMAN, AGENT

JAC:JA

cc: MR. WALTER CHALK
203-204 HOTEL LUBBOCK
LUBBOCK, TEXAS

COATS DRILLING COMPANY, Inc.

PHONES PO 5-7344 — PO 5-5194
905 GREAT PLAINS LIFE BUILDING
LUBBOCK, TEXAS

R. P. COATS
PRESIDENT

MAIN OFFICE OCC
1958 AUG 11 AM 8:36

AUGUST 8, 1958

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
BOX 871
SANTA FE, NEW MEXICO.

RE: ORDER NO. 1224

GENTLEMEN:

I AM RETURNING YOU HEREWITH SIGNED ACKNOWLEDGEMENT OF THE CASE HEARING NO. 1053, ORDER NUMBER R-1224. THIS NOTICE WAS RECEIVED AS OF THIS DATE.

I RESPECTFULLY CALL YOUR ATTENTION TO THE PROPERTY WHICH I AM A JOINT OWNER OF AND THE DESIGNATED OPERATOR OF PROPERTY. SAID PROPERTY DESCRIBED AS FOLLOWS:

J.A. FOSTER LAND. EUMONT FIELD. LEA COUNTY, NEW MEXICO.
SE ¼ OF SECTION 33, TWP. 19S, RGE 36 E.
THREE (3) WELLS, NUMBERED 1,3 AND 4.
PRODUCING ZONE QUEEN SAND.
WELLS IDENTIFIED AS TO LOCATION IN SECTION, 1-P. 3-I, AND 4-J.

PLEASE BE ADVISED THAT THESE WELLS ARE FREE OF SALT WATER, BRINE OR OTHER ELEMENTS THAT MIGHT CAUSE THE CONTAMINATION OF FRESH WATER SANDS. WE ARE CONTINOUSLY CHECKING THIS PRODUCTION AND UPTO THIS TIME THE WELLS HAVE NOT PRODUCED WATER EITHER FRESH OR SALTWATER. WE SHALL CONTINUE TO WATCH THIS VERY CAREFULLY AS WE ARE AWARE OF THE SERIOUSNESS OF POLLUTION OF FRESH WATERS.

BE ASSURED THAT YOU HAVE MY FULL COOPERATION IN ANY MATTER OF SOIL, WATER OR OTHER CONSERVATION MATTERS.

YOURS VERY TRULY,

R. P. Coats

R.P. COATS - OPERATOR COATS AND FOSTER.

WALKER OIL CORPORATION
Wichita, Kansas

September 4, 1958

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

Dear Mr. Porter:

In compliance with Order #R-1224, relative to Salt Water Disposal in the Hobbs Pool, Lea County, New Mexico, we wish to make the following report.

Our two Terry Wells, at the present time, are producing approximately 53 barrels of oil and 7 to 8 barrels of water per day. The water, at present time, is being disposed of in an open pit, a common practice in the area today. With this small amount of daily water production, we do not deem it economically feasible to join the Hobbs Salt Water Disposal System, which at the present time is charging $3,500.00 per well to tie on to the system. We plan to construct an evaporative pit, 80' x 80', and 4' deep, lined with waterproof concrete, 2" to3" thick, which will be more than adequate for a full years water production. The evaporation rate in this area is 8' to 14' per year, so a pit of the above size should easily take care of 6,000 barrels of water per year. Mr. Lyle L. Schlaefli, contractor and engineer of Hobbs, will construct the pit, using the Bondactor Process (blown cement), a highly successful method used throughout the building industry today for the construction of swimming pools, water reservoirs, basins, tunnels, tanks and spillways.

A Pilot Project has just been completed by Mr. Schlaefli, here in the Hobbs Area, and as soon as it is approved by the State Engineers Office, we will carry out our plans for construction of a pit of similar nature. We already have the pit available and a week will be required for completion of project. The cost of pit will be approximately $1,700.00.

We trust that the above plans will meet with your approval. We have always tried to cooperate in every way with your office, in abiding by all Orders issued and complying with all regulations of the Oil Conservation Commission, and will continue to do so in the future.

Respectfully submitted,

William E. Walker
President, Walker Oil Corporation

By: W. H. Vaughan
Production Manager

WHV:gfs

SOUTHERN PETROLEUM EXPLORATION, INC.
Box 1017
ROSWELL, NEW MEXICO

GEOLOGICAL AND
LAND DEPARTMENT

August 1, 1958

CERTIFIED MAIL NO. 1381740
RETURN RECEIPT REQUESTED
SPECIAL DELIVERY

New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

SUBJECT: Case No. 1053, Order No. R-1224

Gentlemen:

We return to you, herewith, your form acknowledging receipt of the same together with Order No. R-1224 relative to shuting in wells that produce water.

This acknowledgment form was received July 31, 1958, and is returned to you by this office. This together with attached Order No. R-1224 should be reviewed by our main office management and the Board of Directors. To send this acknowledgment and order to our office in West Virginia and to get it back to you in five days would be impossible and is, therefore, executed and returned to you by this office. However, neither the acknowledgment form nor the report of the hearing of Order No. R-1224 are dated so that it is very hard to tell how you can ascertain if the acknowledgment receipt is returned to you within five days.

As we read the Order No. R-1224, it gives the suggestion that every well of every operator within the areas designated would have to be committed to the salt water disposal system or to drill an input disposal well which would be prohibitive.

We have committed our wells to the Hobbs salt water disposal system and we are now asking the Rice Engineering and Operating, Inc. to permit us to put all the rest of our wells whether they make water in the Eunice-Monument - Eumont Salt Water Disposal System. Many ofour wells do not make water at all, some of them make as much as one and one-half barrels per day. There comes a question whether the water disposal in earthen pits is evaporated in such small amounts or seeps into the ground. We believe that it cannot be proved either way. But your order is so conclusive and so mandatory that every well of every operator will have to subscribe to any salt water system or take care of the disposal of salt water in his own manner which eventually must be approved by you. It appears that we will need to subscribe to the Eunice-Monument - Eumont system or any other system including the area in which our wells are located whether they are making water or not which will create a considerable additional investment at these poor times of operation.

As for the matter of shuting our wells in because they produce one or one and one-half (1 or 1½) barrels of water, it appears the State is merely cutting off its nose to spite its face because a great number of our wells are on State land and the revenue, therefore, would cease to the State of New Mexico. We also wonder if the Commission recognizes the fact that once a well is shut in for considerable time that it cannot be brought back and that the production is gone forever. We sometimes wonder if New Mexico is part of the United States that comes under provisions to the constitution of the United States of America..

However that may be, we are doing the best we can to get all of our wells subscribed to any salt water disposal system that has been approved by your Commission. We recognize the fact that the Oil Conservation Commission is all powerful and can demand and regulate all things with reference to the production of oil and we, therefore, have no choice in the matter.

Yours very truly,

J. B. Headley

JBH:cw

1 Encl. - Receipt

cc - Southern Petroleum Exploration, Inc.
Sistersville, West Virginia

R. M. MORAN
Box 1718
HOBBS, NEW MEXICO

MAIN OFFICE OCC
1958 AUG 14 AM 8

August 12,1958

New Mexico Oil Conservation Commission
Santa Fe,
New Mexico

Re: Hobbs Pool Salt Water Disposal
Regular Sept.17,1958 Hearing

Gentlemen:

R.M.Moran is the operator of one (1) well in the Hobbs Pool. Namely the Hardin "B" No.1, located in the SE¼ NW¼ of Section 18, Township 18 South, Range 38 East, NMPM.

This well is not at present producing any water whatsoever and I firmly believe that it will never produce an appreciable amount of water.

This well was completed in the Grayburg formation and in the drilling and completion never penetrated the San Andres formation which in most peoples opinion is the water producing formation.

This lease is a marginal lease and if I am compelled to make arrangements to dispose of water I dont produce, it will mean premature abandonment of this lease.

Very truly yours,

R M Moran

R.M.Moran

RMM/jg

R. R. McCARTY
DIV. SUPERINTENDENT
L. H. BYRD
ASST. DIV. SUPERINTENDENT
H. L. HENSLEY
ASST. DIV. SUPERINTENDENT
H. E. MEADOWS
ASST. DIV. SUPERINTENDENT
J. W. GRAYBEAL
DIV. PETROLEUM ENGINEER
R. A. ESTES
DIV. CIVIL ENGINEER

HUMBLE OIL & REFINING COMPANY
WESTERN DIVISION
P. O. BOX 1600
MIDLAND, TEXAS

August 20, 1958

10-2
Salt Water Disposal
Hobbs District

State of New Mexico
Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Gentlemen:

This letter is a report on the progress made thus far by Humble Oil & Refining Company toward effecting efficient subsurface disposal of its produced salt water in Lea County, New Mexico, in compliance with Oil Conservation Commission Order No. R 1224.

Of the fields classed as requiring due diligence in the completion of efficient salt water disposal systems, Humble has water production in only the Hobbs and Eunice Monument areas. Humble has joined with the other operators in these areas in initiating jointly-owned salt water disposal systems, having committed 14 wells to the Hobbs system and 51 wells to the Eunice-Monument-Eumont system. Humble facilities in the Hobbs field, which are currently employed to dispose of salt water produced from two leases, are to become a part of the jointly-owned Hobbs system.

With the exception of four leases in the Eumont Field, all Humble-operated properties which produced salt water during July 1958 in the Hobbs and Eunice-Monument-Eumont areas, have been committed to the jointly-owned systems. The Humble leases which produce water and are not committed to the Eunice-Monument-Eumont system include the New Mexico State "AG", New Mexico State "AT", New Mexico State "G", and New Mexico State "M", on which there are 23 Eumont oil wells, five of which are productive of salt water. The five wells produced a total of 11 barrels of water per day, or slightly more than 2 barrels per day per well during July 1958. The decision not to commit these wells to the system at this time was based on the fact that the volume of water currently produced is small, and in addition, in the case of the New Mexico State "M" lease, it is not in the proximity of the proposed system. Our plans are to provide disposal facilities for these wells, either through committing them to the jointly-owned system or by installing other facilities, at such time as the produced water volume becomes significant.

It is our understanding that representatives of Rice Engineering & Operating, Inc. will be on hand for the September 17 hearing to report for the other operators on the progress made toward installing the Hobbs and Eunice-Monument-Eumont systems.

Of the areas classed as requiring due diligence in formulation of plans for salt water disposal, Humble has water production in the Langlie Mattix, Arrowhead, Brunson, and West Lovington Fields. The volume of Humble water production in the Langlie Mattix Field (2 bbls/day) is considered insufficient to warrant disposal facilities at this time. With a letter of August 7, 1958, Humble contacted the major producer in the Arrowhead and Brunson areas, inquired as to possible plans for calling an operators meeting, and advised that Humble would like to work with the other operators in investigating various approaches to effecting salt water disposal in the area. On August 12, 1958 there was a meeting of operators in the Brunson area called by Shell to discuss salt water disposal. Preliminary data are to be compiled for all reservoirs in the Brunson area and it is anticipated that an engineering committee will be appointed to study salt water disposal in the Brunson area, at the next operators meeting. Humble is currently participating in a joint engineering study of the West Lovington Field, and with a letter of August 7, 1958, Humble recommended to the chairman of the study committee that the problem of salt water disposal be considered concurrently with other phases of the study.

Although the field is not listed in Commission Order No. R 1224, operators in the Caudill Devonian Field are proceeding with initiation of a jointly-owned salt water disposal system. Humble has executed the joint operating agreement and has approved an AFE covering installation of the system.

Yours very truly,

HUMBLE OIL & REFINING COMPANY

R. R. McCarty

JLC:am

RICE *Engineering & Operating, Inc.*

Post Office Box 1142 Telephone EXpress 3-9174

HOBBS, NEW MEXICO

HOBBS OFFICE OCC
1959 OCT 13 AM 7 31

October 9, 1959

New Mexico Oil Conservation Commission
P. O. Box 2045
Hobbs, New Mexico

Attention: Randall F. Montgomery

Gentlemen:

Attached is a tabulation showing the salt water disposed by the Hobbs Salt Water Disposal System for the month of September, 1959. This listing shows the operators and water disposed by leases for those operators connected to the system.

Yours very truly,

RICE ENGINEERING & OPERATING, INC.

W.G. Abbott

W. G. Abbott
Division Manager

WGA/sac
Attachment

COMPANY	LEASE	BBLS/ MTH SEPT. 1959
Amerada	Hardin	1626
"	McKinley	1283
"	St. A-1	180
"	St. B-1	9453
"	St. C-1	446
	St. E-1	3177
Atlantic	Bradley	1944
"	Grimes	293
Byrom	Bradley	451
Cities Service	Fowler	411
"	Hardin	330
Continental	St. A-5	114
"	St. A-33	840
"	St. B-13	4894
	St. B-25	3156
Getty	McKinley	26
Gulf	Graham St. "A"	4933
"	Grimes "A"	10652
"	Grimes "B"	0
"	Grimes "C"	49593
"	Hardin	20007
"	Holt	159
	Lea St. "FO"	76
Humble	Bowers "A"	1932
"	Bowers "B"	569
"	Grimes	122
	N. M. St. "A"	376
Magnolia	Berry	956
Ohio	St. 30	4894
"	St. 32	78
Pan American	Byers NW/3	2626
"	Byers NW/4	410
"	Capps	8854
"	Leach	4503
"	McKinley NW/5	821
"	St. A Tr. 1	1527
"	St. A Tr. 2	1789
"	St. A Tr. 3	408
"	St. A Tr. 4	2151
"	St. A Tr. 5	5958
"	St. A Tr. 6	7335
"	St. A Tr. 7	0
"	St. A Tr. 8 & 9	9590
"	St. A Tr. 10	0
"	St. G	210
"	St. H	142
"	Terry	106
"	Terry 1	5084
"	Terry 2	2200
"	Thorpe	552
"	Turner 1	0
"	Turner 2	120
	St. A Tr. 1 (Drinkard)	351

Samedan	Byers	
"	Moon "A"	3547
"	Moon "B"	0
"	St. B	0
"	St. C	142
"	Turner A	359
"	Turner B	75
		145
Shell	Berry	
"	Grimes	863
"	McKinley A	77
"	McKinley B	20456
"	Rice	7554
"	Sanger	4738
"	St. A	127
"	St. B	50
"	St. D	0
"	St. F	925
"	Thorpe	957
"	Turner	50
		79
Sinclair	Crump	
"	Grimes	1315
"	Selman	1105
		3358
Skelly	McKinley	
"	Fowler	8012
"	Mexico "U"	26
"	Turner	342
		0
Southern Pet. Expl.	Morris A	
"	Morris B	72
		23
Standard of Texas	McKinley	
"	St. 1-17	38261
"	St. 1-29	0
		0
Sun	McKinley	
		711
Sunray	Fowler	
		334
Sweet	State F	
"	Fed. Bowers	5685
"	Grimes	351
"	McKinley B-2	1275
		797
Texaco, Inc.	McKinley	
"	Selman	7254
"	St. N.M. "C"	109
		1425
Tex. Pac. Coal & Oil	St. G	
		0
Tidewater	Grimes	
"	Hardin	0
		1186

NEW MEXICO
OIL CONSERVATION COMMISSION
MONTHLY INJECTION REPORT

Form C-120
(Revised 2-1-56)

Submit this report in triplicate to the District Office, Oil Conservation Commission.

COMPANY Rice Engineering & Operating, Inc. POOL Hobbs
COUNTY Lea MONTH September 1959

INJECTION WELLS

Lease	Well No.	Location UL	S	T	R	MCF Gas Injected	Cumulative Gas Inj.	Bbls Water Injected	Cumulative Water Inj.	Ave. Inj. Pressures
Hobbs SWD	E-15	E	15	19	38			164,349	2,039,933	Vacuum
	P-25	P	25	18	37			125,234	1,097,976	Vacuum
TOTAL								289,583	3,137,909	

PRODUCING WELLS

Lease	Well No.	Location UL	S	T	R	Bbls. Oil Produced	MCF Gas Produced	Gor	Bbls Water Produced	% Water Produced
TOTAL										

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

REMARKS: Hobbs Pool SWD System

NAME W. G. Abbott W. G. Abbott

TITLE Division Manager

Artesia, New Mexico,
September 18, 1958.

Oil Conservation Commission,
Santa Fe, New Mexico.

Gentlemen:

I understand that at the recent hearing in connection with your Order No. B-1224, disposal of salt water, my name, John A. Yates, was called as a non-complier or one who did not answer said Order No. B-1224.

If you will look in your files, you should find the letter I wrote you under date of August 1, 1958, in compliance with said Order NO. B-1224, with the request for further instructions, if said letter was not sufficient. Also in same envelope I acknowledged receipt of Order No. B-1244.

Should you fail to find the letter I wrote you on August 1, 1958, I will be happy to send you a copy of same.

Yours very truly,

John A. Yates
Box 1267,
Artesia, New Mexico.

May 11, 1959

Mr. J. M. Russell
Gulf Oil Corp.
P. O. Box 2167
Hobbs, New Mexico

Dear Mr. Russell:

By letter from this office dated March 30, 1959 you were advised that your proposed manner of disposing of the water from your wells in the Bowers Pool by spreading it on the lease roads would not be satisfactory due to the fact that some of the wells were making more than 1/2 barrel of water per day.

On April 21, 1959 Humble Oil & Refining Co. was advised by letter from Mr. A. L. Porter, Jr., Director of the Commission, that the Commission would permit the disposal of salt water in unlined pits so long as the total water production for the lease does not exceed an average of 1/2 barrel per well per day.

In view of this, I wish to advise you that it will not be necessary for you to dispose of the water from these wells in the Bowers Pool in compliance with Commission Order No. R-1224-A so long as the total water production for the lease does not exceed an average of 1/2 barrel per well per day.

This letter supercedes the notification of March 30th regarding this matter.

Yours very truly,

OIL CONSERVATION COMMISSION

R. F. Montgomery
Proration Manager

mc

cc-A. L. Porter, Jr., Director
OCC, Santa Fe

OIL CONSERVATION COMMISSION

HOBBS, NEW MEXICO

March 30, 1959

COPY

Mr. R. R. Alworth, Superintendent
Humble Oil & Refining Company
P. O. Box 2347
Hobbs, New Mexico

Dear Mr. Alworth:

Your letter of March 26, 1959 in regard to the disposition of produced salt water in the Bowers Pool area outlined the barrels of water per day from several Bowers wells. Further, you stated that the water is drained into a concrete lined sump pit, and that when the sump pit becomes full the water will be pumped out and spread on lease roads.

This is to advise you that this will not be a satisfactory method of disposing of the water for your Federal Bowers A-13 and A-14 which produce more than one half barrel of water per day. Your suggested method of disposition will not be in compliance with Commission Order No. R-1224-A, which is very specific in this matter.

At your earliest convenience we wish to have a letter from you stating what you intend to do with the water, or any minerals which might be concentrated due to evaporation.

Yours very truly,

OIL CONSERVATION COMMISSION

R. F. Montgomery
Proration Manager

RFM/mc

cc-A. L. Porter, Jr., Director
OCC, Santa Fe

OIL CONSERVATION COMMISSION

HOBBS, NEW MEXICO

March 30, 1959

COPY

Mr. J. M. Russell
Gulf Oil Corp.
Box 2167
Hobbs, New Mexico

Dear Sir:

Your letter of March 17, 1959 informed this office as to the amount of water produced by your wells in the Bowers Pool, and further stated that you would produce this water into a steel tank and periodically haul the water, spreading the same on your lease roads, well and battery locations.

The Commission Order is specific in that water shall not be disposed of in a manner that will enable it to percolate into the fresh water zones. Therefore, this is to advise you that it will not be satisfactory to spread this water on your lease roads, and that we will expect to hear from you in regard to your manner of disposing of this water whenever the steel tanks become full.

Yours very truly,

OIL CONSERVATION COMMISSION

R. F. Montgomery
Proration Manager

RFM/mc

cc-A. L. Porter, Jr., Director
OCC, Santa Fe

MAIN OFFICE OCC
1958 SEP 5 AM 8:47

NEVILLE G. PENROSE, INC.
FAIR BUILDING
FORT WORTH 2, TEXAS

September 4, 1958

New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

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

Gentlemen:

Reference is made to Order No. R-1224, dated July 28, 1958 relating to disposal of salt water produced from certain fields in Southeast New Mexico. Although we concur in the desire of the Oil Conservation Commission to prevent contamination of fresh water bearing horizons in Lea County, New Mexico, we do not feel that water production from our wells in the fields mentioned in your order is of sufficient magnitude as to be a source of concern.

In Paragraph 1, Page 2 of the above order, operators are told to "proceed with due diligence to complete efficient disposal systems for all salt water produced" in several fields which were enumerated. The only field listed in which Neville G. Penrose, Inc. has production is the Eumont Field and we have joined the Eumont - Monument Salt Water Disposal System. Although our water production is negligible, we are willing to join with other operators in this first disposal system in order to ascertain the practicality of this manner of handling excessive amounts of water.

In Paragraph 3, Page 3 of the above order, operators in certain named areas were to "proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas". Among those fields listed Neville G. Penrose, Inc. has production in the following fields with the daily water production and number of wells shown opposite each field.

Langlie - Mattix	1 well	0 bbls. water per day
Arrowhead	2 wells	3.2 bbls. water per day
Brunson	4 "	1.5 " "
Vacuum	9 "	1.2 " "

At the present time this small amount of water is being produced into disposal pits and evaporated. We will continue to observe the attempts of some other operators to prevent seepage into the soil by lining pits with cement, plastic, etc. Our observations of similar attempts in other areas has lead us to believe that this method is not too practical. We are willing to cooperate with other operators, in fields where we have production, in studying the feasibility of group disposal systems. However, because we are minority operators in each field listed and because our water production is at a bare minimum, we do not feel justified in instituting such a proposal. Our experience with the Eumont-Monument Disposal System has indicated that it may cost several thousand dollars a well to build a system and in fields where our oil production is marginal

MAIN OFFICE OCC

1958 SEP

and our water production is nominal, such an expenditure might mean the difference between a profit and loss on the lease in question. If our present means of handling produced water is not acceptable, we can and will produce these small amounts of water into tanks from which water can be hauled to disposal facilities.

Very truly yours,

John P. McNaughton

JPM/jp

cc: Oil Conservation Commission
Hobbs, New Mexico
Attention: Mr. Randall Montgomery

Mr. Henry Bright
Eunice, New Mexico

AZTEC OIL & GAS COMPANY

P. O. BOX 847
HOBBS, NEW MEXICO

September 3, 1958

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Case 1053, Order R-1224
Pertaining to Salt Water
Disposal in Lea County,
New Mexico

Gentlemen:

In accordance with provisions of the Oil Conservation Commission Order R-1224, Aztec Oil & Gas Company wishes to report the following:

1. That Aztec Oil & Gas Company is operator of oil and gas wells in the Eumont Pool, this being the only pool of the ten listed in Paragraph (3) of Order R-1224 wherein Aztec operates.

2. That Aztec Oil & Gas Company is a member of the Eunice-Monument-Eumont Salt Water Disposal System and all of Aztec's leases in the Eumont Pool that produce large volumes of oil field brines will be connected to the cooperative disposal system. Progress toward completion of this cooperative system will be made by a member of the Disposal Committee at the regular hearing of the Oil Conservation Commission on September 17, 1958.

3. That Aztec Oil & Gas Company will construct impervious evaporation pits to collect salt water produced in small quantities that may endanger fresh water supplies. These evaporation pits will be completed prior to the completion of the cooperative salt water disposal system.

4. That Aztec Oil & Gas Company will exercise observed care in the disposal of salt water that may endanger fresh water supplies and will take steps toward proper disposal of their future salt water production in areas specified by the Oil Conservation Commission.

Very truly yours,

AZTEC OIL & GAS COMPANY

Prentice R. Watts, Jr.
District Superintendent

PRW:mps

ME-TEX
AND ASSOCIATED COMPANIES

MAIN OFFICE 000

1958 SEP 6 AM 8 59

PHONES EX 6-8013 - 3-5633

JAMES M. MURRAY, Jr., President
D. P. TEED, Vice-Pres. and Secretary
EDNA MURRAY, Treasurer

P. O. Box 2077
HOBBS, NEW MEXICO

September 4,1958

Mr. A.L. Porter, Jr., Secretary
Oil Conservation Commission
State of New Mexico
Santa Fe, New Mexico

Re: Case No. 1053
Order No. R-1224

J.M. Murray, et al
Well No. 1, Sec. 3,
Twp 21, R 36, Wallace
State Lease, Lumont
Field, Lea County,N.M.

Gentlemen:

In compliance with the captioned order we wish to advise that we have not joined with any cooperative group for salt water disposal on the above lease.

The oil producing well is pumping two to four barrels of oil per day and is not producing any salt water to make it a problem of salt water disposal.

Very truly yours,

J.M. MURRAY, ET AL
ME-TEX SUPPLY COMPANY

DWIGHT P. TEED
Secretary

DPT/rc

cc: Randall Montgomery
Oil Conservation Commission
Hobbs, New Mexico

E-1

MAIN OFFICE OCC
1958 SEP 5 AM 8:21

GROVER, MACCURDY & KNOX
SUITE A PATIO BUILDING
MIDLAND, TEXAS

SEPTEMBER 3, 1958

NEW MEXICO CONSERVATION COMMISSION
BOX 871
SANTA FE, NEW MEXICO

RE: CASE NO. 1053
ORDER NO. R-1224

GENTLEMEN:

IN COMPLIANCE WITH THE ABOVE MENTIONED CASE AND ORDER, WE WISH TO ADVISE THAT THE WELLS WHICH WE HAVE IN THE EUMONT POOL ARE MAKING NO WATER AT ALL. WHEN AND IF SUCH WELLS DO MAKE WATER, WE WILL TAKE THE NECESSARY STEPS TO DISPOSE OF THIS WATER IN AN EFFECIENT MANNER.

YOURS VERY TRULY,

GROVER, MACCURDY & KNOX

R. O. Courtright, Jr.

R. O. COURTRIGHT, JR.,
ENGINEER

ROC:EM

PHONE 3-4315
3-5701

R. G. McPHERON
HOBBS, NEW MEXICO

103 EAST TAYLOR
BOX 176

MAIN OFFICE OCC
1958 SEP 5 AM 8:21

September 2, 1958

State of New Mexico,
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

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

With reference to Case No. 1053 and Order No. R-1224 concerning the disposal of brine waters produced from oil and gas wells and being disposed of on the surface, amd which is being demanded that it be disposed in some formation below the fresh water or evaporated, I would like to voice that I do not believe that this matter has been thourghly investigated.

It is my opinion that the State Engineers have not produced sufficent evidence to prove that the water that we are now disposing of in surface pits is contaminating the fresh sub-surface water.

In checking with your local office, it was found that there has been no complaint during the past 25 years of any such water contaminating the sub-surface fresh water. There may be isolated cases where the brime water produced from wells may be of such a saturation that it would demand protective measures, however, I firmly believe that few cases can be found that any of the brime water produced from any of the Permian formations is defecting sub-surface fresh water.

I have personally attended several of the Engineers meetings here concerning the design of the Waste Water Disposal Systems, and it seems that the Engineers are concerned mainly with the mechanics and the operation of the systems.

One certainly would not be hazarding a guess when he estimates that before such a program is completed in Lea County, an investment of at least fifty million dollars will have been made. Before such an investment is demanded by any of our State Departments, absolute and undeniable evidence should be established. There is no doubt in my mind that most each and probably all of these expenditures could be directed toward the economical development of our state, and still preserve our fresh water.

I would also like to mention that the economics concerned with disposing of waste water produced from marginal wells will force the premature abandonment of many of them and result in a loss of revenue to the State.

The New Mexico Oil Conservation Commission has a fine reputation which has been established by an excellent record, and I am sure that they do not desire to impose any order on the Oil Industry which is not supported by unimpeachable evidence.

I request that this information be included in the record of the hearing set for September 17, 1958.

Yours very truly,

R. G. McPheron

TENNESSEE GAS TRANSMISSION COMPANY
Post Office Box 307
Hobbs, New Mexico

August 26, 1958

State of New Mexico
Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

Re: Salt Water Disposal
Lea County, New Mexico
Case No. 1053, Order No. R-1224

Gentlemen:

In compliance with Order No. R-1224 dated July 28, 1958, concerning salt water disposal in certain areas of Lea County, New Mexico, the following information is submitted.

Tennessee Gas Transmission Company is not a member of a cooperative salt water disposal group. Tennessee operates only four wells in the area considered, all on the Bay-USA lease located in Section 35, Township 20 South, Range 36 East, Eumont Field. Water production from this lease is negligible. Frequent well tests indicate only one well, the Bay-USA No. 3, has ever produced water and this in amounts varying between a trace and one-half barrel per day.

Should these wells ever produce an appreciable volume of water, suitable disposal facilities will be obtained.

Yours very truly

TENNESSEE GAS TRANSMISSION COMPANY

J. F. Carnes
District Engineer

JFC/lp
cc: New Mexico Oil Conservation Commission
Hobbs, New Mexico

BERT FIELDS
SUITE 1111 FIDELITY UNION LIFE BLDG
DALLAS, TEXAS

Eumont

August [illegible] 1959

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mrs. A. L. Porter, Jr.
Secretary-Director

Re: Case No. [illegible]
Order No. R-[illegible]
Salt water disposal
Eumont and Jumont Fields
Lea County, New Mexico

Gentlemen:

As required by the above order, we wish to report that we have no salt water production in the Eumont field and have a maximum of one barrel per day of BS&W production from the Jumont Field.

It would appear that this extremely small amount of salt water produced would not justify a salt water disposal system. We have been preparing for such a system, however, in the event that our salt water production does increase, and will dispose of it according to rules and regulations.

Yours very truly,

BERT FIELDS

Mark D. Jackman

MDJ:ja

Water Not Worth its Salt

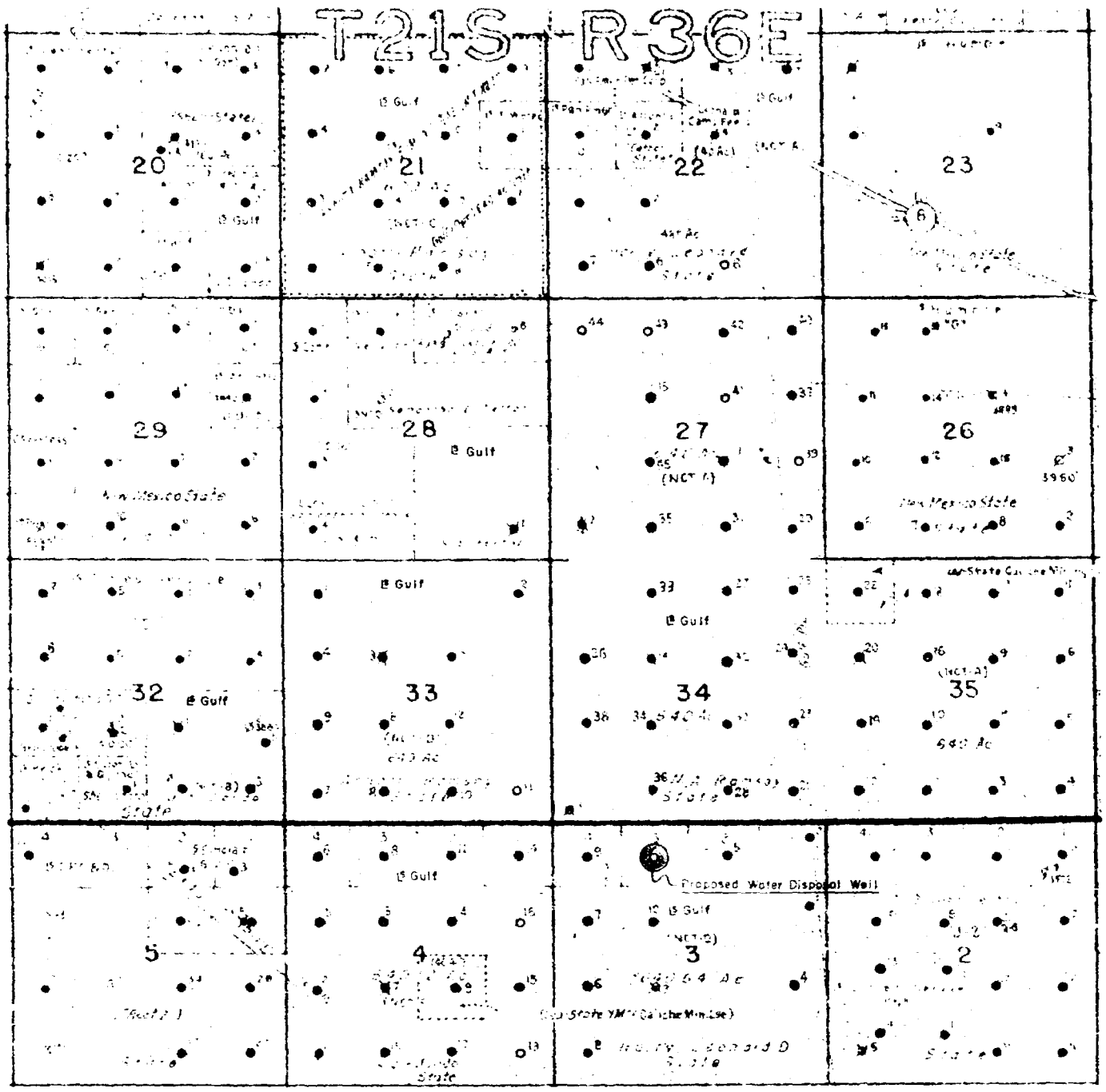
Phillips Petroleum Company

Meets

Pollution

Menace

PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA



AREA PLAT

GULF RAMSAY BLK. SWD SYSTEM

LEA COUNTY, NEW MEXICO

VILAS P. SHELDON
Consulting Geologist and Registered Land Surveyor
Valuations, Appraisals, Geological Reports, Surveys
Harper Building
ARTESIA, NEW MEXICO

MAIN OFFICE OCC
1958 SEP 2 AM 8:28

August 28, 1958

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

Dear Mr. Porter:

This letter is in response to order No. R-1224 of July 28, 1958 wherein we are required to report prior to September 10, 1958 concerning the progress we have made toward the disposal of salt water.

It has not been established that Resler & Sheldon does produce "large volumes of oil field brines which may contaminate the fresh water bearing horizons of Lea County, New Mexico". We are of the opinion that our present surface disposal systems are satisfactory and do not jeopardize the fresh water of Lea County, New Mexico.

Yours very truly,

RESLER & SHELDON

By Vilas P. Sheldon

VPS:dmb

GULF

PETROLEUM AND ITS PRODUCTS

GULF OIL CORPORATION

P. O. DRAWER 669 • ROSWELL, NEW MEXICO

FORT WORTH
PRODUCTION DIVISION

W. A. SHELLSHEAR
DISTRICT MANAGER

September 3, 1958

New Mexico Oil Conservation Commission
Post Office Box 871
Santa Fe, New Mexico

1234

Gentlemen:

Reference is made to the Oil Conservation Commission Order No. R-~~1104~~ in Case No. 1053, dated July 28, 1958, whereby it was directed that salt water disposal reports be submitted in writing by September 10, 1958. In compliance with the above directive, this report covers our wells in the pools listed as of primary importance and which are not included in a cooperative disposal system.

We have 108 wells in the Eunice, Eumont and Monument Pools which are not included in any cooperative project; however, plans are under way to install a system of our own referred to as the Ramsay Block Salt Water Disposal System. An agreement has been executed with Rice Engineering & Operating, Inc. to design and install this system. This project will gather the salt water produced from 59 of our wells within the area as shown on the attached plat and dispose of it in a well to be drilled in Unit "C" of Section 3, T-22-S, R-36-E, Lea County, New Mexico. The disposal well is to be completed in the San Andres formation and the Land Commissioner for the State of New Mexico has given his approval for disposing of salt water in this manner on State Land by letter dated August 15, 1958. The drilling of the well will be started after approval of the necessary forms by the Oil Conservation Commission. It is anticipated that this system should be completed and all salt water produced within the proposed area disposed of underground by the end of the second quarter of 1959.

The following tabulation lists the 59 wells by pools to be connected to the Ramsay Block Salt Water Disposal System.

Lease and Wells	Location Sec.Twsp Range	Pool	No. of Wells
Arnott-Ramsay "C" 1, 5, 8	21-21-36	Eumont	3
Arnott-Ramsay "D" 2, 3, 4, 5, 6, 7, 8, 9	33-21-36	Eumont	8
J. F. Janda "A" 1, 2	20-21-36	Eumont	2
J. F. Janda "B" 1, 3, 4, 5	32-21-36	Eumont	4
Harry Leonard "A" 6, 7	22-21-36	Eumont	2

Lease and Wells	Location Sec.Twsp Range	Pool	No. of Wells
W. A. Ramsay "A" 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 35, 37, 39, 42	27-21-36 34-21-36 35-21-36	Eumont	26
Arnott-Ramsay "C" 2, 3, 4, 6, 7, 9, 10, 11, 12, 13, 14	21-21-36	Eunice	11
Harry Leonard "A" 1, 2, 4	22-21-36	Eunice	3
		TOTAL RAMSAY BLOCK	59.

For your information, the area covered by this Ramsay Block Salt Water Disposal System as shown on the attached plat includes 5,160.76 acres of State Leases and a 160 acre Fee Lease. No water is being produced on the Fee Land at the present, and will not be connected at this time; however, if, and when, water is produced it could be disposed of in this system.

The following is a tabulation of the 49 wells not connected to any disposal system with remarks as to the method of salt water disposal.

Lease and Well	Location Sec.Twsp Range	Pool	Lease Water Production Daily-Bbls.	Remarks
Bell-Ramsay "D" 1 (1 well)	35-20-37	Eumont	0	No disposal necessary.
R. R. Bell "I" 1,2 (2 wells)	34-20-36	Eumont	1	Use lined pit.
Bell-Ramsay "J" 1 (1 well)	25-20-37	Eumont	0	No disposal necessary.
R. A. Butler "B" 1 (1 well)	22-19-37	Eumont	1	Use lined pit. Serving Kutter "F" Lease.
A.L.Christmas "C" 1 (1 well)	18-22-37	Eumont	1	Use lined pit.
W. A. Hudson 1, 2 (2 wells)	26-19-37	Eumont	0	No disposal necessary.
F.W.Kutter "E" 2,3 (2 wells)	10-19-37	Eumont	0	No disposal necessary.
F.W.Kutter "F" 1, 2, 3, 4 (4 wells)	27-19-37	Eumont	3	Use lined pit.

Lease and Well	Location Sec.Twsp Range	Pool	Lease Water Production Daily-Bbls.	Remarks
Lea State "CM" 1 (1 well)	31-18-37	Eumont	0	No disposal necessary.
Lea State "DA" 1, 2, 3, 4, 5, 6, 7, 8, 9 (9 wells)	14-19-36 11-19-36	Eumont	0	No disposal necessary.
Lea State DK "A" 1 (1 well)	23-19-36	Eumont	0	No disposal necessary.
Lea State DK "B" 1, 2 (2 wells)	23-19-36	Eumont	0	No disposal necessary.
H. T. Orcutt "E" 2, 3 (2 wells)	2 -20-37	Eumont	0	No disposal necessary.
R. R. Bell "E" 1,2 (2 wells)	11-21-36	Eunice	2	Use lined pit.
H.C.Collins 1, 3 (2 wells)	14-21-36	Eunice	2	Use lined pit.
Heasley State 1, 5, 6 (3 wells)	5 -21-36	Eunice	4	Use lined pit.
F. Leck, 1 (1 well)	14-21-36	Eunice	0	No disposal necessary.
Sunshine 1, 3 (2 wells)	30-20-37	Eunice	0	No disposal necessary.
L. W. White "A" 1, 2, 3, 4, 5 (5 wells)	25-20-36	Eunice	4	Use lined pit.
C. L. Bates 1 (1 well)	26-19-36	Monument	0.4	Use lined pit.
F.W.Kutter "D" 1 (1 well)	8 -19-37	Monument	0	No disposal necessary.

Lease and Well	Location Sec.Twsp Range	Pool	Lease Water Production Daily-Bbls.	Remarks
Shipp "B" 1 (1 well)	8 -19-37	Monument	0	No disposal necessary.
J. W. Smith 1 (1 well)	34-19-36	Monument	0.4	Well is at economic limit. Will close in if required.
W. A. Weir "B" 1 (1 well)	26-19-36	Monument	1	Use lined pit.

TOTAL 49 wells.

The above tabulation shows that lined pits will be used. If it is uneconomical to install the lined pits due to the well being near its economic limit and if the Commission requires that this small amount of water must be disposed of in lined pits, or underground, then no alternative exists but to close in the well, or wells. We have referred to the use of lined pits; however, in a few instances small steel tanks may be utilized and the salt water hauled to a disposal well. In any event, the lined pits, or tanks, will be installed or the wells closed in, if required, by the date of completion of the Eunice-Monument-Eumont Salt Water Disposal System.

We trust that this report will comply with your directive since all of our other wells in the primary pools are included in cooperative systems and will be reported by the operators at the Statewide Hearing. However, if additional information is desired, please advise.

Yours very truly,

W. A. SHELLSHEAR

Attachment

MAIN OFFICE OCC
1958 SEP 10 AM 8:19

MORRIS R. ANTWEIL
OIL OPERATOR
P. O. BOX 1058
HOBBS, NEW MEXICO

Sept. 5, 1958

New Mexico Oil Conservation Commission,
Santa Fe, New Mexico

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

Reference: Order No. R-1224,
Salt Water Disposal
Lea County, New Mexico

Gentlemen:

Morris R. Antweil is the operator of two wells in the Hobbs pool and ten wells in the Eumont pool, being in Lea County, New Mexico.

The two wells in the Hobbs pool are marginal in oil production and produce approximately 200 barrels of water per day. It was not economically feasible for us to participate in the Hobbs pool disposal program. There are other operators in the Hobbs pool who are of the same opinion and share our concern in this situation. We are presently disposing of our water production by the open pit method. We are studying and are awaiting the judgment on a pilot project from the State Engineer's Office for a proposed cement lined evaporative type pit.

Our wells in the Eumont pool do not make an appreciable amount of water. From the ten wells that Morris R. Antweil operates, the Amerada State Lease, with three wells, produces four barrels of water per day and the Union State Lease, containing one well, produces one-half barrel of water per day. At this time we do not believe it justifiable to be compelled to dispose of this amount of water other than by the existing pit method.

MAIN OFFICE OCC
1958 SEP 10 AM 8:19

We have the highest regard for the State Oil Conservation Commission and have and will conform by all its rules and regulations. Should we be compelled to make arrangements of water disposal which are not economically feasible or necessary, it will mean premature abandonment of our leases.

Yours very truly,

MORRIS R. ANTWEIL,
OIL OPERATOR

Burton Veteto

BV:ec

NEIL E. SALSICH, JR.
Oil Investments
304 CENTRAL BUILDING
MIDLAND, TEXAS

PHONE
MU 4-7393

MAIN OFFICE OCC
1958 SEP 12 PM 1:46

September 10, 1958

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Re: Order # R-1224
Eumont Field
Neil E. Salsich State EA & State EB Leases
Salsich, McGrath & Smith Gulf State Leases

Gentlemen:

In reference to the above order number and leases; I wish to report that these leases are not producing any formation water, therefore we have not joined in the water disposal groups, nor do we deem it necessary to set up a disposal system for our wells.

I trust this will meet with your approval.

Sincerely yours,

Neil E. Salsich

NES:blk

SCHERMERHORN OIL CORPORATION
MAIN OFFICE OCC P. O. BOX 1537
HOBBS, NEW MEXICO

1958 SEP 11 AM 8:22

September 9, 1958

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

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

Re: Case No. 1053
Order No. R-1224

Gentlemen:

This letter is to report progress of water disposal as required under above Commission order.

This company operates twelve oil wells in the Eumont pool. None of these wells make any appreciable amounts of water at the present time. At such time when these wells do commence producing water, necessary steps will be taken to efficiently dispose of the water.

This company does not operate any wells in the other pools named in Item No. 3 on page 1 and 2 of the above captioned order.

Yours very truly,

SCHERMERHORN OIL CORPORATION

By John Moore
John Moore
District Superintendent

cj

Gentlemen:

I am appearing before you to make a statement of position and resolutions in the matter of New Mexico Oil Conservation Commission Order #R-1224.

We recognize that it is the duty of the New Mexico Oil Conservation Commission to cooperate with the State Engineer Office in matters of joint interest and we are mindful that a very serious problem of obtaining and protecting fresh water confronts us all.

Combining all factors, domestic water requirements for the United States by 1980 are estimated at 880,952,380 bbls. per day. This compares with 268,571,427 bbls. per day for 1955, an increase of approximately 327%.

Fresh water demand by 1980 for industrial use is expected to be about 400% of the 1955 demand.

It is highly improbable that the average precipitation over North America will be increased in any significant way in time to relieve the impending shortage. Certainly in much of New Mexico even with an increase in precipitation there is no way to greatly supplement our growing need for water since in most arid areas the moisture would be taken up by the dry surface sands only to eventually evaporate. Thus we must live within our water income. How?

There are the obvious courses: reduce consumption, end waste, develop more fully the use of available supply, or provide means to convert to benificial uses vast and virtually untapped supplies of sea and brackish water, and in our case in the main, conversion of, off color underground water since the vast majority of our state is arid land.

There is little doubt that in the future, in New Mexico, private enterprises will turn in some areas to drilling exclusively for water sources for market.

These startling facts although they deal with the future do have a very direct bearing on the present Commission Order #R-1224 which is before us today.

In particular we refer to paragraph (2) of the findings which states:

> "That it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico.

Also we refer to paragraph (2) of the order which states:

> "That all operators in the above-named areas shall report to the Commission at the Regular Hearing on September 17, 1958, on the progress made thus far and the estimated completion date of a 100 percent disposal system. Operators who are members of a cooperative

group may report through the committee chairman, who shall be prepared to name all operators who are members of such group. All operators who are not members of a cooperative group shall furnish a written progress report to the Commission prior to September 10, 1958, or shall appear at the Regular Hearing on September 17, 1958, to report the progress made thus far and the estimated completion date of a 100-percent disposal system for each well which they operate in the above-named areas."

At the outset let me assure you that we will not permit fresh water to become contaminated from any source as a result of our own actions.

We do feel however that certain considerations should be made in determining just exactly what must be done in disposing of waters that are produced coincidentally with oil and gas.

I wish to point out the economics of many operations could not afford the expense of returning produced waters below the surface. All operators have geared their operations to meet the presently known requirements. To force a premature cessation of operations without first determining that actual damage will or has occurred to fresh water sands, if they are in place, from the disposal of produced fluids into surface pits, would not protect correlative rights and would constitute a gross negligence and waste of a valuable resource.

We do not have any quarrel whatsoever with the duties or perogatives of the State Engineer, as outlined in the booklet entitled "Functions and Activities of the State Engineer Office" by C. B. Thompson, Chief, Technical Division and F. E. Irby, Chief, Water Rights Division, dated Santa Fe, New Mexico, November, 1957.

Reference is made to #s 5 & 6 of the purpose of the agency, i.e.,

#5 To conduct hydrographic surveys.

#6 To coordinate the work of various Federal Agencies as regards water resource programs.

It is in these two provisions that we request help from the State Engineer Office and the New Mexico Oil Conservation Commission.

Referring to #5 of the purpose of the agency, I wish to point out that the only testimony on record in this case concerning the need for fresh water protection and disposal of produced waters in Lea County has been only a comparison of "they do it someplace else and Lea County is like someplace else".

How about getting specific and actually making a study of Lea County and the problem in Lea County. At least then we would have something with a New Mexico name tag on it in the record. To intelligently solve the problem it will be necessary to get down to at least section lines.

We feel that in order to better understand the problem of water polution and how we can effectively protect fresh waters from our own acts we must know more about the exact locations of the water sands; that is to aerial extent as well as vertical limits, also the source of supply for these fresh water beds and the movement of the water within the confines of the beds.

In line with this thinking we respectfully request the New Mexico Oil Conservation Commission help the oil and gas operators within the state to secure, with the aid of the State Engineer Office as complete information as is possible from a comprehensive hydrographic survey of all areas where oil and/or gas and other well effulents are produced. We fully realize that this would be a project of considerable magnitude and would require complete cooperation on the part of the oil and gas operators. And also it would be incumbent upon the operators to take whatever steps that would be necessary to discharge their part of the resulting responsibilities.

Such a study should not be confined however to only those areas where we are now producing. We are constantly searching for new areas of oil and gas production so that we may continue, as in the past and present, to add to the growing economic resources of the state.

Also in line with such hydrographic surveys the studies should be extended to include the practical as well as theoretical possibilities of contaminating fresh water sands from well effulents, however they may be

disposed of. These studies should be pertinent only to those water bearing sands that are of sufficient magnitude that they would bear a reasonable economic and useful value to the people of the state.

Further this study should include the actual physical and chemical composition of waters that are produced coincidentally with oil and gas, and a determination should be made as to the feasibility of utilizing these waters for economic and useful purposes. All produced water from oil and gas wells do not carry high concentration of salt. Further the lifting cost of getting the water to the surface where it is available to do with as may be decided upon is already behind us.

With particular reference to that portions of paragraph (2) of the order that states "100-percent disposal system for each well." I respectfully point back to a statement made by the State Engineer at the May 16, 1956 hearing of case #1053 in which he stated in answer to the following question: "Is it your recommendation that water be disposed of by injection wells, or just the wells producing the excessive amounts of salt water?" "I would like to answer that a little fully. I think some further investigation is warranted, investigation toward this end. That is, to determine where the brine disposal pits might not overlie fresh water and therefore might not endanger fresh water."

Agreeing with the above quote I submit that the provision of paragraph (2) of order #1224 should not apply to all wells.

We submit that without such a study as I have discussed no one would have sufficient information upon which to base an order which would regulate the protection of fresh water and the disposal of waters that are produced from oil and/or gas wells.

In line with protecting fresh water I want to point out that it has long been the practice of oil and gas operators to run casing in wells, to among other things protect known fresh water supplies. In line with this policy on the part of the operators we strongly urge the adoption of Rules and Regulations Governing the Drilling and Completion, and Abandonment of water wells within the state that would effectively protect the water sands. Such regulations quite conceivably would include the following:

1. Casing would be set at a depth to at least the top of the water sand.
2. Such casing would be cemented with sufficient volume of cement to protect the fresh water sand from contamination from any source. In most instances this would mean circulating cement.

In thinking of brines there is one very important concept that I feel needs some clarification. In particular I refer to a statement made at the May 16, 1956 hearing. In answer to a question "Is it your opinion that salt is filtered out or removed in any way in this path which it takes from the pits to the aquifer?" The witness representing the State Engineer office answered in part "No, it is impossible to remove the sodium chloride and almost any other constituent in the brines in any way."

In reply to this statement let me say it's no secret that several methods - including use of nuclear power for separating salt from water are actively under experimentation.

The approaches are numerous - vapor compression; flash evaporation, freezing salt water; using solar energy; using solvents and chemical precipitation; and electro-filtration among others.

The Fluor Corp., of Whittier, Calif., is studying the combination of a nuclear reactor with distillation of saline water, under a contract from the office of Saline Water.

One of the more unusual processes under research is termed "electrodialysis." Unlike distillation, which removes water from salt, electrodialysis removes salt from water.

Another possibility is the use of chemicals to separate the salt from water. Texas A. & M. College is engaged in such a project, using hexadecanol. This chemical apparently combines with the purer part of the water, and the salty brine separates to another level.

Further I respectfully call your attention to the United States Senate Joint Resolution #135 a measure that was sponsored by Senator Clinton P. Anderson and was signed by the President on September 2, 1958.

In brief this resolution establishes a saline water conversion program to demonstrate the economics and feasibility of various processes in converting large quantities of "off-color" water into potable and useful liquid.

The resolution calls for the establishment of five demonstration plants of different types for the conversion of sea water and the treatment of brackish water. One of these plants may be located in the Southwest.

It is quite possible that a plant could be located in S. E. New Mexico and we urge that the State Engineer Office take full advantage of the possible use that such a plant would afford the people of the State of New Mexico.

We submit that there is need for specific studies and time in which to solve this very important problem. Also the problem is not the same in all parts of the state. Further that there are some areas that could not be contaminated because there simply are no fresh water sands in place.

We men of the petroleum industry may have oil in our blood, but we can no more survive without fresh water to drink than the man with manure on his boots or the soil under his fingernails. We are most anxious that a just and satisfactory conclusion be reached in order that the best interest of the state may be served.

GACKLE OIL COMPANY

Paul S. Johnston
Superintendent of Production

SALT WATER DISPOSAL FROM THE ENGINEERING VIEWPOINT

By - W. S. Morris*

It has been said that things happen in cycles. Prior to the discovery of oil by Col. Drake in 1859, wells were drilled in Pennsylvania in search of salt water, which was a valuable commodity at that time; any appearance of oil in such a well was considered highly undesirable. From the early beginning of the oil industry, salt water brought to the surface with oil has been a nuisance and has presented a disposal problem. It has only been within recent years that salt water in an oil field has been converted into a useful purpose. Thus it may appear that the cycle has been completed: from the time salt water was a desirable product in itself to the present time when salt water in an oil field is converted to a useful purpose.

There is little doubt that intentional water flooding of an oil sand was initiated in the Bradfort field of Pennsylvania and dates back to about 1907 when effects of increased oil production were noted, although it is believed that water floods were operated secretly prior to that time.(1) Water flooding started in Nowata County, Oklahoma, as early as 1931 and

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Presented to the Research Committee of the Interstate Oil Compact Commission at Dallas, Texas, May 31, 1956.

*Vice President and General Manager, East Texas Salt Water Disposal Company, Kilgore, Texas.

(1) References at the end of the paper.

developed into systematic operations after 1934. Some water floods have been reported in the shallow pools of Kansas as far back as 1916. The first water-flooding project in Texas was initiated in Brown County in 1936.[2]

What to do with the salt water produced to the surface along with the oil has for years presented a serious problem to the oil operator. No attempt will be made to discuss the limits of concentration of salt water found in oil fields other than to say that some sea water contains about 20,000 parts per million chloride and 35,000 parts per million total solids; East Texas oil field salt water contains about 36,000 parts per million chlorides and 65,000 parts per million total solids[3]; and water in the Valley Center oil field in Kansas is reported to contain 127,220 parts per million chlorides and 248,600 parts per million total solids.[4]

It is not clear just when the subsurface disposal of salt water, strictly as a means of getting rid of the salt water as a potential pollution problem, was first used. However, prior to 1936, so-called cavity wells were utilized in fields on the Gulf coast.[5] In 1929 the Bureau of Mines[6] reported four means by which disposal of oil field waters was effected:

1. Evaporation ponds.
2. Evaporation for recovery of dissolved constituents.
3. Diversion into surface streams.
4. Return to subsurface formations.

It was observed in this report that "....the practicability of this method (subsurface disposal) of salt water disposal has not been proved ..... the disposal of oil field brines by returning them to a subsurface formation, from the information thus far obtained, appears to be feasible in isolated

instances. However, great care must be used in attempting this method. Not only is there danger that the water will migrate to fresh water streams and pollute a potable water supply, but also there is an ever present possibility that this water may endanger present or future oil production."

The subsurface disposal of salt water aside from water flood operations has only been accepted within recent years by the oil industry. No doubt the engineer had considerable influence in pointing out the desirable factors of such a means of disposal. In the East Texas field, for example, it was known shortly after the discovery of the field in September 1930, that it was a water-drive field and that eventually large volumes of salt water would be produced. Early in the life of the field, the proper disposal of salt water became a serious problem. Several of the larger companies assigned their engineers and research departments to investigate the most desirable method for disposing of large quantities of salt water. The possibility of laying a large pipe line or digging a canal from the East Texas field to the Gulf coast was investigated. The cost was believed prohibitive so some other means had to be found to eliminate the pollution and contamination of the watersheds of the streams serving the area of the East Texas field.

While the problem was receiving the attention of engineers, much salt water was dumped into the watersheds of the Sabine River in the north part of the field and the Neches and Angelina Rivers in the south part of the field. The salt water was destructive to fish in the streams and rendered the water unfit for commercial or industrial use by communities between

the East Texas field and the Gulf coast. Furthermore, the rice growers on the Gulf Coast were adversely affected. As a result of this contamination of the streams serving the East Texas field, court action was sought by the cities of Port Arthur and Beaumont who solicited the aid of the Attorney General of the State, the Fish, Game, and Oyster Commission, Health Department, Board of Water Engineers, and the Railroad Commission. A court injunction was issued which prohibited the further release of salt water into the streams serving the area. This drastic action resulted in the construction of many earthen pits which only temporarily brought relief to the oil producers whose wells would have to be shut down unless suitable means of disposal of the salt water were found.

By this time the engineers of the larger companies in the East Texas field had concluded that salt water produced with oil from the Woodbine sand could be returned to the reservoir and that a large scale experiment was justified. Accordingly, 15 operators agreed to underwrite the field test. A well that failed to find oil production in the Woodbine sand, about two miles west of the productive limits of the East Texas field in Smith County, was used to produce approximately 380,000 barrels of salt water from the Woodbine sand to be used in the test. An injection well was drilled especially for the purpose and equipped with cement-lined casing. The feasibility of returning the Woodbine water to the reservoir was demonstrated to the satisfaction of all concerned.

From the beginning, it was observed that the salt water underwent considerable chemical change from the time it was produced from the

reservoir and reached the surface until it was returned to the underground reservoir through the injection well. Chemical treatment, sedimentation, filtration, and other processes had to be worked out before the water was conditioned for injection into the Woodbine sand. From the outset, difficulty was experienced by the presence of living micro-organisms in the water.

In 1938 the first subsurface disposal of water into the lower part of the Woodbine sand - beneath the oil-bearing portion of the sand - was commenced. The method quickly found favor in the field among large operators who installed necessary facilities to take care of their own water. No provision was made for the subsurface injection of water from the smaller operators, so the problem was still acute in the field as a whole. Discussions were started pointing to the formation of a field-wide salt water disposal plan. Early in 1942, a corporation known as the East Texas Salt Water Disposal Company, was formed to operate in the nature of a public utility and dispose of salt water taken from all operators alike in the field. Although there was doubt in the minds of some of the operators that the subsurface disposal of salt water was the best means of disposal, engineers were quick to point out additional benefits to be obtained by returning the salt water to the Woodbine reservoir beneath the oil zone.

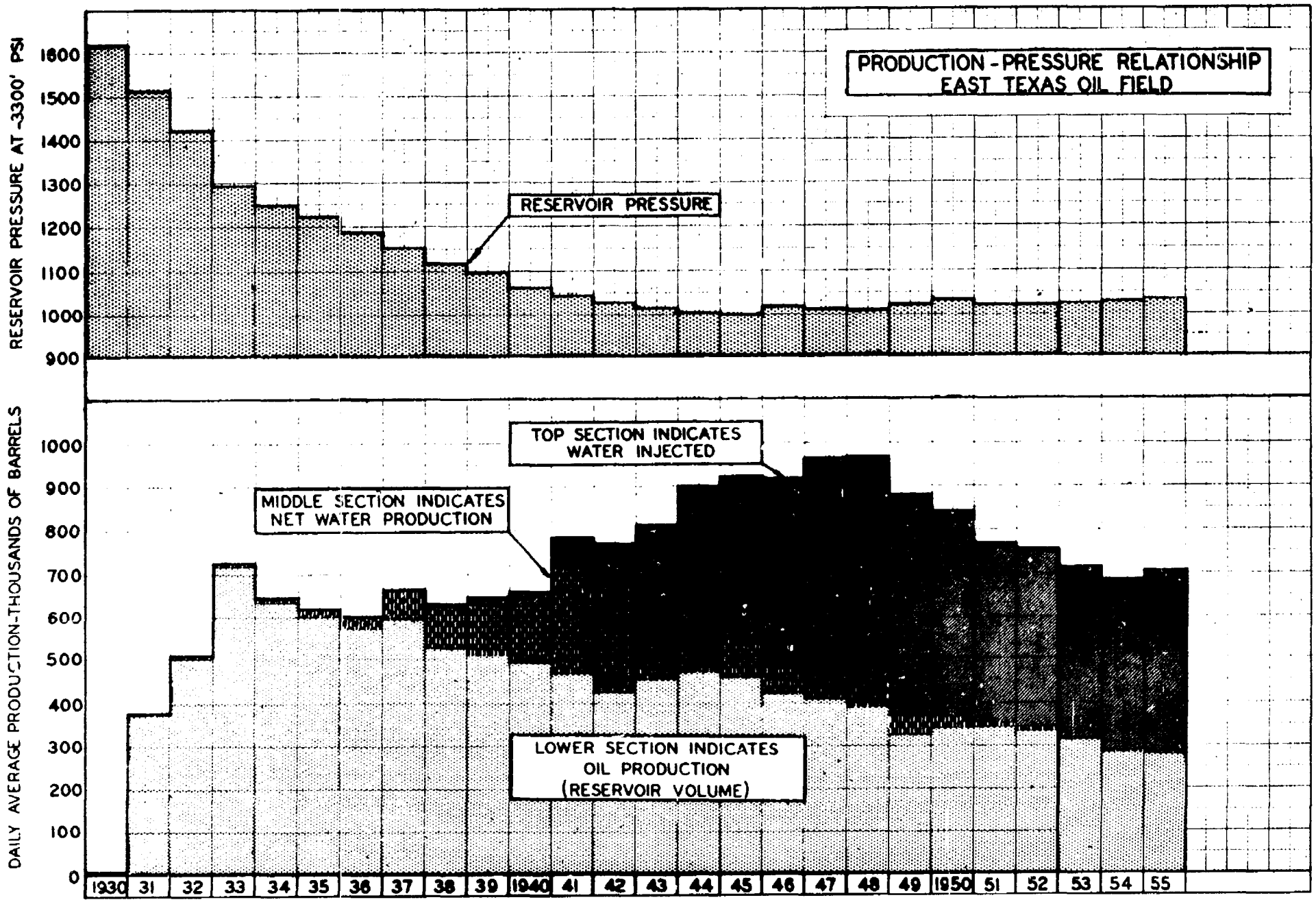
The engineers told the oil operators, Railroad Commission members, and other interested parties that the return of the salt water would not only eliminate the pollution and contamination of the watershed of the East Texas field, but would also help to maintain the reservoir pressure

to the end that many wells would continue to flow for a much longer period and that the necessity of pumping would be indefinitely postponed. Reservoir engineers also pointed out that the ultimate recovery of the field would be greatly increased by the maintenance of pressure so the gas would remain in solution in the oil and as a result the oil would move more readily through the sand body. Furthermore, the washing effect of the water would bring considerably more oil into the well bore. The increase in ultimate recovery by the subsurface disposal of salt water produced in the field was estimated by technologists to range from 400 million to 800 million barrels. It has been generally accepted that the salt water disposal project will increase the recovery in East Texas by 600 million barrels of oil over and above the amount that would otherwise have been produced. (See references 7 through 13.)

The predictions of the engineers prior to 1942 have more than been realized in the East Texas field. On October 1, 1942, when the East Texas Salt Water Disposal Company injected its first barrel of water, the average bottom-hole pressure determined by the Railroad Commission, was 1020.71 psi. On May 1, 1956 (13 years and 7 months later) the pressure was 1034.39 psi - an increase of 13.67 psi. During this interval, the East Texas field produced 1.443 billion barrels of oil and 2.297 billion barrels of salt water. The injection program returned 87.9% (2.020 billion barrels) of this volume of salt water to the reservoir. A chart showing the "Production-Pressure Relationship in the East Texas Field" is shown as Figure 1. Pertinent statistical data on the field from 1930 through 1955 are shown in Tabulation 1. (For details on the operation of the East Texas Salt Water Disposal project, see references 14 through 17.)

DAILY AVERAGE PRODUCTION AND SALT-WATER INJECTION DATA - BY YEARS
EAST TEXAS OIL FIELD

Year	Oil Produced (Tanks) Bbls.	Oil & Gas (Reservoir) Bbls.	Salt Water Produced Bbls.	Total Fluid Produced Bbls.	Salt Water Injected Bbls.	Net Fluid Produced Bbls.	Average Reservoir Pressure psi
1930	295	372	0	372	0	941	1620.00
1931	298,766	376,280	697	376,977	0	376,977	1513.58
1932	397,302	500,380	1,241	501,621	0	501,621	1420.58
1933	568,304	715,748	5,872	721,620	0	721,620	1290.92
1934	502,351	632,684	10,354	643,038	0	643,038	1249.25
1935	477,992	602,005	15,467	617,472	0	617,472	1221.53
1936	451,559	568,714	31,987	600,701	0	600,701	1183.58
1937	469,416	591,204	72,018	663,222	0	663,222	1151.82
1938	413,978	521,383	106,797	628,180	611	627,569	1117.38
1939	398,286	501,620	138,816	640,436	6,166	634,270	1093.65
1940	386,326	486,557	170,445	657,002	29,962	627,040	1060.51
1941	363,820	458,212	322,551	780,763	64,468	716,295	1041.73
1942	334,943	421,843	342,032	763,875	80,546	683,329	1025.19
1943	352,243	455,877	398,640	854,517	201,708	652,809	1014.29
1944	368,219	466,100	465,637	931,737	339,216	592,521	1006.99
1945	358,964	454,385	482,608	936,993	375,769	561,224	1003.35
1946	330,340	418,152	479,624	897,776	427,412	470,364	1012.85
1947	320,403	405,573	544,463	950,036	494,868	455,168	1009.17
1948	305,683	386,941	566,850	953,791	521,342	432,449	1007.37
1949	256,239	324,353	546,427	870,780	505,800	364,980	1019.53
1950	268,052	339,306	501,673	840,979	466,474	374,505	1029.85
1951	272,812	345,332	420,436	765,768	410,307	355,461	1019.06
1952	264,641	334,989	411,481	746,470	406,100	340,370	1020.24
1953	238,320	314,329	399,992	714,321	394,442	319,879	1022.37
1954	222,911	282,166	405,616	687,782	399,622	288,160	1029.61
1955	218,782	276,939	428,129	705,068	421,099	283,969	1032.24


PRODUCTION - PRESSURE RELATIONSHIP
EAST TEXAS OIL FIELD
RESERVOIR PRESSURE AT -3300' PSI
1600
1500
1400
1300
1200
1100
1000
900
RESERVOIR PRESSURE
DAILY AVERAGE PRODUCTION-THOUSANDS OF BARRELS
1000
900
800
700
600
500
400
300
200
100
0
TOP SECTION INDICATES
WATER INJECTED
MIDDLE SECTION INDICATES
NET WATER PRODUCTION
LOWER SECTION INDICATES
OIL PRODUCTION
(RESERVOIR VOLUME)
1930
31
32
33
34
35
36
37
38
39
1940
41
42
43
44
45
46
47
48
49
1950
51
52
53
54
55

The practice of returning salt water to the formation from which it was produced below the oil zone is not restricted to the East Texas field. Salt water is being returned to the Woodbine formation in the Van field; water is also being injected at Quitman, Hawkins, Talco, Conroe, and many other places in Texas, as well as in oil fields outside the State.

When the engineer looks at salt water disposal he thinks in terms of a possible source of energy and a medium for increasing the recovery of oil. Salt water in large volumes has ceased to be a nightmare to him because he has found a way to usefully use this one-time nuisance.

* * * * * * * * *

References

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(12) "A Survey of Secondary Recovery and Pressure Maintenance Operations in Texas to 1952." Engineering Department, The Railroad Commission of Texas. Austin 1952.

(13) Alfred M. Leeston, "Magic Oil, Servant of the World." Page 44. McMurray's Bookstore, Dallas, Texas.

(14) L. H. Dial, "Salt Water Disposal in East Texas." A series of lectures given in a Vocational Training Class at Kilgore Junior College 1944. Reported in The Petroleum Engineer Magazine for September, October, November, December 1944 and February, March, April, May, June, August and September 1945.

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(16) W. S. Morris, "Results of Water Injection in Woodbine Reservoir of the East Texas Field." API Production Bulletin No. 233, 36-45 (1947). "Secondary Recovery of Oil in the United States." API, 1950. Pages 582 - 591.

(17) "Salt Water Disposal - East Texas Field" A Manual by the Staff of East Texas Salt Water Disposal Company. Issued by Petroleum Extension Service, The University of Texas. Austin. 1953.

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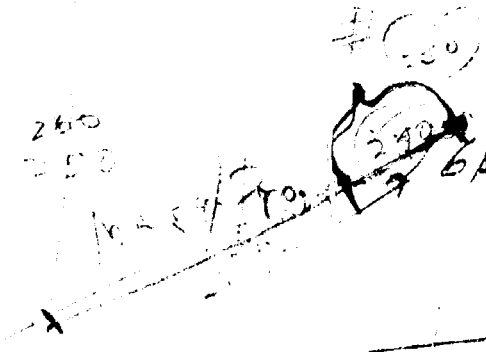

No. 97854

RECEIPT FOR CERTIFIED MAIL—15¢

SENT TO: Harris T Hill

STREET AND NO.

CITY AND STATE: Santa Fe

POSTMARK OR DATE

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If you want restricted delivery, check here
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INSURED NO.

CITY, ZONE, AND STATE: Santa Fe, New Mexico

POD Form 3811, Dec. 1955

INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ DELIVER ONLY TO ADDRESSEE (*20¢ additional*)

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RECEIPT

Received from the Postmaster the Registered, Certified, or Insured Article, the number of which appears on the face of this return receipt.

1. SIGNATURE OR NAME OF ADDRESSEE

X Harris F Malin

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

Louise Daugherty

3. DELIVERY DATE

8-22-58

4.

No. 97858

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CITY, ZONE, AND STATE

Santa Fe, N.M.

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16—71643-9

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1. SIGNATURE OR NAME OF ADDRESSEE

X Lone Star Brewing Co

2. SIGNATURE OF ADDRESSEE'S AGENT *(if agent is authorized, enter addressee's name in item 1 above)*

By E. J. Sneed

3. DELIVERY DATE

AUG 23 19

4.

d—16—71542-2 GPO

POST OFFICE DEPARTMENT

RECEIPT FOR CERTIFIED MAIL—15¢

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SENT TO Atlantic

STREET AND NO.

CITY AND STATE Roswell

POSTMARK OR DATE

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Mar. 1956

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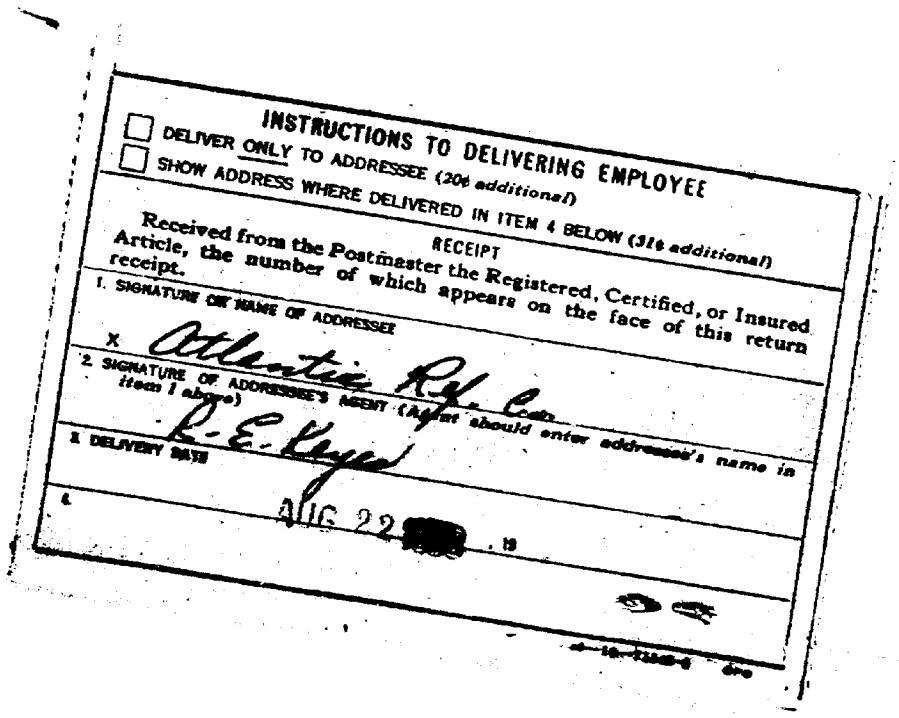
CITY AND STATE Santa Fe, N.M.

POD Form 3811, Dec. 1955

16—71843-9



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RECEIPT

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1. SIGNATURE OR NAME OF ADDRESSEE

X Atlantic Ref. Co.

2. SIGNATURE OF ADDRESSEE'S AGENT (Agent should enter addressee's name in item 1 above)

R. E. Kaye

3. DELIVERY DATE

AUG 22 [redacted]

4.

No. 97852

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CITY AND STATE

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CITY, ZONE, AND STATE
Santa Fe, N.M.

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RECEIPT

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1. SIGNATURE OR NAME OF ADDRESSEE

X Aztec Oil & Gas Co

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

M. P. Sturgill

3. DELIVERY DATE

AUG 22 19[illegible]

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4—16—71260-1 GPO

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CITY AND STATE

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☐ 20¢ fee

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1. SIGNATURE OR NAME OF ADDRESSEE

X R D Mundy

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

Bobby Powell

3. DELIVERY DATE

8-22 19 58

4.

66—16—71562-2 GPO

POST OFFICE DEPARTMENT
OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE

POSTMASTER

No. 97857

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STREET AND NO.

CITY AND STATE Tucson

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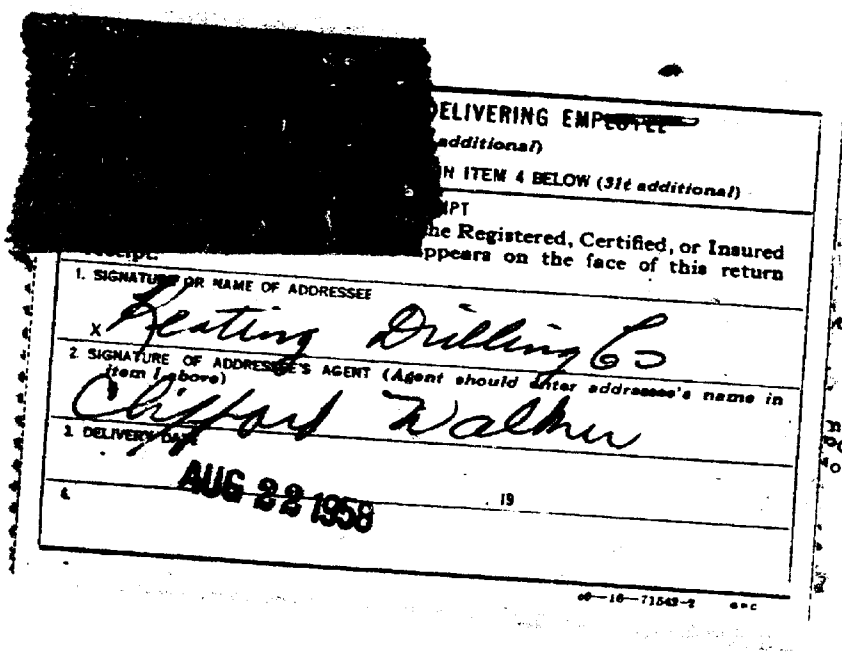
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DELIVERING EMPLOYEE
additional)
H ITEM 4 BELOW (31¢ additional)
IPT
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1. SIGNATURE OR NAME OF ADDRESSEE
X Keating Drilling Co
2. SIGNATURE OF ADDRESSEE'S AGENT (Agent should enter addressee's name in Item 1 above)
Clifford Walker
3. DELIVERY DATE
AUG 22 1958
19
66—16—71543-2

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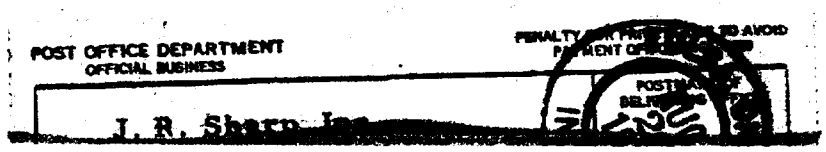

1. Stick postage stamps to your article to pay:
   15-cent certified mail fee
   First-class or airmail postage
   Either return receipt fee (*optional*)
   Restricted delivery fee (*optional*)
   Special-delivery fee (*optional*)
2. If you want this receipt postmarked, stick the gummed stub on the address side of the article, leaving the receipt attached, and present the article to a postal employee.
3. If you do not want this receipt postmarked, stick the gummed stub on the address side of the article, detach and retain the receipt, and mail the article.
4. If you want a return receipt, write the certified-mail number and your name and address on a return receipt card, POD Form 3811, and attach it to the back of the article. Endorse front of article RETURN RECEIPT REQUESTED.
5. Save this receipt and present it if you make inquiry.

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1. SIGNATURE OR NAME OF ADDRESSEE

X J R Sharp Jr

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

D. T. McCarthy

3. DELIVERY DATE

AUG 25 1958 19

4.

TMARK
DATE

ad—16—71542-9 e+c

No. 97856

RECEIPT FOR CERTIFIED MAIL—15¢

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CITY AND STATE	
If you want a return receipt, check which: ☐ *7¢ shows to whom and when delivered* ☐ *31¢ shows to whom, when, and address where delivered*	*If you want restricted delivery, check here* ☐ *20¢ fee*

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	Santa Fe, N.m.

POD Form 3811, Dec. 1955

16—16—71463-9

INSTRUCTIONS TO DELIVERING EMPLOYEE

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3. DELIVERY DATE

AUG 22 1958 19

4.

16—71643-2

No. 97859

RECEIPT FOR CERTIFIED MAIL—15¢

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16—71649-8

POD Form 3811, Dec. 1955

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1. SIGNATURE OR NAME OF ADDRESSEE

X Magenta Oil Co

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

J Nelson

3. DELIVERY DATE

AUG 22 1958 19

4.

16—10—71642-1 GPO

No. 97860

RECEIPT FOR CERTIFIED MAIL—15¢

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CITY AND STATE	
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	Santa Fe, N.m.

POD Form 3811, Dec. 1955

16—71849-9

INSTRUCTIONS TO DELIVERING EMPLOYEE

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☐ SHOW ADDRESS WHERE DELIVERED IN ITEM 4 BELOW (*31¢ additional*)

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1. SIGNATURE OR NAME OF ADDRESSEE

X Richards Corp.

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

M. DeMarsh

3. DELIVERY DATE

4. AUG 21 1958 , 19

No. 97863

RECEIPT FOR CERTIFIED MAIL—15¢

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STREET AND NO.

CITY AND STATE

POSTMARK OR DATE

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CITY, ZONE, AND STATE
Santa Fe, New Mexico

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INSTRUCTIONS TO DELIVERING EMPLOYEE

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RECEIPT

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1. SIGNATURE OR NAME OF ADDRESSEE

x Signal Oil & Gas Co.

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

V. L. Hukey

3. DELIVERY DATE

8/22/58

4.

16—71642-7 GPO

No. 97864

RECEIPT FOR CERTIFIED MAIL—15¢

SENT TO T P Co. Ltd. D. C.

STREET AND NO.

CITY AND STATE Ft. Worth

POSTMARK OR DATE

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CITY, ZONE, AND STATE
Santa Fe, New Mexico

POD Form 3811, Dec. 1955

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1. SIGNATURE OR NAME OF ADDRESSEE

X TP Coal & Oil Co

2. SIGNATURE OF ADDRESSEE'S AGENT *(Agent should enter addressee's name in item 1 above)*

W M Pipher

3. DELIVERY DATE

8/22 19 58

4.

16—71642-2 GPO

No. 97865

RECEIPT FOR CERTIFIED MAIL—15¢

SENT TO: Land Office

STREET AND NO.:

CITY AND STATE: Santa Fe

POSTMARK OR DATE

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97865

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CITY, ZONE, AND STATE: Santa Fe, New Mexico

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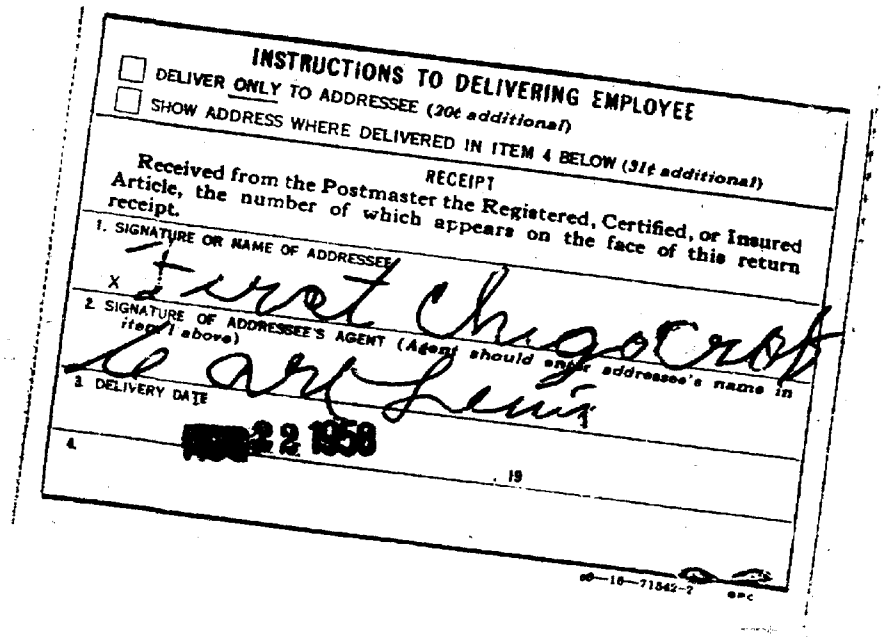

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1. SIGNATURE OR NAME OF ADDRESSEE

X Ernest Shoecraft

2. SIGNATURE OF ADDRESSEE'S AGENT (Agent should enter addressee's name in item 1 above)

Pearl Lewis

3. DELIVERY DATE

FEB 22 1958

4. , 19

16—71842-2 ★U.S.G.P.O.

RECEIPT FOR CERTIFIED MAIL—15¢

No. 97867

SENT TO: Miss K. [illegible]

STREET AND NO.:

CITY AND STATE:

POSTMARK OR DATE

If you want a return receipt, check which
☐ *7¢ shows to whom and when delivered*
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If you want restricted delivery, check here
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Mar. 1956

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Santa Fe, New Mexico

POD Form 3811, Dec. 1955

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INSTRUCTIONS TO DELIVERING EMPLOYEE

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☐ SHOW ADDRESS WHERE DELIVERED IN ITEM 4 BELOW (*31¢ additional*)

RECEIPT

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1. SIGNATURE OR NAME OF ADDRESSEE

X Ines Oil Co.

2. SIGNATURE OF ADDRESSEE'S AGENT (*Agent should enter addressee's name in item 1 above*)

J. Nelson

3. DELIVERY DATE

AUG 22 19[illegible] 19

4.

66—16—71562-1 GPO

No. 97866

RECEIPT FOR CERTIFIED MAIL—15¢

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STREET AND NO.

CITY AND STATE

POSTMARK OR DATE

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If you want restricted delivery, check here

☐ 20¢ fee

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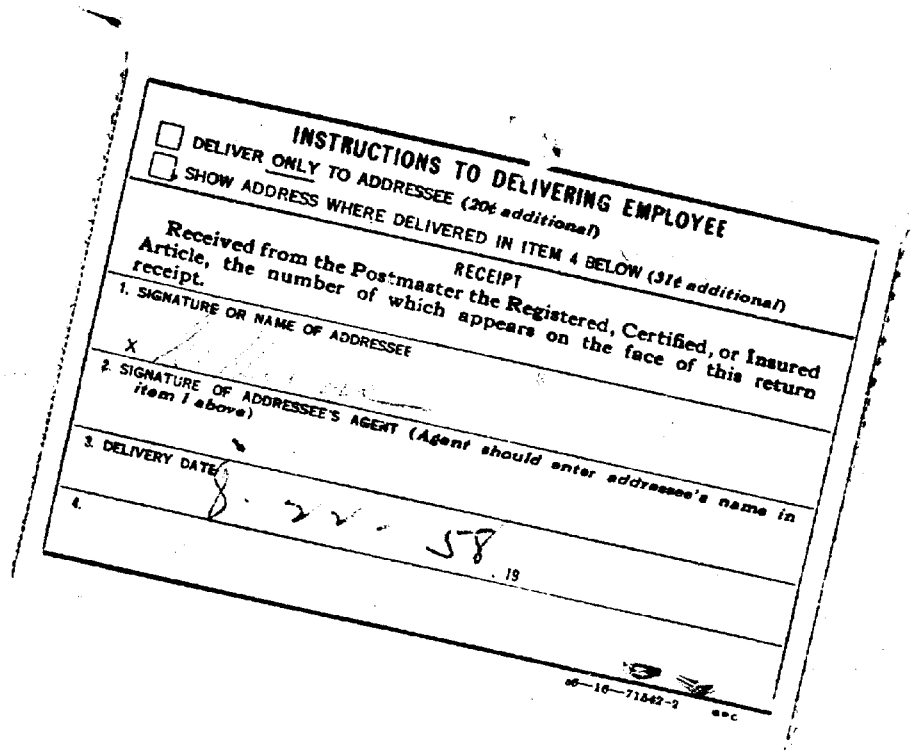
POD Form 3811, Dec. 1955

Santa Fe, New Mexico

46—16—71648-9



INSTRUCTIONS TO DELIVERING EMPLOYEE

☐ DELIVER ONLY TO ADDRESSEE (20¢ additional)

☐ SHOW ADDRESS WHERE DELIVERED IN ITEM 4 BELOW (31¢ additional)

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1. SIGNATURE OR NAME OF ADDRESSEE

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2. SIGNATURE OF ADDRESSEE'S AGENT (Agent should enter addressee's name in item 1 above)

3. DELIVERY DATE

8 - 27 - 58, 19

4.

26—16—71842-2 ★ USCO

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

September 30, 1958

COPY

Great Western Drilling Company
Box 1659
Midland, Texas

Attention: Mr. John T. Hampton

Re: Case 1053, R-1224
First Chicago Corporation

Gentlemen:

This is to acknowledge receipt of your letter of September 29, 1958, concerning the First Chicago Corporation.

It was not evident to the Oil Conservation Commission prior to your letter that Great Western operated the First Chicago well in the Monument Pool. Failure to mention this at the hearing has caused no inconvenience.

Thanks for your letter. The well will be checked as reported.

Yours very truly,

E. J. FISCHER
District Engineer

EJF/og

GREAT WESTERN
Midland drilling co. Texas

R. C. TUCKER, PRES.

PHONE MU 2-5241
ADDRESS REPLY TO:
BOX 1659
MIDLAND, TEXAS

September 29, 1958

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.,
Secretary-Director

Gentlemen:

We are in receipt of your letter of September 26, 1958 addressed to the First Chicago Corporation. According to this letter you have not yet received a report on the progress concerning salt water disposal in the ten (10) most critical areas of Lea County, New Mexico from the First Chicago Corporation. The only well operated by the First Chicago Corporation in the ten most critical areas in New Mexico, is the First Chicago Corporation No. 1 Crutchfield in the Monumnet Field. This well is jointly operated by Great Western Drilling Company and the First Chicago Corporation on a net profits basis. This well was reported owned by Great Western Drilling Company at the hearing held September 17 in Santa Fe, at which time we stated that the well made about five (5) barrels of water per month and that we proposed to dispose of the water if necessary by an asphalt lined pit.

I am extremely sorry that I did not mention the First Chicago Corporation at this hearing, and sincerely hope my failure to do so has not caused you any great inconvenience.

Yours very truly,

GREAT WESTERN DRILLING COMPANY

John T. Hampton

JTH:ab

MEMBER OF OPC

E1

MR. B. H. NOLEN

BOX 326

HOBBS, NEW MEXICO

September 29, 1958

Approved

New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

ATT: A. L. Porter, Jr., Secretary and Director

RE: Salt Water Disposal Report
Under Report No. R-1224

Dear Sir:

Reference is made to your letter to Mr. John F. Lane of September 26, 1958 concerning the subject report. Mr. Nolen is out of town at the present time, however, I checked with Mr. W. G. Abbott of Rice Engineering and Operating, Inc. and we are of the opinion that Mr. Lane's well was included on Rice's report to the Eunice-Monument-Eumont Salt Water Disposal Committee dated September 26, 1958. Enclosed is a copy of their letter.

If we can be of any further service, please feel free to call on us.

Very truly yours,

B. H. NOLEN

BY R. M. Jelinek
R. M. Jelinek

RMJ:bm

Inc.

MAIN OFFICE OCC

1959 OCT 12 AM 8:19

[illegible]
Box 486
[illegible]

August 25, 1959

Rice Engineering and Operating, Inc.
Box 1142
Hobbs, New Mexico

Re: Water Disposal System-Monument Field. Nolen and Lane Wells, [illegible], #3, and #4, East Half of N.W.¼ Section 3, Township 20, Range 37 East and Cooper #1 (S.E.¼ N.E.¼ Section 4, and Humble-Laughlin #1 S.E.¼ N.E.¼, Section 4, Township 20, Lea County, New Mexico.

Gentlemen:

This letter will give you authority to include the above [illegible]ption wells in the water disposal system in the Monument field.

Yours very truly,

[illegible] LANE

BY _____
[illegible] Nolen

Rice Engineering and Operating, Inc.
Box 1142
Hobbs, New Mexico

RE: Water Disposal System-Monument
Field, Nolen and Lane Wells,
Williams #1, Well S.W.¼, S.W.¼
Section 24, Range 1937 East,

Gentlemen:

This letter will give you authority to include the above caption wells in the water disposal system in the Monument field.

Yours very truly,

MRS. JOE [illegible] LANE

BY _____
Agent

Memo

From

A. L. FORTER, JR.
DIRECTOR

To

ok wje

9/5

cy fwd to St. Emp Office this Date.

wje

GIRAND & STOUT
LAWYERS
204 LEA COUNTY STATE BANK BUILDING
HOBBS, NEW MEXICO

W. D. GIRAND
LOWELL STOUT

TELEPHONE:
EXPRESS 3-9116
POST OFFICE BOX 1445

Fremont
MAIL OFFICE OCC
SEP 12 AM 8:42

September 12, 1958.

Oil Conservation Commission,
Santa Fe, New Mexico.

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

Gentlemen:

Enclosed you will find original and three copies of Response of Drilling and Exploration Company, Inc. to Commission's Memorandum No. 22-56 and Order No. 1224.

We would appreciate the Commission considering this Response and Application in connection with the Hearing to be held on September 17, 1958.

Very truly yours,

GIRAND & STOUT,

BY: W. D. Girand

G/bc
cc: Oil Conservation Commission,
Hobbs, New Mexico. (w/one copy)
(Attention: Mr. Randall Montgomery)

MAIL OFFICE OCC

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:
APPLICATION OF THE OIL CONSERVATION COMMISSION UPON ITS OWN MOTION, AT THE REQUEST OF THE STATE ENGINEER, FOR AN ORDER PRESCRIBING RULES AND REGULATIONS TO GOVERN THE DISPOSAL OF SALT WATER IN AREAS OF LEA COUNTY, NEW MEXICO.

CASE NO. 1053

RESPONSE OF DRILLING AND EXPLORATION COMPANY, INC. TO COMMISSION'S MEMORANDUM NO. 22-56, DATED JULY 3, 1956, and ORDER NO. R-1224, DATED JULY 28, 1958, AND REQUESTING AN EXCEPTION FROM ANY ORDER ENTERED BY THE COMMISSION REQUIRING DISPOSAL OF WATER PRODUCED FROM WELLS LOCATED IN THE SW¼NW¼ and SW¼ OF SECTION 19, TOWNSHIP 21 SOUTH, RANGE 36 EAST, N.M.P.M., DESIGNATED AS DRILLING AND EXPLORATION COMPANY, INC. STATE F LEASE AND FROM THE SE¼ OF SECTION 12, TOWNSHIP 21 SOUTH, RANGE 35 EAST, N.M. P.M., DESIGNATED AS DRILLING AND EXPLORATION COMPANY, INC. STATE ENDURA LEASE, OTHER THAN THE PRESENTLY EMPLOYED METHOD OF WATER DISPOSAL.

Order No. R-1224

COMES NOW Drilling and Exploration Company, Inc. and files this its Response and Application to Commission Memorandum No. 22-56, dated July 3, 1956 and Commission Order No. R-1224, dated July 28, 1958, and would respectfully show:

1. Respondent is the operator of nine wells located in the Eumont Field in Lea County, New Mexico, said wells being designated as Wells 1, 2, 3, 4 and 5, located in the SW¼ of the NW¼ and the SW¼ of Section 19, Township 21 South, Range 36 East,

N.M.P.M., Lea County, New Mexico, and designated as Drilling and Exploration Company, Inc. State F Lease, and four wells No. 1, 2, 3, and 4, located in the SE¼ of Section 12, Township 21 South, Range 35 East, N.M.P.M., Lea County, New Mexico, designated as Drilling and Exploration Company, Inc. State Endura Lease.

2. That the five wells located on the State F Lease produce an average of ten barrels of water per day.

3. That the four wells located on the State Endura Lease produce an average of one barrel of water per day.

4. That the water produced from both leases is now being disposed of in open pits located on the Leases.

5. That a well for water was drilled on the State Endura Lease to a depth of 315 feet and was abandoned as a dry hole. That there are no water wells located within a radius of one mile of the State Endura Lease.

6. That on the State F Lease there are no producing water wells. There is one producing water well approximately 1100 feet West of this Lease. The production from this water wells is insufficient at times to furnish water for livestock. That attached hereto and made a part hereof is a Laboratory Report, marked Exhibit "A", showing the properties of the water

produced from this well. That in this connection, production water has been produced on the State F Lease since October 15, 1939 and has been disposed of in an earthen evaporation tank located thereon.

7. Respondent would show that in view of the fact that there are no water wells on, or water basin under, the State Endura Lease, located in Section 12, Township 21 South, Range 35 East, and in view of the fact that the nearest water well to the State F Lease, located in Section 19, Township 21 South, Range 36 East, is approximately 1100 feet West thereon, and since the disposal of production water on the State F Lease has been cared for by earthen evaporative pits since October 15, 1939 without any apparent influence on the said water well, respondent claims that its method of disposal of production water has resulted in no contamination of any fresh water stratum and, therefore, is in full compliance with the requirements of Commission's Memorandum No. 22-56, dated July 3, 1956, and any Orders that may be issued thereunder.

Any requirements placed on this respondent to incur additional expense in the disposal of its production water from the Leases in question would be unwarranted and would result in a financial loss to respondent.

WHEREFORE, applicant prays that having fully responded to the Commission's Memorandum No. 22-56, dated July 3, 1956,

and the Commission Order No. R-1224, dated July 28, 1958, should the Commission continue said Order R-1224, to apply to the Eumont Pool and should the Commission enter an Order requiring any disposition of production water within the Eumont Pool other than the disposition presented used and employed by respondent, that then and in that event the Commission grant unto respondent an Exception and delete from said Order the SW¼NW¼ and the SW¼ of Section 19, Township 21 South, Range 36 East, N.M.P.M., and the SE¼ of Section 12, Township 21 South, Range 35 East, N.M.P.M., Lea County, New Mexico, and for such other and further relief as the Commission may deem the respondent entitled.

DRILLING AND EXPLORATION COMPANY, INC.,

BY _____
OF GIRAND & STOUT, BOX 1445,
HOBBS, NEW MEXICO.

(ATTORNEYS FOR RESPONDENT)

G/bc

Exhibit "A"

DOWELL INCORPORATED

LABORATORY REPORT

WATER ANALYSIS

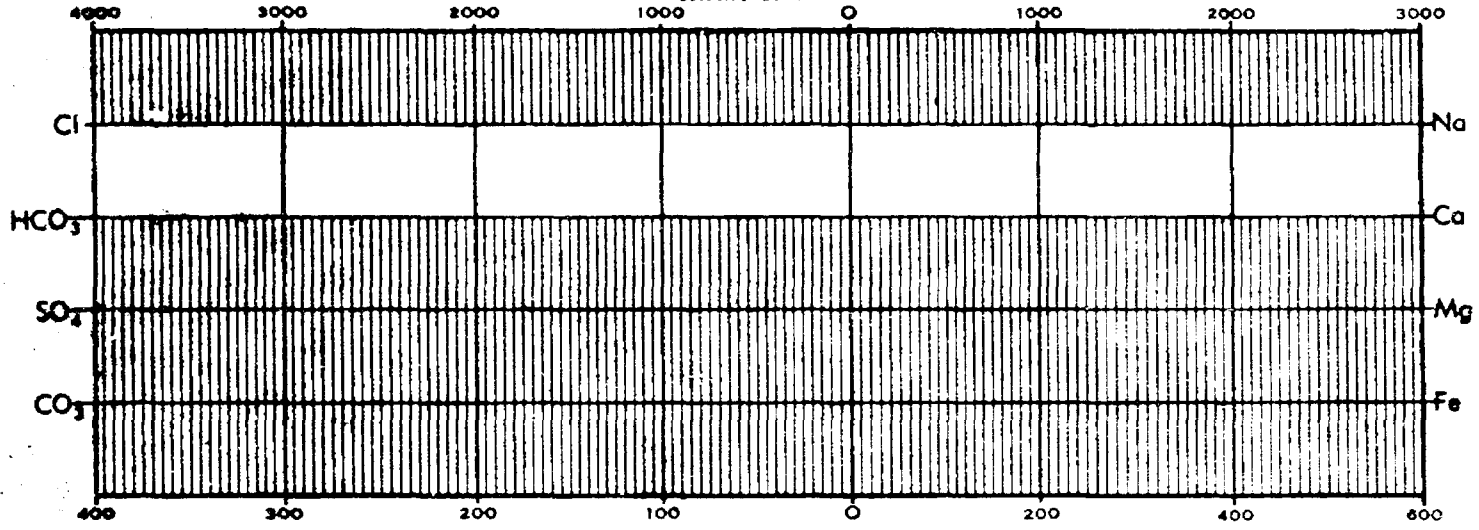
TO: Drilling and Exploration Co. INC
Hobbs, New Mexico

LABORATORY LOCATION: Hobbs, New Mexico
REPORT NUMBER: 0770
COMPANY: Shell Oil Co.
WELL: Water Well San Simon
POOL:
LOCATION: 24-213-35E (approx 1100'
COUNTY:
STATE: West Drlg & Expl State F #1)
DATE SAMPLE SUBMITTED: September 6, 1958
FORMATION:
DEPTH:
SAMPLE SOURCE:
SUBMITTED BY:
TESTS DESIRED: complete

	PPM	EPM		PPM	EPM
CALCIUM	42	2.1	CHLORIDE	52	1.5
MAGNESIUM	22	1.8	SULFATE	45	.9
SODIUM	50	2.2	BICARBONATE	230	3.7
IRON			CARBONATE		
HYDROGEN SULFIDE			HYDROXIDE		

SPECIFIC GRAVITY: 1.000 AT 60 °F | pH: 6.8 | $CaCl_2/MgCl_2$: 1.35 | % SALT SATURATION: .00832

CHART OF EPM



REMARKS:

Rosson — CHEMIST
September 8, 1958 — DATE

MAIN OFFICE OCC
1958 JUL 4 AM 8:36

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1053
Order No. R-1224

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION, AT
THE REQUEST OF THE STATE ENGINEER,
FOR AN ORDER PRESCRIBING RULES AND
REGULATIONS TO GOVERN THE DISPOSAL
OF SALT WATER IN AREAS OF LEA COUNTY,
NEW MEXICO.

ORDER OF CONTINUANCE

BY THE COMMISSION:

This cause originally came on for hearing at 9 o'clock a.m. on May 16, 1956, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and was continued from time to time, last being heard on June 18, 1958.

NOW, on this 28th. day of July, 1958, the Commission, a quorum being present, having considered the evidence adduced 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 it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico.

(3) That by Commission Memorandum No. 22-56, dated July 3, 1956, all operators in the following-named areas were advised to give immediate attention to formulating procedures for the efficient disposal of salt water produced in such areas:

Hobbs
Denton (Devonian) and Denton-Wolfcamp
Eunice Monument Area:
Eunice-Monument
Eumont
Monument-Blinebry
Monument-Paddock
Moore-Devonian
Caprock, East Devonian

Bagley Siluro-Devonian and Bagley-Pennsylvanian
Saunders
Crossroads
Bough
Echol-Devonian

(4) That testimony adduced at the June Regular Hearing indicates that progress is being made in most of the above-mentioned areas, but that 100-percent disposal has been achieved in only a few of such areas.

(5) That all operators in the above-mentioned areas should proceed with due diligence to complete efficient salt water disposal systems.

(6) That all operators in said areas should report to the Commission on or before September 17, 1958, on the progress made thus far and the estimated completion date of a 100-percent disposal system.

(7) That all operators in the following-named areas should proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas - such areas having been listed as the second most critical in Commission Memorandum No. 22-56, dated July 3, 1956:

Jalmat
Langlie-Mattix
Arrowhead
Brunson
South Eunice
Cass
Dollarhide (All Pools)
Lovington (All Pools)
Teague-Ellenburger
SRR-Devonian
Vacuum
Wilson
Lynch

(8) That Case No. 1053 should be continued until the Regular Hearing on September 17, 1958.

IT IS THEREFORE ORDERED:

(1) That all operators in the following-named areas shall proceed with due diligence to complete efficient disposal systems for all salt water produced in such areas:

Hobbs
Denton (Devonian) and Denton-Wolfcamp
Eunice Monument Area:
Eunice-Monument
Esmont
Monument-Blinebry
Monument-Paddock
Moore-Devonian
Caprock, East Devonian
Bagley Siluro-Devonian and Bagley-Pennsylvanian
Saunders
Crossroads
Bough
Echol-Devonian

(2) That all operators in the above-named areas shall report to the Commission at the Regular Hearing on September 17, 1958, on the progress made thus far and the estimated completion date of a 100-percent disposal system. Operators who are members of a cooperative group may report through the committee chairman, who shall be prepared to name all operators who are members of such group. All operators who are not members of a cooperative group shall furnish a written progress report to the Commission prior to September 10, 1958, or shall appear at the Regular Hearing on September 17, 1958, to report the progress made thus far and the estimated completion date of a 100-percent disposal system for each well which they operate in the above-named areas.

(3) That all operators in the following-named areas shall proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas:

Jalmat
Langlie-Mattix
Arrowhead
Brunson
South Eunice
Cass
Dollarhide (All Pools)
Lovington (All Pools)
Teague-Ellenburger
SRR-Devonian
Vacuum
Wilson
Lynch

(4) That Case No. 1053 be and the same is hereby continued until September 17, 1958.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

S E A L

ir/

	Exhibit No.	Item	Title	No. of Pages
Q1	2	Table 1	Water production summary (by pools) Lea County, New Mexico	6
Q2	3a-3h	Table 2 Graphs 1-7	Comparison of oil and water production in 7 pools	8
Q2	4	Extract 1	from Muskat, 1949, pp. 368-369	1
Q5	5	Table 3	Comparison of brine discharge to pit water	1
Q5	6	Table 4	Quantities of water disposed to selected pits in Lea County.	1
Q5	7	Table 5	Computations of maximum net evaporation from salt ponds.	1
Q6	8	Plate 1	Altitude of water table, part of Lea County, January, 1953.	1
Q7	9	Figure 1	Diagrammatic representation of leakage from an unlined pit.	1
	10	Figure 2	Diagrammatic representation of cross-section of a brine pit leaking downward into fresh-water aquifer.	1
	11	Figure 3	Lines of flow from a well injecting water into an artesian aquifer.	1
Q8	12	Table 6	Increases in chloride in 8 wells, Lea County, New Mexico.	1
Q8	13	Plate 2	Map of Lea County showing locations of contaminated wells and thickness of fresh-water zone of saturation.	1
Q8	14	Figure 4	Generalized flow net in section.	1
Q8	15	Figure 5	Diagrammatic representation of coning of brine toward a well partially penetrating a fresh-water aquifer.	1
Q8	16	Figure 6	Calculated maximal rates of flow.	1
Q9	17	Table 7	Annotated references.	10
Q10	18	Extract 2	Williams & Lohman: Wichita Area	3

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1053
Order No. R-1224-A

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION, AT
THE REQUEST OF THE STATE ENGINEER,
FOR AN ORDER PRESCRIBING RULES AND
REGULATIONS TO GOVERN THE DISPOSAL
OF SALT WATER IN AREAS OF LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause originally came on for hearing at 9 o'clock a.m. on May 16, 1956, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and was continued from time to time, and was heard again on June 18, 1958, and again on September 17, 1958.

NOW, on this 25th day of October, 1958, the Commission, a quorum being present, having considered the evidence adduced 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 by virtue of its implied powers and the express powers conferred upon the Commission by sub-section (2) and (7) of Section 65-3-11 of the New Mexico Statutes Annotated (1953).

(2) That the surface disposal of oil field brines in unlined pits in the following-described areas constitutes a hazard to the fresh waters in the Lea County Underground Water Basin, as the same is defined by the State Engineer of the State of New Mexico, and that such method of disposal should be prohibited in said areas, to-wit:

Hobbs	East Caprock	Crossroads
Denton	Bagley	Bough
Moore	Saunders	Echol

(3) That only a portion of the Eunice-Monument-Eumont Area (Eunice-Monument, Eumont, Monument-Blinebry, and Monument

Paddock Pools) lies within the boundaries of the said Lea County Underground Water Basin.

(4) That the disposal of oil field brines in unlined pits in that portion of the Eunice-Monument-Eumont Area which lies within the boundaries of the Lea County Underground Water Basin constitutes a hazard to the fresh waters in said basin and that such method of disposal should be prohibited in that portion of said area.

(5) That the testimony presented at the September 17, 1958, hearing of this case has raised a question as to whether the disposal of oil field brines in unlined pits in any area of Lea County other than those areas referred to in Findings No. 2 and 4 above constitutes a hazard to the fresh water supplies of Lea County.

(6) That paragraph (3) of Order No. R-1224 should, therefore, be rescinded.

(7) That a detailed localized study should be made of each area in Lea County, not included in Findings No. 2 and 4, where substantial quantities of oil field brines are produced, to determine whether the surface disposal of said brines in unlined pits constitutes a hazard to the fresh water supplies of Lea County. Further, that the Secretary-Director of the Commission should, from time to time, appoint pool committees to make such studies.

(8) That any well which produces one half ($\frac{1}{2}$) barrel or less of oil field brines per day should be exempt entirely from the provisions of this order, since there is no evidence that the disposal of such insignificant quantities of oil field brines in unlined pits would constitute a hazard to the fresh waters in the area.

(9) That provision should be made to empower the Secretary-Director to grant administrative exceptions to this order in individual cases where it appears that the granting of such exception would cause no danger of contamination, provided the State Engineer's Office has waived objection to the exception.

IT IS THEREFORE ORDERED:

1. That the surface disposal of oil field brines in unlined pits in the following-described areas be and the same is hereby prohibited as of the effective dates shown below:

Hobbs Area Hobbs Pool Hobbs Drinkard Pool Bowers Pool	-	March 15, 1959
Denton Area Denton Pool Denton-Wolfcamp Pool	-	December 1, 1958
Moore Area Moore-Devonian Pool Moore-Pennsylvanian Pool	-	December 1, 1958
Crossroads Area Crossroads Pool Crossroads-Pennsylvanian Pool Crossroads-Slaughter Pool	-	December 1, 1958
East Caprock Area East Caprock-Devonian Pool	-	December 1, 1958
Bagley Area Bagley-Siluro Devonian Pool Bagley-Pennsylvanian Pool	-	December 1, 1958
Saunders Area Saunders-Pennsylvanian Pool	-	December 1, 1958
Bough Area Bough-Pennsylvanian Pool	-	December 1, 1958
Echol Area Echol Pool	-	December 1, 1958
Eunice-Monument-Eumont Area Eunice Monument Pool Monument-Blinebry Pool Monument-Paddock Pool Eumont Gas Pool Cass Pool Weir Pool	-	March 1, 1960

The provisions of this paragraph apply only to that portion of the Eunice-Monument-Eumont Area which lies within the Lea County Underground Water Basin as the same was declared by the State Engineer in his Order No. 3, dated August 21, 1931, and as the same was extended by Order No. 33, dated October 1, 1952.

PROVIDED HOWEVER; that any well which produces one half (½) barrel, or less, of oil field brines per day shall be entirely exempt from the provisions of this order.

[For several wells into one (1) tank battery the average of ½ bwpd/well should be used.]

2. The Secretary-Director of the Commission shall have authority to extend the effective dates set forth in paragraph 1. above without notice and hearing where good cause is shown.

3. That nothing contained in this order shall be construed as prohibiting the disposal of oil field brines in impervious lined pits, provided said pits are inspected and approved by a representative of the Commission prior to being used.

4. That the Secretary-Director of the Commission shall have authority to grant exceptions without notice and hearing, to paragraph (1) above where, in his opinion, the granting of such exception would not create a hazard to any fresh water supply, provided the State Engineer has waived objection to the proposed exception.

5. That the Secretary-Director of the Commission shall appoint a committee for each area in Lea County, New Mexico, where substantial quantities of oil field brines are produced, which committees shall make studies as to whether the disposal of oil field brines in unlined pits constitutes a hazard to any fresh water source in said areas. The State Engineer shall be a member of each of said committees.

Such committees will not be required to submit formal reports of their findings to the Commission. If, however, a committee or any member thereof is of the opinion that the surface disposal of oil field brines in unlined pits constitutes a hazard to any fresh water supply, the Commission shall be so notified and the matter shall be set for hearing.

6. That paragraph (3) of Order No. R-1224 be and the same is hereby rescinded.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

S E A L
ir/

RECEIVED
DEC 2 AM 8:23

Box 38, Hobbs, New Mexico

December 1, 1958

Re: Salt Water Disposal
Dollarhide Pool
Lea County, New Mexico

DOLLARHIDE OPERATORS

Gentlemen:

In accordance with Commission Memorandum No. 29-58, a meeting of the Dollarhide Committee was held on Tuesday, November 25, 1958, in Hobbs to study the need for salt water disposal in all Dollarhide Pools. A list of those in attendance is attached.

Skelly was elected permanent Chairman of the Committee.

Since it will be necessary to determine the extent of the fresh water in this area, the following information was requested from each Operator.

1. The location and depth of all fresh water wells whether dry or producing.

2. Volume of water present in water wells.

3. Location of all open earthen pits and approximate volume of water being disposed of in same.

It was also requested that all sample logs be checked to determine the top of the Red Beds. With this information, it should be possible to determine whether or not disposal in open pits constitutes a hazard.

It is therefore requested that the above information be submitted as soon as possible to Skelly Oil Company, Box 38, Hobbs. When this information has been gathered, another meeting of the Committee will be called. A suggested form for reporting water well information is attached.

Yours very truly,

J. N. Dunlavey JNR

J. N. Dunlavey
Chairman

JNDye
Enclosure

NAME	COMPANY	LOCATION
John B. Ross	The Texas Company	Midland, Texas
H. J. Bernard	Sinclair	Hobbs, New Mex.
R. L. Borton	State Engr. Office	Roswell, New Mex.
J. W. Brown	Pan American Petroleum Corp.	Roswell, New Mex.
Gus Athanas	Pan American Petroleum Corp.	Lubbock, Texas
Eric Engrecht	N. M. O. C. C.	Hobbs, New Mex.

MAILING LIST

The Texas Company
Box 352
Midland, Texas
Atten.: Mr. John B. Ross

Sinclair Oil & Gas Company
520 East Broadway
Hobbs, New Mexico

Pan American Petroleum Corporation
Box 899
Roswell, New Mexico

Pan American Petroleum Corporation
Box 268
Lubbock, Texas

L. E. Elliott
Box 5669
Roswell, New Mexico

Gulbertson & Irwin
Box 1071
Midland, Texas

J. P. Gibbins
Box 1032
Midland, Texas

Gulf Oil Corporation
Box 2167
Hobbs, New Mexico

State Engineer Office
Roswell, New Mexico

New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Ralph Lowe
Box 832
Midland, Texas

Mr. Ira G. Myers
Skelly Oil Company
Tulsa, Oklahoma

WATER WELL DATA SHEET

DATA SHEETS SHOULD BE SUBMITTED FOR ALL WATER WELLS INCLUDING DRY HOLES

LOCATION 1/4 1/4 1/4 Sec. ___ Twp. ___ Rge. ___

OWNER OF WELL _____ DRILLED BY _____

WHEN DRILLED _____ ELEVATION _____ T.D. _____

CASING: SIZE _____ DEPTH _____ CEMENTED (YES) _____ (NO) _____

PRODUCING INTERVAL _____ PUMP: DEPTH _____ TYPE _____

	ORIGINAL	PRESENT
PRODUCING CAPACITY	_____	_____
PRODUCING RATE	_____	_____
STATIC WATER LEVEL	_____	_____

ORIGINAL PURPOSE FOR WHICH WATER WAS TO BE USED. _____

_____

WHAT IS WATER USED FOR NOW? _____

IS SAMPLE OR DRILLERS LOG AVAILABLE? (YES) _____ (NO) _____

IS MINERAL ANALYSIS OF WATER AVAILABLE? (YES) _____ (NO) _____

PRESENT STATUS OF WELL: PRODUCING _____ SHUT-IN _____ ABANDONED _____

REMARKS: (USE REVERSE SIDE IF NECESSARY) _____

_____

_____

_____

_____

_____

_____

ORGANIZATION SUBMITTING DATA SHEET _____

DATE _____

CHARM OIL COMPANY

CARPER BUILDING

MAIN OFFICE 588

ARTESIA, NEW MEXICO

August 28, 1958

1958 SEP 2 AM 8:28

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

Dear Mr. Porter:

This letter is in response to order No. R-1224 of July 28, 1958 wherein we are required to report prior to September 10, 1958 concerning the progress we have made toward the disposal of salt water.

It has not been established that Charm Oil Company does produce "large volumes of oil field brines which may contaminate the fresh water bearing horizons of Lea County, New Mexico". We are of the opinion that our present surface disposal systems are satisfactory and do not jeopardize the fresh water of Lea County, New Mexico.

Yours very truly,

CHARM OIL COMPANY

By _____

VPS:dmb

MORAN OIL PRODUCING & DRILLING CORPORATION

BOX 1718
HOBBS, NEW MEXICO

GENERAL OFFICES
903 WEST MARLAND
HOBBS, NEW MEXICO

PHONE
EXPRESS 3-2571
EXPRESS 3-2417

1958 AUG 14 AM 8:30

August 12,1958

New Mexico Oil Conservation Commission
Santa Fe,
New Mexico

Re: Hobbs Pool Salt Water Disposal
Regular Sept.17,1958 Hearing

Gentlemen:

Moran Oil Producing & Drilling Corporation is the operator of four (4) Hobbs Pool Wells. Namely the Rice 1, 2, 3 and 4, located in the NE¼ of Section 13, Township 18 South, Range 37-East, NMPM.

These wells are not at present producing any water whatsoever and we firmly believe that they will never produce an appreciable amount of water.

These wells are completed in the Grayburg formation and in the drilling and completion never penetrated the San Andres formation which in most peoples opinion is the water producing formation.

This lease is a marginal lease and if we are compelled to make arrangements to dispose of water we dont produce, it will mean premature abandonment of this lease.

Very truly yours,

R. M. Moran

RMM/jg

R.M. Moran

MAIN OFFICE OCC
1958 OCT 2 AM 8:18

E. J. DANGLADE
Drawer 1687
LOVINGTON, NEW MEXICO

30 September 1958

Re: Danglade & Clower
Oil and Gas Production
Lea County, New Mexico

Commission Order No. R-1224

Mr. A. L. Porter, Jr.
Secretary-Director
New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Dear Pete:

Your letter of 26 September 1958 directed to Danglade and Clower at Wichita Falls, Texas has been returned to me for attention.

For your information, Danglade and Clower are not producing any salt water from any of their producing wells and therefore have no disposal problem.

Yours very truly,

FJD:fh

cc: N.M. Oil Conservation Commission
Box 2045
Hobbs, New Mexico

cc: Mr. J. C. Clower

DIAL. FE 2-3774 - ODESSA
DIAL MU 3-1092 - MIDLAND

P. O. BOX 3985
ODESSA, TEXAS

VEM Oil Co.

October 2, 1958

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter Jr.

Dear Sir:

In regard to your letter of September 26, 1958 concerning the Salt Water Disposal on our State A lease.

I did not receive the Order R-1224 until today and I talked to Mr. Montgomery at Hobbs about it.

We are working over our State A 2-X and will make a report as sonn as it is re-potentialed, the other two wells are not making any water.

Yours very truly,

G. C. Bingham

GCB/lp

GOVERNOR
EDWIN L. MECHEM
CHAIRMAN

New Mexico
OIL CONSERVATION COMMISSION

LAND COMMISSIONER, MURRAY E. MORGAN
MEMBER

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

P. O. Box 871
Santa Fe, New Mexico

Following letter sent to:

E. G. Rodman
Odessa, Tex.

C.C. Pollard
Ft. Stockton, Tex.

Koch Oil Corp.
North Cowden, Tex.

T. F. Hodge
Ft. Worth, Tex.

Danglade & Clower
Wichita Falls, Tex.

H. S. Moss - Dallas, Tex.

J. F. Lane
Hobbs, N.M.

R. B. Honeyman
Monument, N.M.

First Chicago Oil Corp.
Midland, Tex.

Bill Shelton
Roswell

September 26, 1958

Guy R. Zachry
Hobbs, N.M.

Vem Oil Co.
Midland

Two States Oil Co.
Dallas

Gentlemen:

According to Commission records, we have not yet received a report on the progress that you have made thus far concerning salt water disposal in the ten most critical areas of Lea County, New Mexico, which report was required under the terms of Commission Order No. R-1224.

Operators who have not yet submitted such reports are in violation of Commission Order No. R-1224.

Any operator who fails to submit such report by October 15, 1958, will be called to hearing for final determination of this matter.

Your cooperation in this matter will be greatly appreciated.

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.,
Secretary-Director

ALP/DSN/ir

GUY R. ZACHRY
P. O. BOX 1685
HOBBS, NEW MEXICO

MAIN OFFICE OCC
1958 OCT 8 AM 8:14

October 4, 1958

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

Dear Mr. Porter:

I regret to say that because of my own misinterpretation I failed to comply with the provisions of Commission Order No. R-1224. By field standards, I do not produce a measurable amount of formation water in any of the ten most critical areas of Lea County, New Mexico. As I had certified on my C-115s that there was no water production, I assumed that a Progress Report on water disposal was not expected.

In the ten critical areas I operate one well; specifically, Downes No. 3 in the Eumont Pool. Centrifuge tests show that Downes No. 3 has an average cut of three-tenths (3/10) of one percent (1%) bottom sediment and water. Most of this cut remains in suspension in the stock tanks and goes into the pipeline with the oil. The rest settles and gradually builds up tank bottoms. I have cleaned one tank in the approximate two and one half years since Downes No. 3 was completed.

I appreciate your thoughtfullness in asking Mr. Montgomery to check with me in this matter.

Very truly yours,

Guy R. Zachry

Guy R. Zachry

cc: Mr. Randall Montgomery

T. F. HODGE
OIL PRODUCER
1113 CONTINENTAL BANK BUILDING
FORT WORTH 2, TEXAS

OIL CONSERVATION COMMISSION
1958 OCT 10 PM 1:22

October 8, 1958

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

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

Re: Commission Order No. R-1224

Gentlemen:

T. F. Hodge is operator of wells in the Caprock-Queen, Eumont, and Jalmat Pools. The wells in the Caprock-Queen and Jalmat Pools and our Sims well in the Eumont make a minimum of water and are not critical wells since they are not near enough to the Lea County Shallow Ground Water Basin to cause contamination of this large proven fresh water source.

Our Elliott State well in the Eumont is not producing water at this time. When this well becomes water productive, we plan to request permission to join the Eunice-Monument-Eumont Salt Water Disposal Unit. It is our intention, when it becomes necessary, to build pits to evaporate water from the wells in Caprock-Queen, Jalmat and the Sims in Eumont.

Should it become necessary to furnish additional information concerning the disposal of salt water in the area of our leases, please advise.

Yours very truly,

Leroy Gideon

Leroy Gideon

LG:dm

E. G. RODMAN

POST OFFICE BOX 3826
ODESSA, TEXAS

MAIN OFFICE OCC
1958 OCT 10 AM 9:12

October 8, 1958

Mr. A. L. Porter
P. O. Box 871
Santa Fe, New Mexico

Dear Mr. Porter:

Refering to your Order No. R1224 in reference to disposal of water, at this time we have no water disposal problem as the wells we are producing in New Mexico make very little, if any, water.

If there is anything further we should do regarding this matter please notify us.

Yours very truly,

E. G. Rodman

E. G. Rodman

EGR:gk

October 8, 1958

Mr. A. L. Porter, Jr.
New Mexico Oil Conservation Commission
Hobbs, New Mexico

Re: Commission Order No. R-1224

Gentlemen:

We have received your letter of September 26, 1958, in regard to salt water disposal in the ten most critical areas of Lea County, New Mexico.

This letter is to advise you that we have only one well in these areas and this well is making only a very small percentage of salt water, and we do not feel it advisable to provide at this time for disposal of this water.

If at any time the percentage of salt water on this well should increase and disposal become a problem, we feel that we should give consideration to making a further study of means of disposing of it.

Very truly yours,

H. S. MOSS

By John M. Little, Jr.

JML/vl
cc-Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

C. C. POLLARD & SON

C. C. POLLARD
J. FRANK POLLARD

FORT STOCKTON, TEXAS

October 8, 1958

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Re: C. C. Pollard
1-L, 29-21-36,
Eumont Pool,
Lea County, N.M.

Attention: A. L. Porter, Jr.

Dear Sir:

We have one well on the above-mentioned lease, which will make approximately 5 barrels of water per day. This water is now being run into open surface pits for evaporation.

Very truly yours,

C. C. Pollard

CCP:nu

cc: Rice Engineering Company
Hobbs, New Mexico

SHELTON & WARREN
OIL PRODUCERS
PETROLEUM BUILDING ROSWELL, NEW MEXICO
BILL A. SHELTON
PHONE MA 2-0455
JESS L. WARREN

October 9, 1958

New Mexico Oil Conservation
Commission
P. O. Box 871
Santa Fe, New Mexico

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

Gentlemen:

In regard to your letter of September 26, concerning commission order No. R-1224, I wish to report that all of the wells in the Dumont field operated by Bill A. Shelton, Oil Property or Shelton-Warren Oil Producers are not making any salt water at this time.

At such time, when these wells start making water, we will dispose of this water under commission rules.

If there is any further information you may need, please do not hesitate to call.

Very truly yours,

Jess L. Warren, Jr.

JLW/bh

NEW MEXICO
OIL CONSERVATION COMMISSION
Box 871
Santa Fe, New Mexico

STATEMENT OF THE COMMISSION

It has come to our attention that there is some question concerning the Commission's jurisdiction over the subject of salt water disposal. In order to resolve any doubts in this regard, it is our position that the Oil Conservation Commission has general jurisdiction over the subject of salt water disposal by virtue of its implied power to supervise the production of oil and gas in the State of New Mexico. Such jurisdiction is also expressly conferred upon this Commission by subsections (2) and (7) of Section 65-3-11 of the New Mexico Statutes Annotated.

Case No. 1053 was originally called by the Commission on its own motion, at the request of the State Engineer, to consider the need for an order prescribing rules and regulations governing the disposal of salt water in areas of Lea County.

On April 18, 1956, the Commission heard brief testimony by personnel of the State Engineer's Office and continued the case to May 16, 1956. At that time more comprehensive testimony was presented by the State Engineer's Office, and after considerable cross examination the case was again continued to the September 13, 1956 hearing date. The Secretary-Director issued a statement that prior to the hearing on September 16, 1956, operators would be advised as to what areas were considered the most critical by the Office of the State Engineer. By Memorandum No. 22-56 dated July 3, 1956, the operators were advised of the ten areas in which salt water disposal should be given immediate attention. This memorandum also directed attention to thirteen other areas which should be considered in the very near future.

At the September 13 hearing it was brought out that soon after receipt of Memorandum 22-56 a meeting of 41 operators was held in Hobbs, at which meeting Chairmen of Committees for the ten critical areas were selected. It was further stated that there had been meetings of committees for all of the ten most critical fields. Progress reports were submitted by these Chairmen and the case was continued to December 13, 1956. The case has

been successively continued to March 14, 1957, September 19, 1957, March 13, 1958, and June 18, 1958, on all of which dates progress reports were submitted by the Chairman of the ten committees.

When it was decided at the June hearing to continue the case to September 17, 1958, the Commission announced that an order of continuance would be entered. Accordingly Order R-1224 was entered on July 28 and copies were mailed to the 90 operators in the ten most critical areas on July 29th. Return receipts were requested and all operators have now acknowledged receipt of the order.

Order R-1224 requires that all operators in the ten most critical areas file a written report by September 10 or be represented by some one at this hearing to give an oral report. The written reports have been carefully recorded, and in order that all operators who are represented here today may be given credit for reporting, we are asking that each pool chairman be very careful to list all operators whom he represents.

In order that this case may be disposed of in the most orderly and expeditious manner possible, the Commission will receive testimony, reports and statements in the following order:

A. TEN MOST CRITICAL AREAS

(1) Testimony by State Engineer regarding ten most critical areas.

(2) Testimony by interested operators regarding ten most critical areas.

(3) Rebuttal testimony by State Engineer if necessary.

(4) Presentation of progress reports by operators on ten most critical areas.

(5) Statements and recommendations regarding ten most critical areas.

B. THIRTEEN SECOND MOST CRITICAL AREAS

(1) Testimony by interested operators concerning any or all of the thirteen areas listed as the second most critical in Commission Memorandum 22-56.

(2) Testimony by State Engineer regarding these same thirteen areas.

September 17, 1958

ig

KEWANEE OIL COMPANY

Maljamar, New Mexico
September 12, 1958

Re: Salt Water Disposal
Lovington No. 1
Lovington-Paddock Pool

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

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

Dear Sir:

This is to advise that under the provisions of Order No. 1053, we wish to report that our Lovington Well No. 1 (Lovington-Paddock Pool), Section 5, T 17S, R 37E, Lea County, New Mexico, does not produce any water and therefore, we do not at the present have any problem concerning salt water disposal. If, in the future, the above mentioned well starts making water, we will take steps to dispose of the water through an efficient disposal system.

Yours very truly,

R. A. McGee

RAMc:jjl

cc - OCC, Hobbs
Tulsa Office
Division Office

THE BRITISH-AMERICAN OIL PRODUCING COMPANY

P. O. Box 474
Midland, Texas
September 11, 1953

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention - Mr. Edwin L. Mechem, Chairman

Dear Sir:

By your General Order No. R-1224 it was requested that all Operators in the Jalmat Field shall proceed with due diligence to formulate plans for the disposal of salt water. We operate 25 Yates Sand oil wells in the Jalmat Field. Thirteen of these wells are located in Section 11, T-22-S, R-35-E on our Hall State "F" Lease. Nine of these wells are located in Section 14, T-22-S, R-35-E on our New Mexico "B" and Merchant Livestock Leases. Three of these wells are located on our Hall State "D" Lease in Section 23, T-22-S, R-35-E.

Our daily production from these properties is in excess of 800 BOPD and according to our actual tank tests we are producing only 6 BWPD, two barrels per day on the Hall State "D" Lease, and four barrels per day on the Hall State "F" Lease. That water is presently being separated from the oil in heater treaters and dumped into an open evaporation pit for disposal. We feel that this method of disposal is more than adequate for the small amount of water we are handling and that unless we are otherwise directed, or unless our water production increases appreciably, we will make no further plans for water disposal.

Very truly yours,

THE BRITISH-AMERICAN OIL PRODUCING CO.

Cecil E. Brandon by Gregory Merrion

Cecil E. Brandon, District Superintendent

CEB:JGM:jwg
cc: New Mexico Oil Cons. Comm.
P. O. Box 2045
Hobbs, New Mexico
Att'n-Randall F. Montgomery

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1443
Order No. R-1214

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION TO
AMEND RULE 112-A OF THE COMMISSION
RULES AND REGULATIONS.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on May 14, 1958, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 3rd day of July, 1958, the Commission, a quorum being present, having considered 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 Rule 112-A of the Commission Rules and Regulations should be revised in order to facilitate the granting of applications for dual completions by administrative order.

IT IS THEREFORE ORDERED:

That Rule 112-A of the Commission Rules and Regulations be and the same is hereby revised to read as follows:

Rule 112-A - MULTIPLE COMPLETIONS

I. The multiple completion of any well may be permitted only by order of the Commission after notice and hearing, except as hereinafter provided. Multiple completion of any well without prior approval by the Commission shall be solely at the operator's risk and shall in no way commit the Commission to subsequent approval thereof.

II. The Secretary-Director of the Commission shall have the authority to grant an exception to the requirements of Rule 112-A (I.) and approve the dual completion of a well without notice and hearing where application has been filed in due form; and

(a) The well is to be dually completed within the limits of two defined pools or within one mile thereof, and the Commission has previously authorized the dual completion of a well in the same zones as proposed, after notice and hearing; or the well is to be dually completed outside the limits of a defined pool and there is a dual completion in the same zones within one mile of the proposed dual completion which has previously been authorized by the Commission after notice and hearing, provided however that in Rio Arriba, San Juan, and Sandoval Counties, a proposed gas-gas dual completion may be approved even though it is not within defined pools nor within one mile of a previously authorized dual completion of similar nature, if both the upper zone and the lower zone of the proposed dual completion have been recognized by the Commission as being gas producing zones suitable for dual completion; and

(b) The applicant proposes to utilize one of the mechanical installations described below:

1. The well is to be completed as a gas-gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus.

2. The well is to be completed as a gas over oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through the tubing-casing annulus and a single string of tubing respectively.

3. The well is to be completed as an oil over gas dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing or through a single string of tubing and the tubing-casing annulus respectively by means of a crossover flow assembly.

4. The well is to be completed as an oil-oil dual completion and the hydrocarbons from each of the two zones can be safely and efficiently produced through parallel strings of tubing; and

(c) All strings of tubing used for the production of oil in the proposed dual completion will have a nominal inside diamater of not less than 1.750 inches nor greater than 2.50 inches; and

(d) The packer used to segregate the separate producing zones of the dual completion will be a permanent type production packer.

III. Application for administrative approval of a dual completion shall be made in quadruplicate, with two copies of the application to be mailed to the Commission's Santa Fe office, and two copies to the District office for the area in which the well is located.

Application shall be made on the Commission Form entitled, "Application for Dual Completion," and shall be accompanied by the following:

(a) Diagrammatic Sketch of the Dual Completion, showing all casing strings, including size and setting, top of cement, perforated intervals, tubing strings, including diameters and setting depth, location of packers, side door chokes, and such other information as may be pertinent.

(b) Plat showing the location of all wells on applicant's lease, all offset wells on offset leases, and the names and addresses of operators of all leases offsetting applicant's lease.

(c) Waivers consenting to such dual completion from each offset operator, or in lieu thereof, evidence that said offset operators have been furnished copies of the application.

(d) Electrical log of the well or other acceptable log with tops and bottoms of producing zones and intervals of perforation indicated thereon. (If such log is not available at the time application is filed, it shall be submitted as hereinafter provided.)

The Secretary-Director may approve the dual completion, if after a period of 20 days following the filing of the application no operator has filed objection to the proposed dual completion.

IV. Application for public hearing to authorize a multiple completion shall be made in triplicate to the Commission's Santa Fe office. Application shall be made on the Commission Form entitled "Application for Dual Completion," and shall set forth all material facts relative to the common sources of supply involved and the manner and method of completion proposed. Application shall be accompanied by an exhibit showing the location of all wells on applicant's lease and all offset wells on offset leases.

V. All dual completions, whether approved after hearing or by administrative procedure, shall be subject to the following rules:

(a) Prior to actual dual completion of a well, operator shall make adequate pressure tests of the casing to determine that no casing leaks exist. Results of casing tests shall be reported to the Commission on Form C-103.

(b) The well shall be completed and thereafter produced in such a manner that there will be no commingling of hydrocarbons from the separate strata.

(c) The operator shall commence a segregation test and packer leakage test not later than seven days after actual dual completion of the well. Segregation tests and packer leakage tests shall also be made any time the packer is disturbed and at such other intervals as the Commission may prescribe. The operator shall also make all other tests and determinations deemed necessary by the Commission.

Offset operators as well as the Commission shall be notified of the time such tests are to be commenced. Tests may be witnessed by representatives of offset operators and of the Commission at their election. Results of such tests shall be filed with the Commission within 15 days after the completion of tests; provided however, that in the event a segregation test or packer leakage test indicates that there is communication between the separate strata, the operator shall immediately notify the Commission and commence remedial action on the well.

(d) A packer setting affidavit shall accompany the report of the initial segregation test and packer leakage test.

(e) The well shall be so equipped that reservoir pressures may be determined for each of the separate strata and further, be so equipped that meters may be installed and the gas, oil and gas, and oil produced from each of the separate strata may be accurately measured, and the gas-oil ratio or the gas-liquid ratio thereof determined.

(f) Within 15 days after the completion of the well, the operator shall furnish the Commission with a diagrammatic sketch of the mechanical installation which was actually used in completing the well together with a report of the gravity, gas-oil ratio or gas-liquid ratio, and reservoir pressure for each of the separate zones, and the log of the well if the same has not been previously submitted.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

S E A L

ga

NEW MEXICO
OIL CONSERVATION COMMISSION
P. O. BOX 871
Santa Fe, New Mexico

No. 32-57

MEMORANDUM:

TO: All Operators in the following-named Pools:

Hobbs
Denton (Dev.) and Wolfcamp
Eunice-Monument Area
A. Eunice-Monument
B. Eumont
C. Monument Blinebry
Moore Devonian
Caprock, East Devonian
Bagley, Sil/Dev. & Penn.
Saunders
Crossroads
Bough
Echol Devonian

FROM: A. L. Porter, Jr., Secretary-Director

SUBJECT: Salt Water Disposal

The Oil Conservation Commission has received several inquiries from operators in the above-named pools concerning the Commission's position on the matter of salt water disposal in earthen pits in these areas. In turn, the Commission requested that the State Engineer make his position clear in this matter.

The Commission received the following reply from the State Engineer's Office:

"Dear Mr. Porter:

In reply to verbal questions put forth by your legal advisor, Mr. Cooley, please be advised that it is the considered opinion of the State Engineer that any disposal of oil field brines in earthen pits in the following fields is detrimental to the fresh water supplies in those areas:

1. Hobbs
2. Denton- (Dev.) & Wolfcamp
3. Eunice-Monument Area
   A. Eunice-Monument

B. Eumont
C. Monument Blinebry

4. Moore Devonian
5. Caprock, East Devonian
6. Bagley Sil/Dev. & Penn.
7. Saunders
8. Crossroads
9. Bough
10. Echol Devonian"

It is, therefore, the opinion of the Commission that no oil field brines should be disposed of in earthen pits after the completion of the salt water disposal systems in the above-named pools.

November 6, 1957

ga

Bagley-Pennsylvanian and Devonian Pools: Amerada reported [illegible] is now being disposed of - a total of 2,142,7[illegible] barrels to May [illegible]

East Caprock-Devonian Pool: Amerada reported a total of [illegible] barrels before mechanical failure of the disposal well brought a shut-down. Completion (through an oil-SWD dual completion) is now contemplated, and approval of the Oil Commission is pending.

Saunders Pool: Amerada reported that 100% water disposal will be effective this week.

Moore-Devonian Pool: The Texas Company reported that injection started March 21, 1958, had disposed of 19,950 barrels total to June 15, but difficulties with the injection well have been encountered, necessitating shut-down, acidizing and re-acidizing. Operators hope to resume 100% water disposal as soon as repairs are made.

Eunice-Monument-Eumont area: In this area agreements among operators have not yet been completed, and Kilf reported that the project so far is on a 'sound engineering and moral basis,' with Rice Engineering and Operating, Inc., active on the SWD assignment. He predicted that work can be initiated by August or September, asked continuance of the case, said he feels that shut-in at this time is not justified.

Bough: Magnolia reported the system already in operation (for 100% disposal) is being extended to take care of a few wells which have started making water since the initial system was put into effect.

Crossroads: Magnolia reported that the final agreement is now out for execution, and that the system should be in process of installation in two months.

South Denton: Agreement now being executed, according to Magnolia, and should be able to start the system within two months, should be injecting 100% within three months.

Echol: Shell reported that the system was completed April 16, 1958, is now disposing of 100% of water produced, has handled 37,500 barrels to June 1.

Caudill-Devonian: Shell reported that $36,000 has been spent in trying to make a disposal well, with no success, and another try is being made.

Denton: Atlantic reported all working-interest owners have executed the operating agreement, that some pipe has been received and the contract awarded for construction of the system for possible completion in August 1958, if pipe deliveries are not delayed. It was estimated that 100% disposal will be achieved in August.

Hobbs Pool: Pan American reported that the Hobbs Pool operating agreement is now in circulation and is expected to be executed prior to June 25. Rice Engineering and Operating, Inc., also will operate the system in this pool, and expects to have the trunk lines and main lateral lines installed and connected within 6 months after the agreement becomes effective, for the handling of all appreciable water production from 278 wells - including the water from all batteries producing large volumes.

* Irby Recalls Gulf Representative

Recalled to the stand for questioning on the Eunice-Monument-Eumont area, C. M. Pumpass, Hobbs, was questioned closely by Irby, who first said "It appears to me that there has been [illegible] made in your area than in those [illegible] ... be asked for a comparison, both in areal extent and number of wells, of the pool with other pools considered.

Pumpass said 120 wells are involved in the SWD project (as compared to some 300 in the Hobbs Pool), over an area about 20 miles long and varying in width from 2 to 9 miles. An estimated 866,050 feet of pipe is to be used.

Said Irby: "Your testimony indicates that you have accomplished [illegible] months work in the past two years.....Very little testimony as to what has happened in these other 20 months has been entered."

August 21, 1968

COPY

Mr. William V. Kastler
Gulf Oil Corporation
Law Department
Roswell, New Mexico

Dear Mr. Kastler:

Receipt of your letter concerning the proposed drilling of a salt water disposal well in Section 3, Township 22 South, Range 36 East and the enclosed copy of your letter to Commissioner Morgan are herewith acknowledged. We are pleased to learn of the progress you have made in the disposal of this waste fluid. I am sure that we will receive a copy of your application to the Oil Conservation Commission as provided by their rules and regulations when you have progressed to that point. I am sure you are aware that we are interested in the casing program of these salt water disposal wells from the surface through the triassic.

As soon as we have had an opportunity to examine your application, we will make our views known to the Oil Conservation Commission.

Yours truly,

S. E. Reynolds
State Engineer

By:
Frank E. Irby
Chief
Water Rights Division

FEI/ma
cc-Mr. Murray Morgan
Commissioner of Public Lands
cc-Oil Conservation Commission
cc-F. E. Kennighausen

Hudson & Hudson,
Electric Building
Fort Worth, Texas

In reply refer to
our file No.

RECEIVED OCC
1958 SEP 22 AM 8:31

September 19, 1958

New Mexico Oil Conservation Commission
Santa Fe, New Mexico

Gentlemen:

Re: Case No. 1053
Order No. R-1224

As an operator in the Lynch Field which is covered by the above captioned order, we have communicated with The Texas Company, and will join with them in their plan for salt water disposal.

Very truly yours,

HUDSON & HUDSON, PARTNERSHIP

ERH:jbm

By: Edward R. Hudson

RESIDENCE PHONE
SHERWOOD 4-8173

OFFICE PHONE
PORTER 3-7329

J. R. CONE
ROOM 1708 - GREAT PLAINS LIFE BLDG.
LUBBOCK, TEXAS

September 2, 1958

Oil Conservation Commission
State of New Mexico
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.
Secretary - Director

Dear Mr. Porter:

We refer to Order No. R-1224 which relates to the disposal of salt water in certain areas of Lea County.

J. R. Cone is the operator of four wells in the Jalmat Pool which produce salt water in measurable quantities. These wells and their approximate average daily water production rates are tabulated below.

Operator	Lease and Well	Location	Water Prod. Bbl./Day
J. R. Cone	Nix-State No. 2	C-24-22-35	7
J. R. Cone	Nix-State No. 6	M-13-22-35	2
J. R. Cone	Magnolia-Myers No. 4	I-22-24-36	4
Thompson & Cone	Pan American-Myers No. 1	H-22-24-36	1

14 / day

All of the above wells are completed in the Yates sands. The two Nix-State wells are oil producers, whereas the two Myers wells are dry gas producers.

Inasmuch as the water production from these wells is minor, we have not undertaken studies for the disposal of the water. The two gas wells are now barely break-even operations. To burden these wells with the cost of sub-surface water disposal facilities would force abandonment. The cost of water disposal facilities for the Nix-State lease certainly would shorten the economic life of that lease.

In view of the economic aspects involved, we respectfully urge that the Commission give serious consideration to the impact that forced sub-surface water disposal can have on the many marginal leases in the areas listed in Order No. R-1224.

Respectfully yours,

J. R. CONE

By L. O. Storm
L. O. Storm, Agent

MAIN OFFICE OCC

1958 AUG 26 AM 8:16

August 25, 1958

COPY

Mr. Willis V. Kastler
Gulf Oil Corporation
Law Department
Roswell, New Mexico

Dear Mr. Kastler:

The Oil Conservation Commission has called to my attention that my letter to you under date of August 21, 1958 gives the location of the proposed salt water disposal well as Section 3, Township 22 South, Range 26 East. Referring to your letter addressed to Commissioner Murray E. Morgan, I find the description to be Section 3, Township 22 South, Range 36 East, whereas your letter transmitting copy of this letter gives the description as Section 3, Township 22 South, Range 26 East. I have corrected my copy of my letter to you to read Range 36 East. If my correction is improper, please notify me at once.

Yours truly,

S. E. Reynolds
State Engineer

By: Frank E. Irby
Frank E. Irby
Chief
Water Rights Division

FEI/ma
cc-Mr. Murray Morgan
Oil Conservation Commission
Mr. F. E. Hennighausen

Helgi's Spiegel

Stock with Chas L.

QUESTIONS ON BRINE DISPOSAL
LEA COUNTY

1. How much salt water is produced from oil wells in Lea County?
2. What is the probable future trend of salt water production in Lea County?
3. What is the concentration of salt water produced in Lea County?
4. How is brine presently disposed in Lea County?
5. How much water evaporates from brine disposal pits in Lea County?
6. What happens to the brine disposed to unlined pits?
7. What is the distribution of fresh water in Lea County?
8. What evidence is there that contamination has actually occurred in Lea County?
9. What other investigations have been made of contamination of fresh water aquifers by oil field disposal brines?
10. What are the conclusions and recommendations resulting from these investigations?
11. What are your conclusions and recommendations?

Von Ries

Memo

From
W. J. Cooley
Attorney

To Monk

5/20

Make check today

see how many return receipts are Phase received on SW R case.

Send another cy of order to all who have not acknowledged receipt as of this date.

Send certified mail - Return Receipt Requested.

wjc

Aztec Oil & Gas Company
P. O. Box 847
Hobbs, New Mexico

Amerada Pet. Corp.
Monument, New Mexico

Atlantic Refining Company
P. O. Box 6640
Roswell, New Mexico

Anderson Prichard Oil Corp.
Midland, Texas

Morris R. Antweil
P. O. Box 1058
Hobbs, New Mexico

W. K. Bryom
1000 N. Del Paso
Hobbs, New Mexico

Cities Service Oil Co.
Hobbs, New Mexico

Continental Oil Company
Roswell, New Mexico

Cactus Drilling Co.
P. O. Box 788
San Angelo, Texas

Charm Oil Company
302 Carper Building
Artesia, New Mexico

Coates & Foster Drilling Co.
Lubbock Hotel
Lubbock, Texas

Danglade & Clower
523 Oil & Gas Building
Wichita Falls, Texas

Drilling & Exploration Co., Inc.
P. O. Box 2075
Hobbs, New Mexico

John J. Eisner
P. O. Box 1158
Abilene, Texas

Elliott, Inc.
P. O. Box 5669
Roswell, New Mexico

Bert Fields
1211 Fidelity Bank Building
Dallas, Texas

Fish, Northwestern Constructors, Inc.
P. O. Box 354
Houston, Texas

Gulf Oil Corporation
P. O. Box 547
Hobbs, New Mexico

Atten: Mr. C. M. Bumpass

Getty Oil Company
c/o Tidewater Oil Company
Hobbs, New Mexico

Grover, MacCurdy & Knox
Patio Building
Midland, Texas

Gulf Oil Corporation (Byrom)
Hobbs, New Mexico

Albert Gackle
P. O. Box 2076
Hobbs, New Mexico

Harris & Miles
302 Carper Building
Artesia, New Mexico

T. F. Hodge
805 Sinclair Building
Ft. Worth, Texas

Hudson & Hudson, Inc.
1810 Electric Building
Ft. Worth, Texas

Hunt, Stuart Trustee
509 Continental Building
Dallas, Texas

Humble Oil & Refining Co.
Hobbs, New Mexico

Koch Oil Corporation
P. O. Box 128
North Cowden, Texas

John M. Kelly
P. O. Box 5671
Roswell, New Mexico

Keating Drilling Company
P. O. Box 838
Tulsa, Oklahoma

Lone Star Prod. Co.
P. O. Box 4815
Midland, Texas

J. H. Murray et al
P. O. Box 2077
Hobbs, New Mexico

McAlester Fuel Company
P. O. Box 210
Magnolia, Ark.

Magnolia Pet. Co.
Hobbs, New Mexico

Mapenza Oil Corporation
P. O. Box 1628
Hobbs, New Mexico

R. M. Moran
P. O. Box 1718
Hobbs, New Mexico

Moran Oil Prod. & Drill. Corp.
P. O. Box 1718
Hobbs, New Mexico

Ohio Oil Company
P. O. Box 2107
Hobbs, New Mexico

Oil Development Co. of Texas
900 Polk Street
Amarillo, Texas

Pan-American Pet. Corp.
P. O. Box 68
Hobbs, New Mexico

Phillips Pet. Co.
P. O. Box 2105
Hobbs, New Mexico

Neville G. Penrose, Inc.
1813 Fair Building
Ft. Worth, Texas

C. C. Pollard
Ft. Stockton, Texas

Reaho Corporation
1316 Mercantile Bank Building
Dallas, Texas

Reaho Corp. & Ben Hogan
1316 Mercantile Bank Bldg.
Dallas, Texas

Resler & Sheldon
302 Carper Building
Artesia, New Mexico

E. G. Rodman
P. O. Box 591
Odessa, Texas

Shell Oil Company
P. O. Box 845
Roswell, New Mexico

Sinclair Oil & Gas Co.
520 E. Broadway
Hobbs, New Mexico

Skelly Oil Company
Hobbs, New Mexico

Sun Oil Company
P. O. Box 2880
Dallas, Texas

Sunray Mid-Continent Oil Co.
1103 Wilco Building
Midland, Texas

Salsich, Neil E.
304 Central Building
Midland, Texas

Salsich, McGrath & Smith
331 Pet. Life Bldg.
Midland, Texas

Schermerhorn Oil Corporation
P. O. Box 875
Hobbs, New Mexico

Shelton, Bill A.
734 Pet. Building
Roswell, New Mexico

Southern Pet. Expl. Co. Inc.
P. O. Box 1017
Roswell, New Mexico

Standard Oil Company of Texas
Bin B
Royalty, Texas

Superior Oil Company
Midland, Texas

J. R. Sharp, Inc.
P. O. Box 8386
Dawson Station,
Tulsa, Oklahoma

J. R. Simmons
P. O. Box 2076
Hobbs, New Mexico

Samedan Oil Corporation
P. O. Box 2137
Hobbs, New Mexico

C. H. Sweet
P. O. Box 1115
Hobbs, New Mexico

Signal Oil & Gas Co.
1010 Ft. Worth National Bank
Fort Worth, Texas

Signal Oil Co. & Standard Oil of Texas
1010 Ft. Worth National Bank
Ft. Worth, Texas

Two States Oil Company
528 Wilson Building
Dallas, Texas

Tennessee Gas Transmission Co.
P. O. Box 307
Hobbs, New Mexico

Texas Pacific Coal & Oil Co.
Box 2110
Fort Worth, Texas

The Texas Company
P. O. Box 1720
Fort Worth, Texas

Tidewater Oil Company
P. O. Box 547
Hobbs, New Mexico

John A. Yates
312 Carper Building
Artesia, New Mexico

Rodman-Noel Oil Co.
Box 3826
Odessa, Texas

Union Oil Company of Calif.
Midland, Texas

Vem Oil Company
212 North Big Spring
Midland, Texas

Walker Oil Company
c/o Mr. Bill Vaughan
Hobbs, New Mexico

Wilson Oil Company
Artesia, New Mexico

Guy R. Zachry
P. O. Box 1685
Hobbs, New Mexico

Colorado Oil & Gas Co.
P. O. Box 302
Magnolia, Ark.

First Chicago Oil Corp.
P. O. Box 1659
Midland, Texas

General Crude Oil Co.
Rt. 3
Hamlin, Texas

Great Western Drilling Co.
P. O. Box 1659
Midland, Texas

Mr. R. B. Honeyman, Jr.
P. O. Box 332
Monument, New Mexico

J. F. Lane
P. O. Box 326
Hobbs, New Mexico

R. G. McPheron
P. O. Box 176
Hobbs, New Mexico

H. S. Moss
1503 First Nat'l Bank Bldg.
Dallas, Texas

Nolan and Lane
P. O. Box 326
Hobbs, New Mexico

Nolan and Byrom
P. O. Box 326
Hobbs, New Mexico

Oil Well Drilling Company
614-617 Adolphus Tower
Dallas, Texas

Tres Oil Company
P. O. Box 1628
Hobbs, New Mexico

Fred Turner, Jr.
Box 910
Dallas, Texas

TWO STATES OIL COMPANY

MAIN OFFICE DOC

DALLAS, TEXAS

528 Wilson Building,
September 29, 1958.

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

In re: Lea County Salt Water
Disposal System.

Dear Mr. Porter:

Reference is made to your letter of September 26, 1958, in which you requested a report concerning the progress we have made relative to salt water disposal in Lea County.

you are advised that on September 15, 1958, we sent to the Rice Engineering & Operating, Inc. the following letter:

> "We would like to enter into your Eunice - Monument - Eumont Salt Water Disposal System.
>
> There is attached hereto a list of wells operated by us that we would like to commit to your disposal system."

In a letter dated September 18, 1958, Rice Engineering & Operating, Inc. replied as follows:

> "This will acknowledge your letter of September 15, 1958, relative to bringing some of your wells into the SWD System. A vote of the present members of the system will be required to bring additional wells into the system.
>
> Your request will be considered at a committee meeting the later part of this month and you will be advised of the committee action.

To date we have had no word from the committee. As soon as we do the Oil Conservation Commission office will be notified.

Sincerely yours,

Two States Oil Co.

Doyle S. Crain

Doyle S. Crain,
Secretary.

MAIN OFFICE OCC
OCT 2

Eumont Dist

RICE Engineering & Operating, Inc.

P. O. Box 1142 Telephone Ex. 3-9174

Hobbs, New Mexico

September 26, 1958

TO: Eunice - Monument - Eumont Salt Water Disposal Committee

Gentlemen:

The 1958 Annual Meeting (second meeting) of the Eunice - Monument - Eumont Salt Water Disposal Committee was held in Hobbs, September 25, 1958. 18 companies were represented.

The budget (attached) for the fourth quarter of 1958 and the four quarters of 1959 was accepted by the Committee.

B. H. Nolen submitted a letter dated August 26, 1958, asking approval for including his six wells into the E-M-E SWD System. These are as follows:

Wells	Location
2, 3, 4	W/2 NW/4 Sec. 3-20-37
Cooper 1	NE/4 NE/4 Sec. 4-20-37
Humble-Laughlin 1	SE/4 NE/4 Sec. 4-20-37
Williams 1	SW/4 SW/4 Sec. 34-19-37

J. F. [illegible] well

Rice Engineering pointed out that it would cost the system approximately $8200 to connect these Nolen batteries, but the system would gain about $3800, for the estimated six well interest would be $12,000. The Committee voted unanimously to accept the Nolen wells into the system subject to their executing the Articles of Agreement.

Two States Oil Company submitted a letter dated September 15, 1958, asking approval for including six wells into the E-M-E SWD System. These are as follows:

Wells	Location
Etcheverry No. 1	SW/4 NE/4 Sec. 1-20-36
Etcheverry No. 2	NW/4 SE/4 Sec. 10-20-36
Hill A-1	SW/4 SW/4 Sec. 31-20-38
Hill A-2	SE/4 SW/4 Sec. 31-20-38
Hill B	Lot 3 Sec. 5-20-37
St. B - 2527	SE/4 NW/4 Sec. 31-18-36

To SWD System

Rice Engineering stated that the Etcheverry Lease with two wells could be brought into the system with very little additional cost, but advised that the other leases were too far from the system to be connected. The Committee voted unanimously to acknowledge receipt of the Two States letter, and to notify Two States that when the E-M-E SWD System Articles of Agreement are executed by them (Etcheverry Lease only) the Committee would take further action on the request.

Yours truly,

RICE ENGINEERING & OPERATING, INC.

W. G. Abbott

W. G. ABBOTT
Division Manager

WGA/js

Attachments - 3

E-M-E SALT WATER DISPOSAL COMMITTEE

ANNUAL MEETING

September 25, 1958
1:30 P. M.

J. L. Crittenden, Humble Oil & Refining Co., Midland, Texas
H. E. Meadows, Humble Oil & Refining Co., Midland, Texas
R. R. Alworth, Humble Oil & Refining Co., Hobbs, N. M.
B. K. Bevill, Humble Oil & Refining Co., Hobbs, N. M.
F. C. Morgan, Phillips Petroleum Co., Hobbs, N. M.
C. M. Bumpass, Gulf Oil Corp., Hobbs, N. M.
J. W. Meek, Pan American Petroleum Corp., Hobbs, N. M.
J. W. Brown, Pan American Petroleum Corp., Roswell, N. M.
D. H. Collins, Jr.,Superior Oil Co., Midland, Tex.
C. D. Lindsey, Cities Service Oil Co., Hobbs, N. M.
R. C. Penny, The Atlantic Refining Co., Denver City, Tex.
John B. Ross, The Texas Company, Midland, Tex.
R. N. Miller, Tidewater Oil Co., Hobbs, N. M.
H. J. Bernard, Sinclair Oil & Gas Co., Hobbs, N. M.
J. D. Ramey, Skelly Oil Co., Hobbs, N. M.
D. R. Hester, Standard Oil Co. of Texas, Monahans, Texas
G. A. Naert, The Ohio Oil Co., Midland, Texas
T. O. Webb, The Ohio Oil Co., Hobbs, N. M.
Leon Thompson, W. K. Byrom, Hobbs, N. M.
R. E. Broschat, Amerada Petroleum Corp., Monument, N. M.
R. L. Adams, Continental Oil Co., Roswell, N. M.
F. Z. Kellerman, Continental Oil Co., Hobbs, N. M.
Bill Woodrum, Continental Oil Co., Roswell, N. M.
D. C. Capps, Amerada Petroleum Corp., Monument, N. M.
R. E. Seifert, Amerada Petroleum Corp., Midland, Tex.
C. J. Merryman, Sun Oil Co,, Odessa, Texas
D. C. Brown, Sun Oil Co., Midland, Texas
W. G. Abbott, Rice Engineering & Operating, Inc., Hobbs, N. M.
B. I. Routh, Rice Engineering & Operating, Inc., Hobbs, N. M.
I. M. Rice, Rice Engineering & Operating, Inc., Hobbs, N. M.
R. E. Statton, Sunray Mid-Continent Oil Co., Hobbs, N. M.

EUNICE - MONUMENT - EUMONT

SALT WATER DISPOSAL SYSTEM BUDGET

for

Fourth Quarter of 1958 and Four Quarters of 1959

Quarter	Investment *	Operating
Fourth 1958	$293,800	$ 550
First 1959	400,900	4,675
Second 1959	806,600	11,275
Third 1959	309,500	12,650
Fourth 1959	70,000	15,950

Prepared by RICE Engineering & Operating, Inc.

September 25, 1958

* This corresponds to Exhibit "B" of the Articles of Agreement.

EUNICE - MONUMENT - EUMONT

MAILING LIST

Amerada Petroleum Corporation, Drawer D., Monument, N. M.
Anderson-Prichard Oil Corp., Box 1859, Midland, Texas
Atlantic Refining Co., The, Box 1028, Denver City, Texas
Aztec Oil & Gas Co., Box 847, Hobbs, N. M.
Cities Service Oil Co., Box 97, Hobbs, N. M.
Continental Oil Company, Box 427, Hobbs, N. M.
General Crude Oil Co., Route 2, Hamlin, Texas
Getty Oil Company, Box 547, Hobbs, New Mexico
Gulf Oil Corporation, Box 2167, Hobbs, N. M.
Hudson & Hudson, Inc., 1810 Electric Bldg., Fort Worth, Texas
Humble Oil & Refining Co., Box 2347, Hobbs, N. M.
Hunt, Stuart, Trustee, 1507 Mercantile Nat'l. Bank Bldg., Dallas, Texas
Ohio Oil Co., The, Box 2107, Hobbs, N. M.
Pan American Petroleum Corporation, Box 899, Roswell, N. M.
Penrose, Neville G., Inc., 1815 Fair Bldg., Fort Worth, Texas
Phillips Petroleum Company, Box 2105, Hobbs, N. M.
Shell Oil Company, Box 845, Roswell, N. M.
Sinclair Oil & Gas Company, 520 E. Broadway, Hobbs, New Mexico
Skelly Oil Company, Box 38, Hobbs, N. M.
Standard Oil Company of Texas, Box 397, Hobbs, N. M.
Sun Oil Company, Box 2792, Odessa, Texas
Sunray Mid-Continent Oil Co., 1101 Wilco Bldg., Midland, Texas
Superior Oil Company, The, Box 510, Midland, Texas
Texas Company, The, Box 1270, Midland, Texas
Tidewater Oil Company, Box 547, Hobbs, New Mexico
Vem Oil Company, Box 3985, Odessa, Texas
Byrom, W. K., 1000 N. Dal Paso, Hobbs, N. M.
Southern Petroleum Exp., Inc., Box 176, Eunice, N. M.

STATE OF NEW MEXICO

DEPARTMENT OF PUBLIC HEALTH

REGULATIONS

GOVERNING

WATER SUPPLIES AND SEWAGE DISPOSAL

ADOPTED BY THE STATE BOARD OF PUBLIC HEALTH

JUNE 28, 1937

AUTHORIZING ACT

SECTION 5, CHAPTER 39, LAWS OF 1937

PENALTY FOR VIOLATION

SECTION 14, CHAPTER 39, LAWS OF 1937

posed or existing works, system or plant, and all circumstances and conditions by him deemed to be material, shall be made by the State Commissioner of Health. As a part of such investigation, and after ten days' notice by mail to the petitioner, a hearing or hearings may be had before the State Commissioner of Health or an examiner appointed by him for the purpose. At such hearing or hearings witnesses who testify may be sworn by the person conducting the hearing, and evidence, oral and documentary may be required, a record of which shall be made and filed with said Commissioner or examiner. Upon the completion of such investigation said Commissioner,

(a) If he shall determine, as a fact, that the substance being or to be discharged or deposited is such that under all the circumstances and conditions it may so contaminate or pollute such stream, river, lake, or tributary thereof, acequias, ditches or other waters, or lands on which it may be discharged, deposited or caused to overflow, as to endanger the lives or health of human beings, or to constitute a nuisance, or does or may constitute a menace to public health or a nuisance, or that under all the circumstances and conditions it is not necessary so to dispose of such substance, the State Commissioner of Health shall deny the prayer of such petition; and he may order petitioner to make such changes as he shall deem proper for the purpose of these regulations. The State Commissioner of Health may order such repair, alteration or addition to the existing system, plant, and works, that the sewage or substance being or inended to be discharged or disposed of shall not contaminate or pollute streams or other water supplies, or endanger the lives or health of human beings, or constitute a nuisance; and said Commissioner may order such changes of method, manner and place of disposal and the installation of such treatment works that streams or other water supplies will not be polluted or contaminated and the works and disposal shall not constitute a menace to the health of human beings, or a nuisance, which orders shall designate the period within which the required changes are to be made; PROVIDED, HOWEVER, that a temporary permit may be issued by the State Commissioner of Health for said period to permit compliance with such order or orders;

(b) If he shall determine, as a fact, that the substance being or to be discharged or deposited, is not such that under all the circumstances and conditions it will so contaminate or pollute such stream, river, lake, or tributary thereof, or other waters, as to endanger the lives or health of human beings, or to constitute a nuisance, and that under all the circumstances and conditions it is necessary so to dispose of such substance, the State Commissioner of Health shall grant to petitioner a permit authorizing petitioner so to deposit or discharge or to continue to deposit or discharge such substance; PROVIDED, HOWEVER, that such permit shall not be construed to permit any act forbidden by any provision of the laws of this State relative to the preservation or propagation of fish or game, or relative to the deposit of debris in the streams of the State; AND PROVIDED, FURTHER, that all permits issued hereunder shall be revocable by said Commissioner at any time, or subject to suspension, if said Commissioner shall determine, as a fact, that the substance discharged or deposited by virtue thereof causes or may cause a contamination or pollution of waters or land that does or may endanger the lives or health of human beings, or does or may constitute a nuisance.

Section 3. Whenever any petitioner shall be granted any permit by the State Commissioner of Health under the provisions of these regulations, such petitioner shall furnish to said Commissioner, upon demand, a complete report upon the condition and operation of the system, plant or works, which report shall be made by a competent person at the sole cost and expense of the holder of the permit.

Public Health Service Drinking Water Standards 1946

REPRINT No. 2697

FROM THE

PUBLIC HEALTH REPORTS

VOL. 61, NO. 11 MARCH 15, 1946 PAGES 371-384

REISSUED MARCH 1956

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

PUBLIC HEALTH SERVICE

(3) If excess alkalinity is produced by chemical treatment, the total alkalinity should not exceed the hardness by more than 35 p.p.m. (calculated as $CaCO_3$).

4.3. Recommended methods of analysis: [9]

4.31. Ions with required limits of concentration.

Arsenic (As): Official and Tentative Methods of Analysis. Association of Official Agricultural Chemists, 1940, p. 390; also "Colorimetric Microdetermination of Arsenic," Morris B. Jacobs and Jack Nagler, Industrial and Engineering Chemistry, Anal. Ed., **14**: 442 (1942).

Fluoride (F): Standard Methods for the Examination of Water and Sewage, current edition, also Methods of Determining Fluorides, Committee Report, A. P. Black, Chairman. Journal American Water Works Association, **33**: 1965–2017 (1941).

Lead (Pb): Standard Methods for the Examination of Water and Sewage, current edition.

Selenium (Se): Official and Tentative Methods of Analysis. Association of Official Agricultural Chemists, 1940, pp. 11 and 417; also Robinson, W. O., Dudley, H. C., Williams, K. T., and Byers, Horace G.; The Determination of Selenium and Arsenic by Distillation. Industrial and Engineering Chemistry, Anal. Ed., **6**: 274 (1934).

Hexavalent chromium: Standard Methods for the Examination of Water and Sewage, current edition.

4.32. Ions and substances with suggested limits of concentration.

Copper (Cu): Standard Methods for the Examination of Water and Sewage, current edition.

Iron (Fe): and Manganese (Mn): Ibid.

Magnesium (Mg): Ibid.

Zinc (Zn): Ibid.

Chloride (Cl): Ibid.

Sulfate (SO_4): Ibid.

Phenolic compounds: Ibid.

With dibromquinonechlorimide as an indicator.

Total solids: Ibid.

Alkalinity: Ibid.

[9] For the chemical determinations referred to in this report, when given, the methods of analysis recommended by the Association of Official Agricultural Chemists are satisfactory and may be substituted for those recommended in the Standard Methods for the Examination of Water and Sewage, current edition which are specifically cited.

GPO 905091

Water Pollution Control Act
Sept. 18, 1961.

Strengthen Public Health Service Research
Program

Law 12-1-13:

MAIN OFFICE

WOOD RIVER

1958 OCT 3 PM 1:15

Wood River Oil & Refining Co., Inc.

Petroleum Products

321 WEST DOUGLAS WICHITA, KANSAS

Oct. 1.1958
Box 903
Kermit, Texas

New Mexico Oil Conservation Commission
P.O. Box 871
Santa Fe, New Mexico
Att: Mr. A. L. Porter

Dear Sir:

Re: Commission order No. R-1224

This order was complied with in the latter part of July. It was sent to the Oil Conservation Commission office in Hobbs, New Mexico. It just occured to me that this report was filed under the name of Wood River Oil and Refining Co. Inc. instead of Koch Oil Corp. All of our other leases are operated under Wood River. Possibly this is why you have no record of it.

State A Lease-Koch Oil Corporation
2 Wells #1and 2. Lease # B-2456-Eunice-Monument Pool.
No water produced. What falls out in the tanks is bled to pit for evaporation. Varies from 1 to 5 bbls. monthly.

Should this letter not be sufficient I would appreciate notification so that I can give it further attention.

Sincerely
Bill Johnston
Dist. Supt.

MAIL OFFICE OCC

1958 OCT 2 PM 1:16

P. O. Box 332
Monument, New Mexico
September 30, 1958

New Mexico Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Gentlemen:

We are in receipt of your letter of September 26, 1958 concerning our Wulff State Lease, Monument Pool, Lea County, New Mexico.

We have written Rice Engineering & Operating, Inc. asking permission from the Eunice-Monument-Eumont Salt Water Disposal System Committee to enter their system.

As soon as permission is granted to enter the system, we will notify you.

Very truly yours,

R. B. HONEYMAN, JR.

BY Alta Short
Alta Short, Agent

end: letter

SEP 2 PM 1:18

CHAS. A. DILLARD
PRODUCTION SUPERINTENDENT

VERNON TURNER
ASSISTANT PRODUCTION SUPERINTENDENT

McALESTER FUEL COMPANY
PRODUCTION DEPARTMENT
McALESTER BUILDING
MAGNOLIA, ARKANSAS

September 9, 1958

Denton
Gladiola
Eumont.

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

Dear Sir:

In reply to your Order No. R-1224, McAlester Fuel Company operates nineteen wells in the state of New Mexico. Ten of these wells are located in the Denton Field, where we are participants in the Denton Field Salt Water Disposal System. All ten of these wells have been committed to be connected to this system, and actual connection is taking place this date.

McAlester Fuel Company operates seven wells in the Gladiola Field. We are planning to be participants in the Gladiola Field Salt Water Disposal System and will submit our wells there for connection to the system.

McAlester Fuel Company operates two wells in the Eumont area. The Leo V. Sims lease is located in the Southeast Quarter, Section 24, Township 20 South, Range 35 East. This lease is over 14,000' from the nearest proposed line of the Eumont Field Disposal System. This lease was not included in the Eumont Field Disposal System because it is located over 12,500' from the nearest production in the Eumont Field proper. This lease is currently producing 14 barrels of salt water per day. Should it be proved that the small amount of water produced by this lease is damaging the fresh-water supplies underlying this area, this lease will be plugged and abandoned.

Yours very truly,

McALESTER FUEL COMPANY

S. S. Lacy

SSL:msa

cc: Mr. R. F. Montgomery
Oil Conservation Commission
Hobbs, New Mexico

R. H. SIEGFRIED, INC.
OIL PRODUCERS
THIRD FLOOR NATIONAL BANK OF TULSA BUILDING
MAIN OFFICE
TULSA, OKLAHOMA

August 11, 1958

OCC
1958 AUG 13 AM 8:37

Oil Conservation Commission
of the State of New Mexico

Re: Order #R-1224
Salt Water Disposal in Denton-Wolfcamp
Field, R. H. Siegfried, Buckley Lease

Gentlemen:

PROGRESS REPORT

This letter will serve as a report as specified in the above order concerning our lease in the Denton-Wolfcamp Field.

This well produces no water, therefore, discussion concerning the disposal of such does not concern our operation.

Yours very truly,

T. Mayfield

T. Mayfield
Production Manager

TM:mc
Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Oil Conservation Commission
Box 2045
Hobbs, New Mexico

MAIN OFFICE OCC
SEP 11 PM 1 16

COLORADO OIL AND GAS CORPORATION
DENVER CLUB BUILDING
DENVER, COLORADO

September 9, 1958

State of New Mexico
Oil Conservation Commission
Santa Fe, New Mexico

Re: Case No. 1053
Order No. R-1224

Gentlemen:

This letter is in answer to your Order No. R-1224 requesting progress made on efficient salt water disposal methods for certain areas of Lea County, New Mexico.

Colorado Oil and Gas Corporation operates one well in the fields covered by your Order No. R-1224 which is its State A-R No. 2 in the NE NW Section 27-14S-33E, Saunders Field, Lea County, New Mexico.

This well is a marginal well presently producing 12 1/2 bbls oil plus 23 bbls water per day. We are presently disposing of this small amount of water by evaporation from a surface pond which we consider satisfactory and efficient disposal. We feel that this does not conflict with the policy of the Commission as stated in Finding No. 2 of Order No. R-1224 which reads as follows:

"(2) That it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico."

Very truly yours,

COLORADO OIL AND GAS CORPORATION

F. W. Heiser

F. W. Heiser
Asst. Manager of Drilling and Production

FWH:vbs

P. O. Box 845
Roswell, New Mexico

March 13, 1959

Subject: Salt Water Disposal, Saunders Field,
Lea County, New Mexico

New Mexico Oil Conservation Commission
P. O. Box 2045
Hobbs, New Mexico

Attention: Mr. R. F. Montgomery

Gentlemen:

Further to our letter of March 2, 1959, above subject, pumps were installed on the State "A" and Gray Leases on March 10, 1958, and we are now disposing of all produced brine in this field.

Very truly yours,

Original Signed by
P. A. Dennie

P. A. Dennnie
Division Production Manager

cc: New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

TEXAS PACIFIC COAL AND OIL COMPANY

GENERAL OFFICES
FORT WORTH 1
TEXAS

September 5, 1958

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

Subject: Lea County Salt Water Disposal

Dear Sir:

Attached in duplicate are Progress Reports covering properties operated by Texas Pacific Coal and Oil Company in those pools which have been the subject of recent Oil Conservation Commission orders regarding salt water disposal.

The first part of the report covers those pools listed by the Commission as needing immediate attention to salt water disposal. It should be pointed out that in the case of the Hobbs Pool the small amount of water now being produced is being stored in tanks pending construction of the gunnite evaporation pits.

The second part of the report covers those pools where the problem is somewhat less critical and where discussions are now taking place regarding cooperative disposal systems.

Yours very truly,

TEXAS PACIFIC COAL AND OIL COMPANY
By R. W. Hines

R. W. Hines - Manager of Production

RWH:ss
Enclosure

FORM 1225 TM 6 48

TEXAS PACIFIC COAL AND OIL COMPANY

GENERAL OFFICES
FORT WORTH 1
TEXAS

September 2, 1958

New Mexico Salt Water Disposal Progress Report

Arrowhead Pool
Interested in pool cooperative system.

Brunson Pool
Attended Brunson Area Operator's meeting on August 12, 1958, which was called by Shell. Gulf and Magnolia are already operating salt water disposal systems in the area, and with Shell's anticipated system, it was believed other pools in the area could also be included. TP has wells in three of these additional pools: the Drinkard, the Penrose-Skelly and the Paddock.

Jalmat Pool
Interested in pool cooperative system.

Langlie Mattix
Interested in pool cooperative system.

South Eunice
Interested in pool cooperative system.

TEXAS PACIFIC COAL AND OIL COMPANY

GENERAL OFFICES
FORT WORTH 1
TEXAS

PLEASE ADDRESS REPLY TO COMPANY AT
POST OFFICE BOX ~~2057~~ 4067
MIDLAND, TEXAS

September 2, 1958

New Mexico Salt Water Disposal Progress Report

Bagley Pennsylvanian Pool

State "C" a/c-1 Lease - Two producing wells and one well shut-in. Average daily water production: 30 bbls. In cooperative plan with Amerada that is presently in operation.

Bagley Siluro-Devonian Pool

State "B" a/c-1 Lease - Two producing wells that average 160 bbls. of water per day.

State "C" a/c-1 Lease - Three producing wells that average 130 bbls. of water per day.

All water being disposed of in the pool cooperative plan operated by Amerada.

East Caprock Devonian Pool

State "E" a/c-1 Lease - One producing well that averages 510 bbls. of water per day. In cooperative plan that is operated by Amerada.

Hobbs Pool

State "G" Lease - Four producing wells that average 2 bbls. of water per day and produce from the San Andres.

State "V" a/c-1 Lease - Two producing wells that were completed in January and March of 1958 and average 2 bbls. of water per day. Producing formation: Grayburg.

With approval of Oil Conservation Commission, it is planned to install a 100' x 100' x 5' gunnite-lined pit at the State "G" Lease and a 70' x 80' x 5' gunnite-lined pit at the State "V" a/c-1 Lease. The former has an estimated evaporation rate of 25 BPD while the rate for the latter is 14 BPD, and it is believed this will serve TP needs for several years. When these gunnite-lined pits cannot handle the water production, the necessary steps will be taken to devise other means of salt water disposal.

Saunders Pool

State "X" Lease - This recently completed well was potentialed on August 5, 1958, and is not producing water. However, when water production does appear, application will be filed with Amerada for entry in the presently operating cooperative salt water disposal system.

TEXAS PACIFIC COAL AND OIL COMPANY

GENERAL OFFICES
FORT WORTH 1
TEXAS

PLEASE ADDRESS REPLY TO COMPANY AT
POST OFFICE BOX ~~20XX~~ 4067
MIDLAND, TEXAS

September 2, 1958

New Mexico Salt Water Disposal Progress Report

Arrowhead Pool
Interested in pool cooperative system.

Brunson Pool
Attended Brunson Area Operator's meeting on August 12, 1958, which was called by Shell. Gulf and Magnolia are already operating salt water disposal systems in the area, and with Shell's anticipated system, it was believed other pools in the area could also be included. TP has wells in three of these additional pools: the Drinkard, the Penrose-Skelly and the Paddock.

Jalmat Pool
Interested in pool cooperative system.

Langlie Mattix
Interested in pool cooperative system.

South Eunice
Interested in pool cooperative system.

OIL WELL DRILLING COMPANY
NO STOCKHOLDERS LIABILITY
617 Adolphus Tower
DALLAS NATIONAL BANK BUILDING
DALLAS, TEXAS

STATE OF N.M.
1958 SEP 3 PM 1:24

September 2, 1958

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

In Re; Case No. 1053
Order No. R-1224

Gentlemen:

We have a lease in the Eunice-Monument Field, known as our Wood State A lease and also a lease in the South Eunice Field, known as our Shell State A lease, which is effected by the above order.

Our Shell State A lease does not have any drain off of salt water. We steam our tanks every six months and get about two barrels of water each time.

The two wells on our Wood State A lease in the Eunice Monument Field make about six barrels of water per day, which goes into a large earthen pit and evaporates. We do not believe this small amount of water would contaminate the fresh water horizon.

Mr. L. R. Massey, our lease pumper, called at your Hobbs office and was advised that your office is handling all information regarding the above captioned order.

We would appreciate your advising us, if it will be necessary for us to take further steps to protect the fresh water horizon and to comply with your Order No. R-1224. Your promptness will be greatly appreciated.

Very truly yours,

OIL WELL DRILLING COMPANY

By Mary Gordon
(Mrs.) Mary Gordon
Accounting Dept.

MAIN OFFICE OCC
1958 AUG 29 AM 8:19

BERT FIELDS
SUITE 1211 FIDELITY UNION LIFE BLDG.
DALLAS, TEXAS

Eunice

August 26, 1958

Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter, Jr.
Secretary-Director

Re: Case No. 1053
Order No. R-1224
Salt Water Production
Eunice and Eumont Fields
Lea County, New Mexico

Gentlemen:

As required by the above order, we wish to report that we have no salt water production in the Eumont Field and have a maximum of one barrel per day of BS&W production in the Eunice Field.

As we do not feel that this extremely small amount of salt water production that we have would economically justify a salt water disposal system, we have made no plans for such a system. However, in the event that our salt water production does increase, we will dispose of it according to your rules and regulations.

Yours very truly,

BERT FIELDS

Mark D. Jackman

MDJ:js

Santa Fe

PHILLIPS PETROLEUM COMPANY

1958 AUG 25 AM 8:52

P. O. Box 2105
Hobbs, New Mexico

August 19, 1958

In re: Salt Water Disposal - Eunice-Monument-Fumont Pools

Rice Engineering and Operating, Inc.
Box 1142
Hobbs, New Mexico

Attention: Mr. W. G. Abbott

Gentlemen:

In reviewing Commission Order No. R-1224, we note that it will be necessary to report on the progress and the estimated completion date of the subject salt water disposal system at the regular Commission hearing scheduled for September 17, 1958.

It is requested that, as operator, you plan to report such information on behalf of Phillips Petroleum Company at this hearing.

Very truly yours,

PHILLIPS PETROLEUM COMPANY

W. C. Rodgers
District Superintendent
Production Department

FCM:js
cc: New Mexico Oil Conservation Commission - 2
Hobbs, New Mexico

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

September 4, 1958

COPY

Oil Well Drilling Company
614-617 Adolphus Tower
Dallas, Texas

Attention: Mrs. Mary Gordon

Re: Case 1053 - Order No. R-1224
Salt Water Disposal

Gentlemen:

This is in partial reply to your letter of September 2, 1958 to this office.

Memorandum No. 32-57 (enclosed) states the stand of the Oil Commission on the matter of salt water disposal into earthen pits.

It is my suggestion that you plan to have a representative at the September 17, 1958 hearing. Your letter can count as a progress report and may actually serve as a fulfillment, to date, of the conditions of Order R-1224. However, the Commission will present a statement by the Secretary-Director that should help to clarify the stand of the Commission on this very important matter.

If your representative cannot be present please notify me and I will send you a copy of any Commission statements for your guidance.

Very truly yours,

E. J. FISCHER,
District Engineer

EJF/ir

Enclosure

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

WESTERN UNION
TELEGRAM

W. P. MARSHALL, PRESIDENT

1220 (R 11-54)

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

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

LA186 DB334

1953 NOV 28 PM 1:6355

D LUA439 LONG PD=DENVER CITY TEX 28 430PMC=

A L PORTER JR=

NM OIL CONSERVATION COMMISSION SANTA FE NMEX=

CONFIRMING OUR TELEPHONE CONVERSATION TODAY PERTAINING TO ORDER NO R=1224=A THE ATLANTIC REFINING CO REQUESTS AN EXTENSION OF EFFECTIVE DATE FOR 30 DAYS FOR LEASES IN THE DENTON FIELD LEA COUNTY REASON FOR REQUEST OF TEMPORARY MECHANICAL DIFFICULTIES WE ARE HAVING WITH THE SALT WATER DISPOSAL SYSTEM WE OPERATE=

THE ATLANTIC REDINIG CO N A CARR=

File
OCC

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

THE ATLANTIC REFINING COMPANY

PETROLEUM PRODUCTS

November 28, 1958

ADDRESS REPLY TO:
P. O. BOX 1038
DENVER CITY, TEXAS

DOMESTIC CRUDE OIL PRODUCTION

Mr. A.L. Porter, Jr.
N.M. Oil Conservation Commission
Santa Fe, New Mexico

Ref: Order #R-1224-A

Dear Mr. Porter:

Confirming our telephone conversation today pertaining to Order No. R-1224-A, The Atlantic Refining Company requests an extension of effective date for 30 days for leases in the Denton & Denton Wolfcamp Fields, Lea County, New Mexico.

The reason for this request is because of temporary mechanical difficulties we are having in the operation of the field wide salt water disposal system. Gas blocking of the main lines is preventing some of the outlying leases from getting their salt water into the system. This is because of excessive pressure at their point of connection. We are in the process of installing gas bleeders on the systems gathering lines which should eliminate the gas blocking effect and reduce the pressure throughout the system. There is a possibility, especially for those leases that use gun barrels for treating purposes, that pumps will have to be installed in order for them to get their salt water into the disposal system lines.

At any rate we hope to have the system handling 100% of the produced salt water from all leases in these fields by December 31, 1958.

Yours very truly,

THE ATLANTIC REFINING COMPANY

NAC/gs

cc: Frank Irby - Santa Fe
P.E. Fletcher - Midland
Phil Tomlinson - Roswell

By N.A. Carr

N.A. Carr,
District Superintendent

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 2
CASE

TABLE 1
WATER PRODUCTION STATUS
LEA COUNTY, NEW MEXICO

Data on the water production of oil pools tabulated on the following pages were summarized from records of the New Mexico Oil and Gas Engineering Committee at Hobbs, New Mexico by E. I. Horton for all pools in Lea County and for the Caprock Queen pool in adjacent Chaves County. The water production data are originally reported monthly by the operators to the New Mexico Oil Conservation Commission, based on various types of measurements or estimations by the operators, so that the reliability of the data varies greatly; in general, the water production reported is likely to be too low rather than too high.

Thirty one of the pools produced more than 15,000 Bbls water during 1955, accounting for more than 90 percent of all the water produced by oil wells in Lea County. The Bagley-Pennsylvanian, Bagley-Siluro-Devonian, Bagley-Wolfcamp (East), Caprock-East (Devonian), Caprock-East (Wolfcamp), Deste (Denton-Wolfcamp), Eunice, Monument, Monument-Abo, Monument (Blinebry), Monument-Paddock, Hobbs, and Saunders pools are believed to be in positions particularly likely to contaminate existing irrigation or municipal water supply developments.

Footnote 1 on page 4 refers to the following note:

Orders 264 and 264A put most of Cooper-Jal wells into Jalmat, and some into Lee-Yates. All of Eunice into Jalmat. 26 of 87 South Eunice wells into Jalmat; 54 of 504 Langlie Mattix wells (little water) into Jalmat. The cumulative production to 1-1-55 includes Eunice, Jalmat and Cooper-Jal. 1955 production is for the expanded Jalmat oil pool.

					Tot. H_2O		
	Allison-Penn.	2/16/54	8	7	22,275	70,083	92,358
	Anderson Ranch-Dev.	3/26/53	7	7	1,416	36,566	37,982
	Anderson Ranch-Wolf.	7/25/53	13	10	5,283	62,903	68,186
	Arrow (Gas)	-			-	-	-
8	Arrowhead	5/24/38	115	92	10,782,050	1,289,113	12,071,163
19	Bagley-Penn.	7/24/49	18	16	1,355,659	478,653	1,834,312
12	Bagley-Sil/Dev.	4/17/49	20	17	1,801,003	982,043	2,783,046
	Bagley-Wolfcamp, East	7/10/55	1	1	-	2,634	2,634
	Balsh	12/8/35	5	0	595	0	595
	Baum-Wolfcamp	5/2/55	1	1	-	9,558	9,558
	Blinebry	12/10/45	13	7	16,730	10,128	26,858
26	Bough	4/27/49	11	10	377,504	204,274	581,778
	Bowers	11/11/35	57	25	2,612	1,759	4,371
	Bronco-Sil/Dev.	4/4/53	10	1	1,672	35,684	37,366
	Bronco-Wolfcamp	12/8/54	4	0	0	0	0
10	Brunson	9/14/45	133	66	4,326,291	1,099,315	5,425,606
	Buffalo-Wolfcamp	8/20/54	1	1	960	1,554	2,514
7	Caprock, E.-Dev.	8/23/51	24	11	1,407,534	1,670,253	3,077,787
	Caprock, E.-Wolfcamp	2/18/53	5	3	26,222	6,093	32,315
	Carter-San Andres, So.	2/1/55	1	1	0	1,897	1,897
	Cary	6/16/48	3	2	78,373	12,370	90,743
15	Cass	12/20/44	4	3	1,247,219	837,532	2,084,751
	Caudill-Dev.	9/14/54	16	7	0	10,422	10,422
	Corbin	6/10/38	18	1	11,980	86	12,066
	Corbin-Yates	4/25/52	2	0	0	0	0
18	Crossroads	5/6/48	12	3	1,558,871	552,934	2,111,805
	Crossroads-Penn.	7/12/49	13	5	1,364,589	10,789	1,592,941
	Dean-Devonian	7/21/55	1	0	0	0	0
13	Denton	9/25/49	110	55	525,309	948,238	1,473,547
17	Denton-Wolfcamp	2/24/50	96	47	1,262,779	699,381	1,962,160
	Dollarhide-Dev.	4/6/52	13	0	0	0	0
	Dollarhide-Drinkard	12/1/51	72	29	68,689	63,085	131,774

					Tot. - H_2O		
	Dollarhide-Ellenburger	5/24/51	7	1	338,279	60,267	398,546
22	Dollarhide-Fusselman	2/26/52	8	4	471,947	302,828	774,775
	Dollarhide-Queen	1/12/52	63	21	23,057	35,222	58,279
33	Drinkard [b/]	10/26/44	475	210	830,745	123,454	954,199
21	Echol.-Devonian	8/27/51	6	3	154,583	386,183	540,766
	Echol-Devonian-North	5/9/52	4	3	23,547	39,469	63,016
30	Eidson-Penn.	1/8/53	12	8	213,466	163,208	376,674
	E. K.-Queen	4/17/55	26	9	0	1,119	1,119
	Elliott-Abo	9/19/55	1	0	0	0	0
5	Eumont (Gas)		314	197	11,467	2,877,454	2,888,921
3	Eunice	3/21/29	321	278	86,566,864	3,352,590	89,919,454
1	Monument	3/21/29	467	320	68,873,144	6,233,300	75,106,444
	Monument-Abo	9/6/48	3	1	9,738	2,429	12,167
25	Monument-Blinebry	4/26/48	42	23	296,125	233,904	530,029
	Monument-Paddock [c/]	1/6/48	30	14	91,610	61,023	152,633
11	Eunice, South	5/29/30	4	2	25,442,743	1,002,870	26,445,613
	Fowler	5/6/49	13	5	58,261	43,086	101,347
	Fowler-Blinebry	-	1	1	-	61	61
	Fowler-Devonian (Gas)	6/19/55	1	0	0	0	0
	Fowler-Drinkard	11/5/53	1	1	26,937	839	27,776
	Fowler-Fusselman	9/23/53	4	3	359	28,127	28,486
	Garrett	4/9/47	2	1	32,360	973	33,333
	Gem-Yates	7/9/54	1	1	7,436	41,464	48,900
	Gladiola	9/20/50	12	0	0	0	0
27	Gladiola-Wolfcamp	12/16/50	21	19	325,438	194,948	520,386
	Gladiola-Wolfcamp, So.	7/16/55	1	0	0	0	0
	Halfway	10/6/39	4	2	812,216	9,180	821,396
	Hardy	3/27/37	32	10	6,971	3,930	10,901
	Hare	7/20/47	82	36	488,541	113,328	601,869
	Hare, South	9/7/47	1	1	160,409	31,769	192,178
	Hightower	7/16/49	1	0	1,293,895	0	1,293,895
	Hightower-Permo-Penn.	1/3/50	5	5	29,800	68,686	98,486

					Tot.-- H_2O			
6	Hobbs	6/13/28	283	178	72,969,032	2,385,838	75,354,870	
	Hobbs-Drinkard	4/15/52	1	1	9,312	2,123	11,435	
	Hobbs, E.-Blinebry	12/18/51	1	1	2,467	60	2,527	
31	Hobbs, E.-San Andres	1/13/51	25	17	71,233	158,868	230,101	
	Hobbs, E.-Seven Rivers	8/17/53	1	0	18	0	18	
	House	2/2/49	6	5	64,175	16,293	80,468	
	House-San Andres	1/17/50	8	7	15,400	3,336	18,736	
2	Jalmat	d/	305	132	303,820,035	4,870,587	308,690,622	
	King-Wolfcamp	10/26/51	1	1	2,479	1,232	3,711	
20	Knowles	3/31/49	8	7	1,158,866	387,794	2,546,660	
	Knowles, S.-Dev.	5/19/54	11	6	0	17,196	17,196	
4	Langlie Mattix	1/8/29	528	193	11,704,311	3,170,947	14,875,258	
	Lazy "J" Penn.	10/1/52	36	17	17,971	38,846	56,817	
	Leonard	6/18/48	2	1	1,626	181	1,807	
	Leonard, South	2/14/50	15	3	1,730	777	2,507.	
	Littman-San Andres	5/5/53	9	2	1,220	644	1,864	
	Lovington	1/3/39	52	29	598,328	81,283	679,611	
	Lovington-Abo	12/8/51	44	16	108,642	88,720	197,362	
	Lovington-Paddock	6/11/52	85	21	20,368	54,410	74,778	
	Lovington, E.-Penn.	3/30/51	6	3	5,247	4,380	9,627	
	Lovington, West	6/13/44	57	24	453,855	47,323	501,178	
	Lovington-Wolfcamp	11/29/52	1	1	15,816	5,507	21,323	
	Lusk	11/26/42	4	4	12	575	587	
16	Lynch	4/11/29	26	19	17,328,738	826,625	18,155,363	
	Lynch, North	8/1/29	2	2	3,274	794	4,068	
	Maljamar	7/16/26	85	7	138,323	12,027	176,898	
	Maljamar, Repress.	7/16/26	196	28		26,548		
	Maljamar-Devonian	1/31/52	1	1	556,328	93,102	649,430	
35	Maljamar, East	4/15/49	1	0	0	0	0	
	Maljamar, North	1939	4	0	0	0	0	
	Maljamar-Paddock	5/1/50	3	1	991	452	1,443	
	Maljamar, South	7/31/43	2	2	16,801	1,191	17,992	

						Tot.-H_2O
	McCormack	11/24/47	2	1	56,716	52,431	109,147
	Mescalero-Devonian	10/14/52	5	1	1,450	505	1,955
	Mescalero-Penn.	2/28/51	6	4	5,033	18,736	23,769
24	Moore-Devonian	4/52	19	9	417,113	258,200	675,313
	Moore-Penn.	8/18/52	1	0	219	0	219
	Nadine	2/3/50	3	2	6,622	6,259	12,881
	Paddock	3/29/45	104	76	992,622	132,527	1,125,149
	Pearl Bone Spring	9/12/55	1	1	0	461	461
	Pearsall	1/40	26	1	753	1,786	2,539
	Penrose-Skelly	3/36	292	116	82,768	102,373	185,141
	Rhodes	11/1/27	38	5	1,613,041	4,598	1,617,639
	Roberts	8/15/43	30	0	104	0	104
	Sanmal-San Andres	7/22/55	1	0	0	0	0
	San Simon	10/28/43	2	2	872	64	936
14	Saunders	1/13/50	55	54	2,794,591	921,857	3,716,448
	Saunders, South	3/30/51	1	1	925	55	980
	Sawyer	1/4/47	2	2	4,361	812	5,173
	Sawyer-Devonian	8/13/55	1	0	0	0	0
	Shoe Bar-Devonian	9/21/53	3	0	0	0	0
	Shoe Bar-Penn.	3/8/54	1	0	0	0	0
	Skaggs	3/14/37	77	36	84,481	32,938	117,419
	Skaggs-Drinkard	9/28/53	3	1	1,782	3,146	4,928
28	S. R. R.-Devonian	5/11/55	2	2	0	194,370	194,371
	Teague	3/23/48	13	5	91,939	10,597	102,536
	Teague-Devonian	1/26/52	4	1	85	25	110
23	Teague-Ellenburger	2/19/50	10	6	168,555	300,547	469,102
	Teas	3/14/51	14	6	675	3,209	3,884
	Terry-Blinebry	3/3/52	61	27	6,489	24,225	30,714
	Tonto	6/6/44	2	1	18	614	632
	Townsend-Wolfcamp	5/11/52	63	23	3,418	23,630	27,048
	Tulk-Wolfcamp	8/12/51	11	10	224,784	9,596	234,380
29	Vacuum	5/29	456	105	886,456	178,466	1,064,922

a/ Rank of pool in order of water production for 1955; highest 30 pools produced more [illegible]
b/ Vivien and Andrews zones combined.
c/ Nomenclature changed 1955.
d/ (See p. 1).

Exhibits 3a-3h

Exhibit 2

COMPILATION OF
OIL AND WATER PRODUCTION
FROM SEVEN POOLS IN LEA COUNTY

Graphs of the oil and water production from the following seven pools, listed in order of their 1955 water production, are attached. The water production from these pools is as follows:

1955 RANK [a]	POOL	WATER PRODUCTION FOR 1955 (Barrels)	CUMULATIVE WATER PRODUCTION TO 1-1-56 (Barrels)	Exhibit
2	Cooper-Jal [b]	1,870,587	308,690,622	3h
6	Bobbs	2,385,838	75,354,870	3g
8	Arrowhead	1,289,113	12,071,163	3f
11	Saunders	921,857	3,716,148	3e
25	Monument-Blinebry	233,963	539,029	3d
33	Drinkard	123,454	954,199	3c
37	Lovington	81,283	679,611	3b

a/ In descending order of water production for 1955.

b/ Transferred to Jalmat pool in 1955. Figures are for Jalmat pool.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O.C.C. EXHIBIT No. 3a-3h
CASE 1053

4

EXHIBIT
Extracts from

PHYSICAL PRINCIPLES OF OIL PRODUCTION

by

Morris Muskat
McGraw-Hill Book Company, Inc.
1949

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O.C.C. EXHIBIT No. 4
CASE 1053

pp 368-369

"There are commercially productive oil fields that are effectively sealed, throughout their producing life, from contact or interaction with water-bearing strata. However, the majority thus far discovered are bounded by and in fluid intercommunication with water bearing reservoirs. The existence of such water reservoirs is usually established by the "dry" holes generally water productive only delineating the oil-productive area. Because of the lower compressibility of water its fractional expansion in volume on pressure release will be lower than for the oil. However, when a mobile contiguous water reservoir is present at all, its area will often be very much greater than that of the oil reservoir, so that in spite of its lower compressibility the total expansion volumes may exceed the whole of the original reservoir oil volume. Thus, whereas the great majority of known oil fields have areas less than 10 sq miles,* water reservoirs extending over 1,000 sq. miles are not at all uncommon. Moreover, while there is little specific evidence on the subject, it may be anticipated that at least in some water reservoirs the decline in pressure may be followed by gas evolution, similar to that in the oil zone, and may thus result in an effective compressibility even larger than that of the bubble-point oil.

"In addition to the expansion in volume of the fluid content of a water reservoir due to pressure release, an additional source of water that may be available for ultimate entry into the adjacent oil-bearing reservoir is provided by the drainage of surface waters into exposed outcrops of the formation. In general, however, the contribution, if any, due to surface waters is very small as compared with the expansion volume of the original water content and may be neglected, except when otherwise it is known to be of significance."

* In fact a statistical analysis shows that in this country it is only in Pennsylvania and in the Texas Panhandle that a majority of the fields cover surface areas exceeding 1,000 acres.

EXHIBIT 5

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O.C.C. EXHIBIT No. 5
CASE 1053

TABLE 3

COMPARISONS OF CONCENTRATIONS OF OIL WELL DISPOSAL
BRINE DISCHARGE TO PIT WATER
LEA COUNTY, NEW MEXICO

LOCATION a/ Of Disposal Pit	LEASE	CONDUCTIVITY (micromhos at 25° C.)
11.33.34.300	Shell-State "A" (treater)	93,186
"	" (pit)	111,594
15.33.10.	Alcrada "SC" (treater)	96,443
"	" (pit)	99,767
15.37.3.220	Shell-Argo (water knock out)	80,370
"	(pit)	84,800
15.37.3.412	Gulf-Simpson (treater)	70,327
"	" (overflow pit)	71,827
18.38.21.331	Gulf (discharge pipe)	17,666
"	(pit)	16,760
18.38.20.130	Standard-McKinley (discharge pipe)	11,310
"	" (#3 pit)	17,160
20.37.17	Gulf-Anderson (North discharge pipe)	13,677
"	(South discharge pipe)	16,000
	(North overflow pit)	13,148

a/ U. S. Geological Survey well-numbering system: numbers signify Township, Range, Section and subdivision of section

All samples collected and analyzed by R. L. Borton, State Engineer Office, in March and April, 1956. Conductance determinations made on conductivity meter at Roswell Field Office of U.S.G.S. Total dissolved solids (ppm) are approximately 0.6 times conductivity values

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O.C.C. EXHIBIT No. 6
CASE 1053

TABLE 4

G5 EXHIBIT 6

Bagley - Penn.	12.33. 2.331	1	2,011	0.259
Bagley - Sil./Dev.	11.33.34.444	1	20,138	2.595
Caprock, East - Dev	12.32.11.313	1	36,012	4.641
do.	12.32.14.124	1	290,772	37.471
Denton	15.37. 3.241	3	58,561	7.546
Denton - Wolfcamp	15.37.12.144	4	260,492	33.568
Eunice	20.36.32.323	4	1,273	0.164
do.	21.36. 3.323	3	86	0.01108
do.	9.223	7	61,055	7.868
do.	10.124	1	308,257	39.724
do.	16.223	1	274	0.0353
do.	17.144	6	11,376	1.466
Hobbs	18.38.19.413	8	143,515	18.494
do.	20.113	1	71,065	9.158
do.	20.134	1	463,166	59.686
do.	20.323	4	201,893	26.017
do.	20.432	1	300	0.0386
do.	30.223	2	651	0.0839
do.	30.432	6	72,802	9.382
do.	19.38. 5.223	4	5,643	0.727
do.	15.232	1	32,660	4.209
Saunders	14.33.27.233	1	7,072	0.91
do.	15.33. 4.222	5	282,606	36.418
do.	9.222	2	40,484	5.217
do.	10.113	3	427,392	55.076

1/ See explanation on page 14 Exhibit # 13.
2/ As of report on May 1, 1956.

NO. 31,014. DATA SHEET, YEAR BY DAYS.

CODEX BOOK COMPANY, INC., NORWOOD, MASSACHUSETTS.
PRINTED IN U.S.A.

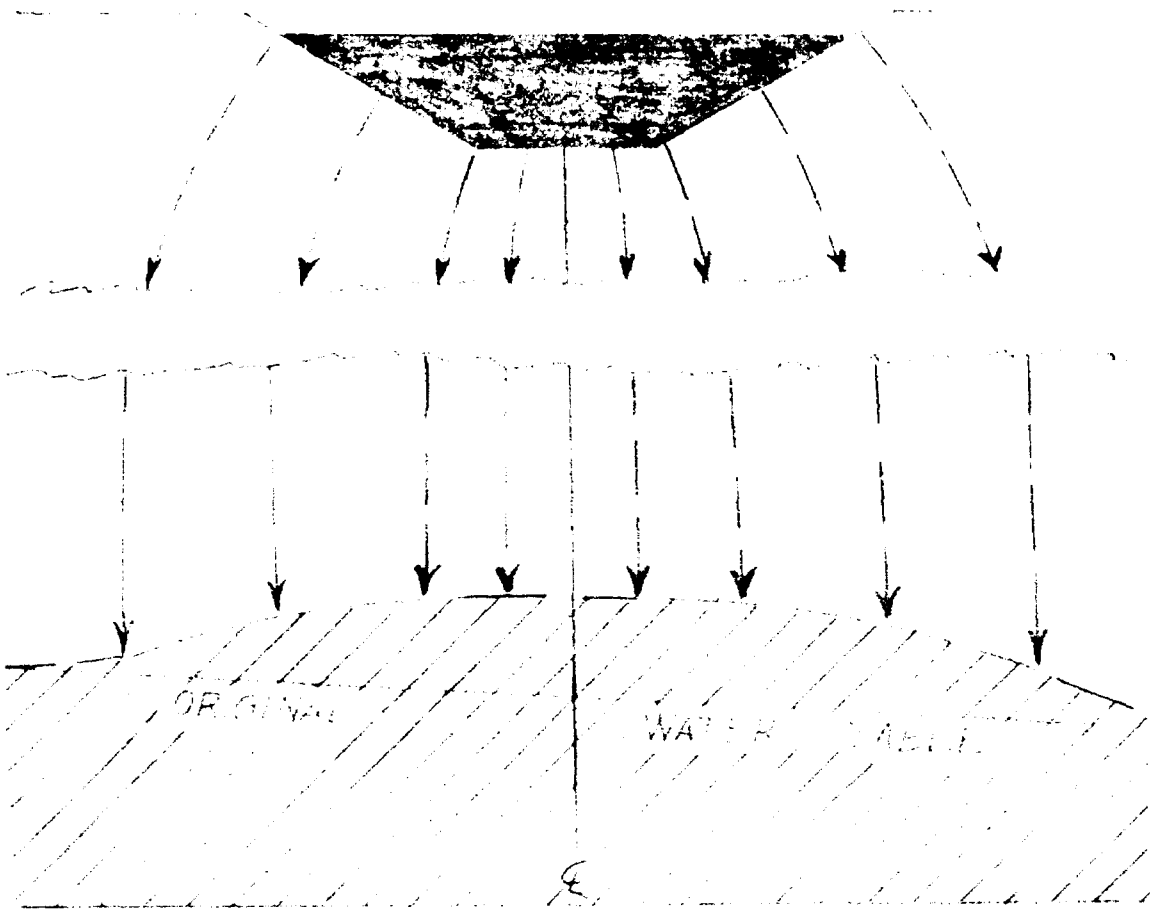
TABLE 5

1954 BRINE DISPOSAL DATA FOR SELECTED POOLS AND PITS, LEA COUNTY

POOL	LOCATION OF DISPOSAL PIT	NO WELLS CONTRIB	DIMENSIONS OF PIT (feet) Av. Depth	Length	Width	AREA OF PIT (sq. ft.)	BRINE PRODUCED (bbl.)	POTENTIAL EVAPORATN (bbl. per yr.)	BRINE PIT LEAKAGE (bbl.)
[illegible]	12 33 2 33	1	6	50	50	2,500	2,011	259	1,752
[illegible]	11 33 34 444	1	3	62	57	3,477	20,138	360	19,515
[illegible]	12 32 11 313	1	5	47	48	2,256		233	
			3.5	35	50	1,750	36,012	181	35,412
	12 32 14 224	1	5	45	50	2,250		233	
			6	40	45	1,800		186	
			3	55	51	2,970	290,772	307	289,602
			14	14	47	3,068		214	
			3	56	63	3,528		365	
[illegible]	15 37 3 24	3	8	55	50	2,750		284	
[illegible] Camp	15 37 2 34	1	7	183	93	17,019	58,561	1,760	56,801
[illegible]	20 36 32 323	4	6	360	200	72,000	260,492	7,446	253,046
[illegible]	21 36 3 323	3	10	90	60	5,400	1,272	558	715
[illegible]	9 223	7	4	52	50	2,600	86	269	0
[illegible]	10 124	1	1	75	75	5,625	61,055	582	60,173
[illegible]	6 223	1	7	111	102	14,382	308,257	1,487	306,770
[illegible]	17 144	6	3	125	95	11,875	271	1,228	0
[illegible]	8 38 19 413	8	8	60	50	3,000	11,376	310	11,066
[illegible]	20 113	1	13	78	57	3,000	143,515	310	143,205
[illegible]	20 133	1	3	260	260	1,146	71,065	460	70,605
[illegible]	20 323	4	8	460	360	67,600	163,166	6,991	156,175
[illegible]	20 432	1	5	100	100	165,600	201,893	17,125	184,768
[illegible]	30 223	2	8	230	95	10,000	300	1,031	0
[illegible]	30 432	6	6	100	75	21,850	651	2,260	0
[illegible]	19 38 5 223	1	6	12	12	7,500	72,802	776	72,026
[illegible]	16 232	3	3	75	75	1,764	5,643	182	5,461
[illegible]	14 38 25 233	1	8	108	110	5,625	32,660	582	32,078
[illegible]	5 33 4 222	5	8	66	64	13,880	7,072	1,229	5,843
[illegible]	9 222	2	1.5	65	45	4,221	282,606	437	282,169
[illegible]	10 113	3	4	68	68	2,925	40,484	302	40,182
			5	57	54	4,612	127,392	178	126,596
						3,078		318	

Ex. 43
Case 5414-5417

Ex. 43 Case 5414-5417



BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O. C EXHIBIT No. 9
CASE 1053

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O.C.C EXHIBIT No. 10
CASE 1053

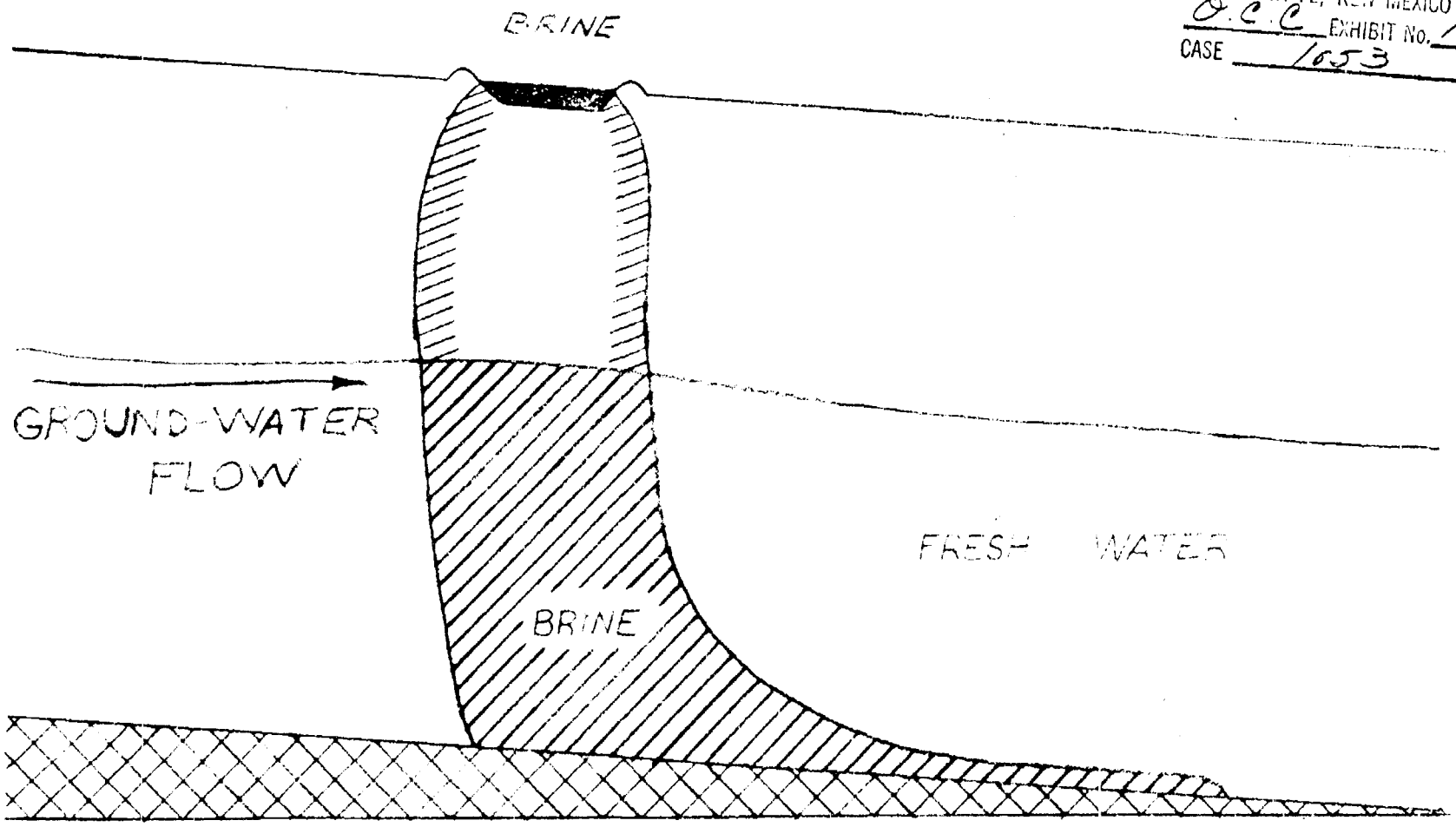


Figure . Diagrammatic representation of cross-section of a brine pit leaking downward into a fresh-water aquifer. Section in direction of natural ground-water flow.

EX #10 1053

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
O. C. C. EXHIBIT No. 12
CASE 1053

TABLE

CHLORIDE CONTAMINATION OF WELL WATERS

LEA COUNTY

(Analyses by U. S. Geological Survey)

WELL LOCATION[a]	OWNER	CHLORIDE CONCENTRATION (ppm) 1942	1951	1952	1953	1954	1955	1956	DEPTH (ft.)
18.38.15.241a	Glen Staley		75			152			
18.38.30.223	G W. Gains						270		70
18.38.34.120	Hobbs #3	59			67			80[b]	206
Hobbs	G W. Going					385			
20.37.4.111	J. Cooper	(Potable before 1952)				450			
20.36.15.421	H S. Record					1,080			50
21.33.2.422a	D.C Berry	(Potable before 1952)				1,020	1,170		120
22.36.333	Gulf Oil Co.	(Formerly potable.)			1,750				
22.37.24.311	G. Sims				675		770		82

a/ According to U S. Geol. Survey system for New Mexico; numbers represent Township, Range, Section, and tract within a section.

b/ Analysis by New Mexico Dept. of Public Health.

been successively continued to March 14, 1957, September 1, 1957, March 14, 1958, and June 18, 1958, on all of which dates progress reports were submitted by the Chairmen of the ten committees.

When it was decided at the June hearing to continue the case to September 17, 1958, the Commission announced that an order of continuance would be entered. Accordingly Order R-1224 was entered on July 28 and copies were mailed to the 90 operators in the ten most critical areas on July 29th. Return receipts were requested and all operators have now acknowledged receipt of the order.

Order R-1224 requires that **all** operators in the ten most critical areas file a written report by September 10 or be represented by some one at this hearing to give an oral report. The written reports have been carefully recorded, and in order that all operators who are represented here today may be given credit for reporting, we are asking that each pool chairman be very careful to list all operators whom he represents.

In order that this case may be disposed of in the most orderly and expeditious manner possible, the Commission will receive testimony, reports and statements in the following order:

A. TEN MOST CRITICAL AREAS

(1) Testimony by State Engineer regarding ten most critical areas.

(2) Testimony by interested operators regarding ten most critical areas.

(3) Rebuttal testimony by State Engineer if necessary.

(4) Presentation of progress reports by operators on ten most critical areas.

(5) Statements and recommendations regarding ten most critical areas.

B. THIRTEEN SECOND MOST CRITICAL AREAS

(1) Testimony by interested operators concerning any or all of the thirteen areas listed as the second most critical in Commission Memorandum 22-56.

(2) Testimony by State Engineer regarding these same thirteen areas.

September 17, 1958

ig

Gentlemen:

I am appearing before you to make a statement of position and resolutions in the matter of New Mexico Oil Conservation Commission Order #R-1224.

We recognize that it is the duty of the New Mexico Oil Conservation Commission to cooperate with the State Engineer Office in matters of joint interest and we are mindful that a very serious problem of obtaining and protecting fresh water confronts us all.

Combining all factors, domestic water requirements for the United States by 1980 are estimated at 880,952,380 bbls. per day. This compares with 268,571,427 bbls. per day for 1955, an increase of approximately 327%.

Fresh water demand by 1980 for industrial use is expected to be about 400% of the 1955 demand.

It is highly improbable that the average precipitation over North America will be increased in any significant way in time to relieve the impending shortage. Certainly in much of New Mexico even with an increase in precipitation there is no way to greatly supplement our growing need for water since in most arid areas the moisture would be taken up by the dry surface sands only to eventually evaporate. Thus we must live within our water income. How?

There are the obvious courses: reduce consumption, end waste, develop more fully the use of available supply, or provide means to convert to benificial uses vast and virtually untapped supplies of sea and brackish water, and in our case in the main, conversion of, off color underground water since the vast majority of our state is arid land.

There is little doubt that in the future, in New Mexico, private enterprises will turn in some areas to drilling exclusively for water sources for market.

These startling facts although they deal with the future do have a very direct bearing on the present Commission Order #R-1224 which is before us today.

In particular we refer to paragraph (2) of the findings which states:

"That it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico.

Also we refer to paragraph (2) of the order which states:

"That all operators in the above-named areas shall report to the Commission at the Regular Hearing on September 17, 1958, on the progress made thus far and the estimated completion date of a 100 percent disposal system. Operators who are members of a cooperative

group may report through the committee chairman, who shall be prepared to name all operators who are members of such group. All operators who are not members of a cooperative group shall furnish a written progress report to the Commission prior to September 10, 1958, or shall appear at the Regular Hearing on September 17, 1958, to report the progress made thus far and the estimated completion date of a 100-percent disposal system for each well which they operate in the above-named areas."

At the outset let me assure you that we will not permit fresh water to become contaminated from any source as a result of our own actions.

We do feel however that certain considerations should be made in determining just exactly what must be done in disposing of waters that are produced coincidentally with oil and gas.

i wish to point out the economics of many operations could not afford the expense of returning produced waters below the surface. All operators have geared their operations to meet the presently known requirements. To force a premature cessation of operations without first determining that actual damage will or has occurred to fresh water sands, if they are in place, from the disposal of produced fluids into surface pits, would not protect correlative rights and would constitute a gross negligence and waste of a valuable resource.

We do not have any quarrel whatsoever with the duties or perogatives of the State Engineer, as outlined in the booklet entitled "Functions and Activities of the State Engineer Office" by C. B. Thompson, Chief, Technical Division and F. E. Irby, Chief, Water Rights Division, dated Santa Fe, New Mexico, November, 1957.

Reference is made to #s 5 & 6 of the purpose of the agency, i.e.,

#5 To conduct hydrographic surveys.

#6 To coordinate the work of various Federal Agencies as regards water resource programs.

It is in these two provisions that we request help from the State Engineer Office and the New Mexico Oil Conservation Commission.

Referring to #5 of the purpose of the agency, I wish to point out that the only testimony on record in this case concerning the <u>need</u> for fresh water protection and disposal of produced waters in Lea County has been only a comparison of "they do it someplace else and Lea County is like someplace else".

How about getting specific and actually making a study of Lea County and the problem in Lea County. At least then we would have something with a New Mexico name tag on it in the record. To intelligently solve the problem it will be necessary to get down to at least section lines.

We feel that in order to better understand the problem of water polution and how we can effectively protect fresh waters from our own acts we must know more about the exact locations of the water sands; that is to aerial extent as well as vertical limits, also the source of supply for these fresh water beds and the movement of the water within the confines of the beds.

In line with this thinking we respectfully request the New Mexico Oil Conservation Commission help the oil and gas operators within the state to secure, with the aid of the State Engineer Office as complete information as is possible from a comprehensive hydrographic survey of all areas where oil and/or gas and other well effulents are produced. We fully realize that this would be a project of considerable magnitude and would require complete cooperation on the part of the oil and gas operators. And also it would be incumbent upon the operators to take whatever steps that would be necessary to discharge their part of the resulting responsibilities.

Such a study should not be confined however to only those areas where we are now producing. We are constantly searching for new areas of oil and gas production so that we may continue, as in the past and present, to add to the growing economic resources of the state.

Also in line with such hydrographic surveys the studies should be extended to include the practical as well as theoretical possibilities of contaminating fresh water sands from well effulents, however they may be

disposed of. These studies should be pertinent only to those water bearing sands that are of sufficient magnitude that they would bear a reasonable economic and useful value to the people of the state.

Further this study should include the actual physical and chemical composition of waters that are produced coincidentally with oil and gas, and a determination should be made as to the feasibility of utilizing these waters for economic and useful purposes. All produced water from oil and gas wells do not carry high concentration of salt. Further the lifting cost of getting the water to the surface where it is available to do with as may be decided upon is already behind us.

With particular reference to that portions of paragraph (2) of the order that states "100-percent disposal system for each well." I respectfully point back to a statement made by the State Engineer at the May 16, 1956 hearing of case #1053 in which he stated in answer to the following question: "Is it your recommendation that water be disposed of by injection wells, or just the wells producing the excessive amounts of salt water?" "I would like to answer that a little fully. I think some further investigation is warranted, investigation toward this end. That is, to determine where the brine disposal pits might not overlie fresh water and therefore might not endanger fresh water."

Agreeing with the above quote I submit that the provision of paragraph (2) of order #1224 should not apply to all wells.

We submit that without such a study as I have discussed no one would have sufficient information upon which to base an order which would regulate the protection of fresh water and the disposal of waters that are produced from oil and/or gas wells.

In line with protecting fresh water I want to point out that it has long been the practice of oil and gas operators to run casing in wells, to among other things protect known fresh water supplies. In line with this policy on the part of the operators we strongly urge the adoption of Rules and Regulations Governing the Drilling and Completion, and Abandonment of water wells within the state that would effectively protect the water sands. Such regulations quite conceivably would include the following:

1. Casing would be set at a depth to at least the top of the water sand.
2. Such casing would be cemented with sufficient volume of cement to protect the fresh water sand from contamination from any source. In most instances this would mean circulating cement.

In thinking of brines there is one very important concept that I feel needs some clarification. In particular I refer to a statement made at the May 16, 1956 hearing. In answer to a question "Is it your opinion that salt is filtered out or removed in any way in this path which it takes from the pits to the aquifer?" The witness representing the State Engineer office answered in part "No, it is impossible to remove the sodium chloride and almost any other constituent in the brines in any way."

In reply to this statement let me say it's no secret that several methods - including use of nuclear power for separating salt from water are actively under experimentation.

The approaches are numerous - vapor compression; flash evaporation, freezing salt water; using solar energy; using solvents and chemical precipitation; and electro-filtration among others.

The Fluor Corp., of Whittier, Calif., is studying the combination of a nuclear reactor with distillation of saline water, under a contract from the office of Saline Water.

One of the more unusual processes under research is termed "electrodialysis." Unlike distillation, which removes water from salt, electrodialysis removes salt from water.

Another possibility is the use of chemicals to separate the salt from water. Texas A. & M. College is engaged in such a project, using hexadecanol. This chemical apparently combines with the purer part of the water, and the salty brine separates to another level.

Further I respectfully call your attention to the United States Senate Joint Resolution #135 a measure that was sponsored by Senator Clinton P. Anderson and was signed by the President on September 2, 1950.

In brief this resolution establishes a saline water conversion program to demonstrate the economics and feasibility of various processes in converting large quantities of "off-color" water into potable and useful liquid.

The resolution calls for the establishment of five demonstration plants of different types for the conversion of sea water and the treatment of brackish water. One of these plants may be located in the Southwest.

It is quite possible that a plant could be located in S. E. New Mexico and we urge that the State Engineer Office take full advantage of the possible use that such a plant would afford the people of the State of New Mexico.

We submit that there is need for specific studies and time in which to solve this very important problem. Also the problem is not the same in all parts of the state. Further that there are some areas that could not be contaminated because there simply are no fresh water sands in place.

We men of the petroleum industry may have oil in our blood, but we can no more survive without fresh water to drink than the man with manure on his boots or the soil under his fingernails. We are most anxious that a just and satisfactory conclusion be reached in order that the best interest of the state may be served.

GACKLE OIL COMPANY

Paul S. Johnston
Superintendent of Production

SUMMARY OF PRESENT DISPOSAL OF WATER FROM OIL WELLS IN LEA COUNTY, NEW MEXICO

By
Zane Spiegel
Technical Division
State Engineer Office
Santa Fe, New Mexico
April 1956

From the standpoint of the conservation of our fresh ground-water supplies, the best way of disposing of salt water produced from oil wells appears to be by injection into salt water-bearing formations, preferably into those from which appreciable quantities of fluids have been or are being withdrawn.

However, the large amounts of salt water that already have been recharged to the freshwater aquifers in Lea County, as well as elsewhere, and the rapidly increasing annual production of salt water from most pools make the present disposal methods a serious threat to the entire economy of the areas in which contamination is occurring.

Our recent study of the disposal of salt water from oil wells in Lea County has resulted in several important conclusions, as follows:

1. The cumulative production of salt water reported in Lea County to January 1, 1956, is 677,627,135 barrels (28,476 million gallons or 87,500 acre feet).

2. The total salt water production in Lea County for 1955 was 40,497,031 barrels (1,700 million gallons or about 5,240 acre feet).

3. The total annual pumpage of fresh ground water for irrigation is on the order of 300,000 acre feet annually.

4. The chloride content of the disposed waters ranges from about 4,500 to more than 300,000 parts per million, averaging about 75,000 parts per million.

5. Calculations of the potential evaporation indicates that the areas of the pits used to dispose of the waters are entirely too small to evaporate even a very small part of all water disposed. Definite field evidence of actual contamination has been collected. Field evidence further substantiates that the disposal water actually is not being evaporated to an appreciable extent, and that the salt water must therefore percolate downward from the disposal pits into underlying aquifers. The lack of data and the characteristics of the movement of salt water in an aquifer containing fresh water make it difficult to prove contamination near every disposal pit at the present time. Generally, changes in quality at a particular well are likely to be gradual and perhaps unnoticed at first.

OIL CONS
SA
CASE 1052

6. The partial evaporation that does occur from waters in present disposal pits results in a slight concentration of the dissolved solids; however, the amount of salt carried downward from leaking pits is virtually the same whether partial evaporation occurs or does not occur. It is necessary to use pits that have tightly sealed bottoms and sides in order to prevent contamination. The size of the present pits used for disposal, if the pits were lined to prevent leakage, is not adequate to evaporate the disposed water except in a very few places where the water yields are very small. Pits many acres in extent would be required to completely evaporate the water from most of the water-producing wells.

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

Memo No. 29-58
November 1, 1958

MEMORANDUM:

TO: All Lea County Operators

FROM: A. L. Porter, Jr., Secretary-Director

SUBJECT: Salt Water Committees

In compliance with the provisions of Commission Order R-1224-A, the Commission has appointed committees for the purpose of making studies relative to the necessity for disposal of oil field brines in certain areas of Lea County. The designated areas and the committees are listed below. Each committee member shall consider this memorandum as his official notice of appointment.

Please note that a temporary chairman has been named for each committee. It is suggested that the first meeting should be a meeting of the temporary chairman and the State Engineer to arrange a schedule for the first meeting of all committees. Because of the large number of pools involved, it is expected that a number of sub-committees will be necessary to study the Brunson, Jalmat, Langlie-Mattix, E.M.E. Area, therefore, we have appointed 21 members of this committee with Gulf and Pan American as co-chairmen.

The Commission does not require nor expect a report as to the conclusions of any committee. In the event, however, that either the Committee or the State Engineer concludes that there is necessity for salt water disposal in any area, an application should be filed with the Commission so that the matter may be called for hearing.

The areas to be considered and the committees are as follows:

1. Brunson, Jalmat and Langlie-Mattix Areas, and that portion of the Eumont-Eunice-Monument Area that lies outside the Lea County underground water basin. The following pools are included in these areas: Brunson, Jalmat, Langlie-Mattix, Arrowhead, Blinebry gas, Blinebry oil, Cary, Crosby-Devonian gas, Drinkard, South Eunice, all Fowler pools, Hare, South Hare, all Justis pools, Paddock, Penrose Skelly, Rhodes, all Teague pools, Tubb gas, Wantz Abo, Terry-Blinebry, McCormack, Leonard and portions of the Eunice-Monument and Eumont pools.

Gulf Oil Corporation and Pan American
Petroleum Corporation - Temporary Co-Chairmen

Continental Oil Company

Magnolia Petroleum Company

Neville G. Penrose

Humble Oil & Refining Company

Skelly Oil Company

Albert Gackle

John M. Kelly

Amon G. Carter

Texas Pacific Coal & Oil Company

Southern California Petroleum Company

Amerada Petroleum Corporation

Shell Oil Company

The Ohio Oil Company

Tidewater Oil Company

Sinclair Oil & Gas Company

Tennessee Gas Transmission Company

Aztec Oil & Gas Company

Cities Service Oil Company

State Engineer

2. Dollarhide Area (all Dollarhide pools)

Skelly Oil Company - Temporary Chairman

Sinclair Oil & Gas Company

The Texas Company

Elliott, Inc.

State Engineer

3. Lovington Area (all Lovington pools)

Amerada Petroleum Corporation - Temporary Chairman

Skelly Oil Company

Tidewater Oil Company

Humble Oil & Refining Company

Pan American Oil Company

Cities Service Oil Company

State Engineer

4. S. R. R. Devonian

Amerada Petroleum Corporation - Temporary Chairman

State Engineer

5. Vacuum Area (all Vacuum pools)

Magnolia Petroleum Company - Temporary Chairman

The Texas Company

Phillips Petroleum Company

Standard Oil Company of Texas

Drilling & Exploration Company

S. P. Yates

State Engineer

6. Wilson Area:

Wilson Oil Company - Chairman

Pan American Petroleum Corporation

State Engineer

7. Lynch Area:

The Texas Company - Temporary Chairman

Phillips Petroleum Company

Paul H. Laverty

State Engineer

It is noted that the order requires that the Secretary-Director of the Commission shall appoint a committee for each area in Lea County where substantial quantities of oil field brines are produced. Other committees will be appointed at a later date.

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CALCULATED EVAPORATION OF SALINE WATER FROM SEALED PITS IN THE VICINITY OF HOBBS, NEW MEXICO

(Calculations for the period October 1940 to December 1942, inclusive, for different surface areas per barrel of saline water placed in pits per month)

Prepared by

D. E. Gray and P. D. Akin

STATE ENGINEER OFFICE
SANTA FE, NEW MEXICO
SEPTEMBER 1958

ESTIMATE OF NET EVAPORATION OF SALINE WATER FROM PITS NEAR HOBBS, NEW MEXICO

(1) Year	(2) Month	(3) Pan evap. Portales (inches)	(4) Estimated pan evap. Hobbs (inches)	(5) Estimated gross evap. --saline water from pits near Hobbs (inches)	(6) Precip. Hobbs (inches)	(7) Estimated net evap.--saline water from pit near Hobbs (inches)	(7) (feet)
1940	Jan.	1.425	1.54	0.92	0.05	0.87	0.072
	Feb.	4.365	4.73	2.84	0.56	2.28	0.190
	Mar.	8.484	9.20	5.52	0.25	5.27	0.439
	Apr.	9.161	9.93	5.96	1.25	4.71	0.392
	May	9.945	10.78	6.47	0.63	5.84	0.486
	June	11.518	12.48	7.49	4.10	3.39	0.282
	July	14.775	16.02	9.61	0.55	9.06	0.755
	Aug.	8.919	9.67	5.80	2.80	3.00	0.250
	Sept.	10.248	11.11	6.67	-	6.67	0.555
	Oct.	6.957	7.54	4.52	3.45	1.07	0.089
	Nov.	4.792	5.19	3.11	1.09	2.02	0.168
	Dec.	2.810	3.05	1.83	0.33	1.50	0.125
	TOTAL:	93.399	101.24	60.74	15.06	45.68	3.803
1941	Jan.	2.389	2.59	1.55	0.22	1.33	0.111
	Feb.	3.200	3.47	2.08	0.84	1.24	0.103
	Mar.	5.832	6.32	3.79	2.88	0.91	0.076
	Apr.	8.735	9.47	5.68	0.69	4.99	0.416
	May	9.969	10.81	6.49	9.19	-2.70	-0.225
	June	9.875	10.70	6.42	3.03	3.39	0.283
	July	9.794	10.62	6.37	2.32	4.05	0.338
	Aug.	8.338	9.04	5.42	1.19	4.23	0.352
	Sept.	6.443	6.98	4.19	6.72	-2.53	-0.211
	Oct.	5.191	5.63	3.38	4.66	-1.28	-0.107
	Nov.	3.452	3.74	2.24	0.08	2.16	0.180
	Dec.	2.805	3.04	1.82	0.37	1.45	0.121
	TOTAL:	76.023	82.41	49.43	32.19	17.24	1.437
1942	Jan.	2.676*	2.53**	1.52	0.16	1.36	0.113
	Feb.	4.943*	4.68**	2.81	-	2.81	0.235
	Mar.	8.854	9.60	5.76	0.50	5.26	0.438
	Apr.	7.752	8.40	5.04	1.71	3.33	0.278
	May	12.100	13.12	7.87	1.47	6.40	0.534
	June	12.726	13.79	8.27	1.51	6.76	0.564
	July	11.826	12.82	7.69	1.10	6.59	0.550
	Aug.	10.458	11.34	6.80	2.89	3.91	0.326
	Sept.	6.462	7.00	4.20	0.67	3.53	0.294
	Oct.	5.298	5.74	3.44	0.86	2.58	0.215
	Nov.	4.735	5.13	3.08	0	3.08	0.257
	Dec.	2.876	3.12	1.87	1.88	-0.01	-0.001
	TOTAL:	90.706	97.27	58.35	12.75	45.60	3.803

NOTES

Col.3-Taken from State Engr Tech.Rept.#5, page #266. Values are minimum recorded for period of record 1934-1954.

Col.4-Taken from Fig. 7, p.54 "Tentative Plan for Develop. of land & water Resources-NM Portion-AWR". Portales-4000' elev. gave 67". Hobbs-3600' elev.gave 72.6" - Ratio $\frac{72.6}{67} = 1.084$

Col.5- 0.60-Conversion factor from pan evap. to surface water evap. for saline water. See p.39 "Possible Improvement of Quality of Water of the Pecos River by Diversion of Brine at Malaga Bend, Eddy Cty, NM," USGS-Dec. 1954.

Col.6-Page 187-State Engr. Tech. Rept.#6-Mean Monthly values for period of record 1913-1954.

Col.7-Equals Column #5 minus Column #6.

* Portales evaporation record not available for these months. Figures are pan evaporation from Lake McMillan station.

** See note Col. 4.

Evaporation at Lake McMillan (3280' elevation) = 76.7"

Evaporation at Hobbs (3600' elevation) = 72.6"

$$\text{Ratio} = \frac{72.6}{76.7} = 0.946$$

ESTIMATED ACCUMULATED DEPTH OF
SALINE WATER IN SEALED
PITS NEAR HOBBS

BY MONTHS FROM OCTOBER 1940
TO DECEMBER 1942, INCLUSIVE

(Surface area 25 square feet per barrel of saline water per month)

(1) Year	(2) Month	(3) Depth of saline water placed in pits (feet)	(4) Estimated net evap: saline water from pits near Hobbs (ft	(5) Difference: Col.3 minus Col.4 (feet)	(6) Accumulated depth of water in pits (feet)
1940	Oct.	.224	.089	.135	.135
1940	Nov.	.224	.168	.056	.191
1940	Dec.	.224	.125	.099	.290
1941	Jan.	.224	.111	.113	.403
1941	Feb.	.224	.103	.121	.524
1941	Mar.	.224	.076	.148	.672
1941	Apr.	.224	.416	-.192	.480
1941	May	.224	-.225	.449	.929
1941	June	.224	.283	-.059	.870
1941	July	.224	.338	-.114	.756
1941	Aug.	.224	.352	-.128	.628
1941	Sept.	.224	-.211	.435	1.063
1941	Oct.	.224	-.107	.331	1.394
1941	Nov.	.224	.180	.044	1.438
1941	Dec.	.224	.121	.103	1.541
1942	Jan.	.224	.113	.111	1.652
1942	Feb.	.224	.235	-.011	1.641
1942	Mar.	.224	.438	-.214	1.427
1942	Apr.	.224	.278	-.054	1.373
1942	May	.224	.534	-.310	1.063
1942	June	.224	.564	-.340	.723
1942	July	.224	.550	-.326	.397
1942	Aug.	.224	.326	-.102	.295
1942	Sept.	.224	.294	-.070	.225
1942	Oct.	.224	.215	.009	.234
1942	Nov.	.224	.257	-.033	.201
1942	Dec.	.224	-.001	+.225	.426

Col. 3 - One barrel = 42 gallons = 5.615 cubic feet.
Depth of water = $\frac{5.615}{25}$ = 0.224 feet.

Col. 4 - From Col. 7, page 1.

ESTIMATED ACCUMULATED DEPTH OF SALINE WATER IN SEALED PITS NEAR HOBBS

BY MONTHS FROM OCTOBER 1940 TO DECEMBER 1942, INCLUSIVE

(Surface area 30 square feet per barrel of saline water per month)

(1) Year	(2) Month	(3) Depth of saline water placed in pits (feet)	(4) Estimated net evap: saline water from pits near Hobbs(ft:	(5) Difference Col.3 minus Col.4(feet)	(6) Accumulated depth of water in pits (feet)
1940	Oct.	.187	.089	.098	.098
1940	Nov.	.187	.168	.019	.117
1940	Dec.	.187	.125	.062	.179
1941	Jan.	.187	.111	.076	.255
1941	Feb.	.187	.103	.084	.339
1941	Mar.	.187	.076	.111	.450
1941	Apr.	.187	.416	-.229	.221
1941	May	.187	-.225	.412	.633
1941	June	.187	.283	-.096	.537
1941	July	.187	.338	-.151	.386
1941	Aug.	.187	.352	-.165	.221
1941	Sept.	.187	-.211	.398	.619
1941	Oct.	.187	-.107	.294	.913
1941	Nov.	.187	.180	.007	.920
1941	Dec.	.187	.121	.066	.986
1942	Jan.	.187	.113	.074	1.060
1942	Feb.	.187	.235	-.048	1.012
1942	Mar.	.187	.438	-.251	.761
1942	Apr.	.187	.278	-.091	.670
1942	May	.187	.534	-.347	.323
1942	June	.187	.564	-.377	0
1942	July	.187	.550	-.363	0
1942	Aug.	.187	.326	-.139	0
1942	Sept.	.187	.294	-.107	0
1942	Oct.	.187	.215	-.028	0
1942	Nov.	.187	.257	-.070	0
1942	Dec.	.187	-.001	+.188	.188

Col. 3 - One barrel = 42 gallons = 5.615 cubic feet.
Depth of water = $\frac{5.615}{30}$ = 0.187 feet

Col. 4 - From Col. 7, page 1.

ESTIMATED ACCUMULATED DEPTH OF SALINE WATER IN SEALED PITS NEAR HOBBS

BY MONTHS FROM OCTOBER 1940 TO DECEMBER 1942, INCLUSIVE

(Surface area 40 square feet per barrel of saline water per month)

(1) Year	(2) Month	(3) Depth of saline water placed in pits (feet)	(4) Estimated net evap: saline water from pits near Hobbs(ft	(5) Difference : Col.3 minus Col.4(feet)	(6) Accumulated depth of water in pits (feet)
1940	Oct.	.140	.089	.051	.051
1940	Nov.	.140	.168	-.028	.023
1940	Dec.	.140	.125	.015	.038
1941	Jan.	.140	.111	.029	.067
1941	Feb.	.140	.103	.037	.104
1941	Mar.	.140	.076	.064	.168
1941	Apr.	.140	.416	-.276	0
1941	May	.140	-.225	.365	.365
1941	June	.140	.283	-.143	.222
1941	July	.140	.338	-.198	.024
1941	Aug.	.140	.352	-.212	0
1941	Sept.	.140	-.211	.351	.351
1941	Oct.	.140	-.107	.247	.598
1941	Nov.	.140	.180	-.040	.558
1941	Dec.	.140	.121	.019	.577
1942	Jan.	.140	.113	.027	.604
1942	Feb.	.140	.235	-.095	.509
1942	Mar.	.140	.438	-.298	.211
1942	Apr.	.140	.278	-.138	.073
1942	May	.140	.534	-.394	0
1942	June	.140	.564	-.424	0
1942	July	.140	.550	-.410	0
1942	Aug.	.140	.326	-.186	0
1942	Sept.	.140	.294	-.154	0
1942	Oct.	.140	.215	-.075	0
1942	Nov.	.140	.257	-.117	0
1942	Dec.	.140	-.001	.141	.141

Col. 3 - One barrel = 42 gallons = 5.615 cubic feet.
Depth of water = $\frac{5.615}{40}$ = 0.140 feet.

Col. 4 - From Col. 7, page 1.

ESTIMATED ACCUMULATED DEPTH OF SALINE WATER IN SEALED PITS NEAR HOBBS

BY MONTHS FROM OCTOBER 1940 TO DECEMBER 1942, INCLUSIVE

(Surface area 50 square feet per barrel of saline water per month)

(1) Year	(2) Month	(3) Depth of saline water placed in pits (feet)	(4) Estimated net evap: saline water from pits near Hobbs(ft:	(5) Difference : Col.3 minus Col.4(feet) :	(6) Accumulated depth of water in pits (feet)
1940	Oct.	0.112	.089	.023	.023
1940	Nov.	0.112	.168	-.056	0
1940	Dec.	0.112	.125	-.013	0
1941	Jan.	0.112	.111	.001	.001
1941	Feb.	0.112	.103	.009	.010
1941	Mar.	0.112	.076	.036	.046
1941	Apr.	0.112	.416	-.304	0
1941	May	0.112	-.225	.337	.337
1941	June	0.112	.283	-.171	.166
1941	July	0.112	.338	-.226	0
1941	Aug.	0.112	.352	-.240	0
1941	Sept.	0.112	-.211	.323	.323
1941	Oct.	0.112	-.107	.219	.542
1941	Nov.	0.112	.180	-.068	.474
1941	Dec.	0.112	.121	-.009	.465
1942	Jan.	0.112	.113	-.001	.464
1942	Feb.	0.112	.235	-.123	.341
1942	Mar.	0.112	.438	-.326	.015
1942	Apr.	0.112	.278	-.166	0
1942	May	0.112	.534	-.422	0
1942	June	0.112	.564	-.452	0
1942	July	0.112	.550	-.438	0
1942	Aug.	0.112	.326	-.214	0
1942	Sept.	0.112	.294	-.182	0
1942	Oct.	0.112	.215	-.103	0
1942	Nov.	0.112	.257	-.145	0
1942	Dec.	0.112	-.001	.113	.113

Col. 3 - One barrel = 42 gallons = 5.615 cubic feet.
Depth of water = $\frac{5.615}{50}$ = 0.112 feet.

Col. 4 - From Col. 7, page 1.

JALMAT POOL	AOF	n	P_c	Acre Factor
EL PASO NATURAL PIPELINE SYSTEM				
AMERADA PET				
C C CAGLE C				
1D032637				2.00
ARGO OIL CORP				
LANEHART				
1H212537				.50
ATLANTIC REFINING				
SELBY				
1F332236	1740	.530	668.2	1.00
STATE 24				
1N322437	1320	.656	316.2	.25
CARPER DRLG CO				
CARPER CON ST A				
1A122235				1.00
CITIES SERVICE				
CLOSSON B				
3D202236				2.00
11H302236	3150	.609	115.2	2.00
CLOSSON C FED				
1A182236	48000	.905	617.2	1.96
3I182236	30000	.681	608.2	1.96
DABBS				
1D232537	540	.771	313.2	.50
STATE AS				
1F 22436	10600	.939	767.2	2.00
STATE H				
2H172236				1.00
STATE Q				
1L362336	2600	.577	798.2	.50
STATE W				
1P362436	5500	.832	733.2	1.25
THOMAS				
10192437	1800	.771	489.2	1.00
2G192437	3250	.664	797.2	1.00
CONE J R				
MAGNOLIA MEYERS				
4I222436	600	.961	608.2	.75
CONTINENTAL OIL				
ASCARTE C 24 FED				
1B242536	17	.771	315.2	.50
ASCARTE D 24 FED				
1J242536	263	.754	221.2	.50
DANCIGER A 8 FED				
2P 82336	2300	.889	523.2	2.00

	AOF	n	P_c	Acre Factor
FARNEY A 5 FED				1.00
21 52336	2460	.771	652.2	1.02
3A052336				
JACK A 20 FED	445	.529	308.2	1.50
4G202437				
JACK A 21 FED	1660	.771	715.2	.75
1M212437				
JACK A 29 FED	1635	1.000	690.2	2.00
3H292437				
JACK B 17 FED	4075	.869	923.2	2.00
3A172437				
JACK B 30 FED				1.00
1H302437				
LOCKHART B 31 FD	5200	.537	1063.2	1.50
4P312136				1.00
6F312136				
LYNN A 28 FED	3950	.544	463.2	1.00
5A282336				
LYNN B 25 FED	2175	.528	800.2	1.00
1J252336	16000	.624	879.2	1.00
2M252336				
LYNN B 26 FED	8800	.708	888.2	1.00
1J262336	1250	.771	816.2	1.00
2A262336	3900	.734	910.2	1.00
3C262336	1600	.839	888.2	1.00
4M262336				
LYNN B 27 FED	1350	.998	793.2	1.00
1A272336				
MEYER A 29 FED				1.00
1O292236	1575	.510	767.2	2.00
4L292236				1.00
5A292236				
MEYER B 22 FED	3200	1.000	823.2	1.00
1I222236				
MEYER B 23 FED	5500	.960	871.2	1.00
1C232236	8300	1.000	886.2	1.00
2O232236				1.00
3E232236				
MEYER B 28 FED	1475	.771	570.2	1.00
1E282236	1350	.900	712.2	1.00
2A282236				
MEYER B 33 FED	2700	.771	658.2	1.00
1M332236				
SHOLES A 13 FED				1.00
3P132536				
SHOLES A 19 FED	740	.953	286.2	1.00
1L192537				
SHOLES B 19 FED	1275	.986	281.2	1.00
1N192537				1.00
2C192537				
SHOLES B 30 FED	32	.771	266.2	.50
2D302537				
STATE A 32	3300	.771	683.2	1.00
2G322236				

	AOF	n	P_c	Acre Factor
3P322236	4650	.771	708.2	1.00
4F322236				2.00
STATE E 17				
4E172236				
5L172236	9800	.628	623.2	1.00
STEVENS B 7 UNIT				2.00
1D 72337	1225	.771	792.2	1.00
STEVENS A 34				
1E342336				
2G342336	2850	.920	723.2	1.00
STEVENS A 35				1.00
1J352336	4300	.891	901.2	
2L352336	1825	.721	618.2	.75
STEVENS B 7				1.00
1M 72337	3750	.967	851.2	1.00
2J 72337	2050	.829	701.2	1.00
STEVENS B 12				
1C122336	11000	.795	888.2	1.00
2A122336	15500	.899	842.2	1.00
STEVENS B 14				
1I142336	14500	.784	927.2	1.00
STEVENS B 15				
2K152336	1825	1.000	838.2	1.00
STEVENS B 18				
1F182337	970	.551	916.2	1.00
2K182337	39000	.947	873.2	1.00
STEVENS NM B 18				
1B182337	203	.771	1049.2	1.00
VAUGHN A 12				
1E122436	3000	.624	623.2	.50
VAUGHAN B 1				
1H 12436	8200	.877	922.2	1.00
2F 12436	2765	.987	920.2	1.00
VAUGHAN B 12				
1H122436	8400	.729	903.2	.50
WELLS B 1				
1A 12536	221	.630	731.2	1.00
CULBERTSON IRWIN				
C J LANEHART				
1B282537				.75
DALPORT OIL CORP				
CHRISTMAS				
10252236	2000	.960	840.2	1.00
CHRISTMAS B				
1J212236	2350	.770	674.2	1.00
HARRISON				
1G 72537	1450	.793	510.2	.50
JONES				
1P342236	8000	.910	875.2	1.00
E F KING				
1M312237	730	.596	713.2	1.00
PAGE 3				

	AOF	n	P_c	Acre Factor
W H KING				
1M 62337	20250	.930	888.2	1.00
LAMAR LUNT				
1P202236	233	.770	738.2	1.00
WINTERS				
1B182537	3900	.847	443.2	1.00
WINTERS B				
2L 72537	1025	.771	393.2	.98
WINTERS C				
1J 72537	2600	.983	443.2	1.00
EL PASO NAT GAS				
BLACK SHELL				
20212437	850	.693	705.2	.75
CARLSON FED				
1L222537	2750	.600	578.2	2.00
CARSON FED				
2N232537	273	.771	1040.2	1.00
MOBERLY ELLIOTT				
2D212637	3500	.771	855.2	.50
ELLIOTT				
1F172637	5665	.771	663.2	1.00
ELLIOTT FED				
3H172637	6200	.700	831.2	1.00
FARNSWORTH C				
2G042637	4995	.771	663.2	1.75
GREGORY FED				
1J332537	6200	.622	591.2	2.75
HARRISON FED				
1L272537	4700	.771	678.2	1.00
2D272537	5445	.771	528.2	1.00
JAL D				
3B 82537	4050	.637	587.2	1.00
LANGLIE A FED				
1J172537	238	.771	514.2	1.00
MOBERLY C				
3E212637	4950	.629	618.2	.50
PARKER A FED				
1D292637	6650	.510	643.2	2.00
PRICHARD				
1N152537	5400	.680	638.2	1.00
1A 92537	6900	1.000	690.2	
SHELL STATE				
2P132336	5850	806	918.2	1.00
3P222336	5350	.700	590.2	1.00
4K 22336	15000	920	930.2	1.00
WELLS FED				
1D 42537	2350	.771	683.2	1.00
1[illegible] 52537	13500	.631	679.2	1.25
2G042537				1.00
3K042537	17600	.762	704.2	1.00
4F052537	1140	.854	634.2	1.00
13L 52537	970	.568	491.2	.75
1A 52537	5500	.990	706.2	1.00

	AOF	n	P_c	Acre Factor
A R EPPENAUER				
F S B STUART				
2C222537	7100	.771	682.2	.75
GACKLE ALBERT				
COWDEN				
1J302337	5800	.804	923.2	.75
COWDEN B				
1L302337	6200	.825	916.2	.50
COWDEN C				
4C312337	2900	.857	910.2	1.98
ESMOND				
1A332236				
2H332236				1.00
ETZ				
4I272336				2.00
KING				
10122336	11500	1.000	903.2	1.00
SINCLAIR STATE				
1I232336	11000	.760	962.2	1.00
2K232336	3930	.786	907.2	1.00
GULF OIL CORP				
JANDA E				
3A212336	1900	.771	553.2	1.00
JANDA H STATE				
1I112336	4900	.650	895.2	1.00
JANDA I STATE				
1H 22336	17000	.890	897.2	1.00
2D 22336	14600	.740	895.2	1.00
HAMILTON DOME LTD				
WELLS FED B				
1A 62537	1220	.810	605.2	.25
HAYNES VT DRLG				
DUNN				
3J132436	2900	.746	438.2	1.00
HUMBLE OIL				
HADFIELD				
1J212537	517	.566	555.2	.25
HARRISON				
1M252436	2665	.715	718.2	.75
3K252436	311	.540	530.2	.25
HUNTER				
1D242436	1215	.679	378.2	1.00
LANEHART				
1K212537	1255	.780	511.2	.25
NEW MEX STATE AA				
1H222336	6790	.809	624.2	1.00
NEW MEX STATE B				
1H 22436	2860	.894	784.2	1.00

	AOF	n	P_c	Acre Factor
THOMAS				
10232436	221	.560	388.2	.50
HUSKY OIL CO				
MONTCTO WOOLWORTH				
2M332437				.50
N SHORE WOOLWORTH				
3E332437				1.00
JAL OIL CO INC				
CHRISTMAS B A				
1L282236	2650	.980	525.2	1.00
2!282236	1445	.754	726.2	1.00
DYER				
3H312537	850	.763	368.2	1.00
HODGE				
2B 82437	8000	.596	913.2	1.00
JACKS				
1E 82437	4300	.698	921.2	1.00
JENKINS				
1M292537	995	1.000	398.2	1.00
LEGAL				
2!312537	1380	.923	365.2	1.00
OWEN				
1M212537				.50
REPOLLO				
1E282537				1.00
WOOLWORTH				
1P262436				1.00
KELLY JOHN M				
HAIR				
1K 82437	7600	.869	915.2	.75
SHAHAN				
3G332537	410	.785	424.2	.75
KING WARREN DYE				
TOBY				
2K 72437	14800	.839	905.2	.50
LATE OIL CO				
THOMAS				
1M172437	6500	.727	886.2	1.00
LEONARD OIL CO				
BATES				
1L202537	1000	.904	383.2	1.00
2D292537	560	.810	423.2	1.00
JUSTIS				
1H192537	249	.771	383.2	.50
2H202537	1300	.720	434.2	1.00
V H JUSTIS				
1D202537	380	.954	333.2	1.00

	AOF	n	P_c	Acre Factor
LANEHART				
4B212537	3950	.761	548.2	1.00
LOWE RALPH				
COATES A				
2E312537	13	.771	300.2	.50
M ROSE				
1M182537	132	.637	355.2	.50
3K182537	1750	.891	300.2	.50
SHELL STATE B				
1K162336				.25
SHELL STATE C				
2N362336	3100	.964	822.2	.50
OLSEN R OIL CO				
BLANKENSHIP				
1J182437	1400	.849	880.2	1.00
BLINEBRY A				
8L292337	2600	.610	748.2	1.00
CALLEY				
1H 72537	5575	.946	528.2	.50
COOPER				
10112436	555	.771	485.2	1.00
1H232436	350	.878	727.2	1.00
5H142436	3200	.921	523.2	1.00
COOPER B				
2C142436	320	.771	384.2	1.00
COOPER G SW4				
1K112436	3450	.551	499.2	2.00
COURTLAND MYERS				
1J 62437	2900	.987	920.2	1.00
2M 52437	1675	.771	913.2	1.00
M JAMES				
1G102236	13250	.949	907.2	1.00
S E KING				
10 12336	2750	.960	855.2	1.00
KING E				
1E 12336	8800	1.000	881.2	1.00
MEYERS B				
1F132436	920	.771	615.2	1.00
2H112436	1800	.715	668.2	1.00
VAN ZANDT				
11252436	1575	.935	475.2	1.00
WINNINGHAM				
1C302537	1500	.771	294.2	1.00
2P192537	1510	.855	333.2	.50
31302537				1.50
OLSEN OILS INC				
FEDERAL				
2L312537				
PAGE 7				.75

	AOF	n	P_c	Acre Factor
PAN AMERICAN				
COURTLAND MYERS B				
13L092437				1.00
C M FARNSWORTH				
4E182637				3.00
LANGLIE B FED				
2D152537	735	.715	441.2	.75
C MEYER B FED				
1D 72437	6450	.722	940.2	1.00
10G 72437	6100	.671	920.2	1.00
PHILLIPS PET CO				
WOOLWORTH G 3				
1M 62537	1050	.771	485.2	.97
2H 62537	1650	.640	573.2	1.00
WOOLWORTH				
4J332437	2959	.791	696.2	2.00
RESLER SHELDON				
STEELER A				
1L202337				1.00
RODMAN E G				
HADFIELD				
2P10212537	865	.811	559.2	1.00
HUMBLE STATE L				
11322437	13000	.957	718.2	.75
RODMAN NOEL OIL				
FEDERAL Y				
1C 52336	1150	.978	683.2	
SAMEDAN OIL CORP				
HUGHES B				
1C192337	12600	.944	925.2	1.00
SCHERMERHORN OIL				
AMERADA MILDRED U				
11242235	5900	.860	877.2	2.00
WHITTEN				
1J332336				1.00
WOOLWORTH				
3J282437	8200	.803	691.2	2.00
SCOTT CLARA T TR				
VAUGHN B 3				
1F 32436	2650	.551	811.2	2.00
E J WELLS				
2A122536				.50
SHELL OIL CO				
CHRISTMAS A				
1M232236	7600	.727	830.2	1.00

	AOF	n	P_c	Acre Factor
CHRISTMAS B				
1L2522 36	4700	.600	878.2	1.00
SHELL CHRISTMAS				
2B212236	3380	.727	699.2	1.00
STATE A				
1D362436	1125	.863	1047.2	1.00
SIMON JULIAN E				
SMITH				
3I 42537				.75
WOOLWORTH				
1K332437	3150	1.000	701.2	.50
SINCLAIR OIL GAS				
CROSBY A FED				
10292537	470	.813	653.2	.50
CROSBY B FED				
1N282537				1.00
FEDERAL 714				
3L172336	5285	.560	1172.2	1.00
HAIR				
2E 92437	1900	.607	350.2	.50
HANAGAN				
4K122536	77	.771	253.2	.75
JONES				
1D352236	3495	.970	851.2	1.00
STATE 157 A				
2J 92236	2050	.960	730.2	1.00
STATE 157 B				
2F 72236	4000	.705	750.2	.95
STATE 157 C				
10322437	4650	.871	704.2	.50
2P322437	5700	.905	810.2	.25
STATE 157 E				
1G322437				.50
STATE 157 F				
1A172336	1100	.740	463.2	1.00
SKELLY OIL CO				
E COATS				
2N 32436	1100	.742	391.2	1.00
3M 32436	890	.893	386.2	1.00
J W COOPER				
3N122436	8750	.946	613.2	1.00
E T JOHNS				
1L212437				.25
KING C				
1G 12336	8900	.659	889.2	1.00
KING D				
1E 62337	4950	.665	877.2	1.00
LIBERTY ROYALTY				
5J 72437	15900	.812	922.2	1.00
MEXICO D				
1J362336	3250	.679	873.2	.50

	AOF	n	P_o	Acre Factor
MEXICO E				
10 22336	8500	.968	917.2	1.00
MEXICO G				
1D162437	1550	.827	853.2	1.00
SHERRELL				
3B 62537	3350	.854	595.2	.50
5N312437	2950	.903	733.2	1.50
STATE M				
3K322437	1160	.878	747.2	.75
S E TOBY				
1MO72437	3500	.816	466.2	.49
SOU CAL PET CORP				
ALSTON				
4F262537				.75
DABBS				
1M342537				1.00
2E342537				1.00
GUTMAN				
1G182437	840	.689	758.2	1.00
HUNTER				
1K132436	1500	.831	493.2	1.00
LANKFORD				
1G252336				.75
LIBERTY ROYALTY				
3L 32537	1340	.774	659.2	1.00
MARTIN				
2A312437	710	.602	625.2	1.00
MARTIN B				
1F312437	760	.759	471.2	1.00
MOSLEY				
2L342437				.50
TEXAS STATE				
21162336	2000	.648	552.2	.50
VAN ZANDT				
4G252436	1550	.591	491.2	.25
VOSBURG				
11182537	380	.615	371.2	.50
WOOLWORTH				
4M 82537	137	.771	703.2	1.00
SUN OIL CO				
LANEHART				
21202537	970	.772	478.2	.50
PEERLESS ET AL				
1C222236	4300	.970	789.2	1.00
HS RECORD UNIT T				
1A222236	6800	.956	849.2	1.00
TEXAS CO THE				
BLACK				
2K212437	1025	.720	718.2	1.25
FRISTOE B ET AL				
2M312437				.50

	AOF	n	Pc	Acre Factor
T P COAL AND OIL				
STATE A 1				
1N222336	1375	.771	623.2	1.00
2L212336	2400	.723	535.2	1.00
3E212336	2675	.865	568.2	.75
4C212336				.75
6F212336	3700	.567	541.2	1.00
8O212336	1800	.660	488.2	1.00
9M 92336	2950	.700	565.2	2.00
12O 92336	10500	.808	929.2	1.00
13H142336	1525	.829	571.2	1.00
14E 92336	2700	.726	626.2	1.00
15F 42336	8500	.579	904.2	1.00
16A112336	6600	.721	558.2	1.00
18M 42336	1010	1.000	569.2	1.00
19E222336	11500	.818	905.2	1.00
20C132336				1.00
21H132336	8100	.731	905.2	1.00
22N132336				1.00
23B 42336	7300	.585	916.2	1.00
24N242336	13000	.757	920.2	1.00
25F242336	10750	.881	928.2	1.00
26G232336	11250	.800	902.2	1.00
28F142336	16600	.700	937.2	1.00
29C112336	5700	.720	989.2	1.00
30 32336	10250	.990	901.2	1.00
31H152336	24000	.880	918.2	1.00
32J242336	6300	.705	842.2	1.00
33F152336	9975	.618	949.2	1.00
34K112336	6800	.881	889.2	1.00
35L 32336	6500	.825	893.2	1.00
37F102336	5500	.839	840.2	1.00
38M102336	5600	1.000	553.2	1.00
39J172336				1.00
STATE A 2				1.96
5A 72236	12000	.971	894.2	2.00
12I 72236	3500	.840	631.2	2.00
36M112236	12200	.675	919.2	2.00
37K 82236	4550	.880	943.2	1.00
38K 92236	6600	.960	875.2	3.00
40A 92236	1775	.576	904.2	1.00
41M 52236	4950	761	1100.2	2.00
42E112236				
43H 82236	8300	.770	911.2	1.00
STATE A 3	11750	.727	926.2	1.00
1A102336				
2I102336				
THOMPSON CONE				
STANOLIND MEYERS				
1H222436	800	.587	507.2	1.00
PAGE 11				

	AOF	n	P_c	Acre Factor
THREE STATES NAT				
STUART				
1M102537	590	.671	625.2	.25
TIDEWATER OIL CO				
CHRISTMAS				
1F262236	4900	.526	865.2	1.00
E F KING				
1M 12336	22250	.930	882.2	1.00
STATE T				
11 22436	16250	.987	922.2	1.00
WEIER DRILLING CO				
WOOLWORTH				
3M282437				.50
4L282437				.50
WESTERN NAT GAS				
BATES				
2D182437	1275	.889	772.2	.98
BLINEBRY A FED				
2D302337	18500	.780	918.2	1.00
7G302337	5900	.826	857.2	1.00
CAMP				
1M 62437	840	.880	467.2	
COMBEST C				
1H352336	5200	.857	744.2	2.00
COOPER				
2F122436	670	.585		.50
COOPER C				
1G122436	500	.771	878.2	.50
COWDEN				
1P302337	1700	.771	788.2	.75
CURRY				
1P 12436	2525	.606	533.2	1.00
GUTHRIE				
103422336	575	.532	579.2	1.00
HALF				
1K342236	2775	.947	860.2	1.00
HARRINGTON				
1D102236	22750	1.000	953.2	1.00
HARRISON B				
1D 72537	2900	.767	475.2	.98
JONES				
1A342236	5750	.891	860.2	2.00
KING				
1L122336	7700	.740	881.2	
LANKFORD				
1C252336	11500	.898	913.2	1.00
MATKINS				
1P152336	3100	.801	808.2	1.00
MCDONALD ST				
1L142236	16200	.806	873.2	1.00
2M262536	3000	.818	869.2	

	A O F	n	P_c	Acre Factor
3P362236	35000	.869	892.2	1.00
4M362236	29250	.980	889.2	1.00
5D362236	12500	.920	885.2	1.00
6B362236	8100	.671	861.2	1.00
7A352236	8400	.910	883.2	1.00
8P262236	51	.818	869.2	1.00
9G262236	9400	.950	883.2	1.00
11D142236	3200	.826	837.2	2.00
12M242236	890	.567	727.2	1.00
13P152236	7700	1.000	840.2	1.00
14G152236				2.00
MCDONALD A 15 ST				
1L152236	3000	.771	711.2	1.00
OWENS				
1M262236	4950	.573	856.2	1.00
RECORD				
1P102236	15200	.660	889.2	2.00
SHIPLEY				
1N272236	6600	.884	793.2	1.00
STATE A 35				
1P352236	16500	.855	869.2	1.00
STATE B				
1C 22537	410	.771	205.2	.25
STEELER C				
1P192337	1590	.869	719.2	1.00
2N192337				1.00
TOBY				
1P122436	2200	.622	783.2	1.00
TOBY A				
1A132436	5700	.771	414.2	1.00
WELLS FED				
1G 62537				1.00
WIMBERLY				
1F232537	5150	771	478 2	.75
WOOLWORTH FED				
1A172537	7000	.855	603.2	1.00
TOTAL EL PASO CONNECTIONS	1544982	228.890	204707.0	346.48

PERMIAN BASIN PIPELINE SYSTEM

AMERADA PETROLEUM				
FALBY				
3K192437	1753	.570	678.3	.25
HODGES				
11 82437	1707	.771	910.9	1.00
STATE JCT				
1B162336				.50
2G162336				.50
STATE LMT				
2F362336	1725	.750	855.0	1.00
5A362336	1299	.771	923.7	1.00

	AOF	n	P_c	Acre Factor
ANDERSON PRICHARD STATE A 32 1E322437	3496	.727	723.8	.75
GULF OIL CORP CHRISTMAS A 2H272236	10700	.920	836.2	2.00
J H DAY 3N062236	980	.771	621.3	1.42
FOWLER HAIR 1M 82437	7450	.720	703.2	.25
H D GREER 1K212236	2650	.680	816.7	1.00
J R HOLT A 2N162437	13650	.900	876.6	1.75
J R HOLT B 2P362336				.50
J F JANDA F 7K 42236	23250	.900	917.8	2.00
JANDA G STATE 1A242336	17500	.990	968.8	1.00
LEONARD D STATE 3K 32236	1300	.780	901.2	3.00
MANDA C 1B352336	1270	.560	415.7	.25
RAMSAY B ST 1M322537	26500	.770	971.2	2.00
W A RAMSAY ST 1M342136	2350	.910	656.1	4.00
ARNOTT RAMSAY B 2H322537	8200	.830	610.1	2.00
ARNOTT RAMSAY E 5E162537	10100	.970	595.9	1.75
RAMSAY E ST 20162537	5459	.850	568.6	1.75
WOOLWORTH 3K302437				1.00
OHIO OIL CO MCDONALD 6N162236	15250	.896	777.2	3.75
25H162236	5000	.858	820.2	
PAN AMERICAN C MEYER B FED 2M 42437	2000	.560	686.6	1.00
C MYERS B FED 11B 62437	11200	.771	855.5	2.00
WOOLWORTH 4E282437	3050	.690	675.3	1.00

	AOF	n	P_c	Acre Factor
SINCLAIR OIL GAS				
STATE 157 G				
1H 52236	726	.771	797.9	1.00
SKELLY OIL CO				
J C JOHNSON				
4D202337	2807	.869	773.5	1.00
E L STEELER				
7L172337	1255	.660	675.8	1.00
TEXAS CO THE				
STATE B NCT 2				
3D162336	2325	.640	512.7	1.00
J D YOUNG				
3O 52437	9380	.600	903.3	1.00
TOTAL PERMIAN CONNECTIONS	194332	22.455	22029.1	43.42
PHILLIPS PIPELINE SYSTEM				
TIDEWATER OIL CO				
DAY				
1C 62236				.25
TOTAL PHILLIPS CONNECTIONS				.25
SCHERMERHORN OIL PIPELINE SYSTEM				
KENWOOD OIL CO				
STATE B148				
1C322437				.25
SCHERMERHORN CONNECTIONS				.25
SOUTHERN UNION PIPELINE SYSTEM				
GACKLE ALBERT				
JONES RODMAN				
1M352236				1.00
SINCLAIR STATE				
4H 32336				2.06
TOTAL SOU UNION CONNECTIONS				3.06
PAGE 15				

	AOF	n	P_c	Acre Factor
UNITED CARBON CO				
PIPELINE SYSTEM				
CITIES SERVICE				
CLOSSON FED				2.00
1J 62236				
CLOSSON B FED				
6E202236	1850	.945	909.2	1.92
8L192236	1250	.771	1066.2	2.00
9J192236				
		1.716		5.92
UNITED CARBON CO	3100		1975.4	
CONNECTIONS				399.38
		253.061		
POOL TOTAL	1742414		228711.5	
POOL TOTAL				
PAGE 16				

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

July 29, 1958

ADDRESS CORRESPONDENCE TO:
P. O. BOX 1079
SANTA FE, N. M.

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

Dear Mr. Porter:

I appreciate receiving copy of your Order of Continuance in Case No. 1053 and note with interest that you are requiring reports from those not in the cooperative agreements.

Yours truly,

S. E. Reynolds
State Engineer

By: Frank E. Irby
Frank E. Irby
Chief
Water Rights Division

FEI/ma

been successively continued to March 26, 1957, September 4, 1957, March 18, 1958, and June 18, 1958, on all of which dates progress reports were submitted by the Chairmen of the ten committees.

When it was decided at the June hearing to continue the case to September 17, 1958, the Commission announced that an order of continuance would be entered. Accordingly Order R-1224 was entered on July 28 and copies were mailed to the 90 operators in the ten most critical areas on July 29th. Return receipts were requested and all operators have now acknowledged receipt of the order.

Order R-1224 requires that all operators in the ten most critical areas file a written report by September 10 or be represented by some one at this hearing to give an oral report. The written reports have been carefully recorded, and in order that all operators who are represented here today may be given credit for reporting, we are asking that each pool chairman be very careful to list all operators whom he represents.

In order that this case may be disposed of in the most orderly and expeditious manner possible, the Commission will receive testimony, reports and statements in the following order:

A. TEN MOST CRITICAL AREAS

✓ (1) Harris - NMSE; Aiken - Witness Testimony by State Engineer regarding ten most critical areas.

(2) Testimony by interested operators regarding ten most critical areas.

(3) Rebuttal testimony by State Engineer if necessary.

(4) Presentation of progress reports by operators on ten most critical areas.

(5) Statements and recommendations regarding ten most critical areas.

B. THIRTEEN SECOND MOST CRITICAL AREAS

(1) Testimony by interested operators concerning any or all of the thirteen areas listed as the second most critical in Commission Memorandum 22-56.

(2) Testimony by State Engineer regarding these same thirteen areas.

September 17, 1958

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NEW MEXICO
OIL CONSERVATION COMMISSION
Box 871
Santa Fe, New Mexico

STATEMENT OF THE COMMISSION

It has come to our attention that there is some question concerning the Commission's jurisdiction over the subject of salt water disposal. In order to resolve any doubts in this regard, it is our position that the Oil Conservation Commission has general jurisdiction over the subject of salt water disposal by virtue of its implied power to supervise the production of oil and gas in the State of New Mexico. Such jurisdiction is also expressly conferred upon this Commission by subsections (2) and (7) of Section 65-3-11 of the New Mexico Statutes Annotated.

Case No. 1053 was originally called by the Commission on its own motion, at the request of the State Engineer, to consider the need for an order prescribing rules and regulations governing the disposal of salt water in areas of Lea County.

On April 18, 1956, the Commission heard brief testimony by personnel of the State Engineer's Office and continued the case to May 16, 1956. At that time more comprehensive testimony was presented by the State Engineer's Office, and after considerable cross examination the case was again continued to the September 13, 1956 hearing date. The Secretary-Director issued a statement that prior to the hearing on September 16, 1956, operators would be advised as to what areas were considered the most critical by the Office of the State Engineer. By Memorandum No. 22-56 dated July 3, 1956, the operators were advised of the ten areas in which salt water disposal should be given immediate attention. This memorandum also directed attention to thirteen other areas which should be considered in the very near future.

At the September 13 hearing it was brought out that soon after receipt of Memorandum 22-56 a meeting of 41 operators was held in Hobbs, at which meeting Chairmen of Committees for the ten critical areas were selected. It was further stated that there had been meetings of committees for all of the ten most critical fields. Progress reports were submitted by these Chairmen and the case was continued to December 13, 1956. The case has

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

October 30, 1958

COPY

Magnolia Petroleum Company
Box 2406
Hobbs, New Mexico

Gentlemen:

Pursuant to our Memorandum No. 29-58 dated November 1, 1958, a meeting of the temporary chairmen of all committees named therein is scheduled for 2:00 p.m. Tuesday, November 4th, 1958, in the conference room of Pan American Petroleum Corporation in Roswell, New Mexico.

It is very important that all operators who have been named as temporary chairmen have representatives on hand for this meeting, the purpose of which will be to work out a schedule of meetings for all of the committees at later dates. If for any reason you will be unable to have a representative at this meeting, please advise immediately.

Very truly yours,

A. L. PORTER, Jr.,
Secretary-Director

ALP/ir

AIR MAIL

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1053
Order No. R-1224-A

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION, AT
THE REQUEST OF THE STATE ENGINEER,
FOR AN ORDER PRESCRIBING RULES AND
REGULATIONS TO GOVERN THE DISPOSAL
OF SALT WATER IN AREAS OF LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause originally came on for hearing at 9 o'clock a.m. on May 16, 1956, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and was continued from time to time, and was heard again on June 18, 1958, and again on September 17, 1958.

NOW, on this 24th day of October, 1958, the Commission, a quorum being present, having considered the evidence adduced 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 by virtue of its implied powers and the express powers conferred upon the Commission by sub-section (2) and (7) of Section 65-3-11 of the New Mexico Statutes Annotated (1953).

(2) That the surface disposal of oil field brines in unlined pits in the following-described areas constitutes a hazard to the fresh waters in the Lea County Underground Water Basin, as the same is defined by the State Engineer of the State of New Mexico, and that such method of disposal should be prohibited in said areas, to-wit:

Hobbs	East Caprock	Crossroads
Denton	Bagley	Bough
Moore	Saunders	Echol

(3) That only a portion of the Eunice-Monument-Eumont Area (Eunice-Monument, Eumont, Monument-Blinebry, and Monument

Paddock Pools) lies within the boundaries of the said Lea County Underground Water Basin.

(4) That the disposal of oil field brines in unlined pits in that portion of the Eunice-Monument-Eumont Area which lies within the boundaries of the Lea County Underground Water Basin constitutes a hazard to the fresh waters in said basin and that such method of disposal should be prohibited in that portion of said area.

(5) That the testimony presented at the September 17, 1958, hearing of this case has raised a question as to whether the disposal of oil field brines in unlined pits in any area of Lea County other than those areas referred to in Findings No. 2 and 4 above constitutes a hazard to the fresh water supplies of Lea County.

(6) That paragraph (3) of Order No. R-1224 should, therefore, be rescinded.

(7) That a detailed localized study should be made of each area in Lea County, not included in Findings No. 2 and 4, where substantial quantities of oil field brines are produced, to determine whether the surface disposal of said brines in unlined pits constitutes a hazard to the fresh water supplies of Lea County. Further, that the Secretary-Director of the Commission should, from time to time, appoint pool committees to make such studies.

(8) That any well which produces one half ($\frac{1}{2}$) barrel or less of oil field brines per day should be exempt entirely from the provisions of this order, since there is no evidence that the disposal of such insignificant quantities of oil field brines in unlined pits would constitute a hazard to the fresh waters in the area.

(9) That provision should be made to empower the Secretary-Director to grant administrative exceptions to this order in individual cases where it appears that the granting of such exception would cause no danger of contamination, provided the State Engineer's Office has waived objection to the exception.

IT IS THEREFORE ORDERED:

1. That the surface disposal of oil field brines in unlined pits in the following-described areas be and the same is hereby prohibited as of the effective dates shown below:

Hobbs Area Hobbs Pool Hobbs Drinkard Pool Bowers Pool	-	March 15, 1959
Denton Area Denton Pool Denton-Wolfcamp Pool	-	December 1, 1958
Moore Area Moore-Devonian Pool Moore-Pennsylvanian Pool	-	December 1, 1958
Crossroads Area Crossroads Pool Crossroads-Pennsylvanian Pool Crossroads-Slaughter Pool	-	December 1, 1958
East Caprock Area East Caprock-Devonian Pool	-	December 1, 1958
Bagley Area Bagley-Siluro Devonian Pool Bagley-Pennsylvanian Pool	-	December 1, 1958
Saunders Area Saunders-Pennsylvanian Pool	-	December 1, 1958
Bough Area Bough-Pennsylvanian Pool	-	December 1, 1958
Echol Area Echol Pool	-	December 1, 1958
Eunice-Monument-Eumont Area Eunice Monument Pool Monument-Blinebry Pool Monument-Paddock Pool Eumont Gas Pool Cass Pool Weir Pool	-	March 1, 1960

The provisions of this paragraph apply only to that portion of the Eunice-Monument-Eumont Area which lies within the Lea County Underground Water Basin as the same was declared by the State Engineer in his Order No. 3, dated August 21, 1931, and as the same was extended by Order No. 33, dated October 1, 1952.

PROVIDED HOWEVER; that any well which produces one half ($\frac{1}{2}$) barrel, or less, of oil field brines per day shall be entirely exempt from the provisions of this order.

2. The Secretary-Director of the Commission shall have authority to extend the effective dates set forth in paragraph 1. above without notice and hearing where good cause is shown.

3. That nothing contained in this order shall be construed as prohibiting the disposal of oil field brines in impervious lined pits, provided said pits are inspected and approved by a representative of the Commission prior to being used.

4. That the Secretary-Director of the Commission shall have authority to grant exceptions without notice and hearing, to paragraph (1) above where, in his opinion, the granting of such exception would not create a hazard to any fresh water supply, provided the State Engineer has waived objection to the proposed exception.

5. That the Secretary-Director of the Commission shall appoint a committee for each area in Lea County, New Mexico, where substantial quantities of oil field brines are produced, which committees shall make studies as to whether the disposal of oil field brines in unlined pits constitutes a hazard to any fresh water source in said areas. The State Engineer shall be a member of each of said committees.

Such committees will not be required to submit formal reports of their findings to the Commission. If, however, a committee or any member thereof is of the opinion that the surface disposal of oil field brines in unlined pits constitutes a hazard to any fresh water supply, the Commission shall be so notified and the matter shall be set for hearing.

6. That paragraph (3) of Order No. R-1224 be and the same is hereby rescinded.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1053
Order No. R-1224

APPLICATION OF THE OIL CONSERVATION
COMMISSION UPON ITS OWN MOTION, AT
THE REQUEST OF THE STATE ENGINEER,
FOR AN ORDER PRESCRIBING RULES AND
REGULATIONS TO GOVERN THE DISPOSAL
OF SALT WATER IN AREAS OF LEA COUNTY,
NEW MEXICO.

ORDER OF CONTINUANCE

BY THE COMMISSION:

This cause originally came on for hearing at 9 o'clock a.m. on May 16, 1956 at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," and was continued from time to time, last being heard on June 18, 1958.

NOW, on this 28th day of July, 1958, the Commission, a quorum being present, having considered the evidence adduced 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 it is the policy of the Commission, in cooperation with the State Engineer, to eliminate the practice of surface disposal of large volumes of oil field brines which may contaminate the fresh water bearing horizons in Lea County, New Mexico.

(3) That by Commission Memorandum No. 22-56, dated July 3, 1956, all operators in the following-named areas were advised to give immediate attention to formulating procedures for the efficient disposal of salt water produced in such areas:

Hobbs
Denton (Devonian) and Denton-Wolfcamp
Eunice Monument Area:
    Eunice-Monument
    Eumont
    Monument-Blinebry
    Monument-Paddock
Moore-Devonian
Caprock, East Devonian
Bagley Siluro-Devonian and Bagley-Pennsylvanian
Saunders
Crossroads
Bough
Echol-Devonian

(4) That testimony adduced at the June Regular Hearing indicates that progress is being made in most of the above-mentioned areas, but that 100-percent disposal has been achieved in only a few of such areas.

(5) That all operators in the above-mentioned areas should proceed with due diligence to complete efficient salt water disposal systems.

(6) That all operators in said areas should report to the Commission on or before September 17, 1958, on the progress made thus far and the estimated completion date of a 100-percent disposal system.

(7) That all operators in the following-named areas should proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas - such areas having been listed as the second most critical in Commission Memorandum No. 22-56, dated July 3, 1956:

Jalmat
Langlie-Mattix
Arrowhead
Brunson
South Eunice
Cass
Dollarhide (All Pools)
Lovington (All Pools)
Teague-Ellenburger
SRR-Devonian
Vacuum
Wilson
Lynch

(8) That Case No. 1053 should be continued until the Regular Hearing on September 17, 1958.

IT IS THEREFORE ORDERED:

(1) That all operators in the following-named areas shall proceed with due diligence to complete efficient disposal systems for all salt water produced in such areas:

Hobbs
Denton (Devonian) and Denton-Wolfcamp
Eunice Monument Area:
- Eunice-Monument
- Eumont
- Monument-Blinebry
- Monument-Paddock

Moore-Devonian
Caprock, East Devonian
Bagley Siluro-Devonian and Bagley-Pennsylvanian
Saunders
Crossroads
Bough
Echol-Devonian

(2) That all operators in the above-named areas shall report to the Commission at the Regular Hearing on September 17, 1958, on the progress made thus far and the estimated completion

date of a 100-percent disposal system. Operators who are members of a cooperative group may report through the committee chairman, who shall be prepared to name all operators who are members of such group. All operators who are not members of a cooperative group shall furnish a written progress report to the Commission prior to September 10, 1958, or shall appear at the Regular Hearing on September 17, 1958, to report the progress made thus far and the estimated completion date of a 100-percent disposal system for each well which they operate in the above-named areas.

(3) That all operators in the following-named areas shall proceed with due diligence to formulate plans concerning the disposal of salt water produced in said areas:

Jalmat
Langlie-Mattix
Arrowhead
Brunson
South Eunice
Cass
Dollarhide (All Pools)
Lovington (All Pools)
Teague-Ellenburger
SRR-Devonian
Vacuum
Wilson
Lynch

(4) That Case No. 1053 be and the same is hereby continued until September 17, 1958.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

ir/

Case #
1053

TIDEWATER OIL COMPANY
HOBBS, NEW MEXICO

September 16,1958

New Mexico Oil Conservation
Commission
Santa Fe, New Mexico

Re: Case No. 1053
Order No.R-1224

Gentlemen:

We enclose with this letter a booklet of production curves on all of the Tidewater wells in the Eumont Pool. We have also included curves on the Tidewater and Getty Wells in the Bowers Pool for the reason that this Pool overlaps the Hobbs Pool. These Bowers curves are included, although not specifically required under the above Order.

This data covers all of the wells not included in any co-operative salt water system and which are within the Pools listed in Paragraph (1) of the Order portion of your Order No. R-1224.

This data, together with this letter, constitute a response to your Order. The data shown indicates that there is such an insignificant amount of water produced from these wells that no further consideration of disposal of such water is required. There are now no treaters or gun barrels on the leases, except a heater treater on the Bowers Field Lease known as the H. D. McKinley Lease of Getty. This treater is not presently in use.

With the submission of this data, we believe that Tidewater has fully complied with Paragraph (1) of the Order portion of your Order No. R-1224 and, further, that it is evident that no further planning of disposal systems is required of it.

Very truly yours,

Allen Seth

ajg

State AD Lease:
N½NE¼, N½NW¼, Section 9, Township 19 South, Range 37 East.

State AG Lease:
NE¼, Section 2, Township 20 South, Range 37 East.

State AH Lease:
W½SW¼, Section 34, Township 18 South, Range 37 East.

State AI Lease:
NW¼, Section 15, Township 19 South, Range 37 East.

State AJ Lease:
E½NE¼, E½SE¼, Section 27, Township 19 South, Range 37 East.

State AL Lease:
NW¼NW¼, Section 35, Township 19 South, Range 37 East.

State AM Lease:
W½SE¼, Section 22, Township 19 South, Range 37 East.

McKinley Lease:
NE¼, Section 30, Township 18 South, Range 38 East.

Grimes Lease:
SE¼NE¼, NE¼SE¼, Section 29, Township 18 South, Range 38 East.

State B Lease:
N½, Section 14, Township 18 South, Range 37 East.

CASE 1052::OCC application for an order prescribing rules & regulations governing disposal of salt water in areas of Lea County.

GLOBE
"TUFTEAR"
FOLDER
TO RE-ORDER SPECIFY
No. FOLDER
MADE IN U. S. A.
3-544